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**E-FILE**

May 18, 2022

Rosemary Chiavetta, Secretary  
Pennsylvania Public Utility Commission  
Commonwealth Keystone Building  
400 North Street  
Harrisburg, Pennsylvania 17120

**Re: PPL Electric Utilities Corporation  
2021 Annual Reliability Report - CORRECTED  
Docket No. M-2016-2522508**

Dear Ms. Chiavetta:

Enclosed for filing on behalf of PPL Electric Utilities Corporation (“PPL Electric” or “the Company”) is PPL Electric’s **CORRECTED** 2021 Annual Reliability Report to the Pennsylvania Public Utility Commission. The Company respectfully requests that its original 2021 Annual Reliability Report, filed on April 29, 2022 pursuant to the Commission’s regulations at 52 Pa. Code § 57.195(a), be removed from the docket to avoid any confusion.

The following corrections have been made in the instant filing:

- **Reliability Indices Table on Page 8** –
  1. The 2021 figure for Number of Sustained Customer Service Interruptions (Trouble Cases) has been corrected from 24,241 to 24,242; and
  2. The 2021 figure for Number of Customers Affected has been corrected from 1,308,569 to 1,309,328.
  
- **Outage Causes Table on Page 9** –
  1. In the Improper Design row, Trouble Cases has been corrected from 0 to 1, Customer Interruptions has been corrected from 0 to 759, and Percent of Customer Interruptions has been corrected from 0.0% to 0.1%;
  2. In the Tree Related row, the Percent of Customer Interruptions has been corrected from 54.4% to 54.3%; and
  3. In the Total row, Trouble Cases has been corrected from 24,241 to 24,242 and Customer Interruptions has been corrected from 1,308,569 to 1,309,328.

As required by the Commission’s regulations, copies of the enclosed report have been served upon the Office of Consumer Advocate (“OCA”) and the Office of Small Business Advocate (“OSBA”).

If you have any questions regarding the enclosed report, please call me or Nikki Jones, PPL Electric's Senior Director - Public and Regulatory Affairs, at (717) 603-4029.

Respectfully submitted,



Kimberly A. Klock

Enclosures

cc via email: Patrick Cicero, Esquire  
Steven Gray, Esquire

Mr. Daniel Searfoorce  
Mr. Harry Bidelspach



**PPL Electric Utilities Corporation  
2021 Annual Reliability Report  
to the  
Pennsylvania Public Utility Commission**

*April 29, 2022*

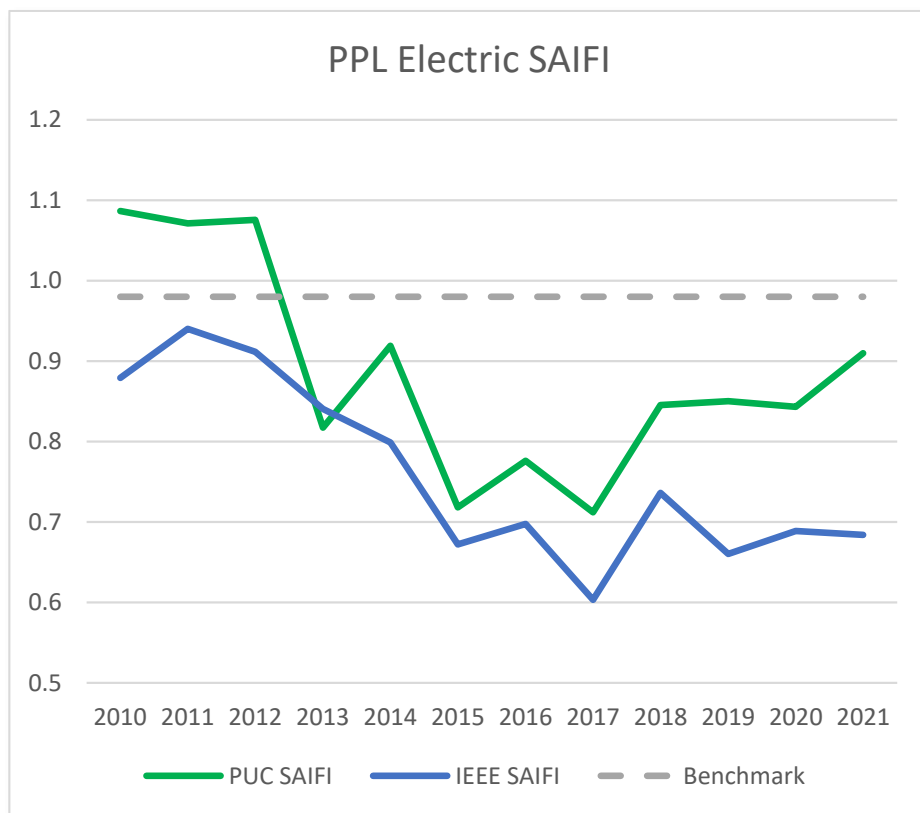
1) ***An overall current assessment of the state of the system reliability in the EDC's service territory including a discussion of the EDC's current programs and procedures for providing reliable electric service.***

SAIFI Performance

In 2021, PPL Electric customers continued to experience industry top quartile reliability performance in a year with the highest total number of storms on record. PUC SAIFI finished at 0.91, or 7% below PUC benchmark, our 9<sup>th</sup> consecutive year below benchmark.

IEEE SAIFI finished at 0.68 which was the fourth best in company history, and top quartile industry performance among large electric utilities nationally.

Our ongoing focus around preventing customer interruptions through system automation, vegetation management and asset performance continues to directly support overall strong reliability results, with over 200,000 customer outages eliminated in 2021 through automation, and over 1.2 million outages saved since the inception of automation in 2017. This level of SAIFI performance is directly related to our high levels of customer satisfaction, with outages being reduced by 27% since 2011 as shown in the SAIFI graph below.



PPL Electric continues to drive high levels of reliability performance through:

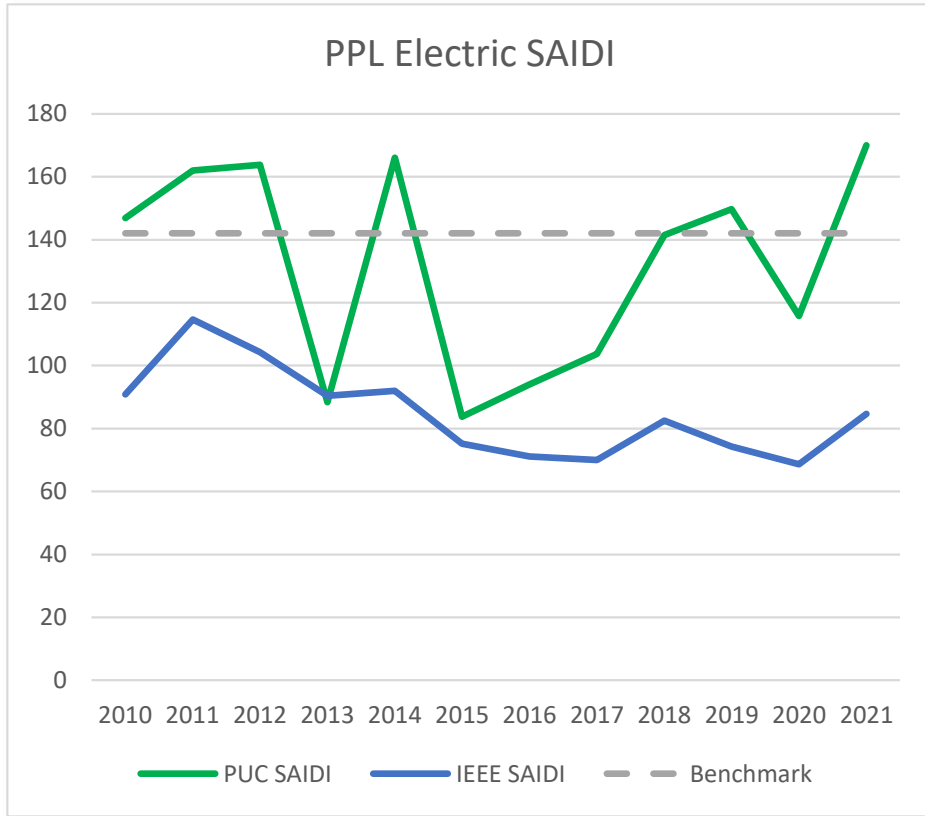
- Commitment to providing safe, reliable, affordable service to our customers.
- Extensive vegetation management program.
- Continued strategic investment in distribution automation technology such as:
  - Multi and single-phase Smart Grid Initiative.
  - Increased leverage of our Automated Distribution Management System (ADMS).
  - Full implementation of Fault Isolation and System Restoration (FISR) technology automatically restoring more than one million customers since 2015.
- Strategic data-driven reliability investments including asset replacement, and system improvements that include storm hardening standards.
- An increased focus on remediating momentary outages before they become permanent outages.
- Continued focus on outage response improvements.
- Moving to data driven condition based maintenance programs

2021 results were achieved in a year of record storm frequency and intensity. 2021 saw an all-time peak of 42 total storms, easily surpassing the previous high of 33 in 2011. 2021 further saw the most PUC storm cases, customers, and minutes on record.

Year	PUC CMI	Storm	
		PUC CI	PUC CASES
2002	99,015,227	446,420	3,760
2003	12,631,167	71,796	851
2004	97,539,670	302,418	2,882
2005	41,206,329	201,503	2,079
2006	148,343,084	546,292	5,067
2007	91,942,918	423,003	3,952
2008	137,727,147	443,305	3,952
2009	52,777,061	257,598	2,692
2010	102,001,866	408,459	4,235
2011	108,993,889	376,095	3,201
2012	112,656,279	358,106	2,628
2013	26,326,830	127,021	1,112
2014	132,178,883	294,201	3,245
2015	28,418,978	167,931	1,015
2016	54,674,446	266,922	2,696
2017	71,286,608	258,504	3,000
2018	110,312,331	303,469	3,927
2019	131,734,085	409,578	5,339
2020	98,853,825	460,988	6,446
2021	177,625,959	616,913	10,230

SAIDI Performance

2021 PUC SAIDI performance was well within standard, but 19.7% above benchmark, largely attributable to a record storm year. IEEE SAIDI, which is more weather-normalized, shows 2021 SAIDI performance at 84.6 versus the non-weather normalized PUC value of 170.

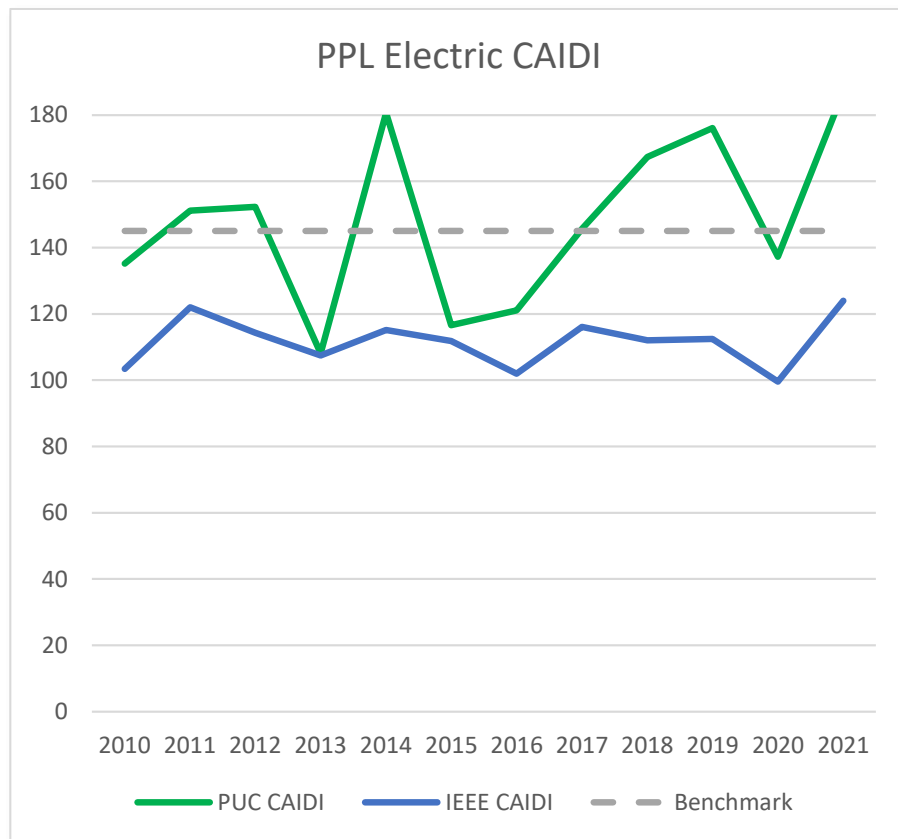


## CAIDI Performance

In 2021 PUC CAIDI was heavily impacted by storms. Our more weather normalized IEEE CAIDI was 124, versus the non-weather normalized PUC value of 187.

With 2021 storms surpassing even the prior 4 years of higher storm frequency and magnitude, along with automated systems preventing and converting outages to momentary interruptions, higher CAIDI values for 2021 are not unexpected. However, several initiatives continue to be evaluated to improve CAIDI performance. Some of these strategic areas include:

- Optimize resource planning and scheduling
- Setting Restore vs. Repair strategy early on in storm response
- Resource Strategy/Optimization
- Resource scheduling and prearrange resource availability
- Leverage data technology to isolate impact and dispatch of resources needed to address outages



## IEEE Metrics

PPL Electric’s IEEE Metrics are shown below. Note that weather events during 2021 had an impact on the volatility of our reliability metrics. The IEEE 1366 standard is a widely used methodology that allows for weather normalized performance evaluation that better reflects system performance during non-major storm events. PPL Electric is consistently a first quartile SAIFI and SAIDI performer. The table below lists PPL Electric’s IEEE performance metrics compared to the 2020 (most recent available) performance quartiles for large utilities nationally, as issued by the IEEE annual reliability survey. PPL Electric’s 2021 quartile performances are projected. PPL Electric’s continued focus on improving system reliability is directly related to its strong SAIFI performance.

	IEEE CAIDI	IEEE SAIFI	IEEE SAIDI
2017	116	0.60	70.0
2018	112	0.74	82.5
2019	113	0.66	74.3
2020	99.6	0.69	68.6
2021	124	0.68	84.6
IEEE First Quartile Ceiling	98	0.82	84
IEEE Second Quartile Ceiling	108	1.04	103

## Reliability Programs

It is PPL Electric’s continuing goal to achieve and maintain best in class levels of electric delivery service to its customers in a cost-effective manner. Maintenance programs are one of the key elements that focus on maintaining system and circuit reliability, equipment performance, and interruption prevention. The scope of these maintenance programs, procedures, and activities covers all areas of the electrical infrastructure.

These programs include:

### **Transmission**

Transmission inspection programs include aerial patrols conducted via helicopter or UAV (Unmanned Aerial Vehicle). These patrols focus on comprehensive inspections and routine “stop and go” inspections for identification of maintenance work. Inspections focus on all transmission line equipment, including poles, arms, line switches, interrupters, arresters, grounding, guying, anchors, and other key components. Proactive replacement programs are in place to target specific risk areas (e.g. cellon treated wood poles, upswept wood arms, etc.) and to apply data-driven approaches to mitigate known reliability risks (e.g. avian interference, lightning performance, etc.).

### **Substation**

Substation maintenance programs include inspections and overhauls of equipment, such as breakers, disconnects, power cables, and security equipment. Some equipment is maintained on a time basis; other equipment is condition-monitored. These two methods help ensure that maintenance work is performed in a cost-effective manner and keep rates

low for our customers. Besides time and condition-based maintenance, thermo-graphic inspections help ensure that substation equipment does not operate at elevated temperature levels for an extended period of time, which helps prevent equipment failure.

### **Distribution**

Distribution programs encompass many maintenance aspects similar to transmission and substations, and also include load surveys that help engineers determine peak load requirements, circuit analyses for the identification of lines requiring maintenance work, voltage relief, or other capital improvements. Overhead line inspections identify damaged or deteriorated equipment that is repaired or replaced proactively. In addition, distribution maintenance includes inspections of poles, voltage regulators, line switches, capacitors, and other key distribution equipment. PPL Electric also tests underground cable to determine if the cable needs to be replaced, repaired or cured to prevent future failures.

### **Vegetation**

The vegetation on PPL Electric's transmission and distribution rights-of-way (ROW) is maintained utilizing a combination of several management techniques. These include tree pruning, tree removal, re-clearing and herbicide application. Lines are field-surveyed on a regular basis. The work is scheduled and budgeted based on the conditions observed and past performance. Outside of the ROW, danger trees with the potential to fall into the ROW are removed when possible.

Each of these programs is more fully described in Appendices A through D.

- 2) *A description of each major event that occurred during the year being reported on, including the time and duration of the event, the number of customers affected, the cause of the event and any modified procedures adopted in order to avoid or minimize the impact of similar events in the future.*

No major events occurred during 2021.

3) *A table showing the actual values of each of the reliability indices (SAIFI, CAIDI, SAIDI, and if available, MAIFI) for the EDC's service territory for each of the preceding 3 calendar years. The report shall include the data used in calculating the indices, namely the average number of customers served, the number of sustained customer interruptions, the number of customers affected, and the customer minutes of interruption. If MAIFI values are provided, the number of customer momentary interruptions shall also be reported.*

<i>Year</i>		<b>2019</b>	<b>2020</b>	<b>2021<sup>1</sup></b>	<b>3 Yr. Avg.</b>
<b>SAIFI</b>	BM 0.98	0.85	0.84	0.91	0.867
	STD 1.18	0.85	0.84	0.91	0.867
<b>CAIDI</b>	BM 145	176.1	137.3	187	166.8
	STD 174	176.1	137.3	187	166.8
<b>SAIDI</b>	BM 142	149.7	115.7	170	145.1
	STD 205	149.7	115.7	170	145.1
<b>MAIFI</b>		5.7	5.3	2.6	4.5
<b>Customers Served<sup>2</sup></b>		1,429,035	1,438,204	1,445,611	1,437,617
<b>Number of Sustained Customer Interruptions (Trouble Cases)</b>		21,498	20,877	24,242	22,205
<b>Number of Customers Affected</b>		1,214,856	1,212,136	1,309,328	1,245,187
<b>Customer Minutes of Interruptions (CMI)</b>		213,941,314	166,414,603	245,413,282	208,589,733
<b>Number of Customer Momentary Interruptions</b>		8,083,944	7,639,856	3,817,912	6,513,904

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<sup>1</sup> Any slight variations from data provided previously are the result of error corrections.

<sup>2</sup> PPL Electric calculates the annual indices using customers served at the end of the period. This is consistent with the method used to calculate PPL Electric's benchmarks.

- 4) *A breakdown and analysis of outage causes during the year being reported on, including the number and percentage of service outages, the number of customers interrupted, and customer interruption minutes categorized by outage cause such as equipment failure, animal contact, tree related, and so forth. Proposed solutions to identified service problems shall be reported.*

The table shows a breakdown of service outage causes for 2021. Service interruption definitions are provided in Appendix E. PPL Electric has maintenance programs to address controllable service outages. Those programs are detailed in Appendices A through D.

Cause Description	Trouble Cases	Percent of Trouble Cases	Customer Interruptions	Percent of Customer Interruptions	Customer Minutes	Percent of Customer Minutes
Animals	3,345	13.8%	57,527	4.4%	3,624,274	1.5%
Contact / Dig-In	159	0.7%	11,508	0.9%	666,976	0.3%
Directed by Non-PPL Authority	64	0.3%	11,070	0.8%	721,796	0.3%
Equipment Failures	5,355	22.1%	288,310	22.0%	31,781,576	13.0%
Improper Design	1	0.0%	759	0.1%	15,901	0.0%
Improper Installation	1	0.0%	14	0.0%	1,776	0.0%
Improper Operation	4	0.0%	1,528	0.1%	11,181	0.0%
Nothing Found	1,046	4.3%	67,251	5.1%	7,359,267	3.0%
Other Controllable	90	0.4%	11,927	0.9%	742,458	0.3%
Other Non Control	287	1.2%	26,322	2.0%	2,382,276	1.0%
Other Public	32	0.1%	4,671	0.4%	545,158	0.2%
Tree Related	13,070	53.9%	711,409	54.3%	183,142,324	74.6%
Unknown	-	0.0%	-	0.0%	-	0.0%
Vehicles	788	3.3%	117,032	8.9%	14,418,320	5.9%
<b>Total</b>	<b>24,242</b>	<b>100.0%</b>	<b>1,309,328</b>	<b>100.0%</b>	<b>245,413,282</b>	<b>100.0%</b>

Analysis of causes contributing to the majority of service interruptions:

**Weather Conditions:** PPL Electric records weather conditions, such as wind or lightning, as contributing factors to service interruptions, but does not code them as direct interruption causes. Therefore, some fluctuations in cause categories, especially tree- and equipment-related causes, are attributable to weather variations. For the current reporting period, weather was considered a significant contributing cause in 59% of cases, 62% of customer interruptions, and 81% of CMI.

**Tree Related:** Vegetation is one of the largest single contributors to the number of cases of trouble, customer interruptions and customer minutes. For the current reporting period, approximately 86% of the cases of trouble, 86% of the customer interruptions and 94% of the customer minutes attributed to tree related outages were weather-related.

**Animals:** Animals accounted for approximately 14% of PPL Electric's cases of trouble. Although this represents a significant number of cases, the effect on SAIFI and CAIDI is small because approximately 73% of the number of cases of trouble were associated with individual distribution transformers. However, when animal contacts affect substation equipment, the effect may be widespread and potentially can interrupt thousands of customers on multiple circuits. In addition to guarding new distribution transformers and substations, PPL Electric initiated distribution and substation animal guarding programs in 2009 to focus systematically on protecting existing facilities most at risk of incurring animal-caused interruptions. A complete effectiveness review of this strategy is being evaluated.

**Vehicles:** Although vehicles cause a small percentage of the number of cases of trouble, they accounted for a large percentage of customer interruptions and customer minutes, because main distribution lines generally are located along major thoroughfares with higher traffic densities. In addition, vehicle-related cases often result in extended repair times to replace broken poles. PPL Electric has a program to identify and relocate poles that are subject to multiple vehicle hits.

**Equipment Failure:** Equipment failure is one of the largest single contributors to the number of cases of trouble, customer interruptions and customer minutes. However, approximately 40% of the cases of trouble, 42% of the customer interruptions and 54% of the customer minutes attributed to equipment failure were weather-related and, as such, are not considered to be strong indicators of equipment condition or performance.

**Nothing Found:** This description is recorded when the responding crew can find no cause for the interruption. That is, when there is no evidence of equipment failure, damage, or contact after a line patrol is completed. For example, during heavy thunderstorms, when a line fuse blows or a single-phase OCR locks open and when closed for test, the fuse holds, or the OCR remains closed, and a patrol reveals nothing.

5) *Specific remedial efforts taken to date and planned for circuits that have been on worst performing 5% of circuits list for a year or more.*

Twenty PPL Electric circuits have been on the worst performing circuit list for a year or more.

**Circuit 47704 -- BLOOMSBURG 77-04**

Remedial Actions

- In 2021, two single-phase reclosers were installed.
- In 2022, a section of line will be reconducted.
- In 2022, a section of single-phase conductor will be relocated.
- In 2022, additional fusing will be installed.
- In 2022, additional sectionalizing capability will be added to this circuit.
- In 2022, five single-phase reclosers will be installed.
- In 2022, a section of conductor in a heavily wooded area will be undergrounded.
- In 2022, additional animal guarding will be installed.
- In 2022, additional hazard tree removal will be performed.

**Circuit 20403 -- ASHFIELD 04-03**

Remedial Actions

- In 2020, additional hot spot trimming was performed.
- In 2020, two and one-half miles of three-phase conductor was rebuilt.
- In 2020, a section of difficult-to-access single-phase was relocated.
- In 2021, three additional single-phase reclosers were installed on this circuit.
- In 2021, an existing recloser was upgraded to a Smart Grid device.
- In 2022, single-phase ties will be evaluated for this circuit.
- In 2022, a section of difficult-to-access conductor will be relocated.
- In 2022, a three-phase tie to the GREENWOOD 20601 will be evaluated.
- In 2022, four additional single-phase reclosers will be installed.
- In 2023, a section of single-phase will be extended.

**Circuit 56504 -- ROCKVILLE 65-04**

Remedial Actions

- In 2020, eight fuses were installed.
- In 2020, 150 hazard trees were removed.
- In 2020, seven single-phase sectionalizing devices were installed.
- In 2021, one fuse was installed.
- In 2021, a section of line was reconfigured to improve reliability.
- In 2022, additional animal guards will be installed.
- In 2022, additional fusing will be installed.

- In 2022, a section of single-phase resourcing will be evaluated.
- In 2022, a section of single-phase will be relocated underground.
- In 2022, full circuit trimming will be performed.
- In 2022, three single-phase reclosers will be installed
- In 2023, two single-phase reclosers will be installed and protection settings will be optimized.

### **Circuit 26001 -- WEST DAMASCUS 60-01**

#### Remedial Actions

- In 2020, additional animal guarding was installed.
- In 2020, eight additional single-phase reclosers were installed.
- In 2020, full circuit trimming was performed.
- In 2021, a section of single-phase was reconductored.
- In 2021, numerous porcelain cutouts were replaced.
- In 2021, additional fusing was installed.
- In 2021, a Smart Grid device was replaced.
- In 2021, a section of difficult-to-access conductor was relocated.
- In 2022, additional animal guarding will be installed.
- In 2022, four additional single-phase reclosers with downstream fusing will be installed.
- In 2022, several poles and cross-arms will be replaced.
- In 2022, a new three-phase tie line will be evaluated.
- In 2022, hazard tree removal will be evaluated.
- In 2023, full circuit trimming will be performed.

### **Circuit 45302 -- WEST BERWICK 53-02**

#### Remedial Actions

- In 2022, two sections of difficult-to-access conductor were relocated.
- In 2022, a section of difficult-to-access conductor was resourced.
- In 2022, several poles and cross-arms will be replaced.
- In 2022, additional fusing will be installed.
- In 2022, full circuit trimming will be performed.
- In 2023, a section of difficult-to-access conductor will be relocated.

### **Circuit 45902 -- AUBURN 59-02**

#### Remedial Actions

- In 2020, additional fusing was installed at several locations.
- In 2020, a dissimilar metal connection was remediated.
- In 2020, multiple cross arms were replaced.

- In 2020, multiple porcelain cutouts were replaced.
- In 2021, additional fusing was installed with more to be done in 2022.
- In 2022, nine single-phase reclosers will be installed.
- In 2022, additional hazard tree removal will be evaluated.
- In 2022, two sections of difficult-to-access conductor will be relocated.
- In 2023, the AUBURN substation will be configured to be remotely transferrable.
- In 2023, a section of this circuit will be transferred to a new line.
- In 2023, full circuit trimming will be performed.

### **Circuit 45402 -- WEST BLOOMSBURG 54-02**

#### Remedial Actions

- In 2021, fault indicators were installed on a section of this circuit and more will be evaluated.
- In 2021, three single-phase reclosers were installed.
- In 2022, additional fusing will be installed.
- In 2022, additional animal guarding will be installed.
- In 2022, six single-phase reclosers will be installed.
- In 2022, full circuit trimming will be performed.
- In 2022, additional sectionalizing will be evaluated.

### **Circuit 43401 -- BENTON 34-01**

#### Remedial Actions

- In 2020, full circuit trimming was performed.
- In 2021, hazard tree removal was performed.
- In 2021, additional fusing was installed.
- In 2022, a section of difficult-to-access single-phase circuit will be relocated.
- In 2022, a single-phase tie will be evaluated for this circuit.
- In 2022, the protection settings for this circuit will be evaluated and optimized.
- In 2022, two single-phase reclosers will be installed.
- In 2022, additional fusing will be installed.
- In 2022, additional sectionalizing will be evaluated.

### **Circuit 20601 -- GREENWOOD 06-01**

#### Remedial Actions

- In 2020, seven additional fuses were installed.
- In 2020, an adjacent circuit was reconductored to improve transfer capability.
- In 2020, two additional single-phase reclosers were installed.
- In 2020, an existing recloser was replaced with a Smart Grid device.
- In 2020, a section of two-phase conductor was upgraded to three-phase.

- In 2021, an additional single-phase recloser was installed.
- In 2021, additional fusing was installed at six locations.
- In 2021, full circuit trimming was performed.
- In 2021, two additional sectionalizing devices were installed.
- In 2022, a three-phase tie to the ASHFIELD 20403 will be evaluated.
- In 2022, additional single-phase ties will be evaluated.
- In 2023, a section of difficult-to-access single-phase will be relocated.
- In 2023, a section of difficult-to-access single-phase will be de-energized and customers will be transferred to an adjacent feeder.

### **Circuit 56802 -- BENVENUE 68-02**

#### Remedial Actions

- In 2020, seven sectionalizing devices were installed.
- In 2020, a section of single-phase line was resourced.
- In 2020, six additional single-phase reclosers were installed.
- In 2021, a single-phase recloser was installed.
- In 2022, additional fusing will be installed.
- In 2022, a section of single-phase will be relocated and reconfigured.
- In 2022, two single-phase reclosers will be installed.
- In 2022, full circuit trimming will be performed.
- In 2023, a section of three-phase will be reconductored.
- In 2023, a section of single-phase will be relocated to underground.

### **Circuit 26401 -- INDIAN ORCHARD 64-01**

#### Remedial Actions

- In 2021, three single-phase reclosers were installed.
- In 2021, additional animal guarding was installed.
- In 2022, additional animal guarding will be installed.
- In 2022, numerous porcelain cutouts will be replaced.
- In 2022, a section of conductor will be reconductoring and relocated.
- In 2022, additional fusing will be installed.
- In 2022 and 2023, six additional single-phase reclosers will be installed.

### **Circuit 46001 -- BERWICK 60-01**

#### Remedial Actions

- In 2022, reconductoring and line relocation will be evaluated.
- In 2022, additional fusing will be installed.
- In 2022, full circuit trimming will be performed.
- In 2022, an additional single-phase recloser will be installed.

- In 2022, several poles and cross-arms will be replaced.
- In 2022, an alternate feed for this circuit will be constructed.
- In 2023, a new line and terminal will be constructed for this circuit.

### **Circuit 52402 -- GREEN PARK 24-02**

#### Remedial Actions

- In 2021, a section of single-phase was relocated overhead.
- In 2021, 215 hazard trees were removed.
- In 2021, expanded trimming right-of-way was obtained for sections of this circuit.
- In 2021, a section of single-phase was relocated to underground.
- In 2021, one section of single-phase was reconductored.
- In 2022, a new battery storage installation will be installed.
- In 2022, an additional single-phase recloser will be installed.
- In 2022, additional animal guarding will be installed.
- In 2022, a section of single-phase will be relocated overhead.
- In 2022, full circuit trimming will be performed.
- In 2022, an additional section of single-phase will be reconductored.
- In 2022, a section of single-phase will be relocated.
- In 2022, two sections of single-phase will be re-sourced to reduce exposure.
- In 2022, additional sectionalizing devices will be evaluated.
- In 2022, an analysis of tree outages versus wire size will be conducted on this circuit.
- In 2024, a new line and terminal will be installed.
- In 2024, a three-phase tie will be installed.

### **Circuit 46302 -- ROHRSBURG 63-02**

#### Remedial Actions

- In 2021, a sectionalizing device was relocated.
- In 2021, additional fusing was installed.
- In 2021, a section of difficult-to-access conductor was relocated with another relocation scheduled for 2022.
- In 2022, additional animal guarding will be installed.
- In 2022, additional fusing will be installed.
- In 2022, additional sectionalizing will be evaluated.
- In 2023, an additional single-phase recloser will be installed.

## **Circuit 11506 -- FREEMANSBURG 15-06**

### Remedial Actions

- In 2020, a section of three-phase conductor was extended.
- In 2020, a Smart Grid device was replaced.
- In 2020, a switch at the substation was replaced.
- In 2021, five additional single-phase reclosers were installed.
- In 2021, additional fusing was installed.
- In 2022, additional single-phase reclosers will be installed.
- In 2022, a section of this circuit will be reconfigured.
- In 2022, full circuit trimming will be performed.
- In 2022, additional fusing will be installed.
- In 2022, a section of single-phase will be evaluated for splitting.
- In 2022, extending a section of conductor will be evaluated.
- In 2022, a new substation will be evaluated that would create more transfer capability for this circuit.
- In 2024, the circuit will be split to reduce loading and improve reliability.

## **Circuit 22003 -- BOHEMIA 20-03**

### Remedial Actions

- In 2021, additional fusing was installed at three locations with two more planned.
- In 2021, an additional Smart Grid device was installed.
- In 2021, additional animal guarding was installed.
- In 2021, a Smart Grid device was upgraded.
- In 2021, additional fusing was installed.
- In 2022, six additional single-phase reclosers will be installed.
- In 2022, additional fusing will be installed.
- In 2022, two Smart Grid devices will be replaced.
- In 2022, a new tie line will be constructed.
- In 2023, full circuit trimming will be performed.

## **Circuit 25801 -- SULLIVAN TRAIL 58-01**

### Remedial Actions

- In 2020, an off-cycle drone inspection was performed with several minor remediations performed as a result.
- In 2021, three additional single-phase reclosers were installed.
- In 2021, a section of three-phase was reconducted.
- In 2021, a section of three-phase conductor was extended.
- In 2021, full circuit trimming was performed.
- In 2022, a Proactive Circuit Analysis will be performed.

- In 2022, additional fusing and single-phase sectionalizing will be evaluated.
- In 2022, additional hazard tree removal will be evaluated.

### **Circuit 52401 -- GREEN PARK 24-01**

#### Remedial Actions

- In 2021, two additional fuses were installed.
- In 2021, a section of single-phase was reconductored.
- In 2022, protective device coordination will be reviewed.
- In 2022, seven fuses will be installed.
- In 2022, two sections of single-phase will be relocated.
- In 2022, additional sectionalizing devices will be evaluated.
- In 2022, an additional Smart Grid device will be installed.
- In 2023, full circuit trimming will be performed.
- In 2023, a battery storage solution will be installed.
- In 2024, a section of single-phase will be relocated to underground.
- In 2024, a section of single-phase will be relocated out of the right-of-way.

### **Circuit 40502 -- CRESSONA 05-02**

#### Remedial Actions

- In 2020, a three-phase sectionalizing device was replaced.
- In 2020, full circuit trimming was performed.
- In 2020, additional fusing was installed.
- In 2021, two single-phase reclosers were installed.
- In 2021, three poles were replaced.
- In 2022, four additional single-phase reclosers will be installed.
- In 2022, a section of difficult-to-access single-phase will be relocated.
- In 2022, additional pole replacement will be performed.
- In 2023, a section of this line will be transferred to a new line.

### **Circuit 12301 -- LANARK 23-01**

#### Remedial Actions

- In 2020, hot spot trimming was performed.
- In 2021, additional animal guarding was installed.
- In 2021, two single-phase reclosers were installed.
- In 2022, full circuit trimming will be performed.
- In 2022, two single-phase reclosers will be installed.

- 6) *A comparison of established transmission and distribution inspection and maintenance goals/objectives versus actual results achieved during the year being reported on. Explanations of any variances shall be included.*

Inspection & Maintenance Goals/Objectives	2021 Budget	Actual	% Variance
<b>Transmission</b>			
Transmission C-tag poles (# of poles)	86	86	0.0%
Transmission arm replacements (# of sets)	29	29	0.0%
Transmission air break switch inspections (# of switches)	0	0	0.0%
Transmission lightning arrester installations (# of sets)	445	445	0.0%
Transmission structure inspections (# of activities)	15,870	15,870	0.0%
Transmission tree side trim-Bulk Power (linear feet)			
Transmission herbicide-Bulk Power (# of acres)			
Transmission reclearing (# of miles) BES Only	539	534	-0.9%
Transmission reclearing (# of miles) 69 kV	998	965	-3.3%
Transmission reclearing (# of miles) 138 kV	80	84	5.0%
Transmission danger tree removals-Bulk Power (# of trees)			
<b>Substation</b>			
Substation batteries (# of activities)	285	284	-0.4%
Circuit breakers (# of activities)	396	405	2.3%
Substation inspections (# of activities)	1,761	1,777	0.9%
Transformer maintenance (# of activities)	494	567	14.8%
<b>Distribution</b>			
Distribution C-tag poles replaced (# of poles)	3,083	1,156	-62.5%
C-truss distribution poles (# of poles)	2,061	2,135	3.6%
Capacitor (MVAR added)	0	0	0.0%
OCR Replacements (# of)	1	3	200.0%
Distribution pole inspections (# of poles)	61,684	57,118	-7.4%
Distribution line inspections (hours)	2,200	2,200	0.0%
Group re-lamping (# of lamps)	16,140	6,178	-61.7%
Test sections of underground distribution cable	301	301	0.0%
Distribution tree trimming (# of miles)	5,848	5,360	-8.3%
Distribution herbicide (# of acres)			
Distribution >18" removals within R/W (# of trees)			
Distribution hazard tree removals outside R/W (# of trees)			
LTN manhole inspections (# of)	616	486	-21.1%
LTN vault inspections (# of)	301	275	-8.6%
LTN network protector overhauls (# of)	55	52	-5.5%
LTN reverse power trip testing (# of)	27	17	-37.0%

Explanation of variances greater than 10%:

**Transformer Maintenance Activities:** Work was made a higher priority in 2021.

**Distribution C-Tag Poles replaced:** Deferred for higher priority work.

**OCR Replacements:** Two additional failures were replaced.

**Group Relamping:** Deferred for higher priority work.

**LTN Manhole Inspections:** Some manhole inspections were deferred to 2022 for scheduling optimization purposes.

**LTN Reverse Power Trip Testing:** Some reverse power trip jobs with a low reliability impact were not performed in 2021 due to scheduling constraints and will be performed in 2022.

7) *A comparison of budgeted versus actual transmission and distribution operation and maintenance expenses for the year being reported on in total and detailed by the EDC's own functional account code or FERC account code as available. Explanations of any variances 10% or greater shall be included.*

The following table provides operation and maintenance expenses for PPL Electric, and includes the work identified in the response to Item (6).

Activity	2021 Budget (\$000)	2021 Actual (\$000)	Variance (%)
Provide Electric Service	6,239	8,269	32.5%
Vegetation Management	36,696	35,595	-3.0%
Customer Response	61,140	73,762	20.6%
Reliability Maintenance	25,438	27,628	8.6%
System Upgrade	3,625	685	-81.1%
Customer Service/Accounts	119,095	98,792	-17.0%
Others	39,453	54,523	38.2%

Explanation of variances of 10% or greater:

**Provide Electric Service** – Higher volume of service requests.

**Customer Response** - Higher than projected driven by storm costs.

**System Upgrade** - Lower than projected costs related to System Facilities upgrades.

**Customer Service/Accounts** - Lower uncollectable accounts as a result of fewer write-offs following the pandemic.

**Other** – driven by pension credit reclass to other income.

- 8) *A comparison of budgeted versus actual transmission and distribution capital expenditures for the year being reported on in total and detailed by the EDC's own functional account code or FERC account code as available. Explanations of any variances 10% or greater shall be included.*

The following table provides capital expenditures for PPL Electric which includes transmission and distribution activities.

Activity	2021 Budget (\$000)	2021 Actual (\$000)	Variance (%)
New Service/Revenue	95,137	103,454	8.7%
System Upgrade	188,825	181,858	-3.7%
Reliability & Maintenance	422,424	435,885	3.2%
Customer Response	28,711	46,520	62.0%
Other	22,271	14,527	-34.8%

Explanation of variances of 10% or greater:

**Customer Response** - Higher than projected driven by storm costs

**Other** – driven by the following Transmission Operations projects: Relay and Security Upgrade, Fault Indicators, and Wood pole replacements

*Quantified transmission and distribution inspection and maintenance goals/objectives for the current year detailed by system area (that is, transmission, substation and distribution).*

Inspection & Maintenance Goals/Objectives	2022 Budget
<b>Transmission</b>	
Transmission C-tag poles (# of poles)	61
Transmission arm replacements (# of sets)	36
Transmission air break switch inspections (# of switches)	1
Transmission surge arrester installations (# of sets)	419
Transmission structure inspections (# of activities)	15,988
Transmission tree side trim-Bulk Power (linear feet)	N/A
Transmission herbicide-Bulk Power (# of acres)	N/A
Transmission reclearing (# of miles) BES Only	821
Transmission reclearing (# of miles) 69 kV	1,628
Transmission reclearing (# of miles) 138 kV	90
Transmission danger tree removals-Bulk Power (# of trees)	N/A
<b>Substation</b>	
Substation batteries (# of activities)	323
Circuit breakers (# of activities)	296
Substation inspections (# of activities)	1,256
Transformer maintenance (# of activities)	797
<b>Distribution</b>	
Distribution C-tag poles replaced (# of poles)	2564
C-truss distribution poles (# of poles)	3,740
Capacitor (MVAR added)	N/A
OCR Replacements (# of)	0
Distribution pole inspections (# of poles)	74,806
Distribution line inspections (miles)	2,200
Group re-lamping (# of lamps)	18,720
Test sections of underground distribution cable	N/A
Distribution tree trimming (# of miles)	4,288
Distribution herbicide (# of acres)	N/A
Distribution >18" removals within R/W (# of trees)	N/A
Distribution hazard tree removals outside R/W (# of trees)	N/A
LTN manhole inspections (# of)	387
LTN vault inspections (# of)	299
LTN network protector overhauls (# of)	60
LTN reverse power trip testing (# of)	25

**10) Budgeted transmission and distribution operation and maintenance expenses for the current year in total and detailed by the EDC's own functional account code or FERC account code as available.**

The following table provides budgeted operation and maintenance expenses for PPL Electric and includes the work identified in the response to Item (9).

Activity	2022 Budget (\$000)
Provide Electric Service	5,799
Vegetation Management	33,292
Customer Response	60,906
Reliability Maintenance	21,217
System Upgrade	3,870
Customer Service/Accounts	109,576
Others	63,970
<b>Total O&amp;M Expenses</b>	<b>298,629</b>

**11) Budgeted transmission and distribution capital expenditures for the current year and detailed by the EDC's own functional account code or FERC account code as available.**

The following table provides budgeted capital expenditures for PPL Electric and includes transmission and distribution activities.

Activity	2022 Budget (\$000)
New Service/Revenue	92,169
System Upgrade	205,389
Reliability & Maintenance	500,801
Customer Response	34,262
Other	27,172
<b>Total</b>	<b>859,793</b>

***12) Significant changes, if any, to the transmission and distribution inspection and maintenance programs previously submitted to the Commission.***

No significant changes were requested.

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***PPL Electric Utilities Corporation  
Transmission Programs & Procedures***

<b>Program</b>	<b>Activity</b>
Helicopter Inspections – Routine	Aerial linemen perform annual routine transmission line patrols from a helicopter. They identify damaged or deteriorated equipment. Engineers review the findings and develop plans for repair or replacement.
Helicopter Inspections – Comprehensive	Aerial linemen perform an overhead comprehensive inspection of transmission line facilities on a risk-based time cycle. Detailed condition reports with close up digital photos are prepared for each specific component problem found along the transmission line and right of way. Engineers review the findings and schedule corrective maintenance as needed.
Helicopter Inspections – Emergency	Aerial linemen perform patrols of transmission lines that operate abnormally. This inspection focuses on identifying damage that may have been caused by lightning, inclement weather, equipment failure or vandalism. Because of the nature of this work, corrective actions are usually expedited.
Field Inspections – Emergency	Line personnel perform emergency foot patrols to inspect transmission lines that operated abnormally. This inspection focuses on identifying damage that may have been caused by lightning, inclement weather, equipment failure or vandalism. Due to the nature of this damage, corrective actions are generally expedited.
Steel Structure Inspection/Repair	Personnel inspect steel structures at the ground line for corrosion, mechanical damage and foundation degradation. Structural components are coated, and repairs are made based on the findings of the inspections as necessary.
Equipment Maintenance	During helicopter and foot patrols, equipment and facilities are identified that require repairs. Based on need and criticality, repairs are either scheduled or completed as soon as possible.
Planned Replacement Programs	Lightning arresters and avian guards are installed on targeted 69kV and 138kV facilities based on a data-driven risk analysis to improve reliability of worst performing circuits.
Line Switches – Maintenance & Inspection	Line personnel inspect, maintain, and perform operational tests on 138kV and 69kV transmission line switches to assure proper operation.

## Appendix A

<b>Program</b>	<b>Activity</b>
Line Switch Upgrades	Transmission line switches are being programmatically upgraded to include motor operators to allow for remote sectionalizing that substantially improves switching times during outages.
Circuit Analysis	Engineers analyze circuit loading and performance to identify areas needing increased line capacity or improved line reliability. Circuits are also reviewed based on operational performance and ranked yearly in a WPC list, with appropriate circuits identified for targeted reliability improvements.

***PPL Electric Utilities Corporation  
Substation Programs & Procedures***

<b>Program</b>	<b>Activity</b>
Load Survey	Automatic monitoring devices such as Supervisory Control and Data Acquisition (SCADA) provide continuous, real-time loading information. Engineers review equipment loading and identify facilities and transfer capabilities approaching capacity limits. A portion of the load may be supplied from a different source, the existing facilities may be upgraded, new lines and equipment may be added, or a new substation may be built to address capacity deficiencies.
Substation Inspection/Repair	Electricians inspect substations for security and equipment reliability on a time based maintenance cycle. They attempt to identify and correct potential equipment problems before a failure or interruption of service occurs.
Equipment Service	Electricians perform operational tests on power transformers, load tap changers (LTC), voltage regulators, circuit breakers, circuit switchers, vacuum switches, air break switches and transformer protective switches on a time based maintenance cycle to assure that equipment is operating within established parameters. Equipment serviced includes batteries, battery chargers, protective relays, HV fuses and high-speed automatic grounding switches. Depending on the type of equipment, “service” can include actions other than operational testing.
Inspection & Overhaul	Electricians inspect and overhaul circuit breakers, wave traps, ground switches, stick-operated disconnects, gang-operated disconnects and motor-operated disconnects on a time based maintenance cycle to assure proper operation.
Insulation Testing	Technicians perform power factor testing on power transformers, potential transformers, lightning arresters, current transformers, select circuit breakers and power cables on a time-based maintenance cycle. Testing also includes other instrument transformers (capacitance coupled voltage transformer, coupling capacitors, potential devices, etc.). They also perform high-potential testing on 12kV oil, air and vacuum circuit breakers to assure proper operation.

## Appendix B

<b>Program</b>	<b>Activity</b>
Condition Monitoring of Station Equipment	Technicians perform dissolved gas-in-oil, dielectric, oxygen, and oil acidity tests for oil in power transformers and impedance and capacity tests on station batteries to assure equipment is within normal parameters. Periodically, AC power factor tests, hi-potential tests, contact resistance tests and motion tests are performed on circuit breakers. Oil dielectric testing is conducted for oil circuit breakers.
Thermographic Inspections	Technicians perform thermography surveys of substation facilities to identify components operating at elevated temperature. Based on the findings, engineers develop plans to repair or replace the component(s) prior to failure.
Minor Improvements	Maintenance activities may identify conditions where additions or upgrades are needed to assure reliability. Engineers evaluate the need and develop action plans and schedules to complete the work.
DC Station Service Improvements	Repairmen identify deteriorated station batteries, battery chargers and battery components. Engineers schedule repair or replacement as necessary.
Capacitor Bank Protection	Engineers monitor the need for synchronous closing schemes on vacuum switches on 69kv capacitor banks. They plan and schedule installations as needed.
Area/Regional Supply	Engineers develop specific projects aimed at improving capacity shortfalls or replacing deteriorated or substandard station equipment.
SCADA Replacement	Engineers identify deteriorating substation SCADA equipment and develop plans to repair or replace it.

***PPL Electric Utilities Corporation  
Distribution Programs & Procedures***

<b>Program</b>	<b>Activity</b>
Load Survey – of equipment that is not continuously monitored	Line personnel measure the loading of facilities during peak periods. Engineers use this data for system studies.
Load Survey – by automatic monitoring devices	Automatic monitoring devices such as SCADA provide continuous, real-time loading information. Operators use this data to assure that loads do not exceed design limits. Engineers use this data for system studies.
Circuit Analysis	Engineers analyze circuit voltage profiles to balance loads and to identify areas requiring voltage support to maintain required voltage at the customer facility.
Voltage Regulator – Inspection & Maintenance	Inspectors examine existing equipment for potential failure, and inspect and maintain controls and tap changers to assure proper operation. Line personnel repair or replace any defective equipment.
Overhead Line Switch – Inspection & Maintenance	Inspectors examine switch installations to identify cracked or broken insulators / bushings, stuck or misaligned blades, insulation or gasket deterioration or other operational problems. Line personnel repair or replace any defective equipment.
Transformer Maintenance	Engineers analyze customer usage data to identify overloaded transformers. Transformers that are heavily loaded are replaced with higher capacity units or part of the load is transferred to other nearby transformers.
Wood Pole – Inspection, Maintenance, Replacement, Trussing, Fiber Wrap (reinforcement)	Inspectors examine wood poles for deterioration and measure the degree of rot. Based on the results, the pole is either scheduled for a future inspection, reinforcement for extended life or replacement.
Overhead Line Inspection	Inspectors examine overhead facilities to identify damaged, deteriorated or substandard equipment. Line personnel repair or replace any defective equipment. Includes visual and thermographic inspections.
Circuit Performance Review	Engineers use PPL Electric’s WPC score to ascertain the need for additional circuit reviews or inspections. The improved index looks at a circuit’s overall impact to system SAIFI and circuit SAIDI. Actual service interruption history is analyzed to identify causal or geographic patterns.

## Appendix C

<b>Program</b>	<b>Activity</b>
Underground Primary Cable – Testing, Maintenance, Replacement, Curing	Inspectors perform insulation and neutral tests on cable in residential developments with potential problems to identify deteriorated cable. Based on the results, the cable is placed back in service, repaired or replaced.
LTN Maintenance	Electricians will inspect, service, maintain and overhaul LTN vaults, manholes, cables, transformers, low voltage network protectors and primary transformer disconnect switches. Based on results, defective equipment is either repaired or replaced.
Public Damaged Facilities Review	A program aimed at identifying the locations of facilities that have been damaged by public contact more than once. Technicians evaluate those installations and, if relocation is possible, schedule work to move the facilities.
Underground Service Cable	Engineers resolve customer service problems that are due to deteriorated service conductors.
Oil Circuit Reclosers	Line personnel replace in-service oil circuit reclosers conditionally.
Line Protection Equipment	Line personnel replace in-service three phase oil circuit reclosers with communicating vacuum devices conditionally.
Capacitor Installation	Engineers perform voltage profiles to determine the need, location and size of any new voltage support equipment required to maintain adequate service voltage levels at customer facilities and provide needed reactive support for system stability. Line personnel install the required equipment.
Upgrade System Facilities	Engineers determine the need for additional capacity and design new and upgraded facilities to assure system reinforcements are constructed by the time they are needed.

***PPL Electric Utilities Corporation  
Vegetation Programs & Procedures***

<b>Program</b>	<b>Activity</b>
Tree Pruning	Tree pruning is scheduled based on field conditions observed and/or a system prioritization process. All pruning is done in accordance with <u>American National Standard for Tree Care Operations-Tree, Shrub and Other Woody Plant Maintenance – Standard Practices (ANSI A300)</u> . All circuits are fully trimmed on a 5 year cycle, with intermediate work performed on an as-needed basis.
Danger Tree Removal	Trees located both within the right-of-way corridor and outside the right-of-way that may be a threat to line performance/ safety are removed when it is feasible to do so.
Herbicide Application	Tall-growing, undesirable vegetation growing within the rights-of-way corridors is selectively treated with herbicides. Low-growing vegetation that does not represent a hazard to the safe, reliable operation of PPL Electric’s facilities is preserved wherever possible.
Reclearing	Tall-growing, undesirable vegetation growing within the rights-of-way corridors is selectively removed in those situations where herbicides can’t be utilized. Low-growing vegetation that does not represent a hazard to the safe, reliable operation of PPL Electric’s facilities is preserved wherever possible.

***PPL Electric Utilities Corporation  
Service Interruption Definitions***

**Trouble Definitions:** After field investigations and repairs are complete, PPL Electric linemen report the cause of each case of trouble. The definitions of the cause codes appear below. Note that while internal codes allow vegetation caused outages to be separated into trimming related and not trimming related, these categories are generally merged for internal reporting purposes, and consistent with the response to question 4.

Improper Design	Controllable	<ul style="list-style-type: none"><li>• When an employee or agent of PPL Electric is responsible for an error of commission or omission in the engineering or design of the distribution system.</li></ul>
Improper Installation	Controllable	<ul style="list-style-type: none"><li>• When an employee or agent of PPL Electric is responsible for an error of commission or omission in the construction or installation of the distribution system.</li></ul>
Improper Operation	Controllable	<ul style="list-style-type: none"><li>• When an employee or agent of PPL Electric is responsible for an error of commission or omission in the operation or maintenance of the distribution system.</li></ul>
Trees –Trimming Related	Controllable	<ul style="list-style-type: none"><li>• Outages resulting from conductors contacted by tree growth within the clearance zone defined by the current trimming specification (within the Right-of-Way).</li></ul>
Trees – Not Trimming Related	Non-Controllable	<ul style="list-style-type: none"><li>• Outages due to trees, but not related to lack of proper tree trimming maintenance. This includes danger timber blown into PPL Electric facilities, and trees or limbs felled by the public.</li></ul>
Animals	Controllable	<ul style="list-style-type: none"><li>• Any outage caused by an animal directly or indirectly coming in contact with PPL Electric facilities. This includes birds, squirrels, raccoons, snakes, cows, etc.</li></ul>
Vehicles	Public	<ul style="list-style-type: none"><li>• When cars, trucks or other types of vehicles or their cargoes strike facilities causing a problem.</li></ul>
Contact/Dig-in	Public	<ul style="list-style-type: none"><li>• When work in the vicinity of energized overhead facilities results in interruptions due to accidental contact by cranes, shovels, TV antennas, construction equipment (lumber, siding, ladders, scaffolding, roofing, etc.).</li><li>• When contact is made by a non-employee with an underground facility causing interruption.</li></ul>

## Appendix E

Equipment Failure	Controllable	<ul style="list-style-type: none"> <li>• Outages resulting from equipment failures caused by corrosion or contamination from build-up of materials, such as cement dust or other pollutants.</li> <li>• Outages resulting from a component wearing out due to age or exposure, including fuse tearing or breaking.</li> <li>• Outages resulting from a component or substance comprising a piece of equipment failing to perform its intended function.</li> <li>• Outages resulting from a failure that appears to be the result of a manufacturer's defect or cannot be described by any other code indicating the specific type of failure.</li> </ul>
Directed by Non-PPL Authority	Non-Controllable	<ul style="list-style-type: none"> <li>• Interruptions under the control of a PPL Electric switchman or direction of a PPL Electric System Operator for the purpose of dropping load or isolating facilities upon request during emergency situations.</li> <li>• Interruptions which cannot be postponed or scheduled for a later time, and include situations like load curtailment during system emergencies, and requests of civil authorities such as fire departments, police departments, civil defense, etc. for interruption of PPL Electric facilities.</li> </ul>
Other – Controllable (Lineman provides explanation)	Controllable	<ul style="list-style-type: none"> <li>• Interruptions caused by phase to phase or phase to neutral contacts, resulting from sleet or ice dropping off conductors, galloping conductors, or any other phase to phase or phase to neutral contact where weather is a factor.</li> <li>• Interruptions resulting from excessive load that cause that facility to fail.</li> <li>• When restoration of service to a facility, which had been interrupted for repairs or other reasons, causes an additional interruption to another facility which had not been involved in the initial interruptions.</li> <li>• Controllable interruptions or Power Service Problems whose cause is not described by one of the previous controllable cause codes.</li> </ul>
Nothing Found	Non-Controllable	<ul style="list-style-type: none"> <li>• When no cause for the interruption can be found.</li> <li>• When there is no evidence of equipment failure, damage or contact after line patrol is completed. This could be the case during a period of heavy thunder and lightning, when a line fuse blows or a single phase OCR locks open.</li> <li>• When closed for test, the fuse holds or the OCR remains closed. A patrol of the tap reveals nothing.</li> </ul>

## Appendix E

Other Public (Lineman provides explanation)	Public	<ul style="list-style-type: none"><li>• All outages resulting from gunfire, civil disorder, objects thrown, or any other act intentionally committed for the purpose of disrupting service or damaging company facilities.</li></ul>
Other – Non-Controllable (Lineman provides explanation)	Non-Controllable	<ul style="list-style-type: none"><li>• Any outage occurring because of a fire, flood or a situation that develops as a result of a fire or flood. Do not use when facilities are de-energized at the request of civil authorities.</li><li>• When an interruption is caused by objects other than trees, such as kites, balls, model airplanes, roofing material, or fences, being accidentally blown or thrown into overhead facilities.</li><li>• All problems caused by contact of energized equipment with facilities of other attached companies or by trouble on customer owned equipment.</li><li>• Interruptions or Power Service Problems whose cause is not described by one of the previous non-controllable cause codes, but is not affected by a PPL Electric employee's decisions.</li></ul>