



**Department
of Public Service**

**2019 ELECTRIC SAFETY STANDARDS
PERFORMANCE REPORT**

Electric Safety & Reliability
Office of Electric, Gas, and Water
June 2020

SUMMARY

On January 5, 2005, the Commission established Electric Safety Standards to safeguard the public from exposure to stray voltage and to identify and eliminate potentially harmful conditions before serious safety hazards and/or reliability deficiencies develop.¹ The Electric Safety Standards include: (1) stray voltage testing of streetlights and electric facilities that are accessible to the public, using certified voltage detection devices; (2) inspection of utility electric facilities on a minimum of a five-year cycle; (3) recordkeeping, certification, quality assurance and reporting requirements; and, (4) adoption of the National Electric Safety Code as the minimum standard governing utility construction, maintenance, and operations.

The utilities are required to identify and record all voltage findings of 1.0 volt (V) or more as part of the stray voltage testing requirements. In 2019, manual stray voltage testing was performed on approximately one million utility facilities statewide, resulting in the identification of 302 stray voltage conditions; of which 199 (66%) were at voltage levels of 4.5V or higher.² The overall total of stray voltage findings decreased from the 2018 level but the percentage of findings above 4.5V was higher than 2018. Mobile stray voltage testing was also performed by the utilities in areas required by Commission order.³ This effort is focused primarily in New York City, yielding 7,683

¹ Case 04-M-0159, Proceeding on Motion of the Commission to Examine the Safety of Electric Transmission and Distribution Systems, Order Instituting Electric Safety Standards (issued January 5, 2005). These Safety Standards are applicable to the investor-owned utilities-- Central Hudson Gas & Electric Corporation (CHGE), Consolidated Edison Company of New York, Inc. (Con Edison), New York State Electric & Gas Corporation (NYSEG), Niagara Mohawk Power Corporation d/b/a National Grid (National Grid), Orange and Rockland Utilities, Inc. (ORU), Rochester Gas and Electric Corporation (RG&E), and the municipal electric utilities.

² Readings below 4.5V are considered low voltage in nature and not an immediate safety concern.

³ Case 06-M-1467, Petition of Orange and Rockland Utilities, Inc. to Modify Its Stray Voltage Testing Program, Order Adopting Changes to Electric Safety Standards (issued December 15, 2008).

findings, of which approximately 5,988 were found on non-utility facilities. In addition to testing programs, utilities are made aware of potential stray voltage locations through information provided to them by the public. In 2019, there were 334 calls from customers reporting shock incidents that resulted in 158 confirmed cases of stray voltage; 53 incidents were caused by problems with utility owned facilities, and 105 incidents were traced to defective customer-owned equipment or wiring. All stray voltage findings identified through testing or from customer calls were made safe.

The Electric Safety Standards require that each utility visually inspect 20% of its electric facilities per year to ensure all facilities are inspected within a five-year period.⁴ Calendar year 2019 marked the fifth year of the third five-year inspection cycle and all utilities completed and met the year's inspection cycle criteria. In 2019, the investor-owned utilities identified a total of 84,961 deficiencies. The majority of these deficiencies were not immediate concerns, and there was a 22% reduction in deficiencies requiring immediate repair when compared to 2018. Other deficiencies found during the inspection process are required to be repaired within appropriate time frames as set forth in the Safety Standards. All utilities were in full compliance with all testing and inspection requirements in 2019.

STRAY VOLTAGE TESTING

Manual Stray Voltage Testing

Table 1 lists the number of stray voltage findings by facility type in 2019 at 1V or above resulting from manual testing.⁵ The total manual stray voltage findings

⁴ An inspection requires a qualified and trained individual to evaluate and examine the entire structure to determine its condition and the potential for it to cause or lead to safety hazards or adversely affect reliability.

⁵ These findings do not include instances of stray voltage discovered by utility personnel as part of their routine work or instances found by other means, such as customer reports. This data also does not include instances of stray voltage discovered by mobile detection.

reported in Table 1 for 2019 show a decrease from 2018. While the number of stray voltage findings on streetlights by Con Edison almost doubled in 2019, the amount mirrors the historic levels of findings recorded prior to 2018-2019.

**Table 1: Stray Voltage Findings from Manual Testing
Greater Than 1 V by Facility Type**

2019 Test Cycle					
Company	Streetlights	Underground Distribution	Overhead Distribution	Transmission	Total Findings
Con Edison	201	7	0	0	208
National Grid	1	0	14	1	16
NYSEG	11	0	10	13	34
RG&E	4	0	1	0	5
Central Hudson	6	3	21	1	31
Orange & Rockland	2	0	6	0	8
Municipal Electric	0	0	0	0	0
Total	225	10	52	15	302
2018 Test Cycle					
Company	Streetlights	Underground Distribution	Overhead Distribution	Transmission	Total Findings
Con Edison	109	10	4	0	123
National Grid	55	0	11	27	93
NYSEG	4	0	16	5	25
RG&E	6	0	1	0	7
Central Hudson	7	0	63	77	147
Orange & Rockland	1	0	0	0	1
Municipal Electric	0	0	0	0	0
Total	182	10	95	109	396

The total manual stray voltage findings reported in Table 2 for 2019 show an increase from 2018 for findings greater than 4.5V. As has been the case historically, the majority of the incidences are attributable to streetlights.

Table 2: Stray Voltage Findings from Manual Testing Greater Than 4.5 V

2019 Test Cycle					
Company	Streetlights	Underground Distribution	Overhead Distribution	Transmission	Total Findings
Con Edison	160	6	0	0	166
National Grid	0	0	4	0	4
NYSEG	6	0	4	3	13
RG&E	4	0	1	0	5
Central Hudson	4	0	4	0	8
Orange & Rockland	0	0	3	0	3
Municipal Electric	0	0	0	0	0
Total	174	6	16	3	199
2018 Test Cycle					
Company	Streetlights	Underground Distribution	Overhead Distribution	Transmission	Total Findings
Con Edison	91	4	4	0	99
National Grid	18	0	8	8	34
NYSEG	3	0	9	1	13
RG&E	6	0	1	0	7
Central Hudson	7	0	3	1	11
Orange & Rockland	0	0	0	0	0
Municipal Electric	0	0	0	0	0
Total	125	4	25	10	164

Mobile Stray Voltage Detection Program

Since the Mobile Stray Voltage Detection Program was established by the Commission in 2008,⁶ Con Edison is required to complete 12 system scans, using mobile stray voltage testing equipment, on an annual basis. In June 2011, the Commission directed that two surveys be completed using mobile stray voltage detection equipment in Buffalo and one survey in Yonkers, White Plains, Albany, Niagara Falls, Rochester, and New Rochelle.⁷ Across the State, the majority of mobile stray voltage findings continue to be low voltage in nature (1.0-4.4V) and are related to Streetlight and Traffic Signal control devices, followed by non-utility facilities. The results of the scans completed in 2019 are summarized below in Tables 3, 4, and 5.

Con Edison's 12 New York City scans show an 11% decrease from last year's mobile survey results. Reductions in findings were seen in the utility's underground and non-utility facilities. These non-utility facilities, such as energized customer or contractor equipment and various New York State Department of Transportation (DOT) facilities, remain the largest sources of stray voltage in New York City, as has been the case historically.

Tables 4 and 5 both indicate an increase in findings as a result of mobile testing in the cities of Buffalo and Rochester. However, the total of findings is within historic levels and the vast majority are low voltage in nature, which has also been the case historically.

⁶ Case 07-E-0523, Con Edison - Electric Rates, Order Establishing Rates for Electric Service (issued March 25, 2008).

⁷ Case 10-E-0271, Examination of Mobile Testing Requirements of the Safety Standards, Order Requiring Additional Mobile Stray Voltage Testing (issued June 23, 2011).

Table 3: Findings by Con Edison Utilizing Mobile Detection

	Facility	1.0-4.4V	4.5-24.9V	>25V	Total
2019 Test Cycle					
New York City					
(12 scans)	Underground	346	159	17	522
	Street Lights/Traffic Signals	541	352	280	1,173
	Non-Utility Facilities	3,953	1,738	297	5,988
Total		4,840	2,249	594	7,683
2018 Test Cycle					
New York City					
(12 scans)	Underground	416	213	31	660
	Street Lights/Traffic Signals	422	364	307	1,093
	Non-Utility Facilities	4,505	2,022	365	6,892
Total		5,343	2,599	703	8,645

Table 4: Findings by National Grid for the City of Buffalo Utilizing Mobile Detection

	Facility	1.0-4.4V	4.5-24.9V	>25V	Total
2019 Test Cycle					
Buffalo	Underground	0	0	0	0
(2 scans)	Street Lights/Traffic Signals	646	119	16	781
	Non-Utility Facilities	0	0	0	0
Total		646	119	16	781
2018 Test Cycle					
Buffalo	Underground	0	0	0	0
(2 scans)	Street Lights/Traffic Signals	560	84	12	656
	Non-Utility Facilities	0	0	0	0
Total		560	84	12	656

Table 5: Findings by RG&E for the City of Rochester Utilizing Mobile Detection

	Facility	1.0-4.4V	4.5-24.9V	>25V	Total
2019 Test Cycle					
Rochester	Underground	16	3	0	19
	Street Lights/Traffic Signals	50	21	2	73
	Non-Utility Facilities	38	12	2	52
Total		104	36	4	144
2018 Test Cycle					
Rochester	Underground	5	3	0	8
	Street Lights/Traffic Signals	40	15	6	61
	Non-Utility Facilities	11	2	0	13
Total		56	20	6	82

Shock Reports

In addition to their testing programs, utilities are made aware of potential stray voltage locations through information provided to them by the public. Utilities are required to respond to and investigate all shock reports, including reports involving domestic animals, regardless of whether or not injuries occurred. Table 6 provides a summary for 2018 and 2019 of the electric shock reports received by the utilities where instances of stray voltage were substantiated after field investigation. Table 6 also classifies shock reports based on the source of the stray voltage. Investigations of shock reports where the cause of the stray voltage was determined to be due to utility owned or operated equipment are classified as company responsibility. Customer responsibility issues include shock incidents where the cause of the stray voltage was found to be due to the customer’s wiring, equipment, or was attributed to other entities such as the City of New York.

In 2019, shock reports from the public showed a decrease from last year’s total count. This is attributable to a reduction in incidents that were ultimately found to be issues associated with both utility and customer equipment.

Table 6: Summary of Shock Reports

2019			
Company	Substantiated Stray Voltage	Company Responsibility	Customer Responsibility*
Con Edison	49	23	26
National Grid	56	11	45
NYSEG	26	12	14
RG&E	3	3	0
Central Hudson	14	1	13
Orange & Rockland	10	3	7
Municipal Electrics	0	0	0
Total	158	53	105
2018			
Company	Substantiated Stray Voltage	Company Responsibility	Customer Responsibility*
Con Edison	77	30	47
National Grid	106	43	63
NYSEG	15	5	10
RG&E	1	1	0
Central Hudson	22	5	17
Orange & Rockland	8	4	4
Municipal Electrics	0	0	0
Total	229	88	141

* The total shock reports listed under Customer Responsibility include cases where responsibility was attributed to other non-utility entities, such as the City of New York

INSPECTION AND REPAIRS OF ELECTRIC FACILITIES

The inspection process involves visual inspection of electric facilities to identify any damage or problem that may cause hazardous conditions or reliability concerns. Inspections are performed by both utility employees and contractors, all of whom first receive training including instruction on the common grading system used by New York electric utilities to classify facility deficiencies. If an inspection reveals a

deficiency, the Electric Safety Standards require utilities to make all repairs necessary to eliminate the deficiency based upon its severity:

- Level I discoveries must be repaired within one week of discovery,
- Level II discoveries must be repaired within one year of discovery,
- Level III discoveries must be repaired within three years of discovery, and
- Level IV conditions do not require repair but are identified to be monitored.

The Electric Safety Standards also require that the utilities use a detailed reporting system that captures deficiencies by equipment type (poles, transformers, and cables), priority level, whether actions have been taken, and the timeliness of the repair activities in relation to the assigned priority level.

Electric Facility Inspections

The Electric Safety Standards require utilities to complete inspections on 20% of their facilities each year, so that 100% of a utility's transmission and distribution facilities are inspected at least once every five years. Calendar year 2019 was the fifth year of the third five-year cycle of the inspection program begun in 2005. All utilities, except Con Edison, met the requirement to inspect a minimum of 100% of their facilities by the end of the fifth year of the current cycle. Con Edison is not required to inspect a minimum of 100% because in Case 16-E-0060, the Commission established a pilot enhancement program for Con Edison's Structure Inspection and Repair programs.⁸ This pilot allocates efforts and funds toward decreasing the repair backlog while incorporating more robust inspection efforts, including infrared scanning and ampere testing in the underground structures. The increased cost to perform these additional measures is offset by the extension of the inspection cycle. In addition, the pilot provides for targeted mobile contact voltage scans in areas with a history of repeat stray voltage detection.

⁸ Case 16-E-0060, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service, Order Approving Electric and Gas Rates (issued January 25, 2017), Joint Proposal at 73, footnote 74 and Appendix 15.

Electric Facility Inspection Findings

In 2019, inspections were performed on approximately 690,316 utility facilities across the State. Inspections performed in 2018 totaled approximately 740,747. Table 7 provides a summary of deficiencies for 2018 and 2019 by utility and facility type. All utilities realized improvements in total deficiencies found with the exception of RG&E and Orange & Rockland. RG&E experienced a significant increase in findings on its underground system, while Orange & Rockland saw a major rise in deficiencies on its overhead distribution system. The driver for the increase at RG&E was a result of new regulations enacted by the City of Rochester in 2019 that require all underground structures in the city to be brought up to grade level and the surrounding pavement restored, if necessary, and it is anticipated that this level of repair work will continue going forward. With respect to Orange & Rockland, the company increased its inspections on the overhead system by 30% from 2018 totals, with the primary driver for the higher deficiency levels being tree related conditions. The company will be devoting additional resources to this area in an effort to mitigate and reduce the deficiencies going forward.

**Table 7: Deficiencies by Facility Type
Found by Investor-Owned Utilities**

2019 Inspection Cycle						
Company	Underground	Distribution	Transmission	Pad Mount	Street Lights	Total
Con Edison	19,114	1,938	18	1,063	0	22,133
National Grid	740	37,741	1,347	557	562	40,947
NYSEG	437	7,260	573	79	106	8,455
RG&E	2,106	1,831	453	33	2	4,425
Central Hudson	2	5,867	333	61	0	6,263
Orange & Rockland	169	2,357	105	107	0	2,738
Total	22,568	56,994	2,829	1,900	670	84,961
2018 Inspection Cycle						
Company	Underground	Distribution	Transmission	Pad Mount	Street Lights	Total
Con Edison	18,582	8,184	6	1,909	0	28,681
National Grid	1,321	43,799	2,677	628	341	48,766
NYSEG	108	9,996	610	136	495	11,345
RG&E	671	2,401	341	50	0	3,463
Central Hudson	0	8,582	275	114	0	8,971
Orange & Rockland	18	697	100	8	0	823
Total	20,700	73,659	4,009	2,845	836	102,049

Table 8 lists the number of deficiencies found in 2019 by severity level and facility type. Compared with the 2018 results, deficiencies found in 2019 were significantly lower in all categories except underground facilities, realizing an approximately 20% decrease in the aggregate. 2019 marks the second consecutive year wherein there was a significant decrease in the number of deficiencies found during the inspection process. Particularly notable is the fact that Level I conditions decreased 22% from 2018 to 2019, the third consecutive year of a significant reduction in Level I conditions. A review of this category revealed that the Con Edison underground system was responsible for the bulk of the deficiencies in this category in 2019, as has been the case historically. While Con Edison's underground system did see an increase in Level I

findings in 2019, Level I findings for pad mount transformers show a significant decrease. This increase in Level I findings for Con Edison can be attributed to the increase in inspections performed on pad mount facilities.

**Table 8: Summary of Deficiencies by Severity Level
Found by Investor-Owned Utilities**

2019 Inspection Cycle						
Level	Underground	Distribution	Transmission	Pad Mount	Street Lights	Total
I	2,796	1,130	15	746	0	4,687
II	14,091	6,499	325	763	275	21,953
III	5,681	49,365	2,489	391	395	58,321
Total	22,568	56,994	2,829	1,900	670	84,961
2018 Inspection Cycle						
Level	Underground	Distribution	Transmission	Pad Mount	Street Lights	Total
I	2,480	2,374	15	1,116	0	5,985
II	13,662	6,780	490	1,042	402	22,376
III	4,558	64,505	3,504	687	434	73,688
Total	20,700	73,659	4,009	2,845	836	102,049

Regarding municipal-owned electric systems, the combined total of deficiencies found was 382, slightly lower than the 2018 total. The municipalities report that all the deficiencies found were on their overhead distribution systems and that all deficiencies were immediately repaired.

Electric Facility Repairs

In 2019, the utilities reported repairing over 99% of Level I deficiencies; and 97% were repaired within the one-week time requirement. As required by the Safety Standards, a repair must be considered a permanent repair for it to be removed from the Level I priority list. The remaining Level I deficiencies awaiting repair were made safe pending permanent repair.

Statewide, the investor-owned utilities reported repairing 60% of Level II and 7% of Level III deficiencies discovered in 2019. For deficiencies discovered in 2018, 72% of Level II and 12% of Level III deficiencies were repaired. Tables 9 and 10, below, lists the number of Level II and Level III repairs completed in the five-year period from 2015-2019 and the number of repairs recorded as overdue as of December 31, 2019.

Table 9: 2015 - 2019 Level II Repair Activity by Investor-Owned Utilities

	Repaired Within Time Frame/Not Due	% Repaired Within Time Frame/Not Due	Not Repaired Overdue
Con Edison	126,335	86%	15,275
National Grid	32,676	94%	522
NYSEG	7,284	36%	6,866
RG&E	1,539	34%	1,497
Central Hudson	973	84%	93
Orange & Rockland	1,285	99%	0
Total	170,092	82%	24,253

Table 10: 2015 - 2019 Level III Repair Activity by Investor-Owned Utilities

	Repaired Within Time Frame/Not Due	% Within Time Frame/Not Due	Not Repaired Overdue
Con Edison	48,939	42%	67,621
National Grid	228,162	94%	8,252
NYSEG	26,338	80%	5,413
RG&E	11,685	86%	1,204
Central Hudson	28,168	99%	289
Orange & Rockland	4,812	92%	62
Total	348,104	79%	82,841

As shown in Tables 9 and 10, Con Edison continues to have the largest number of overdue repairs associated with Level II and III deficiencies. The pilot enhancement program for Con Edison's Structure Inspection and Repair programs is designed to decrease Level II and III overdue repairs by the end of 2020. In 2019, the third year of the pilot, Con Edison completed 4,644 of the backlogged repairs, exceeding its target of 3,760 repairs. At the end of 2019, the Company still had approximately 82,896 overdue Level II and III repairs to be completed in 2020. This data also indicates a major backlog of Level II repairs for NYSEG and RG&E that has suddenly manifested itself in 2019, with compliance levels below 40%. Clearly, this level of performance is unacceptable and must be addressed, and is presently being addressed by Staff in the current rate proceedings for NYSEG and RG&E.

PSEG-LI Pilot Program

Historically, the Long Island Power Authority (LIPA) has not had a comprehensive stray voltage testing or facilities inspection program. In addition, LIPA not subject to the Commission's Safety Standards. In recent years, however, Staff has encouraged LIPA and its operator Public Service Enterprise Group Long Island (PSEG-LI) to begin to implement the Safety Standard requirements on Long Island. As a result of those discussions, in 2020 PSEG-LI will commence a facility inspection and stray voltage testing pilot program. To obtain a representative sample across the LIPA service territory, two townships in the Western Division (Garden City and Levittown) and two towns in the Eastern Division (Deer Park and Coram) were selected, which comprise approximately 10% of total assets. The program will adhere to the requirements of the Safety Standards and approximately \$500,000 has been budgeted for the initiative. The bid package was released in March of 2020, contract awards are expected by the end of April with work commencing in May and completion anticipated by end of September 2020.

CERTIFICATION AND PERFORMANCE MECHANISM

To ensure the utilities maintain the necessary focus on the safety and reliability of their electric systems, the Electric Safety Standards require an officer of each utility to annually certify the results of the testing and inspection programs. Each utility provided statements signed by an officer certifying that it performed the requisite number of stray voltage tests and inspections in 2019.

The Electric Safety Standards also establish a performance mechanism to ensure compliance with the standards by the utilities. This mechanism includes two annual performance targets, one for stray voltage testing and one for facility inspections. Given the safety concerns associated with stray voltage, the performance target is 100% of all facilities and streetlights that are required to be tested. The facility inspection target is set at an annually increasing scale beginning at 85% of the annual requirement of 20% of all electric facilities and increasing to 100% in the fifth year of the cycle. Failure to meet a performance target could result in a negative 75 basis point revenue adjustment (a maximum negative adjustment of 150 basis points may be imposed for failure to achieve both performance targets in one year). All the electric utilities met the requirements of the performance mechanisms in 2019.

COMPLIANCE MONITORING

To ensure proper compliance with the Electric Safety Standards, Staff maintains frequent contact with all electric utilities, individually and collectively, since the inception of the standards. In early 2005, the investor-owned utilities formed a working group to discuss issues related to stray voltage testing and inspection programs. The working group has proven to be an effective means to raise and resolve issues, identify best working practices, and establish a common understanding of the extent and causes of stray voltage across the State. Discussions have evolved from addressing implementation issues, such as data collection, to focusing more on stray voltage mitigation efforts, alternative testing equipment, and repair activities.

Staff also monitors the utilities' compliance with the Electric Safety Standards through field visits. The primary purpose of the field visits is to ensure that stray voltage testing, inspections, and quality assurance programs are being conducted properly. The field visits enable Staff to monitor the utilities' quality assurance programs and provide the opportunity to randomly sample the utility's testing and inspection records to verify the accuracy of the data collected. To further verify the accuracy of inspections, Staff also obtains quality assurance and quality control data to determine whether utility programs are ensuring compliance with the standards.

CONCLUSION

All the utilities are following the 2019 testing requirements and goals established by the Commission's Electric Safety Standards. Stray voltage testing was performed on approximately one million facilities across the State last year. All utilities are also in compliance with the inspection requirement for the fourth year of the third inspection cycle; in total, approximately 690,316 facilities were visually inspected in 2019. Since all the test and inspection requirements were met, no revenue adjustments should be imposed by the Commission.