CENTRAL HUDSON GAS & ELECTRIC

CORPORATION

CONTACT (STRAY) VOLTAGE TESTING

And

FACILITY INSPECTIONS

Report

On the results of the

2011 Contact (Stray) Voltage Testing and Facility Inspections

February 15, 2012

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I. Background

The New York State Public Service Commission's ("PSC" or "Commission") Electric Safety Standards Order issued on January 5, 2005 (Case 04-M-0159), with subsequent revisions issued on July 21, 2005 and December 15, 2008 (collectively referred to herein as the "Safety Standards" or "Order"), requires electric utilities in New York State to test annually all of their publicly accessible transmission facilities and distribution facilities, as well as municipally owned traffic signals and streetlights for contact (stray) voltage and to inspect utility owned electric facilities every five years.

This report describes Central Hudson's contact (stray) voltage detection program and equipment inspection program conducted in 2011.

II. Company Overview

Central Hudson Gas & Electric Corporation is a regulated transmission and distribution utility that provides electric service to approximately 300,000 customers in a service area of approximately 2,600 square miles in eight counties of New York State's Mid Hudson River Valley. Central Hudson's service territory extends north from the suburbs of metropolitan New York City to the Capital District of Albany.

Central Hudson owns substations having an aggregate transformer capacity of 5,300 MVA. Central Hudson's electric transmission system consists of 629 pole miles of line. The electric distribution system consists of 7,298 pole miles of overhead lines and 1,371 trench miles of underground primary lines.

III. Contact (Stray) Voltage Testing Program

During the twelve-month period ending December 31, 2011, contact (stray) voltage testing was completed on all of Central Hudson's publicly accessible transmission and distribution facilities that are capable of conducting electricity along with all Company and non-Company owned metallic streetlights and traffic signals. Central Hudson also tested all publicly accessible facilities within thirty feet of a component found to have an elevated voltage in accordance with the Order.

In addition, as required by the Order, Central Hudson:

a. Immediately safeguarded and/or mitigated all contact (stray) voltages ≥ 1.0 V_{ac}. In instances where the contact (stray) voltage finding was determined to be caused by equipment not owned by Central Hudson, the area was immediately made safe and the municipalities, customers, or responsible parties associated with the premises were notified of the unsafe condition and the need for them to arrange for a permanent repair. Voltage findings that were caused by a Central Hudson owned facility were immediately

safeguarded and/or mitigated. All permanent repairs were completed within 45 days, except in extreme circumstances.

b. Tested all publicly accessible structures and sidewalks within a 30 foot radius of the electric facility or streetlight where there was a voltage finding ≥ 1.0 V_{ac}.

c. Responded to and investigated all shock incidents reported by the public and mitigated positive findings.

All of the facilities that are included in Central Hudson's Contact (Stray) Voltage Testing Program were visited. Of the 238,155 facilities visited, 1,872 locations did not have a contact (stray) voltage test performed because their electrically conductive appurtenances were deemed inaccessible. Inaccessible locations were defined in the Order as locations that have locked gates/fences, are located in dangerous terrain, or are located on limited access highways.

Contact (Stray) Voltage Mitigation Efforts

Central Hudson identified 497 locations with voltage readings greater than or equal to 1 volt. Twenty-two (22) of the locations were found to have contact (stray) voltage as defined in the Order and mitigated. The remaining 475 locations were classified as naturally occurring voltages.

Central Hudson was not required by the Order to perform mobile detection of its system between January 1, 2011 and December 31, 2011. Therefore, Central Hudson did not perform any mobile system scans during this period.

IV. Facility Inspection Program

The Order requires Central Hudson to visually inspect 100% of its electric facilities every five years. This equates to inspecting approximately 20% of these facilities annually.

Central Hudson visually inspects its transmission system on a five year-cycle in accordance with the Order.

Prior to 2011, the distribution system visual inspections were conducted on a three-year cycle, which exceeded the requirements of the Order. Beginning in 2011, the distribution inspection cycle was transitioned to a five-year cycle.

In accordance with the Order, Central Hudson uses the following severity levels to report deficiencies to the PSC and establish priority for repairs and scheduling:

Level I – Repair as soon as possible but not longer than one week. A Level I deficiency is an actual or imminent safety hazard to the public or poses a serious and immediate threat to the delivery of power. Critical safety hazards present at the time of the inspection shall be guarded until the hazard is mitigated.

Level II – Repair within one year. A Level II deficiency is likely to fail prior to the next inspection cycle and represent a threat to safety and/or reliability should a failure occur prior to repair.

Level III – Repair within three years. A Level III deficiency does not present immediate safety or operational concerns and would likely have minimum impact on the safe and reliable delivery of power if it does fail prior to repair.

Level IV – Condition found but repairs are not needed at this time. Level IV is used to track atypical conditions that do not require repair within a five-year timeframe. This level should be used for future monitoring purposes and planning proactive maintenance activities.

In accordance with the PSC requirements, when a temporary repair is located during inspection or performed by the company, best efforts are put forth to make a permanent repair of the facility within 90 days. Temporary repairs that remain on the system for more than 90 days are due to extraordinary circumstances, such as storms, require extensive repair activity, or have special requirements. Central Hudson began tracking temporary repairs during the 2009 calendar year. Results from this tracking have been compiled and described in Appendix 5 of this report.

V. Company Facilities

Structure Categories

Based on the requirements of the Order, Central Hudson has identified approximately 238,155 individual electric facilities that require testing for the presence of contact (stray) voltage. The Order also requires Central Hudson to inspect 20% of its facilities annually. These facilities are broken down into four main categories as follows:

Distribution Overhead – The testing criteria for distribution overhead includes all utility owned or joint use wooden poles with utility electrical facilities that are located on public thoroughfares or customer property, including backyards and alleys. There are approximately 208,591 distribution pole structures in Central Hudson's service territory. Contact (Stray) voltage tests are performed on all wooden poles with metallic attachments such as ground wires, ground rods, anchor guy wires, riser pipes, or any electrical equipment within reach of the general public. Distribution overhead facilities are included in both the contact (stray) voltage and inspection programs.

Underground Facilities – The testing criteria for underground facilities is comprised of subsurface structures, including above ground, pad-mounted structures. There are approximately 14,523 underground facilities that comprise Central Hudson's system. Within this total are approximately 1,326 manholes and pullboxes and approximately 13,197 pad-mounted structures. Included in the underground facilities are padmount switchgear cases, padmount transformer

cases, electric utility manhole covers, submersible transformer covers, electric utility handhole covers, network vaults and grates. These facilities are included in both the contact (stray) voltage and facility inspection programs.

Streetlights and Traffic Signals – The testing criteria for street lights and traffic signals includes all metal pole streetlights, traffic signals, and pedestrian crosswalk signals located on publicly accessible thoroughfares. There are approximately 5,494 metal pole streetlights and approximately 831 traffic signals within Central Hudson's service territory. This total includes 187 metal pole streetlights owned by Central Hudson with the balance of the equipment owned by various municipalities. All contact (stray) voltage testing of streetlights is performed at night while the fixtures are energized. Pursuant to the Order, area and street lighting that is privately owned is not included in the contact (stray) voltage testing program. All Company-owned streetlights are included in the facility inspection program.

Transmission Structures – The testing criteria for transmission structures include all structures, guys, and down grounds attached to the structures. There are approximately 8,612 individual structures that comprise Central Hudson's transmission system. Transmission structures support circuit voltages of 69 kilovolts and above. Transmission structures as described above, with distribution underbuild, are included in this transmission category. Transmission structures are included in both the contact (stray) voltage and facility inspection programs.

Substation Fences – The testing criteria for substation fences consists of testing the fencing on the outside of the substation. There are approximately 104 substation fences in Central Hudson's territory. All substation fences are included in the contact (stray) voltage testing program.

VI. Annual Performance Targets

Central Hudson performed the required contact (stray) voltage testing and facilities inspections in accordance with the requirements set forth in the Order.

In compliance with the Order, Central Hudson has met the annual performance target for contact (stray) voltage by testing 100% of the publicly accessible electric facilities and streetlights/traffic signals for the twelve month period ending December 31, 2011.

In addition, Central Hudson has met the performance target for facility inspections by inspecting more than 18% of its electric facilities during the one-year period ending December 31, 2011 as defined in the Order. The results are summarized in the tables below:

Central Hudson Gas & Electric Corporation	Total System Units Requiring Testing	Units Completed	Percent Completed
Distribution Facilities	208,591	208,591	100.00%
Underground Facilities	14,523	14,523	100.00%
Non-URD	1,326	1,326	100.00%
Street Lights / Traffic Signals	6,309	6,309	100.00%
Substation Fences	104	104	100.00%
Transmission (69kV and Above)	8,612	8,612	100.00%
TOTAL	238,155	238,155	100.00%

Facility Inspection Program Results

Category	PSC Order Requirement	Percentage of Units Inspected in 2011 Actual
Overhead Distribution	18%	20.04%
Overhead Transmission	18%	19.32%
Underground	18%	18.93%
Pad-mounted Transformers	18%	24.44%
Streetlight	100%	100%

5-Year Inspection Performance Summary

Overhead Distribution Facilities

In 2011, Central Hudson transitioned from a 3 year to 5 year inspection cycle on overhead distribution facilities.

Inspection Year	Overhead Distribution Structures Inspected	% of Overall System Inspected (Yearly)	% of Overall System Inspected (Cumulative)
2010	74,023	35.48%	35.48%
2011	41,810	20.04%	55.52%

Overhead Transmission Facilities

Central Hudson performed inspections on overhead transmission facilities on a five-year cycle in 2011 with the exception of the 345 kV transmission lines, which are on a yearly cycle.

Inspection Year	Overhead Transmission Facilities Inspected	% of Overall System Inspected (Yearly)	% of Overall System Inspected (Cumulative)
2010	2,823	32.78%	32.78%
2011	1,664	19.32%	52.10%

Manholes and Pullboxes

Central Hudson performed inspections on manholes and pullboxes on a five-year cycle in 2011.

Inspection Year	Manholes and Pullboxes Facilities Inspected	% of Overall System Inspected (Yearly)	% of Overall System Inspected (Cumulative)
2010	352	26.55%	26.55%
2011	251	18.93%	45.48%

Padmount Transformers

In 2011, Central Hudson transitioned from a 3 year to 5 year inspection cycle on Padmount Transformers.

Inspection Year	Padmount Transformers Inspected	% of Overall System Inspected (Yearly)	% of Overall System Inspected (Cumulative)
2010	7,122	49.04%	49.04%
2011	3,226	24.44%	73.48%

Streetlights

Central Hudson performs inspections on Company-owned streetlights yearly in conjunction with contact (stray) voltage testing. As technicians perform contact (stray) voltage testing, they also perform a visual inspection of the streetlights.

Inspection Year	Streetlights Inspected	% of Overall System Inspected (Yearly	% of Overall System Inspected (Cumulative)
2010	187	100%	100%
2011	187	100%	100%

VII. Certifications

Pursuant to Section 7 of Appendix A of the Order, the President or Officer of each utility with direct responsibility for overseeing contact (stray) voltage testing and facility inspections shall provide an annual certification to the Commission that the utility has, to the best of his or her knowledge, exercised due diligence in carrying out a plan, including quality assurance, that is designed to meet the contact (stray) voltage testing and inspection requirements, and that the utility has:

- Tested all of its publicly accessible electric facilities and street lights/traffic signals, as referred to in the body of the February 15 Report, and

- Inspected the requisite number of electric facilities.

The certifications are attached as Exhibit 1 of this report.

VIII. Analysis of Causes of Findings and Contact (Stray) Voltage

All New York State utilities compile an inventory of all findings and report on the number of these findings each year. Section 1(f) of the December 15, 2008 Order defines a finding as "any confirmed voltage reading on an electric facility or streetlight $\geq$ 1 volt measured using a volt meter and 500 ohm shunt resistor." Section 1(c) defines Contact (Stray) Voltage as "voltage conditions on electric facilities that should not ordinarily exist. These conditions may be due to one or more factors, including, but not limited to, damaged cables, deteriorated, frayed, or missing insulation, improper maintenance, or improper installation."

To distinguish between dangerous contact voltage (defined as "stray voltage" in the Order) and naturally occurring voltage, field forces use a handheld oscilloscope meter to classify these different types of voltages. By looking at the total harmonic distortion of a voltage waveform and the breakdown of the harmonics, in addition to the condition of the location, the proper actions can be taken.

If contact voltage is present, then the waveform will appear as a perfect 60 Hz sinusoidal wave with 10% or less total harmonic distortion. These voltages result from a variety of conditions including: deterioration of conductors; age of equipment; exposure to the elements; and various customer related issues. These voltages should not exist on normally operating electric facilities and are considered to be contact (stray) voltages per the Order definition in Section 1(c).

Section 3(h) of the Order requires "Mitigation shall be completed on any contact (stray) voltage findings." Through the efforts of the Contact (Stray) Voltage

testing program, Central Hudson has been able to repair these issues and mitigate the danger associated with these elevated voltages.

When examining a naturally occurring voltage on a handheld oscilloscope, high harmonic content from different frequencies (generally 180 HZ and 300 Hz) will cause distortion in the voltage waveform. Causes of these voltages include, but are not limited to, naturally occurring neutral to earth voltages (as part of a multi-grounded WYE power system); poor soil grounding conditions; load balance between phases; long low voltage single phase circuit spurs with high current loads; capacitive coupling; and/or proximity to transmission lines. Since all of these voltage sources are considered part of a normally operating electrical distribution system, they do not require mitigation per the Order.

Although not all findings are due to contact (stray) voltage, utilities are required to report on all findings, regardless of whether or not the voltage is normal to the operating system. It has been established that 95.37% of the findings identified in this year's testing effort are normal to the operating system, and not due to contact (stray) voltage. Inclusion of these naturally occurring voltages in the findings gives the perception that there are more potentially hazardous voltage findings than actually exist. True hazardous voltages have been identified and mitigated through the contact (stray) voltage testing program.

In accordance with the PSC requirements, when a finding was discovered on an electric facility during contact (stray) voltage testing, the Company performed contact (stray) voltage testing on all publicly accessible structures and sidewalks within a minimum 30 foot radius of the electric facility or streetlight. No publicly accessible structures with contact (stray) voltage were identified as a result of the 30-foot radius testing.

Appendix 6 provides further discussion on the technical and financial aspects of using harmonic analysis as a diagnostic tool for finding the source of errant voltages.

IX. Harmonics Analysis

Central Hudson has continued to apply the use of harmonics analysis (detailed in section VIII. Analysis of Causes of Findings and Contact (Stray) Voltage) to determine if voltages discovered in the field are dangerous contact voltage (defined as stray voltage in the Order) or naturally occurring/neutral to Earth voltage (NEV) common in a normally functioning electric system. After analysis, the voltages can be classified into one of the three following categories (Please note that Central Hudson mitigates all voltages in accordance with the Safety Order).

Category One Voltage

Category one voltage displays all of the following characteristics:

- Voltage is $\geq 1V_{ac}$
- Sinusoidal waveform
- 60 Hz dominant
- Total Harmonic Distortion is <10% THD

These voltages are considered to be contact voltage, which is hazardous and should not be present in a normally functioning electric system.

Category Two Voltage

Category two voltage display the following characteristics:

- Voltage is $1V_{ac} - 10V_{ac}$
- Non-sinusoidal waveform
- Is 180 Hz dominant
- Total Harmonic Distortion is >10% THD

These voltages show the above listed characteristics. These voltages are considered non-hazardous Neutral to Earth Voltages and are considered part of a normally functioning electric system.

Category Three Voltage

Category three voltage can display the following characteristics:

- Voltage is $\geq 10V_{ac}$
- Non-sinusoidal waveform
- Is 180 Hz dominant
- Total Harmonic Distortion is >10% THD

These voltages can show the above listed characteristics individually or in any combination. These voltages require additional field-testing and review to determine if the source is due to a system abnormality or if it is a result of a normally functioning electric system. Central Hudson makes an attempt to mitigate these voltages at the time of discovery.

Analysis of Findings

This analysis has shown that over the past 3 years the documented accounts of dangerous contact voltage has been consistently less than 0.02% of the total of Central Hudson's entire electric system. The aggregate of the findings over the past three years, shows that contact voltage comprise of 10.8% (131) of the 1,212 during this time period. (0.05% of Central Hudson's total electric system)

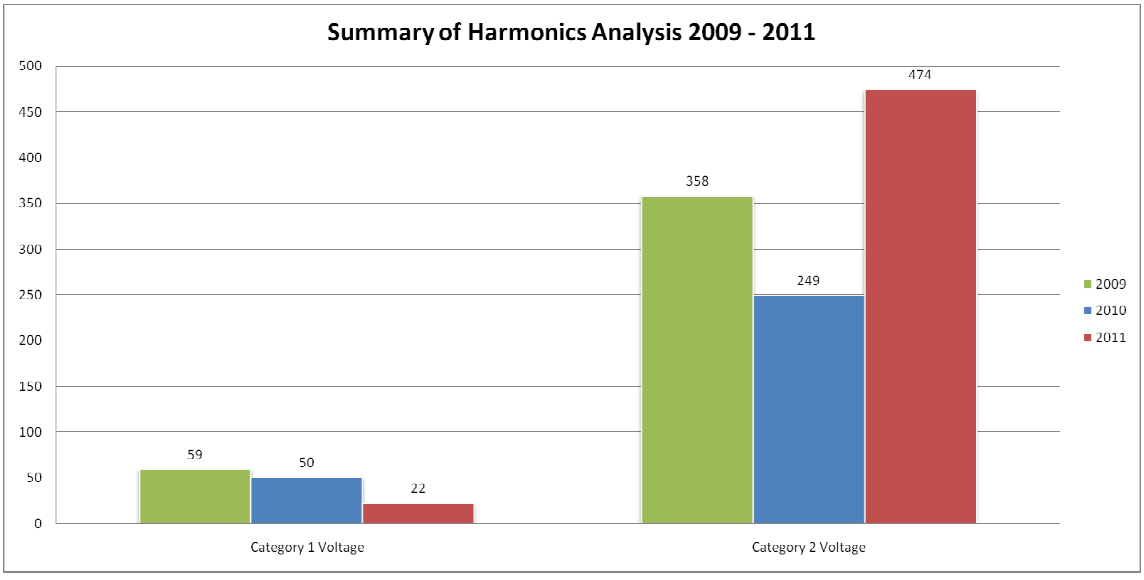
The following table depicts a breakdown of findings by asset class:

Table 1.Summary of Findings by Asset Class

	2009			2010			2011		
Asset Class	Cat 1	Cat 2	Cat 3	Cat 1	Cat 2	Cat 3	Cat 1	Cat 2	Cat 3
Overhead Distribution	47	334	0	43	240	0	19	463	1
Underground (Non-URD)	0	0	0	0	0	0	0	0	0
URD (Pads)	0	7	0	1	4	0	0	8	0
Street and Traffic Lights	12	0	0	6	0	0	3	3	0
Transmission Overhead	0	17	0	0	5	0	0	0	0
Substation Fences	0	0	0	0	0	0	0	0	0
Total	59	358	0	50	249	0	22	474	1

This analysis has also shown that contact voltage on Overhead Distribution accounts for 9.24% of the total findings. Street and Traffic Lights account for 1.98% of the total findings, and URD (Pads) account for 0.08% (1) of the total findings over the past 3 years. There have been no findings of contact voltage in the Underground (Non-URD), Transmission, and Substation Fence groups (see Table 1).

Although there are fluctuations in the total number of category two voltage conditions, these conditions have made up 85% to 95% of the voltages discovered over the past three years. Category 2 voltages are expected to fluctuate due to weather and load conditions. These voltages can be considered part of a properly functioning multi-grounded WYE electric system, and pose no threat to the public. There have been no findings of naturally occurring voltage in the Underground (Non-URD), and Substation Fence groups (see Table 1).
By differentiating between dangerous contact voltage and naturally occurring voltages, field crews can be effectively dispatched to mitigate dangerous voltage conditions ensuring the safety of the public while maintaining reliability of the system in a financially responsible manner.



Appendix 6 discusses detailed studies that have been conducted over the past several years and recommendations on this subject matter for the future.

X. Analysis of Inspection Results

Discussion of Inspection Findings/Repairs

During the inspection process, two or more deficiencies can be reported at a single location during an inspection. Since there is no direct correlation between the number of deficiencies reported to the number of locations with deficiencies, this data has been tabulated separately.

The most common level of deficiencies found in Central Hudson's service territory were Level IV conditions, representing 15,782 out of the 18,049 total deficiencies found (87.44%). The three most common deficiencies all involve overhead distribution poles. These deficiencies are Broken Ground Moldings (6,450; 41.28% of priority level IV deficiencies), Missing Guy Guards, (6,984; 44.70% of priority level IV deficiencies), and Tags Missing (2,146, 13.73% of priority level IV deficiencies).

Currently, Central Hudson is utilizing tree trimming crews and other contract employees to help reduce the number of Level IV deficiencies. As a tree trimming crew is working in an area, the crew is installing missing guy guards to guy wires on the circuit they are working on. Targeted guy guard replacements are also being issued to contract employees. To reduce the backlog of broken ground moldings and missing pole tags, Central Hudson is utilizing contractor technicians to replace the broken ground molding while performing the contact (stray) voltage testing. In the 2012 testing year, the contractor technicians will also replace missing tags while performing contact (stray) voltage testing.

Central Hudson maintains a good response time to Level I deficiencies. There was 1 Level I deficiency that was reclassified and repaired outside of the allotted time frame. Central Hudson strives to repair Level I deficiencies within 24 hours of discovery. This location was initially identified as a padmount transformer having severe rust and holes in the enclosure. Upon foreman review, it was determined that the holes in the enclosure were less than 3" and the conductors inside the enclosure were not accessible through these holes. Since the wires were not exposed or accessible through the holes in the enclosure, it did not present an immediate threat to reliability and public safety; therefore, it was given a lower priority of repair, Level II. This repair was completed four months after discovery.

Overhead Distribution Structures

Table of Locations with Deficiencies

Locations Inspected	Locations w/ Deficiencies	% Locations w/ Deficiencies	% Locations w/ Deficiencies Requiring Repair in 1 year
42,119	14,581	34.62%	0.08%

Breakdown of Locations with Deficiencies

Priority Rating	Number of Deficiencies	% Deficiencies Found
I	31	0.17%
II	144	0.81%
III	1,971	11.09%
IV	15,625	87.92%
Total:	17,771	100%

Overhead Transmission Facilities

Table of Locations with Deficiencies

Locations Inspected	Locations w/ Deficiencies	% Locations w/ Deficiencies	% Locations w/ Deficiencies Requiring Repair in 1 year
2,613	83	0.03%	0.00%

Breakdown of Locations with Deficiencies

Priority Rating	Number of Deficiencies	% Deficiencies Found
I	0	0.00%
II	0	0.00%
III	70	84.33
IV	13	15.66
Total:	83	100%

Manholes and Pullboxes

Table of Locations with Deficiencies

Locations Inspected	Locations w/ Deficiencies	% Locations w/ Deficiencies	% Locations w/ Deficiencies Requiring Repair in 1 year
327	57	17.43%	0.02%

Breakdown of Locations with Deficiencies

Priority Rating	Number of Deficiencies	% Deficiencies Found
I	1	1.43%
II	1	1.43%
III	12	17.14%
IV	56	80.00%
Total:	70	100%

Padmount Transformers

Table of Locations with Deficiencies

Locations Inspected	Locations w/ Deficiencies	% Locations w/ Deficiencies	% Locations w/ Deficiencies Requiring Repair in 1 year
3,192	135	4.23%	23.70%

Breakdown of Locations with Deficiencies

Priority Rating	Number of Deficiencies	% Deficiencies Found
I	32	20.51%
II	0	0.00%
III	30	19.23%
IV	94	60.26%
Total:	156	100%

Streetlights

Table of Locations with Deficiencies

Locations Inspected	Locations w/ Deficiencies	% Locations w/ Deficiencies	% Locations w/ Deficiencies Requiring Repair in 1 year
187	0	0.00%	0.00%

Breakdown of Locations with Deficiencies

Priority Rating	Number of Deficiencies	% Deficiencies Found
I	0	N/A
II	0	N/A
III	0	N/A
IV	0	N/A
Total:	0	100%

XI. Inspection Driven Reliability and Efficiency Improvement Programs

Central Hudson has recognized the opportunity to use the inspection program as a means to help improve system reliability. Operations Staff and Engineering have deployed "micro-surveys" to be completed by contracted technicians in line with contact (stray) voltage testing and inspection surveys. These micro-surveys were added to the existing inspection survey as a line item, and completed during the regular round of testing and inspections, eliminating the need for a second mobilization. The data that is collected during the survey is then aggregated and used to make a more efficient response plan based on what the goal is for each individual micro-survey. The sections below highlight these micro-surveys.

Cutouts: Porcelain vs. Polymer

Porcelain cutouts can fail when exposed to the elements for long periods porcelain cutouts can develop cracks in the insulator which can hold water. This crack filled with water and exposed to freezing can expand the crack. Over time, the constant freezing and thawing can open the crack further. When water flows through the crack, it can create a path for the electricity track, bypassing the fuse.

Prior to the 2010 inspection year, Central Hudson replaced porcelain cutouts with polymer cutouts located in the first zone of protection and/or protecting circuit segments of 500 customers or more. In 2010, a micro-survey was added to the contact (stray) testing and inspection survey to confirm the cutouts were replaced and capture any that may have been missed. The data collected will be aggregated and used to formulate a replacement plan in line with current operational plans and scheduled maintenance in order to avoid a second mobilization to the facility to replace the cutout(s).

Streetlights

In 2011, a micro-survey was added to inventory streetlights mounted on wooden poles (cobra heads) in the electric distribution system. These streetlights are visually inspected from the ground when contractor technicians perform a voltage test. In all over 30,000 pole mounted streetlights were inventoried.

The micro-survey documented the head type, body type, bulb type (when applicable), bulb wattage (when applicable), width (set back style only), and decorative arm (tear drop type only). This information was stored and will be used to update the GIS system available to line crews when repairs are scheduled to ensure that the correct bulb/wattage was on the truck, thus saving a second mobilization.

Animal Guards

Central Hudson has noticed a high rate of outages caused by wildlife. In 2012, a survey of animal guards will be conducted on our system and a plan will be developed to replace and/or add animal protection where it will positively impact customer reliability.

Manhole/Pullbox Inspection Data

Central Hudson Engineers will be using the inspection data collected since the beginning of the program in order to guide maintenance programs and schedules to maintain reliability and efficiency in Central Hudson's underground secondary networks.

Pole Replacements

Central Hudson has plotted inspection data in the GIS system to indicate where repairs are needed. This deployment is currently in progress, but will allow for identifying trends and synergies for reliability improvement. For example, if most of the poles in an off-road section need replacement, engineering analysis of rebuilding the pole plant on road can be evaluated through this system. Currently, identifying these trends is a manual process.

Ongoing Surveys

During the inspection survey, each pole is "sound tested" by contractor technicians when they perform an inspection. Using a hammer, technicians strike the pole from grade to at least four feet above grade, at least 4 times. While striking the pole with a hammer, technicians listen for audible indications of rot in the poles interior where it cannot be seen. Technicians will mark a pole as "unsatisfactory" if rot is suspected. Central Hudson maintains a spending plan in the capital budget to replace any pole that is found to be rotten during the inspection process. Currently Central Hudson has replaced approximately 311 poles and spent approximately $786,000 replacing poles that were discovered to be rotten or broken to date. This does not capture ongoing programs to replace aging assets outside of the Contact (Stray) Voltage Testing and Facility Inspection Program.

XII. Quality Assurance

Central Hudson continues to utilize an external auditor to perform its QA/QC program to review the effectiveness and accuracy of the contact (stray) voltage testing and facility inspection programs and their associated activities. The external auditor report directly to Central Hudson's Internal Auditing Department and submits audit reports simultaneously to the Internal Auditing Department and the Program Manager for review. If there are any findings, an action plan is assembled to address the concerns identified by the external auditor. These audits have resulted in specific improvements to the various processes, which have contributed toward increasing program efficiency and accuracy as well as reducing potential for future errors. The QA/QC program calls for several types of audits and for constant feedback with respect to the data collection and processing. The various audits cover personnel training, field testing and inspection procedures and practices, testing and inspection records, and field trailing audits.

For 2011, to date there were two audits of field-testing and inspection activities, one audit of the initial training, and one audit of test data records. In addition, a comprehensive year-end audit for the 2011 records is currently being processed. The completed audits indicate that all significant activities associated with the contact (stray) voltage testing and facilities inspection programs were conducted

in accordance with established protocols. The external auditor's findings resulted in zero issues that required formal remedial action plans.

XIII. Other Pertinent Information

Central Hudson continues to participate in the NYS Residential Stray Voltage Committee Activities, and through EPRI membership, continues to ensure that the best operational, construction and maintenance practices are being utilized. Central Hudson also participates with the New York State Utilities and the PSC in discussing issues and opportunities regarding both Contact (Stray) Voltage Testing and Facility Inspections.

During 2011, Central Hudson continued working closely with EPRI in the utilization of a handheld oscilloscope meter to analyze the harmonic content of voltages found during contact (stray) voltage testing. Through this collaborative effort, EPRI has been able to prepare documentation identifying the sources of voltage found in the field. By identifying the source of the voltage, technicians are able to determine if a voltage is naturally occurring relative to the operation of an electrical distribution system or due to contact (stray) voltage.

In recognition of harmonic analysis being an effective method of categorizing errant voltages found, Central Hudson was approached to co-author an article about harmonic analysis for the January 2012 issue of T&D World Magazine. Con Edison and EPRI contributed to the article which shares some field experiences using portable oscilloscopes to identify the source of voltages found and highlights cost savings realized.

To advance harmonic analysis and data acquisition, Central Hudson is an active participant in an EPRI research project utilizing iOS devices (iPods and iPads) for voltage detection and waveform capturing. By utilizing the processing power of the iOS devices; the multimeter, oscilloscope, and handheld voltage detector can be combined into one package. Central Hudson is sending collected field data to EPRI for evaluation and implementation into hardware and software revisions.

In addition, Central Hudson participates in the IEEE P1695 Working Group on Voltages at Publicly and Privately Accessible Locations. This working group is working towards creating a trial use guide that addresses the normal and abnormal voltages that exist at publicly and privately accessible locations as a result of the delivery and use of electrical energy (often referred to as stray voltage). The guide will focus primarily on the presence of power frequency related voltages, and will discuss definitions, causes, impacts, testing techniques, mitigation strategies, and hazard levels.

As a result of Central Hudson's involvement in the IEEE P1695 Working Group, Central Hudson has assisted in the preparation of two transaction papers currently under review. The first paper discusses use of harmonic analysis to identify the source of elevated voltages, and the second paper is an analysis of the manual

testing program results in New York State. Both papers are technical expansion of the attached white papers included in Appendix 6 of this report.

Appendix 1: Contact (stray) Voltage Testing Summary – 2011

Central Hudson Gas & Electric Corporation	Total System Units Requiring Testing[1]	Units Completed	Percent Completed	Units with Voltage Found (>= 1.0v)	Percent of Units Tested with Voltage (>= 1.0v)	Units Classified as Inaccessible
Distribution Facilities	208,591	208,591	100.00%	483	0.23%	1,164
Underground Facilities	14,523	14,523	100.00%	8	0.06%	224
Non-URD	1,326	1,326	100.00%	0	0.00%	22
Street Lights / Traffic Signals	6,325	6,325	100.00%	6	0.09%	16
Substation Fences	104	104	100.00%	0	0.00%	0
Transmission (69kV and Above)	8,612	8,612	100.00%	0	0.00%	446
TOTAL	238,155	238,155	100.00%	497	0.21%	1,872

Findings will include naturally occurring and stray voltages. Of the 497 locations that tested positive for voltage, 22 locations were mitigated due to stray voltage and are included in this number.

[1] Central Hudson performs two to three field verifications per year when a structure is not found. If structures are not found for two years, they are removed from the data as invalid structures. In 2011, Central Hudson identified 3,694 structures that were not found for two consecutive years. These structures were removed from the total reported in the previous quarterly reports.

Appendix 2A: Summary of Contact (Stray) Voltage Findings – 2011

The table below shows Central Hudson's Contact (Stray) Voltage Mitigation efforts. Of the 497 locations with findings of 1 Volt or greater, 22 locations were mitigated to less than 1 Volt and were found to have contact (stray) voltage caused by the deterioration of conductors, contact voltage, or broken equipment. The remaining 475 voltage findings were deemed to have been caused by a natural source and therefore did not require mitigation. For a complete breakout of energized objects see Appendix 2B.

Central Hudson Gas & Electric Corporation	Initial Readings				Readings after Mitigation		
	1V to 4.4V	4.5V to 24.9V	25V and Over	**Totals**	< 1 V	1V to 4.4V	4.5V and Over
Distribution Facilities	**466**	**15**	**2**	**483**	**372**	**111**	**-**
Pole	-	-	-	-	-	-	-
Ground	167	2	1	170	116	54	-
Guy	267	11	1	279	233	46	-
Riser	13	2	-	15	13	2	-
Other	19	-	-	19	10	9	-
Underground Facilities	**7**	**1**	**-**	**8**	**6**	**2**	**-**
Handhole / Pull box	3	1	-	-	3	1	-
Manhole	-	-	-	-	-	-	-
Padmount Switchgear	-	-	-	-	-	-	-
Padmount Transformer	-	-	-	-	-	-	-
Vault – Cover/Door	-	-	-	-	-	-	-
Pedestal	-	-	-	-	-	-	-
Other	4	-	-	-	3	1	-
Street Lights / Traffic Signals	**3**	**1**	**2**	**6**	**3**	**3**	**-**
Metal Street Light Pole	3	1	2	6	3	3	-
Traffic Signal Pole	-	-	-	-	-	-	-
Control Box	-	-	-	-	-	-	-
Pedestrian Crossing Pole	-	-	-	-	-	-	-
Other - NOT LISTED	-	-	-	-	-	-	-
Substation Fences	-	-	-	-	-	-	-
Fence	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-
Transmission (69kV and Above)	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Lattice Tower	-	-	-	-	-	-	-
Pole	-	-	-	-	-	-	-
Ground	-	-	-	-	-	-	-
Guy	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-
Miscellaneous Facilities	-	-	-	-	-	-	-
Sidewalk	-	-	-	-	-	-	-
Gate/Fence/Awning	-	-	-	-	-	-	-
Control Box	-	-	-	-	-	-	-
Scaffolding	-	-	-	-	-	-	-
Bus Shelter	-	-	-	-	-	-	-
Fire Hydrant	-	-	-	-	-	-	-
Phone Booth	-	-	-	-	-	-	-
Water Pipe	-	-	-	-	-	-	-
Riser	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-

Appendix 2B: Summary of Energized Objects – 2011

The table below shows the summary of energized objects. Of the 497 locations with findings of 1 Volt or greater, 22 of the locations were mitigated to 1 Volt or less and were found to have contact (stray) voltage caused by the deterioration of conductors, contact voltage, and/or broken equipment.

The table below has a complete breakout of findings along with distinctions between naturally occurring voltage and stray voltage discovered through the Contact (Stray) Voltage Testing Program.

Central Hudson Gas & Electric Corporation	Initial Readings				Voltage Type		
	1V to 4.4V	4.5V to 24.9V	25V and Over	**Totals**	Naturally Occurring	Contact (Stray) Voltage	Mitigated Locations (<1 Volt)
Distribution Facilities	**466**	**15**	**2**	**483**	**464**	**19**	**19**
Pole	-	-	-	-	-	-	-
Ground	167	2	1	170	165	5	5
Guy	267	11	1	279	268	11	11
Riser	13	2	-	15	12	3	3
Other	19	-	-	19	19	-	-
Underground Facilities	**7**	**1**	**-**	**8**	**8**	**-**	**-**
Handhole/Pull Box	3	1	-	4	4	-	-
Other	4	-	-	4	4	-	-
Street Lights / Traffic Signals	**3**	**1**	**2**	**6**	**3**	**3**	**3**
Metal Street Light Pole	3	1	2	6	3	3	3
Traffic Signal Pole	-	-	-	-	-	-	-
Transmission (69kV and Above)	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Lattice Tower	-	-	-	-	-	-	-
Ground	-	-	-	-	-	-	-
Grand Total	***476***	***17***	***4***	***497***	***475***	***22***	***22***

Appendix 3: Summary of Shock Reports from the Public – 2011

	Central Hudson Gas & Electric Corporation	Yearly Total
I.	**Total Shock Calls Received:**	**18**
	Unsubstantiated	2
	Normally Energized Equipment	13
	Contact (Stray) Voltage:	3
	Person	
	Animal	
II.	**Injuries Sustained/Medical Attention Received**	**1**
	Person	1
	Animal	
III.	**Voltage Source:**	**18**
	Utility Responsibility	
	Issue with primary, joint, or transformer	
	Secondary Joint (Crab)	
	SL Service Line	3
	Abandoned SL Service Line	
	Defective service line	
	Abandoned service line	
	OH Secondary	
	OH Service	
	OH Service neutral	2
	Pole	
	Riser	
	Other	
	Customer Responsibility	
	Contractor damage	2
	Customer Equipment / Wiring	8
	Other Utility / Gov't Agency Responsibility	2
	SL Base Connection	
	SL Internal Wiring or Light Fixture	
	Overhead Equipment	2
	Other	
IV.	**Voltage Range:**	**18**
	Unrecorded/Below 1V	15
	1.0V to 4.4V	2
	4.5V to 24.9V	1
	25V and above	

Appendix 4: Summary of Deficiencies and Repair Activity Resulting from the Inspection Process – 2011

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process - Distribution

Overhead Facilities	2009			2010			2011			2012			2013		
Priority Level	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Repair Expected	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years
Poles															
Pole Condition															
Number of Deficiencies	**4**	**48**	**369**	4	54	440	7	50	366	-	-	-	-	-	-
Repaired in Time Frame	4	23	257	4	36	318	7	12	111	-	-	-	-	-	-
Repaired - Overdue	-	21	-	-	14	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	112	-	-	122	-	38	255	-	-	-	-	-	-
Not Repaired - Overdue	-	4	-	-	4	-	-	-	-	-	-	-	-	-	-
Grounding System															
Number of Deficiencies	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anchors/Guy Wire															
Number of Deficiencies	-	-	**634**	-	-	524	-	-	187	-	-	-	-	-	-
Repaired in Time Frame	-	-	459	-	-	437	-	-	37	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	175	-	-	87	-	-	150	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cross Arm/Bracing															
Number of Deficiencies	**2**	**7**	**23**	1	8	31	2	17	33	-	-	-	-	-	-
Repaired in Time Frame	2	6	13	1	8	24	2	10	8	-	-	-	-	-	-
Repaired - Overdue	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	10	-	-	7	-	7	25	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Riser															
Number of Deficiencies	**1**	-	-	-	-	-	4	4	13	-	-	-	-	-	-
Repaired in Time Frame	1	-	-	-	-	-	4	1	1	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	3	12	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductors															
Primary Wire/Broken Ties															
Number of Deficiencies	**27**	**8**	**80**	21	19	69	9	26	195	-	-	-	-	-	-
Repaired in Time Frame	27	4	61	21	19	67	9	13	56	-	-	-	-	-	-
Repaired - Overdue	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	19	-	-	2	-	13	139	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Secondary Wire															
Number of Deficiencies	**2**	-	**22**	1	-	20	-	-	23	-	-	-	-	-	-
Repaired in Time Frame	2	-	14	1	-	19	-	-	3	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	8	-	-	1	-	-	20	-	-	-	-	-	-
Not Repaired - Overdue	-	-		-	-	-	-	-	-	-	-	-	-	-	-

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process - Distribution

Overhead Facilities	2009			2010			2011			2012			2013		
Priority Level	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Repair Expected	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years
Neutral															
Number of Deficiencies	-	-	**22**	-	-	15	-	-	14	-	-	-	-	-	-
Repaired in Time Frame	-	-	18	-	-	13	-	-	4	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	4	-	-	2	-	-	10	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Insulators															
Number of Deficiencies	**1**	-	**20**	1	11	12	-	6	46	-	-	-	-	-	-
Repaired in Time Frame	1	-	15	1	9	12	-	4	10	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	5	-	-	-	-	2	36	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Pole Equipment															
Transformers															
Number of Deficiencies	-	-	**21**	-	1	17	1	4	19	-	-	-	-	-	-
Repaired in Time Frame	-	-	19	-	1	14	1	4	7	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	2	-	-	3	-	-	12	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cutouts															
Number of Deficiencies	-	**34**	-	-	19	-	-	5	-	-	-	-	-	-	-
Repaired in Time Frame	-	34	-	-	18	-	-	3	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lightning Arrestors															
Number of Deficiencies	-	-	**4**	-	-	7	-	-	14	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	3	-	-	4	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	4	-	-	4	-	-	10	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Equipment															
Number of Deficiencies				-	-	-	1	4	13	-	-	-	-	-	-
Repaired in Time Frame				-	-	-	1	1	1	-	-	-	-	-	-
Repaired - Overdue				-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due				-	-	-	-	3	12	-	-	-	-	-	-
Not Repaired - Overdue				-	-	-	-	-	-	-	-	-	-	-	-
Miscellaneous															
Trimming Related															
Number of Deficiencies	**4**	**25**	**1,583**	9	37	2,360	5	23	988	-	-	-	-	-	-
Repaired in Time Frame	4	15	1,574	9	30	2,005	5	17	885	-	-	-	-	-	-
Repaired - Overdue	-	10	-	-	6	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	9	-	-	355	-	6	103	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process - Distribution

Overhead Facilities	2009			2010			2011			2012			2013		
Priority Level	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Repair Expected	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years
Other															
Number of Deficiencies	-	**5**	**28**	2	3	14	-	5	60	-	-	-	-	-	-
Repaired in Time Frame	-	4	25	2	3	8	-	1	1	-	-	-	-	-	-
Repaired - Overdue	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	3	-	-	6	-	4	59	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Overhead Facilities Total															
Total															
Number of Deficiencies	**41**	**127**	**2,806**	39	152	3,509	31	144	1,971	-	-	-	-	-	-
Repaired in Time Frame	41	86	2,455	39	124	2,920	31	66	1,128	-	-	-	-	-	-
Repaired - Overdue	-	37	-	-	22	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	351	-	-	589	-	78	843	-	-	-	-	-	-
Not Repaired - Overdue	-	4	-	-	6	-	-	-	-	-	-	-	-	-	-

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process - Transmission

Transmission Facilities	2009			2010			2011			2012			2013		
Priority Level	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Repair Expected	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years
Towers/Poles															
Steel Towers															
Number of Deficiencies	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poles															
Number of Deficiencies	-	3	31	-	2	50	-	-	16	-	-	-	-	-	-
Repaired in Time Frame	-	2	13	-	2	8	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	18	-	-	42	-	-	16	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anchors/Guy Wire															
Number of Deficiencies	-	-	112	-	-	108	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	5	-	-	6	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	107	-	-	102	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Crossarm/Brace															
Number of Deficiencies	-	-	-	-	-	6	-	-	3	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grounding System															
Number of Deficiencies	-	-	-	-	-	1	-	-	48	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	48	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductors															
Cable															
Number of Deficiencies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Static/Neutral															
Number of Deficiencies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process - Transmission

Transmission Facilities	2009			2010			2011			2012			2013		
Priority Level	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Repair Expected	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years
Insulators															
Number of Deficiencies	-	1	4	-	-	1	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	1	2	-	-	1	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Miscellaneous															
Right of Way Condition															
Number of Deficiencies	-	-	1	-	2	10	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	2	10	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other															
Number of Deficiencies	-	-	71	-	-	-	-	-	3	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	71	-	-	-	-	-	3	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transmission Facilities Total															
Total															
Number of Deficiencies	-	4	219	-	4	191	-	-	70	-	-	-	-	-	-
Repaired in Time Frame	-	3	20	-	4	32	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	199	-	-	159	-	-	70	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process - Manholes and Pullboxes

Underground Facilities	2009			2010			2011			2012			2013		
Priority Level	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Repair Expected	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years
Underground Structures															
Damaged Cover															
Number of Deficiencies	-	4	1	-	-	2	-	-	2	-	-	-	-	-	-
Repaired in Time Frame	-	3	1	-	-	1	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	1	-	-	-	-	-	-	2	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Damaged Structure															
Number of Deficiencies	-	2	10	1	1	4	-	-	1	-	-	-	-	-	-
Repaired in Time Frame	-	-	2	1	1	1	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	8	-	-	3	-	-	1	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Congested Structure															
Number of Deficiencies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Damaged Equipment															
Number of Deficiencies	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductors															
Primary Cable															
Number of Deficiencies	-	-	2	-	-	3	-	-	1	-	-	-	-	-	-
Repaired in Time Frame	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Secondary Cable															
Number of Deficiencies	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neutral Cable															
Number of Deficiencies	-	-	-	-	-	-	-	-	-	-	-	-			
Repaired in Time Frame	-	-	-	-	-	-	-	-	-	-	-	-			
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-			
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-			
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-			

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process - Manholes and Pullboxes

Underground Facilities	2009			2010			2011			2012			2013		
Priority Level	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Repair Expected	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years
Racking Needed															
Number of Deficiencies	-	**3**	**1**	-	-	6	-	-	6	-	-	-	-	-	-
Repaired in Time Frame	-	3	-	-	-	5	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	1	-	-	1	-	-	6	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Miscellaneous															
Other															
Number of Deficiencies	-	-	5	-	-	2	-	1	2				-	-	-
Repaired in Time Frame	-	-	2	-	-	2	-	-	-				-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-				-	-	-
Not Repaired - Not Due	-	-	3	-	-	-	-	1	2				-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-				-	-	-
Underground Facilities Total															
Total															
Number of Deficiencies	-	9	19	1	1	18	1	1	12	-	-	-	-	-	-
Repaired in Time Frame	-	6	7	1	1	12	1	-	-	-	-	-	-	-	-
Repaired - Overdue	-	3	-	-	-	-	-	-	2	-	-	-	-	-	-
Not Repaired - Not Due	-	-	12	-	-	6	-	1	10	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process - Padmount Transformers

Pad Mount Transformers	2009			2010			2011			2012			2013		
Priority Level	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Repair Expected	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years
Pad Mount Transformers															
Damaged Structure															
Number of Deficiencies	**19**	-	**1**	13	1	3	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	19	-	1	13	1	3	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Damaged Equipment															
Number of Deficiencies	-	-	**9**	-	-	45	2	-	18	-	-	-	-	-	-
Repaired in Time Frame	-	-	7	-	-	31	2	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	2	-	-	14	-	-	18	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cable Condition															
Number of Deficiencies	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oil Leak															
Number of Deficiencies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Off Pad															
Number of Deficiencies	**21**	**3**	-	36	19	-	12	-	-	-	-	-	-	-	-
Repaired in Time Frame	21	3	-	36	18	-	12	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Lock/Latch/Penta															
Number of Deficiencies	**1**	-	-	2	-	-	8	-	-	-	-	-	-	-	-
Repaired in Time Frame	1	-	-	2	-	-	8	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Miscellaneous															
Other															
Number of Deficiencies	-	-	**110**	1	8	208	10	-	12	-	-	-	-	-	-
Repaired in Time Frame	-	-	56	1	8	172	9	-	5	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	54	-	-	36	-	-	7	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process - Padmount Transformers

Pad Mount Transformers	2009			2010			2011			2012			2013		
Priority Level	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Repair Expected	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years
Pad Mount Total															
Total															
Number of Deficiencies	41	3	120	52	38	208	32	-	30	-	-	-	-	-	-
Repaired in Time Frame	41	3	64	52	36	172	31	-	5	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	56	-	-	36	-	-	25	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process - Streetlights

Streetlights	2009			2010			2011			2012			2013		
Priority Level	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Repair Expected	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years	Within 1 week	Within 1 year	Within 3 years
Streetlight															
Base/Standard/Light															
Number of Deficiencies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Handhole/Service Box															
Number of Deficiencies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Service/Internal Wiring															
Number of Deficiencies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Access Cover															
Number of Deficiencies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Miscellaneous															
Other															
Number of Deficiencies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Streetlight Total															
Total															
Number of Deficiencies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired in Time Frame	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Not Due	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Repaired - Overdue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process - Level IV Conditions

Level IV Conditions	2009		2010		2011		2012		2013	
	Number of Conditions Found	Number of Conditions Repaired	Number of Conditions Found	Number of Conditions Repaired	Number of Conditions Found	Number of Conditions Repaired	Number of Conditions Found	Number of Conditions Repaired	Number of Conditions Found	Number of Conditions Repaired
Overhead Facilities										
Pole Condition										
Pole Condition	7	7	1,916	67	2,146	22	-	-	-	-
Grounding System	6,375	3,617	8,496	7,419	6,450	5,391	-	-	-	-
Anchors/Guy Wire	13,066	2,871	6,236	6,196	6,984	3,429	-	-	-	-
Cross Arm/Bracing	-	-	-	-	-	-	-	-	-	-
Riser	-	-	-	-	-	-	-	-	-	-
Conductors										
Primary Wire/Broken Ties	-	-	-	-	-	-	-	-	-	-
Secondary Wire	-	-	-	-	-	-	-	-	-	-
Neutral	-	-	-	-	-	-	-	-	-	-
Insulators	-	-	-	-	-	-	-	-	-	-
Pole Equipment										
Transformers	-	-	43	13	41	-	-	-	-	-
Cutouts	-	-	-	-	-	-	-	-	-	-
Lightning Arrestors	-	-	-	-	-	-	-	-	-	-
Other Equipment	-	-	-	-	-	-	-	-	-	-
Miscellaneous										
Trimming Related	-	-	-	-	-	-	-	-	-	-
Other	2,791	126	4		4	-	-	-	-	-
Overhead Facilities Total	22,239	6,706	16,695	13,695	15,625	8,842	-	-	-	-
Transmission Facilities										
Towers/Poles										
Steel Towers	-	-	-	-	-	-	-	-	-	-
Poles	76	1	5	-	10	2	-	-	-	-
Anchors/Guy Wire	99	4	12	-	-	-	-	-	-	-
Crossarm/Brace	10	3	7	-	1	-	-	-	-	-
Grounding System	-	-	2	-	-	-	-	-	-	-
Conductors										
Cable	6	-	-	-	-	-	-	-	-	-
Static/Neutral	-	-	-	-	-	-	-	-	-	-
Insulators	3	2	2	-	-	-	-	-	-	-
Miscellaneous										
Right of Way Condition	1	-	7	-	1	-	-	-	-	-
Other	171	17	6	-	1	-	-	-	-	-
Transmission Facilities Total	366	27	41	-	13	2	-	-	-	-

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process - Level IV Conditions

Level IV Conditions	2009		2010		2011		2012		2013	
	Number of Conditions Found	Number of Conditions Repaired	Number of Conditions Found	Number of Conditions Repaired	Number of Conditions Found	Number of Conditions Repaired	Number of Conditions Found	Number of Conditions Repaired	Number of Conditions Found	Number of Conditions Repaired
Underground Facilities										
Underground Structures										
Damaged Cover	3	-	5	`	1	-	-	-	-	-
Damaged Structure	4	-	-	-	-	-	-	-	-	-
Congested Structure	-	-	-	-	-	-	-	-	-	-
Damaged Equipment	-	-	2	-	-	-	-	-	-	-
Conductors										
Primary Cable	35	-	-	-	3	-	-	-	-	-
Secondary Cable	-	-	-	-	-	-	-	-	-	-
Neutral Cable	-	-	-	-	-	-	-	-	-	-
Racking Needed	7	-	-	-	-	-	-	-	-	-
Miscellaneous										
Other	10	5	43	10	52	-	-	-	-	-
Underground Facilities Total	59	5	50	11	56	-	-	-	-	-
Padmount Transformers										
Underground Structures										
Damaged Structure	-	-	2	-	-	-	-	-	-	-
Damaged Equipment	-	-	-	-	-	-	-	-	-	-
Damaged Cable	-	-	-	-	-	-	-	-	-	-
Oil Leak	-	-	-	-	-	-	-	-	-	-
Off Pad	-	-	-	-	-	-	-	-	-	-
Lock/Latch/Penta	-	-	-	-	-	-	-	-	-	-
Miscellaneous										
Other	198	178	407	4	94	-	-	-	-	-
Pad Mount Transformer Total	198	178	409	4	94	-	-	-	-	-
Streetlights										
Streetlight										
Base/Standard/Light	-	-	-	-	-	-	-	-	-	-
Handhole/Service Box	-	-	-	-	-	-	-	-	-	-
Service/Internal Wiring	-	-	-	-	-	-	-	-	-	-
Access Cover	-	-	-	-	-	-	-	-	-	-
Miscellaneous										
Other	-	-	-	-	-	-	-	-	-	-
Streetlight Total	-	-	-	-	-	-	-	-	-	-
Total Level IV Conditions										
Overall Total	22,862	6,916	17,195	13,710	15,788	8,844	-	-	-	-

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process							
Year	**Priority Level / Repair Expected**		**Deficiencies Found (Total)**	**Repaired In Time Frame**	**Repaired - Overdue**	**Not Repaired - Not Due**	**Not Repaired - Overdue**
2009	I	Within 1 week	82	82	0	0	0
	II	Within 1 year	143	98	40	0	5
	III	Within 3 years	3,164	2,541	0	623	0
	IV	N/A	22,862	6,916	N/A	15,946	N/A
2010	I	Within 1 week	92	92	0	0	0
	II	Within 1 year	195	163	22	4	6
	III	Within 3 years	3,926	3,104	0	822	0
	IV	N/A	17,195	13,710	N/A	3,485	N/A
2011	I	Within 1 week	63	62	0	0	1
	II	Within 1 year	145	66	0	79	0
	III	Within 3 years	2,059	1,133	0	926	0
	IV	N/A	15,788	8,844	N/A	6,944	N/A
2012	I	Within 1 week					
	II	Within 1 year					
	III	Within 3 years					
	IV	N/A					
2013	I	Within 1 week					
	II	Within 1 year					
	III	Within 3 years					
	IV	N/A					

Appendix 5: Temporary Repairs

Central Hudson began tracking temporary repairs on a formal basis in 2009. The process of tracking temporary repairs throughout all divisions in Central Hudson is a complex one requiring interfacing of multiple systems and coordination of several organizations. Currently, Central Hudson is developing an automated system that will track Temp Repairs and produce reports for line crews and supervisors to better manage the process. The tracking method is not as labor intensive as it was in the past, but still requires some manual involvement. Central Hudson continues to utilize contact (stray) voltage technicians to update the inventory annually.

Overall, Central Hudson has completed permanent repairs on 73 out of 100 locations (73%). Of the repairs completed, 43 were completed within the 90 day time frame stated in the Order (58.9%).

Many factors contributed to temporary repairs being completed outside of the 90 day window. In addition, the process of getting a work order created, estimate generated, and obtaining highway permits can cause the permanent repair to be completed outside of the 90 day time frame. Similar to deficiencies identified during inspections, qualified personnel are prioritizing temporary repairs based on circuit reliability and public safety

.

Once a temporary condition is identified, the Company re-evaluates the location and determines if additional safeguards are required to protect the interest of the public, and does so immediately. Other conditions outside of Central Hudson's control have also caused delays such as; weather, field conditions, equipment rentals, and available load capacity due to switching requirements.

Appendix 6: Introduction to Proposed Revision White Papers

Appendix 6 is a collection of white papers that were developed by various sources through ongoing research over the past year. Although we acknowledge contributions from these other sources, the content below does not represent these other sources on the subject matter listed herein.

- **Appendix 6 A: Proposed Revision for Identifying Voltage Sources and Action Level Thresholds**

  This white paper presents conclusions and recommendations on the use of harmonics analysis and the need to clarify terminology referring to contact (stray) voltage in the current Safety Order. This white paper also contains recommendations based on findings from the IEEE Standard Working Group P1695 that support the recommendations within.

- **Appendix 6 B: Proposed Revision to the (Contact) Stray Voltage Manual Testing Cycle for Distribution Overhead, Transmission, and Pad Mounted Equipment**

  This white paper contains an in-depth analysis that supports reducing the current mandate of annual testing of overhead, underground residential distribution (URD), transmission facilities and substation fences to a requirement that utilities manually test these assets in conjunction with periodic onsite inspections. Recommendations are based on findings from the analysis of previous years' data and testing results.

- **Appendix 6 C: Proposed Revision to URD Equipment Inspections**

  This white paper contains an in-depth analysis that supports limiting URD device inspections, namely pad mounted transformers and switchgear, to an external inspection. Recommendations are based on findings from the analysis of previous years' data and inspection results.

Appendix 6 A Proposed Revision for Identifying Voltage Sources and Action Level Thresholds

Background

In January 2005, the New York State Public Service Commission issued Electric Safety Standards (Case 04-M-0159). The Safety Standards require electric utilities annually perform manual stray voltage (also known as contact voltage) testing of all publicly accessible electric facilities and publicly accessible street lights that are directly fed by the electric distribution system regardless of ownership. The order requires utilities respond to all findings greater than 1 V_{ac} and guard the area until the voltage is mitigated. Since the order was instituted, the Electric Power Research Institute ("EPRI") has been working with a consortium of utilities, including Central Hudson to develop techniques that enable the technician performing the test identify the source of the voltage.

In addition, since the order was adopted, the Institute of Electrical and Electronics Engineers ("IEEE") formed a working group on Voltages at Publicly and Privately Accessible Locations (IEEE Standard Working Group P1695). The objective of this working group is to develop a document to serve as a guide for the detection, investigation and mitigation of stray and contact voltages. The document includes definitions of elevated voltages that have been adapted by utilities across the country. The current definitions in the Order are inconsistent with those of the IEEE working group.

Scope of proposed changes

Central Hudson is proposing that the Safety Standards be modified to standardize the terminology between the order and the IEEE working group. Central Hudson is also proposing that tiered action levels be incorporated into the order based on the voltage measured as well as the source of the voltage.

Terminology Changes

Central Hudson is proposing to modify the terminology used in the order to be consistent with the definitions established by the IEEE P1695 working group. The term "stray voltage" currently being used in the Order should be changed to "contact voltage" to be consistent with the proposed IEEE definitions as follows:

a. **Contact Voltage:** A confirmed voltage reading greater than or equal to 1 volt measured using a volt meter and 500 ohm shunt resistor which is the result of an abnormal power system conditions

b. **Stray Voltage:** A confirmed voltage reading greater than or equal to 1 volt measured using a volt meter and 500 ohm shunt resistor which results from the normal delivery and/or use of **e**lectricity

Central Hudson is also proposing different levels of response to stray and contact voltage cases based on both the voltage and source as determined by a measurement of total harmonic distortion.

Proposed Action Levels

The Order should be revised to take advantage of improved technologies and advanced understanding of the nature of voltages found during field testing to better utilize utility company resources. Central Hudson recommends a threshold of 10% total harmonic distortion be used for differentiating between line side faults and voltages associated with neutrals and grounding. Under the current Order there is no threshold for harmonic distortion established. This recommendation is based upon additional knowledge that has been gained through collaborative research with EPRI and interaction with the IEEE P1695 Working Group subsequent to the original procedures established by NYS PSC Safety Order 04-M-0159.

Central Hudson compiles an inventory of all findings; both stray and contact voltages, and report on the number of these findings each year. Section 1(f) of the December 15, 2008 Order defines a finding as "any confirmed voltage reading on an electric facility or streetlight greater than or equal to 1 volt measured using a volt meter and 500 ohm shunt resistor." Section 1(c) defines Stray Voltage as "voltage conditions on electric facilities that should not ordinarily exist. These conditions may be due to one or more factors, including, but not limited to, damaged cables, deteriorated, frayed, or missing insulation, improper maintenance, or improper installation."

The IEEE P1695 Working Group recognizes that elevated voltages come in two varieties, with contact voltage being the greatest concern. Contact voltage is the result of line side voltage energizing a conductive surface in the environment. The voltage that is measured on the surface is a function the resistance of the connection between the energized line and the surface, which is typically referred to as fault impedance. As that fault impedance changes, the voltage on the surface changes. Since contact voltage events are often the result of damaged insulation, the voltage in these cases can vary from very low voltages to full line voltage, which is typically 120 volts.

Because of the sensitivity of most commercially available field instruments, harmonics analysis must be performed when the voltage is greater than or equal to one volt. Since a shunt resistor is a linear load, inserting it or removing it from the circuit will have no impact on the harmonics measurement, therefore harmonics measurements may be taken with or without a shunt resistor. It is important that the measurement is taken using a ground that is not energized. The use of an energized ground may cause erroneous harmonics reading and may increase or decrease the THD as well as the voltage of the measurement. The measurements collected and analyzed herein were made using grounds that were not energized.

To distinguish between a hazardous and normally occurring voltage, the harmonic content of the voltage source can be utilized to determine the source. The IEEE standard 519 for power quality requires that utilities deliver power with less than 5% total harmonic distortion (THD). Total harmonic distortion is a measure of the ratio of the sum of the powers of all harmonic

components to the power of the fundamental frequency, which on a power system in the US is 60 Hz. As a result, faults from line side (phase) sources have the same THD as the source.

When power travels through customer equipment the voltage and current waveforms are often distorted, the resultant current traveling on the neutral typically has a high harmonic content from different frequencies (generally 180 HZ and 300 Hz) with a THD that is typically greater than 10%. Because most customer loads inject harmonic current onto the system neutral, neutral to earth voltages as well as high impedance neutrals will have a higher harmonic content.

Stray voltage is the result of current traveling through the earth and is an artifact of most normally operating power systems. This voltage is often the result of current traveling though the resistance of the earth. It may also be caused by poor soil grounding conditions, poor load balance between phases, long low voltage single phase circuit spurs with high current loads, capacitive coupling and proximity to transmission lines. Stray voltage is not considered harmful to people or pets. The IEEE working group has set a limit of 10 volts in their definition of stray voltage. These voltages are the result of the normal operation of a power system and there are no cost effective measures that can be taken to reduce the voltage. In most cases stray voltages have a THD of greater than 10%. These measured findings are generally stable in voltage and are considered part of a normally functioning electrical system and should not be considered contact voltage or require mitigation.

A review of 299 detections on overhead equipment found and investigated by Central Hudson in 2010 revealed that 249 of the events were the result of normally operating equipment, the remaining 50 events were the result of defective equipment and were repaired and the voltage mitigated to less than 1 volt. In each of the 249 cases the THD exceeded 10%.

Contact voltage which results from faulted phase conductors will show a near perfect 60 Hz sinusoidal waveform. Through collaborative research with EPRI, it has been found that contact voltages will have a total harmonic distortion generally less than 5% and never exceeding 10%. This conclusion was validated by an independent sample of more than 1,800 events in 2010 found no instances where a line side conductor fault generated a THD of greater than 10%.

These contact voltages result from a variety of conditions including; deterioration of conductors, faulted equipment, age of equipment, exposure to the elements, and various customer related issues. These voltages should not exist on normally operating electric facilities and need to be mitigated to prevent harm to the public and maintain system reliability. The Order defines these voltages as stray voltages per the Order definition in Section 1(c), but these should be classified as contact voltages per the IEEE P1695 Working Group definition.

In cases where the THD is greater than 10% and the voltage is greater than 10 volts, the potential for a power system defect exists, and a determination of the cause cannot be made simply on the basis of a voltage harmonics measurement. In these cases the circuit should be examined to determine if the voltage is the result of normal power system operations or the result of defective equipment. If the voltage is the result of normally operating equipment, no additional action should be required. If it is the result of defective equipment then the location should be safeguarded and repaired.

By measuring and analyzing the total harmonic distortion of a voltage waveform and the condition of the location, the proper actions can be taken. By properly identifying the source of the voltage found in the field as part of the Contact Voltage Testing Program, resources can be used in a more efficient manner and prevent using unnecessary funds to attempt repairs at facilities that are not in need of repair. This approach is similar to the approach taken by the Ontario Electric Safety Authority in their recent standard on streetlight testing[2]. Further details on the proposed action levels and incorporation of the use of harmonic data while performing testing for elevated voltages are detailed in the table on the following page.

[2] Guidelines for the Design, Installation, Operation and Maintenance of Street Lighting Assets, 2011, Ontario Electrical Safety Authority

IEEE Definition	Measured Voltage (with 500 Ohm Shunt Resistor)	Total Harmonic Distortion (Contact Measurement)	Repair Protocol	Reporting Protocol
Contact Voltage	Greater than 1 $V_{ac\ (RMS)}$	60 Hz dominant sinusoidal waveform and less than 10% THD (as a percentage of 60hz)	• Safeguard area and/or disconnect supply and/or repair immediately through established response protocol. • Permanent Repair within 45 days	• Report number of events quarterly and annually to PSC Staff • If Customer owned equipment notify customer
Stray or Contact Voltage	Greater than 1 $V_{ac\ (RMS)}$ and less than or equal to $10V_{ac\ (RMS)}$	Greater than 10% THD (as a percentage of 60hz)	• To be evaluated to determine if result of normal system operations. • Permanent Repair within 90 days if source is from abnormal operating conditions.	• If Customer owned equipment notify customer • Reportable only if due to an abnormal operating conditions.
Stray or Contact Voltage	Greater than $10V_{ac\ (RMS)}$	Greater than 10% THD (as a percentage of 60hz)	• Safeguard area and/or disconnect supply and/or repair immediately through established response protocol. • To be evaluated to determine if result of normal system operations • Permanent Repair within 90 days if source is from abnormal operating conditions.	• If Customer owned equipment notify customer • Reportable only if due to an abnormal operating conditions.

Cost Analysis

During three cycles of testing between 2009 and 2011, Central Hudson has established that 89.19% of the findings identified during the manual stray testing efforts are normal to the operating system, and not due to contact voltage. Inclusion of these normally occurring voltages in the findings gives the perception that there are more potentially hazardous conditions than actually exist, and focuses ratepayer funding away from correcting true hazards to the public.

Cost savings can be achieved by utilizing total harmonic distortion as part of the analysis method in diagnosing the type of voltage and source of the found voltage. When the source and nature of the voltage are properly identified, repairs can be focused to the root cause of the problem. Also, through use of harmonic data to properly identify the type of voltage, unnecessary crew travel and attempts at mitigating a non-existent defect can be avoided if the source of the voltage is a true stray voltage. Below is a table detailing the cost savings associated with taking advantage of total harmonic distortion to identify the source of the voltage found.

	2009 Cost Savings	**2010 Cost Savings**	**Expected 2012 Savings**
Central Hudson	$128,200	$99,600	$100,000

Similar savings can be achieved, contingent upon the order of magnitude, by other Utilities based on this analysis.

Conclusion:

Making the language in the order consistent with the IEEE P1695 Working Group definitions and incorporating harmonics analysis into the process statewide will enhance the clarity of the order and will focus the efforts of the utilities on finding and mitigating the conditions that pose a risk to the public. The recommended changes to NYS PSC Safety Order# 04-M-0159 allows the focus of the contact voltage testing program to be identifying and mitigating true hazardous voltages and will enhance public safety, while reducing overall costs.

Appendix 6 B: Proposed Revision to the (Contact) Stray Voltage Manual Testing Cycle for Distribution Overhead, Transmission, and Pad Mounted Equipment

Background

In January 2005, the New York State Public Service Commission issued Electric Safety Standards (Case 04-M-0159). The Safety Standards require, among other things, that electric utilities annually perform manual stray voltage (also known as contact voltage) testing of all publicly accessible electric facilities and publicly accessible streetlights that are directly fed by the electric distribution system regardless of ownership. The Safety Standards require that each utility report annually on the progress of testing and associated repairs. The Safety Standards establish a revenue adjustment of 75 basis points on earnings for failure to test 100% of assets each year.

Scope of proposed change

Central Hudson is proposing that the Safety Standards be modified to eliminate the annual manual-testing requirement for overhead, underground residential distribution (URD), transmission facilities and substation fences and to substitute a requirement that utilities manually test these assets in conjunction with periodic onsite inspections.

Analysis

Elevated voltages generally result from one of two conditions on an electric distribution system, stray and contact voltage, as described in more detail in Appendix 6A. Stray Voltage is historically associated with neutral-to-earth voltage encountered at contact points. Stray voltage is a normally occurring phenomenon that can be found at low levels between two contact points at any property where electricity is grounded. Contact voltage is the primary concern for protecting the public. Contact voltage is an elevated voltage on a conductive surface which is the result of a defective component on the electric system. These conditions most frequently result from damaged insulation on low voltage secondary equipment. Secondary systems are not designed with systems to automatically detect these conditions.

Certain assets presently tested per the Safety Standards requirements are protected by very sensitive protection systems which would prevent the occurrence of contact voltage. Underground primary distribution, transmission and substation facilities are specifically designed to automatically remove the equipment from service if there were insulation breakdown. Nonetheless, these assets, about 220,000 facilities in New York, are tested annually, even though protection systems preclude the occurrence of contact voltage.

Each year more than 3.8 Million manual tests for contact voltage are conducted in New York State on a variety of utility and non-utility assets. In 2009 and 2010, a total of 470 electric shocks were reported to the utilities and confirmed upon investigation. Of those confirmed shocks, 54 in 2009 and 45 in 2010 were the result of defective utility equipment. The remainder of the shocks were the result of customer activities or as a result of defective equipment not owned by

the electric utilities. Figure 1 shows the number of confirmed shocks reported, by utility, from 2005 to 2010.

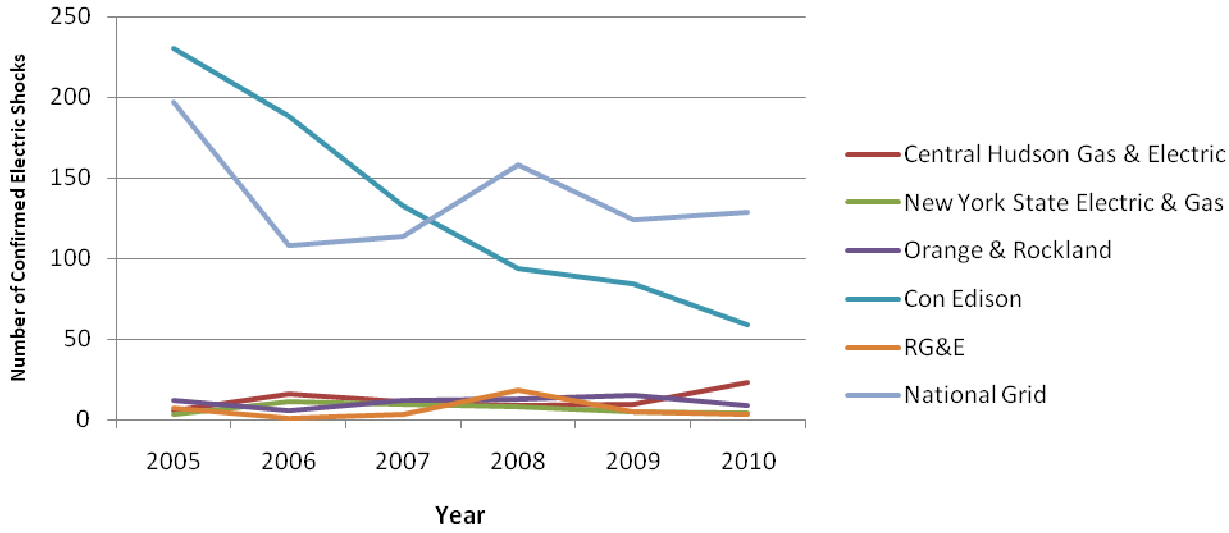


Figure 1 - Confirmed shocks reported from 2005 to 2010.

In 2010, confirmed electric shock reports had dropped to about 50% of the level that were reported in 2005. Most of that decrease was driven by improved performance in the Con Edison service area. In 2005 more than 50% of the shocks reported in the state were in the Con Edison service area. As a result of Con Edison's ability to deploy mobile testing technology to test for contact voltage in its underground service areas (approximately half of its service area), the number of confirmed shocks in Con Edison's service area has substantially decreased and represents approximately 26% of the total confirmed shocks reported in the state in 2010.

While the value of contact voltage testing in Con Edison's underground service area is apparent, when the statewide shock trends are examined and the Con Edison shocks are excluded, the improvement has been minimal. This trend is shown in Figure 2. The primary difference between Con Edison and the rest of the utilities in New York State is the use of the mobile detector in their underground areas. Con Edison's underground assets account for approximately 8% of the total assets in the state, the municipally owned street and traffic lights in New York account for an additional 3.5% of the assets in the state. Overhead transmission and distribution assets account for more than 82% of the assets in the state, because of the electric fields generated by these facilities, assets in these areas cannot be tested using the mobile detector.

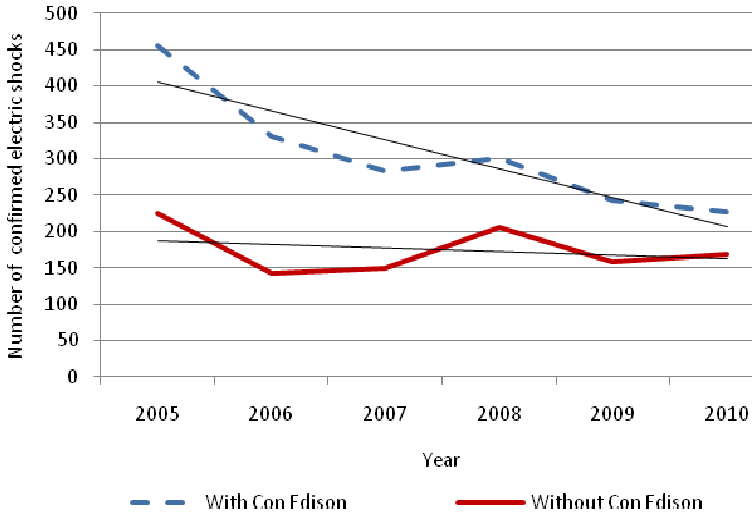


Figure 2 - Statewide confirmed electric shock reports shown with and without Con Edison's reports.

Overall Approximately 50% of electric shocks in both categories are objects that are not owned by the utilities, and are too numerous to test manually. They include a variety of objects in the urban landscape including sidewalks, scaffolds, fences and bus shelters. About half of the shocks reported in New York State are from defective customer owned equipment that are reported to and confirmed by the utility. Figure 3 shows the trend of these shocks with and without Con Edison. As expected, asset based manual testing has had very little impact on reducing shocks in this category. Mobile testing, as shown by the line which includes Con Edison, appears to have had some impact on reducing shocks in this category. A similar trend is emerges when examining shocks which are the result of defective utility equipment as shown in Figure 4.

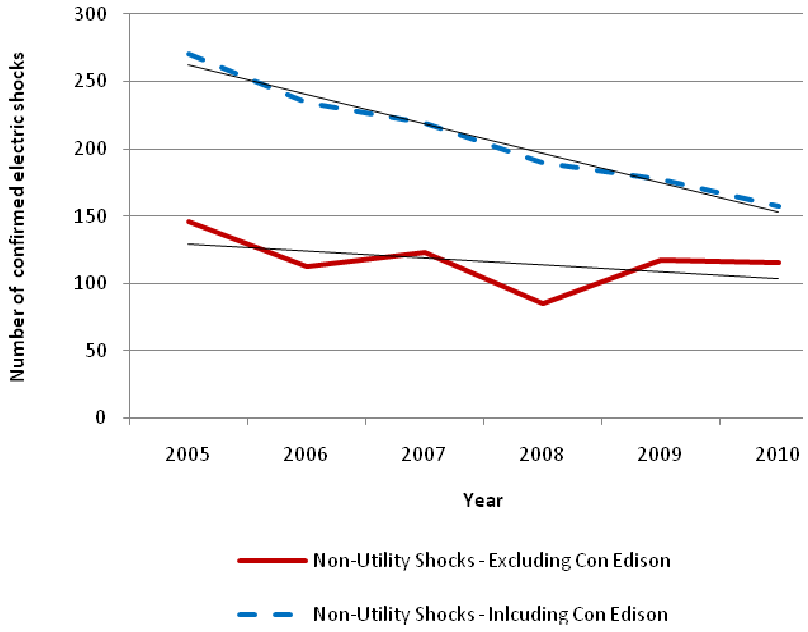


Figure 3 - Statewide confirmed electric shock reports resulting from defective customer equipment.

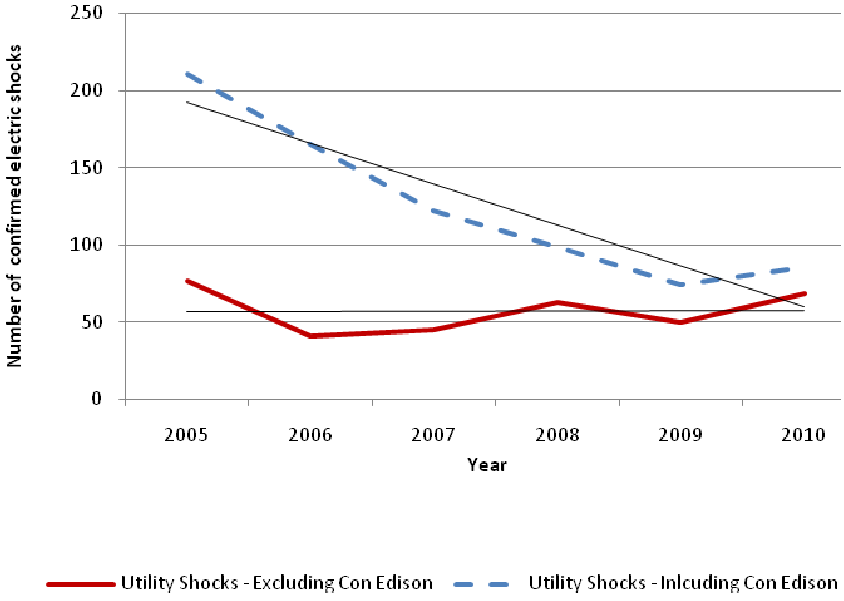


Figure 4 - Statewide confirmed electric shock reports resulting from defective utility equipment.

The data suggests that the initial manual testing, performed in 2005, provided some benefit reducing shocks by nearly 22% statewide. Since that time, when the results of Con Edison's program are excluded, and only the results of an asset based manual testing program are evaluated there has been negligible reduction in confirmed electric shock reports. More than 75% of the tested assets are overhead distribution facilities which make up the large majority of the assets owned by the Upstate utilities; these overhead facilities are tested via manual testing

While the impact of testing some assets such as streetlights is clear in reducing shocks, the data indicates that the testing has had little or no impact on reducing shocks associated with other assets including URD and overhead assets.

There are three main drivers for this behavior. The probability that a person or animal will receive a shock from a given asset is driven by:

- Probability of an undetected failure for the given asset
- Duration that the object is energized
- The frequency in which a human or animal comes into contact with the object.

The intent of the annual manual testing program is to reduce the time that elapses between the time that the object becomes energized and the time that it is detected, with the hope that the detection is made via a proactive test, rather than as a result of a shock report. While there are isolated instances of design changes as a result of detections in the manual testing program the objective of the program was not to reduce the rate of failure, nor was the program aimed at decreasing the frequency of pedestrian contact with utility equipment.

The results of the manual testing program over the last several years show that the vast majority of the assets that are tested in a given year fail at a rate of less than .025%. In some instances there are no confirmed cases of contact voltage ever detected on some of the asset classes, including transmission structures and substation fences, which are tested annually. The individual failure rates of each of the asset types are shown in Table 1.

Asset Class	Number of Units	Statewide 2007 Failure Rate	Statewide 2008 Failure Rate	Statewide 2009 Failure Rate[3]	Statewide 2010 Failure Rate	2011 Central Hudson ONLY
Overhead Distribution	2,872,462	0.0086%	0.0254%	0.0281%	0.0246%	0.0091%
Underground (NON-URD)	307,124	0.0048%	0.0096%	0.0396%	0.0239%	0.0000%
URD	113,145	0.0023%	0.0122%	0.0046%	0.0070%	0.0000%
Street and Traffic Lights	240,227	0.3575%	0.3473%	0.5138%	0.2769%	0.0474%
Transmission Underground	2,158	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
Transmission[4]	206,742	0.0477%	0.0348%	0.1311%	0.1574%	0.0000%
Substation Fences	2,115	0.0701%	0.0000%	0.0000%	0.2104%[5]	0.0000%

Table 1 – Distribution of electric assets and their failure rates in New York State.

[3] Beginning in 2009 utilities were required to report all findings greater than 1 volt, down from the 8 volt threshold used in previous years.

[4] All reported detections were the result of Neutral to Earth Voltage and Induction. There have been no confirmed cases of contact voltage associated with transmission facilities in New York State.

[5] 2010 failure rate includes two detections on by the mobile contact voltage detector which would not have been detected via manual testing. In both cases the elevated voltage was not a result of defective system equipment

Since the failure modes and detection frequencies for each asset class are different, each class of assets will be analyzed independently.

Streetlights

The rate of detection on street and traffic lights continues to be the highest of all asset classes, .378% per year (Figure 5). The high detection rate on these assets is primarily due to the fact that they are large metallic structures in the pedestrian walkway. In addition, no permanently installed cost effective and reliable protection systems exist to detect and eliminate elevated voltages on these assets. Because of the higher rate of detection on this group of assets, Central Hudson recommends annual testing continue as stated in the Order on these assets.

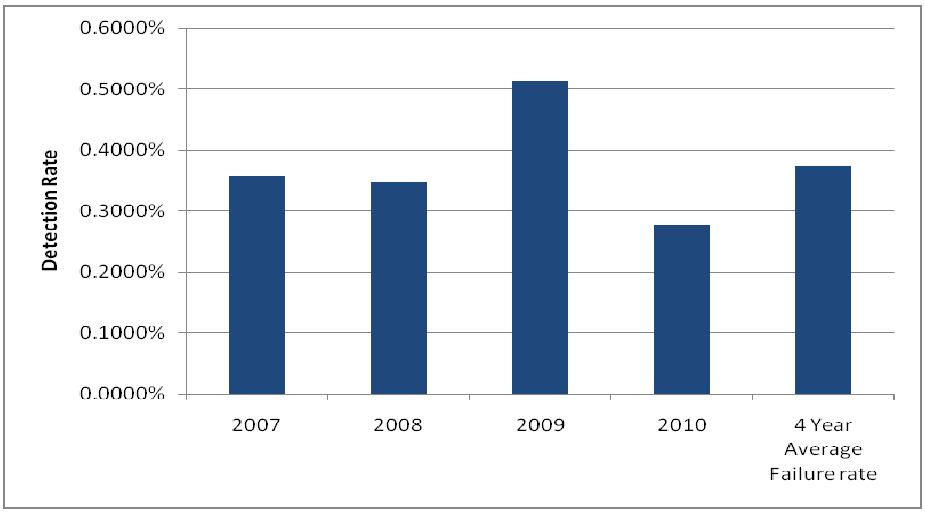


Figure 5 – Statewide detection rate on streetlights and traffic lights

Underground Structures (Non-URD)

The contact voltage detection rate on Underground Structures via manual testing is less than 0.1%. When tested with the mobile detector, the detection rate is 2 to 4 times higher, ranging between 0.2% and 0.4% (Figure 6). These structures have the second highest rate of contact voltage detections and, because of their location in predominantly densely populated urban areas, present a higher probability of a person coming into contact with them. Central Hudson recommends no change to the Order for this asset class.

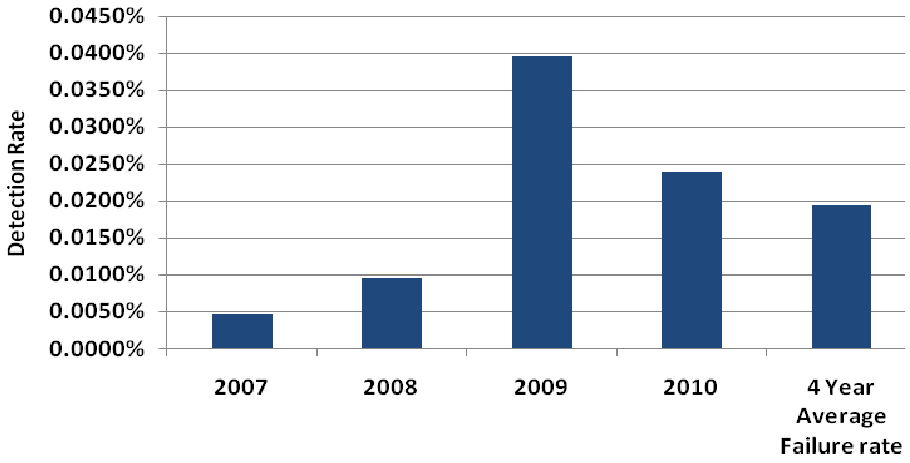


Figure 6 – Statewide detection rate on underground assets.

URD Underground Structures

URD structures as a group represent one of the best performing asset classes. These units have an average detection rate of approximately 0.006%. By design, failures on URD facilities that could result in contact voltage are normally detected before testing. A failure on the primary side of the unit would result in the feeder automatically coming out of service. Because these units do not feed traditional networks, failures on the secondary side usually result in customer complains of flickering lights and low voltage. During 2009 and 2010, there were less than 10 shocks associated with the state-wide population of over 170,000 URD facilities. Because of the low failure rate, the negligible impact of manual testing, and the low number of shocks associated with URD Facilities, Central Hudson recommends that these units be excluded from the annual manual testing requirement. Since the majority of the testing cost associated with these facilities is the cost to deploy personnel to test the equipment Central Hudson further recommends that URD facilities be tested at a cycle consistent with the Facility Inspection Cycle for this asset class as identified in the Electric Safety Standard Order.

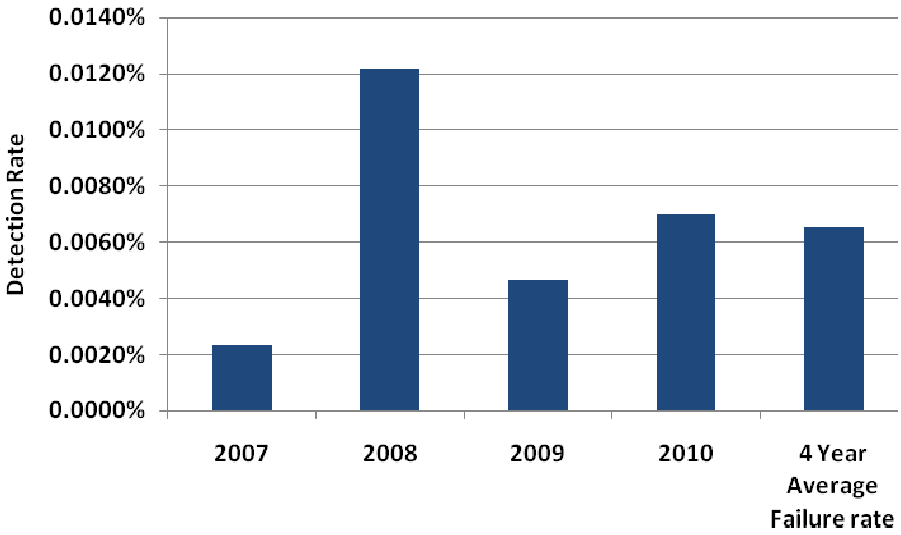


Figure 7 – Statewide detection rate on underground residential distribution assets.

Transmission Structures and Substation Fences

There are more than 200,000 transmission structures and substation fences in New York State. These facilities are generally located on utility right of ways that are not generally accessed by the public. Unlike secondary distribution facilities, these facilities are not prone to contact voltage because the lines are protected by very sensitive relays that are designed to remove the circuit from service as soon as an insulator begins to fail and leak voltage. When elevated voltages are detected on these facilities, it is generally the result of an imbalance of load on the line which causes a small voltage to be induced on nearby metal objects. Since the amount of the imbalance is limited by the protective circuits, and the structures are constructed with extensive grounding systems that protect against these types of voltages, the risk of a shock from contact voltage is nearly zero. The notable increase in the number of reported detections on overhead transmission from 2008 to 2009 is a result of the change in the Safety Standards in late 2008 that required that all detections >1 volt be reported by the utility. No underground transmission structures have been found to be energized as a result of contact voltage since the beginning of the program. The increase in substation fences in 2010 was the result of two pieces ancillary equipment, a doorbell and a garage door opener, and not a result of defective system equipment. Refer to Figure 9 for results

In fact, there have been no substantiated electric shock reports from transmission facilities or substation fences since 2005. Central Hudson recommends that transmission facilities and substation fences be excluded from the annual manual testing requirements. Since the majority of the testing cost associated with these units is the cost to deploy personnel to test the equipment Central Hudson recommends that transmission structures and substation fences be tested at a cycle consistent with the Facility Inspection Cycle for this asset class as identified in the Electric Safety Standard Order.

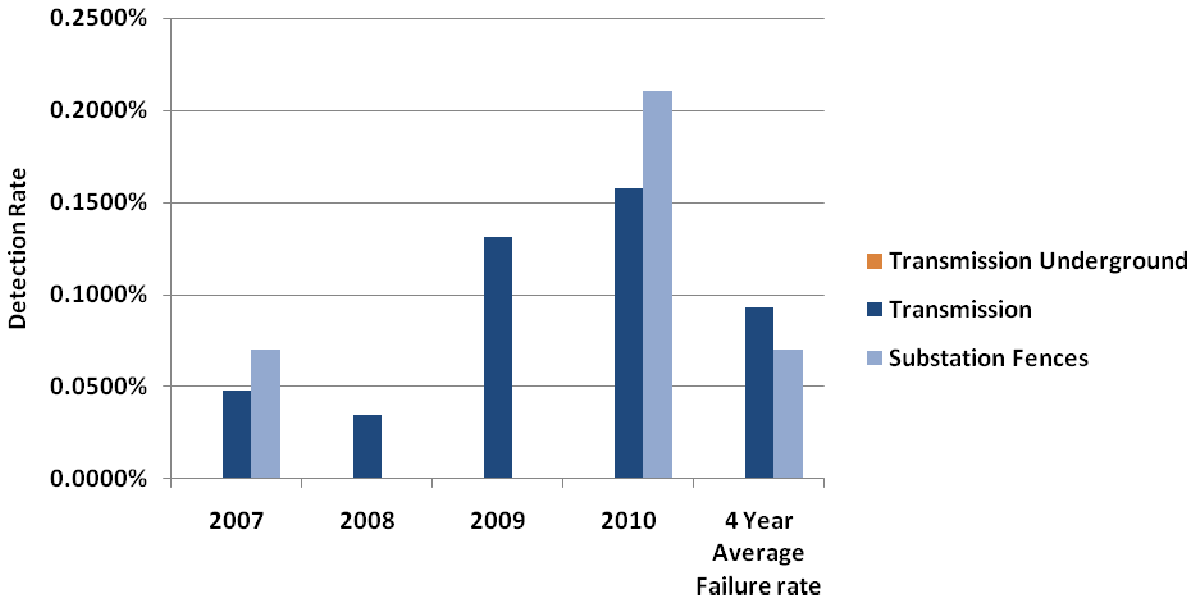


Figure 9 – Statewide detection rate on transmission and substation assets

Overhead Distribution

New York State has approximately 2.9 million overhead distribution assets, accounting for more than 75% of the electric transmission and distribution assets in the state, and yet these assets account for a very small number of shocks, an average of 3[6] per year and 4.47% of Central Hudson's reported shocks resulting from utility equipment over the three year period. Overhead distribution assets contribute proportionally less shocks than underground assets primarily because, unlike the underground, they have a limited number of failure points that are accessible to the public. Whereas an underground cable failure has the potential to conduct voltage to surface structures frequently contacted by the public (service boxes, metal curbs, sidewalks, etc), overhead system failures rarely energize surface structures and the public does not typically encounter conductive equipment at pole locations. Given the statewide shock performance over the past 6 years, it is evident that the manual testing performed on these assets has no measurable impact on reducing shocks. Central Hudson recommends that these units be excluded from the annual manual testing requirements. Since the majority of the testing cost associated with these units is the cost to deploy personnel to test the equipment, Central Hudson recommends that overhead distribution facilities be tested at a cycle consistent with the Facility Inspection Cycle for this asset class as identified in the Electric Safety Standard Order.

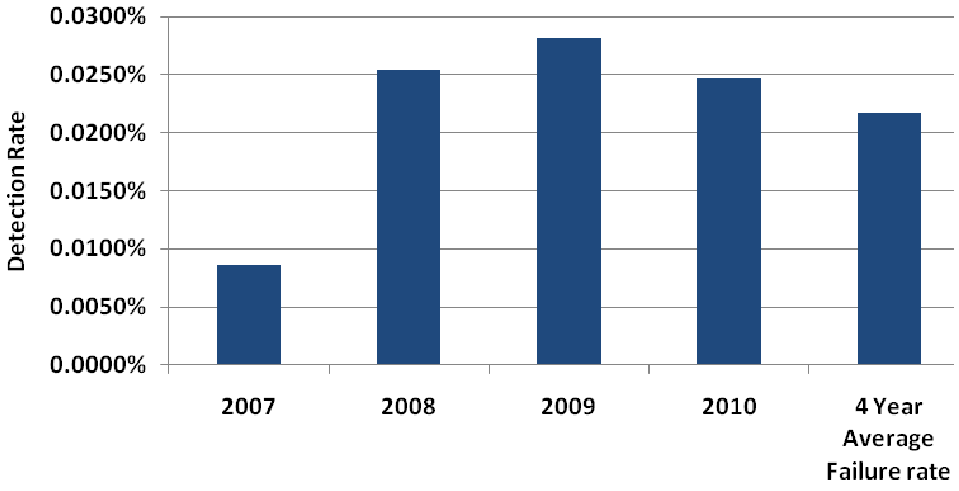


Figure 10 – Statewide detection rate on overhead assets

The data collected and reported by the New York Utilities suggests that following the initial round of asset based manual testing there was little continuing benefit in reducing electric shocks. There are two main drivers for this performance. Firstly more than 50% of the reported electric shocks are the result of defective customer owned equipment which is not likely to be found during asset based manual testing. Secondly the failure rate of the vast majority of assets

[6] Average of shocks between 2009 and 2011. Prior to 2009 utilities were not required to report data with the level of detail required to make this determination.

tested is very low. Street and traffic lights are clearly the outlier in performance across the assets tested in New York. The average failure rates are shown in Figure 11.

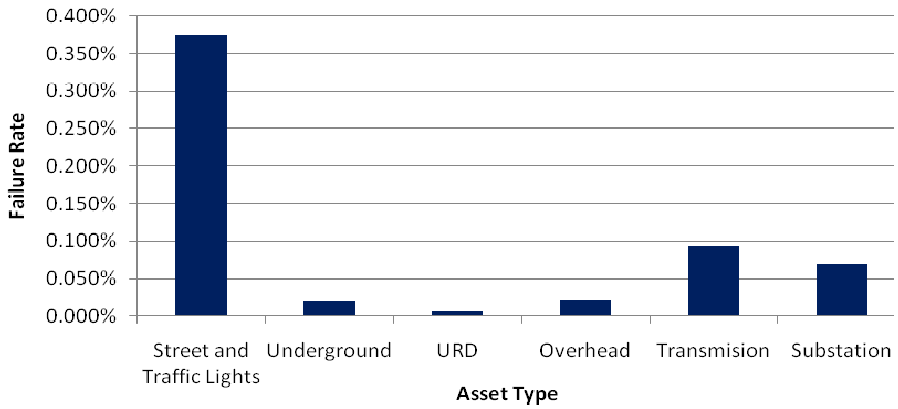


Fig. 11. Average detection Rates of Various Assets

Cost Analysis

The costs of Central Hudson's proposed program revisions have been modeled, and the overall savings are summarized below. The future costs are based on the proposed scope and the current testing contract rates.. As the scope of the programs changes it is likely that the unit costs will increase, potentially causing a slight decrease to the overall annual saving.

Utility	Number of Structures	Current Annual Average Program Costs	Proposed Annual Average Program Costs	Annual Savings
Central Hudson	241,471	$1,350,000	$680,000	$670,000

The data collected indicates that the proposed changes can be implemented without increasing the risk of electric shocks measurably in the state and at the same time offers significant savings to the ratepayers of New York.

Appendix 6 C Proposed Revision to URD Equipment Inspections

Summary

In January 2005, the New York State Public Service Commission issued Electric Safety Standards (Case 04-M-0159). The Safety Standards require, among other things, that electric utilities perform detailed visual inspections of all utility owned electric assets every five years. The first cycle of inspections began in 2005 and all utilities in the state completed their inspections by December 31, 2009. The second inspection cycle began in 2010 and is currently on target for completion in 2014.

In addition to the requirement to inspect all assets every 5 years the order requires that each year utilities meet an inspection completion target both annually, and at the end of each cycle. The order further requires that all defects be classified into one of four levels based on severity; and then addressed within established timeframes based on those classifications. Each year the utilities report on the progress of inspections and repairs in a report that is required under the order. Finally, the order includes a revenue adjustment of 75 basis points on earnings for failure to meet the annual and 5 year targets set by the Commission.

Scope of proposed change

Central Hudson is proposing that the order be modified to require only an external visual inspection and contact voltage test of each publically assessable above grade URD asset every 5 years.

Analysis

New York State has more than 200,000 URD assets. The impact on reliability of the inspection program is undetectable on this class of assets. This is due in part to their robust designs and the number of customers that are fed by each asset. The units generally feed less than 10 customers each. When failures of these units do occur they do not normally fail violently, because the primary supply is protected with fuses which act quickly to interrupt the fault.

Another factor is the inability of an inspector to visually detect defects on these assets. Most of the URD assets are below the ground, and the portions of the system that are above the ground have limited access points, a design which enhances the performance of these systems. Most of the cost associated with the inspection is the work that is required to perform the internal inspection. The external inspection, along with a contact voltage test is approximately half of the cost of an internal visual inspection. If the contact voltage test indicates an elevated voltage at the location the unit will be opened as a part of the investigation of the elevated voltage.

There are some easily detectable assets conditions which Central Hudson believes are significant enough to warrant inspection through an external visual inspection. Because URD transformers are often located above ground the units are subjected to movement by external forces such as snow plows, lawn mowers and automobiles. When these units are moved off of their bases the

high voltage primary cable may be exposed to the public. While the cable is designed to withstand normal operating voltages and does not pose an imminent risk to the public, it is a situation that is easily and cost effectively remedied. The second issue that is easily detected are broken locks. Access to above ground URD transformers is generally secured using an external lock. These locks are also subjected to the environment and in the course of the inspection program are found damaged or missing. Missing locks do not pose an imminent risk to the public, but the condition significantly increases the potential for unauthorized access by a member of the public, this condition too is easily and cost effectively remedied. Having working locks in place also improves the utilities ability to respond to outages in a timely manner.

Data collected in 2009 and 2010 indicates that for Central Hudson 99.8% of the deficiencies identified during inspections can be identified via an external visual inspection.

Pad mount URD Inspections						
Utility	Deficiency Total 2009-2010	Deficiency Priority			Deficiency Location	
		I	II	III	Internal	External
Central Hudson	462	93	41	328	1	461
Other NYS Utilities	7930	646	2485	4799	699	7226
Total	**8392**	**739**	**2526**	**5127**	**700**	**7687**
Percentage of Total		**8.81%**	**30.10%**	**61.09%**	**8.34%**	**91.60%**

Impact on Public Safety and Reliability

No impact on reliability was detected as a result of the inspection program; there is no anticipated impact on reliability as a result of this change. The proposed change would include an external visual inspection to ensure that the public could not access the high voltage portions of the transformer as well as a test for contact voltage. The inspection frequency remains unchanged; there is no anticipated impact to the current level of public safety.

Cost Analysis

Utility	Number of URD Units	Current Program Costs	Future Program Costs	Increase\Decrease
Central Hudson	14,800	$116,704	$65,182	($51,522)

Similar savings can be achieved, contingent upon the order of magnitude, by other Utilities based on this analysis.

Exhibit 1: Certifications

CERTIFICATION
[STRAY VOLTAGE TESTING]

STATE OF NEW YORK)
) ss.:
COUNTY OF DUTCHESS)

Paul E. Haering, on this 15th day of February 2012, certifies as follows:

1. I am the Vice President, Engineering & System Operations of Central Hudson Gas and Electric (the "Company"), and in that capacity I make this Certification for the annual period ending December 31st, 2011 based on my knowledge of the testing program adopted by the Company in accordance the Public Service Commission's Orders issued and effective January 5, July 21, 2005, and December 15, 2008 in Case 04-M-0159 (collectively the "Orders"), including the Quality Assurance Program filed by the Company with the Commission.

2. In accordance with the requirements of the Orders, the Company developed a program designed to test (i) all of the publicly accessible electric facilities owned by the Company ("Facilities") and (ii) all streetlights located in public thoroughfares in the Company's service territory ("Streetlights"), as identified through a good faith effort by the Company, for stray voltage (the "Stray Voltage Testing Program").

3. I am responsible for overseeing the Company's Stray Voltage Testing Program and in that capacity I have monitored the

Company's Stray Voltage Testing Program during the twelve months ended December 31st, 2011 (the "Twelve-Month Period").

4. I hereby certify that, to the best of my knowledge, information and belief, the Company has implemented and completed its Stray Voltage Testing program for the Twelve Month Period. Except for untested structures that are identified as temporarily inaccessible in the Company's Annual Report, submitted herewith, the Company is unaware of any Facilities or Streetlights that were not tested during the Twelve-Month Period.

5. I make this certification subject to the condition and acknowledgment that it is reasonably possible that, notwithstanding the Company's good faith implementation and completion of the Stray Voltage Testing Program, there may be Facilities and Streetlights that, inadvertently, may not have been tested or were not discovered or known after reasonable review of Company records and reasonable visual inspection of the areas of the service territory where Facilities and Streetlights were known to exist or reasonably expected to be found.

Paul J. Hanley

Sworn to before me this 15th day of February, 2012

Notary Public:

JILL SAMMON
Notary Public, State of New York
No. 01SA6038324
Qualified in Dutchess County
Term Expires March 6, 20[illegible]

CERTIFICATION
[FACILITY INSPECTIONS]

STATE OF NEW YORK)
) ss.:
COUNTY OF DUTCHESS)

Paul E. Haering, on this 12th day of February 2012, certifies as follows:

1. I am the Vice President, Engineering & System Operations of Central Hudson Gas and Electric (the "Company"), and in that capacity I make this Certification for the annual period ending December 31st, 2011 based on my knowledge of the inspection program adopted by the Company in accordance with the Public Service Commission's Orders issued and effective January 5, July 21, 2005, and December 15, 2008 in Case 04-M-0159 (collectively the "Orders"), including the Quality Assurance Program filed by the Company with the Commission.

2. The Company has an inspection program that is designed to inspect all of its electric facilities on a five-year inspection cycle, as identified through a good faith effort by the Company ("Facilities"), in accordance with the requirements of the Orders (the "Facility Inspection Program").

3. I am responsible for overseeing the Company's Facility Inspection Program and in that capacity I have monitored the program during the twelve months ended December 31st, 2011 (the "Twelve-Month Period").

4. I hereby certify that, to the best of my knowledge, information and belief, the Company has implemented and completed its Facility Inspection Program to inspect approximately 18 % of its Facilities during calendar year 2011, in order to comply with the five-year inspection cycle required under the Orders.

Paul C Manz

Sworn to before me this 15th day of February, 2012

Notary Public:

JILL SAMMON
Notary Public, State of New York
No. 01SA6038324
Qualified in Dutchess County
Term Expires March 6, 20[illegible]