

February 1, 2018

VIA HAND DELIVERY & ELECTRONIC MAIL

Luly E. Massaro, Division Clerk
Rhode Island Division of Public Utilities and Carriers
89 Jefferson Boulevard
Warwick, RI 02888

RE: Docket D-11-94 – Review of Preparedness and Restoration Efforts by the State’s Electric Utility Companies Related to Tropical Storm Irene October 29-30, 2017 Storm Summary Report

Dear Ms. Massaro:

In accordance with Order No. 20814 (November 20, 2012) in Docket D-11-94, enclosed please find four copies of National Grid’s¹ summary report on the planning and restoration activities associated with the October 29-30, 2017 storm event. Order No. 20814 directs National Grid to file a final written report with the Division of Public Utilities and Carriers within 90 days following major storm events. The October 29-30, 2017 storm event will likely qualify for inclusion in National Grid’s Storm Contingency Fund. Accordingly, National Grid has also filed this summary report with the Public Utilities Commission in Docket No. 2509.

Thank you for your attention to this matter. If you have any questions regarding this filing, please contact me at 401-784-7415.

Very truly yours,



Robert J. Humm

cc: Leo Wold, Esq.
John Spirito, Esq.
Kevin Lynch, Division
Al Mancini, Division
John Bell, Division
Greg Booth, Division

¹ The Narragansett Electric Company d/b/a National Grid (National Grid).

Certificate of Service

I hereby certify that a copy of the cover letter and any materials accompanying this certificate was electronically transmitted to the individuals listed below.

The paper copies of this filing are being hand delivered to the Rhode Island Public Utilities Commission and to the Rhode Island Division of Public Utilities and Carriers.



Robert J. Humm

February 1, 2018
Date

**Docket D-11-94 Review of National Grid’s Tropical Storm Irene Response Assessment
Updated Service List as of 8/24/16**

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National Grid

The Narragansett Electric Company

**Report on
October 29-30, 2017 Event,
Damage Assessment, and
Service Restoration**

February 1, 2018

Docket No. 2509

Submitted to:
Rhode Island Public Utilities Commission

Submitted by:

nationalgrid

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**REPORT ON BEHALF OF
THE NARRAGANSETT ELECTRIC COMPANY d/b/a NATIONAL GRID
ON THE OCTOBER 29-30, 2017 STORM DAMAGE ASSESSMENT AND
SERVICE RESTORATION EFFORTS**

I. EXECUTIVE SUMMARY

The Narragansett Electric Company d/b/a National Grid (National Grid or the Company) presents the following report on the planning and restoration activities associated with the October 29-30, 2017 wind and rain storm (the Storm). For pre-planning purposes, the Company classified the Storm as a National Grid Type 4 emergency event, meaning that restoration activities are generally estimated to be accomplished within a 24 hour period and the event typically results in up to 3% of customers interrupted. The Storm was projected to bring hazardous winds and heavy rain that could potentially cause damage to the Company's electric infrastructure. Ultimately, the Storm's impact and power outages caused by the Storm were greater than anticipated in Rhode Island, impacting 176,247 (approximately 144,144 at peak) of the Company's customers. As soon as the actual impact of the Storm became evident, the Company quickly elevated its response to a National Grid Type 3 event, meaning that restoration activities are generally estimated to be accomplished within a 72 hour period and the event typically results in up to 9% of customers interrupted. Ultimately, the Storm impacted 35.9% of the Company's customers in all of the 38 communities served in Rhode Island.

The Company began preparing for the Storm on Friday, October 27 at 10:00 a.m. by conducting a planning call, during which the Company reviewed the weather forecast and began planning efforts for the possibility that the Storm would impact the Company's electric distribution system in New England. The Company held its first pre-event Operations storm call on Saturday, October 28 at 1:00 p.m. As part of its preparation for the Storm, the Company opened a Storm Room in Providence on October 29 at 6:00 p.m. The Company followed its Emergency Response Plan and mobilized employees and contractors for the restoration using a damage forecast based on its experience in previous storms. Using its own crews and contractor resources, the Company restored power to over 90% of its peak customers impacted in two-and-a-half days, with the final customer restored by November 3, 2017 at 10:38 p.m.

The Company is grateful for the support of customers, employees, state and local officials, and public safety officials, who experienced the effects of the Storm and were an integral part of the Company's restoration efforts.

II. INCIDENT ANTICIPATION

A. Determination of Incident Classification

On Sunday, October 29, 2017 at 6:00 p.m., the Company established a Storm Room in Providence, Rhode Island. As explained below, the Company named a New England Incident

Commander, who was primarily responsible for establishing the projected and actual incident classification level for the Storm.

Factors considered in initially establishing or revising the expected incident classification level included the following:

- Expected number of customers without service;
- Expected duration of the restoration event;
- Recommendations of the State Planning Section Chief, Transmission and Distribution Control Centers, and other key staff;
- Current operational situation (such as number of outages, resources, and supplies);
- Current weather conditions;
- Damage appraisals;
- Forecasted weather conditions;
- Restoration priorities;
- Forecasted resource requirements; and
- Forecasted scheduling and pace of restoration work crews.

Through the Operations storm conference calls, the New England Incident Commander communicated the incident classification to Company leadership and organizations that the Company expected to engage in restoration or support activities. As mentioned above, as soon as the actual impact of the Storm became evident, the New England Incident Commander elevated the response from a National Grid Type 4 event to a National Grid Type 3 event. A Branch Director in charge of Rhode Island restoration was located in the Providence Storm Room.

B. Activation of Incident Command System (ICS)

In the days leading up to the October 29-30, 2017 storm, prior to activation of the ICS Emergency Response Organization (ERO), the Company's Operations management personnel held operational calls to discuss the planning efforts for the possibility of a severe wind and rain storm forecasted to bring hazardous conditions to New England. As a result of these calls, and in accordance with the Company's Emergency Response Plan and anticipated National Grid Type 4 event, the Company activated the Branch Level ERO prior to the first Pre-Event Stage Briefing Call on Saturday, October 28 at 1:00 p.m. At that time, the Company planned to staff its Rhode Island Branch in Providence at approximately 6:00 p.m. on Sunday, October 29 to support Rhode Island restoration, and appointed a Branch level ERO structure for that location. The New England Incident Commander activated the Rhode Island Branch Director, as well as several other Branch Directors in Massachusetts.

Thereafter, the Company activated a number of other positions at the discretion of the Incident Commander and Branch Directors, considering the level of response likely required for the Storm in their respective areas. Throughout the restoration effort, the Company activated additional ICS positions as operating conditions warranted.

C. Determination of Crew Needs and Pre-Staging

Given the potential magnitude of the Storm and forecast of hazardous winds and heavy rain, the Company secured crews in advance from its contractors of choice and other outside contractors to support restoration efforts for all of New England as part of its regional preparation for the Storm, consistent with its Emergency Response Plan. The Company had 30.5 overhead line crews, 11 forestry crews, and 9 underground and substation resources at its disposal at 6:00 p.m. on the evening of October 29, 2017, with additional resources scheduled later that evening. The Company planned for contractors of choice crews and external contractor crews to be on property at 6:00 a.m. the next day, October 30, to assist with restoration. By October 30 at 7:00 a.m., the Company increased the resources available to respond to the event to 64 overhead line crews, 17 contractor crews, 24 forestry crews, and 42 underground and substation resources.

III. THE STORM AND ITS IMPACT

A. Forecast

The Company monitors the weather forecast obtained from its weather provider, DTN, three times daily. The Company also monitors the forecast from various weather websites. On Thursday, October 26, 2017, the weather models indicated a possible hazard wind gust event for the Northeast. However, the various weather models did not agree regarding the timing and position of the low pressure system expected to develop as a result of two weather systems combining. If the low pressure system developed along the Eastern Coast of the United States, then a shorter duration and lessened wind gust impact would occur. However, if the low pressure system developed in the Hudson River Valley of New York, as some models indicated, then a longer duration and much higher wind gust impact would affect a much broader area of the Northeast. As of October 26, DTN reflected a possible hazard wind gusts event of an Energy Event Index (EEI) Type 3 (≥ 45 mph wind speed and ≥ 50 mph wind gusts), both inside and outside of thunderstorm activity, during the day on Sunday, October 29 into Sunday night; and another period of gusty winds through the day on Monday, October 30, all reflecting a medium confidence level in the forecast accuracy, meaning only a 30-60% chance the most likely index level remains at that level through the event.

Moving into Friday, October 27, the weather models began to agree regarding a low pressure system developing in the Hudson Valley of New York, which increased DTN's confidence that this could be a longer duration and more widespread hazard wind event for the Northeast, yet the weather forecasts still offered only a medium confidence level and no increase in the EEI Type 3 rating for wind speeds. There was also a slight shift in timing with the models showing the peak wind event occurring Sunday night into early Monday morning, and then another round of winds spiking during the daytime hours on Monday. Subsequently, the forecast predicted increased wind gusts Sunday night into Monday morning across New England.

By Saturday, October 28 and Sunday, October 29, the models were in agreement regarding the timing, strength, and the Hudson River Valley position of the developing low pressure system. The strongest winds were expected Sunday night into early Monday morning, with the highest gusts expected to remain off the coast. The DTN forecast on Saturday, October 28 at 6:00 a.m. offered only a 5% chance that the EEI wind speed level in Rhode Island would raise to a EEI Type 4 (≥ 60 mph wind speed / ≥ 65 mph wind gusts), and only a 20% chance that the thunderstorm activity could cause EEI Type 4 damaging winds in isolated areas.

On Sunday, October 29 at 7:00 p.m., DTN's forecast continued to reflect a medium confidence rating, and only a 5% and 20% chance for the Capital and Coastal areas of Rhode Island, respectively, to experience EEI Type 4 wind gusts.

B. Impact

Strong, hazardous wind gusts affected the majority of the Northeast during the night on Sunday, October 29, 2017 through Monday, October 30. The strongest wind gusts recorded occurred between 8:00 p.m. October 29 and 5:00 a.m. October 30, with gusts of 55 to 70 miles per hour (mph) experienced along the Eastern Atlantic Seaboard from Long Island, New York and coastal Connecticut and up through coastal Maine, including in Rhode Island. The rest of the Northeast experienced wind gusts of 35 to 50 mph. Ultimately, by the morning of Monday, October 30, parts of the Rhode Island service territory experienced actual wind speeds over 70 mph, which would be closer to a EEI Type 5 wind speed rating (≥ 70 mph wind speed / ≥ 75 mph wind gusts). The forecasts had offered no percent chance of this possibility. A second period of wind gusts continued throughout the day on Monday, October 30, making this a prolonged hazardous wind event that downed trees and branches and caused numerous power outages.

The October 29-30 storm impacted a total of approximately 176,247 customers in the Company's service territory in Rhode Island. The Storm impacted approximately 144,144 customers at its peak, which occurred on Monday, October 30 at approximately 9:20 a.m. The Company restored power to all customers by November 3, 2017 at 10:38 p.m.

The Company experienced interruptions in all of the 38 communities it serves in Rhode Island, with a total of 204 distribution feeders affected. The Storm impacted more customers than Hurricane Sandy in 2012, and produced more physical damage to the Company's poles than Tropical Storm Irene in 2011. Figure 1, below, shows the number of customers interrupted and restored throughout the duration of the Storm.

Figure 1

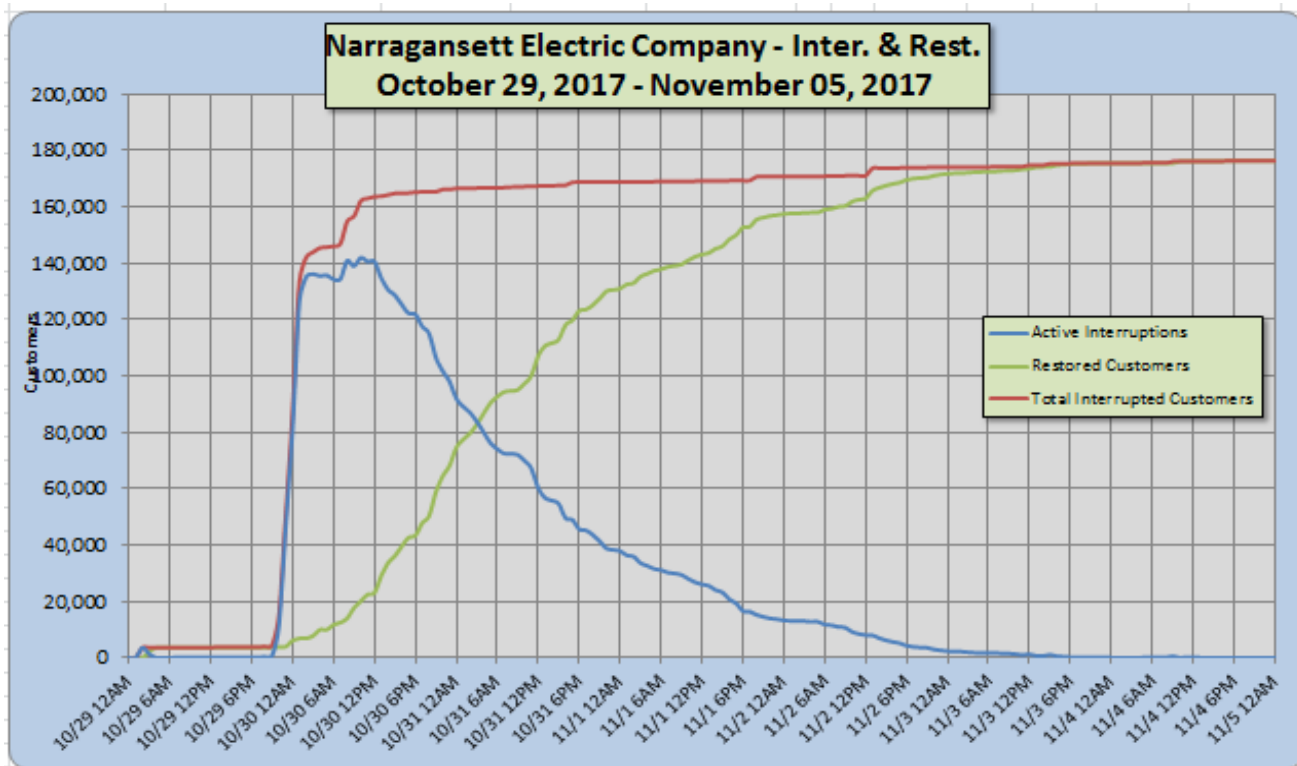


Figure 2, below, shows all municipalities that experienced interruptions during the Storm.

Figure 2

Town Name	Total Customers Interrupted	Customers Served	Percent of Total
BARRINGTON	4,188	6,849	61.15%
BRISTOL	9,433	10,384	90.84%
BURRILLVILLE	1,208	2,607	46.34%
CENTRAL FALLS	1,342	7,259	18.49%
CHARLESTOWN	4,780	5,719	83.58%
COVENTRY	8,519	13,732	62.04%
CRANSTON	6,465	31,620	20.45%
CUMBERLAND	3,819	15,214	25.10%
EAST GREENWICH	3,156	6,098	51.75%
EAST PROVIDENCE	5,311	22,058	24.08%
EXETER	2,571	3,003	85.61%
FOSTER	1,948	2,024	96.25%
GLOCESTER	4,079	4,560	89.45%
HOPKINTON	3,207	3,931	81.58%
JAMESTOWN	1,621	3,334	48.62%
JOHNSTON	3,949	13,630	28.97%
LINCOLN	5,819	10,129	57.45%
LITTLE COMPTON	2,262	2,567	88.12%
MIDDLETOWN	186	8,330	2.23%
NARRAGANSETT	2,298	10,561	21.76%
NEWPORT	386	14,951	2.58%
NORTH KINGSTOWN	8,334	13,382	62.28%
NORTH PROVIDENCE	5,773	16,015	36.05%
NORTH SMITHFIELD	4,473	5,711	78.32%
PAWTUCKET	4,823	33,146	14.55%
PORTSMOUTH	819	9,200	8.90%
PROVIDENCE	8,874	71,409	12.43%
RICHMOND	1,521	3,413	44.56%
SCITUATE	3,649	4,527	80.61%
SMITHFIELD	3,020	8,807	34.29%
SOUTH KINGSTOWN	5,542	14,700	37.70%
TIVERTON	655	8,223	7.97%
WARREN	2,470	5,768	42.82%
WARWICK	13,041	40,273	32.38%
WEST GREENWICH	1,401	2,596	53.97%
WEST WARWICK	8,272	13,458	61.47%
WESTERLY	5,325	14,419	36.93%
WOONSOCKET	7,079	18,795	37.66%

The following sections contain additional details and context regarding the Company's Storm restoration efforts.

IV. RESTORATION

A. Timing and Priority of Service

The Company implemented the system of prioritization for restoration found in its Emergency Response Plan, focusing first on public safety, and then on customer restoration that maximized restoration when lines were energized. The Company gave priority and consideration to critical facilities and concentrated efforts to restore service to its life support customers as quickly as conditions warranted, also as set forth in the Emergency Response Plan.

B. Restoration Coordination

Outages were dispatched out of the Providence Storm Room beginning on Sunday, October 29, 2017 at approximately 6:00 p.m. through the end of the event. The Company activated police and fire coordinators for the event. These employees reported to the Storm Room leads and were responsible for communicating the estimated times for restoration on all police and fire calls, with a standby condition noted. The Company also activated and coordinated Task Force teams, in accordance with the Emergency Response Plan, consisting of Company and municipal personnel who are utilized to clear roads during emergencies.

On Monday, October 30 at 7:00 a.m., the Company also mobilized the Providence wires-down room, with approximately 131 crews available (including wires-down appraisers and cut and clear restoration crews) and 23 office-based support personnel.

C. Personnel Resources

Early in the planning process, the Company prepared for a National Grid Type 4 event in Rhode Island based on the forecasts. The Company's plan remained consistent throughout the pre-event calls on both Saturday, October 28, 2017 and Sunday, October 29. At that time, the Company had 30.5 overhead line crews, 11 forestry crews, and 9 underground and substation resources at its disposal, with additional resources scheduled later that evening.

At approximately 1:00 a.m., on Monday, October 30, the State Incident Commander elevated the response to a National Grid Type 3 event as he monitored the impacts of the Storm, and requested that additional staff be activated and ordered additional external contractor resources. Specifically, at 1:00 a.m., the State Incident Commander requested 200 external contractor line crews and, by 4:00 a.m., he initiated a mutual assistance request for a total of 500 line crews and 210 forestry crews for all of National Grid's New England response to the Storm. Of this request, National Grid allocated 175 line crews and 75 forestry crews for the Rhode Island response.

By 7:00 a.m. on October 30, resources available to respond to the event had increased to 64 overhead line crews, 17 contractor crews, 24 forestry crews, and 42 underground and substation resources.

At peak, the Company secured approximately 817 field crews¹ to restore power to customers in Rhode Island, including approximately 362 external crews and 455 internal crews. This peak number of external and internal crews includes transmission and distribution line, vegetation management, wires down, substation, and underground personnel.

D. Safe Work Practices

Safety is always at the forefront of Company operations, including and especially during activities associated with storm restoration. Both the System and Regional ICS structure designate a lead position for a Safety, Health, and Environment Officer. Safety messages are delivered on all calls to heighten awareness during preparation and restoration.

As with any storm, for the October 29-30, 2017 event, National Grid assembled a safety team with area responsibilities, established the reporting hierarchy, and prepared and communicated organization charts. The safety team prepared safety notices and delivered them Company-wide to all employees through corporate communications. Safety personnel were deployed to assist in specific geographic areas and delivered on-site safety orientations to National Grid workers and contractors prior to the start of each day. During the Storm, safety personnel visited work sites to advise Company personnel and contractors of safety issues and practices. In addition, prior to the start of each new job, the work was reviewed by assigned crews, with a focus on safe working conditions for the specific job. These safety efforts helped the Company experience no injuries during the Storm.

V. COMMUNICATIONS DURING AND AFTER THE EVENT

A. Communication Regarding Estimated Times for Restoration (ETRs)

The Company's Providence Branch Storm Room and Northboro Control Room personnel updated the Outage Management System (OMS) throughout the restoration process. The Company's publicly available website and outage maps (Outage Central) were available and populated information from the OMS throughout the duration of the Storm.

The Company did experience issues with the reported ETRs displayed on the outage map. In the early part of the Storm, OMS generated ETRs based on a Type 4 event, which was the level of restoration event originally forecasted for this Storm. The actual Storm damage and number of customer outages were higher than predicted. On the morning of Monday, October 30, the Company removed the originally predicted ETRs as the Company assessed the

¹ Crews typically include two or three people, although there are some one-person crews in damage assessment, wires down (appraisers), distribution line (troubleshooters), and substation personnel. Transmission crews typically include 6-10 people.

damage and developed more accurate ETRs. The Company refined ETRs based on reported progress on mainline outage repairs. After the Company assigned or repaired the majority of mainline outages, the Company further revised the ETRs by device-level, and again revised the ETRs as crews were assigned and reported ETR updates based on their own findings on arrival. As the information became available, the Company uploaded the updated ETRs into the outage map. The Company continued to update the ETRs throughout the restoration process as information became available to the Company.

B. Intra-Company

The Company began preparing for the Storm on Friday, October 27, 2017 at 10:00 a.m. by conducting a planning call, during which the Company reviewed the weather forecast and began planning efforts for the possibility that the Storm would impact the Company's electric distribution system in New England.

The Company held its first pre-event Operations storm call on Saturday, October 28 at 1:00 p.m., and a second pre-event Operations storm call on Sunday, October 29 at 1:00 p.m. Beginning Monday morning, October 30, the Company held Operations Restoration stage beirfings twice-daily, in the morning and late afternoon, until the end of the event.

Additionally, the Company issued communications to field crews with both restoration and safety information.

C. Public Officials

1. Governor's Office

The Company's Jurisdictional President communicated regularly with the Governor's office during the October 29-30, 2017 Storm.

2. Rhode Island Public Utilities Commission (PUC), Division of Public Utilities and Carriers (Division), and Rhode Island Emergency Management Agency (RIEMA)

The Company's Jurisdictional President reached out to the PUC, and the Company's Director of Performance and Strategy for Rhode Island and Director of Regulatory Affairs reached out to the Division regarding the Company's Storm preparation. Additionally, the Company activated a RIEMA liaison, who commenced postings virtually to RIEMA's WebEOC (Emergency Operations Center) early evening on Sunday, October 29. The Company also participated in communications with RIEMA staff at their State Emergency Operations Center throughout the event.

3. Municipalities

The Company opened a municipal room in Providence on Monday, October 30, 2017 at 7:00 a.m. The purpose of the Company's municipal room was to effectively manage and communicate with any potentially impacted communities in Rhode Island. The municipal room was co-located with the Company's branch operations response personnel. This arrangement afforded efficient access to key restoration personnel in researching and communicating the priorities of the municipalities, including critical customers such as hospitals, nursing homes, and schools. Some of these priorities were assigned to the Task Force teams, which worked collaboratively with the local communities to prioritize road clearing. The Company's branch operations personnel also held municipal conference calls open to all Rhode Island municipalities and emergency management personnel each afternoon on Monday, Tuesday, and Wednesday (October 30, 31, and November 1), to provide an overview of the Storm and the Company's restoration progress. The Company deactivated the municipal room on Friday, November 3, 2017 at 5:30 p.m.

The Company deployed 20 National Grid community liaisons to work with each Rhode Island city or town's emergency, Department of Public Works, and/or public officials as a dedicated liaison. The Company's community liaisons served as full-time resources supporting impacted communities, and enabled direct communications back into the Company's branch municipal rooms, public information coordinators, and branch operations personnel.

D. Customers

On Saturday, October 28, 2017 at 2:00 p.m., the Company made an out-bound call to all life-support customers to notify them of the upcoming weather and to recommend taking necessary precautions and preparations to ensure their wellbeing in the event of an outage. The message also informed life-support customers to contact 911 or their local public safety officials in the event of an emergency. The Company's Customer Contact Center secured additional staffing to respond to incoming life-support calls for those affected by outages, and secured a back-up vendor to support high call volume. Outages from the Storm affected a total of 1,048 life-support customers. The Company continued to conduct proactive calls to its life-support customers until all power was restored.

E. Media

The Company activated its Public Information Officer and related support staff for the event, who participated in all the planning and restoration briefing calls held by Company Operations. The Company distributed two Storm-related news releases on October 30, 2017, one news release on October 31, and one additional release on November 1, to all Rhode Island news media outlets. The Company engaged both traditional and social media channels to distribute the news releases, as well as additional Storm, restoration, and safety-related information. The Company's Strategic Communications Department fielded more than 60 media requests for information and interviews related to the Storm in Rhode Island.

VI. CONCLUSION

The Company understands the impact that electrical outages have on its customers, and makes every effort to restore all outages as soon as possible. The October 29-30, 2017 Storm posed significant challenges for the Company, as the weather rapidly escalated to a very severe event beyond the expected forecasts, and impacted all of the Company's communities within a very short timeframe. The Company was prepared to respond to the Storm's predicted impact as forecasted, having secured crews and other outside contractors to aid in the restoration effort required for the forecast presented. The Company was able to quickly elevate its response effort as Rhode Island experienced the actual impacts of a more severe event than forecasted.

Through use of the Company's own distribution line resources, contractor distribution and transmission line crews, and contractor tree crews, the Company restored service to over 90% of its peak customers impacted (144,144) in two-and-a-half days, with the final customer restored by November 3, 2017 at 10:38 p.m., in a safe and expeditious manner.

The Company is proud of the restoration work that was accomplished during the Storm, and is grateful for the support of customers, employees, state and local officials, and public safety officials, who experienced the effects of this Storm and were an integral part of the Company's restoration efforts.