Jennifer Brooks Hutchinson
Senior Counsel

May 2, 2016

VIA HAND DELIVERY & ELECTRONIC MAIL

Luly E. Massaro, Commission Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

RE: Docket 3628 - 2015 Annual Service Quality Report, Electric Operations

Dear Ms. Massaro:

Enclosed are ten (10) copies of National Grid's[1] performance results for calendar year 2015 under its Service Quality Plan (Plan) as established in the above-referenced docket. Based on actual performance results, the Company has calculated a penalty of $184,000 for calendar year 2015.

The Company's Plan is described in Attachment 1 to the Company's Agreement to Modify Performance Benchmarks (Agreement) filed with the Rhode Island Public Utilities Commission (PUC) on March 14, 2007, and approved by the PUC in Docket 3628. The Plan provides for penalties and offsets relating to performance standards in the areas of reliability and customer service. The service quality standards under the Plan became effective as of January 1, 2007.

This report is organized as follows:

- Section 1: This section provides a summary of each performance standard in the areas of reliability and customer service. Section 1 contains descriptions of each of the performance standards, the targeted performance levels for 2015 with their related dollar values, and the actual 2015 results with the applicable annual penalty or offset.

- Section 2: This section provides a summary calculation of the Company's annual penalty or offset for each of the performance standards for 2015. The annual penalty for 2015 is $184,000 as shown in Column (i).

[1] Submitted on behalf of The Narragansett Electric Company, d/b/a National Grid (the Company or National Grid).

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- Section 3: The Plan requires the Company to report on additional aspects of service quality, including: (1) worst performing circuits; (2) trouble, non-outage calls received; (3) annual meter reading performance; and (4) information on Major Event Days. Section 3 summarizes the results of these reporting requirements.

Thank you for your attention to this filing. If you have any questions concerning this report, please call me at 401-784-7288.

Very truly yours,

Jennifer Brooks Hutchinson

Enclosures

cc: Docket 3628 Service List
Leo Wold, Esq.
Steve Scialabba, Division

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.

Joanne M. Scanlon — **Date** May 2, 2016

National Grid – Electric Service Quality Plan – Compliance - Docket 3628
Service List Updated 1/11/16

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The Narragansett Electric Company
d/b/a National Grid

2015 Electric Service Quality Report

May 2, 2016

Submitted to:
Rhode Island Public Utilities Commission
RIPUC Docket No. 3628

Submitted by:

nationalgrid

TABLE OF CONTENTS

RELIABILITY PERFORMANCE STANDARDS

Interruption Frequency and Duration

Under the Service Quality Plan, an interruption is defined as the loss of electric service to more than one customer for more than one minute. The interruption duration is defined as the period of time, measured in minutes, from the initial notification of the interruption event to the time when service has been restored to the customers. Interruptions are tracked using System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI). SAIFI is calculated by dividing the total number of customers interrupted by the total number of customers served. SAIFI measures the number of times per year the average customer experienced an interruption. This is an average, so in any given year some customers will experience no interruptions, and some will experience several interruptions. SAIDI measures the length of interruption time that the average customer experienced for the year. It is calculated by dividing the total customer minutes of interruption by the total number of customers served.

Certain events are defined as Major Event Days and are excluded from the calculation of reliability performance standards for the purpose of penalty and offset assessment. There is one day in 2015 that qualified as a Major Event Day. It was August 4, 2015.

2015 Frequency (SAIFI) Standard		2015 Frequency (SAIFI) Results	
Frequency of Interruptions per Customer	(Penalty) Offset	Frequency of Interruptions per Customer	Annual (Penalty) Offset
Greater than 1.18	($916,000)		
1.06-1.18	linear interpolation		
0.84-1.05	$0		
0.75-0.83	linear interpolation	0.937	$0
Less than 0.75	$229,000		

2015 Duration (SAIDI) Standard		2015 Duration (SAIDI) Results	
Duration of Interruptions (minutes)	(Penalty) Offset	Duration of Interruptions (minutes)	Annual (Penalty) Offset
Greater than 89.9	($916,000)		
72.0-89.9	linear interpolation		
45.9-71.9	$0	64.30	$0
36.7-45.8	linear interpolation		
Less than 36.7	$229,000		

CUSTOMER SERVICE PERFORMANCE STANDARDS

Customer Contact Survey

The customer contact survey results are based on responses from National Grid's Rhode Island customers from a survey performed by an independent third-party consultant, Opinion Dynamics Corporation (ODC). ODC surveys samples of customers who have contacted the call center quarterly in order to determine their overall level of satisfaction with their contact. Eight types of transactions are included in the survey, and the overall results are weighted based on the number of these transactions actually performed at the call center during the calendar year. The percent satisfied represents respondents who gave a Top-2 rating on a seven-point scale, where 1 means extremely dissatisfied and 7 means extremely satisfied.

2015 Customer Contact Standard		2015 Customer Contact Results	
Percent Satisfied	(Penalty) Offset	Percent Satisfied	Annual (Penalty) Offset
Less than 74.5%	($184,000)	71.7%	($184,000)
74.5%-76.7%	linear interpolation		
76.8%-81.4%	$0		
81.5%-83.7%	linear interpolation		
Greater than 83.7%	$46,000		

Telephone Calls Answered Within 20 Seconds

The calls answered performance standard reflects the annual average of calls answered within 20 seconds. "Calls answered" include calls answered by a customer service representative (CSR) and calls completed within the Voice Response Unit (VRU). The time to answer is measured once the customer makes a selection to either speak with a CSR or use the VRU.

2015 Calls Answered Standard		2015 Calls Answered Results	
% Answered Within 20 Seconds	(Penalty) Offset	% Answered Within 20 Seconds	Annual (Penalty) Offset
Less than 53.5%	($184,000)		
53.5%-65.7%	linear interpolation		
65.8%-90.4%	$0	77.01%	$0
90.5%-100.0%	linear interpolation, to a maximum of $46,000		

National Grid
2015 Results of Service Quality Plan
Calculation of Penalty/Offset

Performance Standard	Potential Penalty (a)	Potential Offset (b)	2015 Results (c)	Maximum Penalty (d)	One Std Dev. Worse Than Mean (e)	Mean (f)	One Std Dev. Better Than Mean (g)	Maximum Offset (h)	Annual (Penalty)/ Offset (i)
Reliability - Frequency	$ 916,000	$ 229,000	0.94	1.18	1.05	0.94	0.84	0.75	$0
Reliability - Duration	$ 916,000	$ 229,000	64.3	89.9	71.9	57.5	45.9	36.7	$0
Customer Service - Customer Contact Survey	$ 184,000	$ 46,000	71.7%	74.5%	76.8%	79.1%	81.4%	83.7%	($184,000)
Customer Service - Telephone Calls Answered	$ 184,000	$ 46,000	77.0%	53.5%	65.8%	78.1%	90.4%	100.0%	$0
Total Penalty/Offset	$ 2,200,000	$ 550,000							($184,000)

Notes:

Columns (a), (b), and (d)-(h) are per the Amended Electric Service Quality Plan, RIPUC Docket No. 3628.

Column (c) represents the actual 2015 annual results for the performance standards listed in the first column.

Column (i) is calculated as follows:

- For Reliability Standards:
  - If Column (c) is between Column (g) and Column (e): $0
  - If Column (c) is between Column (h) and Column (g): [Column (g) - Column (c)] ÷ [Column (g) - Column (h)] x Column (b)
  - If Column (c) is between Column (e) and Column (d): [Column (c) - Column (e)] ÷ [Column (d) - Column (e)] x Column (a)
  - If Column (c) is greater than Column (d): 100% of Column (a)
  - If Column (c) is less than Column (h): 100% of Column (b)
- For Customer Service Standards:
  - If Column (c) is between Column (e) and Column (g): $0
  - If Column (c) is between Column (g) and Column (h): [Column (c) - Column (g)] ÷ [Column (e) - Column (d)] x Column (b)
  - If Column (c) is between Column (d) and Column (e): [Column (e) - Column (c)] ÷ [Column (e) - Column (d)] x Column (a)
  - If Column (c) is less than Column (d): 100% of Column (a)
  - If Column (c) is greater than Column (h): 100% of Column (b)

ADDITIONAL REPORTING CRITERIA

Under the Company's Electric Service Quality Plan, the following additional reporting criteria are required to be filed with the PUC.

1. **Reporting Requirement:** Each quarter, the Company will file a report of 5% of all circuits designated as worst performing on the basis of customer frequency.

   Included in the report will be:

   1. The circuit id and location.
   2. The number of customers served.
   3. The towns served.
   4. The number of events.
   5. The average duration.
   6. The total customer minutes.
   7. A discussion of the cause or causes of events.
   8. A discussion of the action plan for improvements including timing.

   Results: The Company filed its first quarter 2015 feeder ranking results on May 12, 2015, the second quarter results on August 18, 2015, the third quarter results on December 15, 2015, and the fourth quarter results on March 11, 2016.

2. **Reporting Requirement:** The Company will track and report monthly the number of calls it receives in the category of Trouble, Non-Outage. This includes inquiries about dim lights, low voltage, half-power, flickering lights, reduced TV picture size, high voltage, frequently burned-out bulbs, motor running problems, damaged appliances and equipment, computer operation problems, and other non-interruptions related inquiries.

   Results: The Company filed the required Trouble, Non-Outage reports during 2015, with the final report for the 13 months ended December 2015 filed on January 20, 2016.

3. **Reporting Requirement:** The Company will report its annual meter reading performance as an average of monthly percentage of meters read.

   Results: During 2015, the Company's annual meter reading performance (as an average of monthly percentage of meters read) was 98.6%, compared to 98.9% during 2014, and 98.8% during 2013. The following table details the percentage of meters read per month for 2015, 2014, and 2013.

The Narragansett Electric Company
Monthly Percentage of Meters Read

	2015	**2014**	**2013**
January	98.4%	99.0%	99.0%
February	98.2%	98.8%	96.9%
March	98.5%	99.0%	99.0%
April	98.9%	98.9%	99.1%
May	98.9%	98.9%	99.1%
June	98.9%	98.9%	99.0%
July	98.8%	99.0%	99.0%
August	98.6%	98.9%	98.9%
September	98.7%	98.9%	98.9%
October	98.3%	98.9%	98.9%
November	98.6%	98.9%	99.0%
December	98.6%	98.9%	98.9%
YTD Average	98.6%	98.9%	98.8%

4. **Reporting Requirement:** For each event defined as a Major Event Day, the Company will prepare a report, which will be filed annually as part of the annual SQ filing, detailing the following information:

1. Start date/Time of event.
2. Number/Location of crews on duty (both internal and external crews).
3. Number of crews assigned to restoration efforts.
4. The first instance of mutual aid coordination.
5. First contact with material suppliers.
6. Inventory levels: pre-event/daily/post-event.
7. Date/Time of request for external crews.
8. Date/Time of external crew assignment.
9. # of customers out of service by hour.
10. Impacted area.
11. Cause.
12. Weather impact on restoration.
13. Analysis of protective device operation.
14. Summary of customers impacted.

Results:

IEEE Std. 1366-2003 identifies reliability performance during both day-to-day operations and Major Event Days. Major Event Days represent those few days during the year on which the energy delivery system experienced stresses beyond that normally expected, such as severe weather. A day is considered a Major Event Day if the daily SAIDI exceeds a threshold value, calculated using the IEEE methodology. For 2015 the T_{MED} value was 5.48 minutes of SAIDI (using IEEE Std. 1366-2003 methodology). There was only one day that exceeded this threshold in 2015. The storm, which occurred on August 4, 2015 is described below.

August 4 storm

1. Start Date and Time of event:

   The storm began in the early morning on Tuesday, August 4, 2015 with scattered interruptions starting at approximately 6:00 a.m. and peaked around 8:23 a.m.

2. Number/Location of crews on duty (both internal and external crews):

   The Company had approximately 180 overhead line crews and 97 tree crews supporting restoration activities on Tuesday morning, August 4, 2015. By midday on Tuesday, August 4, the Company had secured a total of 275 distribution line and mutual aid contractor line crews ready to respond to the hardest hit areas in the state. In total, the Company ultimately had more than 300 line crews, 120 tree and cut and clear crews, and 80 wires-down personnel working in Rhode Island to restore service to customers throughout the event, with crews from eight northeast states and Quebec.

3. Number of crews assigned to restoration efforts:

   At peak, the Company had the following crews performing restoration activities throughout the impacted areas in the state.

Location	Crew Type	# Crews
Rhode Island	Company Wire Down	47 crews total
	Contractor Line Personnel	280 crews total
	Contractor Tree	124 crews total

4. The first instance of mutual aid coordination:

   The first instance of mutual aid coordination occurred on August 4, 2015 at 4:30 p.m.

5. The first contact with material suppliers:

   Contact with material suppliers was on August 4, 2015 at 3:30 p.m.

6. Inventory levels: pre-event/daily/post-event:

   Inventory levels and issues are summarized in the table below. Balances represent actual day-end totals. The balances do not include "no cost", pre-capitalized items, such as transformers; these items are not reported as inventory on the balance sheet.

   The inventory positions indicate those inventories held in Rhode Island and those allocated to RI stored in National Grid's Central Warehouse located in Whitinsville, MA.

Date	RI Inventory Locations	Allocated NEDC Inventory	Total Narragansett Electric Inventory
8/4/2015	$6,122,248	$104,731	$6,017,517

7. Date/Time of request for external crews:

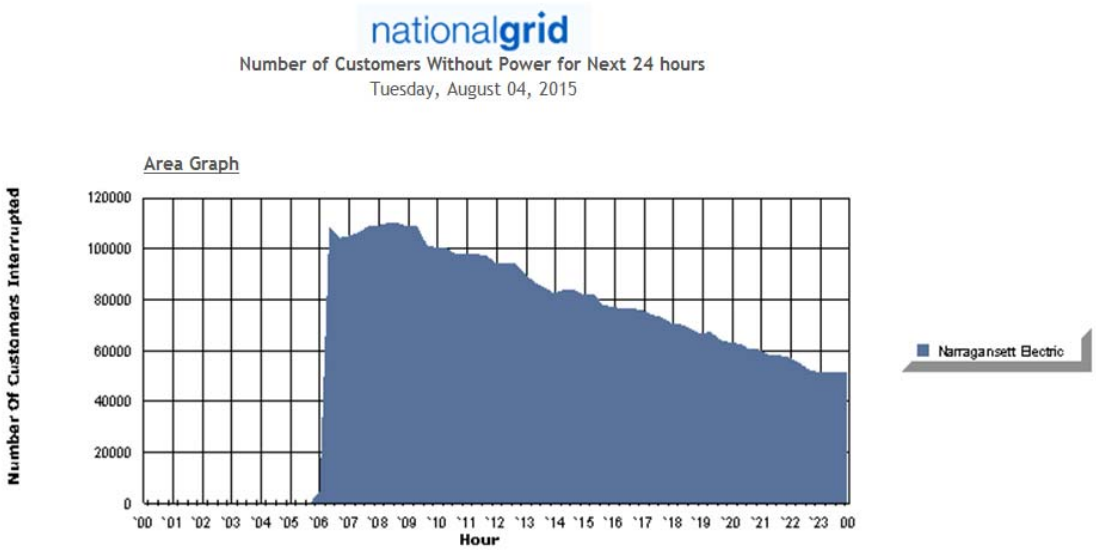
   The Company began securing external crews at approximately 9:00 a.m. on August 4, 2015.

8. Date/Time of external crews assignment:

   External distribution line crews were first assigned and began working on outages on August 4 at approximately 10:00 a.m.

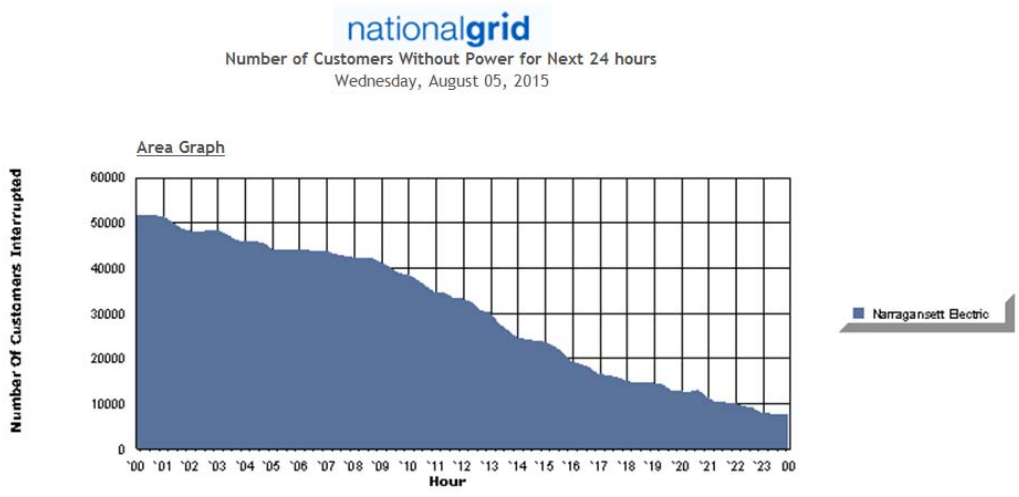
9. # of customers out by hour (graphs following):

August 4, 2015 (Tuesday)



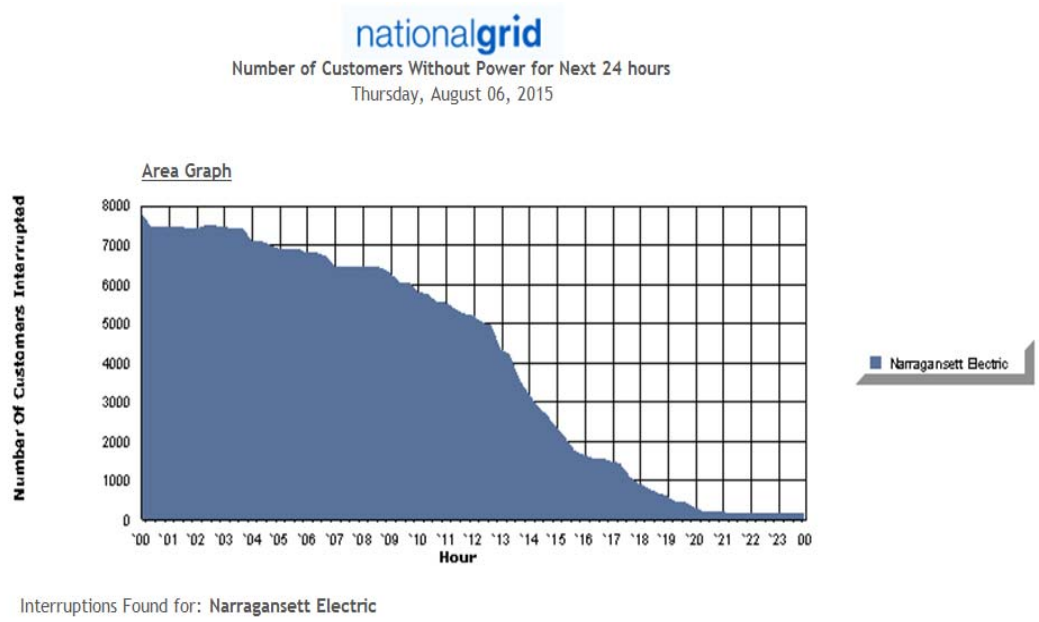
Interruptions Found for: **Narragansett Electric**

August 5, 2015 (Wednesday)

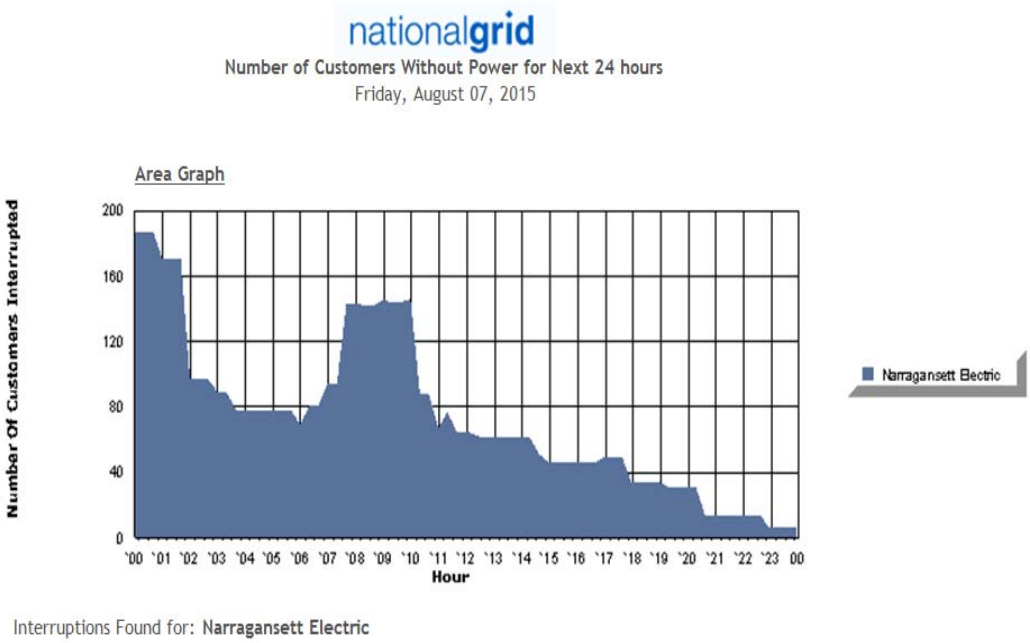


Interruptions Found for: **Narragansett Electric**

August 6, 2015 (Thursday)



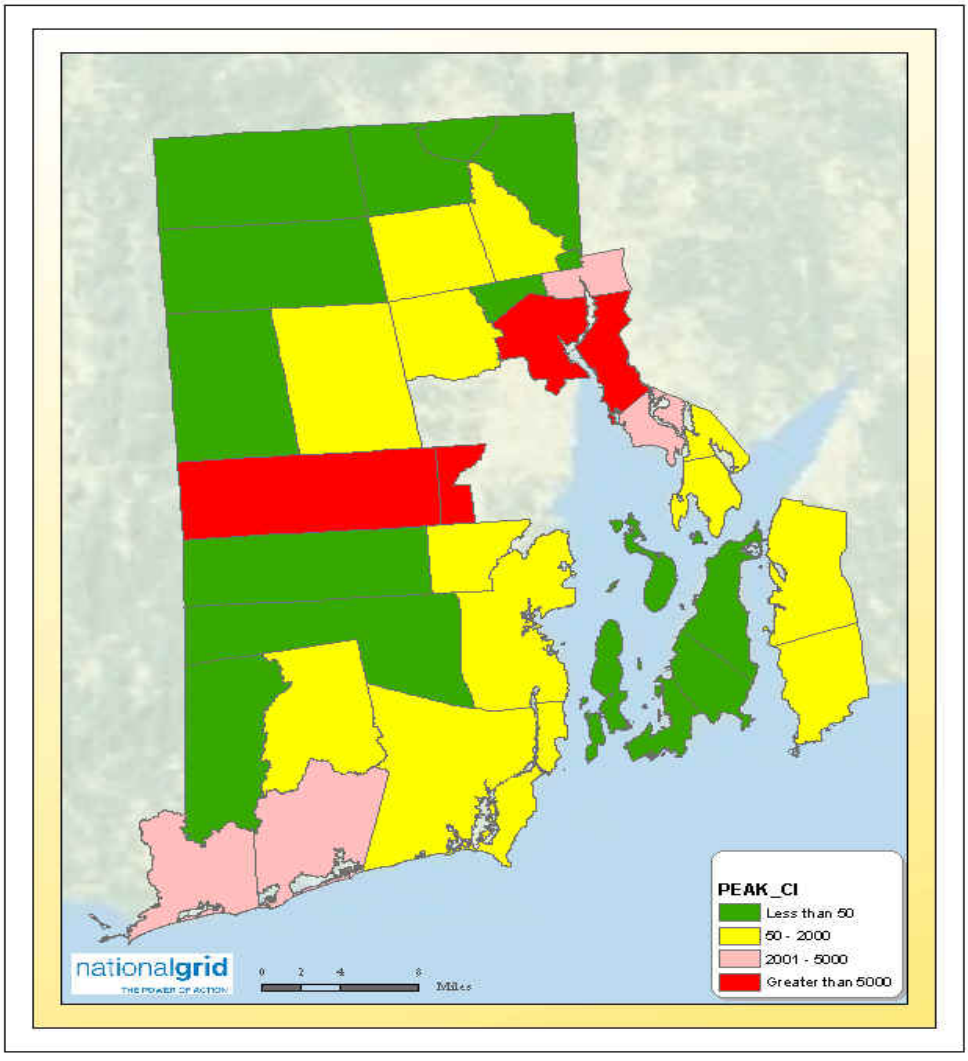
August 7, 2015 (Friday)



10. Impacted area:

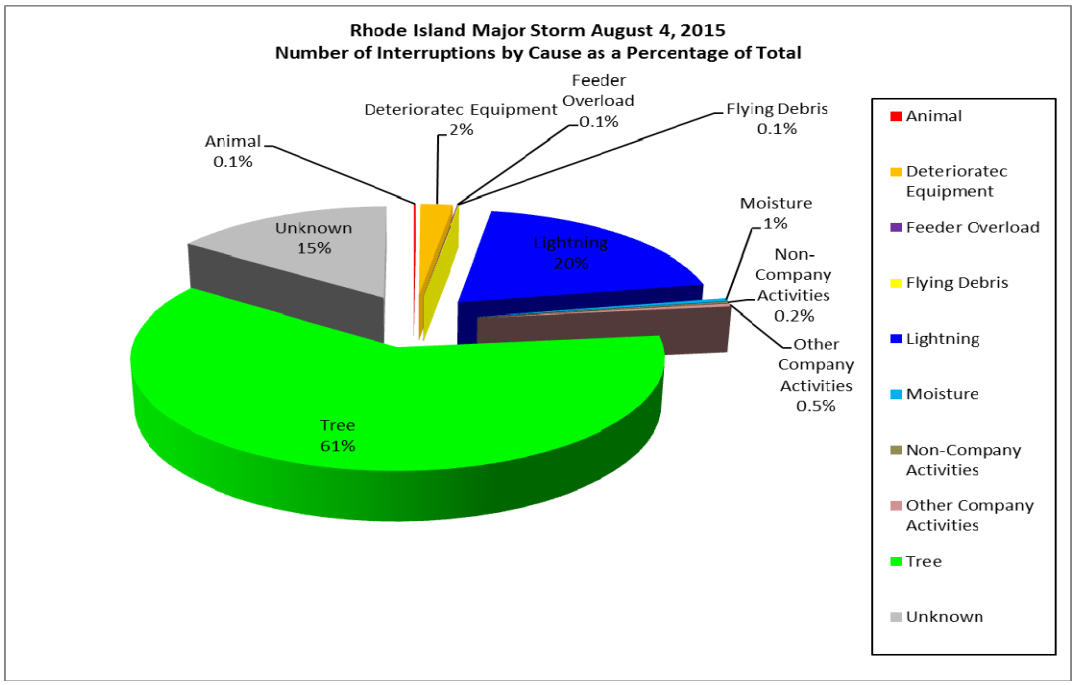
The following map shows the towns that were impacted by the storm, and the customers interrupted during the storm.

Peak Customer Interrupted by Town during 08/04/2015-08/07/2015



11. Cause:

This wind storm in Rhode Island caused widespread destruction to Rhode Island's electric infrastructure resulting in interruptions to customers. The causes of interruptions are shown in the table below.



12. Weather impact on restoration:

A severe thunderstorm tore through Rhode Island Tuesday morning, August 4, 2015, knocking out power to approximately 121,000 customers and blocking roads with pooled water and toppled trees. The storm crossed into the state around 6:00 a.m., and hit the Providence area roughly a half hour later with lightning, heavy rain and wind gusts over 50 mph. The National Weather Service in Taunton, Massachusetts, reported the strongest gust at T.F. Green Airport was 67 mph at 6:28 a.m. Police in Cranston and Warwick were reporting dozens of streets blocked by downed trees and flooding. The Company was able to proceed fully with restoration by very early morning on Tuesday, August 4, 2015 at approximately 9:00 a.m. through the end of the storm.

13. Analysis of Protective Device Operation:

National Grid maintains a wide array of protection and interrupting devices designed to separate faulted components from the electrical system while containing outages to the smallest area practicable. On the distribution system, those devices include fuse cutouts, reclosers, and circuit breakers of various designs. On the transmission system, interrupting devices include circuit breakers, air-break switches, and circuit switchers. Protection relays are used to detect the faults and operate the interrupting device(s) to isolate a faulted component(s).

For the distribution system, design standards exist that indicate how protection devices are to be deployed and coordinated with other devices. Distribution engineers evaluate such devices under normal and fault conditions. Where recent performance may indicate a need for improvement, National Grid performs engineering studies and makes improvements. During a major storm like this event, outages in the distribution system may be far too extensive to assess the function and coordination of individual protection devices in detail, as the focus of storm response is on service restoration. A meaningful analysis would be difficult to perform unless there were specific indications of protection equipment mis-operation.

Protection standards, guides and practices also exist and are followed in the design of the National Grid's transmission system. Post event analysis of all interruptions in the National Grid Bulk Electric System (BES) is performed to confirm proper operation of protection systems. If an improper operation is identified, further analysis is conducted to identify the cause, propose and implement a solution. In addition, National Grid undertakes analysis of transmission and substation protection devices and coordination where there is evidence of a mis-operation. The Company had no mis-operations at the Transmission and substation level in Massachusetts during this event

14. Summary of Customers Impacted:

August 4, 2015

During this storm, on August 4, 2015, Rhode Island experienced a total of 226 interruptions that affected 142,171 customers and 131,567,780 customer minutes of interruption. On average these interruptions resulted in 0.293 SAIFI, 271.33 minutes of SAIDI, and 925.42 minutes of interruption of customers affected. Since a SAIDI value of 271.33 minutes exceeded the threshold value of 5.48 minutes, August 4, 2015 qualified as a Major Event Day under the IEEE methodology.

August 5, 6, and 7, 2015

As reported in the Company's Storm Report in Docket No. 2509, submitted to the PUC on November 5, 2015, restoration activity continued through August 7; however, Major Event Day exemptions were not requested.