David P. Warner
Associate Counsel

February 14, 2020

Via Electronic Filing
Honorable Michelle L. Phillips
Secretary to the Commission
New York State Public Service Commission
Empire State Plaza, Agency Building 3
Albany, NY 12223-1350

Re: Case 04-M-0159, Proceeding on the Motion of the Commission to Examine the Safety of Electric Transmission and Distribution Systems

Consolidated Edison Company of New York, Inc.'s *2019 Contact Voltage Test and Facility Inspection Annual Report*

Dear Secretary Phillips:

Consolidated Edison Company of New York, Inc. submits for filing its *2019 Contact Voltage Test and Facility Inspection Annual Report* ("Report"). The Report is submitted pursuant to the requirements of the Public Service Commission's Electric Safety Standards issued in the referenced proceeding.

Thank you for your assistance.

Sincerely,

Att:

Consolidated Edison Company of New York, Inc.
4 Irving Place New York NY 10003 212 460 4286 212 677 5850 fax warnerd@coned.com

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2019

CONTACT VOLTAGE TEST &

FACILITY INSPECTION

ANNUAL REPORT

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

Report on the results of contact voltage tests & facility inspections for the period beginning

January 1, 2019 and ending on December 31, 2019.

February 14, 2020

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I. Background

The New York State Public Service Commission's ("PSC" or "Commission") Electric Safety Standards ("Safety Standards")[1] in Case 04-M-0159, require utilities to conduct an annual system-wide contact (stray) voltage detection program for underground assets and municipality owned streetlights and a five-year equipment inspection program to mitigate contact (stray) voltage risks to the public and promote reliability.

The term "stray voltage" is historically associated with neutral-to-earth voltage (NEV) encountered by farm livestock at contact points. Stray voltage is a normally occurring phenomenon that can be found at low levels between two contact points at any location where electricity is grounded.[2] In recent years, the term "contact voltage" has been used to describe voltage resulting from abnormal power system conditions associated with low voltage secondary system faults.

This report describes Consolidated Edison Company of New York, Inc.'s ("Con Edison" or "the Company") contact voltage detection program and equipment inspection program conducted in 2019.

II. Company Overview

Con Edison is an investor-owned utility that provides electric service to approximately 3.4 million customers in a service area of approximately 604 square miles within New York State encompassing New York City, except the Rockaway Peninsula, and most of Westchester County. The Company operates an electric transmission and distribution ("T&D") system that provides a high level of reliability in a very dense urban environment.

[1] The Commission's *Order Granting in Part Petition to Modify Electric Safety Standards*, Appendix A, issued January 13, 2015 in Case 04-M-0159, provides the current version of the Safety Standards. The Safety Standards were originally issued on January 5, 2005, with subsequent revisions issued on July 21, 2005, December 15, 2008, March 22, 2013 and January 13, 2015.

[2] Electrical systems — both farm systems and utility distribution systems — are grounded to the earth to ensure safety and reliability. Inevitably, some current flows through the earth at each point where the electrical system is grounded and a small voltage develops. This voltage is called neutral-to-earth voltage (NEV). When NEV is found at animal contact points, it is frequently called stray voltage. Stray voltage is the small voltage that is measured between two points that livestock can simultaneously touch. If these points are simultaneously contacted by an animal, a current will flow through the animal. See http://psc.wi.gov/SiteAssets/svUpdate2006.pdf

- Distribution

  a. *Underground* – The underground system has approximately 283,000 manholes, service boxes, transformer vaults, and above ground pad mounted structures; approximately 25,400 miles of underground duct; and approximately 96,300 miles of underground cable including primary, secondary and service cables. Underground network cables operating at primary voltages of 33kV, 27 kV and 13.8 kV supply underground transformers that step the primary voltages down to 120/208 distribution voltages that are used by customers.

  b. *Overhead* – The overhead system includes: 193 auto loops, 13 **-** 4 kV multi-bank substations, 219 – 4 kV unit substations, approximately 270,000 Con Edison and joint owned poles, and approximately 34,400 miles of overhead wires including primary, secondary, and services. Cables operating at primary voltages of 33 kV, 27 kV, 13.8 kV, and 4 kV supply approximately 51,900 overhead transformers that step the primary voltages down to 120/208/240 distribution voltages that are used by customers.

  c. *Streetlights* – Con Edison does not own, install, or maintain streetlights and traffic signals within its service territory. The New York City Department of Transportation (NYCDOT) and the local Westchester municipalities primarily own the streetlights and traffic signals in New York City and Westchester County. There are approximately 185,000 metal pole street lights and metal pole traffic signals within Con Edison's service territory.

- Transmission

  a. *Underground* – The underground transmission system delivers power at 69 kV, 138 kV, and 345 kV to various switching substations and area substations. The underground system has approximately 2,200 underground transmission facilities and approximately 810 circuit miles of cable. Of the 810 circuit miles, Con Edison owns approximately 727 miles.

  b. *Overhead* **-** The overhead transmission system consists of 138 kV and 345 kV high voltage cable supported on approximately 1,224 towers and poles on rights-of-way located for the most part, north of New York City and terminating in Westchester County where the underground transmission system begins.

- Substations and Unit Substations
  There are 71 properties that contain the 41 transmission and 62 area substations. In addition, 232 unit substations and multi-banks which include the six customer-owned NYC airport multibanks.

III. Inspection and Contact Voltage Testing Frequency for Company and Municipally-Owned Facilities

On January 5, 2005, the Commission established the Electric Safety Standards that require all utility-owned electric facilities to be inspected and contact (stray) voltage testing be performed on a specific frequency. Overhead Distribution facilities, Underground Residential Distribution System facilities, Underground and Overhead Transmission facilities and Substation fences must be inspected and contact (stray) voltage tested once every five years. Underground Distribution Facilities must be inspected once every eight years as part of the pilot program adopted in Case 16-E-0060[3] and contact (stray) voltage tested once per year. The Safety Standards also require annual contact voltage testing for all city and municipally owned streetlights.

The following eight categories of facilities in Con Edison's service area must be inspected and tested for the presence of contact voltage:

- *Underground Distribution* – There are approximately 266,000 underground facilities in Con Edison's Distribution systems. A subsurface structure is defined as any manhole (MH), service box (SB), transformer vaults (V,VS), transformer manholes (TM) associated with the underground distribution system. All Underground Distribution facilities are inspected every eight years and are tested for contact voltage annually in either the manual or mobile contact voltage testing programs.

- *Underground Residential Distribution (URD) System* – There are approximately 17,000 URD facilities in Con Edison's Distribution systems. A subsurface structure is defined as any manhole (MH), service box (SB), transformer vaults (V,VS), transformer manholes (TM), injunction boxes (IJ), P-Boxes (PB), and T-Tap boxes and switchgear associated with the URD system. All URD facilities are inspected and contact voltage tested every five years.

- *Overhead Distribution* – There are approximately 270,000 distribution pole structures that support electric facilities in Con Edison's overhead distribution system. Distribution overhead facilities are inspected and tested for contact voltage every five years. The contact voltage testing criteria include all utility-owned or joint use wooden poles with utility electrical facilities located on public thoroughfares or customer property, including backyards or alleys. Contact voltage tests are performed on all wooden poles with

[3] The Commission's *Order Approving Electric and Gas Rate Plans* issued January 25, 2017 in Case 16-E-0060, et al, authorizes the Company to implement a pilot program to increase the inspection cycle for underground distribution equipment from five to eight years.

metallic attachments, such as, ground wires, ground rods, anchor guy wires, riser pipes, or any electrical equipment within reach of the general public.

- *Street Lights and Traffic Signals* – There are approximately 185,000 metal pole street lights and/or traffic signals within Con Edison's service territory. Streetlights and traffic signals are included in the annual contact voltage testing program. Con Edison does not own any metal pole streetlights, and therefore, these structures are not included in the facility inspection program. Area and street lighting that is privately owned is not included in the contact voltage testing program, as per the Safety Standards. The contact voltage testing criteria include all municipally owned metal pole streetlights, traffic signals, and pedestrian crosswalk signals located on publicly accessible thoroughfares and areas that have streetlights directly supplied by the Company. All contact voltage testing of street lights is performed at night while the fixtures are energized.

- *Substations* – Con Edison's 103 substations are located within 71 properties which are inspected and tested for contact voltage every five years. The contact voltage testing criteria consist of perimeter fencing and other electrically conductive materials where such materials are accessible to the general public. These materials include but are not limited to fences, doors, roll-up gates, metallic delivery boxes, dielectric fluid delivery ports and Siamese connections.

- *Unit Substations* – Con Edison's 232 - 4kV multi-bank and unit stations are required to be inspected and tested for contact voltage every five years. The contact voltage testing criteria consist of perimeter fencing and other electrically conductive materials where such materials are accessible to the general public. These materials include but are not limited to fences, doors, roll-up gates, metallic delivery boxes, and Siamese connections.

- *Overhead Transmission* – Con Edison's overhead transmission system includes 1,224 individual poles or towers. These transmission structures support circuit voltages of 69 kilovolts and greater. Structures that support circuits of lower voltage in addition to the transmission voltage levels are included in this category. Con Edison's overhead transmission structures are inspected and tested for contact voltage every five years. The contact voltage testing criteria include all structures, guys, and down leads attached to these structures.

- *Underground Transmission* – Con Edison's underground transmission system includes approximately 2,200 facilities. These transmission facilities support circuit voltages of 69 kilovolts and greater. Con Edison's underground transmission facilities are inspected and tested for contact voltage every five years or sooner.

IV. Contact Voltage Testing Program

The Safety Standards require that Con Edison complete annual contact (stray) voltage testing of all underground electric distribution facilities and streetlights by December 31 of each year.

In accordance with the contact voltage testing frequencies of the Safety Standards, all underground electric distribution facilities were tested as well as all municipally owned metallic streetlights and traffic signals located on thoroughfares or areas that are publicly accessible and directly supplied with electricity by the Company.

In addition, and in compliance with the Safety Standards, Con Edison:

- Immediately safeguarded and/or mitigated all voltage findings greater than or equal to 1.0 volt. The Company uses its best efforts to effectuate a permanent repair within 45 days to all Company-owned equipment determined to have caused a voltage finding and remaining necessary to provide our customers with safe and reliable service. The aforesaid permanent repairs not effectuated within 45 days are periodically monitored and tracked to completion. In instances where the contact voltage finding was determined to be caused by equipment that is not owned by Con Edison, the Company, after making the area safe, notified a responsible person associated with the premises of the unsafe condition and the need for the owner to arrange for a permanent repair.

- Tested all publicly accessible structures, streetlights, sidewalks and metal objects within a 30-foot radius of an energized structure, or contact voltage finding greater than or equal to 1.0 volt.

- Responded to, investigated and mitigated positive findings of shock incidents reported by the public.

Training

Con Edison manages its contact voltage testing program and uses both Company field personnel and contractor forces to conduct the testing of utility-owned electric facilities and municipal streetlights.

Training for the contact voltage testing program consists of an eight-hour class at our training facility for contractor forces and on-the-job training, performed by Supervisors for Company field forces. The training is based on Company specifications on how to properly test an electric facility for contact voltage. Topics covered in the training are:

- The PSC Safety Standards
- Scope of the contact voltage testing program
- Performing the test and completing the testing form
- Data entry process
- Status of contact voltage testing to annual goal
- Abnormal systems conditions to be reported
- Performance mechanism

Underground Distribution Contact Voltage Testing

Of the total population of approximately 266,000 underground facilities, 136,385 were fielded for manual testing. The remaining facilities were tested under the mobile contact voltage program. Of the 136,385 underground facilities visited during manual testing, 643 did not require contact voltage testing due to inaccessibility, structures retired, or customer owned structures. Inaccessible underground facilities include:

a. *Locked Gate/Fence* – Structures behind locked gates and fences that are not accessible to the public, i.e., facilities located in fenced areas owned by other utilities, such as Water Companies.

b. *Company Property* – Structures located on Company property, such as substations, are accessible only to Company personnel and authorized contractors.

c. *Construction* – A structure located within a construction site. These structures are accessible only to construction personnel.

d. *Buried* – A structure below grade that requires excavation to access the structure.

e. *Vaults* – Structures located inside buildings. These structures are accessible only to Company and building maintenance personnel.

f. *Highway* – Structures located on highways and on exit and entrance highway ramps. The performance of contact voltage testing would constitute an unacceptable risk to the employee.

Underground Residential Distribution (URD) System

Contact voltage testing for the URD system is conducted concurrently with the safety inspection program. Of the population of approximately 17,000 URD facilities, 2,662 facilities were visited and tested for contact voltage in 2019.

Overhead System Contact Voltage Testing

Contact voltage testing for the Overhead system is conducted concurrently with the safety inspection program. Of the population of approximately 270,000 overhead facilities, 5,941 facilities were visited and tested for contact voltage in 2019.

Streetlight and Traffic Signal Contact Voltage Testing

Of the total population of approximately 185,000 streetlight and traffic signal facilities, which the Company directly supplies electric service and which are located on public thoroughfare, approximately 112,012 facilities were required to be tested manually. The remaining facilities were tested under the mobile contact voltage program. Of the facilities visited, 262 did not require contact voltage testing because these structures were not publicly accessible or were retired. Inaccessible streetlights and traffic signals include:

a. *Construction* – A structure located within a construction site. These structures are only accessible to construction personnel.

b. *Restricted Access* – Structures located within areas with active public improvement efforts or the World Trade Center.

c. *Highway* – Structures located on highways or access roads to highways.

Underground Transmission Contact Voltage Testing

Contact voltage testing for the Underground Transmission system is conducted concurrently with the safety inspection program. Of the total population of approximately 2,200 underground transmission facilities, all were fielded for manual testing during this 5-year cycle. Those facilities that are not publicly accessible do not require contact voltage testing. Inaccessible transmission facilities include:

a. *Construction* – A structure located within a construction site. These structures are only accessible to construction personnel.
b. *Con Edison Property* – Structures located on or adjacent to Con Edison properties which are secured from the public via fencing or other barriers and are inaccessible to the public.

c. *Bridges* – Structures located on bridges, such as bridge joints

d. *Buried* – A structure below grade that requires excavation to access the structure

Overhead Transmission Contact Voltage Testing

Contact voltage testing for the Overhead Transmission system is conducted concurrently with the safety inspection program. Con Edison visited and tested all the 1,224 Overhead Transmission facilities on the Company's overhead transmission system.

Mobile Contact Voltage Testing

In accordance with the PSC's "Order Establishing Rates for Electric Service," issued March 25, 2008 in Case 08-E-0539, Con Edison performed 12 underground system scans in the underground distribution areas of New York City using mobile contact voltage detection technology. In accordance with the PSC's "Order Adopting Changes to Electric Safety Standards," issued December 15, 2008 in Case 04-M-0159, the 12 underground system scans must be performed within each rate year (April 1st to March 31st). Furthermore, Con Edison performed one additional underground system scan using mobile contact voltage detection technology in New Rochelle, Yonkers, and White Plains, as ordered in Case 10-E-0271. Con Edison also performed an underground system scan in Mount Vernon.

Results of the 2019 Contact Testing Program

The results of the 2019 Contact Testing Program are provided in the following appendixes of this report:

- Appendix 1 titled, "Summary of MANUAL Contact Voltage Testing"
- Appendix 2a titled, "Summary of Energized Objects - Mobile Testing"
- Appendix 2b titled, "Summary of Energized Objects - Manual Testing + Other"
- Appendix 3 titled, "Summary of Shock Reports from the Public."

V. Facility Inspection Program

The Commission's Safety Standards require that the Overhead Distribution Facilities, Underground Residential Distribution (URD) Facilities, Underground and Overhead Transmission Facilities and Substation fences be inspect at least once every five years. The first five-year cycle covered the period from 2005 through 2009. The second cycle is the period from 2010 through 2014. The third cycle covers the period 2015 through 2019. The Safety Standards also require that utilities inspect a minimum number of electric facilities each year of the five-year cycle based on an annual percentage of total electric facilities as follows: 17 percent in the first year, 18 percent in the second year, and 19 percent in the third, fourth and fifth years except that by the end of every fifth year, the utility must ensure

that it has inspected 100 percent of its facilities. A utility may inspect its facilities pursuant to a compressed schedule and complete its inspection cycle prior to the end of the five-year period so long as the cumulative number of inspections at the end of any year is at least the minimum number required by the annual target formula – 17 percent in first year, 35 percent by end of second year, 54 percent by end of third year, 73 percent by end of fourth year, and 100 percent by end of fifth year.

For the Underground Distribution Facilities, the pilot program adopted under Case 16-E-0060 extends the inspection to an eight-year cycle which covers from 2015 to 2022. The minimum number of inspections to be performed on a yearly basis for this eight-year pilot program is based on an annual percentage of total electric facilities as follows: 10.6% in the first year, 21.9% in the second year, and 33.8% in the third, 45.7% in the fourth year, 57.5% in the fifth year, 69.4% in the sixth year, 81.3% in the seventh year and 100% in the eight year.

In addition, the Safety Standards require that defective equipment found during an inspection be repaired. In accordance with the Safety Standards, Con Edison uses the following severity levels to 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 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 is used for future monitoring purposes and planning proactive maintenance activities.

In accordance with the Safety Standards, 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.

Training

Con Edison manages its inspection program and uses both company field personnel and contractor forces to conduct the inspection of utility owned electric facilities.

Training of the contractor force utilized to perform inspections on our overhead and underground systems consists of classes at our learning facility as well as on-the-job training performed by Contractor Oversight Supervisors who have attended a train-the-trainer session with a Con Edison Subject Matter Expert (SME). For Company field forces, the training is based on Company specifications on how to properly inspect an electric facility which is acquired through their promotional classes, as well as on-the-job training performed by their supervisor.

In addition to the above, the System & Program Engineering, Analysis and Reporting (SPEAR) department of Distribution Engineering conducted train-the-trainer sessions in workout locations since the inception of the program. The participants included the managers, planners, and supervisors of the crews that would be performing the inspections. The SPEAR Team has also conducted various training seminars at work-out locations which included the following topics:

- The PSC Safety Standards
- Scope of the inspection
- Completing the inspection form
- Data entry process
- Status of inspections to annual goal
- Repairs pending
- Accounting of the inspection
- Performance mechanism

In addition to the train-the-trainer sessions, an E-Learning Training Module was developed. This training module can be accessed from any computer on the Con Edison Network. This class is also part of the curriculum in career advancement for new mechanics.

Results of the 2019 Facility Inspection Program

The results of the 2019 Facility Testing Program and associated facility repairs are provided in Appendix 4, entitled “Summary of Deficiencies and Repair Activity Resulting from the Inspection Process.”

VI. Annual Performance Targets

Con Edison performed the required contact voltage testing and facilities inspections in accordance with the requirements of the Commission's Safety Standards.

This being the fifth year of the third cycle ending December 31, 2019 for Overhead Distribution facilities, Underground Residential Distribution System facilities, Underground and Overhead Transmission facilities and Substation fences, Con Edison has cumulatively inspected 100% of its overall population of electric facilities. The Underground Distribution Facilities is on the fifth year of the third cycle ending December 31, 2022 and Con Edison has inspected 61.3% of its overall population of electric facilities. The percentages of inspections through December 31, 2019 by structure category are summarized in Table 1. Con Edison does not own streetlight facilities --these facilities are owned by the City of New York and by the municipalities in Westchester.

Con Edison inspects its underground transmission system at multiple intervals all in less than 5 years (Table 5). The total number of underground facilities to be inspected is approximately 2,200 and were completed in 2018.

Con Edison inspects the overhead transmission facilities (Table 3) and Unit substations/multi-bank fences (Table 7) every year.

Table 1
Facility Inspection Program Results

Category	Actual Cumulative Inspected as of 2019
Overhead Distribution	100%
Overhead Transmission	100%
Underground Distribution	61.3%
Pad Mount (URD) Distribution	100%
Underground Transmission	100%
Substation	100%
Unit Substations	100%
Company-owned Streetlights	N/A

5-Year Inspection Performance Summary

The following tables provide the annual completion and the cumulative percentages of inspections by structure category over the current five-year (2015-2019) inspection cycle.

Table 2
Overhead Distribution Facilities

Inspection Year	Unique Number of Overhead Distribution Structures Inspected	% of Overall Facilities Inspected (Cumulative)
2015	114,594	42.49%
2016	84,979	74.00%
2017	40,042	88.85%
2018	24,135	97.80%
2019	5,941	100.00%

Table 3
Overhead Transmission Facilities

Inspection Year	Unique Number of Overhead Transmission Facilities Inspected	% of Overall Facilities Inspected (Cumulative)
2015	1,220	100%
2016	1,220	100%
2017	1,220	100%
2018	1,220	100%
2019	1,224	100%

Table 4
Underground Residential Distribution (URD) Facilities

Inspection Year	Unique Number of Pad Mount (URD) Facilities Inspected	% of Overall Facilities Inspected (Cumulative)
2015	9,593	54.85%
2016	1,257	62.03%
2017	1,158	68.65%
2018	2,821	84.78%
2019	2,662	100.00%

Table 5
Underground Transmission Facilities

Inspection Year	Unique Number of Underground Transmission Facilities Inspected	% of Overall Facilities Inspected (Cumulative)
2015	707	32.14%
2016	605	59.6%.
2017	746	93.5%
2018	142	100%
2019	0	100%

Table 6
Substation Facilities

Inspection Year	Unique Number of Substation Sites	% of Overall Facilities Inspected (Cumulative)
2015	16	22.54%
2016	15	43.66%
2017	15	64.79%
2018	14	84.51%
2019	11	100.00%

Table 7
Unit Substation Facilities

Inspection Year	Unique Number of Unit Substation Facilities Inspected	% of Overall Facilities Inspected (Cumulative)
2015	232	100%
2016	232	100%
2017	232	100%
2018	232	100%
2019	232	100%

8-Year Underground Inspection Pilot Program Performance Summary

The following table provides the annual completion and the cumulative percentages of the underground distribution eight-year (2015-2022) inspection cycle.

Table 8
Underground Distribution Facilities

Inspection Year	Unique Number of Underground Facilities Inspected	% of Overall Facilities Inspected (Cumulative)
2015	55,320	20.75%
2016	53,989	40.99%
2017	21,596	49.09%
2018	16,471	55.27%
2019	16,010	61.27%
2020		
2021		
2022		

VII. Certifications

Pursuant to Section 7 of the Safety Standards, attached as Exhibit 1 of this report are the certifications of Con Edison's officer with direct responsibility for overseeing contact voltage testing and facility inspections that Con Edison has, to the best of the officer's knowledge, exercised due diligence in carrying out a plan, including quality assurance, that is designed to meet the contact voltage testing and inspection requirements in 2019, and that Con Edison has:

- Tested its publicly accessible electric facilities and street lights in accordance with the Electric Safety Standards Case 04-M0159 effective January 13, 2015.

- Inspected the requisite number of electric facilities.

VIII. Analysis of Causes of Findings and Contact Voltage

All New York State utilities prepare an inventory of all Contact Voltage "findings" and report each year. Section 1(f) of the Safety Standards 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 (referred to herein as Contact 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."

Although not all findings are due to contact voltage, NYS Utilities are required to report on all findings, regardless of whether the voltage is normal to the operating system. In 2019, 7,945 voltage findings resulted from contact voltage testing. These findings resulted from 2,802 sources of contact voltage. A total of 7,729, approximately 97.3% of these findings, were detected by the Mobile Contact Voltage Testing Program. There were 216 findings (2.7%) identified by manual contact voltage testing.

In accordance with the Safety Standards requirements, when a finding is discovered on an electric facility or streetlight during contact voltage testing, the Company must manually test all publicly accessible structures, streetlights, and sidewalks, within a minimum 30-foot radius of the energized object. Two findings were recorded as a result of the 30-foot radius testing during manual contact voltage testing.

Contact voltage findings during 2019 resulted from a variety sources as detailed in the data in Tables 9 and 10. Table 9 provides the sources that were Con Edison's responsibility.

Table 9
2019 Sources of Contact Voltage Finding
Con Edison Responsibility

Source of Contact Voltage	Con Edison
UG Service	821
UG Streetlight Service	385
UG Streetlight Con Edison Neutral	95
Overhead Streetlight Service	89
Sump Pump	65
UG Service Con Edison Neutral	60
UG Main	57
Secondary Burnout	49
UG Main Con Edison Neutral	39
Crab	19
Overhead Streetlight Service Neutral	5
Loose UG SL Service Connection at CE Structure	3
Abandoned Service	2
CE Streetlight Reversed Polarity	2
Overhead Secondary	2
Defective Riser/Insulator	2
Overhead Service Neutral	2
Loose Main Connection at CE Structure	2
Overhead Service	1
Temporary Service	1
Con Ed non-S/L Reversed Polarity	1
Defective Transformer Equipment/Gap	1
Overhead Primary	1
Total	**1,704**

Table 10 contains the 2019 sources of contact voltage findings that were the responsibility of entities other than Con Edison ("Non-Con Edison Responsibility").

Table 10
2019 Sources of Contact Voltage
Non-Con Edison Responsibility

Source of Contact Voltage	Non-Con Edison
Defective Pigtail/Internal City Streetlight Wiring/Loose Connection at Lamp Base/Open Ended Control Wiring	583
Defective Customer Equipment	264
Defective Contractor Equipment	76
Contractor or Customer Damage	68
Dept. of Transportation (DOT)/City Streetlight Neutral	64
Defective Neon Sign	40
DOT Reverse Polarity	2
DOT Temp Service	1
Total	**1,098**

Mitigation through Detection

Five factors affect the likelihood that a member of the public or an animal could experience a shock. These factors are the number of energized structures (ENEs), mobile system scan, voltage levels associated with the ENEs, population density, and the weather. Appendix 3 contains the breakdown of electric shocks (ESRs) reported to Con Edison in 2019.

Since the likelihood of an ESR will increase or decrease in proportion to the total number of energized structures, the detection and repair of identified sources of contact voltage is the principal mitigation effort for reducing ESRs. Each completed repair effectively represents a mitigation of possible ESRs and over time, the potential ESRs decrease accordingly. As can be observed in Chart 1, the sources of ENEs have been decreasing since the inception of the program. Similarly, the Con Edison responsibility ESRs (Chart 2) and Non-Utility responsibility ESRs (Chart 3) show a similar trend.

Chart 1
ENE Sources

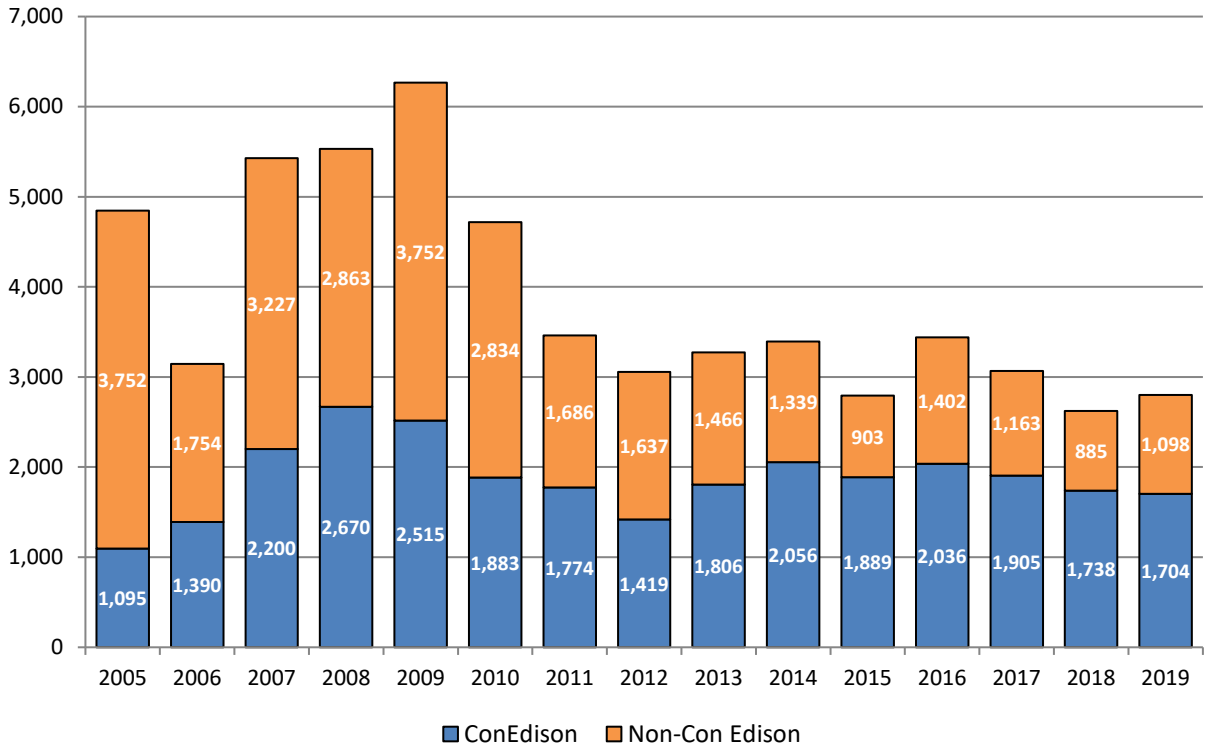


Chart 2
Con Edison ESR

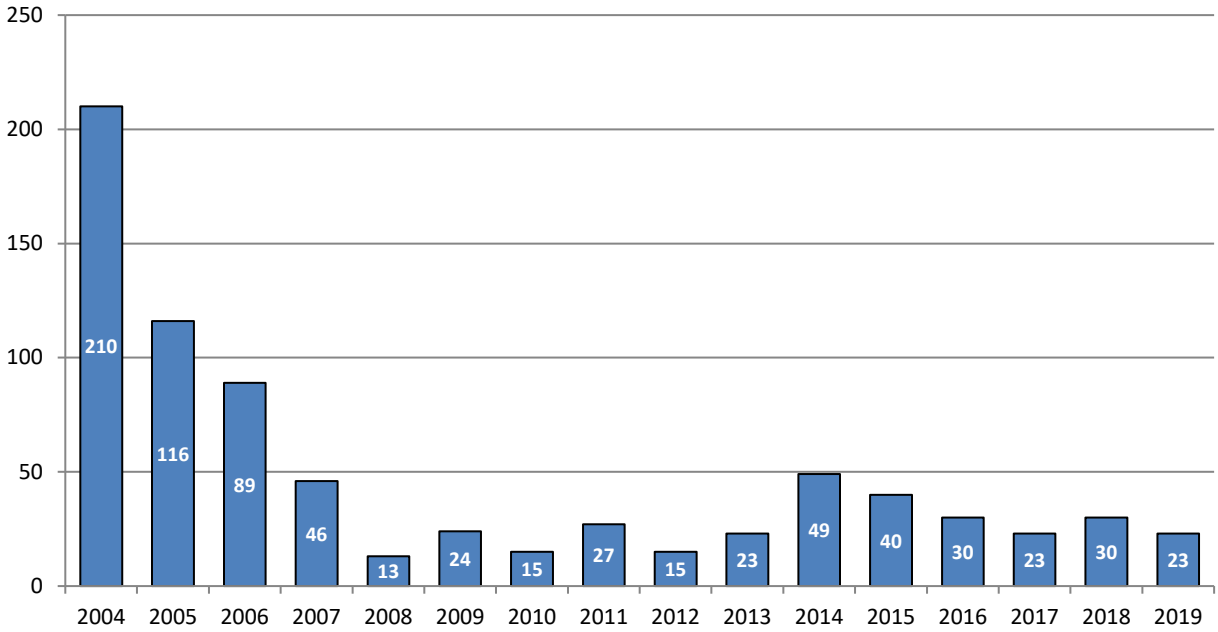
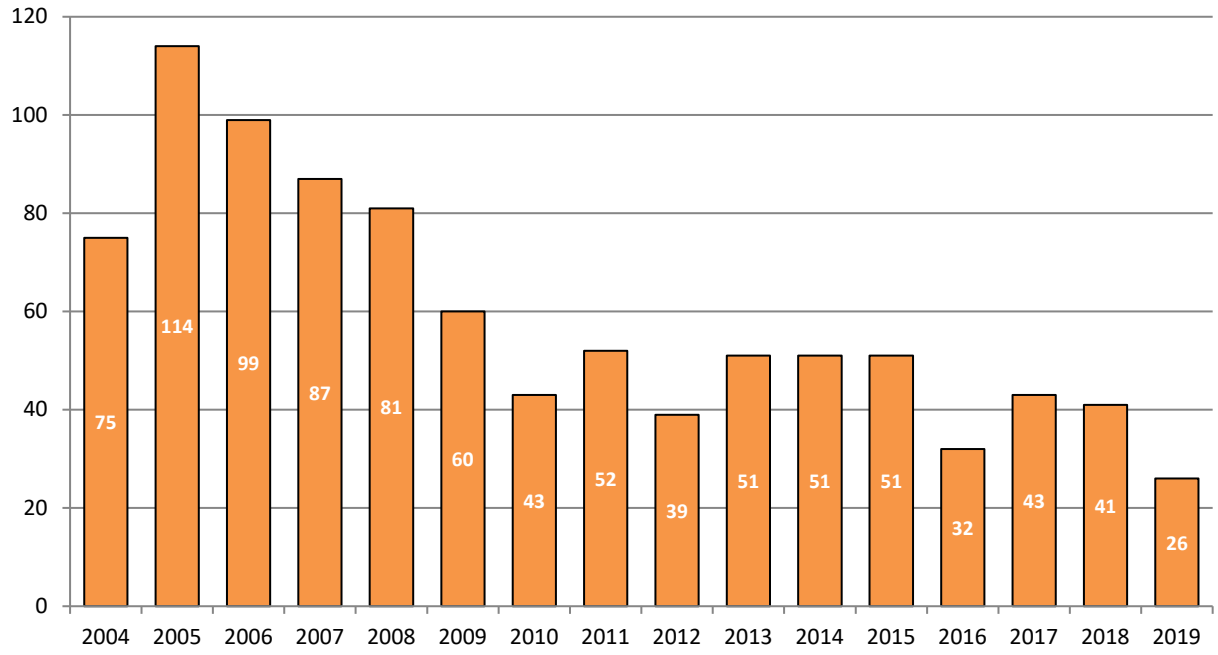


Chart 3
Non-Company ESR



Weather continues to have a direct impact on the electrical system. As has been discussed in prior annual reports, the Company continues to observe a strong correlation between weather and shocks. While there have been five consecutive years of harsh winter conditions and over 750 kilotons of additional salt spread as compared to the prior five years, the ESRs are showing a downward trend over the same period. Part of the reduction is attributed to the "Targeted Mobile" pilot program under which additional mobile scans were performed in areas that historically have had higher events activity. This program resulted in the discovery and repair of additional ENEs which could have potentially resulted in ESRs.

IX. Analysis of Inspection Results

Table 11 details the number of annual inspections performed for each facility type for the current 2015-2019 cycle.

Table 11
Cycle 3 - Yearly Inspection Breakdown

Facility Inspection Program	2015	2016	2017	2018	2019	5-Year Cumulative Unique Inspections	Percent Completed
Distribution Underground*	55,320	53,989	21,596	16,471	16,010	163,386	61.3%
Distribution URD	9,593	1,257	1,158	2,821	2,662	17,491	100%
Distribution Overhead	114,594	84,979	40,042	24,135	5,941	269,691	100%
Transmission Underground	707	605	746	142	0	2,200	100%
Transmission Overhead	1,220	1,220	1,220	1,220	1,224	1,224	100%
Area Substation Fences	16	15	15	14	11	71	100%
Unit Substations	232	232	232	232	232	232	100%
Total	**181,682**	**142,297**	**65,009**	**45,035**	**26,080**	**454,295**	**81.5%**

* Distribution Underground follows an 8-year inspection cycle.

Tables 12 through 15 show the number of deficiencies found in each inspected structure in 2019 by defect level. For example, Table 12 shows that 10.29% of the total defects found in the overhead were Level 2 and they were found on 304 overhead structures. Because a structure can have more than one defect, the same structure may be counted multiple times in different defect levels. Hence, the total number of structures in each of the tables is not the unique number of structures inspected. In addition, the table does not show the structures that had no defects.

Table 12
Overhead Distribution
Breakdown of Locations with Deficiencies

Defect Level	Number of Structures	Number of Deficiencies	% Deficiencies Found
1	16	16	0.47%
2	304	348	10.29%
3	1,355	1,574	46.53%
4	1,255	1,445	42.71%
Total:	**2,930**	**3,383**	**100%**

Table 13
Underground Distribution
Breakdown of Locations with Deficiencies

Defect Level	Number of Structures	Number of Deficiencies	% Deficiencies Found
1	2,546	2,616	5.79%
2	8,489	13,349	29.53%
3	1,341	3,149	6.97%
4	13,547	26,086	57.71%
Total:	**25,923**	**45,200**	**100%**

Table 14
Underground Residential Distribution (URD)
Breakdown of Locations with Deficiencies

Defect Level	Number of Structures	Number of Deficiencies	% Deficiencies Found
1	470	551	32.29%
2	244	283	17.61%
3	40	229	14.25%
4	538	544	33.85%
Total:	**1,292**	**1,607**	**100%**

Table 15
Overhead Transmission
Breakdown of Locations with Deficiencies

Defect Level	Number of Structures	Number of Deficiencies	% Deficiencies Found
1	0	0	0.0%
2	0	0	0.0%
3	15	18	32.14%
4	37	38	67.86%
Total:	**52**	**56**	**100%**

Streetlights

Con Edison does not own streetlight facilities. Streetlight facilities within the Company's service area are owned by the City of New York and municipalities located in Westchester County.

Repair of Deficiencies

During 2019, the Company repaired 84.8% of the Level I, II, and III defects found: 99.3% Level I; 84.0% Level II and 34.0% Level III. Furthermore, as part of the pilot enhancement plan to the Structure Inspection Program, the Company repaired an additional 4,644 Level II and III deficiencies towards eliminating the backlog of overdue repairs.

Table 16
Deficiencies Repaired in 2019

	Repaired Deficiencies that were Generated before 12/31/2018	**Repaired Deficiencies that were Generated in 2019**	**Total Completed Repairs**
Underground Facilities	4,104	15,792	19,896
Overhead Facilities	303	57	360
Pad Mount (URD) Facilities	237	729	966
Total	**4,644**	**16,578**	**21,222**

There are 11 Level I deficiencies pending for the Underground, 2 Level I deficiencies pending for the Overhead and 11 Level I deficiencies pending repair for the Pad Mount (URD) facilities.

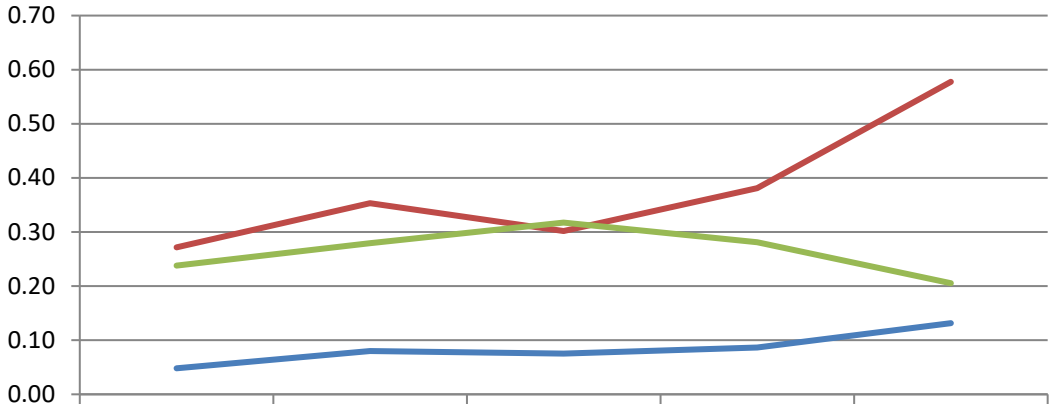
Temporary Repairs

There are 2 URD Level I temporary repairs over 90 days.

Analysis of Defects Found

Chart 5 shows the number of defects found per inspection by classification level. The generation rate of L1 and L2 defects found this year are slightly above the five-year average. The rate is mainly driven by the underground program that had the most inspections completed in 2019. Level III continues on a downward trend.

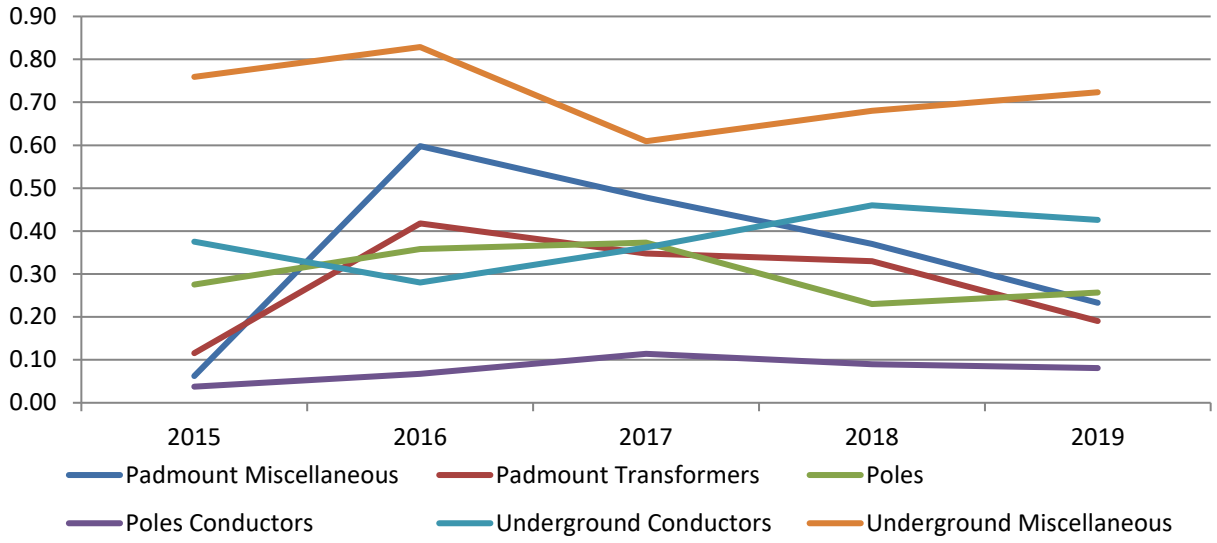
Chart 5
Defect Rate by Level



	2015	2016	2017	2018	2019
Level 1	0.05	0.08	0.075	0.087	0.132
Level 2	0.27	0.35	0.302	0.381	0.578
Level 3	0.24	0.28	0.317	0.281	0.205

Chart 6 shows the 2019 Defect Rate by Category. The Defect Rate shows a downward trend for four of the six major categories listed. Underground Miscellaneous shows a slight increase and Poles remained on par with 2018.

Chart 6
Defect Rate by Category



X. Quality Assurance

The Safety Standards require electric companies to develop a quality assurance program to "ensure timely and proper compliance with these safety standards." Con Edison has developed a comprehensive quality assurance program to address the contact voltage testing and facility inspections requirements. The quality assurance program includes:

- Contact voltage testing of underground distribution structures including Underground Residential Distribution (URD), overhead distribution structures and municipality-owned streetlights
- Contact voltage testing of transmission and substation facilities
- Facility inspections of underground distribution, URD, and overhead distribution structures
- Facility inspections of transmission facilities and substation facilities

This section addresses Con Edison's quality assurance program for the above-referenced contact voltage testing and facility inspections.

Quality Assurance Measures Instituted: Contact Voltage Testing of Underground Distribution Structures, Overhead Distribution Structures, and Municipality Owned Streetlights.

Con Edison developed a quality assurance plan to review whether contact voltage testing was performed as specified. The reliability and error design parameters used were:

- 95% reliability within a ±10% relative precision level and satisfy established industry sample design criteria.

Based on the total inspections performed in 2019, 676 quality assurance checks were required on all tested structures to achieve a 95% confidence rate with a ±10% overall error that the contact voltage tests were conducted in accordance with Company specifications.

The Company's specification EO-10315 (Quality Assurance of the Contact (Stray) Voltage and Periodic Distribution Structure Safety Inspection Programs) calls for quality assurance checks to be performed on the contractor contact voltage testing. The quality assurance checks are randomly selected from a database of all contact voltage tests and include a field test for contact voltage. Con Edison performed 155 quality assurance checks of the underground distribution structures including underground residential distribution (URD), 250 quality assurance checks of overhead distribution structures and 271 quality assurance checks of municipality owned streetlights. Contact voltage was not found during any of these quality assurance reviews. In addition to the 676 quality assurance checks discussed above, Con Edison also conducted Random Quality Assurance reviews of "work in progress."

Quality Assurance Measures Instituted: Contact Voltage Testing of Transmission and Substation Facilities.

In accordance with CE-ES-1043, a planner in Transmission Line Maintenance who has knowledge and expertise in overhead transmission, but who did not perform or directly supervise the contact voltage testing, conducted quality assurance inspections at locations on various transmission lines for overhead transmission facilities. Contact voltage was not found during any of these quality assurance reviews.

Con Edison performed several types of quality assurance on the underground transmission contact voltage-testing program. Contractors, who also performed testing on underground distribution structures, performed the contact voltage testing of underground transmission facilities. Following this contact voltage testing, Con Edison Construction Management personnel performed audits at several locations. Contact voltage was not found during any of these quality assurance reviews.

Con Edison's Asset Management Engineering group performed quality assurance for the substation contact voltage-testing program. The quality assurance consisted of a documents search, records review, as well as physical contact voltage testing. Contact voltage was not found during any of these quality assurance reviews.

Quality Assurance performed a quality review on a randomly selected sample of unit substations. Contact voltage was not found during any of these quality assurance reviews.

These QA checks confirmed the accuracy of the results from the Contact voltage-testing program.

Quality Assurance Measures Instituted: Inspections of Underground Distribution Structures and Overhead Distribution Structures.

A Central Quality Assurance group (QA) was established to oversee work done on the underground electrical system. QA observes specification compliance of the underground inspection program. The Company's specification EO-10315 (Quality Assurance of the Contact Voltage and Periodic Distribution Structure Safety Inspection Programs) establishes standards for the QA program in order to ensure that the underground structure inspections are performed in accordance with the Safety Standards and Con Edison's specifications. The reliability and error design parameters used were:

- 95% reliability within a ±10% relative precision level and satisfy established industry sample design criteria.

Based on the total inspections performed in 2019, 575 quality assurance checks were required to achieve a 95% confidence rate with a ±10% overall error that the inspections were conducted in accordance with Company specifications.

Con Edison employees from the centralized quality assurance department conduct the quality assurance for each of the Company's operating regions. These employees are experienced cable splicers, linemen and mechanics that have been trained in facility inspection and the quality assurance specifications.

The quality assurance personnel performed a complete re-inspection of 400 underground and 175 overhead facilities. The results of the inspections of the randomly selected facilities are compared with the results of the previous inspected of those facilities. Deficiencies identified during quality assurance reviews are communicated to field crews, supervisors, planners, and managers who have been required to reinforce inspection procedures with field crews.

Quality Assurance Measures Instituted: Transmission and Substation Facility Inspections.

Company specifications CE-TS-6830 (Low and Medium Feeder Pressure Periodic Inspection Procedure) and CE-TS-6045 (Inspection and Preventive Maintenance and Contact Voltage Testing of Pipe Type Cable Systems) require that quality assurance inspections of randomly selected transmission manholes be performed. These randomly selected manholes are re-inspected or re-tested by trained and knowledgeable employees who did not perform or directly supervise this work.

Substation Operations' quality assurance program consists of periodic document reviews and field observations to ensure that 100% of the required contact voltage tests and a minimum of 20% of the Safety and Reliability Inspections of Substation facilities will be completed by December 31 of each year and that the testing and inspections are properly conducted.

Quality assurance was performed by members of the Asset Management Engineering group and consisted of a documents search, records review, and physical critical visual inspection. Critical visual inspection quality assurance was also performed. In addition, all inspection and follow-up work order documentation were reviewed. Work orders are entered into the Company's work management system and processed by appropriate personnel. These work orders are tracked closely until all repairs are completed. All personnel are trained on proper reporting and referral of repairs identified during facility inspections. The quality assurance inspections yielded results indicating that the original inspections were performed in accordance with the applicable specifications.

XI. Other Pertinent Information

Con Edison continues to develop its public safety programs through analytic and technical innovation, and through strategic academic and industry partnerships. Since inception, the Company installed over 4,500 Structure Monitors within the Electric Distribution System.

As part of the pilot enhancement plan to Con Edison's Structure Inspection and Repair Program, the Company performed enhanced inspections which included infrared scanning and ampere testing. These enhanced inspections resulted in the identification and repair of over 500 locations since inception in 2018, which are an indication of possible future manhole events. In addition, mobile scans targeting high-activity areas were also successfully performed detecting approximately 1,100 energized objects that are included in the results listed in Table 2a. More broadly, the goal of targeted scanning is to reduce shocks and there has been a decrease in utility shocks from 2018 to 2019 (30 to 23) and a decrease in non-utility shocks (41 to 26). When weather is accounted for, a linear regression would have predicted 25 utility and 52 non-utility shocks in 2019 based on a salt distribution of approximately 285 kilotons. The actual number of utility and non-utility shocks were both lower than predicted by the linear regression, thus we can conclude that our inspection and repair programs are effective at improving Public Safety.

Appendix 1: Summary of Manual Contact Voltage Testing

	Total System Units Requiring Testing	Units Completed	Percent Completed	Units with Voltage Found[1] (>= 1.0v)	Percent of Units Tested with Voltage (>= 1.0v)	Units Classified as Inaccessible
Overhead Distribution Facilities	5,941	5,941	100.00%	0	0.000%	36
Quarterly Update		766	12.89%	0	0.000%	0
Underground Distribution Facilities	136,385	136,385	100.00%	1	0.001%	643
Quarterly Update		3,318	2.43%	0	0.000%	0
Street Lights / Traffic Signals[2]	112,012	112,012	100.00%	186	0.166%	262
Quarterly Update		751	0.67%	2	0.266%	179
Substation Fences[3]	243	243	100.00%	0	0.000%	0
Quarterly Update		0	0.00%	0	0.000%	0
Transmission (69kV and Above)	1,224	1,224	100.00%	0	0.000%	0
Quarterly Update		0	0.00%	0	0.000%	0
TOTAL	255,805	255,805	100.00%	187	0.073%	941
Quarterly Update		4,835	1.89%	2	0.041%	179

1. Contact voltage sources on Con Edison structures and streetlights - found by contractors

2. Con Ed does not own streetlight/traffic signal facilities. These facilities are owned by the City of New York and municipalities located in Westchester County

3. 2019 is the fifth year of the five-year testing cycle for area substation fences. 71 of 71 area substation fences have been completed as of 9/30/19.
Unit SS fences are tested annually.

Appendix 2a: Summary of Energized Objects -Mobile Testing

	1/1/2019 - 12/31/2019						
	Initial Readings				Reading After Mitigation		
	1.0V-4.4V	4.5V-24.9V	>25V	Totals	<1.0V	1.0V - 4.4V	>4.5V
Distribution Facilities	**29**	**12**	**5**	**46**	**46**	**0**	**0**
Ground	1	1	0	2	2	0	0
Guy	0	0	0	0	0	0	0
Other	8	0	0	8	8	0	0
Pole	20	11	5	36	36	0	0
Riser	0	0	0	0	0	0	0
Underground Facilities	**346**	**159**	**17**	**522**	**522**	**0**	**0**
Manhole	1	1	0	2	2	0	0
Other	1	0	0	1	1	0	0
Padmount Switchgear	0	0	0	0	0	0	0
Padmount Transformer	0	0	0	0	0	0	0
Pedestal	1	2	0	3	3	0	0
Service Box	275	133	15	423	423	0	0
Vault - Cover/Door	68	23	2	93	93	0	0
Street Lights / Traffic Signals	**541**	**352**	**280**	**1,173**	**1,173**	**0**	**0**
Metal Street Light Pole	269	214	220	703	703	0	0
Other	3	7	9	19	19	0	0
Pedestrian Crossing Pole	32	22	19	73	73	0	0
Traffic Control Box	3	0	0	3	3	0	0
Traffic Signal Pole	234	109	32	375	375	0	0
Substation Fences	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Fence	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Transmission (Total)	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Lattice Tower	0	0	0	0	0	0	0
Pole	0	0	0	0	0	0	0
Ground	0	0	0	0	0	0	0
Guy	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Miscellaneous Facilities	**3,953**	**1,738**	**297**	**5,988**	**5,988**	**0**	**0**
Bus Shelter	5	2	0	7	7	0	0
Control Box	2	0	0	2	2	0	0
Fire Hydrant	143	42	1	186	186	0	0
Gate/Fence/Awning	739	413	68	1,220	1,220	0	0
Other	1,506	596	107	2,209	2,209	0	0
Phone Booth	1	0	0	1	1	0	0
Riser	0	0	0	0	0	0	0
Scaffolding	44	32	18	94	94	0	0
Sidewalk	1,190	541	89	1,820	1,820	0	0
Traffic Sign	265	102	14	381	381	0	0
Water Pipe	58	10	0	68	68	0	0
Total	**4,869**	**2,261**	**599**	**7,729**	**7,729**	**0**	**0**

Appendix 2b: Summary of Energized Objects - Manual Testing + Other

	1/1/2019 - 12/31/2019						
	Initial Readings				Reading After Mitigation		
	1.0V-4.4V	4.5V-24.9V	>25V	Totals	<1.0V	1.0V - 4.4V	>4.5V
Distribution Facilities	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Ground	0	0	0	0	0	0	0
Guy	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Pole	0	0	0	0	0	0	0
Riser	0	0	0	0	0	0	0
Underground Facilities	**1**	**4**	**2**	**7**	**7**	**0**	**0**
Manhole	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Padmount Switchgear	0	0	0	0	0	0	0
Padmount Transformer	0	0	0	0	0	0	0
Pedestal	0	0	0	0	0	0	0
Service Box	1	4	1	6	6	0	0
Vault - Cover/Door	0	0	1	1	1	0	0
Street Lights / Traffic Signals	**41**	**85**	**75**	**201**	**201**	**0**	**0**
Metal Street Light Pole	37	71	68	176	176	0	0
Other	0	0	0	0	0	0	0
Pedestrian Crossing Pole	0	0	0	0	0	0	0
Traffic Control Box	0	0	0	0	0	0	0
Traffic Signal Pole	4	14	7	25	25	0	0
Substation Fences	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Fence	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Transmission (Total)	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Lattice Tower	0	0	0	0	0	0	0
Pole	0	0	0	0	0	0	0
Ground	0	0	0	0	0	0	0
Guy	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Miscellaneous Facilities	**0**	**4**	**4**	**8**	**8**	**0**	**0**
Bus Shelter	0	0	0	0	0	0	0
Control Box	0	0	0	0	0	0	0
Fire Hydrant	0	1	0	1	1	0	0
Gate/Fence/Awning	0	0	0	0	0	0	0
Other	0	1	3	4	4	0	0
Phone Booth	0	0	0	0	0	0	0
Riser	0	0	0	0	0	0	0
Scaffolding	0	0	0	0	0	0	0
Sidewalk	0	0	0	0	0	0	0
Traffic Sign	0	0	1	1	1	0	0
Water Pipe	0	2	0	2	2	0	0
Total	**42**	**93**	**81**	**216**	**216**	**0**	**0**

Appendix 3: Summary of Shock Reports from the Public

2019	10/1/2019 - 12/31/2019	Yearly Total
I. Total shock calls received:	**20**	**119**
Unsubstantiated	12	66
Normally Energized Equipment	0	4
Substantiated Stray Voltage	8	49
# Persons	5	37
# Animals	3	15
II. Injuries Sustained:	**0**	**0**
Utility Responsibility - Person	0	0
Utility Responsibility - Animal	0	0
Non Utility Responsibility - Person	0	0
Non Utility Responsibility - Animal	0	0
Unsubstantiated - Person	0	0
Unsubstantiated - Animal	0	0
III. Medical Attention Received:	**0**	**0**
Utility Responsibility - Person	0	0
Utility Responsibility - Animal	0	0
Non Utility Responsibility - Person	0	0
Non Utility Responsibility - Animal	0	0
Unsubstanitated - Person	0	0
Unsubstanitated - Animal	0	0
IV. Voltage Source:	**8**	**49**
Utility Responsibility:	2	23
Issue with primary, joint or transformer	0	0
Secondary joint(Crab)	1	3
SL service Line	0	4
Abandoned SL Service Line	0	0
Defective service line	0	14
Abandoned Service Line	0	0
OH Secondary	0	0
OH Service	1	1
OH Service neutral	0	1
OH SL Service	0	0
OH SL Service neutral	0	0
Pole	0	0
Riser	0	0
Other	0	0
Customer Responsibility:	6	26
Contractor damage	1	2
Customer Equipment/Wiring	5	24
Other Utility/Gov't Agency Responsibility:	0	0
SL Base Connection	0	0
SL Internal Wiring or Light Fixture	0	0
Overhead Equipment	0	0
Other - Utility	0	0
V. Voltage Range:	**8**	**49**
1.0V to 4.4V	3	16
4.5V to 24.9V	1	14
25V and above	4	19
No Reading	0	0

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

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process - Distribution															
Detail of Deficiencies by Facilities	**2015**			**2016**			**2017**			**2018**			**2019**		
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
Overhead Facilities															
Repaired in Time Frame	15	44	2,233	347	23	3,635	584	149	912	58	191	22	9	43	0
Repaired - Overdue	34	11	113	424	81	13	222	18	0	103	60	0	5	0	0
Not Repaired - Not Due	0	0	0	0	0	0	0	0	15,704	0	0	6,404	0	305	1,574
Not Repaired - Overdue	0	1,105	32,410	0	2,824	29,157	0	1,989	0	0	1,345	0	2	0	0
Total Overhead Facilities	49	1,160	34,756	771	2,928	32,805	806	2,156	16,616	161	1,596	6,426	16	348	1,574
Underground Facilities															
Repaired in Time Frame	7,676	40,974	2,838	9,621	41,708	2,930	3,308	16,401	3,307	2,111	11,293	2,373	2,589	11,539	1,641
Repaired - Overdue	216	2,451	185	81	1,858	21	28	379	0	38	27	0	16	7	0
Not Repaired - Not Due	0	0	0	0	0	0	0	0	1,330	0	0	1,456	0	1,803	1,508
Not Repaired - Overdue	0	2,186	2,910	0	2,604	2,971	0	1,400	0	0	1,288	0	11	0	0
Total Underground Facilities	7,892	45,611	5,933	9,702	46,170	5,922	3,336	18,180	4,637	2,149	12,608	3,829	2,616	13,349	3,149
Pad Mount Facilities															
Repaired in Time Frame	371	760	117	675	376	52	491	204	33	926	239	148	493	149	40
Repaired - Overdue	189	63	3	74	18	0	83	6	0	79	0	0	47	0	0
Not Repaired - Not Due	0	0	0	0	0	0	0	0	43	0	0	361	0	134	189
Not Repaired - Overdue	0	104	140	0	132	33	0	141	0	0	157	0	11	0	0
Total Pad Mount Facilities	560	927	260	749	526	85	574	351	76	1,005	396	509	551	283	229
Streetlight Facilities															
Repaired in Time Frame															
Repaired - Overdue															
Not Repaired - Not Due															
Not Repaired - Overdue															
Total Streetlight Facilities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transmission Facilities															
Repaired in Time Frame			16			33			10			3			18
Repaired - Overdue															
Not Repaired - Not Due									6			3			
Not Repaired - Overdue															
Total Transmission Facilities	0	0	16	0	0	33	0	0	16	0	0	6	0	0	18

Appendix 4: Summary of Deficiencies and Repair Activity Resulting from the Inspection Process (Cont.)

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process							
Year	Prority Level / Repair Expected		Deficiencies Found (Total)	Repaired In Time Frame	Repaired - Overdue	Not Repaired - Not Due	Not Repaired - Overdue
2015	I	Within 1 week	8,501	8,062	439	0	0
	II	Within 1 year	47,698	41,778	2,525	0	3,395
	III	Within 3 years	40,965	5,204	301	0	35,460
	IV	N/A	95,782	12,210	NA	83,572	NA
2016	I	Within 1 week	11,222	10,643	579	0	0
	II	Within 1 year	49,624	42,107	1,957	0	5,560
	III	Within 3 years	38,845	6,650	34	0	32,161
	IV	N/A	114,290	11,961	NA	102,329	NA
2017	I	Within 1 week	4,716	4,383	333	0	0
	II	Within 1 year	20,687	16,754	403	0	3,530
	III	Within 3 years	21,345	4,262	0	17,083	0
	IV	N/A	64,045	9,421	NA	54,624	NA
2018	I	Within 1 week	3,315	3,095	220	0	0
	II	Within 1 year	14,600	11,723	87	0	2,790
	III	Within 3 years	10,770	2,546	0	8,224	0
	IV	N/A	34,029	5,923	NA	28,106	NA
2019	I	Within 1 week	3,183	3,091	68	0	24
	II	Within 1 year	13,980	11,731	7	2,242	0
	III	Within 3 years	4,970	1,699	0	3,271	0
	IV	N/A	28,113	3,559	NA	24,554	NA

Appendix 4: Summary of Deficiencies and Repair Activity Resulting from the Inspection Process (Cont.)

Summary of Deficiencies and Repair Activity Resulting from the Inspection Process - Level IV Conditions										
	2015		2016		2017		2018		2019	
	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										
Overhead Facilities Total	28,909	230	33,340	291	14,151	35	9,998	31	1,445	3
Underground Facilities										
Underground Facilities Total	66,250	11,529	80,547	11,366	49,579	9,146	23,532	5,580	26,086	3,237
Pad Mount Transformers										
Pad Mount Transformers Total	561	411	337	248	255	191	437	292	544	255
Streetlight Facilities										
Streetlight Facilities Total										
Transmisssion Facilities										
Transmission Facilities Total	62	40	66	56	60	49	62	20	38	64
Overall Level IV Deficiencies										
Level IV Deficiencies Total	95,782	12,210	114,290	11,961	64,045	9,421	34,029	5,923	28,113	3,559

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Exhibit 1: Certifications

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Certification of Contact Voltage Testing

Patrick G. McHugh, on this 14th day of February 2020, certifies as follows:

1. I am Vice President of Consolidated Edison Company of New York, Inc. ("Con Edison" or "the Company").

2. I am responsible for overseeing Con Edison's contact voltage testing program, and in that capacity, I have monitored the Company's contact voltage testing program during the twelve months ended December 31, 2019 ("the twelve-month period"). During the twelve-month period, Con Edison instituted and diligently carried out a program designed to meet the contact voltage testing requirements of the Public Service Commission's Safety Standards, issued in Case 04-M-0159, Proceeding Instituting Safety Standards.

3. To the best of my knowledge, information, and belief, during the twelve month period, Con Edison identified and tested for contact voltage (i) all publicly accessible electric facilities owned by the Company, and (ii) all publicly accessible streetlights and traffic signals located in public thoroughfares in the Company's service territory and directly supplied by the Company as identified through a good faith effort by the Company, except for such facilities that are identified in the Company's Annual Report, submitted herewith.

Patrick G. McHugh

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Certification of Inspections

Patrick G. McHugh, on this 14th day of February 2020, certifies as follows:

1. I am Vice President of Consolidated Edison Company of New York, Inc. ("Con Edison" or "the Company").

2. I am responsible for overseeing Con Edison's electric facility inspection program, and in that capacity, I have monitored the Company's inspection program during the twelve months ended December 31, 2019 ("the twelve-month period"). During the twelve-month period, Con Edison instituted and diligently carried out a program designed to meet the inspection requirements established by the Public Service Commission's Safety Standards, issued in Case 04-M-0159, Proceeding Instituting Safety Standards.

3. To the best of my knowledge, information, and belief, Con Edison has visually inspected the requisite number of electric facilities during the twelve-month period, including the requirement to have conducted a visual inspection of 100% of Overhead and URD electric distribution facilities, 100% of underground and overhead transmission, 100% of substation fences and at least 57.7% of its Underground electric distribution facilities through December 31, 2019.

Patrick G. McHugh

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