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FEDERAL EXPRESS

October 30, 2015

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

RECEIVED

OCT 30 2015

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

**Re: PPL Electric Utilities Corporation
Quarterly Reliability Report for the
Period Ended September 30, 2015
Docket No. L-00030161**

Dear Ms. Chiavetta:

Enclosed for filing on behalf of PPL Electric Utilities Corporation ("PPL Electric") is an original of PPL Electric's Quarterly Reliability Report for the Period Ended September 30, 2015. Also enclosed, in a sealed envelope, is a copy of the report containing competitively sensitive and proprietary information. The Company hereby requests that the Commission treat that information, and the report containing the information, as privileged and confidential. The report is being filed pursuant to 52 Pa. Code § 57.195(d).

Pursuant to 52 Pa. Code § 1.11, the enclosed document is to be deemed filed on October 30, 2015, which is the date it was deposited with an overnight express delivery service as shown on the delivery receipt attached to the mailing envelope.

In addition, please date and time-stamp the enclosed extra copy of this letter and return it to me in the envelope provided.

If you have any questions regarding this document, please call me or B. Kathryn Frazier, PPL Electric's Regulatory Affairs Manager at (610) 774-3372.

Very truly yours,

Paul E. Russell

Enclosures

cc: Tanya J. McCloskey, Esquire
Mr. Daniel Searfoorce
Mr. John R. Evans



PPL Electric Utilities

PPL Electric Utilities Corporation
Quarterly Reliability Report
to the
Pennsylvania Public Utility Commission

November 2015

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PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

- 1) *A description of each major event that occurred during the preceding quarter, 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.*

There were no major events during the third quarter of 2015.

2) **Rolling 12-month reliability index values (SAIFI, CAIDI, SAIDI, and if available, MAIFI) for the EDC's service territory for the preceding quarter. 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 report shall also include the number of customer momentary interruptions.**

The following table provides data for the 12 months ending September 30th, 2015¹.

SAIFI (Benchmark = 0.98; Rolling 12-month Std. = 1.18)	0.69
CAIDI (Benchmark = 145; Rolling 12-month Std. = 174)	124
SAIDI (Benchmark = 142; Rolling 12-month Std. = 205)	86
MAIFI ²	3.76
Average Number of Customers Served ³	1,403,465
Number of Sustained Customer Interruptions (Trouble Cases)	14,555
Number of Customers Affected ⁴	971,001
Customer Minutes of Interruptions (CMI)	120,794,517
Number of Customer Momentary Interruptions	5,275,422

During the third quarter, there were no (0) PUC major events, no (0) PUC reportable storm, and five (5) other storms that required the opening of one or more area emergency centers to manage restoration efforts.

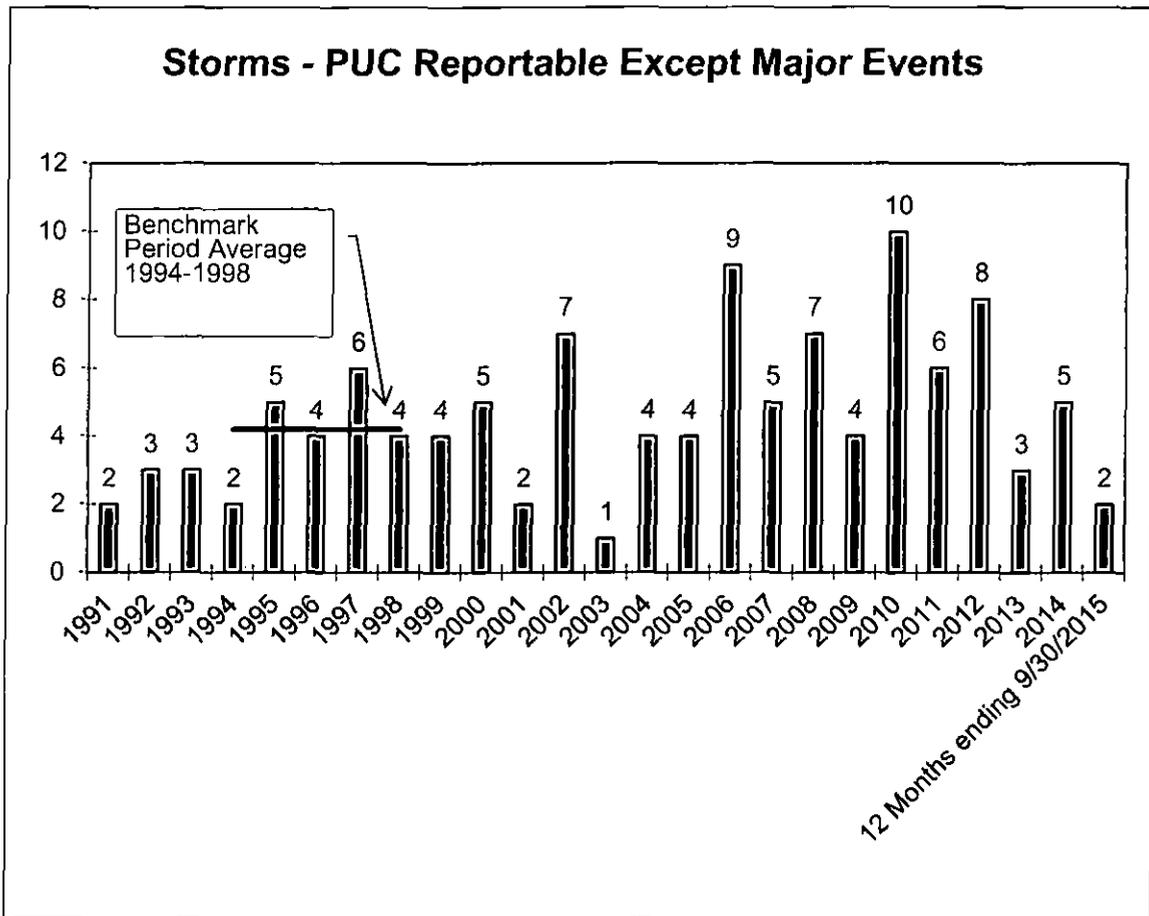
¹ Non-PPL Electric problems are excluded here, but may be found in Item 5.

² MAIFI data is obtained at the substation breaker level and at certain reclosers.

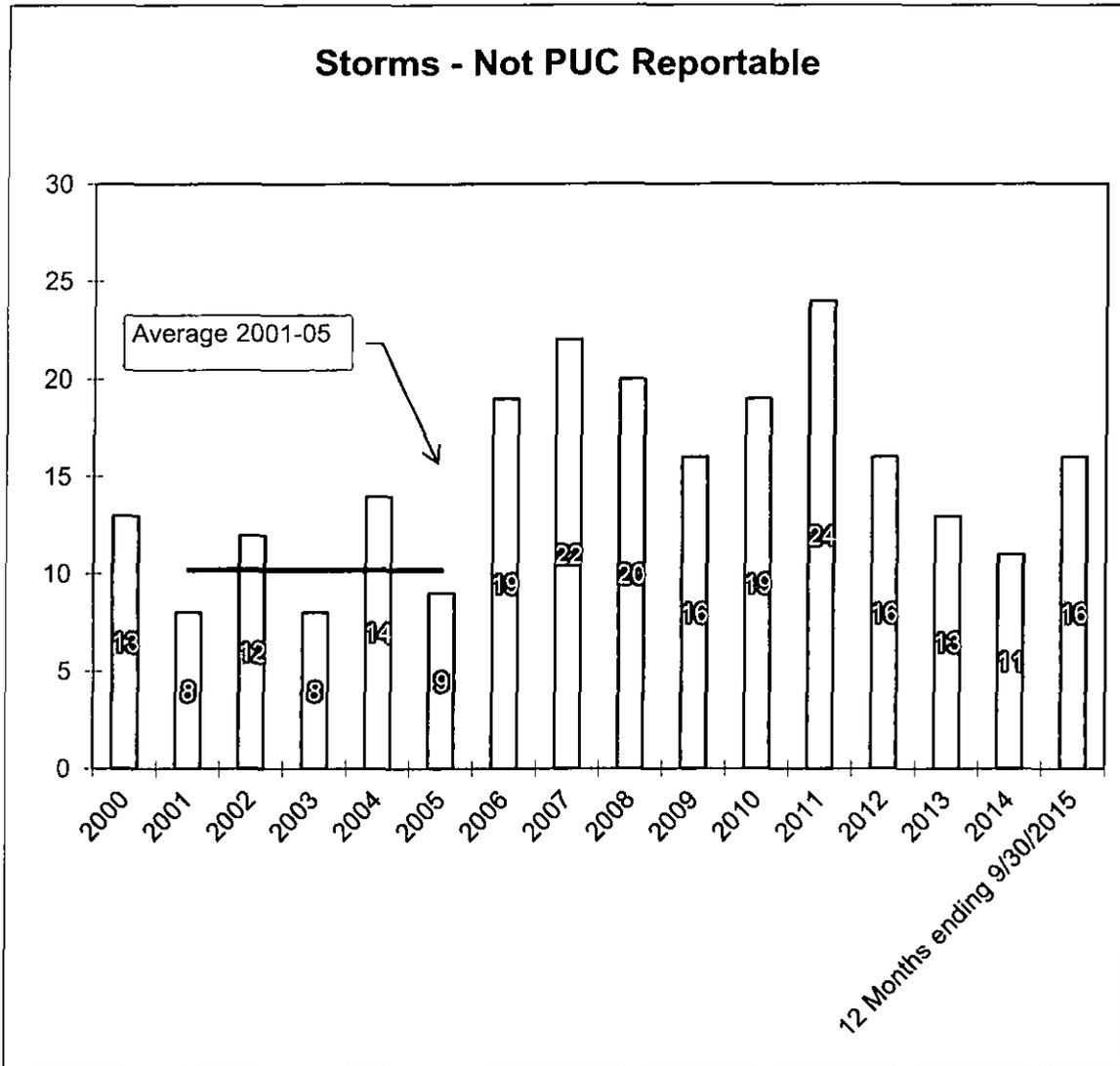
³ PPL Electric calculates the annual indices using customers served at the end of period. This is consistent with the method used to calculate PPL Electric's benchmarks.

⁴ The data reflects the number of customers interrupted for each interruption event summed for all events, also known as customer interruptions. If a customer is affected by three separate cases of trouble, that customer represents three customer interruptions, but only one customer interrupted.

Specifically, during the 12-month reporting period, there were no (0) PUC major events and two (2 PUC-reportable storms ($\geq 2,500$ customers interrupted for ≥ 6 hours) other than major events.



In addition, there were sixteen (16) storms that were not reportable, but which did require the opening of one or more area emergency centers to manage restoration efforts.



3) *Rolling 12-month reliability index values (SAIFI, CAIDI, SAIDI, CMI, and if available, MAIFI) and other pertinent information such as customers served, number of interruptions, customer minutes interrupted, number of lockouts, and so forth, for the worst performing 5% of the circuits in the system. An explanation of how the EDC defines its worst performing circuits shall be included.*

The following table provides reliability index values for the worst performing 5% of the circuits in the system for the 12 months ended at the current quarter. An explanation of how PPL Electric defines its worst performing circuits is included in Appendix A.

WPC Rank	Feeder ID	SAIDI	CAIDI	SAIFI	MAIFI	Customers	Cases of Trouble	Customer Minutes Interrupted (CMI)
1	27101	1,591	1,079	1.47	2.94	1,845	50	2,934,574
2	45602	564	312	1.81	7.13	1,598	35	900,992
3	61801	556	230	2.41	5	1,604	36	891,146
4	42201	509	240	2.12	7.02	1,728	32	879,966
5	47001	351	123	2.86	3	2,480	48	870,401
6	14501	436	152	2.86	1	1,876	18	817,895
7	11102	411	330	1.24	2.01	1,973	16	810,253
8	44301	374	348	1.08	8.99	2,054	47	768,862
9	59101	408	195	2.09	7.36	1,696	37	692,009
10	64502	354	171	2.07	2.93	1,921	12	679,686
11	22201	54,934	362	151.9	4	12	4	659,203
12	14403	257	109	2.35	1.65	2,545	33	654,412
13	26001	468	188	2.49	1.84	1,386	43	648,067
14	27502	221	189	1.17	1.69	2,927	17	645,607
15	40201	391	305	1.28	2.36	1,647	75	643,537
16	51603	267	114	2.34	5.56	2,406	11	642,668
17	18602	1,308	199	6.56	2.02	485	6	634,614
18	26703	331	431	0.77	10.51	1,888	63	623,990
19	64201	338	84	4	8.73	1,846	25	623,083
20	13105	263	376	0.7	0.37	2,367	12	622,136
21	17901	833	187	4.46	3.99	735	12	612,138
22	10702	333	262	1.27	2.01	1,835	19	610,178
23	22805	244	6,567	0.04	4.11	2,371	8	577,916
24	53602	262	117	2.23	4.25	2,197	41	575,685
25	16801	359	70	5.11	4.87	1,602	28	575,067

WPC Rank	Feeder ID	SAIDI	CAIDI	SAIFI	MAIFI	Customers	Cases of Trouble	Customer Minutes Interrupted (CMI)
25	16801	359	70	5.11	4.87	1,602	28	575,067
26	52403	449	285	1.58	2.77	1,264	51	567,114
27	22901	254	247	1.03	3.02	2,179	7	554,419
28	46001	228	403	0.57	2.39	2,362	33	537,929
29	14801	285	294	0.97	7.37	1,840	37	524,589
30	17802	273	270	1.01	2.82	1,889	67	516,536
31	16204	398	491	0.81	2.01	1,273	15	506,901
32	67502	284	172	1.65	5.93	1,775	19	503,690
33	21206	200	48	4.14	4.84	2,499	19	500,030
34	62104	315	118	2.66	3.82	1,587	10	499,848
35	40101	234	210	1.11	2.22	2,125	23	496,900
36	27202	377	100	3.77	8.98	1,316	15	496,471
37	46602	337	239	1.41	3.91	1,470	41	495,144
38	28604	275	164	1.68	1.77	1,775	38	488,597
39	14404	321	120	2.67	2.76	1,518	19	486,702
40	67302	261	200	1.31	3.01	1,854	14	484,236
41	25801	264	121	2.19	2.43	1,817	26	479,970
42	47101	161	182	0.89	2.51	2,976	22	479,623
43	45501	331	304	1.09	9.01	1,433	32	473,805
44	20403	249	75	3.31	1.74	1,901	30	472,515
45	64801	309	260	1.19	6.2	1,527	44	471,805
46	16603	523	250	2.09	3	889	12	465,277
47	65603	188	163	1.15	3.17	2,459	32	462,093
48	17804	299	161	1.86	3.85	1,508	34	451,010
49	28302	274	293	0.93	2.73	1,637	55	448,332
50	29402	273	351	0.78	0	1,640	31	447,770
51	64503	319	131	2.43	2.6	1,396	11	445,036
52	21401	175	64	2.74	1	2,541	19	444,767
53	67402	324	297	1.09	14.17	1,311	25	424,960
54	16101	279	321	0.87	6.29	1,474	21	411,464
55	62606	155	74	2.09	1.5	2,642	9	410,047
56	51905	209	163	1.28	9.78	1,926	11	402,643
57	67804	197	105	1.87	7.19	2,036	12	401,426
58	18603	368	140	2.62	1.99	1,082	18	398,638
59	51502	214	101	2.12	9.19	1,835	16	392,145
60	67401	286	471	0.61	10.82	1,371	33	391,870
61	29401	431	548	0.79	10.89	905	18	390,109

4) *Specific remedial efforts taken and planned for the worst performing 5% of the circuits identified in paragraph (3).*

01 Circuit 27101 -- GREENFIELD 71-01

Performance Analysis

The GREENFIELD 71-01 circuit experienced three outages of over 100,000 CMI between October 2014 and September 2015.

On October 16, 2014, during a period of heavy rain, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,883 customers for up to 85 minutes resulting in 136,838 CMI.

On June 27, 2015, during a period of strong wind, a tree made contact with an overhead switch causing a recloser to trip to lockout. This outage affected 4,242 customers for up to 1,271 minutes resulting in 2,299,760 CMI.

On August 28, 2015, an improper operation occurred on an overhead lightning protector causing a recloser to trip to lockout. This outage affected 1,823 customers for up to 257 minutes resulting in 243,392 CMI.

In total, the GREENFIELD 71-01 circuit had 53 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (17); equipment failure (14); animal contacts (13); other (5); nothing found (3); improper design (1).

Remedial Actions

- In 2015, a section of three-phase line was moved to the road to allow future repairs to be made more quickly and help reduce the duration of outages.

- In 2015, full circuit tree trimming was performed.
- In 2015, single phase fuses will be added in multiple locations.
- In 2015, relocating two sections of three-phase line to the road will be investigated to allow future repairs to be made more quickly and help reduce the duration of outages.
- In 2016, a new sectionalizing device will be investigated to reduce customer exposure, customer count, and line miles.
- In 2016, a line inspection will be completed.
- In 2018, a new tie line is planned between EYNON 16-01 and GREENFIELD 71-01. This tie will provide additional sectionalizing capabilities along with balancing line load to improve tie capabilities.

02 Circuit 45602 -- WOOLRICH 56-02

Performance Analysis

The WOOLRICH 56-02 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On September 9, 2015, a vehicle made contact with a pole causing the circuit to be interrupted. This outage affected 815 customers for up to 606 minutes resulting in 493,890 CMI.

In total, the WOOLRICH 56-02 circuit had 35 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (21); equipment failure (8); nothing found (3); animal contacts (2); vehicles (1).

Remedial Actions

- In 2015, a tie line to the LOCKHAVEN 06 circuit will be evaluated.
- Two Smart Grid devices will be added to this circuit, one in 2016 and one in 2017.
- In 2015, an Expanded Operational Review was performed in on this circuit. As a result minor repairs were performed at 5 locations.

- In 2016, an existing OCR will be replaced.
- In 2016, additional fusing will be installed at various locations on this circuit.
- In 2017, full circuit trimming will be performed on this circuit.

03 Circuit 61801 -- E ELIZABETHTOWN 18-01

Performance Analysis

The E ELIZABETHTOWN 18-01 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On May 18, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,596 customers for up to 924 minutes resulting in 606,838 CMI.

On June 23, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,598 customers for up to 266 minutes resulting in 156,547 CMI.

In total, the E ELIZABETHTOWN 18-01 circuit had 36 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (18); tree related (10); animal contacts (3); other (3); nothing found (1); vehicles (1).

Remedial Actions

- In 2014, full circuit tree trimming was performed.
- In 2015, all aluminum on copper crimps will be replaced on the three phase line.
- In 2015, the settings on a recloser near the substation will be evaluated and adjusted as needed.
- In 2015, opportunities for installing sectionalizing devices near heavily wooded areas will be evaluated.

- In 2016, a tie line will be installed between the RHEEMS 60-01 and EAST ELIZABETHTOWN 18-01 line. This tie will provide additional sectionalizing capabilities.
- In 2016, single phase fusing will be evaluated at six locations.
- In 2018, a recloser will be replaced with an automated vacuum recloser as part of the Smart Grid Initiative.

04 Circuit 42201 -- SHENANDOAH 22-01

Performance Analysis

The SHENANDOAH 22-01 circuit experienced three outages of over 100,000 CMI between October 2014 and September 2015.

On October 16, 2014, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,023 customers for up to 327 minutes resulting in 271,237 CMI.

On March 14, 2015, during a period of heavy rain, an equipment failure occurred on a pole or pole arm causing a recloser to trip to lockout. This outage affected 1,020 customers for up to 248 minutes resulting in 207,453 CMI.

On April 21, 2015, during a period of heavy rain, an equipment failure occurred on a pole or pole arm causing a recloser to trip to lockout. This outage affected 1,020 customers for up to 712 minutes resulting in 294,149 CMI.

In total, the SHENANDOAH 22-01 circuit had 32 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (12); animal contacts (9); tree related (8); contact or dig in (1); other (1); vehicles (1).

Remedial Actions

- In 2015, additional fusing will be installed on single and three phase taps.
- In 2015, animal guarding installation will be evaluated in multiple locations.
- In 2017, a new manual switch will be installed on a section of single and three phase line to improve sectionalizing capabilities.
- In 2017, full circuit tree trimming will be performed.

05 Circuit 47001 -- HUGHESVILLE 70-01

Performance Analysis

The HUGHESVILLE 70-01 circuit experienced three outages of over 100,000 CMI between October 2014 and September 2015.

On May 27, 2015, an animal interfered with a substation component causing a circuit breaker to trip to lockout. This outage affected 2,482 customers for up to 166 minutes resulting in 336,951 CMI.

On June 27, 2015, an improper operation occurred on an overhead switch. This outage affected 827 customers for up to 785 minutes resulting in 115,928 CMI.

On August 4, 2015, an improper operation occurred causing a recloser to trip to lockout. This outage affected 827 customers for up to 345 minutes resulting in 200,027 CMI.

In total, the HUGHESVILLE 70-01 circuit had 48 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (16); tree related (13); animal contacts (8); nothing found (4); Improper Operation (3); vehicles (2); contact or dig in (1); other (1).

Remedial Actions

- In 2015, a normally open switch between the HUGHESVILLE 70-01 and HUGHESVILLE 70-02 circuits was upgraded to a device with remote operational capability as part of the Smart Grid Initiative.
- In 2015, the underground getaway for this circuit was proactively replaced.
- In 2015, animal guarding was installed at the HUGHESVILLE Substation.
- In 2015, a project that will increase the load that can be transferred from the HUGHESVILLE 70-01 to the MILLVILLE 32-02 is scheduled. Approximately 8,500 feet of larger capacity conductor will be installed on the MILLVILLE 32-02.
- In 2015, additional 69kV transmission switches will be installed to allow the HUGHESVILLE 69kV transmission tap to be fed by either the CLINTON – MUNCY #1 69kV transmission line or the CLINTON – MUNCY #2 69kV transmission line.
- In 2016, fuses will be added to protect the three phase backbone.
- In 2016, full circuit tree trimming will be performed.
- In 2016, fuses will be added to protect the three phase backbone, and series fusing will be added at one location.
- In 2017, a project is planned to build one mile of new single phase and remove one mile of inaccessible copper conductor.
- In 2017, a new manually operable switch will be installed to allow line crews to transfer the HUGHESVILLE 70-01 to the HUGHESVILLE 70-02 should the HUGHESVILLE 70-01 circuit breaker or getaway fail.
- In 2018, a project is planned to build 2,500 feet of new single phase.

06 Circuit 14501 -- SCHOENECK 45-01

Performance Analysis

The SCHOENECK 45-01 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On June 8, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,867 customers for up to 1,120 minutes resulting in 428,768 CMI.

In total, the SCHOENECK 45-01 circuit had 18 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (10); equipment failure (3); nothing found (3); animal contacts (2).

Remedial Actions

- In 2015, an Expanded Operational Review was completed.
- In 2015, six locations will be evaluated for single phase fusing.
- In 2015, fault indicators were installed to aid in troubleshooting future outages.
- In 2016, a large project will be completed at the SCHOENECK Substation. This project involves installation of two new lines and an additional transformer and transmission source. One of the new lines will split the SCHOENECK 45-01 line into two separate lines, reducing outage exposure. Additionally, the SCHOENECK 45-01 and the new line will receive sectionalizing devices with remote operational capability.
- In 2016, full circuit tree trimming will be performed.

07 Circuit 11102 -- EGYPT 11-02

Performance Analysis

The EGYPT 11-02 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On June 30, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,978 customers for up to 722 minutes resulting in 586,860 CMI.

On June 30, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 154 customers for up to 1,165 minutes resulting in 156,265 CMI.

In total, the EGYPT 11-02 circuit had 16 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (6); tree related (6); vehicles (2); animal contacts (1); other (1).

Remedial Actions

- In 2015, an Expanded Operational Review identified minor issues and all remediation efforts have been completed.
- In 2015, a project to balance loading on the circuit by extending a new three phase line is being evaluated.
- In 2015, three additional locations are being evaluated for three phase fusing.
- In 2016, full circuit tree trimming will be performed.
- In 2017, three additional sectionalizing devices with remote operational capability will be installed as part of the Smart Grid Initiative.

08 Circuit 44301 -- BEAVERTOWN 43-01

Performance Analysis

The BEAVERTOWN 43-01 circuit experienced three outages of over 100,000 CMI between October 2014 and September 2015.

On February 19, 2015, a vehicle contact occurred causing a recloser to trip to lockout. This outage affected 473 customers for up to 359 minutes resulting in 130,140 CMI.

On May 31, 2015, during a period of heavy rain, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 476 customers for up to 439 minutes resulting in 175,929 CMI.

On June 30, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 475 customers for up to 1,329 minutes resulting in 309,939 CMI.

In total, the BEAVERTOWN 43-01 circuit had 47 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (16); tree related (16); animal contacts (7); nothing found (3); vehicles (3); other (2).

Remedial Actions

- In 2015, an existing recloser, sectionalizing switch and normally open tie switch will be upgraded to *remotely operable devices*.
- In 2015, full circuit trimming is being performed.
- In 2015, a project is being evaluated to build 600ft of new single phase in order to eliminate 2,700 feet of difficult-to-access single phase.
- In 2018, two existing devices will be upgraded to Smart Grid technology.

- In 2021, a project is planned that will provide a tie for 1133 radial customers. As part of this project 7,350 feet of new three phase will be installed and 7,500 feet of existing line will be reconductored.

09 Circuit 59101 -- WALKER 91-01

Performance Analysis

The WALKER 91-01 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On June 8, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,117 customers for up to 1,491 minutes resulting in 506,301 CMI.

In total, the WALKER 91-01 circuit had 37 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (21); equipment failure (8); nothing found (3); animal contacts (2); vehicles (2); other (1).

Remedial Actions

- In 2015, additional single phase fusing will be installed in three areas.
- In 2017, full circuit trimming will be performed.
- In 2018, two sectionalizing devices are scheduled to be installed as part of the Smart Grid Initiative.
- In 2022, a roughly four mile tie line and reconductoring will provide approximately 1,180 radial customers with an alternate source for sectionalizing during cases of trouble. In addition, the tie will also benefit approximately 1,080 radial customers on the MIFFLINTOWN 90-02.

10 Circuit 64502 -- LAVINO 45-02

Performance Analysis

The LAVINO 45-02 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On October 8, 2014, during a period of heavy rain, an unidentified issue occurred with an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,915 customers for up to 173 minutes resulting in 330,835 CMI.

On June 12, 2015, during a period of lightning, an unidentified issue occurred with an overhead switch causing a recloser to trip to lockout. This outage affected 1,894 customers for up to 171 minutes resulting in 323,627 CMI.

In total, the LAVINO 45-02 circuit had 12 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (3); vehicles (3); animal contacts (2); tree related (2); nothing found (1); other (1).

Remedial Actions

- In 2015, full circuit tree trimming will be performed.
- In 2015, all aluminum on copper crimps will be replaced on the three phase line.
- In 2016, a section of the LAVINO 45-03 line is under evaluation for reconductoring to strengthen the tie between the LAVINO 45-02 and LAVINO 45-03 line.
- In 2017, two existing switches will be replaced with remotely operable switches in order to automate switching capabilities between two transmission lines.

11 Circuit 22201 -- ELK MOUNTAIN 22-01

Performance Analysis

The ELK MOUNTAIN 22-01 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On June 27, 2015, during a period of heavy rain, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 903 customers for up to 647 minutes resulting in 520,467 CMI.

On August 11, 2015, during a period of heavy rain, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 906 customers for up to 210 minutes resulting in 138,089 CMI.

In total, the ELK MOUNTAIN 22-01 circuit had 4 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (4).

Remedial Actions

- In 2013, full circuit trimming was performed.
- In 2016, an Expanded Operation Review will be performed.
- For 2016, additional single phase fusing will be installed.

12 Circuit 14403 – SO SLATINGTON 44-03

Performance Analysis

The SOUTH SLATINGTON 44-03 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On July 1, 2015, an equipment failure occurred on a pole or pole arm causing a circuit breaker to trip to lockout. This outage affected 2,543 customers for up to 782 minutes resulting in 300,110 CMI.

On September 12, 2015, a vehicle contact occurred causing a circuit breaker to trip to lockout. This outage affected 2,541 customers for up to 798 minutes resulting in 354,302 CMI.

In total, the SOUTH SLATINGTON 44-03 circuit had 32 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (10); animals (7); nothing found (6); equipment failures (5); vehicles (2); other (2).

Remedial Actions

- In 2014, an Expanded Operational Review was completed.
- In 2015, a single phase tap that has experienced several repeat interruptions was reviewed and a broken cross arm was repaired to prevent future outages.
- In 2015, several spans of conductor that have excess slack will be repaired to prevent future outages resulting from the conductors coming together due to wind..
- In 2015, additional fuses and solid blade disconnects will be installed.
- In 2015, two large single phase taps will be reviewed for improved sectionalizing to reduce outage impacts.

13 Circuit 26001 -- WEST DAMASCUS 60-01

Performance Analysis

The WEST DAMASCUS 60-01 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On December 10, 2014, during a period of ice/sleet/snow, an equipment failure occurred on a substation component causing a circuit breaker to trip to lockout. This outage affected 1,377 customers for up to 139 minutes resulting in 191,664 CMI.

On March 26, 2015, during a period of heavy rain, an equipment failure occurred on a pole or pole arm causing a recloser to trip to lockout. This outage affected 349 customers for up to 413 minutes resulting in 143,969 CMI.

In total, the WEST DAMASCUS 60-01 circuit had 43 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (15); equipment failure (13); nothing found (6); animal contacts (5); vehicles (2); contact or dig in (1); other (1).

Remedial Actions

- In 2015, the WEST DAMASCUS 60-01 to INDIAN ORCHARD 64-01 manual tie switch was replaced with a remotely operated switch as part of the Smart Grid Initiative.
- In 2015, single phase fuses will be added in multiple locations.
- In 2015, relocating three sections of three-phase line to a more accessible location will be investigated to allow future repairs to be made more quickly and help reduce the duration of outages.
- In 2021, a new tie line is planned between the WEST DAMASCUS 60-01 and WEST DAMASCUS 60-02 circuits. This project will improve sectionalizing capabilities between the circuits, reducing outage durations in the future.

- In 2020, a new line and terminal is planned to reduce customer exposure, customer count, and line miles and to improve sectionalizing capabilities.

14 Circuit 27502 -- WEISSPORT 75-02

Performance Analysis

The WEISSPORT 75-02 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On November 2, 2014, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,578 customers for up to 79 minutes resulting in 125,498 CMI.

On July 22, 2015, a vehicle contact occurred causing a recloser to trip to lockout. This outage affected 1,577 customers for up to 284 minutes resulting in 447,868 CMI.

In total, the WEISSPORT 75-02 circuit had 17 outages between October 2014 and September 2015, with the causes breaking down as follows: animal contacts (5); equipment failure (5); tree related (5); nothing found (1); vehicles (1).

Remedial Actions

- In 2014, full circuit tree trimming was performed.
- In 2015, a manual switch will be evaluated for replacement with an automated vacuum recloser in 2017.
- In 2015, an Expanded Operational Review was performed. Several improvements were identified and completed.
- In 2015, three phase fusing will be investigated in multiple locations.
- In 2015, installing a two phase manual switch to improve sectionalizing capabilities will be evaluated.

- In 2015, C-Truss will be installed on a deteriorated river crossing pole.

15 Circuit 40201 -- BEAR GAP 02-01

Performance Analysis

The BEAR GAP 02-01 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On November 26, 2014, during a period of ice/sleet/snow, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 309 customers for up to 905 minutes resulting in 279,805 CMI.

In total, the BEAR GAP 02-01 circuit had 75 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (30); equipment failure (18); animal contacts (13); nothing found (7); other (5); vehicles (2).

Remedial Actions

- In 2015, full circuit tree trimming was completed.
- In 2015, a new sectionalizing device with remote operational capability was installed as part of the Smart Grid Initiative.
- In 2015, single and three phase fusing will be installed in multiple locations.
- In 2015, installing manual switches will be evaluated at several locations.
- In 2015, additional areas for animal guarding are being investigated.
- In 2016, a manual switch will be replaced with an automated vacuum recloser as part of the Smart Grid Initiative.
- In 2016, a new single phase recloser will be installed.
- In 2017, a new sectionalizing device with remote operational capability will be installed as part of the Smart Grid Initiative.

16 Circuit 51603 -- DUKE 16-03

Performance Analysis

The DUKE 16-03 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On March 3, 2015, an equipment failure occurred on an overhead switch causing a circuit breaker to trip to lockout. This outage affected 3,125 customers for up to 171 minutes resulting in 355,047 CMI.

On May 10, 2015, an unidentified issue occurred with a substation component causing a circuit breaker to trip to lockout. This outage affected 2,391 customers for up to 126 minutes resulting in 275,469 CMI.

In total, the DUKE 16-03 circuit had 11 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (6); nothing found (2); animal contacts (1); other (1); tree related (1).

Remedial Actions

- In 2015, full circuit trimming was performed.
- In 2015, a roughly one mile tie line was constructed, and reconductoring was performed to provide an alternate source for sectionalizing during cases of trouble.
- In 2015, a load balancing job was completed.
- In 2015, additional fusing is being evaluated for this circuit.

17 Circuit 18602 -- LAKE NAOMI 86-02

Performance Analysis

The LAKE NAOMI 86-02 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On October 15, 2014, during a period of heavy rain, an equipment failure occurred on a substation component causing a circuit breaker to trip to lockout. This outage affected 1,879 customers for up to 198 minutes resulting in 370,877 CMI.

On August 19, 2015, an equipment failure occurred on an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,608 customers for up to 95 minutes resulting in 152,052 CMI.

In total, the LAKE NAOMI 86-02 circuit had 7 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (5); animal contacts (2).

Remedial Actions

- In 2014, full circuit trimming was performed.
- In 2015, converting a switch to a sectionalizing device will be evaluated.
- In 2016, single phase fuses will be installed in two locations.
- In 2016, an additional transmission feeder will be added to the Lake Naomi substation.

18 Circuit 26703 -- HEMLOCK FARMS 67-03

Performance Analysis

The HEMLOCK FARMS 67-03 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On May 16, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 369 customers for up to 886 minutes resulting in 230,252 CMI.

In total, the HEMLOCK FARMS 67-03 circuit had 64 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (25); animal contacts (20); equipment failure (9); nothing found (9); vehicles (1).

Remedial Actions

- In 2015, single phase fuses will be added in multiple locations.
- In 2015, an Expanded Operational Review will be performed.
- In 2015, full circuit tree trimming will be performed.
- In 2015, relocating a section of single phase line to a more accessible location will be investigated.

19 Circuit 64201 -- KINZER 42-01

Performance Analysis

The KINZER 42-01 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On June 23, 2015, during a period of strong wind, a tree made contact with an overhead switch causing a circuit breaker to trip to lockout. This outage affected 1,867 customers for up to 283 minutes resulting in 316,302 CMI.

On June 23, 2015, during a period of strong wind, an animal interfered with an overhead switch causing a circuit breaker to trip to lockout. This outage affected 659 customers for up to 233 minutes resulting in 153,553 CMI.

In total, the KINZER 42-01 circuit had 25 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (12); tree related (5); animal contacts (3); nothing found (3); other (1); vehicles (1).

Remedial Actions

- In 2014, full circuit tree trimming was performed.
- In 2015, a recloser was replaced with an automated vacuum recloser with additional animal guarding.
- In 2015, two additional reclosers will be replaced with automated vacuum reclosers.
- In 2015, a tie line between the KINZER 42-01 line and the KINZER 42-04 lines will be evaluated. This tie will provide additional sectionalizing capabilities.

20 Circuit 13105 -- NORTHAMPTON 31-05

Performance Analysis

The NORTHAMPTON 31-05 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On June 30, 2015, during a period of strong wind, a tree made contact with an overhead switch causing a recloser to trip to lockout. This outage affected 1,494 customers for up to 249 minutes resulting in 372,006 CMI.

On July 15, 2015, a vehicle made contact with a pole causing a circuit breaker to trip to lockout. This outage affected 2,366 customers for up to 572 minutes resulting in 220,455 CMI.

In total, the NORTHAMPTON 31-05 circuit had 12 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (6); vehicles (3); animal contacts (2); equipment failure (1); nothing found (1).

Remedial Actions

- In 2015, three phase taps will be investigated for fuses or load break disconnect switches.
- In 2015, the circuit will be reviewed for animal guarding for targeted areas where animal outages have had a large impact.
- In 2015, several locations will be reviewed for single phase fuses.
- In 2016, four new Smart Grid devices will be installed on the line allowing remote sectionalizing and restoration.

21 Circuit 17901 -- BARTONSVILLE 79-01

Performance Analysis

The BARTONSVILLE 79-01 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On October 13, 2014, an equipment failure occurred on an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 2,218 customers for up to 286 minutes resulting in 414,747 CMI.

On June 23, 2015, during a period of lightning, an unidentified issue occurred with an underground conductor causing a circuit breaker to trip to lockout. This outage affected 732 customers for up to 379 minutes resulting in 154,491 CMI.

In total, the BARTONSVILLE 79-01 circuit had 12 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (5); tree related (3); nothing found (2); animal contacts (1); other (1).

Remedial Actions

- In 2015, automated switching by the Fault Identification System Restoration (FISR) computer system went live on this circuit, which will reduce outage durations.
- In 2016, one single phase fusing opportunity will be investigated.
- In 2016, all substation getaways will be rebuilt for improved reliability.

22 Circuit 10702 -- CATASAUQUA 07-02

Performance Analysis

The CATASAUQUA 07-02 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On June 30, 2015, during a period of strong wind, an unidentified issue occurred with an overhead conductor causing a recloser to trip to lockout. This outage affected 908 customers for up to 313 minutes resulting in 268,753 CMI.

In total, the CATASAUQUA 07-02 circuit had 19 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (10); animal contacts (3); vehicles (3); equipment failure (2); other (1).

Remedial Actions

- In 2015, full circuit tree trimming was performed.
- In 2015, additional fusing will be evaluated for ten single phase locations, and several three phase locations.
- In 2016, an Expanded Operational Review will be completed.
- In 2017, three sectionalizing devices with remote operational capability will be installed as part of the Smart Grid Initiative.
- In 2017, a project is scheduled to reconfigure a portion of the line and transfer it to a new feeder.

23 Circuit 22805 -- HAUTO 28-05

Performance Analysis

The HAUTO 28-05 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On June 22, 2015, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 2,372 customers for up to 566 minutes resulting in 577,916 CMI.

In total, the HAUTO 28-05 circuit had 8 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (4); animals (2); tree related (1); other (1).

Remedial Actions

- In 2015, full circuit tree trimming will be performed.
- In 2015, installing single and three phase fusing at multiple locations will be evaluated.
- In 2015, a new manual switch will be evaluated for a section of three phase line to improve sectionalizing capabilities.
- In 2016, a manual switch will be replaced with an automated vacuum recloser as part of the Smart Grid Initiative.
- In 2017, a new sectionalizing device with remote operational capability will be evaluated.

24 Circuit 53602 -- DALMATIA 36-02

Performance Analysis

The DALMATIA 36-02 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On May 31, 2015, an equipment failure occurred causing an interruption. This outage affected 814 customers for up to 440 minutes resulting in 145,867 CMI.

On June 12, 2015, during a period of heavy rain, an equipment failure occurred on a pole or pole arm causing a recloser to trip to lockout. This outage affected 672 customers for up to 676 minutes resulting in 123,518 CMI.

In total, the DALMATIA 36-02 circuit had 41 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (15); equipment failure (11); nothing found (5); animal contacts (4); vehicles (3); other (2); contact or dig in (1).

Remedial Actions

- In 2014, full circuit trimming was performed.
- In 2015, two sectionalizing devices were upgraded with remote operational capability as part of the Smart Grid Initiative. Two additional devices are planned to be upgraded in 2015.
- In 2015, a problematic recloser was replaced after malfunctioning.
- In 2015, additional single phase fusing is being evaluated.
- In 2016, 17 motor operated switches are scheduled to be installed on the SUNBURY-DAUPHIN and DAUPHIN-PINE GROVE transmission lines. The switches will allow operators to quickly sectionalize transmission outages to no more than a single distribution substation.

- In 2017, a section of inaccessible line will be relocated to a more accessible location, and reconducted with spacer cable to minimize outage exposure.
- In 2018, a new substation in the Meiserville area is scheduled for construction. The project will significantly reduce customer counts and circuit miles on the DALMATIA 36-02 circuit as well increase transfer capability in the area.

25 Circuit 16801 -- WAGNERS 68-01

Performance Analysis

The WAGNERS 68-01 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On October 15, 2014, during a period of heavy rain, an equipment failure occurred on a substation component causing a circuit breaker to trip to lockout. This outage affected 1,598 customers for up to 103 minutes resulting in 165,632 CMI.

On June 27, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,609 customers for up to 247 minutes resulting in 232,453 CMI.

In total, the WAGNERS 68-01 circuit had 27 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (12); equipment failure (10); nothing found (2); animal contacts (1); other (1); vehicles (1).

Remedial Actions

- In 2015, single phase fuses will be added in multiple locations.
- In 2015, a switch will be reprogrammed to act as a protective device.

- In 2015, a tie line between LAKE NAOMI 86-03 and WAGNERS 68-01 will be investigated. This tie will provide additional sectionalizing capabilities along with balancing line load to improve tie capabilities.
- In 2015, WAGNERS Substation will be upgraded to improve reliability and make the substation less susceptible to transmission outages.

26 Circuit 52403 -- GREEN PARK 24-03

Performance Analysis

The GREEN PARK 24-03 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On June 8, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 457 customers for up to 224 minutes resulting in 102,080 CMI.

On June 8, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 97 customers for up to 1,216 minutes resulting in 118,704 CMI.

In total, the GREEN PARK 24-03 circuit had 51 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (26); equipment failure (12); nothing found (6); animal contacts (5); other (1); vehicles (1).

Remedial Actions

- In 2014, full circuit trimming was performed.
- In 2015, a roughly four mile tie line was constructed to provide customers with an *alternate source for sectionalizing during cases of trouble*. As part of this project approximately two miles of conductor was relocated to a more accessible location.

- In 2015, a recloser was upgraded with a new communicating device as part of the Smart Grid Initiative.
- In 2015, a section of difficult-to-access single phase is being relocated.
- In 2015, additional fusing is being evaluated for this circuit.

27 Circuit 22901 -- HARWOOD 29-01

Performance Analysis

The HARWOOD 29-01 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On June 27, 2015, during a period of heavy rain, an equipment failure occurred on an overhead splice causing a circuit breaker to trip to lockout. This outage affected 2,179 customers for up to 1,120 minutes resulting in 549,635 CMI.

In total, the HARWOOD 29-01 circuit had 7 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (7).

Remedial Actions

- In 2014, full circuit tree trimming was performed.
- In 2015, three Smart Grid devices were installed on this circuit as part of the Smart Grid Initiative.
- In 2015, a tie line between two three phase sections was built to improve sectionalizing capabilities.
- In 2015, a tie line between the EAST HAZLETON 41-01 and the HARWOOD 29-01 was built.

28 Circuit 46001 -- BERWICK 60-01

Performance Analysis

The BERWICK 60-01 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On June 27, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 946 customers for up to 501 minutes resulting in 470,327 CMI.

In total, the BERWICK 60-01 circuit had 33 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (11); equipment failure (10); animal contacts (7); nothing found (2); vehicles (2); other (1).

Remedial Actions

- In 2015, a project will be evaluated to build a tie for approximately 1,000 radial customers.
- In 2015, a remotely operable sectionalizing device will be added.
- In 2016, full circuit tree trimming will be performed.
- In 2017, a project to improve the reliability for customers that have experienced multiple interruptions is scheduled.
- In 2017, two new remotely operable sectionalizing devices will be added to this circuit.

29 Circuit 14801 -- TREICHLERS 48-01

Performance Analysis

The TREICHLERS 48-01 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On December 10, 2014, during a period of ice/sleet/snow, an equipment failure occurred on an overhead conductor causing an interruption. This outage affected 532 customers for up to 459 minutes resulting in 145,563 CMI.

On February 14, 2015, during a period of extreme temperatures, an equipment failure occurred on an overhead conductor causing a recloser to trip to lockout. This outage affected 530 customers for up to 433 minutes resulting in 220,785 CMI.

In total, the TREICHLERS 48-01 circuit had 37 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (13); tree related (9); animal contacts (7); nothing found (6); other (1); vehicles (1).

Remedial Actions

- In 2015, full circuit trimming was performed.
- In 2015, an Expanded Operational Review was completed.
- In 2015 through 2017, several sections of underground primary cable will be replaced.
- In 2015, additional fusing has been installed at several locations to reduce outage exposure to customers.
- In 2015, additional series fusing will be evaluated.
- In 2015, a project to relocate or reconfiguring a single phase tap will be investigated.
- In 2015, a project to reconductor the three phase tie line to SOUTH SLATINGTON 44-04 will be evaluated.

- In 2016, an existing recloser will be replaced with new device with remote operational capability as part of the Smart Grid Initiative.
- In 2017, an additional device with remote operational capability will be installed as part of the Smart Grid Initiative.

30 Circuit 17802 -- GILBERT 78-02

Performance Analysis

The GILBERT 78-02 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On August 30, 2015, an equipment failure occurred on an overhead conductor causing a recloser to trip to lockout. This outage affected 596 customers for up to 223 minutes resulting in 132,794 CMI.

On September 13, 2015, during a period of heavy rain, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 596 customers for up to 194 minutes resulting in 115,182 CMI.

In total, the GILBERT 78-02 circuit had 67 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (26); equipment failure (20); animal contacts (11); nothing found (3); other (3); vehicles (3); contact or dig in (1).

Remedial Actions

- In 2015, an Expanded Operational Review was conducted, no problems found.
- In 2016, full circuit trimming will be performed.
- In 2016, two fusing opportunities will be investigated.
- In 2016, automated switching by the Fault Identification System Restoration (FISR) computer system will go live on this circuit, which will reduce outage durations.

31 Circuit 16204 -- POCONO FARMS 62-04

Performance Analysis

The POCONO FARMS 62-04 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On June 27, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 962 customers for up to 492 minutes resulting in 472,659 CMI.

In total, the POCONO FARMS 62-04 circuit had 15 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (7); tree related (4); animal contacts (2); contact or dig in (2).

Remedial Actions

- In 2014, full circuit tree trimming was performed.
- In 2015, single phase fuses will be added in multiple locations.
- In 2015, replacing a single recloser with two reclosers on separate taps will be investigated.
- In 2016, an Expanded Operational Review will be performed.
- In 2016, a tie between POCONO FARMS 62-04 and 64-03 will be investigated.

32 Circuit 67502 -- WEST WILLOW 75-02

Performance Analysis

The WEST WILLOW 75-02 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On June 23, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,748 customers for up to 1,359 minutes resulting in 229,510 CMI.

On July 9, 2015, during a period of strong wind, a tree made contact with an overhead switch causing a recloser to trip to lockout. This outage affected 253 customers for up to 421 minutes resulting in 106,424 CMI.

In total, the WEST WILLOW 75-02 circuit had 19 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (12); equipment failure (5); animal contacts (2).

Remedial Actions

- In 2015, an Expanded Operational Review was performed. Several minor improvements were identified and implemented.
- In 2015, all aluminum on copper crimps will be replaced on the three phase line.
- In 2016, single phase fuses will be added in multiple locations.
- In 2016, a manual switch will be replaced with an automated vacuum recloser as part of the Smart Grid Initiative.

33 Circuit 21206 – EAST CARBONDALE 12-06

Performance Analysis

The EAST CARBONDALE 12-06 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On September 22, 2015, an equipment failure occurred on an overhead splice causing a circuit breaker to trip to lockout. This outage affected 2,500 customers for up to 263 minutes resulting in 500,030 CMI.

In total, the EAST CARBONDALE 12-06 circuit had 17 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (8); other (3); tree related (2); vehicle (2); animals (1); improper design (1).

Remedial Actions

- In 2015, full circuit trimming was performed.
- In 2015, an Expanded Operation Review was performed; old style dead ends and old switches will be replaced in 2016.
- In 2015, aluminum crimps on copper-to-copper connections remediation was completed.
- In 2016, fault indicators will be installed on an Underground Residential Development (URD) to allow for faster fault location and restoration.
- In 2016, a tie line between the EAST CARBONDALE 12-06 and 12-03 line will be investigated.
- In 2016, automated switching by the Fault Identification System Restoration (FISR) computer system will go live on this circuit, which will reduce outage durations.

34 Circuit 62104 -- EAST LANCASTER 21-04

Performance Analysis

The EAST LANCASTER 21-04 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On October 7, 2014, an equipment failure occurred on an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 4,055 customers for up to 188 minutes resulting in 481,934 CMI.

In total, the EAST LANCASTER 21-04 circuit had 10 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (6); animal contacts (1); other (1); tree related (1); vehicles (1).

Remedial Actions

- In 2014, a new automated vacuum recloser and an automated vacuum recloser tie switch were installed as part of the Smart Grid Initiative.
- *In 2015, all aluminum on copper crimps will be replaced on the three phase line.*
- In 2015, four manual switches were replaced with Smart Grid devices.
- In 2016, full circuit tree trimming will be performed.

35 Circuit 40101 -- HUNTER 01-01

Performance Analysis

The HUNTER 01-01 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On January 7, 2015, during a period of strong wind, an equipment failure occurred on an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 2,132 customers for up to 315 minutes resulting in 415,858 CMI.

In total, the HUNTER 01-01 circuit had 23 outages between October 2014 and September 2015, with the causes breaking down as follows: animal contacts (8); tree related (8); equipment failure (5); nothing found (1); other (1).

Remedial Actions

- In 2015, full circuit tree trimming was completed.
- In 2015, an Expanded Operational Review was performed. Several minor improvements were identified and implemented.
- In 2015, several poles were identified for replacement.
- In 2015 additional fusing will be investigated in multiple locations.
- In 2015, a manual switch will be evaluated for replacement with an automated vacuum recloser.

36 Circuit 27202 -- YATESVILLE 72-02

Performance Analysis

The YATESVILLE 72-02 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On December 2, 2014, during a period of heavy rain, an equipment failure occurred on an overhead splice causing a circuit breaker to trip to lockout. This outage affected 3,899 customers for up to 397 minutes resulting in 412,381 CMI.

In total, the YATESVILLE 72-02 circuit had 15 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (8); nothing found (3); animal contacts (2); contact or dig in (1); vehicles (1).

Remedial Actions

- In 2015, four Smart Grid devices were installed on this circuit as part of the Smart Grid Initiative.
- In 2015, a tie line between the PINE RIDGE 76-04 and the YATESVILLE 72-02 was built.
- In 2015, all aluminum on copper crimps will be replaced on the three phase line.
- In 2015, additional fusing will be evaluated in multiple locations.
- In 2018, full circuit tree trimming will be performed.

37 Circuit 46602 -- LARRYS CREEK 66-02

Performance Analysis

The LARRYS CREEK 66-02 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On January 5, 2015, during a period of strong wind, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 647 customers for up to 328 minutes resulting in 212,216 CMI.

On March 31, 2015, during a period of ice/sleet/snow, a vehicle made contact with a pole causing a recloser to trip to lockout. This outage affected 666 customers for up to 261 minutes resulting in 173,826 CMI.

In total, the LARRYS CREEK 66-02 circuit had 41 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (24); nothing found (7); equipment failure (6); animal contacts (3); vehicles (1).

Remedial Actions

- In 2014, full circuit tree trimming was performed.
- In 2014, 2,800 feet of difficult to access single phase line was relocated. A single phase recloser and additional tap fuses were also installed to add additional sectionalizing.
- In 2015, 10 spans of difficult to access line were relocated and additional fusing was installed to add additional sectionalizing.
- In 2015, five additional fuses were installed on single phase lines.
- In 2016, the power transformer at the LARRYS CREEK substation will be replaced with a new, larger capacity transformer.
- In 2015, a project to construct a new tie line between the JERSEY SHORE 09-01 and the LARRYS CREEK 66-02 lines is being evaluated.

- In 2016, a project is scheduled to install several fuses to add additional sectionalizing.

38 Circuit 28604 -- BLYTHEBURN 86-04

Performance Analysis

The BLYTHEBURN 86-04 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On April 4, 2015, during a period of heavy rain, an equipment failure occurred on an overhead lightning protector causing a circuit breaker to trip to lockout. This outage affected 1,776 customers for up to 168 minutes resulting in 298,243 CMI.

On April 20, 2015, during a period of heavy rain, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 602 customers for up to 558 minutes resulting in 151,094 CMI.

In total, the BLYTHEBURN 86-04 circuit had 38 outages between October 2014 and September 2015, with the causes breaking down as follows: animal contacts (15); tree related (10); nothing found (5); equipment failure (4); contact or dig in (2); vehicles (2).

Remedial Actions

- In 2015, single phase fusing will be installed in multiple locations.
- In 2016, a tie line will be evaluated between the BERWICK 60-01 and the BLYTHEBURN 86-04.
- In 2018, a section of single phase will be relocated and fed from a different source in order to eliminate difficult to access lines.
- In 2018, full circuit tree trimming will be performed.

39 Circuit 14404 -- SO SLATINGTON 44-04

Performance Analysis

The SO SLATINGTON 44-04 circuit experienced three outages of over 100,000 CMI between October 2014 and September 2015.

On November 6, 2014, during a period of heavy rain, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,519 customers for up to 224 minutes resulting in 131,268 CMI.

On February 27, 2015, an equipment failure occurred on an overhead conductor causing an interruption. This outage affected 686 customers for up to 371 minutes resulting in 139,361 CMI.

On March 2, 2015, an equipment failure occurred on an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,516 customers for up to 479 minutes resulting in 138,956 CMI.

In total, the SO SLATINGTON 44-04 circuit had 19 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (7); tree related (7); animal contacts (4); nothing found (1).

Remedial Actions

- In 2014, an Expanded Operational Review was performed.
- In 2015, an existing sectionalizing device with remote operational capability will be reprogrammed to operate as a protective device.
- In 2015, an existing three phase recloser was replaced with a sectionalizing device with *remote operational capability* as part of the Smart Grid device.
- In 2015, one single phase fuse and four load break disconnects will be installed.

- In 2016, additional fusing will be installed at several locations.
- In 2016, a single phase tap will be reconducted.
- In 2017, a section of difficult-to-access and heavily wooded section of three phase will be relocated.
- In 2016, a project to reconductor the three phase tie to TREICHLERS 48-01 will be evaluated.
- In 2017, full circuit tree trimming will be performed.

40 Circuit 67302 -- WYOMISSING 73-02

Performance Analysis

The WYOMISSING 73-02 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On January 11, 2015, during a period of extreme temperatures, a vehicle contact occurred causing a circuit breaker to trip to lockout. This outage affected 1,850 customers for up to 390 minutes resulting in 338,386 CMI.

In total, the WYOMISSING 73-02 circuit had 14 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (5); animal contacts (3); equipment failure (3); vehicles (2); nothing found (1).

Remedial Actions

- In 2015, two Smart Grid devices were installed on this circuit.
- In 2015, an infrared inspection was performed on the three phase line prior to animal guarding.
- In 2015, the entire substation will be animal guarded.
- In 2015, reconductoring an inaccessible rear lot construction with covered conductor.

- In 2016, a disconnect switch on a three phase underground dip will be replaced.
- In 2016, an Expanded Operational Review will be performed.
- In 2018, two automated vacuum recloser will be installed as part of the Smart Grid Initiative.

41 Circuit 25801 -- SULLIVAN TRAIL 58-01

Performance Analysis

The SULLIVAN TRAIL 58-01 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On April 4, 2015, during a period of heavy rain, an equipment failure occurred on a pole or pole arm causing a circuit breaker to trip to lockout. This outage affected 1,818 customers for up to 486 minutes resulting in 179,226 CMI.

In total, the SULLIVAN TRAIL 58-01 circuit had 26 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (18); animal contacts (3); equipment failure (3); nothing found (2).

Remedial Actions

- In 2014, extensive hazard tree removal was completed on the SULLIVAN TRAIL 58-01 line.
- In 2014, SCADA was installed at the SULLIVAN TRAIL substation.
- In 2014, a line inspection was completed to proactively identify failing equipment. As a result of this inspection, 19 locations were identified and corrected during the first quarter of 2015.
- In 2015, locations for fault indicators on the SULLIVAN TRAIL 58-01 line were identified to improve troubleshooting during outages.

- In 2016, full circuit tree trimming will be performed.
- In 2016, two new sectionalizing devices with remote operational capability will be installed on this circuit as part of the Smart Grid Initiative.
- In 2019, a tie line between the SULLIVAN TRAIL 58-01 line and the EXETER 14-02 line will provide approximately 1,100 radial customers with an alternate source for sectionalizing during cases of trouble. Spacer cable is being considered for this project due to the area being heavily wooded.

42 Circuit 47101 -- MARLIN 71-01

Performance Analysis

The MARLIN 71-01 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On October 1, 2014, an equipment failure occurred causing a recloser to trip to lockout. This outage affected 2,147 customers for up to 184 minutes resulting in 396,507 CMI.

In total, the MARLIN 71-01 circuit had 22 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (10); animal contacts (6); tree related (2); vehicles (2); nothing found (1); other (1).

Remedial Actions

- In 2015, a Smart Grid device was installed on this circuit as part of the Smart Grid Initiative.
- In 2015, deteriorated insulators were replaced at multiple locations.
- In 2016, an Expanded Operational Review will be performed.
- In 2016, three new sectionalizing devices with remote operational capability will be installed on this circuit as part of the Smart Grid Initiative.

- In 2017, full circuit tree trimming will be performed.

43 Circuit 45501 -- DERRY 55-01

Performance Analysis

The DERRY 55-01 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On October 20, 2014, an equipment failure occurred on an underground conductor causing a temporary open point to be interrupted. This outage affected 347 customers for up to 1,148 minutes resulting in 298,420 CMI.

In total, the DERRY 55-01 circuit had 32 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (9); tree related (9); animal contacts (6); nothing found (4); vehicles (3); other (1).

Remedial Actions

- In 2015, a new manual disconnect switch will be installed at the head of a radial tap. This switch will help crews sectionalizing this circuit during restoration.
- In 2015, a new sectionalizing device with remote operational capability was installed to improve sectionalizing as part of the Smart Grid Initiative.
- In 2015, additional fusing will be installed.
- In 2015, solid blade disconnects will be installed on a three phase tap.
- In 2015, a new project to construct a three phase tie for 363 radial customers is being evaluated.
- In 2017, full circuit trimming will be performed.
- In 2017, 500 feet of new single phase will be built to replace a section of difficult to access conductor, and a new recloser will be installed.

44 Circuit 20403 -- ASHFIELD 04-03

Performance Analysis

The ASHFIELD 04-03 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On May 10, 2015, a vehicle made contact with a pole causing a recloser to trip to lockout. This outage affected 1,857 customers for up to 204 minutes resulting in 105,494 CMI.

In total, the ASHFIELD 04-03 circuit had 30 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (12); tree related (9); animal contacts (5); nothing found (3); vehicles (1).

Remedial Actions

- In 2014, full circuit tree trimming was performed.
- In 2015, all aluminum on copper crimps will be replaced on the three phase line.
- In 2015, single phase fusing will be installed in multiple locations.
- In 2015 a new manual switch will be evaluated for a long span of single phase line to improve sectionalizing capabilities.
- In 2015, installing fault indicators will be evaluated for multiple locations to improve troubleshooting during outages.

45 Circuit 64801 -- MOUNT NEBO 48-01

Performance Analysis

The MOUNT NEBO 48-01 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On February 16, 2015, during a period of ice/sleet/snow, an equipment failure occurred on an overhead switch causing a recloser to trip to lockout. This outage affected 520 customers for up to 446 minutes resulting in 207,406 CMI.

In total, the MOUNT NEBO 48-01 circuit had 44 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (23); equipment failure (13); animal contacts (4); nothing found (2); other (2).

Remedial Actions

- In 2015, an infrared inspection was performed on a section of three phase backbone line. Nothing was found.
- In 2015, full circuit tree trimming will be performed.
- In 2015, all aluminum on copper crimps will be replaced on the three phase line.
- In 2015, single phase fuses will be added in multiple locations.
- In 2015, a new sectionalizing device will be investigated in a heavily wooded area.

46 Circuit 16603 -- POINTE NORTH 66-03

Performance Analysis

The POINTE NORTH 66-03 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On November 27, 2014, during a period of ice/sleet/snow, a vehicle contact occurred causing a recloser to trip to lockout. This outage affected 728 customers for up to 182 minutes resulting in 131,971 CMI.

On June 30, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 890 customers for up to 307 minutes resulting in 267,936 CMI.

In total, the POINTE NORTH 66-03 circuit had 12 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (6); equipment failure (3); animal contacts (2); vehicles (1).

Remedial Actions

- In 2015, several locations will be evaluated for single phase fusing.
- In 2015, circuit will be patrolled to evaluate opportunities for hazard tree removal and additional sectionalizing.
- In 2016, two new automated devices will be installed as part of the Smart Grid Initiative.
- In 2017, an Expanded Operational Review will be performed.

47 Circuit 65603 -- QUARRYVILLE 56-03

Performance Analysis

The QUARRYVILLE 56-03 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On August 2, 2015, a vehicle made contact with a pole causing a circuit breaker to trip to lockout. This outage affected 2,458 customers for up to 479 minutes resulting in 365,733 CMI.

In total, the QUARRYVILLE 56-03 circuit had 32 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (13); animal contacts (7); tree related (7); other (3); contact or dig in (1); vehicles (1).

Remedial Actions

- In 2015, improvements were made to several of distribution capacitors. The work will improve the circuit's voltage regulation.
- In 2015, all aluminum on copper crimps will be replaced on the three phase line.
- In 2016, full circuit tree trimming will be performed.
- In 2016, a new line and terminal is planned to reduce customer exposure, customer count, line miles, and to improve sectionalizing capabilities.
- In 2016, an automated vacuum recloser will be installed as part of the Smart Grid Initiative.

48 Circuit 17804 -- GILBERT 78-04

Performance Analysis

The GILBERT 78-04 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On February 15, 2015, during a period of ice/sleet/snow, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 598 customers for up to 1,084 minutes resulting in 281,868 CMI.

In total, the GILBERT 78-04 circuit had 34 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (11); equipment failure (9); animal contacts (5); nothing found (5); other (2); contact or dig in (1); vehicles (1).

Remedial Actions

- In 2015, a new tie line was completed.
- In 2015, three single phase reclosers were added to single phase and two phase taps.
- In 2016, a new electronic recloser will be installed.
- In 2017, full circuit trimming will be performed.

49 Circuit 28302 -- NEWFOUNDLAND 83-02

Performance Analysis

The NEWFOUNDLAND 83-02 circuit experienced no outages of over 100,000 CMI between October 2014 and September 2015.

In total, the NEWFOUNDLAND 83-02 circuit had 55 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (27); equipment failure (13); animal contacts (9); nothing found (3); other (2); vehicles (1).

Remedial Actions

- In 2015, single phase fuses were added in multiple locations.
- In 2015, full circuit tree trimming will be performed.
- In 2015, relocating a section of single phase line to the road will be investigated to reduce customer exposure by eliminating inaccessible lines.
- In 2015, a new substation will be built which will split the NEW FOUNDLAND 83-02 circuit, reducing customer exposure.

50 Circuit 29402 -- BELTZVILLE 94-02

Performance Analysis

The BELTZVILLE 69/12 KV 94-02 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On February 15, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing an interruption. This outage affected 346 customers for up to 623 minutes resulting in 215,447 CMI.

In total, the BELTZVILLE 69/12 KV 94-02 circuit had 31 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (9); tree related (9); animal contacts (8); nothing found (3); other (1); vehicles (1).

Remedial Actions

- In 2015, single phase fusing was installed in multiple locations.
- In 2015, additional fusing will be evaluated for multiple locations.
- In 2015, all aluminum on copper crimps will be replaced on the three phase line.
- In 2015, a new sectionalizing device with remote operational capability will be evaluated.
- In 2015, replacing a fuse with a sectionalizing device with remote operational capability will be evaluated.
- In 2018, full circuit tree trimming will be performed.

51 Circuit 64503 -- LAVINO 45-03

Performance Analysis

The LAVINO 45-03 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On October 8, 2014, during a period of heavy rain, an unidentified issue occurred with an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,951 customers for up to 162 minutes resulting in 314,969 CMI.

On June 12, 2015, during a period of strong wind, an unidentified issue occurred with an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,400 customers for up to 90 minutes resulting in 126,000 CMI.

In total, the LAVINO 45-03 circuit had 11 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (4); other (2); vehicles (2); animal contacts (1); equipment failure (1); nothing found (1).

Remedial Actions

- In 2014, full circuit tree trimming was performed.
- In 2015, all aluminum on copper crimps will be replaced on the three phase line.
- In 2016, reconductoring a section of the LAVINO 45-03 line will be evaluated.
- In 2017, replacing existing switches with remotely operable devices will be evaluated in order to automate switching capabilities between two transmission lines.

52 Circuit 21401 -- EXETER 14-01

Performance Analysis

The EXETER 14-01 circuit experienced three outages of over 100,000 CMI between October 2014 and September 2015.

On November 26, 2014, during a period of ice/sleet/snow, an unidentified issue occurred with an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 2,549 customers for up to 65 minutes resulting in 163,314 CMI.

On December 3, 2014, during a period of heavy rain, an equipment failure occurred on an overhead fuse causing a recloser to trip to lockout. This outage affected 1,530 customers for up to 114 minutes resulting in 121,777 CMI.

On January 22, 2015, during a period of ice/sleet/snow, an equipment failure occurred causing a circuit breaker to trip to lockout. This outage affected 2,550 customers for up to 59 minutes resulting in 149,328 CMI.

In total, the EXETER 14-01 circuit had 19 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (8); nothing found (5); other (3); animal contacts (2); tree related (1).

Remedial Actions

- In 2014, a line inspection was completed to proactively identify failing equipment. As a follow-up to the line inspection, six locations were identified and corrected in the first quarter of 2015.
- In 2015, three new sectionalizing devices with remote operational capability were installed as part of the Smart Grid Initiative.
- In 2015, all aluminum on copper crimps will be replaced on the three phase line.
- In 2016, four new sectionalizing devices with remote operational capability will be installed as part of the Smart Grid Initiative.
- In 2017, two new sectionalizing devices with remote operational capability will be installed as part of the Smart Grid Initiative.
- In 2017, full circuit tree trimming will be performed.

53 Circuit 67402 -- WAKEFIELD 74-02

Performance Analysis

The WAKEFIELD 74-02 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On November 24, 2014, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 298 customers for up to 396 minutes resulting in 117,888 CMI.

On June 23, 2015, during a period of lightning, an equipment failure occurred on an overhead switch causing a recloser to trip to lockout. This outage affected 182 customers for up to 733 minutes resulting in 133,406 CMI.

In total, the WAKEFIELD 74-02 circuit had 25 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (10); tree related (10); animal contacts (2); contact or dig in (1); nothing found (1); vehicles (1).

Remedial Actions

- In 2015, full circuit tree trimming will be performed.
- In 2015, installation of a sectionalizing device on a section of single phase line will be investigated.
- In 2016, a new tie line is planned between WAKEFIELD 74-01 and WAKEFIELD 74-02. This tie will provide additional sectionalizing capabilities

54 Circuit 16101 -- BINGEN 61-01

Performance Analysis

The BINGEN 61-01 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On June 14, 2015, during a period of strong wind, a tree made contact with an overhead fuse causing a circuit breaker to trip to lockout. This outage affected 2,921 customers for up to 781 minutes resulting in 411,463 CMI.

In total, the BINGEN 61-01 circuit had 21 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (7); equipment failure (6); vehicles (4); animals (3); other (1).

Remedial Actions

- In 2015, a single phase tap that has experienced repeat interruptions will be reviewed for targeted tree trimming and additional sectionalizing.
- In 2015, several locations will be evaluated for single phase fusing.
- In 2015, a long two-phase tap feeding 500+ customers will be reviewed for additional sectionalizing.
- In 2016, a single phase tap that has experienced several tree related outages will be reconducted with heavier conductor.
- In 2017, a new automated tie switch will be installed as part of the Smart Grid Initiative.

55 Circuit 62606 -- ENGLSIDE 26-06

Performance Analysis

The ENGLSIDE 26-06 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On March 2, 2015, during a period of ice/sleet/snow, an unidentified issue occurred with a substation component causing a circuit breaker to trip to lockout. This outage affected 2,646 customers for up to 90 minutes resulting in 147,474 CMI.

On July 9, 2015, during a period of heavy rain, a tree made contact with an overhead conductor causing an interruption. This outage affected 2,641 customers for up to 231 minutes resulting in 228,270 CMI.

In total, the ENGLSIDE 26-06 circuit had 9 outages between October 2014 and September 2015, with the causes breaking down as follows: nothing found (2); other (2); animal contacts (1); contact or dig in (1); equipment failure (1); tree related (1); vehicles (1).

Remedial Actions

- In 2015, full circuit tree trimming will be performed.
- In 2015, an Expanded Operational Review will be performed.
- In 2015, all aluminum on copper crimps will be replaced on the three phase line.
- In 2016, a manual switch will be replaced with an automated vacuum recloser as part of the Smart Grid Initiative.
- In 2016, two automated vacuum recloser will be installed as part of the Smart Grid Initiative

56 Circuit 51905 -- COLONIAL PARK 19-05

Performance Analysis

The COLONIAL PARK 19-05 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On May 12, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing an interruption. This outage affected 1,924 customers for up to 469 minutes resulting in 287,864 CMI.

On July 15, 2015, an equipment failure occurred on an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 370 customers for up to 340 minutes resulting in 101,360 CMI.

In total, the COLONIAL PARK 19-05 circuit had 11 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (5); tree related (5); animal contacts (1).

Remedial Actions

- In 2015, a single phase tap that has experienced repeat interruptions will be reviewed for targeted tree trimming and additional sectionalizing.
- In 2015, several locations will be evaluated for single phase fusing.
- In 2015, a long two-phase tap feeding 500+ customers will be reviewed for additional sectionalizing.
- In 2016, a single phase tap that has experience several tree related outage will be reconducted with heavier conductor.
- In 2017, a new automated tie switch will be installed as part of the Smart Grid Initiative.

57 Circuit 67804 -- WEST LANCASTER 78-04

Performance Analysis

The WEST LANCASTER 78-04 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On September 30, 2015, during a period of strong wind, a tree made contact with an overhead switch causing a recloser to trip to lockout. This outage affected 1,219 customers for up to 422 minutes resulting in 313,027 CMI.

In total, the WEST LANCASTER 78-04 circuit had 12 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (7); tree related (3); animal contacts (1); nothing found (1).

Remedial Actions

- In 2015, relocating a section of three phase line to a more accessible location will be investigated.
- In 2015, single phase fuses will be added in multiple locations.

- In 2015, an Expanded Operational Review will be performed.
- In 2015, load balancing will be performed.
- In 2017, full circuit tree trimming will be performed.
- In 2018, a manual switch will be replaced with an automated vacuum recloser as part of the Smart Grid Initiative.
- In 2018, an automated vacuum recloser will be installed as part of the Smart Grid Initiative

58 Circuit 18603 -- LAKE NAOMI 86-03

Performance Analysis

The LAKE NAOMI 86-03 circuit experienced two outages of over 100,000 CMI between October 2014 and September 2015.

On October 15, 2014, during a period of heavy rain, an equipment failure occurred on a substation component causing a circuit breaker to trip to lockout. This outage affected 1,079 customers for up to 197 minutes resulting in 213,318 CMI.

On August 19, 2015, an equipment failure occurred on an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,080 customers for up to 129 minutes resulting in 139,158 CMI.

In total, the LAKE NAOMI 86-03 circuit had 18 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (9); tree related (4); animal contacts (3); nothing found (2).

Remedial Actions

- In 2015, full circuit trimming was performed
- In 2016, an additional transmission source will added to the Lake Naomi substation.

- In 2016, automated switching by the Fault Identification System Restoration (FISR) computer system will go live on this circuit, which will reduce outage durations.

59 Circuit 51502 -- SWATARA 15-02

Performance Analysis

The SWATARA 15-02 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On June 9, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing an interruption. This outage affected 1,834 customers for up to 839 minutes resulting in 313,285 CMI.

In total, the SWATARA 15-02 circuit had 16 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (6); tree related (4); animal contacts (3); contact or dig in (2); vehicles (1).

Remedial Actions

- In 2014, four sectionalizing devices were upgraded with remote operational capability as part of the Smart Grid Initiative.
- In 2015, the protection scheme for the circuit will be evaluated.
- In 2016, full circuit trimming will be performed.
- In 2018, two new devices with remote sectionalizing capability will be installed as part of the Smart Grid Initiative.

60 Circuit 67401 -- WAKEFIELD 74-01

Performance Analysis

The WAKEFIELD 74-01 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On June 23, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a load break fuse to operate. This outage affected 99 customers for up to 1,398 minutes resulting in 138,341 CMI.

In total, the WAKEFIELD 74-01 circuit had 33 outages between October 2014 and September 2015, with the causes breaking down as follows: tree related (14); equipment failure (13); animal contacts (5); other (1).

Remedial Actions

- In 2015, an additional single phase fuse will be installed.
- In 2015, a single phase recloser and several new load break disconnect switches will be installed.
- In 2015, a section of difficult-to-access single phase line will be relocated.
- In 2015, additional hot spot tree trimming will be evaluated.
- In 2015, a new tie line between the WAKEFIELD 74-01 and QUARRYVILLE 56-02 circuits will be evaluated.
- In 2016, a new tie line is planned between WAKEFIELD 74-01 and WAKEFIELD 74-02. This tie will provide additional sectionalizing capabilities.
- In 2017, full circuit tree trimming will be performed.

61 Circuit 29401 -- BELTZVILLE 94-01

Performance Analysis

The BELTZVILLE 94-01 circuit experienced one outage of over 100,000 CMI between October 2014 and September 2015.

On September 16, 2015, an equipment failure occurred on an underground conductor causing a recloser to trip to lockout. This outage affected 404 customers for up to 786 minutes resulting in 275,452 CMI.

In total, the BELTZVILLE 94-01 circuit had 18 outages between October 2014 and September 2015, with the causes breaking down as follows: equipment failure (7); animal contacts (5); tree related (4); nothing found (1); vehicles (1).

Remedial Actions

- In 2015, additional fusing will be evaluated in multiple locations.
- In 2015, a section of underground cable will be evaluated for conversion to overhead construction in order to increase restoration time in case of an outage.
- In 2016, full circuit tree trimming will be performed.
- In 2016, an Expanded Operational Review will be performed.

5) *A rolling 12-month breakdown and analysis of outage causes during the preceding quarter, 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 following table shows a breakdown of service interruption causes for the 12 months ended at the current quarter. PPL Electric’s maintenance programs focus on corrective actions to address controllable service interruptions (e.g., trees and equipment failure).

Cause Description	Trouble Cases	Percent of Trouble Cases	Customer Interruptions	Percent of Customer Interruptions	Customer Minutes	Percent of Customer Minutes
Animals	2,790	19.2%	39,283	4.0%	3,327,374	2.8%
Contact / Dig-In	172	1.2%	8,011	0.8%	629,474	0.5%
Directed by Non-PPL Authority	205	1.4%	14,721	1.5%	1,037,190	0.9%
Equipment Failures	5,023	34.5%	331,189	34.1%	39,962,232	33.1%
Improper Design	3	0.0%	1,856	0.2%	245,849	0.2%
Improper Installation	3	0.0%	1,926	0.2%	95,547	0.1%
Improper Operation	4	0.0%	4,509	0.5%	429,290	0.4%
Nothing Found	1,138	7.8%	67,145	6.9%	5,285,795	4.4%
Other Controllable	85	0.6%	20,843	2.1%	513,164	0.4%
Other Non Control	218	1.5%	41,030	4.2%	3,767,776	3.1%
Other Public	57	0.4%	6,565	0.7%	728,157	0.6%
Tree Related	4,139	28.4%	301,483	31.0%	51,298,183	42.5%
Vehicles	718	4.9%	132,440	13.6%	13,474,486	11.2%
Total	14,555	100.0%	971,001	100.0%	120,794,517	100.0%

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 41% of cases, 45% of customer interruptions, and 47% of CMI.

Tree Related: PPL Electric has recently increased funding to more aggressively address outside of the right-of-way danger trees. For trees within the right-of-way, PPL Electric has implemented a more aggressive trimming strategy. We are in year three of a five year cycle for the new standard.

Animals: Animals accounted for about 19% 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 79% of the number of cases of trouble was 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, in 2009, PPL Electric initiated distribution and substation animal guarding programs to focus systematically on protecting existing facilities most at risk of incurring animal-caused interruptions. All substations are scheduled to be animal guarded by 2017.

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. Service interruptions due to vehicles are on the rise as a result of an increasing number of drivers and vehicles on the road. 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 44% of the cases of trouble, 50% of the customer interruptions and 57% 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.

6) *Quarterly and year-to-date information on progress toward meeting transmission and distribution inspection and maintenance goals/objectives. (For first, second and third quarter reports only.)*

Inspection & Maintenance Goals/Objectives	Annual Budget	3rd Quarter		Year-to-date	
		Budget	Actual	Budget	Actual
Transmission					
Transmission C-tag poles (# of poles)	324	152	136	314	301
Transmission arm replacements (# of sets)	23	1	1	15	15
Transmission air break switch inspections (# of switches)	13	13	3	13	7
Transmission lightning arrester installations (# of sets)	5,484	614	207	4,312	3,796
Transmission structure inspections (# of structures)	737	467	451	467	451
Transmission tree side trim-Bulk Power (linear feet)	N/A				
Transmission herbicide-Bulk Power (# of acres)	N/A				
Transmission reclearing (# of miles) BES Only	625	118	81	584	551
Transmission reclearing (# of miles) 69 kV	974	320	317	705	754
Transmission reclearing (# of miles) 138 kV	336	92	0	262	152
Transmission danger tree removals-Bulk Power (# of trees)	N/A	N/A	6,272	N/A	19,669
Substation					
Substation batteries (# of activities)	652	127	121	609	604
Circuit breakers (# of activities)	582	179	231	466	447
Substation inspections (# of activities)	4,326	1,068	1,076	3,494	3,507
Transformer maintenance (# of activities)	1,353	305	358	1,042	1,066

Inspection & Maintenance Goals/Objectives	Annual Budget	3rd Quarter		Year-to-date	
		Budget	Actual	Budget	Actual
Distribution					
Distribution C-tag poles replaced (# of poles)	1,234	281	320	1,030	1,012
C-truss distribution poles (# of poles)	5,748	1,699	1,625	3,862	3,849
Capacitor (MVAR added)	0	0	0	0	0
OCR Replacements (# of)	106	5	6	101	108
Distribution pole inspections (# of poles)	114,822	31,343	27,345	85,123	85,187
Distribution line inspections (hours)	8,820	2,417	3,019	6,891	6,834
Group re-lamping (# of lamps)	15,073	6,508	6,105	15,073	13,731
Test sections of underground distribution cable	698	285	285	605	605
Distribution tree trimming (# of miles)	6,247	1,651	1,679	4,750	4,555
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	N/A	4,781	N/A	12,751
LTN manhole inspections (# of)	313	27	19	264	231
LTN vault inspections (# of)	714	190	182	583	560
LTN network protector overhauls (# of)	75	22	17	59	47
LTN reverse power trip testing (# of)	49	0	11	35	45

- 7) *Quarterly and year-to-date information on budgeted versus actual transmission and distribution operation and maintenance expenditures in total and detailed by the EDC's own functional account code or FERC account code as available. (For first, second and third quarter reports only.)*

The following table provides the operation and maintenance (O&M) expenses for PPL Electric, as a whole, which includes the work identified in response to Item (6).

Activity	3rd Quarter		Year-to-date	
	Budget (\$000)	Actual (\$000)	Budget (\$000)	Actual (\$000)
Provide Electric Service	2,002	2,057	5,796	5,835
Vegetation Management	15,790	17,330	43,217	42,033
Customer Response	21,804	15,738	54,969	42,431
Reliability Maintenance	14,084	14,067	41,867	42,019
System Upgrade	122	89	430	421
Customer Service/Accounts	39,417	43,123	100,422	101,766
Others	8,981	4,494	26,275	29,514
Total O&M Expenses	102,200	96,898	272,976	264,019

- 8) *Quarterly and year-to-date information on budgeted versus actual transmission and distribution capital expenditures in total and detailed by the EDC's own functional account code or FERC account code as available. (For first, second and third quarter reports only.)*

The following table provides the capital expenditures for PPL Electric, as a whole, which includes transmission and distribution ("T&D") activities.

Activity	3rd Quarter		Year-to-date	
	Budget (\$000)	Actual (\$000)	Budget (\$000)	Actual (\$000)
New Service/Revenue	19,548	25,304	56,868	68,881
System Upgrade	128,033	130,447	404,146	360,980
Reliability & Maintenance	112,351	125,127	329,489	337,639
Customer Response	4,278	2,058	8,301	5,138
Other	5,477	5,421	21,869	18,063
Total	269,687	288,357	820,673	790,701

- 9) *Dedicated staffing levels for transmission and distribution operation and maintenance at the end of the quarter, in total and by specific category (for example, linemen, technician and electrician).*

The following table shows the dedicated staffing levels as of the end of the quarter. Job descriptions are provided in Appendix B.

Transmission and Distribution(T&D)	
Lineman Leader	67
Journeyman Lineman	232
Journeyman Lineman-Trainee	50
Helper	2
Groundhand	5
Troubleman	53
T&D Total	409
Electrical	
Elect Leaders-UG	5
Elect Leaders-Net	9
Elect Leaders-Sub	25
Journeyman Elect-UG	22
Journeyman Elect-Net	29
Journeyman Elect-Sub	56
Journeyman Elect Trainee-UG	2
Journeyman Elect Trainee-Net	7
Journeyman Elect Trainee-Sub	15
Helper	15
Laborer-Network	-
Laborer-Substation	-
Electrical Total	185
Overall Total	594

PPL Electric Utilities Corporation

***Worst Performing Circuit Definition / Comparison under old and new
Circuit Performance Index (CPI) formulas.***

PPL Electric uses total Customer Minutes Interrupted (CMI) during the previous four quarters to define the worst performing circuits on its system. Major events and pre-arranged outages are excluded. This ranking system was put in place as of the second quarter of 2013, for the following reasons:

- It focuses remediation efforts where they will have the greatest customer impact. Small pockets of customers with multiple interruptions are addressed under the CEMI (Customers Experiencing Multiple Interruptions) program, which is adequately funded to remediate these smaller customer groups.
- It identifies the circuits contributing the most to system SAIDI.
- It is simple and transparent, therefore allowing WPCs to be identified and remediated on a short timetable.

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Appendix B

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PPL Electric Utilities Corporation

Job Descriptions

Transmission and Distribution

Groundhand	<ul style="list-style-type: none">• Performs manual labor and assists employees in higher job classifications.
Helper	<ul style="list-style-type: none">• Performs semi-skilled labor at any work location on de-energized overhead and underground transmission, and distribution facilities to prepare the employee for entrance into the Journeyman Lineman Apprenticeship Program.
Journeyman Lineman	<ul style="list-style-type: none">• Works alone or as part of a crew on the maintenance, operation, and construction activities of the transmission and distribution systems associated with, but not limited to, PPL Electric facilities.
Journeyman Lineman-Trainee	<ul style="list-style-type: none">• Works alone or as part of a crew on the maintenance, operation, and construction activities of the transmission and distribution systems associated with, but not limited to, PPL Electric facilities.
Lineman Leader	<ul style="list-style-type: none">• Responsible for completing assigned work by directing one or multiple groups of employees involved in the maintenance, operation, and construction activities of the transmission and distribution systems associated with, but not limited to, PPL Electric facilities.• Engage in and perform work along with providing the necessary leadership, all-around knowledge, initiative, judgment, and experience to produce a quality job.• Performs all the direct duties of the Journeyman Lineman when not acting as a Lineman Leader.
Troubleman	<ul style="list-style-type: none">• Investigates and resolves trouble calls, voltage abnormalities on transmission and distribution systems associated with, but not limited to, PPL Electric facilities.

Electrical

<p>Electrician Leader</p> <ul style="list-style-type: none">- Substation- Network- Underground	<ul style="list-style-type: none">• Responsible for completing assigned work by directing one or multiple groups of employees involved in the construction and maintenance activities of the transmission and distribution systems associated with, but not limited to, PPL Electric facilities.• Engage in and perform work along with providing the necessary leadership, all-around knowledge, initiative, judgment, and experience to produce a quality job.• Performs all direct duties of the Journeyman Electrician when not acting as a leader.
<p>Helper</p> <ul style="list-style-type: none">- Substation- Network- Underground	<ul style="list-style-type: none">• Performs manual labor at any work location including those areas containing non-exposed energized electrical equipment, and to prepare the employee for entrance into the Apprenticeship Program.
<p>Laborer</p> <ul style="list-style-type: none">- Substation- Network- Underground	<ul style="list-style-type: none">• Performs manual labor and assists employees in higher job classifications.
<p>Journeyman Electrician</p> <ul style="list-style-type: none">- Substation- Network- Underground	<ul style="list-style-type: none">• Normally under limited supervision performs and is responsible for work associated with, but not limited to, PPL Electric facilities involving the highest degree of skill in construction and maintenance work associated with substations, LTN or underground distribution and transmission.• Uses microprocessor based equipment for troubleshooting and revising relay logic and its control systems related to the Field Services electrical discipline.

Appendix B

<p>Journeyman Electrician - Trainee</p> <ul style="list-style-type: none">- Substation- Network- Underground	<ul style="list-style-type: none">• Normally under limited supervision performs and is responsible for work associated with, but not limited to, PPL Electric facilities involving the highest degree of skill in construction and maintenance work associated with substations, LTN or underground distribution and transmission.• Uses microprocessor based equipment for troubleshooting and revising relay logic and its control systems related to the Field Services electrical discipline.
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