

August 29, 2013

**VIA HAND DELIVERY & ELECTRONIC MAIL**

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

**RE: Commission Investigation relating to Stray and Contact Voltage Occurring in  
Narragansett Electric Company Territories  
National Grid Annual Contact Voltage Compliance Report  
Docket No. \_\_\_\_\_**

Dear Ms. Massaro

Enclosed is the first Annual Contact Voltage Compliance Report filed by The Narragansett Electric Company d/b/a National Grid ("National Grid" or the "Company") pursuant to the provisions of the Contact Voltage Program approved by the Rhode Island Public Utilities Commission ("Commission") in Docket 4237. In that docket, the Commission established a contact voltage detection, repair, and reporting program, which would be applicable to National Grid, pursuant to the provisions of the newly enacted Rhode Island Contact Voltage statute. R.I.G.L. §39-2-25.<sup>1</sup> Under the approved program, the Company is required to file findings and results of its contact voltage detection and testing in an annual report by no later than September 1, 2013. Additionally, the Commission directed the Company to include in this report a recommendation of the Designated Contact Voltage Risk Areas to be tested in the subsequent year.

Please be advised that pursuant to the provisions of Commission Rule 1.2(g) and R.I.G.L. §38-2-2(4)(i)(B), the Company requests protective treatment for the competitive pricing information contained on page 11 of the report. Consequently, the Company is submitting a motion for protective treatment along with one copy of the unredacted page 11 of the report.

Thank you for your attention to this transmittal. If you have any questions, please feel free to contact me at (401) 784-7667.

Very truly yours,



Thomas R. Teehan

Enclosure

cc: Docket 4237 Service List  
Steve Scialabba  
Leo Wold, Esq.

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<sup>1</sup> The Rhode Island Contact Voltage statute was enacted on June 6, 2012.

**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS**

**RHODE ISLAND PUBLIC UTILITIES COMMISSION**

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**COMMISSION INVESTIGATION RELATING TO STRAY AND CONTACT VOLTAGE  
OCCURRING IN NARRAGANSETT ELECTRIC COMPANY TERRITORIES**

**Docket No.** \_\_\_\_\_

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**NATIONAL GRID'S REQUEST  
FOR PROTECTIVE TREATMENT OF CONFIDENTIAL INFORMATION**

National Grid<sup>1</sup> hereby requests that the Rhode Island Public Utilities Commission (“Commission”) provide confidential treatment and grant protection from public disclosure of certain confidential, competitively sensitive, and proprietary information submitted in this proceeding, as permitted by Commission Rule 1.2(g) and R.I.G.L. § 38-2-2(4)(i)(B). National Grid also hereby requests that, pending entry of that finding, the Commission preliminarily grant National Grid’s request for confidential treatment pursuant to Rule 1.2 (g)(2).

**I. BACKGROUND**

In compliance with the provisions of the Contact Voltage Program approved by the Commission in this docket, on August 29, 2013, National Grid filed with the Commission its Annual Contact Voltage Compliance Report. This filing included the total costs to survey, monitor, and test the thirteen Designated Contact Voltage Risk Areas under the pricing it received from the contractor selected to provide mobile testing

services under the RFP procedure approved by the Commission. National Grid is requesting confidential treatment for this pricing information.

## **II. LEGAL STANDARD**

The Commission's Rule 1.2(g) provides that access to public records shall be granted in accordance with the Access to Public Records Act ("APRA"), R.I.G.L. §38-2-1, *et seq.* Under APRA, all documents and materials submitted in connection with the transaction of official business by an agency is deemed to be a "public record," unless the information contained in such documents and materials falls within one of the exceptions specifically identified in R.I.G.L. §38-2-2(4). Therefore, to the extent that information provided to the Commission falls within one of the designated exceptions to the public records law, the Commission has the authority under the terms of APRA to deem such information to be confidential and to protect that information from public disclosure.

In that regard, R.I.G.L. §38-2-2(4)(i)(B) provides that the following types of records shall not be deemed public:

Trade secrets and commercial or financial information obtained from a person, firm, or corporation which is of a privileged or confidential nature.

The Rhode Island Supreme Court has held that this confidential information exemption applies where disclosure of information would be likely either (1) to impair the Government's ability to obtain necessary information in the future; or (2) to cause substantial harm to the competitive position of the person from whom the information

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<sup>1</sup> The Narragansett Electric Company d/b/a National Grid ("National Grid or "the Company").

was obtained. Providence Journal Company v. Convention Center Authority, 774 A.2d 40 (R.I.2001).

The first prong of the test is satisfied when information is voluntarily provided to the governmental agency and that information is of a kind that would customarily not be released to the public by the person from whom it was obtained. Providence Journal, 774 A.2d at 47.

In addition, the Court has held that the agencies making determinations as to the disclosure of information under APRA may apply the balancing test established in Providence Journal v. Kane, 577 A.2d 661 (R.I.1990). Under that balancing test, the Commission may protect information from public disclosure if the benefit of such protection outweighs the public interest inherent in disclosure of information pending before regulatory agencies.

## **II. BASIS FOR CONFIDENTIALITY**

The Company seeks protective treatment for the cost information, which reflects the bid prices received under the RFP. The information is proprietary and confidential to the Company and its contractor. This is not the type of information that the Company would ordinarily share with others, and if it were made public, it would cause substantial harm to the competitive position of the contractor from whom the information was obtained. Moreover, it would interfere with the Company's ability to obtain competitive pricing for services in the future.

### **III. CONCLUSION**

The Company respectfully requests that the Commission grant its Motion for Protective Treatment as stated herein.

Respectfully submitted,

**NATIONAL GRID**

By its attorney,



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Thomas R. Teehan, Esq. (RI Bar #4698)  
National Grid  
280 Melrose Street  
Providence, RI 02907  
(401) 784-7667

Dated: August 29, 2013

The Narragansett Electric Company  
d/b/a National Grid

# **Rhode Island Annual Contact Voltage Compliance Report**

August 29, 2013

**Submitted to:**  
Rhode Island Public Utilities Commission  
R.I.P.U.C. Docket No. \_\_\_\_\_

**Submitted by:**

**nationalgrid**

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## **Section 1**

### **Background and Summary**



## **1. Background and Summary**

On June 6, 2012, R.I.G.L., §39-2-25 the Rhode Island Contact Voltage statute was signed into law. That statute directed the Rhode Island Public Utilities Commission (“Commission”) to establish a contact voltage detection, repair, and reporting program, which would be applicable to National Grid.<sup>1</sup> On October 4, 2012, the Commission issued an order (“Program Order”)<sup>2</sup> approving an amended contact voltage program that had been filed by the Company. The Program Order established thirteen Designated Contact Voltage Risk Areas (“DCVRA”)<sup>3</sup> for the state of Rhode Island and directed the Company to conduct testing and surveys for contact voltage on all conductive surfaces in public rights of way identified within these DCVRAs.

On January 21, 2013 the Commission issued a subsequent order (“Compliance Order”)<sup>4</sup> directing the Company to complete its initial testing and surveying of the thirteen DCVRAs in the first year. The Compliance Order further required the Company to file the findings and results of this testing in an annual report (“DCVRA Annual Report”) by no later than September 1, 2013. The DCVRA Annual Report is required to identify the specific elevated voltage events found during surveying and testing and explain the appropriate remedial action taken by the Company to ensure public safety. In addition, the Compliance Order further directed that after reviewing the findings and

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<sup>1</sup> The Narragansett Electric Company d/b/a National Grid (“National Grid” or the “Company”).

<sup>2</sup> Docket No. 4237, written order 20871 issued November 9, 2012.

<sup>3</sup> The thirteen Designated Contact Voltage Risk Areas including Newport, Pawtucket, Woonsocket and ten designated sections in the City of Providence (College Hill, Downtown, Elmwood, Federal Hill, Lower South Providence, Olneyville, Smith Hill, Upper South Providence, Washington Park and West End)

<sup>4</sup> Docket No. 4237, written Order 20950 issued February 1, 2013.

results of its initial survey and testing, the Company is to provide the Commission with a recommendation of those specific DCVRAs to be surveyed and tested in the second year of the program. Finally, the Compliance Order further directed the Company to keep the Commission apprised on any advances in contact voltage technology as part of its annual report.

The Commission stated that the Contact Voltage Annual Report is to be provided in Excel or searchable PDF format and is to include the information below by DCVRA.<sup>5</sup> Exhibit 1 provides a searchable Excel file containing information for each mobile event recorded during testing (1-14 below).

1. A record number for each contact voltage event (*Exhibit. 1, Column (a)*);
2. The date and time of the testing (*Exhibit. 1, Columns (b), (c)*);
3. The specific location of the testing (*Exhibit. 1, Columns (d),(f),(g),(h),(i),(j)*);
4. An identification of whether it was a Company or customer asset (*Exhibit. 1, Column (p)*);
5. The type of the equipment that failed, (*Exhibit. 1, Columns (n),(o)*);
6. The voltage recorded (*Exhibit 1, Column (l)*);
7. Whether there was any personal injury to public, pet or property damage(*Section 4*)<sup>6</sup>;
8. An identification of any other equipment involved, (*Exhibit 1, Columns (n),(y)*);
9. Whether there were any prior incidents for the last 5 years at that location (*Exhibit 1, Column (u)*)<sup>7</sup>;
10. The corrective actions taken at the location (*Exhibit 1, Column (y), (ac)*);
11. The number of customers if service is interrupted (*Exhibit 1, Column (s)*);
12. The duration of the interruption (*Exhibit 1, Column (t)*);
13. A summary of the investigation into the cause of the incident (*Exhibit 1, Column (y)*);

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<sup>5</sup> Program Order at 28-29.

<sup>6</sup> Reports of any injury to the public, pets or property are reported in Section 4 below.

<sup>7</sup> Since this is the first year of mobile testing, the Company will identify any prior incidents each year as data is collected.

14. The date when corrective action was taken and the date repairs were made (i.e. temporary and final) (*Exhibit 1, Columns (x),(z),(ab)*);

In addition, the Commission further directed that the Contact Voltage Annual Report also include information concerning the following:<sup>8</sup>

15. The aggregated costs-to-repair for each contact voltage event by DCVRA;  
16. The number of calls to the “Shock Line”;  
17. Any additional back-up information currently included in Section 7.2 of the Company’s current EOP-G016;  
18. A recommendation on whether any DCVRA should be added or modified with a specific rationale supporting the recommendation;  
19. A recommendation of which DCVRAs should comprise the 20 percent to be tested in the second year; and  
20. For the Company to monitor and report on any updates on standards (IEEE) and advances in equipment technology.

Section 2 of this Annual Report provides a summary of the Company’s surveying and testing results for the thirteen DCVRAs for the period March 18, 2013 to March 30, 2013. Section 3 provides a preliminary summary of the aggregate costs of the contact voltage program. (#15 above) Section 4 provides the listing of the number of calls to the Company’s “Shock line” and reports of any injury to the public, pets or property. (#7 and #16 above) Section 5 includes copies of the Company’s updated EOP- G016. (#17 above) Section 6 provides additional information on the Company’s total harmonic distortion (“THD”) pilot program results that were previously filed with the Commission and Division on May 14, 2013. Section 7 includes the Company’s recommendation for the addition of a new DCRVA in Westerly, Rhode Island and presents two options for the percentage of DCVRAs to be completed in the second year of the program. (# 18 and

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<sup>8</sup> Program Order at 28-29, Compliance Order at 7-8.

#19 above) Finally, Section 8 provides the Company's latest understanding of the current state of electrical standards and mobile equipment technology. (#20 above)

## **Section 2**

### **Survey and Testing Results**

## **2. Survey and Testing Results**

Premier Utility Services, LLC (“Premier”) conducted the surveying and testing of the thirteen DCVRAs over the period of March 18, 2013 to March 30, 2013. All surveying and testing took place at night in order to include the testing of street lights. In total, the surveying and testing of all thirteen DCVRAs covered approximately 208 total miles.<sup>9</sup> The Company had underground crews available, as well as inspectors to guard any fault or area discovered during the surveying and testing until it could be made safe. Where an elevated voltage condition of 4.5 volts or above was found and verified, the site was guarded until it could be made safe by Company personnel or if customer owned, the owner or municipality was notified and the Company took appropriate action to ensure public safety at that location.<sup>10</sup>

In addition, the testing in each DCVRA included the total harmonic distortion (“THD”) pilot during which any voltage measure greater than 1 volt and less than 4.5 volts that had a total harmonic distortion of less than 10 percent was considered contact voltage. As noted in the Company’s THD Pilot Program filing of May 14, 2013, during testing the Company remediated five locations where the THD was less than 10 percent. As such, these locations were safeguarded from the public and appropriate permanent

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<sup>9</sup> The 208 total miles includes all mileage driven to survey, such as where the survey included both sides of a street, not simply linear mileage.

<sup>10</sup> Guarded is defined as guarded by a person or a protective barrier that prevents public contact if the elevated voltage found is greater than 4.5 volts. If the voltage measures greater than 4.5 volts and less than 8 volts it is either guarded in person or by installation of a protective barrier that prevents public contact. If the voltage measurement is greater than 8 volts it is guarded by an equipment elevated voltage inspector or a Company employee that has been trained to stand by on energized facilities; and an immediate maintenance and repair response is required.

repairs made. THD was determined by the use of a Fluke power quality clamp meter or a Fluke scope meter. As discussed in more detail in Section 6, although not considered hazardous to the public, as part of the testing, the Company also remediated two events where the total harmonic distortion was greater than ten percent.

The chart below provides the dates of testing, elevated mobile events, and shunt voltage readings.

DCVRA	Dates Tested	Mobile Events*	Readings Greater than 1 Volt but less than 4.5 Volts		Readings Greater than 4.5 Volts	
			Customer Equipment	Company Equipment	Customer Equipment	Company Equipment
<b>PROVIDENCE</b>						
College Hill	3/24 - 3/25	3				1
Downtown	3/18 - 3/22	46	1	1		2
Elmwood	3/27					
Federal Hill	3/26	1				
Lower So. Prov	3/27					
Olneyville	3/26	1				
Smith Hill	3/25	4		1		
Upper So. Prov	3/26 -3/27					
Washington Park	3/27	1				
West End	3/27	6			2	3
<b>NEWPORT</b>	3/28 -3/29	7		4		
<b>PAWTUCKET</b>	3/27	2			2	
<b>WOONSOCKET</b>	3/30	4				3
<b>Total</b>		<b>75</b>	<b>1</b>	<b>6</b>	<b>4</b>	<b>9</b>

\* A Mobile Event is defined as a mobile reading having possible elevated voltage of 1 volt or greater. The readings above reflect the actual voltage determined by manual shunt meter testing of the asset.

Overall, during the mobile surveying several hundred stops were made to investigate elevated voltage readings where the mobile detection system indicated increased electric field strength in the area surveyed. All available conductive objects

and surfaces in the location were tested with the vast majority of these events resulting in a finding of no actionable voltage on a conductive object or surface. This included those events that were tested as part of the THD pilot which set off the hand held voltage detector and were further investigated using a Fluke 175 multi-meter.

As shown above, in total, out of the hundreds of readings investigated, seventy-five were documented as having possible elevated voltage. This included fifty-seven street lights, eleven traffic control boxes, two traffic standards, two private lights, one storefront sign, one no parking sign and one other type of surface. Of these seventy-five events, twenty events registered 1- volt or above, with thirteen of these twenty events registering an actionable voltage level of 4.5-volts or above. These twenty events included fifteen Company streetlights (four in Newport, three in Woonsocket, three in Providence-West End, three in Providence-Downtown, one in Providence-College Hill and one in Providence-Smith Hill), four customer street lights (two in Pawtucket and two in Providence-West End) and one customer traffic standard (Providence-Downtown). In each of these twenty events, the Company took immediate remedial action by disconnecting the street light, placing protective barriers, temporarily repairing the asset and notifying customers where customer assets were involved. All of the Company's fifteen street light assets that registered greater than 1 volt were permanently repaired between May 3, 2013 and May 14, 2013.



## **Section 3**

### **Contact Voltage Program Costs**

**3. Contact Voltage Program Costs**

Total costs to survey, monitor and test 13 DCVRAs, were \$ [REDACTED]. While the testing was performed in FY 2013, the vendor invoice was paid in FY 2014, and therefore these costs are not included in the recent FY13 ISR Reconciliation filing, but will be included in the FY14 ISR Reconciliation. The chart below provides a summary of the aggregated temporary and permanent repair costs of the fifteen Company locations identified during the contact voltage surveying and testing.

**Aggregate Contact Voltage Repair Costs**

	<b>Prov-Downtown</b>	<b>Prov-College Hill</b>	<b>Prov-Smith Hill</b>	<b>Prov-West End</b>	<b>Newport</b>	<b>Pawtucket</b>	<b>Woonsocket</b>	<b>Total</b>
<b>Repair Costs</b>	\$5,461	\$1,033	\$1,658	\$7,097	\$6,750	\$1,476	\$20,362	<b>\$43,837</b>

## **Section 4**

### **“Shock Line” Calls**

#### **4. “Shock Line” Calls**

The Company agreed to report annual calls to its “Shock Line” as part of its Contact Voltage Annual Report. “Shock Line” calls to the Company record an event of elevated voltage reported by the public or other entities, such as another utility. For the period April 1, 2012 to March 31, 2013, the Company received eight calls of elevated voltage to its “Shock Line.” While there were no reported personal injuries or damage to property from any of these incidents, the Company received reports of two events in which that a dog was shocked but was not injured. Each of these incidents was responded to, tested, mitigated where necessary and repaired by the Company or notification was given to the customer who owned the asset.

<b>Date &amp; Time</b>	<b>Town</b>	<b>Street</b>	<b>Asset</b>	<b>Voltage Found</b>	<b>Owner</b>	<b>Injury</b>
05/02/12 at 15:20	No. Kingstown	Pine River Drive	Wood Pole	0 Volts	Company	No
09/17/12 at 14:48	E. Providence	Pawtucket Avenue	Steel Pole	118 Volts	Customer	No – Dog Reported Shocked but OK
10.07/12 at 20:07	Newport	Thames Street	Street Light	0 Volts	Company	No – Dog Reported Shocked but OK
12/05/12 at 0:09	Providence	Doyle Avenue	Street Light	75 volts	Company	No
01/12/13 at 16:21	Narragansett	Bishop Road	Drain Pipe	0 Volts	Customer	No
01/29/13 at 11:24	Foster	Winsor Road	Wood Pole	0 Volts	Company	No
03/18/13 at 23:38	Providence	Dyer Street	Street Light	8 volts	Company	No
03/19/13 at 2:05	Providence	South Street	Street Light	0 Volts	Company	No

In five of these incidents no elevated voltage was found. However, despite these zero voltage readings, in an abundance of caution, the Company did replace equipment in

Newport, Foster and Providence at South Street to ensure no further incidents. In Newport, the Company replaced a capacitor in a gas lamp two poles down from the area tested. In Foster, Company personnel found a ground missing on a pole and replaced the ground. In Providence at South Street, the Company installed a new cable and pole set with a new drop, arm and head.<sup>11</sup> In North Kingston the Company responded to a residential customer call that a cable technician had received a shock while working outside the house. Company personnel investigated and could not find any issue with the Company's facilities, so no repairs were made.

In the remaining three incidents, the Company found that voltage exceeded 4.5 Volts. The first incident was on Pawtucket Avenue in East Providence where the Company received a report that a dog received a shock from a customer-owned steel pole that had become energized. The Company responded and found the pole energized to 118 Volts. The Company disconnected the pole and notified the customer. The second incident was on Doyle Avenue in Providence where a Company trouble man performing elevated voltage testing on a Company-owned pole discovered a deteriorated cable. The cable was repaired by Company personnel. Finally, the third incident was on Dyer Street in Providence where a Company street light standard had become energized due to another pole in proximity that had been hit and came in contact with it. The Company responded and rewired the pole and street light standard.

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<sup>11</sup> In Narragansett, the Company found that a customer's drain pipe had become energized due to vinyl siding that had become worn. Company personnel removed the vinyl siding where it touched the Company's service and installed a new service which resolved the event.

There were no reported personal injuries from any of the elevated voltage instances found as a result of the Company's mobile contact voltage testing.

## **Section 5**

### **Company EOP G016**

**5.     Company EOP G016**

The Company agreed to provide additional back-up information currently included in Section 7.2 of the Company's EOP G016. The Company amended EOP G016 to include a new Section 7.3 that contains those categories applicable to mobile contact voltage surveying and testing, and this information is provided in Exhibit 1. In addition, Section 10.0 of the EOP includes the Rhode Island specific reporting requirements included in Exhibit 1 and Section 4 (Shock Line) of this report. A copy of this updated amended EOP G016 is included in this filing as Exhibit 2. This EOP has recently been approved, and will be issued in the fall of 2103.



## **Section 6**

### **THD Pilot Program**

**6. THD Pilot Program Results**

The THD pilot program was performed as part of the first year testing from March 18, 2013 to March 30, 2013. Under the THD pilot program, during contact voltage testing any voltage measures greater than 1 volt and less than 4.5 volts that had a total harmonic distortion of less than 10 percent would be consider contact voltage and treated accordingly. That is, these areas would be safeguarded from the public and permanent repairs will be made. However, if the total harmonic distortion was found to be greater than 10 percent and no visual defects are found, then no further action would be required. THD was determined by the use of a Fluke power quality clamp meter or a Fluke scope meter, both of which have the ability to measure THD.

A summary of the results of the THD pilot program are set forth in the table below:<sup>12</sup>

	<b>1 V - &lt;4.5Vs</b>	<b>THD &lt; 10%</b>	<b>THD &gt; 10%</b>
<b># of Readings</b>	<b>7</b>	<b>5</b>	<b>2</b>

As shown above, the results of the THD pilot indicate a total of seven readings between 1 volt and 4.5 volts. Of that total, five were below the distortion level of 10 percent and thus were considered as contact voltage. In each of these occurrences the Company took the appropriate remedial actions. Specifically, four of the contact voltage findings were on Company owned streetlights on Narragansett Ave. in Newport. The

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<sup>12</sup> The Company previously submitted these results to the Commission and Division on May 14, 2013.

first two street lights, 5-1 and 6-1, had a shunt voltage reading of 2.56 (Exhibit 1, Event ID 66) and 2.89 (Exhibit 1, Event ID 67) volts respectively and both had a THD reading of 8.5 percent. The Company identified deteriorated connections on both streetlights. The Company remade all connections on both lights and mitigated the voltage down to one volt on both streetlights. The third and fourth streetlights, 7-1 and 8-1, had a shunt voltage reading of 3.7 (Exhibit 1, Event ID 68) and 4.27 (Exhibit 1, Event ID 69) volts respectively and both had a THD reading of less than 7 percent. The Company determined that both the wiring and the lamps needed to be replaced and completed the repair. The fifth asset was a streetlight on Smith Hill in Providence. The streetlight had a shunt voltage reading of 1.28 volts (Exhibit 1, Event ID 53) and a THD of 6.4 percent. The Company repaired this streetlight by replacing the connections in the street light standard.

In addition, two readings were above the distortion level of 10 percent. While the two contact voltage detections were visually examined and determined that no hazard was present, the Company decided to mitigate the voltage in each case. The first asset was a Company-owned streetlight on Benefit Street in Providence. The shunt voltage reading was 1.64 volts (Exhibit 1, Event ID 45) with a THD of 11.4 percent. The Company replaced the streetlight head and wiring. The second asset was a traffic standard on Fountain street in downtown Providence owned by the City of Providence. The shunt voltage reading was 1.8 volts (Exhibit 1, Event ID 26) with a THD of 27.8 percent. The Company notified the City of Providence Traffic Engineering department on March 21, 2013 of its finding.

After a review of the above THD pilot information, as well as the overall testing results of the first year mobile survey, the Company plans to continue the use of THD testing during its FY 2014 mobile survey cycle. The Company believes that using THD testing as part of its FY 2014 mobile testing will provide the Company and Commission with additional information and testing results upon which to make a recommendation for continued THD use and possible modifications or changes in the Contact Voltage Program in future periods.

## **Section 7**

### **DCVRA Recommendation**

**7. DCVRA Recommendation**

In the Compliance Order, the Commission directed the Company to include in its Contact Voltage Annual Report a recommendation as to which DCVRAs would be included in the twenty percent to be surveyed and tested in the second year of the Contact Voltage and Repair Program.<sup>13</sup> In formulating its recommendation, as discussed below, the Company relied on the results of the initial surveying and testing. In addition, the Company also has examined an additional area of the state that may qualify as a new DCVRA. That examination has identified one additional DCVRA that the Company is proposing to add for surveying and testing in FY 2014.

At this time, the Company would recommend no changes to the current DCVRAs. The seventy-five documented possible elevated voltage readings occurred in 10 of the 13 DCVRAs. Of the twenty contact voltage incidents found, seven of the DCVRAs had contact voltage instances greater than 1.0 volt; and of those, five DCVRAs had contact voltage instances greater than 4.5 volts; furthermore, five DCVRAs had more than one contact voltage instance. Based on this, it is the Company's view that it would be more appropriate to consider modifications or the elimination of a DCVRA after having reviewed data from at least two consecutive years of testing. Two consecutive years of testing will provide the Company and the Commission with a more complete benchmark to consider for each DCVRA.

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<sup>13</sup> Compliance Order at 9.

While the Company is not recommending any changes to the current DCVRAs, it is proposing an additional DCVRA which will encompass a portion of High St. and Broad St. in Westerly. This additional DCVRA represents approximately 1,500 linear feet of roadway and contains a small underground distribution system and underground-municipally-owned street lights. The Company has examined this roadway and its immediate surroundings and has concluded it to be a pedestrian dense area. Upon approval of the Commission, the Company will negotiate the addition with the vendor and incorporate the Westerly DCVRA into the mobile testing schedule. A map of the proposed Westerly DCVRA is attached as Exhibit 3.

With respect to surveying and testing for the second year, the Company has considered two options. The first option would be to again survey and test 100 percent of the DCVRAs in FY 2014. Like the THD pilot program, testing 100 percent of the DCVRAs in FY 2014 would provide the Company and Commission with two complete years of elevated voltage results for each DCVRA. This option would be more operationally efficient, as mobile testing for the entire state could be completed in approximately one week, rather than testing only two or three days a year. While surveying and testing 100 percent of the DCVRAs in FY 2014 would be more expensive than only the 20 percent testing required by the Contact Voltage statute, the Company would expect these costs to be similar to the past year. When balanced against the more timely information on potential elevated voltage and the increased administrative efficiency, the Company believes that to incur these increased costs for one more year is

reasonable. Again, if approved by the Commission, the Company will negotiate with the vendor as allowed for in the existing contract.

In the alternative, if the Commission does not agree that surveying and testing for 100 percent of the DCVRAs for FY 2014 is warranted, the chart below provides the Company's recommendation for the specific DCVRAs to be tested over each of the next four years. In compiling this schedule the Company considered the 20 percent statutory requirement and recognized those areas that had hits and high voltage incidents from the initial mobile survey. As detailed in the Company's amended Contact Voltage program, to test twenty percent of the DCVRAs each year as required in the statute, the Company will test a minimum of three DCVRAs each year. The Company has "rounded up" in determining how to meet the twenty percent requirement, and recommends a four year cycle rather than a five year cycle. A four year cycle would allow the Company to avoid testing of only a portion of a DCVRA and allows for full completion of a cycle prior to starting the next cycle.

The four year cycle was based on the number and voltage level of contact voltage instances in the initial testing. The schedule has the larger areas (as measured by miles required to scan) in the earlier years, and the mileage surveyed decreases for each of the following years.



<b>Region</b>	<b>Miles Traveled to Scan DCVRA (1)</b>	<b>Scheduled Year for Next Scan (2)</b>
Providence-Zone 1-College Hill	18.1	2
Providence-Zone 2-Downtown	64.9	1
Providence-Zone 3-Elmwood	6.3	4
Providence-Zone 4-Federal Hill	11.1	3
Providence-Zone 5-Lower South Providence	3.3	4
Providence-Zone 6-Olneyville	2.8	3
Providence-Zone 7-Smith Hill	16	3
Providence-Zone 8-Upper South Providence	12.4	3
Providence-Zone 9-Washington Park	7.4	4
Providence-Zone 10-West End	13.8	1
Newport	26.9	1
Pawtucket	15.9	2
Woonsocket	9.1	2
Westerly	Est. 1.0	1
<b>Total</b>	<b>209</b>	
Year One	88.8 miles	
Year Two	60.9 miles	
Year Three	42.3 miles	
Year Four	17.0 miles	

- (1) Miles Traveled to Scan DCVRA is based on actual results from the FY 2013 Scan and may include traveling down the same street twice, such as once in either direction or twice in different lanes in a one way street, to cover the entire DCVRA.
- (2) Year 1 = FY 2014 (April 1, 2013 to March 31, 2014), Year 2 = FY 15 (April 1, 2014 to March 31, 2015), etc.

## **Section 8**

### **Standards and Equipment Update**

**8.     Standards and Equipment Update**

In its Compliance Order, the Company was directed to continue to monitor advances in mobile technology and keep the Commission apprised of these efforts.<sup>14</sup> At this time, the Institute of Electrical and Electronics Engineers (“IEEE”) Working Group is still meeting and has not completed its work. As such IEEE has not published any final documentation or final recommendations on elevated voltage. In addition, the Company is not aware of any additional change to mobile testing technology. As for FY 2014, the Company plans to continue to use its existing manual technology and chosen vendor mobile technology for the second year of the Contact Voltage Program.

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<sup>14</sup> Compliance Order at 8.

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(ad)	(ab)	(ac)	
Event ID	Date Found	Time Found	Zone Name	Action Taken	Address Number	Street	Cross Street	Latitude	Longitude	Voltage	Shunt Voltage	3rd Harmonic	Asset Type	Asset number	Asset Owner?	Ground Source	Work Order #	# of Customers Interrupted	Duration of Interruption	Prior EV Hit?	>= 4.5 Volts	Repair Crew	Repair Date	Type of Repair	Repair Due Date	Mitigated Repair Voltage	Repair Status	Shunt Voltage Category	Contacted 3rd Party ( City, State, Owner)	
1	03/18/2013	22:04	Providence-Zone 2-Downtown	Below Threshold	78	Allens Ave	Henderson St	41.8125	-71.40535	0.91	0.21	0	Streetlight	15	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
2	03/18/2013	22:20	Providence-Zone 2-Downtown	Below Threshold	6	Allens Ave	Globe St	41.81452	-71.40632	0.56	0.26	0	Traffic Control Box	881	Customer	Sign Post	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
3	03/18/2013	22:25	Providence-Zone 2-Downtown	Below Threshold	6	Allens Ave	Globe St	41.81456	-71.40362	0.229	0.136	0	No Parking Sign	N/A	Customer	Sign Post	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
4	03/18/2013	22:40	Providence-Zone 2-Downtown	Below Threshold	439	Eddy St	Point St	41.81671	-71.40632	1.04	0.19	0	Traffic Control Box	N/A	Customer	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
5	03/18/2013	22:55	Providence-Zone 2-Downtown	Below Threshold	392	Eddy St	South St	41.81767	-71.40692	0.502	0.502	0	Streetlight	21	Company	Fire Hydrant	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
6	03/18/2013	23:15	Providence-Zone 2-Downtown	Disconnected	UNK	Dyer St	319 Eddy St	41.81938	-71.40778	94.2	8.09	0	Streetlight	10	Company	Ground Rod	90000128963	0	N/A	No	At or Above 4.5 Volts	Internal	03/21/2013	Repaired/capped cable at adjacent hit pole (mva)	Thursday, May 02, 2013	0.20	Repair Complete	4.5 - 24.9 Volts		
7	03/18/2013	23:43	Providence-Zone 2-Downtown	Below Threshold	UNK	Dyer St	319 Eddy St	41.81963	-71.40752	4.11	0.525	0	Streetlight	9	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
8	03/19/2013	0:20	Providence-Zone 2-Downtown	Below Threshold	385	Eddy St	South St	41.81758	-71.40711	0.384	0.343	0	Streetlight	UNK	Company	Sign Post	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
9	03/19/2013	1:00	Providence-Zone 2-Downtown	Below Threshold	64	Point St	Eddy St	41.81692	-71.40591	1.2	0.82	0	Streetlight	4	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
10	03/19/2013	1:50	Providence-Zone 2-Downtown	Disconnected	100	South St	Parsonage St	41.81666	-71.40964	26	18.2	7.10%	Streetlight	3	Company	Ground Rod	90000128963	0	N/A	No	At or Above 4.5 Volts	Internal	04/25/2013	Replaced pole, head, wire, & service.	Friday, May 03, 2013	0.01	Repair Complete	4.5 - 24.9 Volts		
11	03/19/2013	23:45	Providence-Zone 2-Downtown	Below Threshold	282	Eddy St	Dyer St	41.81953	-71.40806	3.31	0.34	0	Streetlight	11	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
12	03/20/2013	0:34	Providence-Zone 2-Downtown	Below Threshold	196	Richmond St	Ship St	41.81934	-71.40938	0.461	0.158	0	Streetlight	5	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
13	03/20/2013	1:50	Providence-Zone 2-Downtown	Below Threshold	107	Pine St	Garnet St	41.82177	-71.41052	0.56	0.34	0	Streetlight	9	Company	Fire Hydrant	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
14	03/20/2013	1:56	Providence-Zone 2-Downtown	Below Threshold	107	Pine St	Garnet St	41.82196	-71.41042	0.421	0.17	0	Streetlight	8	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
15	03/20/2013	2:16	Providence-Zone 2-Downtown	Below Threshold	109	Pine St	Garnet St	41.82163	-71.41077	0.452	0.145	0	Other	N/A	Customer	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
16	03/20/2013	2:36	Providence-Zone 2-Downtown	Below Threshold	198	Weybosset St	Union St	41.822201	-71.41197	0.682	0.148	0	Streetlight	N/A	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
17	03/20/2013	3:30	Providence-Zone 2-Downtown	Below Threshold	47	Greene St	Washington St	41.8213	-71.417	0.48	0.38	0	Traffic Control Box	N/A	Customer	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
18	03/20/2013	3:35	Providence-Zone 2-Downtown	Below Threshold	47	Greene St	Washington St	41.82135	-71.41704	0.142	0.12	0	Streetlight	N/A	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
19	03/20/2013	22:03	Providence-Zone 2-Downtown	Below Threshold	13	Greene St	Garden St	41.82084	-71.41673	0.145	0.123	0	Streetlight	N/A	Company	Metal Pipe	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
20	03/20/213	22:21	Providence-Zone 2-Downtown	Below Threshold	8	Greene St	Garden St	41.82055	#NAME?	0.44	0.16	0	Traffic Standard	N/A	Customer	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
21	03/20/2013	22:45	Providence-Zone 2-Downtown	Below Threshold	UNK	Garden St	25 Greene St	41.82074	-71.41727	45.2	0.158	0	Private Lighting	N/A	Customer	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
22	03/20/2013	23:30	Providence-Zone 2-Downtown	Below Threshold	50	Empire St	Broad St	41.8201	-71.41458	0.48	0.22	0	Streetlight	1	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
23	3/20/2013	23:55	Providence-Zone 2-Downtown	Below Threshold	30	Chestnut St	Pine St	41.81958	-71.41292	0.6	0.48	0	Traffic Control Box	N/A	Customer	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
24	03/21/2013	1:00	Providence-Zone 2-Downtown	Below Threshold	86	Snow St	Chapel St	41.82142	-71.41407	0.218	0.123	0	Streetlight	N/A	Company	Fire Hydrant	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
25	03/21/2013	1:00	Providence-Zone 2-Downtown	Below Threshold	86	Snow St	Chapel St	42.82132	-71.41403	0.52	0.322	0	Streetlight	N/A	Customer	Fire Hydrant	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
26	03/21/2013	2:05	Providence-Zone 2-Downtown	Installed Barriers	22	Fountain St	Dorrance St	42.82485	-71.41453	2.6	1.8	27.8	Traffic Standard	N/A	Customer	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts			Customer Owned				Repair Pending	1- 4.4 Volts	City DPW notified on 3/21/13. Left message with directors office. Tony Dookio traffic engineering has been notified
27	03/21/2013	2:33	Providence-Zone 2-Downtown	Below Threshold	43	Dorrance St	Fulton St	42.82386	-71.41241	0.297	0.186	0	Streetlight	N/A	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
28	03/21/2013	2:33	Providence-Zone 2-Downtown	Below Threshold	43	Dorrance St	Fulton St	42.82397	-71.41234	0.194	0.06	0	Streetlight	N/A	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
29	03/21/2013	2:58	Providence-Zone 2-Downtown	Below Threshold	26	Friendship St	Dorrance St	42.82219	-71.4093	0.309	0.198	0	Streetlight	4	Company	Sign Post	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
30	03/21/2013	3:21	Providence-Zone 2-Downtown	Below Threshold	56	Fulton St	Arcade St	42.82466	-71.41165	2.6	0.4	0	Streetlight	N/A	Company	Metal Pipe	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
31	03/21/2013	3:43	Providence-Zone 2-Downtown	Below Threshold	34	Fulton St	Exchange St	42.82526	-71.41114	1.26	0.105	0	Streetlight	N/A	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
32	03/21/2013	4:15	Providence-Zone 2-Downtown	Below Threshold	28	Exchange Ter	Dorrance St	42.82553	-71.41364	3.55	0.5	0	Streetlight	N/A	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
33	03/21/2013	4:28	Providence-Zone 2-Downtown	Below Threshold	33	W Exchange St	Sabin St	42.82505	-71.41481	3.8	0.488	0	Streetlight	N/A	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
34	03/21/2013	22:57	Providence-Zone 2-Downtown	Below Threshold	17	Peck St	Pine St	41.82334	-71.40983	0.182	0.05	0	Streetlight	3	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
35	03/22/2013	0:37	Providence-Zone 2-Downtown	Below Threshold	500	S Main St	Transit St	41.8201	-71.40304	1.5	0.4	0	Streetlight	N/A	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
36	03/22/2013	0:47	Providence-Zone 2-Downtown	Below Threshold	459	S Main St	James St	41.82055	-71.40348	0.499	0.325	0	Streetlight	N/A	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
37	03/22/2013	0:54	Providence-Zone 2-Downtown	Below Threshold	343	S Main St	Williams St	41.82129	-71.40432	0.44	0.21	0	Streetlight	N/A	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
38	03/22/2013	1:49	Providence-Zone 2-Downtown	Below Threshold	98	S Main St	College St	41.82572	-71.40777	0.159	0.062	0	Traffic Control Box	N/A	Customer	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
39	03/22/2013	2:46	Providence-Zone 2-Downtown	Below Threshold	126	Canal St	Elizabeth St	41.82737	-71.41027	1.2	0.2	0	Private Lighting	N/A	Customer	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
40	03/22/2013	3:30	Providence-Zone 2-Downtown	Below Threshold	199	Canal St	Park Row	41.82845	-71.41051	0.16	0.12	0	Streetlight	N/A	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
41	03/22/2013	3:50	Providence-Zone 2-Downtown	Below Threshold	39	Steeple St	Canal St	41.82726	-71.40949	0.54	0.32	0	Traffic Control Box	N/A	Customer	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
42	03/22/2013	3:50	Providence-Zone 2-Downtown	Below Threshold	39	Steeple St	Canal St	41.82734	-71.40964	0.62	0.58	0	Traffic Control Box	N/A	Customer	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
43	03/22/2013	3:51	Providence-Zone 2-Downtown	Below Threshold	39	Steeple St	Canal St	41.82729	-71.40965	0.62	0.54	0	Traffic Control Box	N/A	Customer	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
44	03/22/2013	3:52	Providence-Zone 2-Downtown	Below Threshold	39	Steeple St	Canal St	41.82714	-71.40972	0.63	0.55	0	Traffic Control Box	N/A	Customer	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
45	03/22/2013	4:30	Providence-Zone 2-Downtown	Installed Barriers	55	College St	Benefit St	41.82614	-71.40655	2.65	1.64	11.4	Streetlight	2	Company	Ground Rod	90000128963	0	N/A	No	Below 4.5 Volts	Internal	04/23/2013	Replaced Head and Wire.	Monday, May 06, 2013	0.20	Repair Complete	1- 4.4 Volts		
46	03/24/2013	23:50	Providence-Zone 1-College Hill	Disconnected	420	Taber Ave	Angell St	41.82966	-71.39083	30.7	12.7	12.4	Streetlight	38	Company	Ground Rod	90000128961	0	N/A	No	At or Above 4.5 Volts	Internal	04/15/2013	Replaced pole, head, wire, & service.	Wednesday, May 08, 2013	0.20	Repair Complete	4.5 - 24.9 Volts		
47	03/25/2013	0:25	Providence-Zone 1-College Hill	Below Threshold	112	Waterman St	Brook St	41.82746	-71.39967	0.12	0.1	0	Streetlight	17	Company	Ground Rod	90000128961	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
48	03/25/2013	2:02	Providence-Zone 1-College Hill	Below Threshold	165	Hope St	George St	41.82585	-71.39733	4.6	0.5	0	Streetlight	19	Company	Ground Rod	90000128961	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
49	03/25/2013	4:04	Providence-Zone 2-Downtown	Below Threshold	96	Sabin St	Empire St																							

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(ad)	(ab)	(ac)	
Event ID	Date Found	Time Found	Zone Name	Action Taken	Address Number	Street	Cross Street	Latitude	Longitude	Voltage	Shunt Voltage	3rd Harmonic	Asset Type	Asset number	Asset Owner?	Ground Source	Work Order #	# of Customers Interrupted	Duration of Interruption	Prior EV Hit?	>= 4.5 Volts	Repair Crew	Repair Date	Type of Repair	Repair Due Date	Mitigated Repair Voltage	Repair Status	Shunt Voltage Category	Contacted 3rd Party ( City, State, Owner)	
55	03/26/2013	3:51	Providence-Zone 6-Olneyville	Below Threshold	631	Broadway St	Harris Ave	41.817	-71.44025	0.58	0.36	0	Streetlight	66	Company	Ground Rod	90000128967	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
56	03/27/2013	1:01	Providence-Zone 9-Washington Park	Below Threshold	1428	Broad St	Payton St	41.78816	-71.40365	1.6	0.42	0	Store Fronts	N/A	Customer	Ground Rod	90000128972	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
57	03/27/2013	2:34	Providence-Zone 10-West End	Disconnected	621	Broadway St	Barton St	41.81753	-71.43883	74	71.2	3.5	Streetlight	61	Company	Fence	90000128974	0	N/A	No	At or Above 4.5 Volts	Internal	04/15/2013	Replaced head, wire, & service.	Saturday, May 11, 2013	1.40	Repair Complete	>25 Volts		
58	03/27/2013	5:01	Providence-Zone 10-West End	Installed Barriers	870	Westminster St	Cranston St	41.81679	-71.42321	109	81.2	0	Streetlight	N/A	Customer	Fence	90000128974	0	N/A	No	At or Above 4.5 Volts	Customer	03/28/2013	Customer Owned		0.20		>25 Volts	Customer - Citizen Bank, notified by Pat Matulialis, Bus. Service. And UG Supervisor Vincent Scirocco visited site and spoke to the manager. Customer to make repairs today 3/27/13 per UG supervisor. Aladdin Electric on Site 3/28/13 making repairs.	
59	03/27/2013	5:01	Providence-Zone 10-West End	Installed Barriers	870	Westminster St	Cranston St	41.81658	-71.42328	114	78	0	Streetlight	N/A	Customer	Fence	90000128974	0	N/A	No	At or Above 4.5 Volts	Customer	03/28/2013	Customer Owned		0.20		>25 Volts	Customer - Citizen Bank, notified by Pat Matulialis, Bus. Service. And UG Supervisor Vincent Scirocco visited site and spoke to the manager. Customer to make repairs today 3/27/13 per UG supervisor. Aladdin Electric on Site 3/28/13 making repairs.	
60	03/27/2013	22:41	Providence-Zone 10-West End	Disconnected	325	Washington St	W Franklin St	41.81973	-71.41997	54	6.38	10.2	Streetlight	40/41	Company	Ground Rod	90000128974	0	N/A	No	At or Above 4.5 Volts	Internal	04/22/2013	Replaced Damaged neutral in HH off MH 2429, Wash.ST.	Saturday, May 11, 2013	0.00	Repair Complete	4.5 - 24.9 Volts		
61	03/27/2013	22:41	Providence-Zone 10-West End	Disconnected	325	Washington St	W Franklin St	41.8196	-71.42	55.9	7.45	10.2	Streetlight	23 1/2	Company	Ground Rod	90000128974	0	N/A	No	At or Above 4.5 Volts	Internal	04/22/2013	Replaced Damaged neutral in HH off MH 2429, Wash.ST.	Saturday, May 11, 2013	0.00	Repair Complete	4.5 - 24.9 Volts		
62	03/27/2013	22:41	Providence-Zone 10-West End	Below Threshold	325	Washington St	W Franklin St	41.8197	-71.41999	2.21	0.267	0	Traffic Control Box	N/A	Customer	Ground Rod	90000128974	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
63	03/27/2013	23:51	Pawtucket	Disconnected	67	Roosevelt Ave	Main St	41.87766	-71.38341	120	120	0	Streetlight	N/A	Customer	Fence	90000128960	0	N/A	No	At or Above 4.5 Volts			Customer Owned				Repair Pending	>25 Volts	NGrid Crews worked to disconnect and stayed at location. Randy from Pawtucket Public Works out on Roosevelt Ave. We energized the circuit so we could show him the elevated voltage on two poles. He assured me that these poles would be removed from the circuit so when the lights come on tonight there will be no elevated voltage present. Per Vinnie Scirocco
64	03/28/2013	1:56	Pawtucket	Disconnected	67	Roosevelt Ave	Main St	41.87713	-71.38357	54	25	0	Streetlight	N/A	Customer	Ground Rod	90000128960	0	N/A	No	At or Above 4.5 Volts			Customer Owned				Repair Pending	4.5 - 24.9 Volts	NGrid Crews worked to disconnect and stayed at location. Randy from Pawtucket Public Works out on Roosevelt Ave. We energized the circuit so we could show him the elevated voltage on two poles. He assured me that these poles would be removed from the circuit so when the lights come on tonight there will be no elevated voltage present. Per Vinnie Scirocco
65	03/28/2013	22:22	Newport	Below Threshold	199	Narragansett Ave	Ochre Point Ave	41.47579	-71.29762	1.08	0.229	0	Streetlight	1 30	Company	Ground Rod	90000128959	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
66	03/28/2013	22:39	Newport	Installed Barriers	138	Narragansett Ave	Annandale Rd	41.47559	-71.03084	3.1	2.56	8.5	Streetlight	5 1	Company	Ground Rod	90000128959	0	N/A	No	Below 4.5 Volts	Internal	04/18/2013	Remade All Connections	Sunday, May 12, 2013	1.00	Repair Complete	1- 4.4 Volts		
67	03/28/2013	22:46	Newport	Installed Barriers	102	Narragansett Ave	Annandale Rd	41.4754	-71.30506	3.66	2.89	8.5	Streetlight	6 1	Company	Ground Rod	90000128959	0	N/A	No	Below 4.5 Volts	Internal	04/18/2013	Remade All Connections	Sunday, May 12, 2013	1.00	Repair Complete	1- 4.4 Volts		
68	03/28/2013	22:55	Newport	Installed Barriers	88	Narragansett Ave	Clay St	41.47541	-71.306	4.65	3.7	5.7	Streetlight	7 1	Company	Ground Rod	90000128959	0	N/A	No	Below 4.5 Volts	Internal	04/18/2013	Replaced Head and Wire (sweep/drop)	Sunday, May 12, 2013	1.70	Repair Complete	1- 4.4 Volts		
69	03/28/2013	23:04	Newport	Installed Barriers	74	Narragansett Ave	Clay St	41.4753	-71.30727	4.89	4.27	7	Streetlight	8 1	Company	Ground Rod	90000128959	0	N/A	No	Below 4.5 Volts	Internal	04/18/2013	Replaced Head and Wire (sweep/drop)	Sunday, May 12, 2013	1.60	Repair Complete	1- 4.4 Volts		
70	03/29/2013	2:17	Newport	Below Threshold	86	Marsh St	Gladys Carr Bolhouse Rd	41.49116	-71.32052	2.89	0.8	0	Streetlight	2	Company	Ground Rod	90000128959	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
71	03/29/2013	3:30	Newport	Below Threshold	19	Truro St	Thames St	41.49025	-71.31451	1.2	0.538	0	Streetlight	N/A	Company	Ground Rod	90000128959	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
72	03/29/2013	22:07	Woonsocket	Below Threshold	29	Rathburn St	Social St	42.00998	-71.50386	0.429	0.362	0	Streetlight	32	Company	Ground Rod	90000128976	0	N/A	No	Below 4.5 Volts							1- 4.4 Volts		
73	03/29/2013	22:57	Woonsocket	Disconnected	N/A	Worral St, behind post office	Federal St	42.00562	-71.51097	60	52.8	7.6	Streetlight	4 dash 310	Company	Ground Rod	90000128976	0	N/A	No	At or Above 4.5 Volts	Internal	05/07/2013	Replaced head, wire, & service.	Monday, May 13, 2013	0	Repair Complete	>25 Volts		
74	03/29/2013	23:10	Woonsocket	Disconnected	245	Clinton St	Veterans Pkwy	42.00647	-71.50732	53	13.6	5.4	Streetlight	26 dash 1	Company	Ground Rod	90000128976	0	N/A	No	At or Above 4.5 Volts	Internal	04/15/2013	Replaced head, wire, & service.	Monday, May 13, 2013	0.2	Repair Complete	4.5 - 24.9 Volts		
75	03/30/2013	0:08	Woonsocket	Disconnected	36	N Main St	Blackstone St	42.00642	-71.51291	62	20.1	3.2	Streetlight	2 dash 1	Company	Ground Rod	90000128976	0	N/A	No	At or Above 4.5 Volts	Internal	04/15/2013	Fed Overhead, repaired neutral connection	Tuesday, May 14, 2013	0	Repair Complete	4.5 - 24.9 Volts		

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## **INTRODUCTION**

The purpose of this procedure is to outline the requirements for the annual equipment elevated voltage testing on National Grid Facilities in New York as required by the New York Public Service Commission's "Electric Safety Standards" issued on January 5, 2005, the New York Public Service Commission's "Order Adopting Changes to Electric Safety Standards issued and effective on December 15, 2008, the New York Public Service Commission's "Order Requiring Additional Mobile Stray Voltage Testing" issued and effective on July 21, 2010 and the New York's Public Service Commission "Order Granting Petition In Part and Modifying Electric Safety Standards" issued and effective on March 22, 2013.

This procedure also outlines requirements for equipment elevated voltage testing in Rhode Island and requirements by the Rhode Island Public Utilities Commission in Docket 4237 "Order to Establish a Contact Voltage Detection, Repair and Reporting Program" issued on November 9, 2012, and the subsequent order issued on February 1, 2013.

Additionally the Massachusetts Department of Telecommunications and Energy provided a series of recommendations on December 9, 2005, that have been included in this procedure.

While there are variances in requirements between New York, Massachusetts, and Rhode Island driven by particular regulatory requirements in each State, the minimum requirements are based on sound utility practice.

## **PURPOSE**

This procedure applies to all personnel involved with or responsible for the testing, repair and reporting of facilities designated by this EOP for equipment elevated voltage. It should be noted that the term "Contact Voltage" has been adopted and is used in the EOP (refer to definitions section).

## **ACCOUNTABILITY**

1. Standards, Policies and Codes
  - A. Update program as necessary.
  - B. Provide personnel guidance and assistance as requested.
2. Inspections & Maintenance
  - A. Ensure the equipment elevated voltage program as outlined in this EOP is implemented properly and timely.
  - B. Ensure that the program as outlined in the EOP is completed each year.
  - C. Provide qualified personnel to complete equipment elevated voltage testing.
  - D. Ensure all equipment elevated voltage inspectors have been trained.

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3. Equipment Elevated Voltage Inspector

- A. Demonstrate the ability and proficiency to perform equipment elevated voltage testing per this EOP.
- B. Demonstrate the ability to become proficient in the use of the appropriate database.
- C. Possess the ability to do walking patrols, collect information, edit data, and guard unsafe facilities.
- D. Attend equipment elevated voltage training program.

4. Learning & Development

- A. Provide training upon request.

5. Distribution Network Strategy

- A. Provide input into program revisions.
- B. Ensure the equipment elevated voltage program as outlined in this EOP is implemented properly and timely.
- C. Ensure the program as outlined in the EOP is completed each year.
- D. Provide qualified personnel to complete equipment elevated voltage testing.
- E. Ensure all equipment elevated voltage inspectors have been trained.
- F. Provide program management.

**REFERENCES**

NYPSC Order 04-M-0159  
NYPSC Order Adopting Changes to Electric Safety Standards  
NYPSC Order Requiring Additional Mobile Stray Voltage Testing  
RIPUC Docket 4237 Order 20871 (November 9, 2012) and Order 20950 (February 1, 2013)  
Proposed Rhode Island Electric Contact Voltage Program, Revised October 2, 2012 (Docket 4237)  
NYPSC Order Granting Petition In Part And Modifying Electric Safety Standards  
Applicable National Grid Safety Rules & Procedures  
Testing Equipment Operation Instructions

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## **DEFINITIONS**

**Contact Voltage** (Draft definition as defined by the Working Group of the Institute of Electrical and Electronic Engineers (IEEE)): Voltage resulting from abnormal power system conditions that may be present between two conductive surfaces that can come into contact by members of the general public and/or animals. Contact voltage is caused by power system fault current as it flows through the impedance of available fault current pathways. Contact voltage is not related to normal system operation and can exist at levels that may be hazardous.

**Contact Voltage Area (CVA)**: Designated underground distribution areas within the cities of Providence, Pawtucket, Newport and Woonsocket established in the “proposed Rhode Island Electric Contact Voltage Program”, Revised October 2, 2012 (Docket 4237)

**Equipment Elevated Voltage**: An A.C. rms voltage difference between utility equipment and the earth, or to nearby grounded facilities that exceeds the lowest perceptible voltage levels for humans.

**Equipment Elevated Voltage Inspector**: The individual performing the equipment elevated voltage inspection.

**Finding**: Any confirmed voltage reading on an electric facility or streetlight greater than or equal to 1V measured using a volt meter and a 500 ohm shunt resistor.

**Handheld Computer**: An electronic data recording device that is used in the field to create a record of conditions found.

**Mitigation**: Corrective actions performed by the utility to address the stray voltage finding.

**Proximity Detection Unit**: A low voltage hand held detector used to test exposed metallic surfaces and conductors for the presence of low voltage from 6V to 600V.

**Shall**: The word shall is to be understood as mandatory.

**Should**: The word should is to be understood as advisory.

**Stray Voltage**: As defined by NYPSC the term “Stray Voltage” means voltage conditions on electric facilities that should not ordinarily exist.

**Stray Voltage Testing**: The process of checking an electric facility for stray voltage using a device capable of reliably detecting and audibly and/or visually signaling voltages in the range of 6 to 600 volts.

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## **1.0 FACILITIES WHERE EQUIPMENT ELEVATE VOLTAGE TESTING/DOCUMENTATION IS REQUIRED – NEW YORK**

### **1.1 Street Lights and Municipally Owned Facilities**

- 1.1.1 Company owned metallic street lighting standards are required to be tested for equipment elevated voltage annually. This test is to be performed while the light is operating.
- 1.1.2 Municipally owned street light systems that National Grid directly provides energy to shall be tested for equipment elevated voltage annually. National Grid will complete this testing unless assurances of the completion of required testing and transfer of such test data are made by the appropriate municipality. This test is to be performed while the light is operating.
- 1.1.3 Municipal owned metallic traffic signal standards and accessible devices are to be tested annually for equipment elevated voltage by National Grid.
- 1.1.4 All street lights identified on public thoroughfares regardless of ownership are to be tested annually.
- 1.1.5 All street lights under a maintenance contract are to be tested annually. Exceptions not requiring equipment elevated voltage testing: private lighting, park associations, parking lots, fiberglass (or other non-conductive) street light standards, and locations where street light standards are not publicly accessible, such as facilities located in the center of highways that cannot be accessed without stopping traffic or creating potentially hazardous situations for the worker and/or public.

### **1.2 National Grid Substation Fences**

- 1.2.1 Metallic fencing surrounding substations with National Grid Facilities shall be tested for equipment elevated voltage annually. This fencing can be customer owned for customer stations, if a National Grid facility is part of the station.

### **1.3 Overhead Distribution Facilities**

- 1.3.1 Towers and/or metallic poles with distribution facilities shall be tested for equipment elevated voltage at an annual rate of twenty percent (20%) in conjunction with field inspections on a five-year cycle.
- 1.3.2 The following equipment on wood distribution poles requires equipment elevated voltage testing at an annual rate of twenty percent (20%) in conjunction with field inspections on a five-year cycle:
  - 1. Metallic riser guard or conduit (company or non-company).
  - 2. Uncovered or uninsulated down ground (company or non-company).
  - 3. Down guy (company or non-company).
  - 4. Any other publicly accessible conductive piece of equipment (company or non-company) on the pole within reach from the ground.

- 1.3.3 Exceptions: Customer meters and customer meter poles are excluded.

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#### 1.4 Overhead Transmission Facilities

- 1.4.1 Towers and/or metallic poles with transmission facilities shall be tested for equipment elevated voltage at an annual rate of twenty-percent (20%) in conjunction with field inspections on a five-year cycle. ↗
- 1.4.2 The following equipment on wood transmission poles or structures require equipment elevated voltage testing at an annual rate of twenty-percent (20%) in conjunction with field inspections on a five-year cycle: ↗
  - a. Metallic riser guard or conduit (company or non-company).
  - b. Uncovered or uninsulated down ground (company or non-company).
  - c. Down guy (company or non-company).
  - d. Any other publicly accessible conductive piece of equipment (company or non-company) on the pole or structure within reach from the ground.

#### 1.5 Underground Facilities

- 1.5.1 Annual equipment elevated voltage testing is required on all of the following equipment where accessible to the public.
  - a. All metallic manhole covers, vault covers and grates, junction box covers, and handhole covers.
- 1.5.2 Pad-mounted transformers and switchgear are tested at an annual rate of twenty percent (20%) in conjunction with field inspections on a five-year cycle. ↗
- 1.5.3 Starting in 2010 and continuing thereafter, unless changed by subsequent order of the NY Public Service Commission, two mobile stray voltage surveys shall be conducted annually in Buffalo and one mobile stray voltage survey is required to be conducted annually in Albany and Niagara Falls.
- 1.5.4 Exceptions: Non-metallic concrete or fiberglass pads or handholes or pull/splice boxes are not required to be tested.

#### 1.6 Daily Job Site Test Requirements

- 1.6.1 Each job site where National Grid personnel or its contractors complete a work assignment shall be tested for equipment elevated voltage at the start and at the end of the work day or at the start or at the completion of the assignment. This testing requirement is considered good utility practice and does not require specific documentation.
- 1.6.2 Exceptions:
  - a. Substation fencing will not require equipment elevated voltage testing unless scheduled as part of the inspection program or if work was done on the fencing.
  - b. In a storm situation, where mutual aid is required, testing by other than National Grid personnel will not be required.

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## 1.7 Exemptions

- 1.7.1 A completely fenced in area where access is denied to the general public and where access is only achieved by climbing a fence. Good judgment is required by the tester in these scenarios.

## **2.0 FACILITIES WHERE EQUIPMENT ELEVATED VOLTAGE TESTING/DOCUMENTATION IS REQUIRED – RHODE ISLAND**

### 2.1 Company Owned Street Lights

- 2.1.1 Company owned metallic street lighting standards are required to be tested for equipment elevated voltage on a three-year cycle.
- 2.1.2 Exceptions: Testing shall not be completed at locations where street light standards are not publicly accessible, such as facilities located in the center of highways that cannot be accessed without stopping traffic or creating potentially hazardous situations for the worker and/or the public.

### 2.2 Overhead Distribution Facilities

- 2.2.1 Towers and/or metallic poles with transmission facilities shall be tested for equipment elevated voltage at an annual rate of twenty-percent (20%) in conjunction with field inspections on a five-year cycle..
- 2.2.2 The following equipment on wood transmission poles or structures require equipment elevated voltage testing at an annual rate of twenty-percent (20%) in conjunction with field inspections on a five-year cycle:
- Metallic riser guard or conduit (company or non-company).
  - Uncovered or uninsulated down ground (company or non-company).
  - Down guy (company or non-company).
  - Any other publicly accessible conductive piece of equipment (company or non-company) on the pole or structure within reach from the ground.

### 2.3 Underground Facilities

- 2.3.1 Testing for equipment elevated voltage shall be done while completing scheduled inspections of underground equipment covered by NG-EOP UG006, Underground Inspection and Maintenance. The following items are to be tested on a five year cycle, pad-mounted transformers, pad-mounted switchgears, and metallic handhole covers.
- 2.3.2 Testing for equipment elevated voltage shall be completed on underground facilities while completing working inspections covered by NG-EOP UG006. The metallic items to be tested are manholes covers, vault covers and grates, handhole covers, splice box covers, junction box covers, pad-mounted transformers, pad-mounted switchgears, and submersible equipment covers.

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2.3.3 Starting in Fiscal Year 2013 and continuing thereafter, unless changed by subsequent order of the Rhode Island Public Utilities Commission, mobile contact voltage surveys will be performed in designated Contact Voltage Areas (CVA) The mobile surveys will be performed on a five-year cycle. A survey of 100 percent of the CVA will be performed the first year of the program followed by 20 percent of the CVA in successive years.

2.4 Daily Job Site Test Requirements

2.4.1 Each job site where National Grid personnel or its contractors complete a work assignment shall be tested for equipment elevated voltage at the start and at the end of the work day or at start and at the completion of the assignment. This testing requirement is considered good utility practice and does not require specific documentation.

a. In a storm situation, where mutual aid is required, testing by other than National Grid personnel will not be required.

2.5 Exemptions

2.5.1 A completely fenced in area where access is denied to the general public and where access is only achieved by climbing a fence. Good judgment is required by the tester in these scenarios.

**3.0 FACILITIES WHERE EQUIPMENT ELEVATED VOLTAGE TESTING/DOCUMENTATION IS REQUIRED – MASSACHUSETTS**

3.1 Company Owned Street Lights

3.1.1 Company owned metallic street lighting standards are required to be tested for equipment elevated voltage on a five year cycle.

3.1.2 Exceptions: Testing shall not be completed at locations where street light standards are not publicly accessible, such as facilities located in the center of highways that cannot be accessed without stopping traffic or creating potentially hazardous situations for the worker and/or public.

3.2 Overhead Distribution Facilities

3.2.1 Towers and/or metallic poles with transmission facilities shall be tested for equipment elevated voltage at an annual rate of twenty-percent (20%) in conjunction with field inspections on a five-year cycle.

3.2.2 The following equipment on wood transmission poles or structures require equipment elevated voltage testing at an annual rate of twenty-percent (20%) in conjunction with field inspections on a five-year cycle:

- a. Metallic riser guard or conduit (company or non-company).
- b. Uncovered or uninsulated down ground (company or non-company).
- c. Down guy (company or non-company).

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- d. Any other publicly accessible conductive piece of equipment (company or non-company) on the pole within reach from the ground.

### 3.3 Underground Facilities

3.3.1 Equipment elevated voltage testing is required on all of the following equipment where accessible to the public on a five year cycle.

- a. All metallic manhole covers, vault covers and grates, junction box covers, handhole covers, pad-mounted transformers, secondary pedestals, and pad-mounted switchgears.

Exceptions: Non-metallic concrete or fiberglass pads or handholes or pull/splice boxes are not required to be tested.

### 3.4 Daily Job Site Test Requirements

3.4.1 Each job site where National Grid personnel or its contractors complete a work assignment shall be tested for equipment elevated voltage at the start and at the end of the work day or at the start or at the completion of the assignment. This testing requirement is considered good utility practice and does not require specific documentation.

- a. In a storm situation, where mutual aid is required, testing by other than National Grid personnel will not be required.

### 3.5 Exemptions

3.5.1 A completely fenced in area where access is denied to the general public and where access is only achieved by climbing a fence. Good judgment is required by the tester in these scenarios.

## **4.0 TEST EQUIPMENT**

4.1 A hand held device (proximity detection unit) that is capable of detecting voltage from 6 volts to 600 volts.

4.2 A portable AC digital high impedance volt meter must have the ability to take readings with and without an input load impedance of 500 ohms.

4.3 The handheld devices utilized shall be certified by an independent test laboratory as being able to reliably detect voltages of 6 – 600 volts. The following units have been certified:

4.3.1 HD Electric model LV-S-5 (5-600 volts).

Fluke 85  
Fluke 87  
Fluke 170 series or equivalent  
Fluke 175  
Fluke 177  
Fluke 179  
Fluke 187  
Fluke 189

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- 4.4 Mobile Voltage Detection Equipment:  
Narda 8950/10 Stray Voltage System  
SVD2000 Stray Voltage Mobile Detector

## **5.0 TEST PROCEDURE**

### **5.1 Job Briefing**

5.1.1 At minimum, the following information shall be communicated to all personnel at the beginning of each shift for equipment elevated voltage testing:

- Structures are never to be touched with a bare hand while performing the tests, only the voltage detector or meter probe is to be used to make contact with the facilities.
- Appropriate PPE shall be worn.
- Each individual needs to be aware of his/her surroundings at all times.
- Make sure to observe all traffic before entering a street, either at intersections or any other point.
- Traffic safety vest (DOT Compliant Class II) is to be worn at all times when exposed to traffic. Be aware that when bending down, the visibility benefits of the traffic safety vest are diminished.
- Obey all traffic control devices.
- When working in the street, face oncoming traffic whenever possible.

### **5.2 Measurements for voltages will be performed in accordance with the following:**

5.2.1 Initial measurements for the presence of voltage shall be made using a certified proximity detection unit as noted in the testing equipment certified equipment list in Section 4.0, 4.3.

- To verify the proper operation of the proximity detector, follow operating instructions for the particular certified unit being utilized, this is to be done daily.
- After verification that the detection unit is working, approach the area/equipment to be tested. The proximity detector will illuminate prior to touching the area/equipment being tested if voltage is present. If the proximity detector does not illuminate in close proximity to the area/equipment touch the area/equipment to be tested with the probe of the unit.

5.2.2 If this test detects voltage, repeat the test with the portable AC voltmeter (The 500 ohm resistor is NOT used in this initial test):

- Measurements with a portable AC voltmeter shall be taken on clean bare metallic surface (structure, ground wire, etc.)
- When using a portable AC voltmeter, connection shall be made to suitable neutral or ground source with the common (black) lead.

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1. In locations where the neutral or ground point is at a distance in excess of the voltmeter lead length, the connection to the neutral/ground shall be made with up to 25' of # 16 stranded copper lead wire (covered), the other end of which shall be securely connected to the negative (black) probe of the meter. When using such "extension leads" appropriate care shall be taken in the placement of such leads so as to not create a physical hazard to workers, pedestrian or vehicular traffic.
  2. In locations where a system ground is not available, or the existing ground registered voltage upon the proximity test, a metal rod shall be firmly embedded into the earth to a depth of no less than 6" to create a ground reference point for the measurement to be taken. An alternate method is available for obtaining a ground reference point utilizing an aluminum plate in lieu of driving a ground rod. The reference point should be as close as practicable to the facility being tested to simulate an equipment elevated voltage situation (3' to 4'.) On occasion longer leads may be necessary to find undisturbed earth (up to 25'.)
  - c. The "live" meter probe lead shall then be placed into contact with the structure under inspection to determine the voltage.
    1. Voltages readings greater than 30 volts shall be recorded in the database for the site.
    2. For voltage readings less than 30 volts, install a 500 ohm input load impedance resistor on the volt meter. Take another voltage measurement and record this voltage in the database for the site.
- 5.2.3 Measurements for elevated voltages/contact voltage using mobile technology will be performed in accordance with the following:
- a. Mobile testing is performed by contract crews driving pre-determined routes in Contact Voltage Areas searching for elevated voltage levels. The equipment used is mounted to vehicles and detects voltage levels greater than 1 volt while driving at speeds of up to 25 mph near underground facilities. Once elevated voltages are detected the crew stops and performs a thorough check with certified manual testing equipment to determine if there is contact voltage present.
- 5.2.4 Any positive indications by either mobile testing or hand held tools shall be followed up with multi-meter measurements on the target structures. Voltage measurements shall be taken in accordance with Section 5.2.2 above. The investigators shall verify that a suitable ground (i.e. a ground that is not energized) is used as a reference. Ground source location shall be marked with tape, paint or flag for future testing of repair work.
- 5.2.5 A Total Harmonic Distortion (THD) test method will be implemented as a pilot for Rhode Island mobile elevated voltage testing. THD will be determined by the

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use of a Fluke Power Quality clamp meter or a Fluke scope meter both of which have the ability to measure THD.

## **6.0 CORRECTIVE ACTION REQUIREMENTS FOR ELEVATED VOLTAGE FINDINGS**

### **6.1 State Specific Requirements**

#### **6.1.1 New York**

If equipment elevated voltage condition is found and verified by the Test Procedure in Section 5.0, the site is to be guarded until made safe by Company personnel or if municipally owned, made safe by the owner or company. Guarded for the purpose of this EOP is defined as guarded by a person or a protective barrier that prevents public contact if the equipment elevated voltage found is greater than 1 volt. **If the voltage measures less than 1 volt and is found to be consistent with system operation design (no visual evidence of a problem upon review) no further action is required.** If the voltage measures greater than or equal to 1 volts and less than 4.5 volts it can either be guarded in person or by a protective barrier that prevents public contact, contact your supervisor for required action. Sound judgment shall be utilized in this application. If the voltage measurement is greater than or equal to 4.5 volts it shall be guarded by an equipment elevated voltage inspector or a Company employee that has been trained to stand by on energized facilities, and immediate response is required using the notification in Section 6.3 below.

#### **6.1.2 Massachusetts and Rhode Island**

If equipment elevated voltage condition is found and verified by the Test Procedure in Section 5.0, the site is to be guarded until made safe by Company personnel or if municipally owned, made safe by the owner or company. Guarded for the purpose of this EOP is defined as guarded by a person or a protective barrier that prevents public contact if the equipment elevated voltage found is greater than 4.5 volts. **If the voltage measures less than 4.5 volts and is found to be consistent with system operation design (no visual evidence of a problem upon review) no further action is required.** If the voltage measures greater than 4.5 volts and less than 8 volts it can either be guarded in person or by a protective barrier that prevents public contact, contact your supervisor for required action. Sound judgment shall be utilized in this application. If the voltage measurement is greater than 8 volts it shall be guarded by an equipment elevated voltage inspector or a Company employee who has been trained to stand by on energized facilities; an immediate response is required using the notification in section 6.3 below

#### **6.1.3 Rhode Island Total Harmonic Distortion Pilot**

Under the Total Harmonic Distortion (THD) pilot in Section 5.2.5, if during mobile testing of the Contact Voltage Area the voltage measures greater than 1 volt and less than 4.5 volts and has a total harmonic distortion of less than 10% the voltage will be considered contact voltage. These areas will then be safeguarded from the public and permanent repairs will be made. If the total harmonic

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distortion is greater than 10% and no visual defects are found, no further action will be required.

6.1.4 New York and Rhode Island

In the event of an elevated voltage finding on an electric facility or street light during the stray voltage test procedure, all publicly accessible structures and sidewalks within a minimum 30 foot radius of the electric facility or street light must be tested for stray voltage.

6.2 The following notification process for personnel to respond shall be utilized.

6.2.1 Notification by location:

a. New York: contact Systems Operations Dispatch 1-877-716-4996

b. New England North, Northborough Distribution Control Center:

1. North Shore (MA) 1-877-247-3606

2. Merrimack Valley (MA) 1-877-247-3607

3. Central (MA) 1-877-247- 3608

4. Western (MA) 1-877-247-3609

c. New England South, Northborough Distribution Control Center

1. Capital (RI) 1-877-247-3610

2. Coastal (RI) 1-877-247-3599

3. Southeast (MA) 1-877-411-3812

4. South Shore (MA) 1-877-411-5599

6.2.2 Inform the operator that this is an equipment elevated voltage call, giving inspector name, company (if not National Grid), unique ID, address where problem is identified, facility number, circuit number, ownership, type of equipment, voltage found and whether they are physically guarding or leaving the site after flagging and installing a protective barrier. National Grid personnel or designee will be assigned to respond.

6.3 Temporary repairs may be used to correct the equipment elevated voltage thereby removing the need to guard the site.

6.4 Except as noted in Section 6, 6.6, permanent repairs to the equipment shall be made within 45 days of the occurrence.

6.5 If permanent repairs can not be made within 45 days due to extraordinary circumstances, the company shall periodically perform site visits to monitor the condition of the temporary repair. For New York, all exceptions shall be identified and justified in the annual reporting of the program to the NYPSC.

6.6 The Stray Voltage Tester/Equipment elevated Voltage Inspector may detect a minimal voltage level that is attributable to the design of the facility and not the result of an improper condition, no corrective action is required in this instance.

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- 6.7 The individuals conducting the equipment elevated voltage tests on street light standards shall have a supply of “Angel guards” available for installation if the cover is missing or wires are found to be exposed to the public at the time of testing. Angel guards shall only be installed after the testing of the street light standard is complete and 1) there is no indication of equipment elevated voltage above 1 volt, or 2) repairs have been completed to correct the equipment elevated voltage.
- 6.8 The equipment elevated voltage inspector shall report any potentially hazardous conditions found on National Grid facilities seen visually during the survey process.
- 6.9 Customer Owned Equipment
- 6.9.1 Where the Company finds equipment elevated voltage above 1 volt and identifies its source as customer-owned equipment, the Company shall guard the site and notify the customer or a responsible person, as appropriate, that a potentially hazardous situation exists. The Company shall advise the customer or responsible person that the cause of the equipment elevated voltage shall be immediately remedied.
- 6.9.2 Company personnel are encouraged to work with the customer to determine and rectify the problem. If the customer agrees to accept the Company’s assistance, the Company may charge a reasonable cost for this effort.
- a. The Company may temporarily remove a customer’s meter or take such other actions as are appropriate and necessary to protect the public.

## **7.0 DATABASE REQUIREMENTS**

- 7.1 The database in use shall be easily searchable for information and reporting.
- 7.2 Information fields required to be completed for facilities:
- Survey Date
  - Region
  - District
  - Contractor
  - GIS ID/Asset # (Unique ID)
  - Facility Type
  - Owner
  - Feeder/Circuit
  - Line #
  - Tax District
  - Pole/Structure/Equipment ID
  - Street Name
  - Inspectors Name
  - GPS Taken
  - Pre-load Match
  - Equipment elevated Voltage Test Required
  - Voltage Found Y/N
  - Voltage Measurement
  - Type of Equipment (See Appendix A)

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- Immediate Action Taken  
Person Notified  
Permanent Repair Date  
Type of Repair  
Person Responsible for repair (Employee ID)
- 7.3 Information fields required to be completed for facilities in mobile testing
- Survey Date  
Region  
District  
Contractor  
Facility Type  
Owner  
Pole/Structure/Equipment ID  
Street Name  
GPS taken  
Voltage Measurements  
Type of Equipment (see Appendix A)  
Immediate Action Taken  
Person Notified  
Permanent Repair Date  
Type of Repair

## **8.0 NEW YORK ANNUAL REPORTING AND CERTIFICATION REQUIREMENTS**

- 8.1 Each Regional program supervisor shall provide certification to the program manager that the Region they supervise has complied with the equipment elevated voltage testing and inspection program as ordered by the PSC.
- 8.2 The program manager shall provide certification to the Vice President Distribution Network Strategy and the Senior Vice President of Customer Operations & Maintenance that the organization has complied with the equipment elevated voltage testing and inspection program as ordered by the PSC.
- 8.3 Written certification of the completion and results of every equipment elevated voltage test and inspection shall be completed, as well as a certification that all unsafe conditions identified have been remediated by appropriate company personnel.
- 8.4 The President or officer with direct responsibility for overseeing the equipment elevated voltage testing and inspection shall provide an annual certification to the NYPSC that the Company has tested all of its publicly accessible conductive surface electric facilities and all street lights, as well as completed all required inspections.
- 8.5 The President or officer with direct responsibility for overseeing facility inspections shall provide an annual certification to the Commission that the utility is in compliance with its inspection program and has inspected the requisite number of electric facilities. Additionally, at the end of the five-year inspection cycle, the officer shall certify that all of the utility's electric facilities have been inspected at least once.

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- 8.6 The annual reporting and certification is required by February 15 of each year. In addition to certifications, it shall address the following:
- 8.6.1 Details the results of stray voltage test results and inspections conducted over the 12-month period ending December 31 of the prior calendar year. (A separate report will be required for inspections from November 1 – December 31, 2008 to account for transition to calendar year reporting.)
  - 8.6.2 Addresses the performance mechanism contained in Section 10 of the PSC Order Adopting Changes to Electric Safety Standard effective December 15, 2008 (December 15, 2008 Order).
  - 8.6.3 Contain certification describe in 8.3, 8.4 and 8.5 of this section.
  - 8.6.4 Contain a breakdown of the voltage findings in a tabular format as detailed in Attachment 1 of the December 15, 2008 Order; for all findings that result in a reading of 1 V or more after completion of mitigation efforts, a detail report of company efforts shall be provided.
  - 8.6.5 Contain a breakdown of the shock reports received from the public as detailed in Attachment 2 of the December 15, 2008 Order.
  - 8.6.6 Discussion of the analysis undertaken on the causes of the stray voltage within the Company's electric system, the conclusions drawn there from, the preventative and remedial measures identified, and the Company's plan to implement those measures.
  - 8.6.7 Description of the priority levels used to gauge the severity of a deficiency, including repair timeframes, and details the requirements for training personnel to properly identify and categorize the deficiencies.
  - 8.6.8 Contain a breakdown of facilities to be inspected, unique inspection conducted per year, and the cumulative number of unique inspections conducted to meet the five year requirement.
  - 8.6.9 Contain a breakdown of the deficiencies found, permanent repair actions taken by year, whether a repair was completed within the required timeframe, and the number of deficiencies awaiting repair. This information should be provided on a yearly basis by priority level and by equipment groupings as detailed in Attachment 3 of the December 15, 2008 Order.
  - 8.6.10 Contain a review and analysis of the inspection results. Identifying areas of concern along with remedial actions or future plans to alleviate inadequacies in current program assets.
  - 8.6.11 Description of the quality assurance program along with the results from quality assurance activities conducted during the year.
  - 8.6.12 Any additional information that is pertinent to the issues addressed by the safety standards should also be included.
- 8.7 The Company shall file reports on their mobile stray voltage testing with the Secretary of the New York PSC within 45 days after completion of the mobile testing or February 15, 2011, whichever is earliest, and in each subsequent year. The filing shall include the

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historic results and costs associated with the manual test program in each area listed in Section 1.5 of this procedure.

- 8.8 The Company is required by the December 15, 2008 Order to have independence in the quality assurance program required by the order. The management and personnel performing the quality assurance activities shall be separate from those performing the required stray voltage testing and inspection activities.
- 8.9 The Company shall maintain its written certification and other documentary proof of its testing at its' Albany, Buffalo, and Syracuse office facilities. These documents shall be made available to the public for review upon request.

#### **9.0 MASSACHUSETTS REPORTING REQUIREMENTS**

- 9.1 National Grid shall submit an annual report that includes the following:
  - 9.1.1 Annual reports that list inspection and testing data, including number of inspections conducted by equipment type.
  - 9.1.2 Number of equipment elevated voltage events detected by inspection personnel versus call-ins or notification by third parties.
  - 9.1.3 Variance reports on current year inspection targets.
  - 9.1.4 Equipment elevated voltage events detected on equipment that is not included in equipment elevated voltage equipment inspection schedules (which will enable the DTE to determine if the company is inspecting and testing the correct equipment).
  - 9.1.5 Number of exceptional or non-routine events that required reporting to OSHA or other government organizations due to injuries or other substantive impacts

#### **10.0 Rhode Island Reporting Requirements**

- 10.1 National Grid shall submit an annual report that includes the following in a searchable form:
  - 10.1.1 Event record number.
  - 10.1.2 Location of testing
  - 10.1.3 Date and time of testing
  - 10.1.4 Company or customer asset
  - 10.1.5 Failed equipment type
  - 10.1.6 Voltage recorded
  - 10.1.7 Personal injuries to members of the public, pets or property damage
  - 10.1.8 Any other equipment involved and age
  - 10.1.9 Prior incidents at this location in the past five years

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- 10.1.10 Corrective actions taken at the location and date taken
- 10.1.11 Number of customers if service is interrupted while making repairs.
- 10.1.12 Duration of interruption.
- 10.1.13 Summary of investigation into cause of the incident.
- 10.1.14 Number of calls to the company “shock” line.
- 10.1.15 Total repair costs by Contact Voltage Area.
- 10.1.16 All information as provided for in Section 7.3.

The Company will provide a summary of the above information as part of the report. In addition, the Company will include a recommendation for which specific CVAs will be tested the following year, whether there are any recommended changes to the CVAs and whether there are any advances in technology for detection of elevated voltages.

#### **11.0 TYPE OF EQUIPMENT - APPENDIX A**

TYPE	CODE	EQUIPMENT DESCRIPTION
Distribution	910	Pole
	911	Regulator
	912	Sectionalizer
	913	Recloser
	914	Ground
	915	Guy
	916	Riser
	917	Switch Handle Mechanical Operated
	929	Distribution – Other (use comments)
Transmission	930	Pole
	931	Tower
	932	Guy
	933	Ground
	934	Riser
	935	Switch Hand Mechanical Operator
	949	Transmission – Other (use comments)
Underground	950	Handhole
	951	Manhole
	952	Switchgear
	953	Transformer
	954	Vault – Cover/Door
	969	Underground – Other (use comments)

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<b>Street Light</b>	<b>970</b>	<b>Handhole</b>
	971	Standard
	979	Street light – Other (use comments)
Customer Street Light/Other	980	Handhole
	981	Standard
	989	Customer SL/Other – Other (use comments)
Traffic Control	990	Handhole
	991	Standard
	992	Control Box
	993	Pedestrian Crossing Pole
	999	Traffic control – Other (use comments)

## 12.0 REVISION HISTORY

<b>Version</b>	<b>Date</b>	<b>Description of Revision</b>
1.0	04/01/11	This document supersedes document dated 08/17/09.
2.0	xxxxxx	This document supersedes document dated 04/01/11.

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# Contact Voltage Risk Area High Street, Westerly, RI

The Narragansett Electric Company  
d/b/a National Grid  
Docket No. \_\_\_\_\_  
Annual Contact Voltage Compliance Report  
Exhibit 3  
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