30-DAY EVENT REPORT
TROPICAL STORM ISAIAS

Submitted to the Connecticut Public Utilities Regulatory Authority
September 8, 2020
September 8, 2020

Marissa Paslick Gillett, Chair
John W. Betkoski III, Vice Chair
Michael Caron, Commissioner
Connecticut Public Utilities Regulatory Authority
Ten Franklin Square
New Britain CT 06051

Re: Docket No. 20-08-03, Investigation into Electric Distribution Companies’ Preparation and Response to Tropical Storm Isaias – Compliance with Order No. 2: 30-Day Event Report

Chair Gillett and Commissioners,

On behalf of the 8,300 dedicated employees of The Connecticut Light and Power Company dba Eversource Energy (“Eversource” or “the Company”), as well as the contractors and mutual aid crews supporting our response to historic and destructive Storm Isaias, we are pleased to submit this 30-Day Event Report to the Public Utilities Regulatory Authority (“PURA”) detailing Eversource’s planning, preparation and recovery efforts during the historic Storm Isaias.¹

We appreciate PURA’s plan to conduct a thoughtful and expeditious inquiry into the circumstances of Storm Isaias and our preparedness in responding to the damage wrought across the entire State of Connecticut by the storm. Every storm is a learning opportunity. We know that there are things we could have done better and that there is always room to improve our performance. We are already working to examine what went right and what went wrong in responding to the storm and PURA’s proceeding will provide an opportunity to bring the results of this examination forward to improve for the future.

However, we also know we were fully prepared and that the perception that we were not prepared, is inaccurate. Particularly in the COVID-19 environment, we recognized well in advance that we had to be prepared to meet the conditions of a major event coming into the hurricane season, so that the health of our employees and customers would not be jeopardized in responding to such an event. We are looking forward to presenting the facts and information to you for review and we appreciate PURA’s plan to conduct a thorough, fair and impartial review of our response to the storm.

¹ This 30-Day Event Report is submitted pursuant to PURA’s August 14, 2020, Revised Notice of Proceeding & Orders for Emergency Response, Order 2: “In accordance with Conn. Gen. Stat. § 16-32h(h), the EDCs shall each submit a supplemental emergency response report to the Authority within thirty (30) days. Such report shall include a description of the EDC’s preparation for and response to Tropical Storm Isaias and shall include any proposed corrective actions or improvements to the emergency response plan.”
Our response to the Storm Isaias was the quickest and largest mobilization ever achieved for the State of Connecticut and our customers. This 30-Day Event Report presents a step-by-step, detailed view of our response throughout key areas of our company, subdivided into the following categories:

**Emergency Response Planning and Preparation:** Eversource used multiple weather sources to track the progress of Storm Isaias ahead of its impact and made thorough preparations in anticipation of a major storm event. We made these preparations in keeping with safety protocols laid out in our pandemic emergency plan, which was already in place and tested in previous storm events.

**The Storm Event:** The actual destructive force of the Storm was much more severe than anyone expected, with Connecticut suffering the brunt of the disintegrating tropical storm, its far-flung energy systems and the combined impact of drought-weakened trees. Eversource responded to almost 200 life-threatening downed wire situations within 24 hours of the event, and over 4,000 downed wire events throughout the restoration, all caused by the unexpected intensity of the storm conditions.

**Aftermath and Restoration:** Eversource assembled a massive response to address customer outages and community priorities in parallel, which was made possible only as a result of the company’s advanced preparation and planning. Power was restored more quickly than any prior event of this magnitude, despite the greater level of damage than expected.

Our report also addresses topics of interest to our customers and communities, including the temporary issues experienced with our outage reporting systems; our effort to balance customer restoration with the response priorities of community leaders; and our communication throughout the storm with community officials and first responders. As leaders of a learning organization, we know with certainty that Eversource has room to improve, and we look forward to working with PURA and other stakeholders to better serve our Connecticut customers.

Lastly, we would be remiss if we did not recognize the thousands of Eversource employees who worked diligently, as a dedicated team, to achieve the most expeditious restoration in our history, given the level of damage that occurred. Our employees leave their families to work incredibly long hours, under difficult conditions, all devoted to the task of restoring power to customers as quickly as possible while also assisting communities with their priorities. Our employees did an excellent job in this event, working with external contractors and countless local and state police, firefighters, public works employees, and elected officials to respond to this catastrophic storm event. Most importantly, we did so safely, adhering to our COVID-19 pandemic protocols. We are extraordinarily grateful for their dedication, skill and perseverance under challenging working conditions.
Thank you again for the opportunity to provide you with this report and we look forward to the process ahead.

Sincerely,

James J. Judge
Chief Executive Officer

Craig A. Hallstrom
President

Penni McLean-Conner
Chief Customer Officer

cc: Service List
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I. EXECUTIVE SUMMARY

On August 4, 2020, between the hours of 2 p.m. and 6 p.m., a major weather event – Tropical Storm Isaias – roiled through the State of Connecticut. The onset of Tropical Storm Isaias was expected. The storm trundled up from south of Puerto Rico, along the East Coast of the U.S., over the 10 days prior to impact in Connecticut under the watchful eye of the National Weather Service, the National Hurricane Center (“NHC”), innumerable meteorologists, electric utility companies, state authorities and customers. Ultimately, the devastating impact of Tropical Storm Isaias in Connecticut caused 632,632 customer outages at peak on the Eversource system and 21,669 damage locations, which is more than any major weather event in the history of Connecticut, except for the October 2011 Nor’easter.

This 30-Day Report on Tropical Storm Isaias and Eversource’s preparedness, response and event review is submitted as required by directive of the Connecticut Public Utilities Regulatory Authority (“PURA”), in Docket No. 20-08-03, Investigation into Electric Distribution Companies’ Preparation and Response to Tropical Storm Isaias (August 7, 2020).1

The destructive force of Storm Isaias was much more severe than expected, with Connecticut suffering the brunt of the dissipating tropical storm and its far-flung energy pockets.

From early on, Storm Isaias was on a track northward. However, as of Wednesday, July 29 and into Thursday, July 30, the storm was tracking well to the southeast of New England. Forecasts associated with the path, windspeeds and intensity remained unsettled through the weekend. On Friday, July 31, despite the unsettled nature of storm conditions and low degree of confidence among the weather forecasts as to how the storm track would wind into the Eversource service areas in Connecticut, Massachusetts and New Hampshire. Eversource moved forward with emergency preparations for its three service areas by procuring 120 crews from Canada and pre-staging local crews in each area, including Connecticut. On Friday, July 31, Eversource declared a Level 4 emergency event to take effect as of 7:00 a.m. on Tuesday, August 4, and took steps to prepare for a high-side Level 4, low-side Level 3 event by decentralizing operations across the State of Connecticut.

1 In compliance with PURA’s storm performance standards established in Docket No. 12-06-09, the Company will submit supplemental information on lessons learned from this storm “within 60 days after the end of an event”. See Docket 12-06-09, PURA Establishment Of Performance Standards For Electric And Gas Companies, November 1, 2012 Decision at Appendix A, Storm Performance Standard Section 3.7 entitled “After Action Report.”
and planning for outside crews and all of the logistical support necessary for that endeavor, such as procuring hotels, rental vehicles, repair materials and food.

On Saturday, August 1, and Sunday, August 2, the storm was still a considerable distance from Connecticut — located approximately 120 miles south southeast of Cape Canaveral, Florida. Throughout the day, the forecasts fluctuated as to the potential impact on Eversource’s service territory in Connecticut, Massachusetts and New Hampshire, with the predicted storm strength weakening during the day on Sunday, August 2, before regaining strength that evening. Probabilities for tropical storm force winds (sustained winds >39 mph), remained low-to-moderate according to the NHC and other forecasts into early Monday morning.

Late Sunday into Monday, August 3, the forecasted track of Tropical Storm Isaias began to shift west, toward New York State. By Monday afternoon, it was clear that a much larger area of Eversource’s Connecticut service territory was going to be exposed to the eastern portion of the storm, which had the highest wind potential. By 8:00 p.m. on Monday night, August 3, the NHC was predicting a higher probability of tropical storm force winds, indicating the storm system would likely present as a more typical tropical storm event rather than the lower-level event expected over the weekend.

By the time Tropical Storm Isaias reached Connecticut on August 4, the storm was undergoing an “extratropical transition,” which happens when a hurricane dissipates into a hybrid storm extending tropical cyclone-like conditions over a widespread area and in latitudes that do not typically experience such events. During an extratropical transition, a cyclone frequently acquires increased forward motion and sometimes intensifies substantially, so that such systems pose a serious threat to land and maritime activities. A tropical storm system undergoing an extratropical transition can be likened to a spinning top—beginning with a tight spin and then, as it slows down, will often times release its energy in an erratic, unpredictable, and exaggerated manner over a relatively short period of time. Forecasting the timing, intensity, and track of an extratropical transition is challenging for weather prediction models due to the dynamics and the energetics involved in the dissipation of a tropical system.

The extratropical transition that occurred in Connecticut on August 4 was consistent with all of these characteristics—it was unpredictable, difficult to forecast, and unleashed powerful winds that caused significant and widespread damage to the Eversource electric distribution system. The eastern portion of Tropical Storm Isaias hit the Company’s system hard, with higher than forecast wind speeds

and peak wind gusts reaching 67 mph in some areas. Sustained wind speeds well over 30 mph and in excess of 50 mph occurred in far flung localized pockets. Several tornado warnings were issued across Connecticut as storm cells showed rotation at the cloud level through the afternoon of August 4.

The damage caused by Storm Isaias was greater than any major event experienced in recent history, except for the October 2011 Nor’easter, which involved similar dynamics of heavy pressure on tree canopies and weakened tree root systems.

By 6 p.m. on August 4, the Eversource system had recorded approximately 5,300 damage locations; had received reports of thousands of wires down across the state; and had 25 transmission lines that had tripped out of service, and another 12 transmission lines that had “opened and closed” meaning that the lines were not out of service, but had suffered some type of damage indicative of a substantial storm impact. This scale of damage in such a short time period was unprecedented, but thoroughly reminiscent of the October 2011 Nor’easter. That event occurred in October when tree canopies were still partially intact and root systems were weakened by the rain saturation caused by Tropical Storm Irene, which occurred just weeks before. Although Storm Isaias was not characterized by heavy rain, the tree population in Eversource’s territory has suffered an unprecedented scale of tree mortality and loss of integrity due to insect infestations and drought, which rendered trees susceptible to downfall in the high winds.

Isaias passed by approximately 2 a.m. on Wednesday, August 5, but winds remained elevated and the system continued to take on damage, causing 632,632 customer outages at peak and 21,669 damage locations spread throughout the entire state. No weather forecast predicted the destructive force and widespread impact of the storm event and no weather forecast zeroed in on the true severity of the event until the storm system was essentially knocking at the door. This is borne out by the fact that two damage predictions models utilized by Eversource to help inform its storm knowledge severely under-predicted the number damage locations, with the UCONN Model predicting 3,000 to 6,000 damage locations late on August 3 and another predicting even fewer. Unlike other catastrophic storm events such as Tropical Storm Irene and Superstorm Sandy where damage was concentrated in certain portions of the state, every single one of the 149 communities served by Eversource in Connecticut suffered significant damage as a result of Storm Isaias.

To restore power, Eversource cleared more than 8,900 fallen trees and replaced more than 2,506 damaged utility poles, 1,438 transformers and more than 500 miles of downed wire.
Eversource mobilized quickly to respond to Fire & Police high-priority public safety calls; to restore downed transmission lines feeding the overall system; to restore customers within committed deadlines; and to balance municipal priorities for critical facilities and blocked roads.

For the restoration effort, Eversource quickly augmented the crew resources already on hand in Connecticut, shifting hundreds of crews from Massachusetts and New Hampshire to Connecticut, along with crews secured from the Midwest, Canada and other locations. Eversource increased the crew count in Connecticut rapidly, to 504 line crews and 235 tree crews on Wednesday, August 5, after storm conditions subsided; to 852 line crews and 285 tree crews in Connecticut by Thursday August 6; and to more than 2,500 line crews and 780 tree crews in Connecticut by August 9.

The powerful winds of Tropical Storm Isaias caused widespread damage to trees, damaging utility poles (over 2,000 in total), and transmission and distribution lines across Eversource’s service territory. Within the first 24 hours, Eversource dedicated crews to responding to 193 imminent danger emergency calls reported by Fire & Police and restoring 25 downed transmission lines supplying the distribution system. Some of the imminent danger calls that the Company responded to between 1:15 PM and 7:40 PM during the event included: 31 Fire, Police & Safety (“FPS”) priority 1 calls (or “FPS1”) related to people trapped in vehicles; 7 structure fires with people trapped inside; and, a house with wires down and a child trapped along in the house. Throughout the entire event, Eversource handled a total of 263 imminent danger calls and all were addressed without injury to the public, first responders or the Company’s personnel.

Ultimately, the Connecticut distribution system sustained over 21,669 damage locations, representing the second most damaging storm event on record. Notwithstanding the lack of adequate warning regarding the true extent of the destructive force of Storm Isaias, Eversource met the commitments made to Governor Lamont, the State of Connecticut and to customers:

- We committed to a rapid ramp-up in the number of outside crews to restore power to levels exceeding Emergency Response Plan (“ERP”) expectations for the number of damage locations. We increased the number of line crews working on the system to restore power and address municipal priorities, ramping up to more than 2,500 crews working on the Connecticut distribution system by August 9, or within five days of the storm impact. This is double the number of line crews anticipated in the ERP for 21,669 damage locations. We met this commitment for crews.

- We committed to have 90% of customers restored by Sunday night, August 9. On Sunday, August 9, service to 90% of customers was restored, well before the end of the night. We met this commitment to customers.
• We committed to have restoration substantially complete by Tuesday night, August 11, meaning 99% of customers restored in every single one of the 149 towns we serve. We met this commitment to customers.

During the event, Eversource deployed a significant number of crews to respond to emergency calls from local Fire and Police who are standing by a damaged electric wire down and municipal “make safe” requests, involving blocked roads. Within the 9-day restoration effort, Eversource handled 2,431 Priority 2 calls (hindering operations) and 2,273 Priority 3 calls (non-threatening electric hazard) calls, as well as responding to or restoring power to 860 affected critical facilities predesignated by local municipalities. Eversource also received numerous priorities from state officials regarding state-level critical facilities, and blocked roads and highways. Eversource worked with municipal responders to clear over 1,900 blocked roads through the days following the event. Eversource was also asked to restore power to almost 500 polling locations across the State of Connecticut and this commitment was met.

Eversource recognizes that despite these genuine efforts, many towns are disappointed in the level of response that they experienced. Eversource ERP teams are already working on a “deep dive” examination into the experience of these municipalities in Storm Isaias to identify improvements to the process that would provide municipalities with greater access to vital information on workplans and the location of crews, and response timelines more in line with expectations.

These and other lessons learned will be identified, evaluated and presented with recommended improvements in the After-Action Report due to PURA on October 12, 2020.

Although Eversource successfully handled approximately 6 million proactive outbound customer updates and more than 3 million inbound customer interactions during the event, the Eversource communication channels experienced noticeable capacity constraints due to the fact that customer interactions were double the historic peak volume of communications occurring during a major event.

On Tuesday, August 4, as the sheer volume of customer contacts hit the system at the start of the storm, the Eversource digital channels such as two-way texting, mobile app and online outage communication options slowed due to capacity constraints. These large volumes caused a similar impact to the Interactive Voice Response (“IVR”) system and call center. For customers, this caused intermittent “time outs” and “fast busy” signals to occur on the mobile channels, IVR and calls into the Call Center. None of the digital channels, IVR or Call Center system crashed or failed to operate. However, the process of getting through the Company’s various channels was inordinately slow due to the volume. During the peak period on the first day of the storm, customers experienced a 19-minute average wait time to speak to a customer service representative, or sometimes a busy signal or
dropped call, due to the large volume of simultaneous users. However, despite the intermittence at the onset the event, Eversource’s digital systems and customer service representatives successfully recorded over 85,000 outage tickets during those first few hours and 220,000 customer-reported outages on Wednesday, August 5.

As part of Eversource’s preparedness efforts, the contact channels are routinely tested to accommodate inbound customer contacts 20 percent higher than the volumes experienced in Superstorm Sandy. However, the volume of inbound customer communications for Storm Isaias was more than double the record level experienced for Superstorm Sandy, reflecting customer behavior trends of using numerous digital channels at once from smartphones and laptops, which is a dynamic not necessarily experienced in Superstorm Sandy.

The slowdown experienced by customers was understandably frustrating for them as they sought to report their outage. However, the scope and location of outages were largely known through the separate Outage Management System, which is able to identify and track outages from just a few outage reports. Therefore, the customer’s delay in using the system did not affect the duration of any customer outage. The Eversource information technology team worked diligently through this challenge and was able to make modifications to accommodate the heavy traffic. Eversource is already working through permanent testing and changes to the system to mitigate the potential for similar slowdowns in the future.

The overlay of a major weather event with the COVID-19 pandemic exponentially elevated the tension and frustration of our customers and created logistical challenges for Eversource, its employees and outside contractors.

Customers and their families are working and staying at home using air conditioners, fans, phones, computers and other electrical appliances. The unexpected loss of power during COVID-19, along with the social and economic disruptions many customers are experiencing, is simply overwhelming for customers. This has made the entire experience much more burdensome than usual for our customers.

COVID circumstances also created challenges for Eversource, although employees worked through the challenges diligently and no employees were infected through the event. The need to consistently and effectively apply COVID-19 protocols to protect the health of employees and customers permeated every aspect of Eversource’s response. For example, in accordance with the Eversource COVID protocols established at the outset of the pandemic, Eversource prepositioned COVID personal protective equipment and supplies in the Area Work Centers (“AWCs”), office buildings and storm response trailers that would be utilized during restoration. All
AWCs and emergency operating center locations were appropriately sanitized and staged to enable social distancing.

Eversource also took proactive steps to protect its highly skilled and trained control room operators given their critical role in operating the transmission and distribution system. Eversource created sterile environments in its control room and forbade entry to anyone other than the control room operators. Eversource also conducted medical screening of the control room operators at the beginning of their shifts.

Pre-event preparations were made to provide lodging for more than 6,000 employees and contractors, maintaining full attention on the need to protect workers in the COVID-19 environment. The logistical efforts were substantial – and critical to the duration of the restoration period. For example, the Eversource ERP Logistics team arranged for over 6,400 beds each night over the peak workdays, and a total of 40,000 beds over 10 days. More than 107,000 meals were procured and served at the decentralized staging areas, Area Work Centers and Emergency Operating Centers.

Eversource could not have organized these resources or managed the number of personnel involved under COVID protocols without the thorough, pre-event preparations for logistical support to equip, house and feed the thousands of employees, mutual aid crews and external contractors dedicated to the event.

In addition, given that a majority of Eversource personnel were still under a work-from-home status due to the COVID pandemic, plans were made for Company personnel to carry out their assigned storm duties in Eversource facilities closest to their homes in the event that they lost power and/or internet service due to Tropical Storm Isaias. Eversource made sure that spaces that would potentially be used were identified, cleaned and sanitized and staged to enable social distancing and established security protocols to enter the building.
II. OVERVIEW OF THE 30-DAY EVENT REPORT

This 30-Day Event Report is organized to provide the reader with a comprehensive perspective on how Eversource prepares for and responds to major weather events in accordance with its Emergency Response Plan, and how it carried out these functions in relation to Storm Isaias. The 30-Day Event Report also provides background and discussion regarding specific aspects of this event that will require introspection, investigation and action by Eversource in the coming weeks as an important area of focus for lessons learned and future improvement.

From a contextual perspective, the organization of the remaining sections of the 30-Day Event Report is as follows:

Section III -- Prologue: Focus on Emergency Preparedness provides a comprehensive perspective on Eversource’s emergency preparedness structure and institutional focus throughout the year. It is not possible to mobilize to meet the challenges of major weather event like Storm Isaias without persistent, methodical and rigorous focus on all aspects of event preparedness and response throughout the year. This work permeates Eversource’s day-to-day planning and encompasses a wide range of activities including training, drills, customer and community outreach, along with intensive, iterative review of the strategies and tactics that will be employed to meet the challenges of a major event.

Section IV -- Tropical Storm Isaias: Putting Plans & Preparedness Into Action reviews the details of the Eversource response to Tropical Storm Isaias in the phases of Storm Isaias as a major weather event, discussing: (1) weather forecasting for major events; (2) weather track of Storm Isaias; (3) day-by-day preparedness; (4) outage prediction models; (5) impacts of Storm Isaias and immediate
triage work; (6) outages, damage locations and wire downs; and (7) aftermath and restoration. As detailed below, Eversource was prepared and positioned to mobilize rapidly the largest response in the history of Connecticut, during the COVID-19 pandemic with thousands of employees working remotely. Although customer and community frustration, anxiety and pain in these types of events should always be minimized to the maximum extent possible, the Eversource response was executed with urgency; with appropriate care and caution regarding COVID-19 considerations; with methodical purpose and strategy; and with as much attention to detail as realistically possible. Still, we can do better by customers and communities, and we will.

Section V – Coordination: Balancing Customer Restoration with Make Safe Priorities explains and discusses the numerous levels of important priorities that exist in responding to a major weather event. All priorities are important and must be addressed by Eversource following a major event; Eversource operates the electric system and numerous interests are dependent on that system and the speed and effectiveness of Eversource’s response. However, every priority cannot be addressed at once within hours of a major event. In addition, some priorities must come first, such as life-threatening situations; repair of the transmission system feeding the New England regional transmission grid and Connecticut distribution system; and, restoration of critical facilities without backup generation. Once the storm conditions subside, a window of time is needed to address the highest priorities involving the protection of human life and the restoration of facilities that are the connection between the interstate electric grid the distribution system and that are vital to the flow of power into Connecticut cities and towns. Once the high-priority, life-threatening emergency calls and transmission system issues are addressed or at least underway, Eversource commences restoration work and, in parallel, works to address municipal priorities across the numerous communities that
experienced damage. This section reviews the painstaking efforts that Eversource takes to balance all priorities so that appropriate decisions are made on the allocation of resources across the entire State. *The balance will never appear adequate, reasonable or fair to those who come last. Therefore, careful review of the prioritization is always warranted.*

**Section VI – The Customer Experience: Customers Access Is Vital** explains and reviews the slowdown that Eversource customers experienced in attempting to report their outages for two blocks of time during and immediately following the event. Put simply, the slowdown occurred due to the volume of simultaneous contacts with the Company’s system, enabled by the multiple digital channels now available to customers. Although the system did not fail and capacity was added within hours of the event, customer anxiety during the event about outage reporting was caused by the slowdown of the contact channels. *This is a problem that will be fixed and Eversource is already well down that path.*
III. PROLOGUE: FOCUS ON EMERGENCY PREPAREDNESS

A. Overview

In Connecticut, Eversource delivers electric service to approximately 1.2 million homes, neighborhoods and businesses in 149 cities and towns through its operating subsidiary, The Connecticut Light and Power Company. Eversource is among the Connecticut’s larger employers, operating a highly complex, fully integrated, overhead and underground transmission and distribution system located within a 4,000 square mile service territory. This equates to 87 percent of the total area of Connecticut, including large urban centers, suburban and rural settings. Eversource’s service territory encompasses areas with dense tree and vegetation growth, shoreline areas and hilly terrain. Eversource has organized its Connecticut operations into three regional districts, designated as the Western, Central and Eastern districts.

Figure 1

Connecticut Regional Work Districts
Eversource’s transmission system consists of approximately 1,675 circuit miles of overhead transmission facilities and 137 miles of underground transmission lines. There are 20 transmission substations and 98 distribution substations supplied fed by the overhead transmission system, with another 72 substations on the Eversource distribution system. The distribution system consists of approximately 16,798 circuit miles of overhead primary construction and 6,658 circuit miles of underground primary construction, including both direct-buried and underground duct and manholes. Primary distribution voltages range from 4.16kV to 34.5kV, with the majority of circuits operated at 4.8kV, 13.2kV, 13.8kV, and 23kV. Eversource supplies electric service to customers using over 269,000 distribution transformers; approximately 725,639 utility poles supporting the distribution system; and, 1,279,330 meters supporting residential, commercial and industrial electric customers, as of May 1, 2020.

B. **Eversource Plans and Prepares Year-Round for Major Weather Events**

Eversource’s strong focus on planning and preparation is precisely designed to achieve a high level of readiness to respond to large-scale emergency events. The Eversource Emergency Response Plan (“ERP”) provides a systematic and organized approach to prepare for, respond to, and recover from emergency events causing power outages or other disruptions to the distribution and transmissions systems. More specifically, the ERP establishes systematic approach to monitoring, assessing and preparing for events that have the potential to impact the distribution and/or transmissions system, customers, employees and other stakeholders, such as the cities and towns encompassed within the Company’s service territory. The high level of organizational and operational readiness maintained by Eversource translates directly into the ability to restore power safely, efficiently and expeditiously when emergency events occur.
For **Readiness Condition – NORMAL**, general everyday operations are being performed, and business units are maintaining situational awareness by observing the changing and predicted weather conditions and the news for any event that could adversely affect operations.

Under **Readiness Condition – MONITORING**, general everyday operations are being performed, but conditions are developing or exist, such as a tropical storm like Tropical Storm Isaias, that present a potential risk in the near future to Eversource, its systems and its customers. Though the conditions currently pose no immediate threat, a heightened level of situational awareness is adopted, both internal and external, and monitoring is implemented with more frequent communications taking place among the Company’s decision-making managers.

Under **Readiness Condition – WARNING**, conditions are developing or will soon exist that have a relatively high level of probability of impact for some or all of the Company’s service area. General everyday operations are still being performed, but certain day-to-day tasks and operations may be suspended or redirected. It is at this point that the Company will begin to mobilize internal resources and acquire and/or mobilize external resources.

Under **Readiness Condition – EMERGENCY**, emergency event conditions that will cause or have caused significant impact to the Company’s distribution and/or transmission system and customers are imminent. At this point, the Company will activate the ERP, declaring an “event level” and mobilizing all aspects of the ERP organization to meet the oncoming threat.

The ERP provides the overall framework for emergency preparedness and response. The ERP is premised upon guiding principles, including but not limited to: (1) a “safety always” philosophy; (2) restoration of the largest number of customers in the shortest amount of time practical; (3) optimal
use of information systems; and (4) consistent reporting of storm response progress to all internal and external stakeholders. In furtherance of these goals, the ERP ensures that the Company is sufficiently prepared to restore service to its customers in a safe and reasonably prompt manner during emergency events.

In addition to the guiding principles discussed above, the ERP is based on the implementation activities of the National Incident Management System (“NIMS”) and uses the Incident Command System (“ICS”). This alignment assists in the de-centralization and recentralization of command and control throughout an emergency event in order to provide optimum and efficient response and utilization of resources. To the extent applicable and appropriate, the ERP was developed to align with the concepts of the National Response Framework and Emergency Support Function 12 (“ESF12”), All Hazards Energy and Utility Annex, which is utilized by the State of Connecticut.

**Function of the ERP:** When the ERP is triggered, the Company’s internal organization is reconfigured into the ICS with a pre-designated management hierarchy taking effect at each organizational level with operations responsibility, from the highest level of management to the local operations level. The ICS is designed to be flexible and used for emergency events of any type, scope or complexity and guides the process for planning, building, and adapting the structure to best fit the emergency event.

Not all outage-related events or incidents require the full activation of the ERP. For those events that do require the activation of the ERP, it functions in a number of ways to prepare for, respond to and recover from those events. The primary functions of the ERP are to: (a) establish the identity and organization of Eversource staff who will be responsible for operations during an emergency event
and delineate their specific duties in that event; (b) guide the acquisition of external resources; (c) structure the deployment of internal, external and mutual aid crews to work areas; (d) ensure adequate and appropriate logistical support, including procurement of sufficient supplies and equipment needed during an emergency; (e) provide for damage assessments; (f) set forth a process for communicating with customers, municipalities and other stakeholders during an emergency event that extends beyond normal business hours and business conditions; (g) establish a procedure for the identification of Life Support customers and protocols to communicate with Life Support customers and the municipalities in which they reside before, during and after an emergency event; and (h) provide for measures to assure the safety of employees, contractors and the public during an emergency event.

**ERP Organization – Roles and Responsibilities:** The ERP is not in effect at all times and does not govern routine outages that occur from day-to-day on the electric system due to equipment damage, minor or localized weather events or other causes. The ERP is triggered where there is or may be an “emergency event,” which is an event in which widespread outages occur on an electric distribution service area due to storms or other causes beyond the control of an electric company. Classification of outage events within the ERP ranges from Level 1 through Level 5 depending on anticipated impact, with each level reflecting the severity of damage expected by or experienced during the event. Figure 2, below, sets out the Eversource ERP Event Level Matrix.

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3 “Life Support” customers are customers who have provided documentation to the Company of a medical condition that requires utility service.
As shown in Figure 2, above, the ERP Event Level Matrix identifies the general characteristics and/or impact expected by each event level, based on pre-event estimations of: (1) the number of customer outages resulting from the impact of the weather event; (2) the number of damage locations typically experienced for this kind of event; (3) the number and type of crews necessary to accomplish the restoration within the restoration duration specified for the event level; and (4) the duration of restoration efforts expected for the scale of the emergency event.

The ICS is a component of NIMS, an emergency management doctrine used across the United States to coordinate emergency preparedness and incident management and response among the public.
(Federal, Tribal, state, and local government agencies) and private sectors. The ICS provides for a standardized, on-scene, all-hazards incident management approach that: allows for the integration of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure; enables a coordinated response among various jurisdictions and functional agencies, both public and private; and establishes common processes for planning and managing resources.

When the ERP is activated for Event Levels 1, 2, 3 or 4, the Incident Management Team (“IMT”) is also activated and all ERP functions are coordinated through an Incident Command Center (“ICC”). The IMT provides an organized structure that facilitates the safe, efficient and expeditious restoration of power accompanied by a flow of information that both advances the restoration process and allows for constructive communication with customers, state and local government officials and other stakeholders.

Under the ICS, the Company’s President designates the authority for the performance and direction of actions under the ERP to the Incident Commander, providing the Incident Commander with the authority to manage the overall emergency response for the Company. The following positions comprise the IMT and report directly to the Incident Commander: members of the Command Staff (Safety Officer, Human Resources Officer, Liaison Officer, Regulatory Officer, Communications Officer, Deputy Incident Commander, and Emergency Preparedness Specialist) and General Staff (Operations, Planning, Logistics, and Finance and Administration Section Chiefs). The members of the IMT are all highly trained and experienced employees, drawn from the highest levels of management within Eversource. Of the positions encompassing the IMT, seven positions are held by director-level employees and four positions are held by Eversource Vice Presidents, who have day-
to-day responsibility for the same or similar functions fulfilled within the ERP organization. The Incident Commander, Emergency Preparedness ("EP") Specialist and Operations, Planning, Logistics, and Finance and Administration Section Chiefs meet a minimum of 12 times annually to coordinate the planning for emergency events.

As noted above, the Incident Commander is responsible for the overall management of an emergency event. Incident Commander responsibilities include, but are not limited to: (1) reviewing external resources/resource support plans; (2) verifying that the safety and health of all Eversource employees, contractors, and the public are incorporated into every aspect and decision pertaining to the restoration efforts; (3) reviewing restoration/recovery progress; (4) overseeing the activities being performed for the addition of resources, redeployment of resources, the release of resources for redeployment, and the preparation of an overall demobilization plan; and (5) reviewing and approving the Incident Action Plan ("IAP") for each operational period of the response and restoration efforts under the ERP.4

The EP Specialist is responsible for maintaining situational awareness of potential threats to the Eversource infrastructure, including adverse weather impacts. The EP Specialist is tasked with coordinating the opening of the ICC and providing status reports and updates to the Incident

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4 The IAP is developed to coordinate restoration activities and resources during large emergency events. The IAP generally identifies the operational period and defines response and restoration goals for that period and describes weather conditions and forecasts, taking into consideration the impacts that current or future weather could have on the response to the emergency event. The IAP also includes information on the communications plan for the relevant operational period. The IAP is prepared and distributed prior to the daily Operations briefings and a revised Plan is prepared for each operational period. The operational period for extended emergency events that require 24-hour operations is divided into two operational shifts of 12 hours each starting at 0600 and 1800 with a turnover period that begins 30 minutes before each shift starts.
Commander. Additionally, the EP Specialist is responsible for ensuring that the restoration process is consistent with the Eversource ERP and that the IAP is documented for each operational period.

Within the ERP, the IMT is structured around four functional areas overseen by the Operations, Planning, Logistics, and Finance and Administration Section Chiefs, who in turn report directly to the Incident Commander. The primary responsibilities of the four ERP sections are as follows:

**Operations Section:** The Operations Section is comprised of the Management, Supervision, and Field workforce tasked with the primary responsibility of response and restoration tasks during an emergency event. The Operations Section is responsible for the tactical level execution of the IAP in accordance with the guidance and priorities established by the Incident Commander. The Operations Section organization structure is scalable depending on the size and extent of an emergency event and is based on the established Operating Regions within Eversource’s service territory. The Operations Section structure is designed to leverage the existing management and supervisions resources within the Company but encompasses an inherent flexibility that enables the efficient integration of additional management and field forces that are required for the response to a larger scale emergency event.

The Operations Section Chief is responsible for the restoration of the Eversource distribution and transmission systems during an emergency event and directs and coordinates all restoration operations and ensures the safety of personnel under their supervision. Specifically, the Operations Section Chief is responsible for overseeing the conversion of the IAP’s strategic goals into executable tactical plans that implement the Company’s restoration priorities. The Operations Section Chief monitors the overall effectiveness of the field restoration activities to accomplish the stated IAP goals.
The Operations Section Chief is supported by the Operations Branch Director who is located in a Regional Emergency Operations Center (“EOC”). The Operations Branch Director oversees the overall readiness and operational capability of the Regional EOC and partners with the Community Liaison Unit to ensure that community priorities and critical care customer issues are being addressed. The Operations Section Chief is also assisted by the Transmission Branch Director and the Substation and Community Task Force Branch Director.

The Operations Group Manager has direct management responsibilities and oversight of the Restoration Management Teams (“RMTs”) assigned to the EOC. The Operations Group Manager is assisted by an RMT Operations Coordinator, who is responsible for implementing and overseeing the tactical restoration processes in coordination with field supervision to ensure the RMTs’ restoration goals and objectives are met and that the restoration crews and the IMT organization’s situational awareness is maintained during the restoration process. The RMT Systems Operator models the Eversource Outage Management System (“OMS”) to match the actual distribution system configuration related to switching evolutions and updates information in the OMS.

The Operations Section is further supported by the RMT Modeler(s), who are responsible for identifying call patterns in the OMS to validate and confirm outage locations throughout the Company’s service territory. Using data modeling techniques, RMT Modelers determine what is happening on the system within their assigned zone and consolidate events in the OMS to accurately reflect conditions in the field. The RMT Modelers are responsible for keeping the OMS up to date, including Estimated Times to Restoration (“ETRs”) established during the emergency event and the status of crews to specific locations in the service territory, e.g. – en route including an estimate time of arrival, onsite, or restoration activities complete.
The Operations Section Chief is also assisted by the Vegetation Management Unit Leader who is responsible for management and coordination of the vegetation management crews in their assigned region in the service territory and works closely with the RMTs to ensure that downed branches are safely and efficiently cleared so that line crews can begin restoring service to customers. Additionally, the Wire Guard and Services Branch Director manages and oversees the Wire Guard process by ensuring a Wire Guard is sent to stand by and monitor potential electrical hazards during the emergency event and manages and coordinates the deployment of Service Crews focused on the restoration of residential electrical services.

**Planning Section:** The Planning Section Chief, in collaboration with the Incident Commander and other Command and General Staff personnel, is responsible for developing and recommending the overall restoration strategy, including ETRs based on current resources available, damage assessment data, and current and forecasted weather conditions. The Planning Section Chief oversees the execution of the damage assessment process and the development of situation and resource status information and collaborates with the Operations and Logistics Section Chiefs to determine resource requirements, allotting and tracking all emergency event resources once activated or checked in. Using all available and relevant data, the Planning Section, in coordination with the Operations and Logistics Sections, develops each operational period’s IAP and ensures that the OMS ETRs, and the associated messaging around those ETRs, are maintained, up to date and accurate.

Damage Assessment during and following an emergency event is a core component of the Planning Section’s responsibilities. Damage assessment determines, among other things, the number and locations of blocked roads, the amount of physical damage caused by an emergency event, including the number and locations of broken poles, the number and locations of damaged transformers and
oil spills, the number and locations of wires down, and the number and locations of tree and tree limb damage. Accurate damage assessment data and information is critical to developing an IAP and determining whether to deploy additional support personnel and/or acquire mutual aid. Damage assessment is also critical to identify nested outages and to model the system to reflect the conditions in the field to the Outage Management System. This is a critical step in determining the actual number of the OMS “trouble events” or damage locations, which is an input to ETR development. The Planning Section utilizes Damage Assessment Patrollers to examine the condition of the Eversource system and identify equipment damage and possible hazards. The Damage Assessment Patrollers rely on three types of damage assessments techniques, i.e., Rapid, Detailed, and Post-Event Surveys.

The Planning Unit Leader (Strategic) uses the assessments provided by the Damage Assessment Patrollers to estimate the amount of work that is necessary to restore service to customers. The information is aggregated to determine the overall resource requirements to restore service to customers, including whether additional resources are required to support the restoration process. Additionally, the Planning Unit Leader determines the prioritization of damage assessment based on pre-established priority guidelines. Using the information gathered through this process, the Operations Group develops their priorities based on the goals and objectives in the IAP.

The Planning Section uses the above information to develop a critical piece of information in relation to the response to an emergency event and the restoration of service to customers – the ETR. The Planning Section uses algorithms based on the available objective and observational input to develop Global (system-wide) and/or Town ETRs. Regional Planning Branch Directors work closely with the Regional Operations Branch Directors to relay important information necessary to maximize the accuracy of ETRs reported to customers.
Once the emergency event that caused the outages has passed, e.g., a storm event has concluded, and the number of customers whose service was interrupted by the event has peaked, the Planning Section develops restoration projections based on: (1) the number of trouble locations; (2) the relative geographic scope of those locations; (3) the condition of the transmission system; (4) the number of circuit breakers and reclosers affected; and (5) the number of service-related trouble spots. The OMS System is used to create and manage both Global and Town level ETRs. As restoration progresses, The Planning Section continuously gathers data, monitors conditions, and recalculates the global ETRs with increasing precision and accuracy.

Following the Incident Commander’s approval of the Global ETR associated with an emergency event response, the OMS is used to create and manage ETR-related messaging to customers. These messages are provided to customers using the Integrated Voice Response (“IVR”) system, Eversource website, and Customer Care Center representatives.

**Logistics Section:** The Logistics Section supports and coordinates with the Incident Commander and the other ERP Sections to ensure that all facets of the Company that are responding to the emergency event are adequately supported. The Logistics Section is responsible for a variety of tasks, including but not limited to: (1) supply and replenishing necessary materials; (2) feeding, lodging and ensuring the welfare of Eversource and restoration personnel; (3) fueling and maintaining vehicles and equipment; (4) acquiring personnel, including crew resources; and (5) Information Technology (“IT”) and Communications support services. The Logistics Section is composed of three branches: Services; Resource Acquisition; and Support.
The Logistics Section Services Branch oversees and coordinates the following service units: (1) Food and Lodging Services; (2) Material Logistics Services; (3) IT/Telecom Services; (4) Security Services; (5) Fleet Services; (6) Environmental Services; (7) Property Management Services; and (8) Staging Area Services. The Logistics Resource Acquisition Branch acquires additional personnel and equipment resources through the use of Mutual Aid and contractor relationships and by reallocating Eversource personnel to specific emergency job positions for which they are qualified and trained. These resources include but are not limited to line resources, service resources, vegetation management resources, and Damage Assessment Patrollers. The Logistics Support Branch ensures that all of the logistics needs for services, personnel, and equipment required for the restoration of service to customers are met in a timely and efficient manner and that the requirements defined in the IAPs are appropriately supported.

**Finance and Administration Section.** The Finance and Administration Section provides administrative and financial tracking support to the Incident Commander and IMT staff. This Section ensures that the correct accounting has been established to track and report on all costs associated with the emergency event. The Finance and Administration Section Chief provides updates of the accumulating financial impacts of the event to the Incident Commander. The Finance and Administration Section Chief is also responsible for oversight and reporting of expenditures associated with restoration activities, including but not limited to distributing Company credit cards and petty cash as needed throughout the emergency event and response and tracking and analyzing personnel time records for timeliness and accuracy. The Finance and Administration Section Chief is responsible for overseeing the unvouched liability (“UVL”) entries for response activities.
The Finance and Administration Section Chief also manages a rigorous process after the storm event to compile and review the significant cost documentation associated with an event of this type, including invoices from external contractors and mutual aid crews and receipts for a wide range of services, materials and equipment used in the restoration. From the date of an event, this process can take up to 12-18 months or even longer due to the fact that 80-90% of the costs will be associated with external contractor crews and mutual aid crews, which routinely conduct invoicing many over months after the event, despite Eversource’s best efforts to request and collect invoices from those vendors. Once the invoices are received, Eversource conducts a meticulous process to review and validate the costs and will challenge costs when and if invoices are inaccurate.

**Communications Organization:** In addition to the IMT Sections described above, Eversource also relies on the Communications Organization to maintain the flow of information before, during and after the emergency event to five primary stakeholder groups: employees; customers; local municipal public safety officials; media outlets; and Connecticut safety officials, regulators and legislators. The Communications Officer is responsible for unity of messaging and communications processes to ensure that the messages are accurate, consistent, timely, meaningful and complete across all channels of delivery, including the Eversource website, social networking sites and news media. In essence, the Communications Officer acts as the public voice of the Incident Commander.

The Communications Officer’s duties include but are not limited to: (1) conducting initial and routine briefings with the activated Assistant Communications Officers; (2) ensuring applicable web pages are updated as the emergency event progresses; (3) preparing and issuing a Communications Briefing Sheet that can be used as a response to media inquiries and as a public statement for all other audiences; (4) ensuring that the Assistant Communications Officer – Customer Group is acting as a
conduit to ensure customer concerns are being brought to the Communications Officer and escalated as needed; (5) ensuring that medical customers are alerted to make preparations for the event; (6) ensuring effective support of inbound customer interactions, both digitally and via telephone so that customers can accurately and timely report their outages; and (7) developing daily communications messages and providing them to the Planning Section Chief for inclusion in the IAP. Each day, the Communications Officer, in coordination with the Incident Commander, oversees the development of that day’s communications strategy, considering the current phase of the emergency event, specific information of general and regional interest, and the current status and priorities of the restoration effort. This strategy ensures a directed approach to data gathering and dissemination and results in a timely and consistent message to best meet customer needs.

**Liaison Organization:** The Liaison Officer also plays a key role in communications during the emergency and works closely with the Communications Officer as an adjunct member of the Communications organization. The Liaison Officer is responsible for the coordination of effort and communications with the Company’s external municipal, state and federal agencies and stakeholders and ensures a bi-directional communication flow with these agencies and stakeholders through the Eversource liaison network. One of the key components of the Liaison Organization are the Community Liaisons. These individuals interact with towns and municipalities, acting as the conduit for real-time information, support, notification, coordination, and communications between municipal officials and Eversource for system restoration, including communication of mutual assistance activities. The Community Liaisons identify critical information and issues to be relayed through the Liaison Organization, including issues such as damage assessment data, blocked roads, and requests to address emergent priorities.
Within this organization, the Utility Liaison communicates and coordinates with other public service and telecom companies, with a primary objective of enabling restoration of priority services, among other priorities. The Government & Regulatory Affairs Liaisons communicate on a regular basis with state government and regulatory entities, respectively. The State EOC Liaison is stationed at the State Armory when the State Emergency Operations Center is open and communicates with the Connecticut Division of Emergency Management and Homeland Security (“DEMHS”) and other state agencies.

IV. TROPICAL STORM ISAIAS: Turning Preparedness into Action

A. Introduction

On August 4, 2020, between the hours of 2 p.m. and 6 p.m., a major weather event – Tropical Storm Isaias – roiled through the State of Connecticut. The onset of Tropical Storm Isaias was expected. The storm trundled up from south of Puerto Rico, along the East Coast of the U.S., over the 10 days prior to impact in Connecticut under the watchful eye of the National Weather Service, the National Hurricane Center (“NHC”), innumerable meteorologists, electric utility companies, state authorities and customers. Ultimately, Tropical Storm Isaias had a devastating impact on the entire State of Connecticut, causing 632,632 customer outages at peak on the Eversource system and more damage events than any other major weather event in Connecticut, except for the October 2011 Nor’easter.

This 30-Day Event Report is structured to provide a detailed account of Eversource’s preparation and response to Tropical Storm Isaias within three phases of the storm: (a) Pre-Storm Preparation; (b) the Storm Event; and (c) Post-Storm Restoration. For each of these phases, the narrative below explains what was happening to prepare and respond to the storm conditions; to quickly respond to high-
priority, life-threatening electric wire down events within the municipalities during and immediately following the event; to repair over 25 transmission lines taken out of service that supply power to the distribution system; to restore power to state and local critical facilities that were without any power across the state; to respond to municipal wire down calls and blocked roads; and to restore power to residential and business customers within 168 hours of the point when weather conditions subsided.

B. Pre-Event Planning and Preparation: Starting Well In Advance

1. Forecasting Major Weather Event

As part of pre-event planning, Eversource compiles and evaluates data and forecasts from several different weather services and other source information to make decisions regarding an oncoming weather system. In essence, a forecast is an estimate of the future state of the atmosphere. Forecasts are founded on probabilities, with lower levels of accuracy inherent in forecasts made farther out in time from the actual event. As the storm system approaches, and the time between prediction and impact shortens, the probability quotient increases and the forecast reliability improves. However, all weather forecasts have a level of inherent uncertainty. Therefore, the Company has to work with this uncertainty because planning and preparation for a major weather event must occur well in advance of the storm impact, when the probabilities of weather conditions and associated impacts are often times low.

Meteorologists typically attempt to mitigate the inherent uncertainty through the use of “ensemble” forecasts, particularly during the initial development of a higher impact storm or weather pattern. Ensemble model guidance involves using several individual model runs that are compiled and averaged out to a reasonable solution, rather than making and relying on a single model guidance. The set of ensemble forecasts is essentially a composite summary of all of the different possible forecasts, which
aims to provide an indication of the range of possible future states of the atmosphere. By comparing
the different forecasts contained within the ensemble, the forecaster can make a more reasonable
prediction regarding the characteristics of an upcoming weather event.

Ensemble forecasts typically are assigned a low degree of confidence that the predicted weather event
will develop and impact a region in a particular way. If the ensemble forecasts indicate a wide degree
of variation (i.e., a low or zero degree of consensus), then the forecaster knows that there is a
significant amount of uncertainty as to what the weather will actually do. However, if the ensemble
forecasts are all substantially similar (i.e., higher degree of consensus), then meteorologists have more
confidence in predicting the outcome of a particular event. Although ensemble forecasts are useful
for maintaining situational awareness, these forecasts do not necessarily form a sufficient basis for
activating the ERP.

However, as the time period moves closer to the actual weather event (typically within 84 to 72 hours
of the forecasted event), meteorologists start using operational model guidance to refine the forecast.
In short, the ensemble model guidance is low resolution aimed at an “average” solution. Operational
model guidance runs, by comparison, are higher resolution and do not average out a solution for a
particular weather event. Operational model guidance is informed by real-time weather parameters
beginning at a specific point in time (referred to as the “initialization time”). The model then produces
a forecast in certain time intervals going forward. These forecasts represent “snapshots” of solutions
based strictly on the specific initialization input data for that model run only. The forecast will change
with each successive operational model run.
In preparation for a major weather event, Eversource utilizes weather services primarily from DTN, StormGEO, the National Weather Service (“NWS”), UtiliWeather and the University of Connecticut (“UCONN”), but also from other sources such as meteorological reports on local news channels. These entities provide Eversource with the analysis and delivery of real-time weather forecasting information to be used to assess the impact that oncoming weather conditions could have on the Eversource system and its customers. Given its categorization as a tropical storm, Eversource also utilized National Hurricane Center forecasts and data to track Storm Isaias and its potential impacts in order to develop preparedness plans under the ERP.

2. **Weather Track of Storm Isaias**

Tropical Storm Isaias developed from a large tropical wave off the coast of western Africa around July 23-24. For much of the week of July 27, the forecasts associated with Tropical Storm Isaias remained unsettled. On Tuesday, July 28, the NHC designated the storm system “Potential Tropical Cyclone Nine” and by Wednesday, July 29, Isaias became a tropical storm when it was centered about 150 miles south of Puerto Rico. On Wednesday, July 29, Tropical Storm Isaias was tracking to impact the Southeast region of the United States, and then to track well to the southeast of New England. This trend continued on Thursday, July 30, with the storm continuing to track north and northeast toward the Carolinas and then to the southeast of New England. NHC forecasts as of Thursday, July 30, showed low probabilities that the predicted storm track would be accompanied by tropical storm-force winds (sustained winds of greater than 39 mph), when arriving to the Eversource service territory on Tuesday, August 4.

By the morning of Friday, July 31, Tropical Storm Isaias was located approximately 295 miles southeast of Nassau in the Bahamas, with maximum sustained winds of 75 mph and was heading...
northwest at 16 mph. On Friday, July 31, the predicted storm track remained to the Southeast of New England. The NHC issued a forecast with an average probability that Tropical Storm Isaias would be accompanied by tropical storm-force winds (sustained winds of greater than 39 mph) upon impact to Eversource’s service territory on Tuesday, August 4.

On Saturday, August 1, at mid-day, the storm was located approximately 40 miles west/southwest of Nassau in the Bahamas with maximum sustained winds of 85 mph and moving to the northwest at 12 mph. On Saturday, August 1, NHC forecasts predicting an impact on August 4, in Eversource’s territory involving tropical storm-force winds (sustained winds of greater than 39 mph) ranged from a low probability at 7:00 a.m., to a higher probability at 2:00 p.m. before settling back to a lower probability at 10:00 p.m. on Saturday evening.

On Sunday, August 2, at 11 a.m., Tropical Storm Isaias was still a considerable distance from Connecticut—located approximately 120 miles south southeast of Cape Canaveral, Florida with maximum sustained winds of 65 mph and moving north northwest at 8 mph. Sunday, August 2, brought similar forecast variability as previous days. The predicted storm strength weakened on Sunday, August 2, before regaining strength and intensity on Sunday evening. Into the early morning hours of Monday, August 3, the NHC forecast very low probabilities (35 percent or less) for tropical storm force winds for Eversource’s Connecticut service territory. However, the forecasted track of Tropical Storm Isaias began to shift west, toward New York State.

By the afternoon of Monday, August 3, the storm was located approximately 220 miles south/southwest of Myrtle Beach, South Carolina with maximum sustained winds of 70 mph and moving north at 13 mph. Around this time, the weather forecasting models finally began to converge, predicting that the storm center would take a more westerly path over eastern New York State.
Consequently, it was becoming clear at this point that the eastern Massachusetts coast and Cape Cod were not going to see the more significant impacts of the weather event, as was previously forecast. Instead, a much larger area of Eversource’s Connecticut service territory was going to be exposed to the eastern portion of the storm, which had the highest wind potential.

By 8:00 p.m. on Monday night, August 3, the NHC was predicting a high probability of tropical storm force winds (sustained >39 mph) in the Eversource service territory, indicating a more typical tropical storm event than the lower-level event previously forecast by weather services over the weekend. However, even at this point, the actual destructive impact of Storm Isaias was indeterminate.

At noon on August 4, Tropical Storm Isaias was 10 miles west southwest of Wilmington, Delaware and by 2:00 p.m. the storm was 40 miles west of New York City and accelerating north at 40 mph. In the late afternoon of August 4, the eastern portion of Tropical Storm Isaias hit the Company’s system hard, with higher than forecast wind speeds and peak wind gusts reaching 67 mph in some areas. Sustained wind speeds well over 30 mph and in excess of 50 mph occurred in far flung localized pockets.

Figure 3, below, illustrates the unsettled nature of the storm system and the difference between the forecast conditions in the days leading up to the event and the actual event. For example, on Sunday August 2, which was two days before the storm impact, the NHC forecast only a 25% probability that Connecticut would experience tropical storm-force winds (sustained winds greater than 39 mph). Figure 3 also illustrates that the probability of experiencing tropical storm-force winds did not exceed 50% until Monday morning, August 3, which was the day before storm impact. Consequently, after-
the-fact claims by some commentators that Eversource should have better prepared for a storm of the magnitude of Storm Isaias, are contradicted by credible weather forecast sources such as the NHC.

Figure 3
Forecast Strength Relating to Probabilities for Connecticut to Experience Tropical Storm Force Winds

By the time Tropical Storm Isaias reached Connecticut on August 4, the storm was undergoing an “extratropical transition” (“ET”), which happens when a hurricane dissipates into a hybrid storm extending tropical cyclone-like conditions over a widespread area and in latitudes that do not typically experience such events. During an ET, a cyclone frequently acquires increased forward motion and sometimes intensifies substantially, so that such systems pose a serious threat to land and maritime
activities.\(^5\) A tropical storm system undergoing an ET can be likened to a spinning top—beginning with a tight spin and then, as it slows down and releases energy, moves in a more and more erratic, unpredictable, and exaggerated manner. Forecasting the timing, intensity, and track of an ET is challenging for weather prediction models due to the dynamics and the energetics involved in the dissipation of a tropical system.

The ET that occurred in Connecticut on August 4 was consistent with all of these characteristics—it was unpredictable, difficult to forecast, and unleashed powerful winds that caused significant and widespread damage to the Eversource electric distribution system. The eastern portion of Tropical Storm Isaias hit the Company’s system hard, with higher than forecast wind speeds and peak wind gusts reaching 67 mph in some areas. Sustained wind speeds well over 30 mph and in excess of 50 mph occurred in far flung localized pockets. Several tornado warnings were issued across Connecticut as storm cells showed rotation at the cloud level through the afternoon of August 4.

3. **Day-to-Day Preparations for the Oncoming Weather Event**

Sunday, July 26 through Wednesday, July 29

Consistent with **Readiness Condition – MONITORING**, the Company began monitoring developing weather forecasts associated with Tropical Storm Isaias on Sunday, July 26. By Wednesday, July 29, Storm Isaias was 150 miles south of Puerto Rico with an expected path to the Northeast U.S, although the exact path north was not known. Throughout the day Wednesday and Thursday, the storm remained south of the Bahamas, traveling north-northwest, with some weather forecasts indicating the potential for tropical storm force winds to reach the Northeast, although at low levels of intensity.

The Logistics Section of Eversource’s Connecticut ICS began initial preparatory activities for Tropical Storm Isaias on Wednesday, July 29. Specifically, the Logistics Section began to identify and evaluate alternative lodging availability for line resources and updated, as necessary, lodging contacts. The Logistics Section also looked at alternate lodging sites that Eversource had used during past emergency events, such as college campuses like Post University and Western Connecticut State University, to determine if lodging alternatives were available. Ultimately, alternate lodging was set up at Lake Compounce, Post University, Western Connecticut State University, Camp Jewell and Freight Street Garage. The Logistics Section also confirmed that it had access to over 4,000 bedding kits, including
cots and toiletry kits, and that food trucks and caterers were available and able to provide mobile food locations as necessary.

Under **Readiness Condition – WARNING**, conditions are developing or will soon exist that have a relatively high level of probability of impact for some or all of the Company’s service area. General everyday operations are still being performed, but certain day-to-day tasks and operations may be suspended or redirected. At this point, the Company will begin to mobilize internal resources and acquire and/or mobilize external resources.

Consistent with this Readiness Conditions, the Eversource Resource Acquisition team began working on Thursday July 30, to procure supplemental crews for the Connecticut, Massachusetts and New Hampshire distribution systems. All sections within the ICS commenced work to build preparedness through forecast monitoring, resource assessment and procurement, systems and equipment testing, vegetation management activities, training and re-training, and meticulous planning.

**Facilities/Staging Areas Preparation.** The Logistics Section began to prepare staging areas and facilities. Staging areas are critical components of a successful restoration effort following an emergency event. To ensure that these key areas were sufficiently prepared, the Logistics Section checked the inventory of all wind and rain-related stock that could be required for restoration. Additionally, in accordance with the Eversource COVID protocols, the Logistics Section prepositioned COVID personal protective equipment (“PPE”) and supplies in the Area Work Centers (“AWCs”), office buildings and storm response trailers that would be utilized during restoration.
Logistics Section also confirmed that all AWC and emergency operating center (‘EOC’) locations were appropriately sanitized and staged to enable social distancing.

**Line Resources/Crews:** The Resource Acquisition Section participated in the North Atlantic Mutual Assistance Group (‘NAMAG’) conference call regarding Tropical Storm Isaias. On that call, various NAMAG members requested mutual aid resources. At that point on July 30th, however, no mutual aid resources were available as the NAMAG member utilities were not releasing their crews given the unsettled nature and track of the Tropical Storm Isaias forecasts.

Typically, Eversource does not seek to bring in mutual aid resources so early in the timeline for a potential emergency event, particularly when the weather forecasts associated with the event are still forecasting with a low degree of confidence that the weather event will impact the Company’s service territory. This is because the pre-staging of crews comes at a cost; therefore, the Company always works hard to balance considerations of responsiveness and cost in the days leading up to a potential weather event. However, consistent with a directive given by the President of Electric Operations for Connecticut at the start of the COVID pandemic, Eversource had developed a contingency plan that required earlier than typical securing of mutual aid resources in a manner designed to mitigate any COVID impacts on Eversource personnel and the restoration efforts. Under this contingency plan, Eversource determined it necessary to secure mutual aid crews early in the process. Normally, Eversource seeks mutual aid crews from the southern and midwestern United States. However, given the relatively high incidents of COVID in those regions compared to New England and Canada, the decision was made to secure as many available contractors as possible from the New England region.
and to source Canadian mutual aid crews immediately. Efforts to procure these mutual aid crew resources took place on July 31.

Friday, July 31

By the morning of Friday, July 31, the dominant ensemble model guidance indicated that the track of the storm remained to the east. Forecasts including the National Weather Service indicated tropical storm conditions with sustained winds greater than 39 mph (tropical storm force winds) and gusts in the range of 50-70 mph, could occur offshore of the eastern coastal region of Connecticut, and easterly to the Massachusetts coast and Cape Cod. Due to the more easterly track, interior regions of Connecticut were forecast to experience only 15-20 mph for sustained winds. However, notwithstanding the forecasts of a relatively low-impact tropical storm event primarily descending upon the eastern Massachusetts coast and Cape Cod, Eversource was concerned that the weather system had the potential to impact the entire Eversource system with some intensity. Therefore, Eversource moved ahead with planning for a major event for its Connecticut, Massachusetts and New Hampshire electric systems.

Activation of the ERP. On Friday, July 31, the Connecticut Incident Commander commenced preparation for Tropical Strom Isaias, meeting with the Incident Commanders for Massachusetts and New Hampshire, along with senior Eversource leadership, including the President of Electric Operations for Connecticut. A Level 4 ERP Event was formally declared on Friday, July 31, to take effect the day of the event on Tuesday, August 4, at 7:00 a.m.
A Level 4 Event is classified as a local emergency event that has an appreciable impact on customers, the environment, and safety; that is typically expected to last between two and six days after the weather conditions have subsided and it is safe to deploy crews; and, that will require additional organizational and resource support to respond to the event and restore service. The initiating conditions for activation of the ERP at this level include: (1) broad customer or critical facility impact; and (2) threat to public safety. Within a Level 4 event, there is a range of impacts anticipated and a high-side Level 4 event overlaps with a low-side Level 3 event, by design. The overlap between events is incorporated into the ERP Event Level Matrix because larger weather systems do not always maintain the same characteristics of strength, precipitation, wind levels and path from the beginning to end of the event.

The Incident Commander scheduled the first IMT conference call for 11:00 a.m. on Friday, July 31. At the 11:00 a.m. IMT conference call, the Incident Commander and ICT reviewed the line resources available to assist in restoration efforts. As part of its planning process for ERP events and the necessary line resources to respond to those events, Eversource plans on a three-state basis. Given the proximity of the three Eversource electric operating companies, each electric operating company in Connecticut, Massachusetts and New Hampshire, is able to call on Eversource resources during emergency events.

On the July 31 conference call between the Connecticut, Massachusetts and New Hampshire Incident Commanders and the President of Electric Operations for Connecticut, a regional response to Tropical Storm Isaias was discussed and developed whereby line resources would be deployed to the state suffering the worst impacts of the storm. Given that the weather forecasts were predicting that Massachusetts, particularly Cape Cod, was slated for the worst impacts, the conclusion drawn on the
July 31 call was that line resources would likely need to be dispatched to Massachusetts. The Massachusetts Incident Commander, consistent with the weather forecasts pertaining to the Eversource service area, had secured 266 external crews to assist in restoration efforts.

As of Friday, July 31, Eversource had 330 line crews stationed in Connecticut, including internal line crews, RSO troubleshooters, distribution contractor crews, transmission contractor crews, and service crews, with up to 590 line crews readily available in Massachusetts and New Hampshire to pivot to Connecticut should circumstances warrant. For a Level 4 ERP event the expectation is that a range of 250 to 800 line resources will be needed, whereas a Level 3 ERP event expects a range of 750 to 1,250 line resources will be needed. Therefore, with 920 lines resources stationed in Connecticut and/or available to pivot to Connecticut, Eversource was prepared for a high-side Level 4 event/low-side Level 3 event. Eversource’s crew movements for line and tree crew resources are discussed in further detail below in Section IV.D.

Based on initial conversations with its Canadian counterparts, the Resource Acquisition Section determined on July 31 that 120 Canadian crews were available to assist with restoration efforts in the event that Tropical Storm Isaias impacted the Eversource service territory. The Canadian crews were secured as of Saturday, August 1, subject to the necessary paperwork. Given that Tropical Storm Isaias was forecasted, at that time, to impact the Cape Cod region, the Massachusetts Incident Commander made the formal request that the crews be moved across the border. Consistent with

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6 This number is the movable number of crews, over and above the number of crews that would be needed to remain stationed in either Massachusetts or New Hampshire to conduct operations. On any given day, Eversource has a significant number of local contractor crews working on its distribution and transmission systems. Based on Eversource’s contractual relationships with these local contractor crews, the crews are available to assist with ERP response and restoration efforts in any of the three state jurisdictions.
established process in Massachusetts, the NSTAR Electric Company IMT asked that the Massachusetts Emergency Management Agency (“MEMA”) request that United States Customs and Border Protection (“USCBP”) authorize the Canadian crews to cross into the United States. To effectuate this request, MEMA must supply to the USCBP an exact roster of every person on the Canadian crews crossing into the United States. The Eversource Resource Acquisition Sections coordinated with their Canadian counterparts to develop the roster and other necessary paperwork to secure the Canadian crews throughout Friday, July 31 and Saturday, August 1.

Given that a majority of Eversource personnel were still under a work-from-home status due to the COVID pandemic, the Logistics Section had previously put in place plans for Company personnel to carry out their assigned storm duties in Eversource facilities closest to their homes in the event that they lost power and/or internet service due to Tropical Storm Isaias.

On Friday, July 31, the Logistics Section ensured that those spaces that would potentially be used were identified, cleaned and sanitized and staged to enable social distancing. The Logistics Section also coordinated with the Security Officer to ensure that this transition to working in Company facilities, if necessary, was accomplished safely and efficiently. Specifically, the Logistics Section coordinated with the Safety Officer regarding staging area plans, COVID protocols and appropriate on-boarding processes, such as logging in personnel, to assist with any contact tracing in the event of suspected COVID exposure. The Logistics Section utilized an online building access form to allow for more efficient tracking and approval of personnel that needed to be granted access to any building where access had been restricted due to the COVID pandemic.
The Logistics Section also contacted and coordinated with BASE Logistics, a third-party independent contractor that specializes in disaster recovery and assists in setting up base camps and staging areas. BASE Logistics confirmed that it was available to support the Company’s restoration efforts with up to 1,000 bunk bed trailers, feeding tents and support staff. The Logistics Section finalized the necessary support with BASE Logistics on Monday, August 3, with BASE Logistics personnel and equipment arriving Tuesday, August 4. Upon their arrival, BASE Logistics personnel assisted Eversource in setting up the staging areas across Connecticut. Ultimately, six large staging areas were set up across Connecticut to support material laydowns, crew check-ins and assignments, parking, feeding personnel and fueling vehicles. The staging areas were set up at the Danbury Welcome Center, the Danbury Fair Mall, Cove Island, Sherwood Island, Crystal Mall and Eversource’s Berlin, Connecticut headquarters.

As part of the process of securing the Canadian crews, the Logistics Section provided the crews with Eversource’s COVID contractor safety protocols. Under these protocols, each Canadian crew member had to self-certify that he/she was not experiencing any COVID symptoms, such as a fever, shortness of breath, loss of taste or smell, or a cough. The Canadian crew members were also required to self-certify that that had not been exposed to anyone with COVID in the 14 days prior to their travel to the United States. Following the IMT conference call with the Incident Commander on Friday, July 31, at 11:00 a.m., the Logistics Section Chief contacted the Logistics Branch Directors and Leads via email and directed them to contact primary hotels/caterers to ensure that the Company would not be impacted by limited availability or other challenges and the contractors/vendors were ready to provide the necessary food and lodging support during the ERP event.
Vegetation Management Activities. During blue sky days, Eversource has 235 vegetation management crews working on its distribution system. When vegetation management crews are needed, alliance partners under contract are acquired to supply personnel and equipment for emergency restoration work. Beginning on Friday, July 31 and continuing through Monday, August 3, Eversource dedicated approximately 75 vegetation crews, working in conjunction with the Company’s arborists, to perform patrols of circuit backbones, identifying immediate hazards and scheduling tree crews to mitigate those hazard issues in advance of the storm. The patrols identified numerous overhead dead wood locations, noted previously identified dead or otherwise hazardous trees and trees in contact with distribution system facilities, secured customer permission, where required, and abated those hazards through Monday, August 3.

In addition, the Vegetation Management Unit Leader developed a work schedule utilizing the 235 crews to ensure that vegetation management activities would take place 24 hours/day to assist with restoration efforts. Approximately 170 crews were scheduled to work the day shift, with 65 crews working the overnight shift.

Materials/Equipment. Following the ICT conference call with the Incident Commander on 11:00 a.m. on Friday, July 31, the Logistics Section Chief contacted the Logistics Branch Directors and Leads to contact key contractor and vendors, including rental companies (generators, vehicles, staging area equipment, etc.) and materials and equipment suppliers to ensure that the supply chain would not be impacted by limited supplies or other challenges and the contractors/vendors were ready to provide the necessary support during the ERP event. The Procurement Unit of the Logistics Section confirmed with key material suppliers, i.e., Graybar (storm kits, electric materials); AJ Hurley (wire); Howard Industries (transformers); Koppers (wood poles); Dival (safety); and Grainger (MRO), that
they were able to provide 24/7 materials and supplies coverage during the emergency event. The Material Logistics Services Unit ordered extra materials to have on hand, including multiple truckloads of transformers.

**IT/Telecom.** On Friday, July 31, the Telecom Services Unit confirmed the quantities, availability and location of “Network in a Box” or “NIB”, communications trailers and other key equipment. IT also suspended any ongoing system enhancements or routine system updates that may have been scheduled to assure the system was stable and dedicated.

On Friday, July 31, the Environmental Services Unit contacted spill vendors, NRC and Clean Harbors ensure their readiness ahead of Tropical Storm Isaias.

At 3:30 p.m., on Friday, July 31, Eversource notified PURA of the decision to pre-stage external crews in advance of the storm. In that filing, Eversource noted that it had declared a Level 4 event for the oncoming tropical storm, with the expectation of 125,000 to 380,000 customer outages at peak and 1,500 to 10,000 trouble spots (damage locations).

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7 **NIB** is the shared use of a frequency band for a certain application together with other specified users under the specific conditions that: (1) no protection from harmful interference, i.e., interference which endangers or seriously degrades, obstructs, or repeatedly interrupts the functioning of the operation of any radiocommunication service, from the other specified users is given; and (2) causing harmful interference to the other specified users is prohibited.

Over the weekend, the Incident Commander held multiple readiness calls, including calls at 11 a.m. on Sunday, August 2; and, at 11 a.m. on Monday, August 3, to assure that each ERP Section was sufficiently prepared for the declared Level 4 ERP event and restoration in accordance with the ERP. The Operations Section also reviewed the situational awareness of the distribution system in the days prior to Tuesday, August 4. The Operations Section recalled any previously planned and scheduled work, such as on critical lines, on the distribution system. Additionally, Eversource cancelled planned work on the transmission and distribution system for the week of August 3 to ensure that scheduled work would not impact any restoration efforts. Through these activities, the Operation Section ensured that the distribution system was in its normal configuration in advance on Tropical Storm Isaias. The Operations Section confirmed that the distribution system was operating under its normal configuration on Monday, August 3.

**Emergency Operations Centers.** Normally, during an ERP event, Eversource will dispatch its control room operators and embed them with other Company personnel in the Regional EOCs during the emergency event. With the onset of the COVID pandemic, Eversource took proactive steps to protect its highly skilled and trained control room operators given their critical role in operating the distribution system. Eversource created sterile environments in its control room and forbade entry to anyone other than the control room operators. Eversource also conducted medical screening of the control room operators at the beginning of their shifts.
There are three major EOCs in Connecticut: the eastern region EOC is located in New London; the central region EOC is located in Hartford; and the western region EOC is located in Newtown. Consistent with COVID-19 protocols put in place in April 2020 by the President of Electric Operations for Connecticut, the Operations Section developed a plan to open the New London and Newtown EOCs on a limited basis to provide support to through the event, with several smaller EOCs and AWCs used for additional personnel. Control operators were located in the Berlin and Hartford control rooms. Operations coordinators and modelers worked in the EOCs and AWCs, with a designated operator working virtually. The Newtown and New London and the smaller EOCs were readied between Friday, July 31 and Sunday, August 2.

**Staffing Roster and Assignments.** Following the Friday, July 31 declaration of a Level 4 emergency event effective Tuesday, August 4, at 7:00 a.m., the Operations Section reviewed the personnel rosters for the line resources to be utilized during restoration efforts and used those rosters to develop crew assignments. Crew assignments were developed to ensure that the Company had 24/7 coverage during the restoration period. The Operations Section also utilized the crew rosters and assignments to pre-stage resources across Connecticut. Resources were dispersed across Connecticut throughout the various EOCs and AWCs.

On Saturday, August 1, the Fleet Services Unit reviewed initial rental requests and coordinated with the Logistics Section Chief and Incident Commander regarding the rental requests. On Sunday, August 2, the Fleet Services Unit notified Altec that rental bucket trucks and heavy-duty auger trucks used to set poles would be needed for the Eversource response to Tropical Storm Isaias and informed

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Altec that the initial rental order for this equipment for Massachusetts would be reallocated to Connecticut. The Fleet Services Unit was dispatched to stores to obtain all necessary items included on its pre-storm checklist. Additionally, the section activated its contract for three dedicated pole delivery/repositioning trucks.

On Saturday, August 1, the Logistics Section again reached out to key hotel contacts to finalize lodging terms and conditions consistent with appropriate COVID protocols and to determine the number of available rooms. The Logistics Section originally sought to place personnel in single hotel rooms due to COVID protocols.

On Sunday, August 2, the Environmental Services Unit notified the spill response teams to ensure that the teams entered the appropriate spill reporting in the Enviance system during the emergency event.

Under **Readiness Condition – EMERGENCY**, emergency event conditions that will cause or have caused significant impact to the Company’s distribution and/or transmission system and customers are imminent. At this point, the Company will activate the ERP, declaring an “event level” and mobilizing all aspects of the ERP organization to meet the oncoming threat.

On Tuesday, August 4, at 7:00 a.m., the ERP was triggered with the Level 4 ERP Event declared on Friday, July 31. Eversource was preparing for a high-side Level 4/low-side Level 3 event, decentralizing operations into regional staging areas, as is the standard for a Level 3 event. With the
Canadian crews included, Eversource had approximately 920 line crews on hand in Connecticut, Massachusetts and New Hampshire that were readily movable. No crews were available from the south, as mutual aid crews were holding pending the advancing storm. However, Eversource was solidly positioned to pivot the internal crew complement to follow the storm path, and to supplement those crews with internal resources and contractor crews from Massachusetts, New Hampshire and Canada.

On Monday, August 3, the Operations Section confirmed that each of the EOCs were ready; that the IT systems had been tested and confirmed operational; and that the rooms and equipment had been properly sanitized and set up for social distancing in accordance with COVID protocols. The Operations Section also set up Microsoft Teams meetings between the main and smaller EOCs to ensure that personnel could communicate effectively and maintain situational awareness.

Consistent with the Mutual Aid Agreement, the Canadian crews departed Canada on Sunday, August 2. Given that the forecasts at that time were still predicting impact in the Cape Cod region, the Canadian crews were initially scheduled to deploy to Massachusetts, with the understanding that the a portion of the crews would be re-deployed to Connecticut in the event that the forecasts shifted and predicted impacts to Eversource’s service territory. Once the storm cleared and the Canadian mutual aid crews could be relocated, the crews were redirected to Connecticut and arrived on Wednesday, August 5.

On Monday, August 3, the Logistic Section gave the order to commence booking 1,000 hotel rooms. Additionally, the Food and Lodging component of the Logistics Section decentralized food ordering to coordinate with local AWCs during the emergency event.
On Monday, August 3, the Vegetation Management Unit Leader worked with the Operations Section Chief to pre-stage vegetation crews in certain locations across Eversource service territory ahead of Tropical Storm Isaias to have them available to assist line resources in cut and clear activities ahead of restoration efforts. Those tree crews that were not dispatched as specifically requested by the Operations Section Chief or his delegates were dispatched by the Vegetation Management Unit Leader to address tree events caused by Tropical Storm Isaias.

On Monday, August 3, the Material Planning Unit stood at the ready to move the necessary materials across Eversource’s service territory to bolster restoration efforts in the hardest hit areas.

On Monday, August 3, the IT Services Unit confirmed that all Company computers had been restarted, with the appropriate software updates installed if required. Additionally, the IT Services Unit ordered additional MIFIs for the Planning Section to support poor connectivity issues. The IT Services Unit established System Operations Center ("SOC") and EOC IT support techs for all areas across the Eversource service territory.

The Fleet Services Unit procured a total of 34 rental vehicles from Enterprise to support the Planning Section’s damage assessors and wire guards in the event that they were unable to utilize their personal vehicles. The Fleet Services Unit confirmed that the Enterprise vehicles initially ordered to support the Tropical Storm Isaias response in Massachusetts were redeployed to Connecticut. A total of 21 Altec rental buckets trucks and diggers began arriving in Connecticut on August 3rd. The Fleet Services
Unit also confirmed tracked vehicle and bucket truck fleet availability and locations across the Company’s service territory.

**Tuesday, August 4**

By August 4, the work of each IMT Section and Organization toward the Company’s readiness goal was complete, following the pre-designated responsibilities delineated in the ERP, while also adapting to address changing circumstances, particularly those occasioned by the developing weather forecasts.

By 8:00 a.m. on August 4, all logistics branches were operational. The Company made a request for mutual aid through the Edison Electric Institute (“EEI”) Mutual Assistance Network—asking for 800 Distribution Line Crews (approximately 1600 FTEs) and 100 Tree Crews (approximately 200 FTEs). At the time of the Company’s initial request, the EEI member companies were not generally releasing their resources to the mutual aid pool because they were still monitoring the storm and its impacts on their respective service territories. The Company was able to secure 12 crews from UGI Utilities, Inc. out of Pennsylvania.

The Company also reached out both its non-affiliated, contractor resources and to private electrical contractors from around the county to check resource availability. Eversource secured 25 crews from Pike Electrical Contractors.

As noted previously in this Report, at the time Storm Isaias onset the Eversource system on Tuesday, August 4, Eversource had **330 line crews** stationed in Connecticut, including internal line crews, troubleshooters, distribution contractor crews, transmission contractor crews, and service crews, with up to **590 line crews** readily available in Massachusetts and New Hampshire to pivot to Connecticut.
should circumstances warrant. Therefore, with 920 lines resources stationed in Connecticut and/or available to pivot to Connecticut, Eversource was prepared for a high-side Level 4 event/low-side Level 3 event. In addition, the Company had stationed 235 tree crews, 181 Wire Guards and 106 Damage Assessors.

<table>
<thead>
<tr>
<th>Crews Count Stationed in CT</th>
<th>August 4, 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resources</strong></td>
<td><strong>Count</strong></td>
</tr>
<tr>
<td>Line Resources</td>
<td></td>
</tr>
<tr>
<td>Transmission Crews</td>
<td>41</td>
</tr>
<tr>
<td>Internal Distribution Crews</td>
<td>74</td>
</tr>
<tr>
<td>Contract Distribution Crews</td>
<td>72</td>
</tr>
<tr>
<td>RSO Troubleshooters</td>
<td>116</td>
</tr>
<tr>
<td>Service Crews</td>
<td>27</td>
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<tr>
<td><strong>Total Line Resources</strong></td>
<td><strong>330</strong></td>
</tr>
<tr>
<td>Tree</td>
<td>235</td>
</tr>
<tr>
<td>Wire Guards</td>
<td>181</td>
</tr>
<tr>
<td>Damage Assessors</td>
<td>106</td>
</tr>
</tbody>
</table>

Other final arrangements on Tuesday, August 4, included the following:

- Submittal of border-crossing documentation for the Canadian crews to DEMHS.
- The Logistics Section reserved all available hotel rooms through Friday, August 7. Subsequently, the Logistics Section extended the reservations through Sunday, August 9.
- The Fleet Services Unit procured an additional 11 bucket trucks from Altec.
- The Environmental Storm Hotline/Storm Center opened at 8:00 a.m.

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This number is the movable number of crews, over and above the number of crews that would be needed to remain stationed in either Massachusetts or New Hampshire to conduct operations. On any given day, Eversource has a significant number of local contractor crews working on its distribution and transmission systems. Based on Eversource's contractual relationships with these local contractor crews, the crews are available to assist with ERP response and restoration efforts in any of the three state jurisdictions.
4. Outage Prediction Models

As part of its preparation for potential emergency events, Eversource receives inputs from two, different outage prediction models (“OPMs”), which are DTN and UCONN. The DTN model applies a combination of weather parameters, such as high winds, lightning, ice accretion and similar factors, to determine the strength of incoming storms and the risks associated with those storms at various time horizons. The DTN OPM also utilizes other data to create an application that predicts and displays severe weather threats as those threats move through Eversource’s service territory. DTN uses statistical modeling and predictive analytics to determine the impact of the weather event on Eversource’s assets and translates these analyses into impact statistics, such as anticipated damage and outages.

The UCONN group is a research lab that develops storm damage modeling technology and forecasting to help Eversource plan for reliable service throughout Connecticut and New England. UCONN issued five predictions to Eversource between August 1 and August 4 for the Eversource service territory, with each prediction showing increasing storm severity. The last prediction was released on the morning of August 4, a few hours before the storm – calling for an extreme impact. However, even with its increasingly ominous indicators, the storm’s damage exceeded the UCONN OPM as strong winds blew through the state and non-meteorological factors – including the weakened and insect-damaged trees – became an unexpected part of the equation. An extreme drought affected the region in 2016 and caused stress on many trees, particularly in the northern portion of Connecticut, and drought conditions have persisted in much of the state. Also, tree canopy defoliations by Gypsy moth infestations in 2016, 2017 and 2018 created vulnerabilities statewide.
UCONN also cited that the National Weather Service confirmed that a tornado, characterized by a maximum wind speed of 95 to 105 mph, occurred in Westport in a region where power outages were extensive. Other small tornadoes and microbursts are also suspected to have taken place in some locations, which may have caused localized pockets of extreme winds.

UCONN researchers say a key observation from Tropical Storm Isaias and its aftermath is the recognition that vegetation management should be implemented more widely, perhaps including more attention to large trees that have been outside of historical trimming zones. Faculty members who specialize in natural resources will be analyzing data from the UCONN’s Stormwise forest management sites and remote sensing data from NASA to investigate tree damages as it continues reviewing the incident.

The predictive accuracy of an OPM will always be a function of the quality of the forecasts input to the model, i.e., weather data with a higher confidence level of occurring is important as an input. For this reason, the output of the two OPMs available to the Company is not available early in the process. In relation to Storm Isaias, the Company received the first outputs of the DTN and UCONN models starting on the weekend (August 1 and 2), after the Company’s decision to trigger the ERP to prepare for a major weather event. With a potential major event, the Company cannot wait for the model outputs to arrive. To be prepared, the Company has to make reasoned decisions based on the best information known at the time, prior to the availability of the outage predictions, which renders the OPMs a reference tool to confirm planning decisions rather than an actual planning tool. As shown in the table below, the first results of the DTN and UCONN OPMs became available starting Saturday, August 1, and neither the DTN nor the UCONN OPMs predicted outages greater than 3,000 customers for Eversource’s territory through Monday, August 3.
Due to the 2017-2018 drought in Connecticut and the Gypsy Moth and Emerald Ash Borer infestations, the tree population in Eversource’s territory has suffered an unprecedented scale of tree mortality and loss of integrity. Specifically, the drought significantly weakened trees’ root systems, making them susceptible to falling due to high winds, such as those experienced during Tropical Storm Isaias. There is no way to test a tree to determine if its root system has been compromised due to the drought or other factors. This vulnerability was exacerbated by the fact that the trees were in full leaf during Tropical Storm Isaias. Although these trees appear outwardly healthy, Tropical Storm Isaias’ high sustained winds and wind gusts proved to be catastrophic for trees in Eversource’s Connecticut service territory. Eversource estimates that approximately 90 percent of the 10,000 trees downed as a result of Tropical Storm Isaias fell into this category of trees weakened by the drought. This was an unprecedented impact in Eversource’s history and experience.

<table>
<thead>
<tr>
<th>Date / Time</th>
<th>Organization</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/1 16:00</td>
<td>UCONN</td>
<td>500 - 1,000</td>
</tr>
<tr>
<td>8/2 16:00</td>
<td>UCONN</td>
<td>1,000 - 2,000</td>
</tr>
<tr>
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<td>DTN</td>
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<td>DTN</td>
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<td>8/3 08:00</td>
<td>DTN</td>
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<tr>
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<td>UCONN</td>
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<tr>
<td>8/4 11:00</td>
<td>UCONN</td>
<td>3,000 - 6,000</td>
</tr>
</tbody>
</table>
C. Tropical Storm Isaias – The Storm Event

1. A Swift and Destructive Impact

Between August 1 and into the early morning hours of Monday, August 3, the National Hurricane Center forecasted very low probabilities (35 percent or less) for tropical storm force winds for Eversource’s Connecticut service territory (Figure 3, above). By the afternoon of Monday, August 3rd, the storm was located approximately 220 miles south southwest of Myrtle Beach, South Carolina with maximum sustained winds of 70 mph and moving north at 13 mph. Around this time, the weather forecasting models began to converge and predicted that the storm would take a more westerly path over eastern New York State. Consequently, it was starting to become clear that the coast and Cape Cod were not going to see the more significant impacts as previously forecast and that a much larger area of Eversource’s service territory was going to be exposed to the eastern portion of the storm, which had the highest wind potential. By 8:00 p.m. on Monday night, the National Hurricane Center was predicting tropical storm-force winds (sustained >39 mph) in Eversource’s service territory at a 72.5 percent probability. Although this represented a last-minute shift, Eversource had been preparing over several days for a forceful Tropical Storm Event consistent with the parameters of the ERP.

On Monday, August 3, Isaias strengthened into a hurricane, made landfall, and battered the Carolinas throughout the course of the day. The storm was later downgraded to a tropical storm as it exited the Carolinas and continued to make its way north.

At noon on August 4, Tropical Storm Isaias was 10 miles west southwest of Wilmington, Delaware and by 2:00 p.m. the storm was 40 miles west of New York City and accelerating north at 40 mph. In the late afternoon of August 4th, the eastern portion of Tropical Storm Isaias hit the Company’s
system hard, with higher than forecast wind speeds and peak wind gusts reaching 67 mph in some areas. Sustained wind speeds well over 39 mph and in excess of 50 mph occurred in far flung localized pockets.

In addition, several tornado warnings were issued across Connecticut as storm cells showed rotation at the cloud level through the afternoon of August 4. By the time Tropical Storm Isaias reached Connecticut on August 4th, the storm was undergoing an ET, which happens when a hurricane dissipates into a hybrid storm extending tropical cyclone–like conditions over a larger area and in latitudes that do not typically experience such events. During ET, a cyclone frequently acquires increased forward motion and sometimes intensify substantially, so that such systems pose a serious threat to land and maritime activities.\(^\text{11}\) A tropical storm system undergoing an ET can be likened to a spinning top—beginning with a tight spin and then, as it slows down and releases energy, moves in a more and more erratic, unpredictable, and exaggerated manner. This release of energy manifests itself as an unpredictable weather system with high winds and in some cases tornadic activity. Forecasting the timing, intensity, and track of an ET is challenging for weather prediction models due to the dynamics and the energetics involved in the dissipation of a tropical system.\(^\text{12}\) The ET that occurred in Connecticut on August 4 was consistent with all of these characteristics—it was

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unpredictable, difficult to forecast, and unleashed powerful winds that caused significant and widespread damage to the Eversource electric distribution system.

Tropical Storm Isaias occurred on the Company’s electric transmission and distribution system between 2 p.m. and 6 p.m. on August 4 in western Connecticut and between 3 p.m. and 8 p.m. in the eastern part of the state. Eversource continued to take additional system damage from storm weakened trees throughout the remainder of the week with outages peaking at 632,632 customers at 3:30 p.m. on Wednesday, August 5. Actual sustained wind speeds, wind gusts and observed wind direction are shown in Figures 5, 6 and 7, below.

Figure 5
Observed Sustained Winds (mph), August 4, 2020
Figures 5 and 6, above, illustrate that the wind speeds for the event were higher than forecast with sustained wind speeds in the general range of 35 to 50 mph, with frequent wind gusts of 55 mph and more. Trees were in a weakened state on the system, which combined with the more intensive winds and storm dynamics to create a highly destructive weather event. Figure 7, below, illustrates the actual wind direction during the event, and explains the atypical impact on Connecticut tree stock.
During the height of the storm, in the extra-tropical transition, the dominant wind direction across Connecticut averaged from the southeast, which statistically is not a typical direction in Connecticut for most high impact weather systems. This condition placed a significant strain on the trees, some of which were healthy fully leafed trees and others of which were dead or deteriorating.
due to drought and insect infestations. Wind direction was a factor in the severity of the event because trees become “hardened” over the years to whatever the primary wind direction is for a given region. Across the Northeast, the primary wind direction is typically from the western half of the compass, i.e., SW-W-NW. In the case of Storm Isaias, Connecticut was on the eastern side of the storm system, with 4 to 6 hours of strong, sustained winds speeds coming from the 180-degree opposite direction; that is, from the SE-SSE (averaged) direction causing significantly greater stress on the tree stock that would normally occur.

As a result of this confluence of storm characteristics, the damage to the electric system was more severe and widespread than could have been anticipated given the storm’s wind speeds and path once it reached Connecticut. Specifically, three conditions combined to intensify the destructive force of the storm beyond expectations for tropical storm conditions:

1. The westerly track of the storm toward the New York border left Connecticut on the east side of the storm where the higher impact winds occur. This condition was forecast on Monday, August 3, immediately prior to the weather event, but would not have unexpectedly elevated the destructive force of the event on its own.

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13 Docket No.17-10-46RE03, Application of the Connecticut Light and Power Company d/b/a Eversource Energy to Amend its Rate Schedules – Approval of System resiliency Plan for 2021-2022, Testimony of Alan C. Carey at 5, 7-8, 11-14 (July 17, 2020) (describing the substantial rates of tree mortality in the State of Connecticut caused by drought and insect infestation); Vulnerable Trees, High Winds, Other Factors Combined for Strong Storm Damage from Isaias, UCONN today (August 14, 2020), https://today.uconn.edu/2020/08/vulnerable-trees-high-winds-factors-combined-strong-storm-damage-isaias/ (“Gypsy moth infestations and drought conditions in recent years have weakened trees throughout Connecticut to such an extent that forests were particularly vulnerable when the remnants of Hurricane Isaias swept through on Aug. 4, causing extensive power outages related to tree damage.”).
2. The storm was dissipating and experiencing an ET, spewing higher sustained winds and wind gusts than anticipated across a widespread area, with localized pockets of powerful wind circulations that caused severe impact to trees and vegetation surrounding the overhead system.

3. Long-running drought conditions occurred across Connecticut in 2015-2017, undermining the integrity of tree root systems and making trees more vulnerable to insects such as Gypsy Moths and Emerald Ash Borers, as well as pervasive disease arising as a condition of infestation and drought. These environmental factors coupled with higher-than forecast sustained wind speeds in local circulations caused thousands of trees to topple on overhead electric infrastructure.

As shown in Figure 8, below, the range of the sustained windspeeds experienced in Storm Isaias ranged up to 40 mph, which was greater than the range experienced in Tropical Storm Irene and on par with the range experienced for Superstorm Sandy.

Figure 8
Comparison of Sustained Wind Speeds and Wind Gusts
Figure 9, below, illustrates that the damage was much more severe and widespread than would have been expected given the forecasted wind speeds and storm path. Unlike other storm events in Connecticut where the damage was concentrated in certain geographic regions, Figure 9 shows that all of Eversource’s 149 towns were impacted by this event.

**Figure 9**

Severity of Storm Damage by Customer Outages.
2. Public Safety Phase of Emergency Response

Scope of Immediate Impact

On Tuesday, August 4, Eversource was fully prepared for the onset of Storm Isaias. Crews were prepared and on the system or available to be moved to the system; logistics was ready to go with vehicles, material kits; communications, housing, and food; planning calls had been conducted over the weekend to check and recheck all aspects of the ERP readiness; and all ERP branches were fully prepared. On Tuesday morning, crews were on the system performing work; other crews were ready for activation. It started to rain around noon time. Normally local contractors do not work in the rain; however, Eversource kept them working to be available in the event. As storm conditions onset the system, each section of the Incident Command Team begins to perform their designated functions in accordance with the ERP and with the foremost objective of protecting the health and safety of the Company’s employees and the general public.

Between 3:00 and 4:00 p.m., a band of tornadoes and thunderstorms rolled through. The OMS started recording outage reports. In a matter of an hour, Eversource had 30,000, 40,000, 50,000 and then 60,000 customers out and 25 transmission lines tripped out of service. Into early evening another 12 transmission lines opened and reclosed indicating some type of encroachment or damage took place, a lightning strike or a tree struck it and cleared it. With at least 100,000 customers experiencing an outage at this point, it was clear that a major event of much greater proportion than predicted was taking place.
By 4:00 p.m., the Eversource system had already sustained 230,000 customer outages; 4,200 damage locations; and 6 transmission lines were knocked out of service. By 6:00 p.m., damage locations had increased to 5,300 sites and an unprecedented 25 transmission lines had tripped out of service. Another 12 transmission lines had opened and closed—meaning they had suffered damage which interrupted their operation. By midnight on August 4th, there were over 500,000 power outages recorded by the Company’s OMS.

Under emergency conditions, the event classification level is changed or modified based on a continual assessment of the severity and complexity of an event. Decisions regarding event classification levels are made at the incident command level. Accordingly, in light of the escalating storm impact, at 8:00 p.m., Tuesday, August 4, the Incident Commander escalated the storm event from a Level 4 to a Level 3 to align the classification with the actual, escalating circumstances on the electric distribution system. The number of damage locations detected and reported on the system were within the range of a Level 4 ERP event but approaching the lower end of the range for a Level 3 event.

Accordingly, at 8:00 p.m., Eversource elevated the event classification to a Level 3 ERP Event. Under the ERP, a Level 3 event is an emergency event that has a significant impact on customers, the environment, or safety with a restoration duration of between 5-10 days. Significant organizational support or multi-level agency and government involvement is normally required. The initiating conditions for activating the Level 3 emergency classifications include an event that causes: (1) a

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14 A Trouble Spot is a unique event in the OMS that requires a repair(s) to restore a customer or group of customers, typically tied to a device (i.e., switch, fuse, transformer). There may be many repair locations for crews to repair within a trouble spot.
system-wide event; (2) significant potential adverse impact to public safety; and/or (3) major customer impact.

Concurrent with the decision to escalate the event classification in Connecticut, the Incident Management Team was closely monitoring the storm impacts in Massachusetts and New Hampshire. When Eversource moved to a Level 3 ERP classification in Connecticut, the Incident Commander immediately directed the transfer of Massachusetts and Canadian mutual aid line resources to Connecticut. The Incident Commander also directed the ERP Director to commence acquisition of additional crews external to Eversource’s on-hand line resources.

Figure 10
Transition from Level 4 ERP Event to Level 3 ERP Event
Although not yet apparent at this point in time, Storm Isaias was by far the worst storm to hit Connecticut since 2011-2012 when customers experienced the sequence of Tropical Storm Irene, a mid-fall snowstorm (the October 2011 Nor’easter) and Superstorm Sandy. Isaias caused a total of 21,669 damage locations spread across the entire state. Every single one of the 149 communities served by Eversource in Connecticut suffered significant damage. To restore power, Eversource ultimately cleared more than 8,900 fallen trees and replaced more than 2,506 damaged utility poles, 1,438 transformers and more than 500 miles of downed wire.

**Strategy of Immediate Response**

Crews already in the field were directed to respond to Fire/Police Safety (“FPS1”) priority calls involving life threatening situations and imminent danger to human life. From the night of Tuesday, August 4th into early Wednesday, the Company’s primary focus was on public safety—responding to FPS1 priorities, clearing impassable roads, and assisting customers who needed emergency assistance. FPS calls are classified into three categories\(^\text{15}\):

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**Figure 11**

**Public Safety Wire Down Classifications**

<table>
<thead>
<tr>
<th>Priority 1 (FPS1)</th>
<th>A life-threatening situation.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Priority 2 (FPS2)</strong></td>
<td>A situation that is hindering emergency operations such as firefighting or rescue operations but NOT life threatening. It is not an imminent threat but may prevent a future rescue or emergency responder from responding to a threat. An example is a blocked road.</td>
</tr>
<tr>
<td><strong>Priority 3 (FPS3)</strong></td>
<td>Any electrical hazard such as downed wires, with no immediate threat to life or property.</td>
</tr>
</tbody>
</table>

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\(^{15}\) The priority of an FPS call is determined by the municipal fire, police, or emergency operator placing the call.
The powerful winds of Tropical Storm Isaias caused widespread damage to trees, damaging utility poles (over 2,000 in total), and transmission and distribution lines across Eversource’s service territory. The Company responded to 153 FPS1 emergency calls reported during the event, on the evening of August 4, and another 37 FPS calls reported Wednesday, August 5, during the day. Some of the FPS1 calls that the Company responded to between 1:15 PM and 7:40 PM on August 4th are as follows:

- 31 FPS1 calls related to people trapped in vehicles including:
  - 2 fire engines,
  - a U.S. Postal service truck,
  - a bus with 14 people on it, 4 injured
  - a vehicle with a pregnant woman in it
- 7 structure fires, including:
  - 1 house with people trapped
  - A trailer park with multiple people trapped
- A house with wires down that had a child alone trapped in the house
- A building roof collapse

The Company also had two separate incidents where trees fell on its own trucks—one of which occurred while a worker was in a raised bucket when a tree fell on the extended boom. During storms, front line workers typically hunker down in their vehicles, but during Isaias the weather conditions were so extreme that crews were returning to the Company’s work centers for safety.

In total, within the first 24 hours after Storm Isaias onset the system, Eversource received and responded to 193 FPS1 calls, ultimately handling a total of 263 FPS1 calls throughout the restoration period. All FPS1 events were addressed without injury to the public, first responders or the Company’s personnel.
Figure 12

FPS1 Calls Responded to by Eversource

<table>
<thead>
<tr>
<th>Date</th>
<th>FPS1 Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>08/04/2020</td>
<td>156</td>
</tr>
<tr>
<td>08/05/2020</td>
<td>37</td>
</tr>
<tr>
<td>08/06/2020</td>
<td>17</td>
</tr>
<tr>
<td>08/07/2020</td>
<td>18</td>
</tr>
<tr>
<td>08/08/2020</td>
<td>15</td>
</tr>
<tr>
<td>08/10/2020</td>
<td>9</td>
</tr>
<tr>
<td>08/12/2020</td>
<td>5</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>264</strong></td>
</tr>
</tbody>
</table>

In addition to the above FPS1 calls, the Company also responded to a total of 2,431 FPS2 and 2,273 FPS3 calls. Once the priority public safety and emergency issues were addressed, the Company turned its attention to damage assessment, additional state and municipal priorities and customer-restoration efforts.

Internal line crews and contractor crews were fully engaged responding to the FPS1 calls, many of which were associated with large outages. For example, a distribution circuit may trip out of service supplying 2,000 customers in a town. Right around the same time, Eversource may receive an FPS1, priority call from the municipal Fire Department indicating that a tree has taken down multiple sections of wires and that there is imminent danger that has to be addressed urgently. Customers also will call in, and it might be 2,000 individual customers or some other number of customers representing a 2,000-customer circuit, but the OMS is able to vector in on the damage location from just a few outage reports. At the same time, Eversource is obtaining intelligence through smart switches and the SCADA system detecting that this line tripped out of service. All of this information combines, so that the crews are directed to that location to eliminate the hazard situation. If it is safe to do so, the crews will start some restoration associated with that damage location. If Eversource
can restore a couple thousand customers by cutting the trouble area away and closing the switch, it
does that because it is an efficient use of crews already on site in response to the FPS1 priority call.

In parallel to the FPS1 priority calls, any automatic switching that could take place, has taken place,
although the damage that was occurring to the Eversource system in Storm Isaias was so traumatic
that the immediate opportunity for that was limited. Operations coordinated with the engineering
group to determine whether digital fault recorders on the transmission lines could pinpoint where
damage was located.

In addition, during this early stage of the Eversource response, the Eversource Operations Chief
began working with a group of transmission crews to start patrols of the downed transmission lines
to isolate damage locations. Repair of downed transmission lines is an imperative at this point because
power to distribution customers cannot be restored if the supply source is down. Therefore, downed
transmission lines receive immediate attention when storm conditions subside.

Damages and associated outages continued to occur throughout the early morning hours of
Wednesday August 5, with 632,632 customer outages at peak, on Wednesday, August 5, at 3:30 p.m.
Thousands of downed wires and associated blocked roads were reported by communities. Eversource
deployed its Damage Assessors who worked remotely with the Unit Coordinators of the Community
Liaison Group. Many of the blocked road reports are known to Eversource because the blocked road
is typically associated with an FPS2 or FPS3 call on the priority call lines. Eversource began
responding to those calls working down from the most urgent situations first.

The first 24 hours of any major event is unavoidably dedicated to public-safety response, i.e., FPS1
priority calls, critical facilities and transmission outages. Damage locations, FPS1, FPS 2 and FPS3
events and other priorities are recorded in OMS, disaggregated by geographical and electrical circuitry area. Each AWC or EOC started dispatching crews to specific outage jobs using the OMS system, starting with the largest customer count jobs first. Eversource directs the crews to go out and repair the job and call back when complete so the OMS can be updated in real time, rather than allowing crews to take three or four job assignments at once, which would have them working remotely for extended periods without updated information in the OMS as to the time spent on any one job, or the priority of the next job coming up.

Every town rightly wants their issues addressed as the first priority; however, the restoration priority requires working through the towns that have the greatest number of customer outages. Larger outages are almost always associated with an FPS1 or FPS2; therefore, responding to larger outages first provides a dual benefit because restoration is achieved, while also addressing a municipal priority.

Damage assessors were deployed on the system investigating and reporting on damage locations, compiling information on FPS 2 wire down events. If the Damage Assessor came upon a wire down, the Damage Assessor would call into the Unit Leader and a Wire Down Guard would arrive to install caution tape or cones and stand by, allowing the Damage Assessor to go to the next job. The Wire Down Guard must remain at that location and make the area safe until a qualified electric field crew arrives to successfully mitigate the issue. RSO Troubleshooters were deployed as the primary responder to municipal wire down calls.
In accordance with the public-safety imperative, Eversource focused its resources on public-safety circumstances, including emergency (life-threatening) situations and critical facilities throughout the day on Wednesday, August 5, with many resources working 16-to-18 hour shifts and others working 24-hour shifts. This work was highly challenging due to the significant amount of tree damage that hindered travel by both utilities and emergency responders. As part of the preparedness plan, many employees were working remotely using laptops and mobile units, although some employees lost internet access as a result of the storm event, which Eversource expected and planned for. Many employees arrived in the middle of the night at their assigned work centers. Eversource had created places for employees to go and set up if their power was lost. The Damage Assessors deployed as soon as it was safe to do so and were able to visually inspect damage locations and provide input to OMS to give operations insight on what the issue is on a particular type of job.

3. Restoration Phase of Emergency Response

On Wednesday night, August 5, Eversource commenced its full-scale restoration work. Eversource quickly augmented the crew resources already on hand in Connecticut, shifting hundreds of crews from Massachusetts and New Hampshire, to Connecticut, along with crews secured from the Midwest, Canada and other locations throughout the day Wednesday and into Thursday, as the Public Safety Phase progressed.
As illustrated in Figure 13, below, Eversource increased the crew count in Connecticut quite rapidly, to 504 line crews and 235 tree crews on Wednesday, August 5, after storm conditions subsided; to 852 line crews and 285 tree crews in Connecticut by Thursday August 6; and to more than 2,500 line crews and 780 tree crews in Connecticut by Sunday, August 9. This effort was made possible only as a result of the Company’s advanced preparation and planning. Power was restored more quickly than any prior event, despite the greater level of damage than expected by the models, weather forecasts and other data sources.

**Figure 13**

*Total Crews Available and Deployed in Connecticut*
The crew resources assembled for the Storm Isaias storm response included a historic level of restoration crews, tree crews, wire down guards and damage assessors, representing over 9,100 fulltime equivalents. In addition, Eversource leveraged the entire Eversource organization with over 2,800 employees working to manage the overall storm process and the logistics associated with this large response. Eversource accomplished this while practicing pandemic safety protocols.

**Figure 14**
Support Resources at Peak

<table>
<thead>
<tr>
<th>Total Resources Deployed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Crews</td>
</tr>
<tr>
<td>Tree Crews</td>
</tr>
<tr>
<td>Wire Down Guards</td>
</tr>
<tr>
<td>Damage Assessors</td>
</tr>
<tr>
<td>Logistical Support</td>
</tr>
</tbody>
</table>

**Figure 15**
Origin of External Crews Acquired to Assist in Restoration

![Origin of External Crews Acquired to Assist in Restoration](image)
On Thursday, August 6, Eversource issued a global estimated time of restoration or “ETR,” as required under the ERP. Damage assessment was not complete, but information yielded by the OMS enabled designation of the ERT. The global ETR was set for Tuesday, August 11, at midnight, and full-scale restoration progressed from there.

On Friday, August 7, Eversource committed to have 90 percent of all Eversource customers restored by Sunday night, August 9. In addition, Eversource committed to restore power to 500 polling locations by Sunday night, August 9, for voting in the primary planned for Tuesday, August 11.

The expected number of customer outages in a Level 3 event is greater than 625,000 outages, with a restoration time of 5-10 days. In this case, Eversource reached substantial completion, or 99% of customers restored in every town in the Eversource service territory, within 7 days of the point at which storm conditions subsided, enabling the start of restoration (or 8 days from the onset of the storm event to 99% completion). The commitment of 99% restoration across the State of Connecticut occurred at midnight Tuesday, August 11, as committed to Governor Lamont and PURA.

As discussed above, the first 24 hours of the event are dedicated to the protection of the public safety, with crews responding to FPS1 priority calls, downed transmission lines, impassable roads, and other state and municipal priorities. This is depicted in Figure 16, below, in red. Once the bulk of these issues are resolved, full-scale restoration commences. This occurred on Wednesday evening, August
5. From this point forward, Eversource focused on customer restoration along with continuing to balance municipal priorities and requests for restoration of critical facilities.

Figure 16
Restoration Phases

Also as shown on Figure 16, from the start of the weather event, Eversource accomplished a total number of customers restored of 1,152,045, with a total of 632,632 customer outages at peak. Eversource achieved 99% completion by Tuesday, August 11, at midnight. The total number of customers restored represents all customers that lost power throughout the restoration and includes
customers that lost power multiple times as part of restoring the transmission and distribution system to normal.

As indicated previously, there were far more damage locations caused by Storm Isaias than caused by Tropical Storm Irene or Superstorm Sandy. In Isaias, Eversource experienced 21,669 damage locations, which is about 25 percent more than occurred in either Irene (16,100) or Sandy (16,500). However, the restoration time for Irene was 10 days and for Sandy was 11 days, so that those events took approximately two days longer to address fewer than three-quarters (75%) of the damage locations occurring in Isaias.

Figure 17
Comparative Statistics for Historical Events

<table>
<thead>
<tr>
<th></th>
<th>Tropical Storm Isaias: August 2020</th>
<th>Tropical Storm Irene: August 2011</th>
<th>Superstorm Sandy: October 2012</th>
<th>October 2011 Nor'easter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration:</strong></td>
<td>9 days</td>
<td>10 days</td>
<td>11 days</td>
<td>13 days</td>
</tr>
<tr>
<td><strong>Peak outages:</strong></td>
<td>632,632</td>
<td>671,000</td>
<td>496,769</td>
<td>807,228</td>
</tr>
<tr>
<td><strong>Total outages:</strong></td>
<td>1,152,038</td>
<td>1,000,728</td>
<td>856,184</td>
<td>1,358,718</td>
</tr>
<tr>
<td><strong>Trouble spots</strong></td>
<td>21,669</td>
<td>16,101</td>
<td>16,460</td>
<td>25,566</td>
</tr>
<tr>
<td><strong>Broken utility poles:</strong></td>
<td>2,506</td>
<td>707</td>
<td>2,763</td>
<td>856</td>
</tr>
<tr>
<td><strong>Damaged transformers:</strong></td>
<td>1,438 (more than)</td>
<td>1,743</td>
<td>2,196</td>
<td>1,964</td>
</tr>
<tr>
<td><strong>No. of line crews:</strong></td>
<td>2,555 (at peak)</td>
<td>1,334</td>
<td>1,642</td>
<td>1,803</td>
</tr>
<tr>
<td><strong>No. of tree crews:</strong></td>
<td>789 (at peak)</td>
<td>555</td>
<td>813</td>
<td>870</td>
</tr>
</tbody>
</table>
Conversely, the Eversource system experienced 25,566 damage locations in the October 2011 Nor’easter, which is about 25% more damage locations than for Isaias. Total restoration time for the October 2011 Nor’easter was 13 days, as compared to 9 days for Isaias, so the restoration for the 2011 October Nor’easter was four days longer, for only 25 percent more damage locations.

Once all customers were restored, Eversource inspected the distribution system to determine any temporary repairs that must be made permanent, and to look for any additional storm damage that must be addressed to conform to construction and maintenance standards.

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16 Measured using standard major exclusion day metric from date of the event to the last major exclusion day. The duration of time from the event to substantial completion at 1% or less in every municipality was 7.5 days.
Although the restoration effort was completed in record time, Eversource is acutely aware of the frustration of customers who had to endure several hot summer days and other discomfort for several days before their power was restored, while also grappling with stress caused by the COVID-19 pandemic and other factors. This situation clearly hit customers hard and Eversource made every effort possible to restore power to customers as quickly and safely as possible to alleviate this unexpected sequence of events.

**Planning, Operations and Logistics Sections**

In support of the restoration effort, Eversource’s Logistics Section set up six large staging areas across the state to support material laydowns, crew check-in and assignments, parking, feeding, and fueling (over 110,000 gallons of diesel and 12,000 gallons of gas):

- Danbury Welcome Center
- Danbury Fair Mall
- Cove Island
- Sherwood Island
- Crystal Mall
- Berlin Campus

The Logistics Section also arranged for 40,000 beds for its frontline workers (peaking at over 6,400 beds per night) and served over 107,000 meals. Due to limited hotel availability due to the COVID-
19 pandemic, Eversource set-up five alternative lodging sites to feed and lodge crews and support staff:

- Lake Compounce - Base Logistics setup bunk trailers that are capable of lodging 1,000 people (restricted to 375 for COVID)
- Post University - setup 250 beds in dorms
- WCSU - setup 100 beds in dorms
- Camp Jewell - setup 100 beds in cabins
- Freight Street Garage - setup 75 cots

A more detailed timeline of the actions taken by the Planning, Operations, and Logistics Sections over the course of the restoration effort is provided in the sections that follow:

**Wednesday, August 5**

Following the cessation of the extreme wind conditions, it became clear that the most significant damage to the Eversource Energy electric distribution system was in Connecticut and that Massachusetts and New Hampshire were not as severely damaged. Accordingly, on the morning of Wednesday, August 5, Eversource dispatched 173 (143 primary and 30 secondary) restoration crews and 62 Damage Assessment and Support crews from Massachusetts and 77 Canadian-based crews to Connecticut.
As discussed above, from Tuesday August 4, into Wednesday, August 5, the Company’s primary focus was addressing public safety issues and responding to FPS1 and other emergency calls. The Company also dedicated resources to clearing blocked roads once all life threatening FPS1 emergencies were resolved. The Company worked with communities to obtain lists of roads and assigned line personnel to start clearing blocked roads so both the Company and other emergency service providers could get around the public ways, perform their work, and begin damage assessment and restoration activities.

As the Company was substantially addressing priority emergency situations in parallel with road clearing, the Company also initiated its damage assessment activities. The Company’s Damage Assessment teams are supervised and managed out of the Planning Section, and these teams conduct electric system damage and safety assessments to accurately determine the locations and severity of damage and damaged equipment, access restrictions, and other information needed to estimate the time necessary for repair. Damage assessment is a critical, preliminary step in the wake of a significant storm event because it gives the Company actionable intelligence about the conditions in the field and informs the restoration strategy—planning, logistics, and decision making about crew and resource levels and materials (e.g., cross arms, poles, transformers). Moreover, it is difficult, if not impossible, to develop a valid and actionable ETR based solely on customer outage data without having first-hand reports from front line workers about actual conditions in the field that may impact or otherwise delay restoration. Simply put, it is critical to have boots on the ground and eyes on the damage to assess the impacts to the electric distribution system.
Among other things, damage assessment entails patrolling the circuits in the field by vehicle, and in some cases by foot, to determine the locations and causes of outages, and the nature and extent of the damage. Regarding transmission, it is not reasonable or practical to patrol the miles and miles of transmission rights-of-way by vehicle or foot to perform a damage assessment. The quickest and most effective way to perform a damage assessment on the transmission system is by air. Accordingly, given the significant amount damage caused to the transmission system, Eversource contracted for six helicopters to patrol the electric transmission system to collect information on the damage.

Restoration activities are supervised and managed out of the Operations Section. In the early hours of August 5, the Company’s system was still taking damage, outages were still on the rise, and the focus remained on addressing emergency life threatening situations and clearing roads. By the afternoon of August 5, the outages on the Eversource system reached their peak at 632,632 with 21,669 trouble locations. At 7:00 p.m., the Incident Commander escalated the event from a Level 3 to a Level 2 to better align the event classification with the actual damage. The low end of the range for a Level 2 ERP event is 625,000 outages at peak and 15,000 trouble spots; both of which were exceeded at this point in time.

Notably, the Company’s distributed automation devices contributed to most of the restorations on the first day following the storm—accounting for 26,482 total customer restorations. A more detailed discussion of the Company’s distributed automation activities is presented later in this report.
Thursday, August 6 to Sunday, August 9

As discussed above, on August 4th the Incident Commander escalated the storm event from a Level 4 to a Level 3. Pursuant to the ERP, the Company is required to provide a global restoration projection within 48 hours after a storm has left its service territory. Accordingly, on Thursday, August 6, the Company’s Planning Section issued a global restoration time of midnight on Thursday, August 11. In addition, the Company committed to issue town-by-town ETRs by Saturday, August 8th, and cities and towns that had not been restored by Saturday were provided with ETR information on Saturday.

Due to the extent of the damage and the associated outages, the Logistics Section continued to ramp-up the internal and external crew count (i.e., Line Crews, Vegetation Management/Tree Crews, Damage Assessors, Troubleshooters, Wire Guards, etc.) between August 6th and August 9th. By late Wednesday, August 5 into early Thursday, August 6th, mutual aid crews became available through EEI’s mutual assistance program, and the Logistics Section was able to secure crews from the Midwest, Illinois, and Missouri, among other places. In parallel, the Logistics Section was communicating with utility counterparts across the country to try to secure additional resources—leaving no stone unturned in their efforts to secure crews. Between August 6 and August 9, the Logistics Section secured a total of 1,600 crews through the mutual aid and contractor process to work on the restoration in Connecticut.

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In addition to mutual aid resources, the Company continued to redeploy internal resources from Massachusetts and New Hampshire to assist in the restoration effort. Specifically, in addition to the internal crews which has already been sent to Connecticut prior to August 6th, between August 6th and August 9th the Company redeployed additional crew resources from Massachusetts and New Hampshire. By Sunday August 9th, the Company had thousands of individuals working on restoration efforts in Connecticut, including more than 2,500 restoration crews and 780 tree crews.

As noted above, the Operations Section was largely focused on responding to FPS1 emergency (life-threatening) situations and clearing roads from late Tuesday, August 4 into Wednesday, August 5. Beginning late Wednesday August 5 and into early Thursday, August 6, Eversource was able to dedicate more resources to restoration and outages began to steadily decline beginning on the evening of August 5.

Eversource typically directs the switching and tagging activities in support of restoration from the system operations centers. However, pursuant to the ERP, the Company may adopt a practice called “controllership” during state-wide and regional events where the distribution system is divided into segments and qualified individuals who understand the switching and tagging process are delegated oversight responsibility for each designated segment.18 This individual is assigned crews and they are responsible for directing the crews, the restoration activities, and the switching and tagging for the segment to which they are assigned. Given the volume and dispersion of outages from Tropical Storm

Isaias, it was clear that the decentralized, controllership model was a more appropriate approach to restoration and it was implemented by the Operations Section on Thursday, August 6.

**Monday, August 10 - Tuesday, August 11**

The Company restored 111 of 149 towns by midnight on Monday August 10. This included all towns in Eversource's Central Division and all but two in the Eastern Division. The two towns in the Eastern Division were restored prior to 7 a.m. on August 11. On Tuesday August 11, at approximately 6:00 p.m., the Company achieved its goal of substantially completing the restoration with less than 11,000 customer outages at approximately 6:00 p.m. on Tuesday August 11. At approximately 11:30 p.m. on August 11, Eversource achieved its town-level ETR goal with 99% of storm-related outages per-town restored.
V. COORDINATION: Balancing Restoration with Make Safe Priorities

A. Classification of Wire Down Events

The Eversource system experienced severe damage as a result of Storm Isaias with 21,669 “damage locations” representing those locations on the system where storm conditions caused power outages to customers. Although these damage locations will encompass the majority of wire down events experienced by cities and towns in Connecticut, causing blocked roads. Eversource is called on to perform additional work to respond to E911 calls, low wires, trees hanging on wires, and supporting municipal efforts to unblock roads not associated with FPS1 and FPS2 priority calls.

The Communications section of our ERP Team staffs the Eversource call center and provides community liaison staff to coordinate with local municipalities and DEMHS. In this case, Eversource was operating under Emergency Pandemic Protocols, so that the response effort was assisted by hundreds of Eversource trained personnel working remotely from their homes or other safe locations.

During an emergency event, a significant number of resources are deployed to: (1) emergency calls from local Fire and Police who are standing by a damaged electric facility; and (2) “wire down” calls, which are reports of wires down that are received from customers and do not involve public safety apparatus standing by. Wire down calls are typically received by the Eversource call center and classified by the public safety official on scene. Eversource responds to all wire down calls, even
though a relatively large portion of these calls involve facilities that are not the Company’s (such as wires owned by cable or telecommunications providers)

Fire and Police calls from local communities are handled with special attention using a prioritization system that is designed to work in tandem with restoration efforts in those communities, as discussed above in Section C.2. More specifically, Fire and Police Calls are classified into three categories: FPS1, FPS2, and FPS3. The highest priority calls or, FPS1 calls, involve life-threatening circumstances and are handled directly by Electric Operations through emergency dispatch. FPS2 and FPS3 calls are handled through by the Company’s customer service representatives, via priority telephone lines and via a customized portal for online reporting, or through community liaisons and recorded into the OMS.

A more detailed description of the FPS1, FPS2 and FPS3 classifications is as follows:

**FPS1 “Imminent Danger”:** Calls designated as FPS1 are calls from local fire/police regarding emergency situations involving life threatening circumstances in which electric wires or infrastructure are preventing emergency response personnel from performing rescue efforts and/or administering first aid treatment to someone who may be injured or is in danger of being injured.
An example would be where a person is trapped in a vehicle that has struck a pole and the pole or equipment is prohibiting emergency personnel from approaching the vehicle. FPS1 calls are received by the Eversource Emergency Operation Center on a special telephone line that is provided in advance to local public safety officials. A System Operation Supervisor receives the call and code the call as FPS1, which is then dispatched to the nearest qualified crew. Local public safety officials also have access to a second line, which routes directly to the emergency dispatch centers. This line is intended for use only when there are “imminent danger” circumstances.

Within the first 24 hours after storm conditions onset the system, Eversource received and responded to 193 FPS1 and handled a total of 263 FPS1 (imminent danger) throughout the storm. All FPS1 events were addressed without injury to the public, first responders or the Company’s personnel.

FPS2: “Hindering Emergency Operation”: Wire down calls are categorized as an FPS2, where electrical equipment is preventing the municipality from responding to a situation that is not considered life threatening or imminent danger; yet, requires the attention of emergency personnel.

Within the 9-day restoration effort, Eversource handled 2,431 FPS2 (hindering operations) calls over the days following the Storm. All FPS2 events were addressed without injury to the public, first responders or the Company’s personnel.

FPS3: “Non-Threatening Electrical Hazard”: Wire down calls are categorized as an FPS3, where electrical equipment has created the need for emergency response personnel to remain on the scene to protect the public from the hazard created by the utility’s equipment.
Within the 9-day restoration effort, Eversource handled 2,273 FPS3 (non-threatening electric hazard) calls over the days following the Storm. All FPS3 events were addressed without injury to the public, first responders or the Company’s personnel.

Following an event of the magnitude of Isaias, another top priority is critical facilities. Each year, each municipality designates or confirms previously identified “critical facilities” within their boundaries and Eversource maintains a list of these pre-designated facilities, which were used to prioritize response in Storm Isaias. This is the “public safety” phase of restoration. There are 860 affected critical facilities on this list, although many facilities on this list are prepared to operate on a generator until Eversource was able to get there to restore power and alleviate the use of the generator. Eversource also received numerous priorities from state officials regarding state-level critical facilities, and blocked roads and highways. Eversource worked with municipal responders to clear over 1,900 blocked roads through the days following the event.

Eversource knows that all municipal priorities are important to the public-safety officials dealing with those priorities and that providing assistance as quickly as possible would be the optimal solution for these municipalities. Storm Isaias resulted in over 7,000 different priorities on different levels of severity in a very short amount of time. The highest priority must be those priorities that directly impact or threaten life. However, Eversource endeavors to balance municipal priorities with the important responsibility of restoring customers as quickly as possible.

In that regard, as shown in Figure 19, below, information regarding these additional trouble events streams to Eversource from several channels, such as the community liaison process contemplated by the ERP, as well as channels unique to the weather event and the nature and location of damage that
has occurred. In Storm Isaias, Eversource received more than 3,000 calls from municipal fire and police personnel with a 9-second average speed of answer. Fire and police personnel self-served through Eversource’s new municipal portal more than 2,000 times, although the portals experienced slowdowns and “timeouts” during the period where the digital channels were experiencing slowdowns. Eversource estimates that it completed 11,287 touchpoints with communities including phone calls, emails, briefings, and text messages.

Figure 19
Sources of Inputs for Restoration and Make Safe Priorities

It is important to understand that “make safe” crews are not different than restoration crews. There is very little difference between a make safe crew and a restoration crew. Both of these designations refer to qualified line workers trained to handle testing, clearing, repairing of high-voltage conductors.
Make safe crews and restoration crews are really one and the same in many cases, and it really comes down to the job site assignment. When crews go into a town just to clear blocked roads, that means they are testing conductors, deenergizing, moving downed wires out of the way so that Eversource and municipal tree crews can clear out the trees and open the road. Restoration crews are primarily assigned to fix a specific broken part of the system and restore customer outages. But, in many cases, these two types of work are the same job, because trees were the major cause of damage and associated outages. Communities did make requests and Eversource filled the requests as best as possible given all of the overarching priorities sought for resolution by state and local authorities. However, it is a balance for Eversource and certainly the decisions involved in balancing priorities will not be acceptable, reasonable or sufficient for municipalities that wait in line for crews.

To assist in the process and alleviate the need for municipal Fire and Police to stand by a wire down location, Eversource recruits, trains and deploys “Wire Down Guards” in major events to replace Fire and Police personnel on scene until relieved by a restoration crew who can either make the situation safe for the public or complete necessary permanent repairs. Wire Down Guards are primarily drawn from the customer care organization (Meter Readers and Collectors), who have vehicles and communications, as well as a basic understanding of the electrical system and the hazards. Supplemental resources were also drawn from underground construction inspectors and station operations personnel who are knowledgeable in construction of the electric system, as well as field service technicians who normally install electric meters, and other business units within Eversource.

Similarly, the Eversource Community Liaison Organization is designed to play a key role in communications during the restoration effort. The Community Liaison Organization is responsible for the coordination of effort and communications with external municipal, state and federal agencies.
and stakeholders and charged with maintaining a bi-directional communication flow with stakeholders throughout the event. Community liaisons assigned individually to each municipality in the Eversource service territory form the backbone of the Community Liaison Organization. These individuals are trained to interface with towns and municipalities, acting as the conduit for real-time information, support, notification, coordination, and communications between municipal officials and Eversource for system restoration, including communication of mutual assistance activities. The Community Liaisons identify critical information and issues to be relayed through the Liaison Organization, including issues such as damage assessment data, blocked roads, and requests to address emergent priorities. The Company’s community liaisons also are responsible for coordinating and harmonizing FPS2 and FPS3 priorities from multiple sources, all in effort to ensure that the FPS2 and FPS3 work was described accurately, classified correctly, and appropriately prioritized.

The severe impact of Storm Isais challenged the Community Liaison process and made it clear that there is room for improvement in communications with customers and with the municipalities that we serve. In an event of the magnitude of Storm Isaias, there are literally thousands of new and unanticipated priorities that are each of vital importance, but that cannot be addressed simultaneously. For example, over 500 polling locations throughout the state had to be restored prior to Connecticut’s Primary election by Tuesday, August 11. Although Eversource diligently strived to achieve an optimal, efficient and effective allocation of resources, we know that the response was not viewed as adequate by all constituencies dependent on Eversource for resolution. Eversource will take a hard look at the challenges that arose during our restoration effort and will find meaningful ways to improve the process for the future.
In parallel with the restoration work that was being carried out using the controllership model, the Company dedicated resources to the significant volume of FPS2 and FPS3 “make safe” priorities, most which were addressed in the period between Thursday, August 6th and Monday, August 10. The FPS2 and FPS3 work was prioritized using information provided by cities and towns to the Company’s community liaisons, who in turn attempted to work with towns to evaluate that information to help appropriately classify FPS2 or FPS3 priorities. For example, the Company received some reports of “completely blocked” roads, which did not comport with the conditions in the field—i.e., there was tree and/or pole damage but the road was passable.

At same time that information was being provided by local municipalities, state officials were sending the Company priority lists for clearing state roads. State officials were also providing priorities on behalf on municipalities but in some cases these lists did not match-up with what was being provided though the local communications channels, and in some cases contained FPS situations that had been resolved by the Company two and three days previous. Also, the Company was separately receiving requests from Legislators. Therefore, the Company’s community liaisons worked to coordinate and harmonize what were oftentimes competing and inconsistent priorities from multiple sources, all in effort to ensure that the FPS2 and FPS3 work was described accurately, classified correctly, and appropriately prioritized.

As the classifications and priority lists were finalized by the community liaisons, this information was relayed to the Planning and Operations Sections to plan the work in the context of the global restoration effort, taking into account resource and logistical considerations, and whether the applicable locations had power (e.g., no outage or with power by a generator). Once the work was properly planned and prioritized, the Operation Section dispatched crews to the locations to perform
the “make safe” work and information was communicated to the cities and towns about when crews would be arriving at the respective priority locations. In some cases, New Milford being one example, Company crews spent multiple shifts in a single town addressing numerous FPS2 and FPS3 situations in the town.

Eversource appreciates that every municipality views its FPS2 and FPS3 situations as a top priority and understands the frustration that arises when issues are not resolved immediately. The Company also appreciates that state officials and legislators are zealous advocates for the public. The damage caused by Storm Isaias was both significant and spread over a very wide area, which means that both restoration work and FPS 2 and 3 work must be planned and prioritized in a systematic, logical, balanced, and above all, safe manner.

VI. CUSTOMER EXPERIENCE: Customer Access Is Vital

A. Pre-Event Communications

The Communications Officer reports to the Incident Commander and is responsible for developing and providing accurate, consistent, timely, and complete information regarding the status of the restoration efforts throughout the course of the emergency event. The Communications Officer attends all the Incident Commander’s calls leading up to and during a storm event and communicates pertinent information to Company’s Customer Group and Communications Organization.

Once the Incident Commander shifts the Company’s operations from blue-sky mode to preparation for a storm event, the customer Communications Organization immediately begins planning storm-related messaging to customers. In support of this effort, the Company works with local media channels to get information out to customers about pre-event storm preparations.
The primary outbound messaging that occurs in advance of any storm event, as was the case with Tropical Storm Isaias, is outbound calls to critical care customers (e.g., customers of record on life support, customers with serious illnesses, etc.). In addition to outbound messaging to critical care customers, once it becomes clear that there will be a major storm event and the Incident Commander classifies the event as such, the Communications Officer determines whether the Company should activate its storm page and the Company’s outage recording process. In this case the Company the “Storm Preparedness” web page was up and running on Monday, August 3.

One of the many unique aspects of Storm Isaias is that the Company put together a plan in advance of the storm to draw on resources from an outside vendor, Alorica, to provide additional customer service representatives. A kind of “mutual aid” plan for customer service representatives. Alorica normally handles the Company’s credit call operations but the Company trained them to take outage calls leading up the storm event.

In the early afternoon of Tuesday, August 4, Eversource contacted Alorica and activated the Alorica representatives to handle outage calls from customers. Eversource had over 500 internal and external customer service representatives dedicated to Storm Isaias at the peak, which is significantly higher than the number of customer service representatives assisting customers during Superstorm Sandy.

**B. Customer Communications During the Event**

On Tuesday, August 4, as the sheer volume of customer contacts hit the system at the start of the storm, Eversource’s digital channels such as two-way texting, mobile app and online outage communication options slowed due to capacity constraints. As the digital channels bogged down due to extreme volume, customer moved to the Interactive Voice Response (“IVR”) system and call center
for access to report their outages, which caused those channels to become overwhelmed despite the fact that Eversource had arranged to have more than 500 customer service representatives available to conduct “live calls.” For customers, this caused intermittent “time outs” and “fast busy” signals to occur on the mobile channels. None of the digital channels, IVR or Call Center system failed to operate. The process of getting through the Company’s various channels was just inordinately slow at time due to the unprecedented inbound contact volume. For example, during the peak period on the first day of the storm, customers experienced a 19-minute average wait time to speak to a customer service representative, or sometimes a busy signal or dropped call, due to the large volume of simultaneous users. However, despite the intermittence at the onset the event, Eversource’s digital systems and customer service representatives successfully recorded over 85,000 outage tickets during those first few hours. On Wednesday, August 5, the system recorded over 220,000 customer reported outages.

As part of Eversource’s preparedness efforts, the contact channels are routinely tested to accommodate inbound customer contacts 20% higher than the volumes experienced in Superstorm Sandy. However, the volume of inbound customer communications for Storm Isaias was more than double the record level experienced for Storm Sandy, reflecting customer behavior trends of using numerous digital channels at once from smartphones and laptops, which is a dynamic not necessarily experienced in Superstorm Sandy.

The slowdown experienced by customers for blocks of time on Tuesday, August 4, and to a more limited extent on Wednesday, August 5, was understandably frustrating for customers as they sought to report their outage. However, Eversource had a good read on the scope and location of outages using the separate Outage Management System, which is able to identify and track outages from just
a few outage reports, and is also obtaining data fed from remote line sensors and other technology installed in recent years. As a result, the customer’s delay in using the system did not affect the duration of any customer outage. The Eversource Information Technology team worked diligently through this challenge and was able to make quick modifications to accommodate the heavy traffic.

**Figure 20**

Inbound Traffic by Hour

In addition, the Eversource Customer Service and Communications ERP Team is responsible for managing all public communications, including the Eversource website, social networking sites and news media. In this event, the Eversource Customer Service and Communications Team provided approximately 6 million proactive, outbound customer updates and handled more than 3 million inbound customer interactions. Of the 6 million outbound communications, our customers received
more than 5 million proactive updates across various channels, including notifications about outage reporting issues. Customers self-served using our digital channels more than 2.4 million times. Customers spoke or chatted with us individually more than 200,000 times, with an average speed of answer of less than five minutes.

C. Customer Communications During the Restoration Phase

As part of the IMT structure, the Communications Officer designates an Assistant Communications Officer – Customer Group ("ACO") to remain embedded in the IMT during the preparation for and response to an emergency event. The ACO attends all IMT calls and shares that information with the Customer Group to ensure that communications with customers prior to and during the event is consistent with all other IMT messaging in terms of content, timeliness, accuracy and completeness. The ACO also elevates Customer Group issues impacting customer satisfaction for information and assistance to the attention of the Communications Officer.

The ACO participated in the first IMT conference call at 11:00 a.m. on Friday, July 31, as well as all subsequent IMT calls during the preparation for and response to Tropical Storm Isaias. The ACO uses information provided at the IMT calls during the twice daily Customer Group. Beginning with the first IMT call on Friday, July 31, the ACO relayed the IMT's determinations regarding the then-projections for Tropical Storm Isaias, including the then-forecasted magnitude of the event and its projected impact on the Eversource system and customers. Based on the information relayed by the ACO, as well as the July 31 declaration of a Level 4 ERP Event to take effect on Tuesday, August 4, at 7:00 a.m., the Customer Group assessed and determined the type and manner of pre-event alerts to send to customers.
Throughout the preparation for Tropical Storm Isaias, the Customer Group paid strict attention to the declared ERP Event Level as that influenced the type, number and content of notifications sent to customers in advance of the storm. Additionally, as the Operations Section transitioned from blue sky to grey sky to storm mode in advance of Tropical Storm Isaias, the Customer Group determined whether customers alerts should be sent through automated channels, e.g., text messages and social media updates, versus manual channels, e.g., phones calls. The Customer Group examined, assessed and adapted the customer alerts as part of its twice daily phone calls in the days leading up to Tropical Storm Isaias.

With a percentage of customers in Connecticut having selected outage alert notification, the Customer group works with operations and strategic communications to provide customers with twice a day updates in their channel of choice. During “grey” or “black sky” events, the automated messaging directed from the outage management system is disabled, and customized messaging is developed and pushed to customers two times per day in the customer’s channel of choice. Eversource manually develops the message and pushes it to customers because the OMS system is designed to push a message to (a) confirm that a customer’s outage is recorded; (b) note crews on site (disabled during grey/black); (c) provide ETR (disabled during grey/black due to nested); (d) confirm power restored (disabled during grey/black). So, to provide messaging, Eversource develops messaging from the ICT meetings and pushes that messaging to customers.

In recent years, based on customer feedback from prior storm events, the Customer Group has focused on informing customers of the Company’s storm preparations using the Company’s news media partners. Prior to the arrival of Tropical Storm Isaias, the Customer Group worked with media partners to provide customers with information on the Company’s preparations. Prior to the arrival
of Tropical Storm Isaias, customers were able to learn about Eversource’s preparations, as well as other critical storm information, through local television news broadcasts and alerts.

The Customer Group also took critical steps to ensure that customers who rely on electricity to power medical devices, refrigerate medications or for other medical/health-related needs were well informed prior to the arrival of Tropical Storm Isaias. The Customer Group focused its outbound messaging on this vulnerable subset of customers to ensure that they were aware of the pending weather event, the Company’s preparations and the need to be ready with their back-up plan in the event that they were without service due to the storm. Additionally, the Customer Group reviewed and finalized plans for sending outbound calls to these customers during and after the emergency event. Eversource makes outbound telephone calls to these customers throughout the duration of the restoration if they are without power to check on their well-being. If the customer does not respond to these calls, the Company may deem it necessary to contact local law enforcement to conduct a wellness check and provide any necessary assistance.

In advance of the arrival of Storm Isaias, the Customer Group utilizes the information provided by the ACO to determine when to adapt the up-front IVR message customers would hear when contacting the Company via telephone. The IVR message is typically updated once the Company has determined the extent of the damage caused by the weather event in order to provide customers with accurate and up to date information about restoration efforts. For Tropical Storm Isaias, the IVR message was adapted to provide information about the storm event. Once the Company becomes aware of outages caused by the storm event, the Customer Group activates the outage notification message on the IVR. Additionally, all outbound non-emergency event calls, such as customer satisfaction surveys, were halted.
The Customer Group finalized all necessary steps to utilize representatives from Alorica, Eversource’s credit call handling agency, as customer services representatives (“CSRs”) during the restoration phase. Due to the COVID pandemic, Eversource developed plans in the spring of 2020 to leverage Alorica representatives as mutual aid CSRs during emergency events. Alorica operates in Texas, West Virginia and Pennsylvania, states that are unlikely to be impacted by weather events impacting Connecticut. Thus, Alorica representatives represent a significant resource to assist the Company in taking and recording outage calls from customers during an emergency event. As a result of the Customer Group’s efforts, Eversource had over 500 Alorica CSRs assisting customers whose service was interrupted due to Tropical Storm Isaias. This is compared to the approximately 350-375 CSRs who assisted customers during Superstorm Sandy.

The Customer Group trained the Alorica representatives to take and report outage calls from customers. At 1:00 p.m. on August 4, the Customer Group activated the Alorica CSRs prior to Tropical Storm Isaias impacting Connecticut so that they would be available to begin assisting customers as soon as outages due to the storm began occurring. Additionally, once the IMT determined that Tropical Storm Isaias would not impact Massachusetts and New Hampshire to the degree originally forecasted, the Customer Group was able to utilize Eversource Energy CSRs from Massachusetts and New Hampshire to assist Eversource customers.

The Company had an “After the Storm” web page up and running on Tuesday, August 4, which was updated several times per day over the course of the restoration effort. During an event and in its aftermath, Police and Fire services have a dedicated priority line through which they can report outages and other emergency situations. Customers report outages to the Company and that information is compared with information in the OMS system—correlating customer-reported outages to locations.
on the Company’s distribution circuits. Eversource Communications Organization is able to utilize that information to proactively reach out to other customers located on the affected circuits to alert them that Eversource is aware that their power is out.

Eversource also dedicated a “concierge team” that attempted to reach the Company’s critical medical care customers to check-in on their status during the event and in the restoration phase. If the Company does not receive a response, then it calls the local police department to conduct a wellness check at the customer’s residence. The Communications Organization also creates a list of callers who have contacted the Company multiple times (i.e., “repeat callers”), and the Company’s concierge team makes outbound calls to this list of customers to check-in on their status.

D. Communication Channels Used with Customers and Communities

The receipt and delivery of information to customers is essential to the restoration process. Over the course of the last few years, the Company has proactively acquired and developed new technologies to better serve customers. The table below reflects many of these new communication channels, along with the approximate number of customers benefiting from each communication method.
<table>
<thead>
<tr>
<th>METHOD</th>
<th>PURPOSE</th>
<th>INTERACTIONS</th>
</tr>
</thead>
</table>
| INTERACTIVE VOICE RESPONSE (IVR) SYSTEM | • Receives calls  
• Self-service outage reporting  
• Outage status and restoration time updates  
• Provides upfront customer announcements | 164,261 Outage Calls |
| CALL CENTER                | • Highly trained customer service representatives (CSRs) serve customers who prefer to speak with a person                                | 149,088 CSR Answered |
| EVERSOURCE.COM             | • Storm™ home page provides easy access to storm resources and tools  
• Provides preparedness information  
• Offers self-service functions like outage reporting  
• Includes CT outage map  
• Includes town-by-town global restoration estimates following field damage assessment (24-48 hours) | 835,056 Visitors  
2,389,636 Page Views  
Home Page:  
Outage Map  
990,646 Visitors  
4,175,614 Page Views  
105,612 Outages Reported Via Web  
1,816,053 Outage Status Check Via Web |
| SOCIAL CARE TEAM           | • Answer general questions  
• Provide customer service assistance to customers with account specific inquiries  
• Concierge calls, single no light, repeat callers, missed ETR, customers requiring an electrician, and other | 63,764 posts and customer responses  
8,159 Concierge Services |
| SOCIAL MEDIA UPDATES       | Media representatives shared updates on Facebook, Twitter, and Instagram:  
• Posts on storm preparedness  
• High-level restoration updates  
• Pictures and video from the field | Total Number of posts: 87  
• Facebook – 33  
• Twitter – 45  
• Instagram – 9 |
<table>
<thead>
<tr>
<th>METHOD</th>
<th>PURPOSE</th>
<th>INTERACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOBILE APP</td>
<td>The Eversource mobile app is free and enables residential customers to view and pay bills, manage their account, and report or check outages while on the go. With the Eversource mobile app you can: ▪ View the Eversource outage map ▪ Report or check an electric outage ▪ Contact customer service</td>
<td>315,258 Outage Status Check via Mobile App ▪ 37,222 Outage Status Check via Mobile App*</td>
</tr>
<tr>
<td>TEXT MESSAGING</td>
<td>▪ Inbound outage reporting from customers ▪ Outbound acknowledgements and restoration updates to targeted customers</td>
<td>Inbound Text (Out/Stat): 140,574 ▪ Outbound Automated Text: 999,151 ▪ Outbound Manual Text: 984,872</td>
</tr>
<tr>
<td>OUTBOUND EMAIL</td>
<td>▪ Electronic channel delivering information to those customers who have provided their email address and prefer that we provide outage and restoration information by email ▪ Important customer updates before, during and after a storm</td>
<td>Outbound Automated Emails: 532,074 ▪ Outbound Manual Emails: 1,597,601 ▪ Total: 2,129,675</td>
</tr>
<tr>
<td>OUTBOUND CALLS</td>
<td>▪ Provide pre-recorded information to targeted groups of customers ▪ Preparedness calls to customers who rely on electricity for medical reasons. ▪ Calls to customers who have reported single property outage ▪ Supplemental restoration or Estimated Time of Restoration (ETR) information</td>
<td>Outbound Automated Calls: 213,967 ▪ Outbound Manual Calls: 689,999 ▪ Total: 903,966</td>
</tr>
<tr>
<td>METHOD</td>
<td>PURPOSE</td>
<td>INTERACTIONS</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| MEDIA OUTREACH                | ▪ Proactively share information with local media before, during and throughout the entire restoration to communicate with customers  
▪ Respond to 24x7 media questions before, during and throughout the event and restoration  
▪ Preparedness and storm response advertising through select media and digital channels | Daily Media Briefings    
News releases – 11  
Media availabilities - 10  
TV interviews – 57  
Radio interviews – 21  
Print inquiries - 369 |
| LIAISON OUTREACH             | ▪ Liaisons responsible for providing information before, during and after the storm communicate regularly with major stakeholders like community and emergency officials, government, regulatory and elected officials, other utilities, | 133 CT community liaisons with an additional 85 mutual aid liaisons from MA and NH supporting all 149 communities statewide. |
| PREPAREDNESS & EMERGENCY BRIEFINGS | ▪ High-level preparedness and storm restoration information distributed internally, for sharing with customers, community leaders, regulators and legislators. | Preparedness Briefing was issued 19 Emergency Briefings were issued |
VII. DISTRIBUTION AUTOMATION AND SYSTEM RESILIENCE

A. Overview

Eversource engineers and designs electric distribution infrastructure to withstand a variety of threats and works hard to prioritize installation of investments with the greatest impact for maintaining electric service to customers. Substantial effort is made to identify and implement opportunities to improve the resiliency of the electric distribution system to withstand the destructive forces of major storm events. Although it is difficult to appreciate the underlying importance of these investments with the overlaying damage caused by Storm Isaias, targeted resiliency programs provide valuable benefits to customers.

Every year, Eversource deploys resources to implement a comprehensive resiliency program aimed at reducing the system’s vulnerability to major wind and rain events, such as was experienced in Isaias, as well as extreme instances of snow, ice, flooding and physical security attacks. These programs effectively result in rebuilding areas of the distribution system with taller and stronger poles; stronger cable wire designed to better withstand tree contact and ice loading; new pole-top construction with lightning protection; and, extensive vegetation management. Eversource has also recently largely modified several substations, raising infrastructure to withstand 100-year flood levels to address the impact of climate change. Eversource has also hardened its communication towers, allowing for operation of remote automation devices regardless of system conditions.

Resiliency investments made since 2015 have produced reductions of over 50% in non-major event outages on circuits segments where work has been completed relative to the four-year average for the same circuit segments prior to program implementation.
These resiliency program benefits are augmented by the substantial investment made by Eversource in modernizing its system with the installation of automated devices such as line sensors and smart switches that isolate faults and re-feed unaffected sections from an alternate source, reducing the number of customers impacted by an outage event. These automation schemes have been an important driver in reducing the number of customers impacted by more minor storm events but also had benefit in Storm Isais by isolating outage events in areas where damage was less extensive and supporting faster restoration with remote switching capability.

4. Progress on System Resiliency

Since 2016, the Company has installed automatic lines switches or “Smart Switches” as well as reclosers and associated equipment at targeted locations along its overhead distribution system backbone. Constructing automatic loops schemes with advanced devices, along with other equipment like sensors and communications equipment, helps reduce the outage impact on customers through further sectionalizing of circuits and helps enhance system efficiencies. Specific locations for application of smart switches are prioritized based on recent outage history and the number of customers affected.

As shown in Figure 21, below, the Company is continuing its progress to install switches, monitors, and reclosers on selected circuits to provide the distribution system with the capability to isolate power disruptions and rapidly restore the functional portions of circuits.
Figure 21
Summary of Smart Switch Program

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Devices Added or Forecasted for Addition</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>64</td>
</tr>
<tr>
<td>2017</td>
<td>99</td>
</tr>
<tr>
<td>2018</td>
<td>60</td>
</tr>
<tr>
<td>2019</td>
<td>35</td>
</tr>
<tr>
<td>2020 Forecast</td>
<td>63</td>
</tr>
<tr>
<td>2021 Forecast</td>
<td>35</td>
</tr>
<tr>
<td>2022 Forecast</td>
<td>37</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>393</strong></td>
</tr>
</tbody>
</table>

Figure 22, below, shows that smart switches were employed to automatically restore power to 46,651 customers during the Storm Isaias event. But for the presence and successful operation of the automatic loop schemes on the Eversource electric distribution system, these customers would have remained without service until restoration crews arrived.

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The Company’s Structural and Electrical hardening program was funded between 2014-2017 at a level that resulted in upgrades to approximately 10-20 circuits per year, which overall equates to approximately 3-4 percent of Eversource’s backbone segments. The benefits of this program are illustrated in the table below showing the improvement for circuit segments addressed under the program.
Figure 23
Comparative Overall Benefits of Key System Resiliency
Structural and Electrical Hardening Initiatives
2015 – 2017

<table>
<thead>
<tr>
<th>Program Year</th>
<th>4 Year Average Before Construction</th>
<th>Average of Years Post Construction</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>49</td>
<td>14</td>
<td>-72%</td>
</tr>
<tr>
<td>2016</td>
<td>81</td>
<td>50</td>
<td>-38%</td>
</tr>
<tr>
<td>2017</td>
<td>57</td>
<td>27</td>
<td>-53%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program Year</th>
<th>4 Year Average Before Construction</th>
<th>Average of Years Post Construction</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>20,955</td>
<td>5,991</td>
<td>-71%</td>
</tr>
<tr>
<td>2016</td>
<td>28,273</td>
<td>19,205</td>
<td>-32%</td>
</tr>
<tr>
<td>2017</td>
<td>19,126</td>
<td>7,849</td>
<td>-59%</td>
</tr>
</tbody>
</table>

The focus of the Structural and Electrical program was on circuits that were most impacted by the major storms that occurred in 2011 and 2012. Although the Structural and Electrical Hardening program within the overall System Resiliency Plan officially ended in 2017, when a line needs to be rebuilt for other reasons (capacity, 4.8kV conversion, reliability) it is constructed using the storm resiliency Standards.

Another example of the impact of the resiliency program is demonstrated by the performance of the DSCADA communications towers during Tropical Storm Isaias. The Company did not experience any tower failures. These towers support antennas and systems that carry voice, data and DSCADA communications for the Company. These towers also support telecommunications infrastructure for the Connecticut State Police through a telecommunications tower sharing agreement. The towers
were rebuilt to the TIA-222 standard. The TIA-222 standard is an approved American National Standard for telecommunication structure design. TIA-222 defines load combinations for maximum wind and ice loadings to be applied during the design of each telecommunication structure. Connecticut has adopted the more stringent design criteria of TIA-222-REV-G; maximum wind speeds from 105-120 mph.

The Company’s system resiliency initiatives continue to focus on identifying targeted areas to yield the greatest benefits per dollar of capital invested. For example, under the Right of Way (“ROW”) lines initiative within the System Resiliency Program, the Company plans capital expenditures for the ROW lines program by selectively targeting the most critical needs. Although there are approximately 500 miles of distribution ROW in Connecticut, the proposed expenditure of $10 million recently filed in PURA Docket 17-10-46RE03, targets remediation to approximately 8 – 10 miles per year that is in the greatest need of repair or replacement in order to yield the greatest benefits per dollar of capital invested. Since the resiliency programs began back in 2013, the Company has addressed 24.1 miles which equates to 4.8% of our distribution ROW lines.

Another initiative in the System Resiliency Program is the “Pole Integrity Program.” The Company has been systematically replacing aging and weaker class poles (e.g., Class 3, 4, 5) on its distribution system through the Pole Integrity Program. When older, smaller diameter poles are replaced with a higher class of poles there will be improvements in system resiliency because every step increase in pole class results in a pole that is approximately 25 percent stronger. Therefore, changing from a Class 4 to a Class 2 pole increases pole strength by 50 percent. This step-up in pole strength increases system resiliency because utility poles are the first line of defense in maintaining uninterrupted service to customers through a range of operating conditions. The recent experience of Tropical Storm Isaias
reinforces the need to replace existing poles with taller, thicker, stronger poles as over 2,000 utility poles were destroyed or damaged during this extreme weather event.

It would be difficult to quantify the benefits the system experienced because of the resiliency efforts during Storm Isaias. It is too early to tell the impact the improvements had to the storm performance given the percentage of circuitry hardened to date. The damage that was sustained by Storm Isaias was due to large trees and debris taking down power lines and breaking poles. The Company rebuilds and replaces poles in accordance with the storm hardening guidelines, which require poles to be able to withstand up to 95 mph winds; as a result, the Company did observe sections of the system that held up to large trees and branches across the primary.

The Company’s System Resiliency program is a long-term initiative to rebuild the system over time, addressing the worst performing areas first. These system resiliency programs will yield a noticeable improvement in performance as more of the system is hardened over time.

**Impact of Enhanced Tree Trimming and Enhanced Tree Removal**

Connecticut is a heavily forested geographic location with beautiful, and beloved, tree canopies that unfortunately will always create problems with falling trees in major weather events. However, over the past several years, the tree stock in Connecticut has suffered long-term impacts from overall climatological issues. There are a few factors at play. One factor is that there was a drought in 2017-2018, so a lot of the trees have compromised root structures, rendering even healthy trees weak and susceptible to strong winds. Another factor is gypsy moth infestation. After the first battle with drought in 2017-2018, the leaves came back and the trees survived, although there may have been a loss of root integrity as a result. After the second battle, significant tree mortality
occurred and the leaves did not come back. This has meant that there are a lot of dead or deteriorating trees that threaten the overheads system, more particularly in weather events involving snow and ice. A third factor is the emerald ash borer that has affected ash trees in Connecticut.

In terms of major weather events, enhanced tree trimming ("ETT") and enhanced tree removal ("ETR") plays a critical role. However, in Connecticut there are significant challenges in terms of getting permission to do tree-trimming and maintenance work along the overhead distribution system. The process for obtaining permission to trim is highly complex and cumbersome, and rests on the requirement to obtain individual customer permissions prior to trimming their trees. Although some customers allow the trimming, the Company receives thousands of customer refusals each year, often impairing trimming along entire circuit lengths. In some cases, it has been necessary for Eversource to go to court to get the right to trim trees in certain areas of Connecticut.

In addition, on the transmission side, trimming under the wires has been challenging because of legacy agreements barring trims and tree removals, whereas other state jurisdictions have recognized the need for heavy trimming and tree removal around transmission lines. In Connecticut, Eversource has focused heavily on transmission area trimming to the extent that it is able to gain access.

In 2016, Eversource had a budget of $17 million to conduct hazard tree removal in Connecticut. Over the past several years, this budget was increased, first to $20 million in 2017, and then $32 million in 2018 and 2019, and PURA has authorized the increase in funding due to the significant impact that is generated by ETT and ETR for day-to-day reliability improvement, and as a mitigating factor in major weather events. With a budget of $32 million, it is possible to remove about 30,000 trees per year around the overhead system; however, there remains tens of thousands of hazard trees
to remove to achieve an incremental improvement in reliability and resilience. To make the use of the budget allowed, Eversource works hard to identify those hazard trees that would impact the system the most and remove those trees.

What Eversource field crews and damage assessors observed in this event is that the vast majority of trees that toppled over under the pressure of sustained winds were fully canopied, fully leafed trees that looked healthy prior to the storm and came over during the wind event. This is because wind is not a problem for hazard trees; hazard trees do not necessarily have any leaves. Hazard trees are more of an impact during cold, snow, heavy rains, when the weight of the nature brings the trees down. For trees with compromised root structures, there is no way to test for that or to detect the root integrity through visual inspection. This factor was a dynamic in the impact of Tropical Storm Isaias. When heavy, healthy trees are falling, there is no way to stop the damage, although ETT ground-to-sky trimming will help.

Eversource is allowed to trim 8 feet on either side of the trees as a standard practice, but trees are not trimmed to the sky unless ETT is used, so that trees remain hanging above the overhead wires if ETT cannot be conducted. ETT clears 8-feet side to side, ground to sky, but many towns in Connecticut do not allow Eversource to do ETT due to the ground-to-sky clearance that results. This leaves a healthy tree canopy over the overhead wires in Connecticut, which in a major weather event will have an impact in causing outages.
Even when the Company attempts to conduct patrols prior to the storms, the permission process in Connecticut creates challenges for because Eversource cannot just patrol the circuit; see a tree and cut it. Instead, Eversource needs to get permission from the customer, which is a process that cannot occur in preparation for a major event. As a result, work to streamline the process to authorize trimming and/or allow ETT will improve situational preparedness in major weather events.
VIII. CONCLUSION

Eversource designed this 30-Day Event Report to provide a comprehensive perspective on how Eversource prepares for and responds to major weather events in accordance with its Emergency Response Plan, and how it carried out these functions in relation to Storm Isaias. As detailed herein, the Eversource response was executed with urgency; with appropriate care and caution regarding COVID-19 considerations; with methodical purpose and strategy; and with attention to detail. Still, we can do better by customers and communities. Thus, the very important next step for Eversource is the ongoing introspection, investigation and action to identify areas of the response that could be improved for the future. Eversource is currently working to identify lessons learned along with recommendations for future improvement and will include these findings in the 60-day after-action report required under PURA’s rules and practices.20

20 In compliance with PURA’s storm performance standards established in Docket No. 12-06-09, the Company will submit supplemental information on lessons learned from this storm “within 60 days after the end of an event”. See Docket 12-06-09, PURA Establishment of Performance Standards For Electric And Gas Companies, November 1, 2012 Decision at Appendix A, Storm Performance Standard Section 3.7 entitled “After Action Report”, stating:

“Each EDC shall submit a written report to the PURA within 60 days after the end of an event. In preparation for these reports, the EDC should establish a standard template for collecting desired information following an event from staff at all levels of the EDC, each municipality and local agencies within its service territory impacted by the Emergency Event, as well as the Department of Emergency Services and Public Protection in order to assist in lessons learned and continual improvement. These may include:

1. Information necessary to evaluate pre-established measures defined under Restoration/Recovery;

2. Facilitated forums to gather information and exchange ideas for improvement between EDC staff at all levels of the organization;

3. Facilitated forums to gather information and exchange ideas for improvement with agency representatives; and

4. Identification of gaps and develop action steps for addressing areas for improvement.”