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FEDERAL EXPRESS

July 31, 2014

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

RECEIVED

JUL 31 2014

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

**Re: PPL Electric Utilities Corporation
Quarterly Reliability Report for the
Period Ended June 30, 2014
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 June 30, 2014. 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 July 31, 2014, 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**

July 2014

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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 second quarter of 2014.

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 June 30th, 2014¹.

SAIFI (Benchmark = 0.98; Rolling 12-month Std. = 1.18)	0.89
CAIDI (Benchmark = 145; Rolling 12-month Std. = 174)	150.7
SAIDI (Benchmark = 142; Rolling 12-month Std. = 205)	134.6
MAIFI²	3.46
Average Number of Customers Served³	1,397,341
Number of Sustained Customer Interruptions (Trouble Cases)	16,206
Number of Customers Affected⁴	1,247,726
Customer Minutes of Interruptions (CMI)	188,064,283
Number of Customer Momentary Interruptions	4,828,327

PPL Electric was affected by a significant ice storm concentrated in the Lancaster region starting on February 5, 2014. Due to the concentrated nature of the storm, it did not affect enough customers to be declared a PUC major event. Without this storm, which would be excluded under the IEEE 2.5B standard, system values would be: SAIFI 0.83; CAIDI 109; and SAIDI 90.

During the second quarter, there were no (0) PUC major events, no (0) PUC reportable storms, and four (4) other storms that required the opening of one or more area emergency centers to manage restoration efforts.

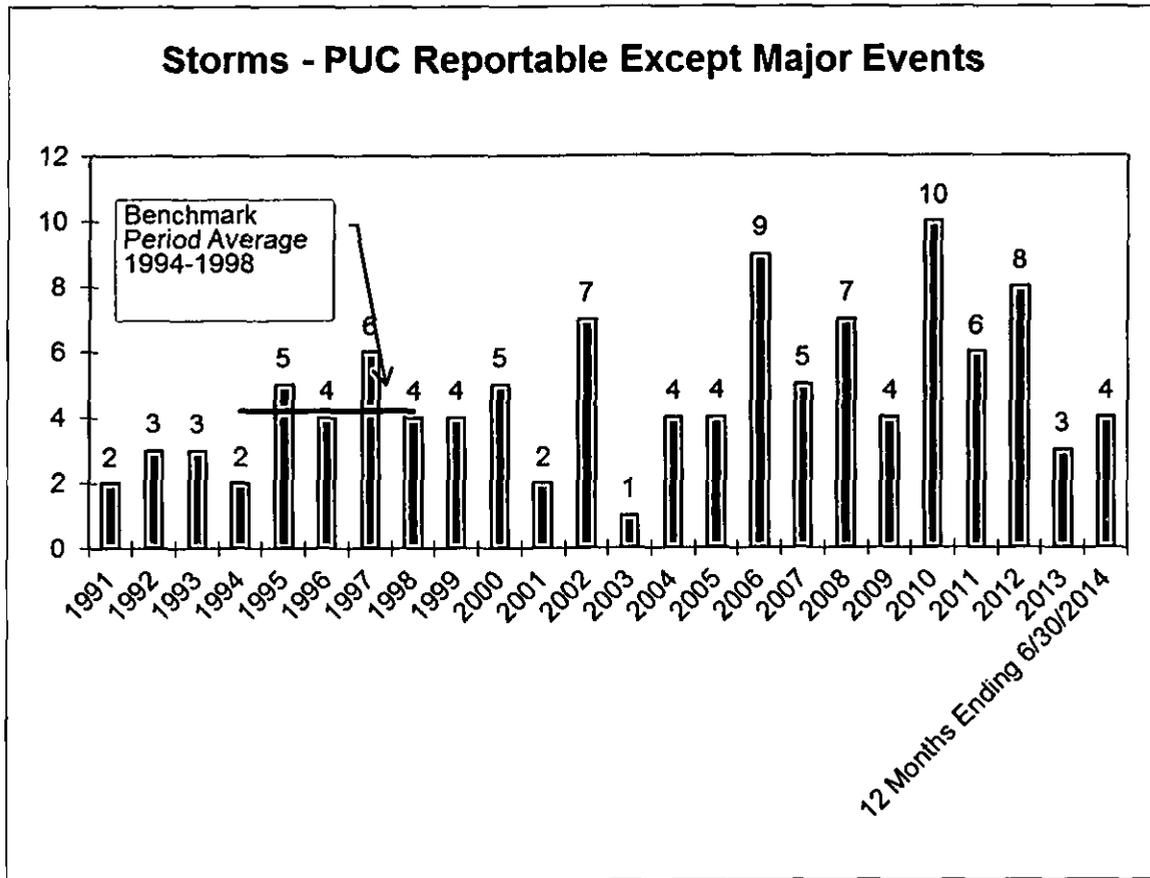
¹ Non-PPL Electric problems are excluded here, but may be found in Item 5.

² MAIFI data is obtained at the substation breaker and does not include momentary interruptions at lower level devices.

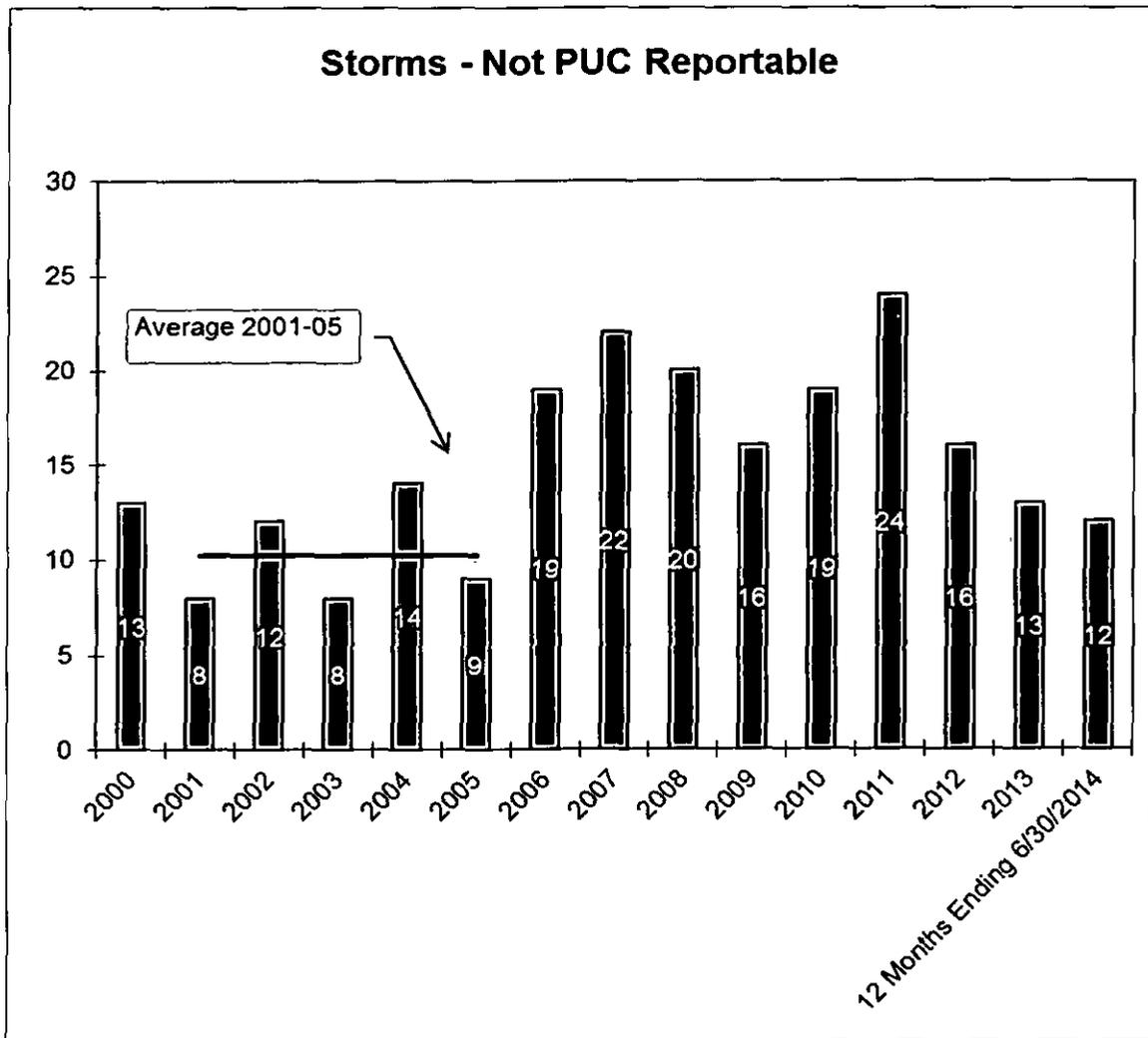
³ PPL Electric calculates the annual indices using customers served at the end of the period. This is consistent with the method used to calculate PPL Electric's benchmarks.

⁴ 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 four (4) PUC-reportable storms ($\geq 2,500$ customers interrupted for ≥ 6 hours) other than major events.



In addition, there were twelve (12) 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, 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 7.5% of the circuits in the system for the 12 months ended at the current quarter. NOTE: The February 5, 2014, Lancaster ice storm caused a large number of historically non-problematic circuits to make the worst performing list. Therefore, PPL Electric has elected to report on the worst 7.5% of circuits so as not to lose track of circuits that would be included had the ice storm not occurred. An explanation of how PPL Electric defines its worst performing circuits is included in Appendix A.

WPC Rank	Feeder ID	SAIFI	CAIDI	SAIDI	MAIFI ⁵	Customers	Cases of Trouble ⁶	Customer Minutes Interrupted
1	64101	2.03	743.3	1506.6	6.1	1,638	31	2,467,817
2	66202	2.06	915.9	1890.9	1.0	1,271	8	2,403,283
3	64904	1.98	386.4	764.2	3.0	3,044	14	2,326,167
4	63404	2.53	800.7	2026.8	4.1	1,067	22	2,162,589
5	64801	2.00	692.4	1383.4	12.3	1,519	58	2,101,391
6	64802	1.82	900.4	1642.5	13.4	1,263	52	2,074,420
7	65603	1.35	619.8	838.4	6.0	2,456	73	2,059,027
8	65702	0.71	1522.6	1083.4	4.0	1,678	33	1,818,028
9	41902	2.86	469.8	1344.3	8.3	1,308	37	1,758,347
10	45002	2.36	380.8	897.2	3.3	1,936	52	1,736,928
11	67401	1.26	968.1	1217.8	2.7	1,361	26	1,657,360
12	65004	1.18	1068.8	1263.8	8.0	1,233	17	1,558,266
13	63402	1.83	435.7	798.1	2.1	1,896	20	1,513,287
14	52402	5.16	175.8	907.8	1.0	1,635	64	1,484,227
15	61701	0.78	1570.6	1230.7	0.0	1,109	10	1,364,888
16	22001	7.53	115.9	872.8	3.0	1,529	50	1,334,437
17	62607	0.38	1171.5	446.0	3.0	2,926	31	1,305,036
18	65802	2.12	314.1	667.2	3.0	1,897	38	1,265,742
19	67502	0.60	1223.1	728.9	6.1	1,730	25	1,260,997
20	28604	1.37	516.9	706.2	0.0	1,775	26	1,253,499
21	60803	1.34	472.9	632.3	5.1	1,913	23	1,209,583
22	63403	2.35	355.3	833.8	5.1	1,439	28	1,199,789
23	22403	2.71	470.7	1275.2	8.3	922	10	1,175,720

⁵ MAIFI data is obtained at the substation breaker and does not include momentary interruptions at lower level devices.

⁶ Cases of trouble are the number of sustained customer service interruptions.

WPC Rank	Feeder ID	SAIFI	CAIDI	SAIDI	MAIFI ⁵	Customers	Cases of Trouble ⁶	Customer Minutes Interrupted
24	62105	1.84	443.2	816.9	7.3	1,436	28	1,173,132
25	60901	2.59	277.0	716.3	5.0	1,565	28	1,121,068
26	46902	20.30	182.6	3707.1	2.1	300	7	1,112,124
27	63401	1.91	686.7	1313.0	2.1	818	14	1,074,016
28	14602	3.08	204.7	630.5	4.0	1,674	10	1,055,450
29	64203	1.56	489.3	763.4	2.1	1,380	10	1,053,428
30	64201	3.87	142.6	552.3	4.2	1,832	41	1,011,736
31	21702	2.08	220.9	459.0	4.2	2,199	12	1,009,383
32	60801	1.32	880.3	1159.3	0.0	792	20	918,192
33	67402	1.77	388.7	689.8	5.1	1,310	28	903,688
34	10602	0.79	832.3	659.8	0.0	1,346	41	888,072
35	61801	1.99	276.0	549.4	1.0	1,589	42	872,987
36	60502	1.38	330.6	457.2	2.0	1,907	24	871,878
37	53101	3.61	121.6	438.8	5.1	1,952	32	856,537
38	41801	4.04	253.0	1021.5	2.0	837	28	855,018
39	47001	2.21	157.6	349.0	2.1	2,448	32	854,291
40	60701	1.19	319.7	380.8	3.1	2,129	23	810,707
41	44301	1.25	317.0	396.8	4.0	2,041	44	809,941
42	66203	2.89	281.2	813.5	2.0	952	13	774,424
43	66703	0.82	630.8	520.0	6.2	1,475	31	767,043
44	64202	0.66	1126.1	742.8	1.0	1,031	38	765,780
45	57505	1.56	167.9	261.2	7.0	2,795	29	730,164
46	11102	4.33	84.7	366.6	3.0	1,969	21	721,778
47	60301	0.53	851.0	454.7	6.0	1,587	24	721,624
48	57304	1.13	412.5	466.1	5.0	1,546	22	720,582
49	62102	1.05	305.2	319.4	2.7	2,250	19	718,640
50	65804	1.21	669.3	811.9	1.1	878	7	712,853
51	45001	2.06	197.3	406.1	3.3	1,753	47	711,972
52	67503	0.94	453.9	425.1	5.0	1,669	42	709,415
53	67804	1.99	173.8	346.7	0.0	2,022	15	701,081
54	53602	3.20	100.2	320.3	5.4	2,185	64	699,834
55	15406	4.48	102.2	458.0	4.7	1,505	18	689,258
56	65401	2.25	166.2	373.3	8.5	1,835	12	684,999
57	61304	2.92	152.7	446.6	13.7	1,533	25	684,614
58	18502	3.08	123.4	380.0	5.2	1,785	62	678,381

WPC Rank	Feeder ID	SAIFI	CAIDI	SAIDI	MAIFI ⁵	Customers	Cases of Trouble ⁶	Customer Minutes Interrupted
59	64401	1.11	677.8	749.3	2.0	900	13	674,398
60	63801	1.29	369.9	476.5	8.1	1,415	24	674,311
61	61001	2.89	123.1	355.7	6.1	1,841	9	654,812
62	45801	1.71	144.2	246.5	5.8	2,614	52	644,481
63	11203	3.16	116.7	368.2	6.1	1,720	19	633,251
64	60605	1.42	318.2	452.4	3.1	1,395	19	631,054
65	53501	3.52	80.6	284.3	10.1	2,144	56	609,448
66	24206	4.22	95.7	403.7	4.1	1,493	10	602,741
67	17801	1.89	150.7	285.4	9.7	2,098	45	598,671
68	61505	2.36	147.2	347.7	16.9	1,663	8	578,241
69	63803	0.97	439.7	428.5	4.1	1,334	17	571,616
70	61504	1.33	367.8	489.8	6.0	1,164	21	570,115
71	57702	1.09	548.5	599.6	5.1	922	12	552,853
72	11506	4.17	100.8	419.8	3.1	1,313	63	551,186
73	10101	2.41	83.0	199.8	3.1	2,671	23	533,776
74	53801	4.29	88.2	378.5	3.2	1,405	11	531,772
75	41503	2.31	186.9	431.6	3.1	1,230	7	530,839
76	67301	2.12	163.4	346.6	2.0	1,529	13	529,980
77	63501	1.58	177.5	279.9	17.5	1,893	61	529,891
78	52004	2.06	222.4	458.8	7.1	1,150	36	527,607
79	12402	4.91	193.0	947.6	3.7	555	38	525,924
80	42903	2.25	230.2	518.0	7.6	1,003	18	519,553
81	26001	1.95	194.2	378.4	0.0	1,367	47	517,283
82	47704	5.16	136.6	704.9	2.1	731	28	515,307
83	40602	1.57	142.5	223.4	3.2	2,303	33	514,500
84	67603	2.85	120.8	344.5	4.0	1,480	14	509,889
85	28301	2.49	90.0	223.6	2.1	2,263	55	506,090
86	63602	0.45	688.7	310.1	4.1	1,626	41	504,151
87	55001	2.03	192.1	389.8	3.1	1,267	53	493,929
88	59202	2.00	107.5	214.9	9.1	2,283	63	490,594
89	51402	2.13	149.4	317.8	1.1	1,494	21	474,862

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

01 Circuit 64101 RED FRONT 41-01

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 740 customers for up to 5,081 minutes, resulting in 1,231,950 CMI.

On February 05, 2014, a tree made contact with an overhead pole arm attachment and caused a recloser to trip to lockout. The outage affected approximately 180 customers for up to 4,876 minutes, resulting in 812,575 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 150 customers for up to 2,437 minutes, resulting in 360,799 CMI.

In total, the Red Front 41-01 circuit had 31 outages between July 2013 and June 2014. The causes of these outages include: tree related (18); equipment failures (7); other (3); vehicles (2); and nothing found (1).

Remedial Actions

- In 2015, the entire Red Front 41-01 line is scheduled to be trimmed in order to reduce tree related outages.
- In 2016, a new midline remotely operated recloser will be installed as part of the Smart Grid project. This remotely operated device will help to reduce customer exposure to outages and reduce future outage durations.
- In 2017, a new three-phase tie will be constructed for a section of radial customers. The project will help to improve future sectionalizing capabilities and reduce future outage durations.
- A project is being investigated to relocate a section of three phase line to a more accessible location.

02 Circuit 66202 SILVER SPRING 62-02

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,290 customers for up to 1,829 minutes, resulting in 2,394,817 CMI.

In total, the Silver Spring 62-02 circuit had 8 outages between July 2013 and June 2014. The causes of these outages include: tree related (5); equipment failures (2); and other (1).

Remedial Actions

- Full circuit tree trimming is scheduled for 2014.
- One remotely operated midline recloser and one remotely operated normally open device will be installed in 2015.

03 Circuit 64904 MILLERSVILLE 49-04

Performance Analysis

This circuit experienced major outages as a result of the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 430 customers for up to 1,894 minutes, resulting in 816,702 CMI.

On February 05, 2014, an equipment failure occurred on an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 1,670 customers for up to 804 minutes, resulting in 739,871 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 700 customers for up to 750 minutes, resulting in 527,388 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 90 customers for up to 2,010 minutes, resulting in 184,879 CMI.

In total, the Millersville 49-04 circuit had 14 outages between July 2013 and June 2014. The causes of these outages include: tree related (8); and equipment failures (6).

Remedial Actions

- Full circuit tree trimming was completed in the first quarter of 2014.
- As part of the tree trimming program, multiple hazard trees were removed during the second quarter of 2014.
- New and existing mid-line sectionalizing and tie devices will be automated in 2015 as part of the Smart Grid program.
- A tie line between the Millersville 49-04 and the West Willow 75-05 is being investigated to allow 700 radial customers to be remotely restored.

04 Circuit 63404 HONEYBROOK 34-04

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 1,130 customers for up to 3,824 minutes, resulting in 2,051,877 CMI.

In total, the Honeybrook 34-04 circuit had 22 outages between July 2013 and June 2014. The causes of these outages include: tree related (9); animal contacts (7); equipment failures (4); vehicle (1); and nothing found (1).

Remedial Actions

- Full circuit tree trimming is scheduled for the second half of 2014.
- A tie line to the Honeybrook 34-02 has been scheduled to be built in 2016 and will allow customers to be remotely restored.

05 Circuit 64801 MOUNT NEBO 48-01

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,370 customers for up to 481 minutes, resulting in 656,406 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 60 customers for up to 3,887 minutes, resulting in 217,638 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 70 customers for up to 2,464 minutes, resulting in 177,405 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and required a temporary sectionalizing open point to be opened for repairs. The outage affected approximately 60 customers for up to 3,269 minutes, resulting in 148,493 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 40 customers for up to 2,535 minutes, resulting in 101,385 CMI.

On March 13, 2014, a tree made contact with an overhead pole arm attachment and caused a recloser to trip to lockout. The outage affected approximately 550 customers for up to 414 minutes, resulting in 228,854 CMI.

In total, the Mount Nebo 48-01 circuit had 57 outages between July 2013 and June 2014. The causes of these outages include: tree related (40); equipment failures (10); animal contacts (4); nothing found (2); and other (1).

Remedial Actions

- An infrared inspection was completed in the first quarter of 2014. Only minor issues were found, and these have been repaired.
- Several crimps and cross arms were replaced in April 2014. These were identified during a recent line inspection.
- Animal Guards were installed at several locations in April 2014. These were also identified during the recent line inspection.
- Full circuit tree trimming is scheduled for 2015.
- New and existing mid-line sectionalizing and tie devices will be automated in 2015 as part of PPL Electric's Smart Grid program.

06 Circuit 64802 MOUNT NEBO 48-02

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 780 customers for up to 1,660 minutes, resulting in 1,294,608 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 60 customers for up to 3,518 minutes, resulting in 211,076 CMI.

On February 05, 2014, a tree made contact with an overhead pole arm attachment and required a temporary sectionalizing open point to be opened for repairs. The outage affected approximately 50 customers for up to 4,862 minutes, resulting in 177,345 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 100 customers for up to 2,780 minutes, resulting in 151,288 CMI.

In total, the Mount Nebo 48-02 circuit had 52 outages between July 2013 and June 2014. The causes of these outages include: tree related (30); equipment failures (11); animal contacts (6); vehicles (3); and nothing found (2).

Remedial Actions

- An infrared inspection was completed in the first quarter of 2014. No problems were found.
- Full circuit tree trimming is scheduled for completion in the third quarter of 2014.
- In the third quarter of 2014, a section of single phase primary cable will be relocated in order to improve its accessibility to crews. This will help to reduce future outage durations on the line.
- The Hill Road line relocation project is scheduled to be placed in-service in December, 2014.
- The company is currently reviewing series fusing for a single tap that experienced multiple outages in three of the last four quarters.

07 Circuit 65603 QUARRYVILLE 56-03

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 110 customers for up to 3,391 minutes, resulting in 379,840 CMI.

On February 05, 2014, a tree made contact with an overhead switch and caused a recloser to trip to lockout. The outage affected approximately 100 customers for up to 3,823 minutes, resulting in 174,717 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 90 customers for up to 2,044 minutes, resulting in 135,762 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 50 customers for up to 1,962 minutes, resulting in 96,136 CMI.

On February 05, 2014, a tree made contact with an overhead pole arm attachment and caused a tap fuse to operate. The outage affected approximately 30 customers for up to 2,564 minutes, resulting in 87,156 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 40 customers for up to 1,788 minutes, resulting in 76,844 CMI.

In total, the Quarryville 56-03 circuit had 73 outages between July 2013 and June 2014. The causes of these outages include: tree related (39); equipment failures (17); animal contacts (9); vehicles (5); and nothing found (3).

Remedial Actions

- An Expanded Operational Review on the circuit was completed in December 2013. Only minor issues were found and repairs were made immediately.
- Full circuit tree trimming is scheduled for 2016.
- An existing manual device will be automated in 2014.
- New and existing mid-line sectionalizing and tie devices will be automated in 2015 as part of PPL's Smart Grid program.
- A new circuit out of the Quarryville substation will be built in May, 2016, that will further reduce the customer count and circuit mileage of the line.
- The circuit will be re-configured in November, 2016, to lower the customer count and circuit mileage of the line. This will help minimize the number of customers affected by an outage and improve the overall reliability of the circuit.
- Distribution Planning is investigating the installation of a recloser in 2016 to remotely sectionalize customers.
- Distribution Planning is investigating a tie between the Quarryville 56-3 and the Quarryville 56-2 to restore power to customers in the case of an outage in the middle of the line.

08 Circuit 65702 ROSEVILLE 57-02

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 180 customers for up to 2,076 minutes, resulting in 366,656 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 140 customers for up to 2,328 minutes, resulting in 325,994 CMI.

On February 05, 2014, a tree made contact with an overhead switch and caused a recloser to trip to lockout. The outage affected approximately 100 customers for up to 3,211 minutes, resulting in 314,655 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 80 customers for up to 3,540 minutes, resulting in 262,023 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 60 customers for up to 3,606 minutes, resulting in 227,126 CMI.

In total, the Roseville 57-02 circuit had 33 outages between July 2013 and June 2014. The causes of these outages include: tree related (27); animal contacts (3); nothing found (1); equipment failure (1); and contact/dig-in (1).

Remedial Actions

- Full circuit tree trimming was completed in the first quarter of 2014.
- In 2014, additional fusing will be installed on two single phase taps. These were identified through an Expanded Operational Review.
- New and existing mid-line sectionalizing and tie devices will be automated in 2015 as part of PPL's Smart Grid program.

09 Circuit 41902 REED 19-02

Performance Analysis

On December 22, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,390 customers for up to 909 minutes, resulting in 413,065 CMI.

On March 30, 2014, a tree made contact with an overhead switch and caused a recloser to trip to lockout. The outage affected approximately 1,390 customers for up to 2,644 minutes, resulting in 1,068,802 CMI.

On August 22, 2013, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 190 customers for up to 880 minutes, resulting in 165,436 CMI.

On October 12, 2013, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 390 customers for up to 322 minutes, resulting in 108,346 CMI.

In total, the Reed 19-02 circuit had 37 outages between July 2013 and June 2014. The causes of these outages include: tree related (17); equipment failures (10); animal contacts (8); other (1); and nothing found (1).

Remedial Actions

- Spans of copper were recondored at the end of 2013. The remaining spans will continue to be recondored throughout 2014. In areas where possible, spans will be relocated to more accessible locations. The recondoring will improve the load and transfer capability of the circuit.
- Hot spot tree trimming was performed in the first quarter of 2014 on sections of three phase line that experienced multiple interruptions due to tree contact.
- Fault indicators were installed in 2014 on a single phase tap experiencing outages.
- Two remotely operable sectionalizing devices will be installed in the third quarter of 2014 under the Smart Grid program. This will improve sectionalizing and reduce the number of customers affected by future outages.
- A full circuit tree trim is scheduled for 2015.
- A project will be scheduled to install solid blade disconnects and fault indicators on a single phase tap that experienced a recent outage. These will be used to quickly identify the outage location and isolate a damaged section of line.

10 Circuit 45002 LIMESTONE 50-02

Performance Analysis

On July 7, 2013, during a period of thunder and lightning, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 2,030 customers for up to 1,164 minutes, resulting in 1,384,942 CMI.

On November 27, 2013, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 1,430 customers for up to 105 minutes, resulting in 150,059 CMI. These two outages accounted for approximately 90% of the total CMI over the past 12 months.

In total, the Limestone 50-02 circuit had 52 outages between July 2013 and June 2014. The causes of these outages include: tree related (22); equipment failure (16); animal contacts (8); nothing found (5); and vehicle (1).

Remedial Actions

- A manually operated recloser was upgraded to a remotely operable recloser on January 29, 2014.
- The entire circuit was trimmed in February, 2014.
- A manually operated sectionalizing switch was upgraded to a remotely operable sectionalizing switch in April, 2014.

- In October, 2014, a remotely operable recloser will be installed at a new location on this circuit to reduce restoration times.
- A plan has been developed to relocate a section of inaccessible line. This work is scheduled for 2015.

11 Circuit 67401 WAKEFIELD 74-01

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 1,460 customers for up to 1,162 minutes, resulting in 1,695,617 CMI.

In total, the Wakefield 74-01 circuit had 26 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (12); tree related (9); nothing found (3); and animal contacts (2).

Remedial Actions

- The circuit was trimmed in 2013.
- In 2015, the Reliability Preservation program will be replacing several spans of old, three phase conductor.
- Full circuit tree trimming is again scheduled for 2017.

12 Circuit 65004 NEFFSVILLE 50-04

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,160 customers for up to 815 minutes, resulting in 941,631 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 80 customers for up to 3,609 minutes, resulting in 277,885 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 40 customers for up to 2,909 minutes, resulting in 127,967 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 50 customers for up to 2,577 minutes, resulting in 123,689 CMI.

In total, the Neffsville 50-04 circuit had 17 outages between July 2013 and June 2014. The causes of these outages include: tree related (9); equipment failures (4); animal contacts (3); and other (1).

Remedial Actions

- Full circuit tree trimming was completed in the first quarter of 2014.
- An infrared inspection was completed in the first quarter of 2014.
- In late 2014, additional fusing will be installed on several single phase taps as part of our Reliability Preservation program.
- New and existing mid-line sectionalizing and tie devices will be automated in 2015 as part of the Smart Grid program.
- Customers on a single phase tap will be transferred from the Neffsville 50-04 to the East Petersburg 15-04 in order to reduce the outage exposure to those customers.

13 Circuit 63402 HONEYBROOK 34-02

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 1,320 customers for up to 5,804 minutes, resulting in 1,379,597 CMI.

In total, the Honeybrook 34-02 circuit had 20 outages between July 2013 and June 2014. The causes of these outages include: animal contacts (8); tree related (7); equipment failures (4); and nothing found (1).

Remedial Actions

- Full circuit tree trimming is scheduled for 2015.
- New and existing mid-line sectionalizing and tie devices will be automated in 2015 as part of the Smart Grid program.
- In 2016, a tie line will be built between the Honeybrook 34-02 and the Honeybrook 34-04 lines to reduce outage durations.

14 Circuit 52402 GREEN PARK 24-02

Performance Analysis

Two outages significantly affected this circuit's reliability in the past four quarters. Tree related interruptions and equipment failures were the most common outage causes.

On November 30, 2013, an equipment failure occurred on the bushing of a three phase recloser and caused the circuit breaker to trip to lockout. Restoration was delayed due to cold load pickup. The outage affected approximately 1,720 customers for up to 555 minutes, resulting in 694,763 CMI.

On June 12, 2014, an equipment failure occurred on an overhead switch and caused a recloser to trip to lockout. The outage affected approximately 1,120 customers for up to 159 minutes, resulting in 178,623 CMI.

In total, the Green Park 24-02 circuit had 64 outages between July 2013 and June 2014. The causes of these outages include: tree related (23); equipment failures (23); animal contacts (11); other (4); and nothing found (3).

Remedial Actions

- Two failed reclosers were replaced in late 2013.
- Additional fusing was installed at two locations during the third quarter of 2013 in order to reduce customer exposure.
- The Green Park 24-02 getaway was reconnected in early 2014 to alleviate cold load pickup concerns.
- Two vintage oil circuit reclosers were replaced with vacuum reclosers on a CEMI customer tap in the second quarter of 2014. This will allow for better device coordination and limit the impact of outages for 200 customers.
- A roughly 4,000 foot single phase extension is planned for 2015. The extension will transfer approximately 50 high CEMI customers to an adjacent circuit to limit line and outage exposure.
- Additional sectionalizing devices will be installed or upgraded in 2016 as part of the Smart Grid initiative. This will allow for the remote troubleshooting of trouble locations and faster restoration times.

15 Circuit 61701 ELIZABETHTOWN 17-01

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead switch and caused a recloser to trip to lockout. The outage affected approximately 830 customers for up to 3,504 minutes, resulting in 1,366,265 CMI.

In total, the Elizabethtown 17-01 circuit had 10 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (4); tree related (3); animal contacts (2); and contact/dig-in (1).

Remedial Actions

- Full circuit tree trimming is scheduled for 2015.
- Ties are being investigated to the Elizabethtown 17-03 and the Elizabethtown 17-02 to provide opportunities to sectionalize the line and remotely restore customers in the case of an outage.

16 Circuit 22001 BOHEMIA 20-01

Performance Analysis

On July 30, 2013, a momentary contact of the overhead primary conductor caused an upstream recloser to trip to lockout. Crews investigated the cause of the outage and found nothing in the affected area. The recloser was closed and did not trip back to lockout. The outage affected approximately 420 customers for up to 170 minutes, resulting in 71,024 CMI.

On December 06, 2013, the circuit breaker tripped to lockout. Crews investigated the line and could not find the cause of the outage. System operators closed the breaker, and it did not trip back to lockout. The outage affected approximately 2,360 customers for up to 154 minutes, resulting in 354,693 CMI.

On January 06, 2014, conductor to insulator tie broke on the overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 2,360 customers for up to 61 minutes, resulting in 144,588 CMI.

On February 06, 2014, an equipment failure occurred on the transmission line which caused the entire Bohemia Substation to be out. The outage affected approximately 2,360 customers for up to 106 minutes, resulting in 250,348 CMI.

On April 18, 2014, a failure of a 12kV lightning arrester caused the circuit breaker to trip to lockout. The outage affected approximately 2,367 customers for up to 170 minutes, resulting in 403,029 CMI.

In total, the Bohemia 20-01 circuit had 50 outages between July 2013 and June 2014. The causes of these outages include: animal contacts (24); equipment failures (10); nothing found (8); tree related (6); and other (2).

Remedial Actions:

- In 2013, the entire Bohemia 20-01 line was trimmed in order to reduce tree related outages.

- In 2014, single-phase reclosers were replaced with two sectionalizers in order to prevent single-phase outages downstream of these devices from causing the Bohemia 20-01 circuit breaker to operate.
- In July, 2014, a new line out of the Bohemia substation will be placed in-service. This line will move approximately 779 customers off of the Bohemia 20-01 line. This move will help improve sectionalizing capability and significantly reduce customer outage durations.
- In 2018, the entire Bohemia 20-01 line will be trimmed in order to reduce future tree related outages.

17 Circuit 62607 ENGLSIDE 26-07

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 240 customers for up to 2,009 minutes, resulting in 490,052 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 190 customers for up to 2,487 minutes, resulting in 455,770 CMI.

In total, the Engleside 26-07 circuit had 30 outages between July 2013 and June 2014. The causes of these outages include: tree related (21); animal contacts (5); equipment failures (3); and nothing found (1).

Remedial Actions

- New and existing mid-line sectionalizing and tie devices will be automated in 2015 as part of the Smart Grid program.
- Full circuit tree trimming is scheduled for 2016.
- The placement of three fuses on the single phase taps is being evaluated. These fuses would be placed beyond a recloser that operated during the ice storm and caused the largest outage on the line.

18 Circuit 65802 ROHRERSTOWN 58-02

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 540 customers for up to 4,852 minutes, resulting in 584,546 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 60 customers for up to 2,271 minutes, resulting in 147,570 CMI.

On February 05, 2014, a tree made contact with an overhead switch and caused a tap fuse to operate. The outage affected approximately 70 customers for up to 1,662 minutes, resulting in 114,655 CMI.

In total, the Rohrerstown 58-02 circuit had 37 outages between July 2013 and June 2014. The causes of these outages include: tree related (21); animal contacts (9); equipment failures (5); vehicle (1); and nothing found (1).

Remedial Actions

- Full circuit tree trimming was completed in the second quarter of 2014.
- An infrared inspection of the line was completed in the first quarter of 2014. Nothing was found.
- New and existing sectionalizing and tie devices will be automated in 2014 as part of the Smart Grid program.
- In 2014, several transformers were identified to receive animal guards to help prevent future animal related outages.
- Multiple hazard trees were removed to protect several single phase lines.

19 Circuit 67502 WEST WILLOW 75-02

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, an equipment failure occurred on an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 160 customers for up to 2,433 minutes, resulting in 365,333 CMI.

On February 05, 2014, a tree made contact with an overhead pole arm attachment and caused a recloser to trip to lockout. The outage affected approximately 260 customers for up to 977 minutes, resulting in 255,906 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 40 customers for up to 3,641 minutes, resulting in 138,324 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 40 customers for up to 3,214 minutes, resulting in 115,129 CMI.

On February 06, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 160 customers for up to 26,238 minutes, resulting in 160,467 CMI.

In total, the West Willow 75-02 circuit had 25 outages between July 2013 and June 2014. The causes of these outages include: tree related (14); equipment failures (7); vehicles (2); nothing found (1); and contact/dig-in (1).

Remedial Actions

- The circuit was trimmed in 2013.
- New and existing mid-line sectionalizing and tie devices will be automated in 2015 as part of the Smart Grid program.
- Full circuit tree trimming is again scheduled for 2017.

20 Circuit 28604 BLYTHEBURN 86-04

Performance Analysis

On April 15, 2014, a tree made contact with an overhead pole arm attachment and caused a recloser to trip to lockout. The outage affected approximately 1,960 customers and resulted in 1,194,856 CMI.

In total, the Blytheburn 86-04 circuit had 26 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (13); tree related (5); vehicles (3); animal contacts (3); and nothing found (2).

Remedial Actions

- A project to reconnector an existing tie between the Blytheburn 86-04 and Saint John's 03-02 is planned for 2017. The improved tie capability will provide additional transfer options to both circuits.
- A project to install a new tie between the Blytheburn 86-04 and Blytheburn 86-02 is under review. The project will provide a tie to customers who are currently radial on the Blytheburn 86-04.

21 Circuit 60803 BUCK 08-03

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 2,020 customers for up to 1,912 minutes, resulting in 1,093,463 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 50 customers for up to 2,216 minutes, resulting in 101,901 CMI.

In total, the Buck 8-03 circuit had 23 outages between July 2013 and June 2014. The causes of these outages include: tree related (9); equipment failures (5); vehicles (4); animal contacts (3); and nothing found (2).

Remedial Actions

- A line patrol of the circuit was performed in late January 2014. Only minor repairs were needed.
- An infrared inspection was completed on this circuit in the first quarter of 2014. Only minor repairs were needed.
- Full circuit tree trimming is scheduled for the second quarter of 2014.
- An Expanded Operational Review will be completed on this circuit in 2014.
- A section of line will be relocated from the right-of-way to a more accessible location along a public road in late 2014 that will allow repairs to be made more easily and help reduce the duration of outages.
- New and existing sectionalizing and tie devices will be automated in 2014 as part of the Smart Grid program.
- The circuit will be re-configured in November 2016 to lower the customer count and circuit mileage of the line. This will help minimize the number of customers affected by an outage and improve the overall reliability of the circuit.
- A project is being planned for 2016 to extend the 3 phase along Truce Road and remove the inaccessible three phase in the current right of way.
- The vehicle pole hits were investigated but no opportunities were found that would reduce the number of pole hits and outages.

22 Circuit 63403 HONEYBROOK 34-03

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead pole arm attachment and caused a recloser to trip to lockout. The outage affected approximately 1,480 customers for up to 5,062 minutes, resulting in 1,083,856 CMI.

In total, the Honeybrook 34-03 circuit had 28 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (13); tree related (7); animal contacts (5); nothing found (2); and vehicle (1).

Remedial Actions

- The circuit was trimmed in 2013.
- New and existing sectionalizing and tie devices have been automated in 2014 as part of the Smart Grid program.
- In 2017, the entire circuit will be trimmed in order to reduce tree related outages.

23 Circuit 22403 MORGAN 24-03

Performance Analysis

On September 11, 2013, a tree made contact with the overhead primary conductor and caused the Morgan 24-03 circuit breaker to trip to lockout. The outage affected approximately 2,400 customers for up to 1,262 minutes, resulting in 1,159,611 CMI.

In total, the Morgan 24-03 circuit had 10 outages between July 2013 and June 2014. The causes of these outages include: animal contacts (5); tree related (3); vehicle (1); and equipment failure (1).

Remedial Actions:

- In 2013, an infrared scan was performed on the Morgan 24-03 line to identify equipment that had a high probability of failure. The equipment that was identified by this analysis was replaced promptly after identification. It is expected that these actions will reduce future equipment failures and improve overall line reliability.
- In 2014, additional locations for animal guarding were identified.
- In 2014, an expanded operational review (EOR) will be performed on the entire Morgan 24-03 line in order to identify circuit improvements to reduce the potential for outages.
- A midline switch will be replaced with a remotely operated recloser in 2014 as part of the Smart Grid project plan. This remotely operated device will help to reduce exposure to outages as well as outage duration.
- In 2015, the Morgan 24-03 to Edella 21-01 and Morgan 24-03 to Edella 21-03 manual tie switches will be automated as part of the Smart Grid project. These remotely operated devices will improve sectionalizing capabilities and reduce future outage durations.
- In 2016, a new line and terminal will be built out of the Edella Substation. The new line will help to improve tie capabilities and sectionalizing capabilities which will improve reliability for all customers on the Morgan 24-03 line.
- In 2017, Vegetation Management plans to trim the entire Morgan 24-03 circuit.

24 Circuit 62105 EAST LANCASTER 21-05

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On November 26, 2013, an equipment failure occurred on an overhead switch and caused a recloser to trip to lockout. The outage affected approximately 1,000 customers for up to 211 minutes, resulting in 194,873 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 1,000 customers for up to 349 minutes, resulting in 346,738 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 80 customers for up to 3,264 minutes, resulting in 176,439 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 70 customers for up to 1,985 minutes, resulting in 138,946 CMI.

In total, the East Lancaster 21-05 circuit had 28 outages between July 2013 and June 2014. The causes of these outages include: tree related (18); equipment failures (5); and animal contacts (5).

Remedial Actions

- Full circuit tree trimming was completed at the end of the second quarter in 2014.
- An infrared inspection of the line was completed in the first quarter of 2014. No issues were identified.
- A failed mainline recloser was replaced with a new remotely operated recloser in 2014.
- In 2014, a project was initiated to re-sag a three phase slack span which had a potential to cause future outages.
- New and existing mid-line sectionalizing and tie devices will be automated in 2015 as part of the Smart Grid program.

25 Circuit 60901 DONEGAL 09-01

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead pole arm attachment and caused a recloser to trip to lockout. The outage affected approximately 1,170 customers for up to 4,910 minutes, resulting in 976,340 CMI.

In total, the Donegal 9-01 circuit had 28 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (11); tree related (9); animal contacts (4); vehicles (2); other (1); and nothing found (1).

Remedial Actions

- An infrared inspection of the line was completed in the first quarter of 2014. No issues were identified.
- Full circuit tree trimming is scheduled for the second half of 2014.
- In the second quarter of 2014, a section of old copper-weld wire has been reconducted in order to prevent potential conductor failure.
- In the second quarter of 2014, a load break disconnect has been installed on a getaway riser pole to improve switching capability.
- New and existing mid-line sectionalizing and tie devices will be automated in 2015 as part of the Smart Grid program.

26 Circuit 46902 MONTGOMERY 69-02

Performance Analysis

On March 17, 2014 at 0600 the Montgomery Substation was taken out of service to maintain the 69kV source to the substation. The Montgomery 69-02 circuit was tied to the Montgomery 69-03 circuit, and both circuits were transferred to the Watson 33-01 circuit.

On March 17, 2014, at 0720 a failed crimp caused a recloser to operate to lockout. This outage affected approximately 1,940 customers for up to 367 minutes, resulting in 574,536 CMI. Later in the day at 1540 another crimp failed and caused a recloser to operate to lockout. This outage affected approximately 2,710 customers for up to 245 minutes, resulting in 482,636.

These two outages account for more than 90% of the total CMI on this circuit over the past 12 months.

In total, the Montgomery 69-02 circuit had seven outages between July 2013 and June 2014. The causes of these outages include: equipment failure (3); animal contact (2); vehicle (1); and nothing found (1).

Remedial Actions

- Line patrols of the circuits were conducted and infrared imaging of potential hot spot areas was completed in March, 2014. Two potential problems were identified during the infrared inspection and were immediately repaired.
- All three circuits were returned to the normal configuration on March 22, 2014.
- A project has been developed to build a new substation at the Great Stream Commons Business Park. This project will provide additional transfer capacity in the area which will reduce the load on the Watson 33-01 when it is carrying the Montgomery 69-02 and

Montgomery 69-03 circuits during substation maintenance at Montgomery. This project is planned for November, 2017.

27 Circuit 63401 HONEYBROOK 34-01

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 690 customers for up to 3,641 minutes, resulting in 1,062,543 CMI.

In total, the Honeybrook 34-01 circuit had 14 outages between July 2013 and June 2014. The causes of these outages include: animal contacts (5); equipment failures (4); tree related (3); other (1); and contact/dig-in (1).

Remedial Actions

- Full circuit tree trimming is scheduled for 2014.
- In 2014, several new remotely operated midline and tie devices will be installed. The new devices will provide additional switching capabilities and help to reduce future outage durations.
- Additional fusing opportunities are being investigated which will reduce future customer outage exposure.

28 Circuit 14602 SOUTH WHITEHALL 46-02

Performance Analysis

In the past twelve months, the South Whitehall 46-02 has had two circuit breaker lockouts. In addition, there have been several small, isolated outages.

On November 01, 2013, a report of a pole fire caused System Operations to open the circuit breaker for safety reasons. No actual pole fire was found. The outage affected approximately 1,700 customers for up to 116 minutes, resulting in 197,872 CMI.

Also on November 01, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,700 customers for up to 260 minutes, resulting in 331,216 CMI.

On February 01, 2014, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 1,700 customers for up to 1,041 minutes, resulting in 531,583 CMI.

In total, the South Whitehall 46-02 circuit had 10 outages between July 2013 and June 2014. The causes of these outages include: nothing found (3); animal contacts (2); vehicle (1); tree related (1); equipment failure (2); and contact/dig-in (1).

Remedial Actions

- Five new Smart Grid devices are scheduled to be installed in 2014. There will be three reclosers/switches and two normally open tie switches.
- A three phase tap will be fused in 2014.
- Due to multiple pole hits, pole relocation is currently being evaluated for this circuit.
- A new line and terminal out of the Mickleys substation will go into service in 2018, and will pick up approximately 750 customers and improve sectionalizing.

29 Circuit 64203 KINZER 42-03

Performance Analysis

On February 05, 2014, during a severe ice storm, a tree made contact with an overhead primary conductor and caused a transformer to be interrupted. The outage affected approximately 1,110 customers for up to 2,083 minutes, resulting in 906,533 CMI.

On February 07, 2014, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 1,110 customers for up to 470 minutes, resulting in 192,384 CMI.

On April 19, 2013, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 1,080 customers for up to 464 minutes, resulting in 155,902 CMI.

On May 10, 2013, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 1,090 customers for up to 587 minutes, resulting in 103,265 CMI.

In total, the Kinzer 42-03 circuit had 11 outages between July 2013 and June 2014. The causes of these outages include: tree related (3); animal contacts (3); vehicles (3); equipment failure (1); and contact/dig-in (1).

Remedial Actions

- In 2013, PPL completed an Expanded Operational Review on the circuit. Only minor repairs were needed as a result of the study's findings.
- The Kinzer 69/12 kV substation will be animal guarded in 2014.
- In 2014, the 69 kV air break at the Kinzer substation will be replaced.
- In the third quarter of 2014, under the Reliability Preservation program, a section of 2/0 copper double circuit will be replaced with 477 aluminum along Route 30 from Ronks Road to Oakhill Road.
- In 2014, several new remotely operated midline and tie devices will be installed. The new devices will provide additional switching capabilities and help to reduce future outage durations.

- In 2014, the multiple vehicle hits on the Kinzer 42-03 line were investigated, and no remedial actions were identified.
- In 2015, the Asset Optimization Strategy program will be rebuilding the Face Rock-Kinzer 13 69 kV transmission line.
- In 2015, the entire circuit will be trimmed in order to reduce tree related outages.

30 Circuit 64201 KINZER 42-01

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 310 customers, resulting in 509,443 CMI.

In total, the Kinzer 42-01 circuit had 41 outages between July 2013 and June 2014. The causes of these outages include: tree related (15); equipment failures (14); vehicles (10); other (1); and animal contact (1).

Remedial Actions

- *Full circuit tree trimming is scheduled for the fourth quarter of 2014.*
- In 2014, the multiple vehicle hits on the Kinzer 42-03 line were investigated, and no remedial actions were identified.
- In 2014, several new remotely operated midline and tie devices will be installed. The new devices will provide additional switching capabilities and help to reduce future outage durations.
- A new tie line with the Kinzer 42-01 line is currently being evaluated.
- In 2014, the Kinzer substation will be animal guarded.
- In 2014, the 69 kV air break at the Kinzer substation will be replaced.
- In 2015, the Face Rock-Kinzer 13 69 kV transmission line will be rebuilt.

31 Circuit 21702 SUBURBAN 17-02

Performance Analysis

On September 14, 2013, an equipment failure occurred on an overhead primary conductor and caused the Suburban 17-02 circuit breaker to trip to lockout. The outage affected approximately 3,350 customers for up to 425 minutes, resulting in 787,023 CMI.

On April 11, 2014, an equipment failure on the 12kV primary line caused an upstream recloser to trip to lockout. The outage affected approximately 1,118 customers for up to 406 minutes, resulting in 219,360 CMI.

In total, the Suburban Yard 17-02 circuit had 12 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (7); animal contacts (2); tree related (1); other (1); and nothing found (1).

Remedial Actions:

- In November 2013, a section of existing three-phase conductor was rephased to single-phase with fusing in order to minimize the number of customers affected by an outage like the one that occurred on September 14, 2013.
- In December 2013, a remotely operable switch was installed on the Suburban 17-02 to Providence 42-02 tie. The automation will allow for improved sectionalizing capability and reduced outage durations.
- In 2014, an Expanded Operational Review will be conducted on the entire Suburban 17-02 line to identify circuit improvements.
- In 2014, a midline recloser will be replaced with a remotely operable recloser as part of the Smart Grid project plan. The device automation is anticipated to significantly reduce outage exposure to customers and future outage durations.
- In 2015, a manual midline switch and the Suburban 17-02 to Providence 42-06 manual tie switch will be replaced with two remotely operated switches as part of the Smart Grid project plan. The device automation will improve sectionalizing capabilities and reduce future outage durations on the circuit.
- In 2015, a new midline remotely operated recloser will be installed in order to further improve sectionalizing capability and reduce outage exposure to customers on the Suburban 17-02 line.
- In 2016, the entire Suburban 17-02 circuit will be trimmed.

32 Circuit 60801 BUCK 08-01

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 480 customers for up to 779 minutes, resulting in 371,540 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 280 customers for up to 1,997 minutes, resulting in 310,743 CMI.

On February 05, 2014, a tree made contact with an overhead pole arm attachment and caused a tap fuse to operate. The outage affected approximately 60 customers for up to 1,997 minutes, resulting in 121,815 CMI.

On February 06, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 80 customers for up to 1,514 minutes, resulting in 91,452 CMI.

In total, the Buck 8-01 circuit had 20 outages between July 2013 and June 2014. The causes of these outages include: tree related (8); equipment failures (6); animal contacts (4); vehicle (1); and contact/dig-in (1).

Remedial Actions

- In 2013, a fuse was installed on a single phase tap near the substation as a result of the Expanded Operational Review conducted in 2013.
- In the first quarter of 2014, an infrared inspection of the line was completed. Nothing was found upon the completion of the inspection.
- In 2016, the entire circuit will be trimmed in order to reduce tree related outages.
- A new 12 kV tie is being developed for the Buck 08-03 line in order to improve future sectionalizing capability and reduce future outage durations.

33 Circuit 67402 WAKEFIELD 74-02

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 330 customers for up to 2,025 minutes, resulting in 666,060 CMI.

On September 21, 2013, an equipment failure occurred on an overhead switch and caused the circuit breaker to trip to lockout. The outage affected approximately 1,390 customers for up to 221 minutes, resulting in 156,448 CMI.

In total, the Wakefield 74-02 circuit had 28 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (10); tree related (9); vehicles (3); nothing found (3); animal contacts (2); and other (1).

Remedial Actions

- The recloser that failed on September 21, 2013, was replaced.
- In 2014, several new remotely operated midline and tie devices will be installed. The new devices will provide additional switching capabilities and help to reduce future outage durations.
- In the second quarter of 2014, new single phase along Kirks Mill Road will be extended and the inaccessible conductor removed.
- In 2015, the entire circuit will be trimmed in order to reduce tree related outages.

34 Circuit 10602 BLOOMING GLEN 06-02

Performance Analysis

In the past twelve months, the Blooming Glen 6-02 has had one large outage. In addition, there have been several small, isolated outages on this circuit.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 360 customers for up to 2,305 minutes, resulting in 797,761 CMI. There were significant delays in restoration which led to a significant CMI for this outage.

In total, the Blooming Glen 6-02 circuit had 37 outages between July 2013 and June 2014. The causes of these outages include: tree related (13); animal contacts (12); equipment failures (11); and other (1).

Remedial Actions

- The Blooming Glen 06-02 is located in the Buxmont area and will receive radio upgrades to its existing remotely operable reclosers and switches in 2014.
- Opportunities to install animal guards in an area with multiple animal outages are being evaluated.
- Circuit load balancing is currently being evaluated.
- Comprehensive tree trimming will take place in 2016.

35 Circuit 61801 EAST ELIZABETHTOWN 18-01

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 580 customers for up to 542 minutes, resulting in 316,062 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and required a temporary sectionalizing open point to be opened for repairs. The outage affected approximately 360 customers for up to 432 minutes, resulting in 155,434 CMI.

In total, the East Elizabethtown 18-01 circuit had 42 outages between July 2013 and June 2014. The causes of these outages include: tree related (13); equipment failures (11); animal contacts (8); other (5); nothing found (3); and vehicles (2).

Remedial Actions

- In the fourth quarter of 2014, the entire circuit will be trimmed in order to reduce tree related outages.
- In 2015, new remotely operated midlines and tie devices will be installed.
- A new 12 kV tie is being developed for the East Elizabethtown 18-01 line in order to improve future sectionalizing capability and reduce future outage durations.

36 Circuit 60502 NORTH MANHEIM 05-02

Performance Analysis

The North Manheim 05-02 circuit experienced the following major outage which strongly influenced the current ranking of this circuit on the WPC list. This one outage was the result of the February 5, 2014 ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,950 customers for up to 458 minutes, resulting in 804,707 CMI.

In total, the North Manheim 5-02 circuit had 24 outages between July 2013 and June 2014. The causes of these outages include: tree related (10); equipment failures (7); animal contacts (5); vehicle (1); and nothing found (1).

Remedial Actions

- In 2014, new remotely operable midline and tie devices will be installed.
- In the third quarter of 2014, several poles with multiple vehicle hits will be relocated to less vulnerable locations.
- During the fourth quarter of 2014, a new tie line will be constructed which will reduce the number of outages that have been experienced by customers along Mastersonville Road. This project will also provide a strong tie to reduce overall outage durations for over 1,000 customers that are on this line.
- In 2015, a new tie line will be constructed between the North Manheim 05-01 and 05-02 lines.
- In 2016, the entire circuit will be trimmed in order to reduce tree related outages.

37 Circuit 53101, WILLIAMSTOWN 31-01

Performance Analysis

Four outages significantly affected this circuit's reliability in the past four quarters. Equipment failures were the most common outage cause.

On March 29, 2014, an equipment failure occurred on an overhead pole arm attachment and caused the circuit breaker to trip to lockout. The outage affected approximately 1,960 customers for up to 147 minutes, resulting in 133,732 CMI.

On March 31, 2014, the Eldred-Pine Grove 69kV circuit tripped to lockout due to a broken transmission pole. This outage affected approximately 15,000 customers at Frailey, Gratz, Hegins, Lykens, Pine Grove, and Williamstown substations. Approximately 1,900 customers on the Williamstown 31-01 were interrupted for up to 77 minutes, resulting in 146,087 CMI.

On April 30, 2014, an equipment failure occurred on an overhead transformer and caused a recloser to trip to lockout. The outage affected approximately 1,060 customers for up to 193 minutes, resulting in 205,044 CMI.

On June 05, 2014, the Sunbury-Dauphin 69kV circuit tripped to lockout due to a broken transmission pole crossarm. This outage affected approximately 14,000 customers at Dalmatia, Elizabethville, Gratz, Lykens, and Williamstown substations. Approximately 1,950 customers on the Williamstown 31-01 were interrupted for up to 161 minutes, resulting in 313,102 CMI.

In total, the Williamstown 31-01 circuit had 32 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (13); tree related (9); nothing found (4); animal contacts (3); other (2); and vehicle (1).

Remedial Actions

- Additional fusing was installed in 2014 at three locations in order to reduce customer exposure.
- Approximately 30 vintage cutouts prone to failure were replaced in the second quarter of 2014.
- Additional sectionalizing devices will be installed or upgraded in 2016. This will allow for the remote troubleshooting of trouble locations and faster restoration times.
- In response to the March 31, 2014 outage of the Eldred-Pine Grove 69 kV line, a comprehensive study was completed. Approximately 33 Cellon poles have been identified in this section and are scheduled for replacement with steel structures in 2016.
- Approximately 17 motor operated switches are scheduled to be installed on the Sunbury-Dauphin and Dauphin-Pine Grove 69 kV lines. The switches will allow operators to quickly sectionalize transmission outages to no more than a single distribution substation.

38 CIRCUIT 41801 GOWEN CITY 18-01

Performance Analysis

On March 30, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 380 customers for up to 2,629 minutes, resulting in 589,629 CMI.

In total, the Gowen City 18-01 circuit had 28 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (9); tree related (7); animal contacts (5); other (4); and nothing found (3).

Remedial Actions

- The entire Gowen City 18-01 was patrolled and studied under an expanded operational review in 2013. As a result there are plans to install eight new fuse locations, to perform maintenance on six pole locations, and to replace failed sectionalizing at one location.
- The three phase backbone Gowen City 18-1 was patrolled in April 2014. Two cracked cross arms were identified and will be replaced.
- In 2015, the entire circuit will be trimmed in order to reduce tree related outages.
- In 2015 a recloser will be relocated to better divide the customers between protective devices.
- A project to tie the Gowen City 18-1 to the Gratz 33-2 is being evaluated. This project would reduce the number of radial customers on the Gowen City 18-1 and improve outage restoration.
- A project to install an air break switch directly outside the Gowen City substation is being reviewed. The switch will improve reliability during substation work.

39 Circuit 47001, HUGHESVILLE 70-01

Performance Analysis

On September 11, 2013, a tree fell on the overhead primary conductor and broke an overhead pole arm attachment which caused the circuit breaker to trip to lockout. The outage affected approximately 2,550 customers for up to 367 minutes, resulting in 637,042 CMI.

On November 7, 2013, an equipment failure occurred on an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 2,550 customers for up to 50 minutes, resulting in 128,953 CMI. These two outages accounted for approximately 90% of the total CMI on this circuit over the past 12 months.

In total, the Hughesville 70-01 circuit had 32 outages between July 2013 and June 2014. The causes of these outages include: equipment failure (13); tree related (10); animal contact (8); and other (1).

Remedial Actions

- Ten slot fuses were installed in 2013.
- A project was completed in December 2013 that extended the three phase backbone of the Hughesville 70-01 and created a remotely operable tie to the Millville 32-02. Three remotely operable sectionalizing devices were also installed as part of this project.
- New controls were added to an existing sectionalizing device. The remotely operable device was placed into service in April, 2014.

- Spot trimming and hazard tree removal on the Pine Summit Tap was completed on April 16, 2014.
- New controls were added to an existing recloser. The remotely operable recloser is scheduled to be placed into service during the third quarter of 2014.
- As part of the 2014 Smart Grid Program, the normally open switch between the Hughesville 70-1 and Hughesville 70-2 circuits will be upgraded to a remotely operable switch.
- A project has been developed that will increase the load that can be transferred from the Hughesville 70-01 to the Millville 32-02. Approximately 8500 ft of larger capacity conductor will be installed on the Millville 32-02. This project is scheduled to be completed in the fourth quarter of 2015.
- The radial Hughesville 69kV transmission tap that supplies the Hughesville distribution substation is currently sourced by only the Clinton – Muncy 1 69kV transmission line. 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. This work is scheduled to be completed by 2015.
- A new manually operable switch will be installed along SR 2040. This switch will allow line crews to transfer the Hughesville 70-01 to the Hughesville 70-02 should the Hughesville 70-01 circuit breaker or getaway fail. This work is scheduled for 2016.

40 Circuit 60701 BRECKNOCK 07-01

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a vehicle pole hit caused the circuit breaker to trip to lockout. The outage affected approximately 2,170 customers for up to 2,948 minutes, resulting in 755,482 CMI.

In total, the Brecknock 7-01 circuit had 23 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (10); vehicles (4); tree related (4); animal contacts (3); other (1); and nothing found (1).

Remedial Actions

- Full circuit tree trimming is scheduled for 2014.
- In 2014, several new remotely operable midline and tie devices will be installed. The new devices will provide additional switching capabilities and help to reduce future outage durations.
- The company is currently reviewing a potential project to bring a new line and terminal out of the Terre Hill substation or the Honeybrook substation to decrease the number of customers fed from the Brecknock 07-01.

41 Circuit 44301, BEAVERTOWN 43-01

Performance Analysis

On July 7, 2013, a tree contacted the Sunbury – Middleburg 69kV transmission line and caused the 69kV circuit breaker at Sunbury to trip to lockout. This transmission outage affected approximately 2,140 customers for up to 307 minutes, resulting in 656,587 CMI. This outage accounted for more than 80% of the circuit's CMI over the past 12 months.

In total, the Beavertown 43-01 circuit had 44 outages between July 2013 and June 2014. The causes of these outages include: tree related (16); equipment failure (12); animal contact (8); nothing found (6); and contact/dig-in (2).

Remedial Actions

- Hot spot trimming was completed on the Sunbury – Middleburg 69kV transmission line in July, 2013. The entire circuit is scheduled to be trimmed in 2014 as part of its normal maintenance.
- In January, 2014, select trouble areas on this circuit were trimmed and hazard trees were removed.
- A new remotely operable sectionalizing switch was installed on February 26, 2014.
- In 2014, a 900 foot section of new single phase will be built along Ettinger Rd so that inaccessible line can be removed.
- This circuit is scheduled to be trimmed in 2015.
- In 2015, an existing recloser, sectionalizing switch, and normally open tie switch will be upgraded to remotely operable devices.
- A new remotely operable sectionalizing switch will be installed on the Sunbury - Middleburg 69kV transmission line. This work is planned for 2016.

42 Circuit 66203 SILVER SPRING 62-03

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 980 customers for up to 1,666 minutes, resulting in 703,443 CMI.

In total, the Silver Spring 62-03 circuit had 13 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (4); animal contacts (4); tree related (2); vehicle (1); other (1); and nothing found (1).

Remedial Actions

- In 2015, several new remotely operable midline and tie devices will be installed. The new devices will provide additional switching capabilities and help to reduce future outage durations.
- In 2016, the entire circuit will be trimmed in order to reduce tree related outages.

43 Circuit 66703 STRASBURG 67-03

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 50 customers for up to 3,469 minutes, resulting in 176,884 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 180 customers for up to 753 minutes, resulting in 138,454 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 60 customers for up to 2,178 minutes, resulting in 126,282 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 60 customers for up to 2,002 minutes, resulting in 124,104 CMI.

On February 05, 2014, a tree made contact with a primary splices and connector and required a temporary sectionalizing open point to be opened for repairs. The outage affected approximately 80 customers for up to 1,442 minutes, resulting in 117,282 CMI.

In total, the Strasburg 67-03 circuit had 31 outages between July 2013 and June 2014. The causes of these outages include: tree related (16); equipment failures (11); and animal contacts (4).

Remedial Actions

- In the third quarter of 2014, a remotely operated recloser will be installed.
- *In the fourth quarter of 2014, the circuit breaker for this line will be replaced.*
- In 2015, entire circuit will be trimmed in order to reduce tree related outages.
- In 2015, new remotely operable midline and tie devices will be installed.

44 Circuit 64202 KINZER 42-02

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead pole arm attachment and caused a recloser to trip to lockout. The outage affected approximately 90 customers for up to 3,313 minutes, resulting in 294,780 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 130 customers for up to 948 minutes, resulting in 123,194 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 30 customers for up to 4,587 minutes, resulting in 116,817 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 30 customers for up to 3,351 minutes, resulting in 110,551 CMI.

In total, the Kinzer 42-02 circuit had 38 outages between July 2013 and June 2014. The causes of these outages include: tree related (16); equipment failures (8); animal contacts (6); vehicles (4); nothing found (3); and other (1).

Remedial Actions

- The circuit was trimmed in 2013.
- A total of 115 hazard trees were identified during the 2013 tree trimming cycle and removed. Approximately 80 additional hazard trees were identified and have been removed in the second quarter of 2014.
- In 2015, the Face Rock-Kinzer 13 69 kV transmission line will be rebuilt.
- The Kinzer substation will be animal guarded in 2014.
- The 69 kV air break at the Kinzer substation will be replaced in 2014.
- Existing sectionalizing and tie devices will be automated in 2016.
- In 2017, the entire circuit will be trimmed in order to reduce tree related outages.
- The company is currently investigating a potential new substation to split up the customers being fed from this line and other Kinzer 12 kV lines.

45 Circuit 57505, Lawnton 75-05

Performance Analysis

Two outages significantly affected this circuit's reliability in the past four quarters. Equipment failures were the most common outage cause.

On July 19, 2013, a tree made contact with an overhead primary conductor during a storm and caused the circuit breaker to trip to lockout. The outage affected approximately 2,890 customers for up to 280 minutes, resulting in 386,225 CMI.

On December 20, 2013, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 550 customers for up to 561 minutes, resulting in 307,198 CMI.

In total, the Lawnton 75-05 circuit had 29 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (11); tree related (8); vehicles (3); nothing found (3); animal contacts (3); and other (1).

Remedial Actions

- Additional fusing was installed at one location during September, 2013, in order to reduce customer exposure.
- Loops were installed in June 2014 near the pole which was hit by a vehicle last December. The loops will allow for quicker sectionalizing and restoration during outages.
- Three existing sectionalizing and tie devices will be upgraded in 2014.
- Additional sectionalizing devices will be installed or upgraded in 2016. This will allow for the remote troubleshooting of trouble locations and faster restoration times.

46 Circuit 11102 EGYPT 11-02

Performance Analysis

In the past twelve months, the Egypt 11-02 has had two circuit breaker lockouts. In addition, there have been several small, isolated outages.

On July 04, 2013, a vehicle accident caused the circuit breaker to trip to lockout. The outage affected approximately 1,986 customers for up to 173 minutes, resulting in 93,722 CMI.

On January 04, 2014, an equipment failure caused the circuit breaker to trip to lockout. The outage affected approximately 1,964 customers for up to 363 minutes, resulting in 357,738 CMI.

In total, the Egypt 11-02 circuit had 21 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (11); animal contacts (2); tree related (1); vehicles (6); and nothing found (1).

Remedial Actions

- Two new Smart Grid devices will be installed in 2015 to split the line for automatic sectionalizing.
- The causes of multiple equipment failures on this line are being investigated. Work will be initiated to eliminate any other equipment of same type/vintage.

- Load balancing is being evaluated.
- The normally open device at the Mickleys 28-01 tie will be replaced with a Smart Grid device.

47 Circuit 60301 TWIN VALLEY 03-01

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 250 customers for up to 4,858 minutes, resulting in 339,889 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 100 customers for up to 2,285 minutes, resulting in 156,168 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 30 customers for up to 3,207 minutes, resulting in 89,781 CMI.

In total, the Twin Valley 3-01 circuit had 24 outages between July 2013 and June 2014. The causes of these outages include: tree related (13); equipment failures (4); animal contacts (4); nothing found (2); and other (1).

Remedial Actions

- The circuit was trimmed in 2013.
- In 2014, several new remotely operated midlines and tie devices are being installed as part of the Smart Grid program. The new devices will provide additional switching capabilities and help to reduce future outage durations.
- Further investigation of the Twin Valley 03-01 and the surrounding circuits are currently being performed to balance load and improve reliability in the area.
- A second transmission line that will supply the Twin Valley substation will be built in 2015.
- In 2017, the entire circuit will be trimmed in order to reduce tree related outages.

48 Circuit 57304, MOUNT ALLEN 73-04

Performance Analysis

A single circuit breaker outage significantly affected this circuit's reliability in the past four quarters. Tree related interruptions were the most common outage cause.

On February 05, 2014, an equipment failure occurred on an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,520 customers for up to 566 minutes, resulting in 679,167 CMI. Restoration times were delayed due to a widespread ice storm that affected the area.

In total, the Mount Allen 73-04 circuit had 22 outages between July 2013 and June 2014. The causes of these outages include: tree related (13); equipment failures (4); vehicles (2); animal contacts (2); and nothing found (1).

Remedial Actions

- Three reclosers were upgraded to include remote operator control in early 2014. The devices were out of service awaiting programming during the February 5th outage. Had the devices been in service, the outage would have been limited to less than 500 customers.
- An existing sectionalizing device was upgraded in 2014 as part of the Smart Grid initiative. The device allows for the remote transfer of approximately half the customers to an adjacent circuit.
- The Mount Allen 73-04 circuit is scheduled to be trimmed in the third quarter of 2014.

49 Circuit 62102 EAST LANCASTER 21-02

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead pole arm attachment and caused the circuit breaker to trip to lockout. The outage affected approximately 2,270 customers for up to 305 minutes, resulting in 671,465 CMI.

In total, the East Lancaster 21-02 circuit had 19 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (8); tree related (6); animal contacts (3); and vehicles (2).

Remedial Actions

- In the first quarter of 2014, animal guards were installed on several sections of line that will mitigate future animal related outages.
- In the first quarter of 2014, an infrared inspection was completed on the line. Nothing was found as a result of the study.

- In 2015, a new remotely operable device will be installed. The new device will provide additional switching capability and help to reduce future outage durations.
- In 2016, the entire circuit will be trimmed in order to reduce tree related outages.

50 Circuit 65804 ROHRERSTOWN 58-04

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead pole arm attachment and caused the circuit breaker to trip to lockout. The outage affected approximately 880 customers for up to 576 minutes, resulting in 508,032 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 130 customers for up to 1,584 minutes, resulting in 199,530 CMI.

In total, the Rohrerstown 58-04 circuit had seven outages between July 2013 and June 2014. The causes of these outages include: tree related (4); equipment failures (2); and animal contact (1).

Remedial Actions

- Full circuit tree trimming was completed at the end of the first quarter of 2014. Additional hazard trees were removed by the end of the second quarter of 2014.
- In the first quarter of 2014, an infrared inspection of the line was completed. Nothing was found as a result of the inspection.
- In 2016, a new remotely operable device will be installed. The new device will provide additional switching capability and help to reduce future outage durations.

51 Circuit 45001, LIMESTONE 50-01

Performance Analysis

On October 26, 2013, an equipment failure occurred on an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 290 customers for up to 321 minutes, resulting in 91,906 CMI.

On March 26, 2014, a snow plow truck struck a pole and the pole fell on the truck and entrapped the operator. The circuit breaker was intentionally de-energized to remove the entrapped operator of the truck and to replace the pole. The outage affected approximately 1,820 customers for up to 688 minutes, resulting in 445,065 CMI.

In total, the Limestone 50-01 circuit had 47 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (20); tree related (11); animal contact (6); vehicle (5); other (4); and nothing found (1).

Remedial Actions

- Hot spot trimming was completed and hazard trees were removed downstream of the Wildwood tap fuse in July 2013. The entire Limestone 50-01 circuit was trimmed in the first quarter of 2014.
- The normally open switch that ties the Limestone 50-01 to the Laurelton 10-01 was upgraded to a remotely operable switch. This work was completed in March, 2014.
- A project is underway to rebuild 0.5 miles of single phase downstream of the Graybill tap recloser to two phase. The project will relocate a several spans of conductor to along the road, replace several spans of copper conductor, and install two single phase reclosers to protect the tap that serves 284 customers. The new line will be constructed with 1/0 ACSR. In areas with trees and limited right of way, 1/0 ACSR XLP (tree wire) will be used. This work is scheduled to be completed by December, 2014.
- In 2015, two existing sectionalizing switches will be upgraded to remotely operable sectionalizing switches. A new remotely operable recloser will also be installed.
- In 2015, a new remotely operable switch will be added and an existing recloser will be upgraded to a remotely operable recloser in 2015.
- Plans have been developed to relocate inaccessible line along Walnut Acres Road and Wildwood Road. This work is scheduled for to be completed by December, 2015.

52 Circuit 67503 WEST WILLOW 75-03

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 50 customers for up to 3,916 minutes, resulting in 191,842 CMI.

On February 05, 2014, a tree made contact with a tap fuse and caused a tap fuse to operate. The outage affected approximately 110 customers for up to 1,443 minutes, resulting in 154,379 CMI.

In total, the West Willow 75-03 circuit had 42 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (17); tree related (16); vehicles (4); nothing found (2); animal contacts (2); and other (1).

Remedial Actions

- The circuit was trimmed in 2013.
- Engineers are currently investigating additional fusing downstream of the single phase recloser that operated during the ice storm.
- The opportunity to reconfigure the inaccessible single phase section of line downstream from the recloser that operated during the ice storm is being evaluated.

- In 2015, a new remotely operable will be installed. The new device will provide additional switching capability and help to reduce future outage durations.
- In 2017, the entire circuit will be trimmed in order to reduce tree related outages.

53 Circuit 67804 WEST LANCASTER 78-04

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,960 customers for up to 147 minutes, resulting in 287,072 CMI.

In total, the West Lancaster 78-04 circuit had 14 outages between July 2013 and June 2014. The causes of these outages include: tree related (8); equipment failures (3); other (1); nothing found (1); and animal contact (1).

Remedial Actions

- The circuit was trimmed in 2013.
- In 2015, a new remotely operable will be installed. The new device will provide additional switching capability and help to reduce future outage durations.
- In 2017, the entire circuit will be trimmed in order to reduce tree related outages.

54 Circuit 53602, DALMATIA 36-02

Performance Analysis

Three outages significantly affected this circuit's reliability in the past four quarters. Equipment failures were the most common outage cause.

On July 13, 2013, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 440 customers for up to 150 minutes, resulting in 66,381 CMI.

On April 04, 2014, an equipment failure occurred on an overhead pole arm attachment and caused a recloser to trip to lockout. The outage affected approximately 400 customers for up to 242 minutes, resulting in 94,192 CMI.

On April 30, 2014, an equipment failure occurred on a primary splices and connector and caused a recloser to trip to lockout. The outage affected approximately 840 customers for up to 148 minutes, resulting in 59,247 CMI.

In total, the Dalmatia 36-02 circuit had 64 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (28); tree related (25); vehicles (4); nothing found (3); animal contacts (3); and other (1).

Remedial Actions

- Three phase voltage regulators were installed on the adjacent PENS 74-01 circuit in 2013. The regulators allow for additional customers to be transferred in the event of an outage.
- Additional fusing was installed in two locations in September 2013 in order to reduce customer exposure.
- The Dalmatia to Dauphin section of the Sunbury-Dauphin 69 kV circuit was trimmed in early 2014.
- Additional radio communication is scheduled to be added to a recloser and normally open air break in 2014. This will allow remote operator controlled switching for approximately 200 customers.
- The Dalmatia 36-02 circuit is scheduled to be trimmed in the third quarter of 2014 as part of its vegetation management cycle.
- The Sunbury-Dauphin and Dauphin-Pine Grove 69 kV circuits are scheduled to have remote operator controlled switches installed in 2014. The switches will allow operators to quickly sectionalize and limit the impact of any outage.
- A new 69-12 kV 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. The substation was originally intended to go into service in November, 2012, but has been delayed by land acquisitions and condemnation proceedings. If a successful resolution can be reached, the new substation will be scheduled for completion in 2016.

55 Circuit 15406 WEST ALLENTOWN 54-06

Performance Analysis

In the past twelve months, there have been three circuit breaker lockouts on the West Allentown 54-06 that affected all 1,484 customers. Additionally, several smaller, more isolated outages have contributed to the circuit's poor CPI.

On July 30, 2013, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 540 customers for up to 157 minutes, resulting in 79,639 CMI.

On September 03, 2013, phase conductors contacted each other due to a loose slack span causing the circuit breaker to trip to lockout. The outage affected approximately 1,970 customers for up to 1,149 minutes, resulting in 418,231 CMI.

On December 06, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,520 customers for up to 41 minutes, resulting in 61,266 CMI.

In total, the West Allentown 54-06 circuit had 18 outages between July 2013 and June 2014. The causes of these outages include: vehicles (4); equipment failures (5); tree related (4); animal contacts (3); and other (2).

Remedial Actions

- Fault indicators were installed in 2014.
- A three phase tie to Crackersport 05-01 was completed in the second quarter of 2014 and successfully used to restore approximately 500 customers during an outage on July 3rd.
- Two new Smart Grid reclosers and one new Smart Grid normally open switch will be installed in August, 2014.
- A three phase tie to Trexlertown will be installed in 2015. This project will also balance load and eliminate a conductor loading issue.

56 Circuit 65401 MARIETTA 54-01

Performance Analysis

The Marietta 54-01 circuit experienced the following major outages which strongly influenced the current ranking of this circuit on the WPC list.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 211 customers for up to 1,978 minutes, resulting in 397,131 CMI.

On October 27, 2014, a vehicle contacted an overhead primary pole and caused the circuit breaker to trip to lockout. The outage affected approximately 1,859 customers for up to 26 minutes, resulting in 397,131 CMI.

In total, the Marietta 54-01 circuit had 12 outages between July 2013 and June 2014. The causes of these outages include: tree related (5); vehicles (3); equipment failures (2); nothing found (1); and animal contact (1).

Remedial Actions

- A project is being developed to install a tie between the Marietta 54-01 and the Donegal 9-02 in 2014, which will include new remotely operable sectionalizing devices.
- In 2015, a new remotely operable vacuum recloser will be installed. This device will help reduce customers' exposure to outages.
- In 2016, the entire circuit will be trimmed in order to reduce tree related outages.

57 Circuit 61304 EARL 13-04

Performance Analysis

The Earl 13-04 circuit experienced the following major outages which strongly influenced the current ranking of this circuit on the WPC list. All three outages were the result of the February 5, 2014 ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 220 customers for up to 965 minutes, resulting in 145,512 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 140 customers for up to 715 minutes, resulting in 90,723 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 40 customers for up to 2,054 minutes, resulting in 90,347 CMI.

In total, the Earl 13-04 circuit had 25 outages between July 2013 and June 2014. The causes of these outages include: tree related (11); equipment failures (9); vehicles (2); animal contacts (2); and nothing found (1).

Remedial Actions

- In the first quarter of 2014, an infrared inspection of the line was completed. Nothing was found as a result of the inspection.
- Full circuit tree trimming is scheduled for the second half of 2014.
- In 2014, a project to install a tie between the Earl 13-04 and the Earl 13-03 lines is being evaluated. The tie would help reduce future outage durations and improve reliability on both lines.
- In 2015, a new remotely operated midline and tie device will be installed. The new devices will provide additional switching capabilities and help to reduce future outage durations.

58 Circuit 18502 CANADENSIS 85-02

Performance Analysis

On January 05, 2014, an equipment failure occurred on an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,800 customers for up to 325 minutes, resulting in 363,575 CMI.

On May 17, 2014, a tree related contact of the 12 kV overhead primary conductor caused a recloser to trip to lockout. The outage affected approximately 293 customers for up to 192 minutes, resulting in 56,391 CMI.

In total, the Canadensis 85-02 circuit had 62 outages between July 2013 and June 2014. The causes of these outages include: tree related (26); equipment failures (21); animal contacts (8); nothing found (6); and vehicle (1).

Remedial Actions:

- In 2014, the construction of a new three-phase tie line between the North Stroudsburg 56-01, North Stroudsburg 56-04, and Canadensis 85-01 12 kV lines will be completed. The tie will provide greater sectionalizing capability and provide reduced outage durations for customers.
- In 2016, the entire Canadensis 85-02 circuit will be trimmed in order to reduce tree related outages.

59 Circuit 64401 LANDISVILLE 44-01

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, an equipment failure occurred on an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 910 customers for up to 3,477 minutes, resulting in 664,770 CMI.

In total, the Landisville 44-01 circuit had 13 outages between July 2013 and June 2014. The causes of these outages include: animal contacts (6); equipment failures (4); tree related (2); and nothing found (1).

Remedial Actions

- In the first quarter of 2014, an infrared inspection of the line was completed. Nothing was found as a result of the inspection.
- In 2015, a new remotely operable will be installed. The new device will provide additional switching capability and help to reduce future outage durations.
- In 2015, the entire circuit will be trimmed in order to reduce tree related outages.
- In 2016, additional remotely operated switches will be installed to further improve the circuits sectionalizing capabilities.

60 Circuit 63801 HEMPFIELD 38-01

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with the substation circuit breaker and caused the circuit breaker to trip to lockout. The outage affected approximately 1,450 customers for up to 433 minutes, resulting in 590,293 CMI.

In total, the Hempfield 38-01 circuit had 24 outages between July 2013 and June 2014. The causes of these outages include: tree related (10); equipment failures (10); vehicles (2); other (1); and animal contact (1).

Remedial Actions

- The circuit was trimmed in 2013.
- In the first quarter of 2014, an infrared inspection of the line was completed. Nothing was found as a result of the inspection.
- In 2014, a new remotely operable will be installed. The new device will provide *additional switching capability and help to reduce future outage durations.*
- In 2015, a section of copper wire along Manor Street will be reconducted.
- In 2017, the entire circuit will be trimmed in order to reduce tree related outages.

61 Circuit 61001 DONNERVILLE 10-01

Performance Analysis

This circuit experienced a major outage during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,873 customers for up to 213 minutes, resulting in 399,733 CMI.

In total, the Donnerville 10-01 circuit had nine outages between July 2013 and June 2014. The causes of these outages include: tree related (4); equipment failures (3); vehicle (1); and animal contact (1).

Remedial Actions

- Full circuit tree trimming is scheduled for 2014.
- In 2015, two additional remotely operated reclosers will be installed to help improve the sectionalizing capabilities of the line.

62 Circuit 45801 HEGINS 58-01

Performance Analysis

On March 30, 2014, an equipment failure occurred on the transmission and caused a recloser to trip to lockout. The outage affected approximately 2,600 customers for up to 1,365 minutes, resulting in 373,300 CMI.

On May 10, 2014, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 960 customers for up to 121 minutes, resulting in 115,548 CMI.

In total, the Hegin 58-01 circuit had 52 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (21); tree related (18); animal contacts (7); vehicles (2); other (2); and nothing found (2).

Remedial Actions

- Equipment on the transmission line feeding the Hegin substation was replaced after an equipment failure caused an outage at the Hegin substation.
- A hydraulic recloser on the Hegin 58-01 line has been upgraded to a remotely operable vacuum recloser.
- A project is in place to reconductor the tie between the Hegin 58-1 and the Hegin 58-2 in order to support the transfer of load between both circuits.
- A project is in place for 2015 to replace a section of small copper wire. All currently inaccessible sections of the line will be moved to the road as part of the project.
- Additional fuses were installed at seven locations in 2014 to better protect the line.
- Two fuses will be upgraded to reclosers in 2015.
- A new remotely operable vacuum recloser is planned to be installed on the Hegin 58-01 to further split the customer count and allow for better sectionalizing in the event of an outage.

63 Circuit 11203 ELLIOTT HEIGHTS 12-03

Performance Analysis

During the past twelve months the Elliott Heights 12-03 circuit breaker has tripped to lockout three times interrupting all 1,740 customers. The circuit has also experienced several small outages.

On July 20, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,740 customers for up to 171 minutes, resulting in 297,540 CMI.

On August 07, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,740 customers for up to 126 minutes, resulting in 57,367 CMI.

On November 05, 2013, Mylar balloons became entangled in the 12kV line causing the circuit breaker to trip to lockout. The outage affected approximately 1,750 customers for up to 148 minutes, resulting in 229,170 CMI.

In total, the Elliott Heights 12-03 circuit had 19 outages between July 2013 and June 2014. The causes of these outages include: tree related (7); equipment failures (3); animal contacts (4); vehicles (1); and other (4).

Remedial Actions

- Comprehensive tree trimming has been completed in January 2014.
- An additional Smart Grid reclosing device was installed to split the line into approximately 500 customer blocks in June of 2014.
- A midline Smart Grid switch was installed in 2014.
- The section of the Elliot Heights 12-04 will be transferred to the Fountain Hill substation after it is completed in mid-2014.
- A tie will be built between Elliott Height 12-03 and East Allentown 42-01 in 2015.
- The possibility of moving inaccessible portion of line to the road will be investigated.

64 Circuit 60605 NORTH COLUMBIA 06-05

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 210 customers for up to 4,930 minutes, resulting in 420,526 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and required a temporary sectionalizing open point to be opened for repairs. The outage affected approximately 40 customers for up to 3,669 minutes, resulting in 135,732 CMI.

In total, the North Columbia 6-05 circuit had 19 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (7); tree related (6); vehicles (2); nothing found (2); and animal contacts (2).

Remedial Actions

- The circuit was trimmed in 2013.
- In 2015, a new remotely operated midline and tie device will be installed. The new devices will provide additional switching capabilities and help to reduce future outage durations.
- In 2017, the entire circuit will be trimmed in order to reduce tree related outages.

65 Circuit 53501, Elizabethville 35-01

Performance Analysis

Three outages significantly affected this circuit's reliability in the past four quarters. Tree related interruptions were the most common outage cause.

On February 12, 2014, an equipment failure occurred on an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 2,130 customers for up to 266 minutes, resulting in 107,698 CMI.

On June 05, 2014, the Sunbury-Dauphin 69kV circuit tripped to lockout due to a broken transmission pole crossarm. This outage affected approximately 14,000 customers at Dalmatia, Elizabethville, Gratz, Lykens, and Williamstown substations. Approximately 1,950 customers were interrupted for up to 161 minutes, resulting in 313,102 CMI.

On June 05, 2014, an equipment failure occurred on an overhead switch and caused a recloser to trip to lockout. The outage affected approximately 1,750 customers for up to 49 minutes, resulting in 85,348 CMI.

In total, the Elizabethville 35-01 circuit had 56 outages between July 2013 and June 2014. The causes of these outages include: tree related (22); equipment failures (16); animal contacts (12); nothing found (4); and other (2).

Remedial Actions

- The Elizabethville 35-01 was trimmed in 2013 as part of the vegetation management cycle.
- Additional fusing was installed at five locations during the third quarter of 2013 in order to reduce customer exposure.
- Two existing sectionalizing and tie devices will be upgraded in 2015.
- Approximately 17 motor operated switches are scheduled to be installed on the Sunbury-Dauphin and Dauphin-Pine Grove 69 kV lines. The switches will allow operators to quickly sectionalize transmission outages to no more than a single distribution substation.
- Additional sectionalizing devices will be installed and/or upgraded in 2016. This will allow for the remote troubleshooting of trouble locations and faster restoration times.

66 Circuit 24206 PROVIDENCE 42-06

Performance Analysis

On September 11, 2013, an equipment failure occurred on an overhead switch and caused a recloser to trip to lockout. The outage affected approximately 740 customers for up to 173 minutes, resulting in 128,851 CMI.

In total, the Providence 42-06 circuit had 10 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (7); tree related (1); other (1); and animal contact (1).

Remedial Actions:

- In 2014, the entire Providence 42-06 circuit will be trimmed in order to reduce tree related outages.
- In 2015, an existing normal open manual switch with a new remotely operated VCR switch will be installed in order to significantly reduce future outage exposure and durations.

67 Circuit 17801 GILBERT 78-01

Performance Analysis

On July 09, 2013, an underground primary cable failure caused a single phase tap fuse to operate. The outage affected approximately 30 customers for up to 314 minutes, resulting in 274,101 CMI.

On December 24, 2013, a vehicle pole hit caused the circuit breaker to trip to lockout. The outage affected approximately 2,220 customers for up to 53 minutes, resulting in 117,816 CMI.

On March 15, 2014, Mylar balloons became entangled with the overhead primary conductor which required temporary sectionalizing to make repairs. The outage affected approximately 870 customers for up to 230 minutes, resulting in 71,764 CMI.

In total, the Gilbert 78-01 circuit had 45 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (14); tree related (12); animal contacts (9); vehicles (4); nothing found (4); and other (2).

Remedial Actions:

- In December, 2013, six new remotely operated devices were installed on the Gilbert 78-01 line as part of PPL's Smart Grid project plan. These devices will improve sectionalizing capability and reduce outage durations in the future.
- In 2016, the entire Gilbert 78-01 line will be trimmed in order to reduce future tree related outages.
- The company will review a project to add a new tie line between the Appenzell 92-02 line and the Gilbert 78-01 line. The project is expected to help reduce future outage durations by improving sectionalizing capability.
- In 2019, a project will relieve a portion of the Gilbert 78-01 line. This project will improve sectionalizing capability on the Gilbert 78-01 line in the future.

68 Circuit 61505 EAST PETERSBURG 15-05

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On August 31, 2013, an equipment failure occurred on a substation relay and caused the circuit breaker to trip to lockout. The outage affected approximately 1,640 customers for up to 67 minutes, resulting in 109,491 CMI.

On February 05, 2014, an equipment failure occurred on an overhead pole arm attachment and caused the circuit breaker to trip to lockout. The outage affected approximately 1,660 customers for up to 215 minutes, resulting in 320,554 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 40 customers for up to 2,506 minutes, resulting in 95,190 CMI.

In total, the East Petersburg 15-05 circuit had eight outages between July 2013 and June 2014. The causes of these outages include: equipment failures (4); tree related (2); nothing found (1); and contact/dig-in (1).

Remedial Actions

- In the first quarter of 2014, an infrared inspection of the line was completed. Nothing was found as a result of the inspection.
- In 2015, the entire circuit will be trimmed in order to reduce tree related outages.
- In 2015, a new remotely operated midline and tie device will be installed. The new devices will provide additional switching capabilities and help to reduce future outage durations.

69 Circuit 63803 HEMPFIELD 38-03

Performance Analysis

The Hempfield 38-03 circuit experienced the following major outage which strongly influenced the current ranking of this circuit on the WPC list. This one outage was the result of the February 5, 2014 ice storm.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 260 customers for up to 4,646 minutes, resulting in 466,766 CMI.

In total, the Hempfield 38-03 circuit had 17 outages between July 2013 and June 2014. The causes of these outages include: tree related (9); equipment failures (3); vehicles (2); nothing found (1); contact/dig-in (1); and animal contact (1).

Remedial Actions

- In the first quarter of 2014, an infrared inspection of the line was completed. Nothing was found as a result of the inspection.
- Full circuit tree trimming is scheduled for the third quarter of 2014.
- In 2015, a new remotely operated midline and tie device will be installed. The new devices will provide additional switching capabilities and help to reduce future outage durations.

70 Circuit 61504 EAST PETERSBURG 15-04

Performance Analysis

The East Petersburg 15-04 circuit experienced the following major outages which strongly influenced the current ranking of this circuit on the WPC list.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a single phase fuse to operate. The outage affected approximately 74 customers for up to 2,044 minutes, resulting in 151,203 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a single phase fuse to operate. The outage affected approximately 30 customers for up to 3,497 minutes, resulting in 104,907 CMI.

In total, the East Petersburg 15-04 circuit had 21 outages between July 2013 and June 2014. The causes of these outages include: tree related (9); equipment failures (8); nothing found (1); improper installation (1); and contact/dig-in (1).

Remedial Actions

- In 2015, the entire circuit will be trimmed in order to reduce tree related outages.
- In 2015, a new remotely operable device will be installed. The new device will provide additional switching capability and help to reduce future outage durations.

71 Circuit 57702, PAXTON 77-02

Performance Analysis

A circuit breaker outage significantly affected this circuit's reliability in the past four quarters. Animal contacts were the most common outage cause.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 950 customers for up to 2,312 minutes, resulting in 548,587 CMI. Restoration times were delayed due to a widespread ice storm that affected the area.

In total, the Paxton 77-02 circuit had 12 outages between July 2013 and June 2014. The causes of these outages include: animal contacts (6); equipment failures (3); tree related (2); and other (1).

Remedial Actions

- Two existing sectionalizing and tie devices will be upgraded with remote communication in 2015. This will allow for quicker sectionalizing and restoration in the event of an outage and would have reduced the impact of the February 5 outage.
- Additional sectionalizing devices will be installed and/or upgraded in 2016. This will allow for the remote troubleshooting of trouble locations and faster restoration times.

72 Circuit 11506 FREEMANSBURG 15-06

Performance Analysis

In the past twelve months, there have been several outages affecting a large number of customers on the Freemansburg 15-06.

On July 17, 2013, an equipment failure occurred on an overhead primary conductor requiring a temporary open point be made for repairs. The outage affected approximately 440 customers for up to 342 minutes, resulting in 62,159 CMI.

On July 20, 2013, an equipment failure occurred on an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 700 customers for up to 338 minutes, resulting in 52,366 CMI.

On September 01, 2013, a recloser tripped to lockout, upon investigation, crews found no cause for the interruption. The outage affected approximately 330 customers for up to 126 minutes, resulting in 41,007 CMI.

On September 08, 2013, an equipment failure occurred on an overhead switch and caused a recloser to trip to lockout. The outage affected approximately 330 customers for up to 68 minutes, resulting in 22,170 CMI.

On September 27, 2013, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 440 customers for up to 329 minutes, resulting in 30,224 CMI.

On January 6, 2014, trees fell from outside the right of way causing a recloser to trip to lockout, interrupting 558 customers for up to 273 minutes, resulting in 88,713 CMI.

In total, the Freemansburg 15-06 circuit had 63 outages between July 2013 and June 2014. The causes of these outages include: tree related (27); equipment failures (15); nothing found (7); animal contacts (9); vehicles (2); contact/dig-in (2); and other (1).

Remedial Actions

- Comprehensive tree trimming was completed in the second quarter of 2014.
- One new Smart Grid switch will be added in 2015.
- Distribution Planning is implementing a project to break up a long single phase tap to reduce customer count exposure.

73 Circuit 10101 ALLENTOWN 01-01

Performance Analysis

In the past twelve months, the Allentown 01-01 circuit breaker has tripped to lockout twice. In addition, there have been several small, isolated outages.

On September 25, 2013, an equipment failure occurred on the substation circuit breaker and caused the circuit breaker to trip to lockout. The outage affected approximately 2,950 customers for up to 66 minutes, resulting in 194,898 CMI.

On December 20, 2013, an equipment failure occurred causing the circuit breaker to trip to lockout. The outage affected 2,960 customers for up to 136 minutes, resulting in 273,085 CMI.

In total, the Allentown 01-01 circuit had 23 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (17); animal contacts (2); other (2); and nothing found (2).

Remedial Actions

- Four Smart Grid reclosers will be installed or upgraded in 2015.
- All single phase taps within the circuit breaker lockout zone will be fused.
- As a result of a new private development project, PPL Electric will install one new recloser and transfer approximately 1,200 customers to the Allentown 01-09 in 2015. Off-road sections of line will be relocated to underground as part of this project.
- The Allentown substation will be rebuilt in 2015 which will improve operation, eliminating effects from transmission outages.

74 Circuit 53801, MILLERSBURG 38-01

Performance Analysis

Four outages significantly affected this circuit's reliability in the past four quarters. Tree related interruptions were the most common outage cause.

On July 05, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,490 customers for up to 367 minutes, resulting in 125,248 CMI. Restoration was delayed due to multiple reports of trouble,

personnel availability, long driving distance for support crews, equipment limitations, a SCADA communication failure, and heavy loading.

On July 23, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,520 customers for up to 274 minutes, resulting in 104,033 CMI.

On September 29, 2013, an equipment failure occurred on the substation circuit breaker and caused the circuit breaker to trip to lockout. The circuit breaker failed to go through proper reclosing cycle and would not close via SCADA due to failed latching mechanism on charging spring. The outage affected approximately 1,510 customers for up to 122 minutes, resulting in 66,406 CMI.

On May 27, 2014, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,410 customers for up to 147 minutes, resulting in 203,754 CMI.

In total, the Millersburg 38-01 circuit had 11 outages between July 2013 and June 2014. The causes of these outages include: tree related (4); equipment failures (4); animal contacts (2); and other (1).

Remedial Actions

- Repairs were made to the Millersburg 38-1 circuit breaker in response to the failed latching mechanism on the charging spring.
- A weak tie line between the Millersburg 38-1 and Millersburg 38-2 was reconducted in spring 2014. This will offer the ability to transfer additional customers during outages and would have improved restoration times for at least one of the outages.
- An existing tie device will be upgraded with remote communication in 2015.
- Additional sectionalizing devices will be installed or upgraded in 2016 as part of the Smart Grid initiative. This will allow for the remote troubleshooting of trouble locations and faster restoration times.

75 Circuit 41503 FAIRVIEW 15-03

Performance Analysis

On September 21, 2013, a tree made contact with an overhead primary conductor and required a temporary sectionalizing open point to be opened for repairs. The outage affected approximately 1,390 customers for up to 332 minutes, resulting in 324,108 CMI.

In total, the Fairview 15-03 circuit had seven outages between July 2013 and June 2014. The causes of these outages include: tree related (3); equipment failures (3); and animal contact (1).

Remedial Actions

- Animal guarding was installed at ten locations on this circuit in the first quarter of 2014.
- One new remotely operable sectionalizing switch will be installed under the 2014 Smart Grid program.
- Three existing devices will be upgraded to normally open remotely operable switches under the Smart Grid program in 2014. This will improve sectionalizing and reduce the number of customers affected by future outages.
- A new remotely operable recloser will be installed in 2015.
- An additional remotely operable recloser will be installed in 2016.

76 Circuit 67301 WYOMISSING 73-01

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On October 11, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,550 customers for up to 77 minutes, resulting in 119,784 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,550 customers for up to 505 minutes, resulting in 402,727 CMI.

In total, the Wyomissing 73-01 circuit had 13 outages between July 2013 and June 2014. The causes of these outages include: tree related (6); equipment failures (4); animal contacts (2); and vehicle (1).

Remedial Actions

- Full circuit tree trimming was performed in the second quarter of 2014.
- In the first quarter of 2014, an infrared inspection of the line was completed. Nothing was found as a result of the inspection.
- In 2014, remote operation capabilities will be added to the sectionalizing air break in the middle of the line to improve restoration times as part of the Reliability Preservation program.
- In 2015, a new remotely operated midline and tie device will be installed. The new devices will provide additional switching capabilities and help to reduce future outage durations.

77 Circuit 63501 HEIDELBERG 35-01

Performance Analysis

This circuit experienced major outages during the February 5, 2014, ice storm.

On June 25, 2013, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 230 customers for up to 545 minutes, resulting in 101,851 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 50 customers for up to 1,759 minutes, resulting in 84,057 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused a tap fuse to operate. The outage affected approximately 30 customers for up to 1,996 minutes, resulting in 59,591 CMI.

In total, the Heidelberg 35-01 circuit had 61 outages between July 2013 and June 2014. The causes of these outages include: tree related (23); equipment failures (17); animal contacts (12); vehicles (4); nothing found (2); contact/dig-ins (2); and other (1).

Remedial Actions

- The circuit was trimmed in mid-2013. Fifty hazard trees were identified and removed during the tree trimming.
- In 2014, a new remotely operated midline and tie devices were installed as part of the Smart Grid program. The new devices will provide additional switching capabilities and help to reduce future outage durations
- In the second quarter 2014, an Expanded Operational Review was performed on the circuit.
- In 2014, line patrols were initiated after two momentary outages occurred on the line. Nothing was found as a result of the inspections.
- In late 2015, a long, single phase tap that has experienced multiple outages will be sectionalized. A second phase will be added along Springhaven Road that will be used to sectionalize the customers along the Netzley tap. This will greatly improve the reliability for the 230 customers on this section of line.
- In 2016, a new circuit will be built out of the Heidelberg Substation. This new circuit will split the existing 35-01 line in half. This will lower the customer count and circuit mileage of the line. This will help minimize the number of customers affected by an outage and improve the overall reliability of the circuit.
- In 2016, three substation transformers will be replaced.
- In 2017, the entire circuit will be trimmed in order to reduce tree related outages.

78 Circuit 52004, LINGLESTOWN 20-04

Performance Analysis

Two recloser outages significantly affected this circuit's reliability in the past four quarters. Tree related interruptions were the most common outage cause.

On September 19, 2013, an equipment failure occurred on an overhead switch and caused a recloser to trip to lockout. The outage affected approximately 840 customers for up to 373 minutes, resulting in 184,146 CMI.

On March 30, 2014, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 660 customers for up to 780 minutes, resulting in 252,751 CMI. A downstream protective device which would have limited the impact of the outage was out of service at the time.

In total, the Linglestown 20-04 circuit had 36 outages between July 2013 and June 2014. The causes of these outages include: tree related (14); equipment failures (9); animal contacts (5); vehicles (4); nothing found (3); and contact/dig-in (1).

Remedial Actions

- The Linglestown 20-04 was trimmed in the second quarter of 2014 as part of the Vegetation Management cycle.
- Approximately two miles of weaker conductor was reconducted in the second quarter of 2014. This will offer the ability to transfer additional customers and would have helped for both major outages in the last four quarters.
- A failed recloser was replaced after the March 30, 2014 outage.

79 Circuit 12402 MILFORD 24-02

Performance Analysis

During the past twelve months, there has been one circuit breaker lockout that interrupted all 1,490 customers on this line. There have also been several small isolated outages that contributed to the circuit's high CMI.

On August 22, 2013, an equipment failure occurred on an overhead pole arm attachment and caused the circuit breaker to trip to lockout. The outage affected approximately 1,490 customers for up to 151 minutes, resulting in 177,763 CMI.

In total, the Milford 24-02 circuit had 38 outages between July 2013 and June 2014. The causes of these outages include: tree related (19); equipment failures (9); vehicles (3); animal contacts (3); other (1); and nothing found (3).

Remedial Actions

- The Trumbaursville substation went into service in October 2013, reducing the customer count and length of the Milford 24-02 line.
- Comprehensive tree trimming was completed in April 2014.
- Three new Smart Grid VCR's will be installed in 2014.
- Fault indicators will be installed in two locations in 2014.

80 Circuit 42903, MIDDLEBURG 29-03

Performance Analysis

On July 7, 2013, a tree contacted the Sunbury – Middleburg 69kV transmission line and caused the 69kV circuit breaker at Sunbury to trip to lockout. This transmission outage caused all 1,030 customers on this circuit to experience an outage. Approximately 110 customers experienced a longer outage due to an additional outage downstream of a recloser. These two faults affected approximately 1,030 customers for up to 1,197 minutes, resulting in 356,124 CMI.

On October 14, 2013, a vehicle pole hit caused the circuit breaker to trip to lockout. The outage affected approximately 1,030 customers for up to 211 minutes, resulting in 119,406 CMI.

These two outages accounted for more than 90% of the total CMI over the past 12 months.

In total, the Middleburg 29-03 circuit had 18 outages between July 2013 and June 2014. The causes of these outages include: tree related (8); equipment failures (5); nothing found (2); animal contact (1); contact/dig-In (1) and other (1).

Remedial Actions

- Hot spot trimming was completed on the Sunbury – Middleburg 69kV transmission line in July, 2013. The entire circuit is scheduled to be trimmed in 2014 as part of its normal maintenance.
- Load break disconnect switches and fault indicators were installed in October, 2013, to provide additional sectionalizing.
- A manually operable sectionalizing switch was upgraded to a remotely operable sectionalizing switch. This work was completed in February, 2014.
- This circuit is scheduled to be trimmed in 2015 as part of its Vegetation Management cycle.
- The normally open tie switch from the Middleburg 29-03 to the Penns 74-03 will be upgraded to a remotely operable tie switch. This work is scheduled for 2015.
- Plans have been developed to remove inaccessible line and to relocate along Dock Hill Road. This work is scheduled to be completed by December 2015.
- A new remotely operable sectionalizing switch will be installed on the Sunbury - Middleburg 69kV transmission line. This work is planned for 2016.

81 Circuit 26001 WEST DAMASCUS 60-01

Performance Analysis

On November 18, 2013, a tree made contact with an overhead primary conductor and required a temporary sectionalizing open point to be opened for repairs. The outage affected approximately 430 customers for up to 358 minutes, resulting in 155,385 CMI.

On February 06, 2014, an equipment failure occurred on the Blooming Grove-West Damascus 69kV line. The outage affected approximately 1,450 customers on the West Damascus 60-01 line for up to 106 minutes, resulting in 153,424 CMI.

In total, the West Damascus 60-01 circuit had 47 outages between July 2013 and June 2014. The causes of these outages include: tree related (26); equipment failures (13); animal contacts (6); other (1); and nothing found (1).

Remedial Actions:

- In 2015, the West Damascus 60-01 to Indian Orchard 64-01 manual tie switch will be replaced with a remotely operated switch as part of the Smart Grid project plan. This remotely operated device is anticipated to significantly reduce future outage durations and improve sectionalizing capabilities.
- In November 2016, a new tie line project will be implemented between the West Damascus 60-01 and West Damascus 60-02 circuits. This project will improve sectionalizing capability between the circuits, reducing outage durations in the future.
- In 2017, the entire West Damascus 60-01 line will be trimmed in order to reduce future tree related outages.

82 Circuit 47704, BLOOMSBURG 77-04

Performance Analysis

On July 04, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 770 customers for up to 92 minutes, resulting in 58,115 CMI.

On November 18, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 770 customers for up to 461 minutes, resulting in 249,685 CMI.

On March 30, 2014, an equipment failure occurred on an overhead pole arm attachment and caused a recloser to trip to lockout. The outage affected approximately 180 customers for up to 347 minutes, resulting in 61,345 CMI.

In total, the Bloomsburg 77-04 circuit had 28 outages between July 2013 and June 2014. The causes of these outages include: tree related (13); equipment failure (10); nothing found (3); animal contact (1); and other (1).

Remedial Actions

- Undergrowth along Millville Road was removed in March, 2014. A split cross arm and pin insulators will be replaced by August, 2014.
- A section of this circuit was approved for hot spot trimming and hazard tree removal. This work is scheduled to be completed by October, 2014. The entire circuit is scheduled to be trimmed in 2015 as part of the vegetation management cycle.
- A project was developed to improve the reliability for ten customers on the Davenport Tap. The Mellick Hollow Road project will relocate inaccessible line and replace copper conductor. The project is scheduled to be completed by December, 2014.
- A project was developed to improve the reliability for 133 customers on the Dutch Hill Tap. The Dutch Hill project will relocate 8,400 feet of inaccessible line to along the road. A new recloser and series fusing will be installed. The project is scheduled to be completed by December, 2015.
- A project will add a new remotely operated device that will allow system operators to remotely transfer customers from the 77-04 circuit to the 77-03 circuit. This project is scheduled to be completed by November, 2015.

83 Circuit 40602 PINE GROVE 06-02

Performance Analysis

On March 31, 2014, an equipment failure occurred on the transmission and caused the circuit breaker to trip to lockout. The outage affected approximately 2,310 customers for up to 81 minutes, resulting in 189,097 CMI.

On January 14, 2014, an equipment failure occurred on an overhead transformer and caused a recloser to trip to lockout. The outage affected approximately 260 customers for up to 1,060 minutes, resulting in 175,521 CMI.

In total, the Pine Grove 6-02 circuit had 33 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (11); animal contacts (9); tree related (6); vehicles (3); other (2); and nothing found (2).

Remedial Actions

- Two remotely operable vacuum reclosers will be installed in 2014 for improved sectionalizing capability.
- A project is planned to extend the three phase line on the Pine Grove 06-02 and build a tie between the Pine Grove 06-02 and the Pine Grove 06-03 to allow for load transfer between the lines.

- A project is being evaluated to extend two phases on a long single phase tap to create a three phase tie with the Pine Grove 06-01. This tie will provide transfer benefit for both circuits.

84 Circuit 67603 WARWICK 76-03

Performance Analysis

On August 12, 2013, a 69/12 kV transformer failure caused the entire substation including the 76-03 line to experience an outage. The outage affected approximately 1,520 customers for up to 185 minutes, resulting in 280,715 CMI.

On January 05, 2014, a vehicle contacted an overhead primary pole and caused the circuit breaker to trip to lockout. The outage affected approximately 1,517 customers for up to 399 minutes, resulting in 118,048 CMI.

In total, the Warwick 76-03 circuit had 14 outages between July 2013 and June 2014. The causes of these outages include: nothing found (5); vehicles (3); equipment failures (3); tree related (2); and animal contact (1).

Remedial Actions

- In 2014, two substation transformers that were damaged due to fire will be replaced. In addition, the substation will be reconfigured to improve substation reliability.
- In 2015, the entire circuit will be trimmed in order to reduce tree related outages.
- In 2015, a new remotely operated midline and tie device will be installed. The new devices will provide additional switching capabilities and help to reduce future outage durations.

85 Circuit 28301 NEWFOUNDLAND 83-01

Performance Analysis

On November 18, 2013, two trees came in contact with the overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 2,390 customers for up to 627 minutes, resulting in 196,245 CMI.

In total, the Newfoundland 83-01 circuit had 55 outages between July 2013 and June 2014. The causes of these outages include: tree related (24); equipment failures (14); animal contacts (11); nothing found (5); and other (1).

Remedial Actions:

- In 2013, spot trimmed was performed on two miles of single phase conductor to reduce tree related outages in line sections that historically had numerous contacts.

- In 2014, the Hamlin 87-01 to Newfoundland 83-01 manual tie switch will be replaced with a remotely operated switch as part of the Smart Grid project. This remotely operated device is anticipated to significantly reduce future outage durations and improve sectionalizing capabilities.
- In 2014, a single phase line relocation will be completed to improve reliability for approximately sixty CEMI 6 customers on the circuit.
- In 2015, an existing midline sectionalizer will be replaced with a new remotely operated recloser in order to significantly reduce future outage exposure and durations.
- In 2015, a new remotely operated sectionalizing will be installed in order to reduce outage exposure for approximately 900 customers on the Newfoundland 83-01 line.
- In 2017, Vegetation Management plans to trim the entire Newfoundland 83-01 circuit in order to reduce tree related outages.

86 Circuit 63602 LETORT 36-02

Performance Analysis

On February 05, 2014, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 48 customers for up to 5,271 minutes, resulting in 157,962 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 41 customers for up to 3,811 minutes, resulting in 94,629 CMI.

On February 05, 2014, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 47 customers for up to 1,904 minutes, resulting in 89,485 CMI.

In total, the Letort 36-02 circuit had 41 outages between July 2013 and June 2014. The causes of these outages include: tree related (20); equipment failures (13); contact/dig-ins (3); animal contacts (3); other (1); and nothing found (1).

Remedial Actions

- In 2015, the entire circuit will be trimmed in order to reduce tree related outages.
- In 2015, a new remotely operated midline and tie device will be installed. The new devices will provide additional switching capabilities and help to reduce future outage durations.

87 Circuit 55001, NEWPORT 50-01

Performance Analysis

Two outages significantly affected this circuit's reliability in the past four quarters. Tree related interruptions were the most common outage cause.

On July 27, 2013, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 230 customers for up to 642 minutes, resulting in 61,118 CMI.

On May 27, 2014, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 1,040 customers for up to 1,392 minutes, resulting in 275,000 CMI.

In total, the Newport 50-01 circuit had 53 outages between July 2013 and June 2014. The causes of these outages include: tree related (30); equipment failures (10); animal contacts (7); vehicles (3); nothing found (2); and other (1).

Remedial Actions

- Three existing sectionalizing and tie devices will be upgraded to include remote operation capability in 2015.
- The Newport 50-01 is scheduled to be trimmed in 2015.

88 Circuit 59202, THOMPSONTOWN 92-02

Performance Analysis

On April 13, 2014, an equipment failure occurred on an underground riser pole and caused a recloser to trip to lockout. The outage affected approximately 2,270 customers for up to 326 minutes, resulting in 230,938 CMI.

In total, the Thompsontown 92-02 circuit had 63 outages between July 2013 and June 2014. The causes of these outages include: tree related (28); equipment failures (20); nothing found (8); animal contacts (4); other (2); and vehicle (1).

Remedial Actions

- Additional fusing was installed at four locations during the third quarter of 2013 in order to reduce customer exposure.
- Several recloser settings were optimized in the second quarter of 2014 for better protective device coordination.
- A new circuit at McAlisterville substation is planned for construction in spring 2015. The new circuit will reduce customer exposure on the Thompsontown 92-02 and provide increased transfer capability during outages. Had the new circuit been in service, the

customers affected by the April 13, 2014 outage would have been approximately 600 fewer.

89 Circuit 51402, LYKENS 14-02

Performance Analysis

Two outages significantly affected this circuit's reliability in the past four quarters. Equipment failures were the most common outage cause.

On June 05, 2014, the Sunbury-Dauphin 69kV circuit tripped to lockout at the due to a broken transmission pole crossarm. This outage affected approximately 14,000 customers at Dalmatia, Elizabethville, Gratz, Lykens, and Williamstown substations. Approximately 1,500 customers on the Lykens 14-02 were interrupted for up to 155 minutes, resulting in 231,880 CMI.

On March 31, 2014, the Eldred-Pine Grove 69kV circuit tripped to lockout at the due to a broken transmission pole. This outage affected approximately 15,000 customers at Frailey, Gratz, Hegins, Lykens, Pine Grove, and Williamstown substations. Approximately 1,490 customers on the Lykens 14-02 were interrupted for up to 136 minutes, resulting in 202,351 CMI.

In total, the Lykens 14-02 circuit had 21 outages between July 2013 and June 2014. The causes of these outages include: equipment failures (17); and tree related (4).

Remedial Actions

- Approximately 15 vintage cutouts prone to failure were replaced in the second quarter of 2014.
- The Lykens 14-02 was trimmed in the second quarter of 2014 as part of the Vegetation Management cycle.
- SCADA is scheduled to be installed at Lykens substation in 2015.
- Approximately 17 motor operated switches are scheduled to be installed on the Sunbury-Dauphin and Dauphin-Pine Grove 69 kV lines. The switches will allow operators to quickly sectionalize transmission outages to no more than a single distribution substation.
- Additional sectionalizing devices will be installed or upgraded in 2016. This will allow for the remote troubleshooting of trouble locations and faster restoration times.
- In response to the March 31, 2014 outage of the Eldred-Pine Grove 69 kV line, a comprehensive study was completed. Approximately 33 Cellon poles have been identified in this section and are scheduled for replacement with steel structures in 2016.

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. The top three causes (Equipment Failures, Tree Related, and Animals), which are based on the percent of cases of trouble, are highlighted in the table. PPL Electric's maintenance programs focus on corrective actions to address controllable service interruptions (e.g., trees and equipment failure).

Cause Description	Trouble Cases ⁷	Percent of Trouble Cases	Customer Interruptions ⁸	Percent of Customer Interruptions	Customer Minutes	Percent of Customer Minutes
Animals	3,300	20.4%	55,188	4.4%	3,928,000	2.1%
Contact/Dig-In	146	0.9%	19,517	1.6%	1,440,329	0.8%
Directed by Non-PPL Authority	209	1.3%	12,574	1.0%	1,183,897	0.6%
Equipment Failures	5,589	34.5%	452,274	36.2%	46,861,343	24.9%
Improper Design	10	0.1%	12,832	1.0%	285,921	0.2%
Improper Installation	7	0.0%	8,084	0.6%	634,698	0.3%
Improper Operation	6	0.0%	7,838	0.6%	616,035	0.3%
Nothing Found	1,144	7.1%	94,088	7.5%	5,620,031	3.0%
Other-Controllable	117	0.7%	19,193	1.5%	1,095,782	0.6%
Other-Non Control	279	1.7%	43,236	3.5%	2,606,389	1.4%
Other-Public	50	0.3%	8,327	0.7%	1,113,039	0.6%
Tree Related	4,638	28.6%	367,158	29.4%	107,756,488	57.3%
Vehicles	711	4.4%	147,417	11.8%	14,922,331	7.9%
Total	16,206	100.0%	1,247,726	100.0%	188,064,283	100.0%

⁷ Cases of trouble are the number of sustained customer service interruptions (i.e., service outages).

⁸ 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.

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.

Tree Related: Although their effect on reliability is significant, tree outages not related to trimming generally are caused by trees falling from outside of PPL Electric's rights-of-way. PPL Electric has recently increased funding to more aggressively address out of right-of-way danger trees. For trees within the right-of-way, PPL Electric has implemented a more aggressive trimming strategy.

Animals: Animals accounted for about 20% 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 78% 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 39% of the cases of trouble, 40% of the customer interruptions and 46% of the customer minutes attributed to equipment failure were weather-related and, as such, are not considered to be 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	2nd Quarter		Year-to-date	
		Budget	Actual	Budget	Actual
Transmission					
Transmission C-tag poles (# of poles)	455	100	66	132	110
Transmission arm replacements (# of sets)	0	0	0	0	0
Transmission air break switch inspections (# of switches)	29	6	9	15	9
Transmission lightning arrester installations (# of sets)	497	497	293	497	293
Transmission structure inspections (# of structures)	1,270	876	614	876	614
Transmission tree side trim-Bulk Power (linear feet)	N/A				
Transmission herbicide-Bulk Power (# of acres)	N/A				
Transmission reclearing (# of miles) BES Only	416.24	175.69	184.23	331.29	334.72
Transmission reclearing (# of miles) 69 kV	1070.34	255.91	293.45	424.39	535.70
Transmission reclearing (# of miles) 138 kV	12.16	12.16	11.91	12.16	11.91
Transmission danger tree removals-Bulk Power (# of trees)	N/A	N/A	10,174	N/A	19,345
Substation					
Substation batteries (# of activities)	652	62	114	483	533
Circuit breakers (# of activities)	675	247	137	516	369
Substation inspections #(of activities)	4,539	1,059	1,067	2,390	2,403
Transformer maintenance #(of activities)	1,430	383	294	753	675
Distribution					
Distribution C-tag poles replaced (# of poles)	1,416	302	405	776	924
C-truss distribution poles (# of poles)	5,367	1,400	1,435	2,835	2,538
Capacitor (MVAR added)	29	8	6	25	25
OCR replacements (# of) ⁹	157	42	42	123	111
Distribution pole inspections (# of poles)	90,000	21,809	20,724	34,514	33,525
Distribution line inspections (hours)	7,446	2,266	1,869	3,835	3,755
Group re-lamping (# of lamps)	21,000	6,500	4,279	10,000	9,337
Test sections of underground distribution cable	225	177	152	307	256
Distribution tree trimming (# of miles)	6052.77	1653.73	1690.08	3090.19	3171.29
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	6,049	N/A	10,456

⁹ On 12/3/2013 PPL EU notified the PUC of its plan to replace all 3 phase oil circuit reclosers with vacuum devices over a 10 year cycle.

Inspection & Maintenance Goals/Objectives	Annual Budget	2nd Quarter		Year-to-date	
		Budget	Actual	Budget	Actual
LTN manhole inspections (# of)	373	31	45	296	298
LTN vault inspections (# of)	724	159	149	382	394
LTN network protector overhauls (# of)	79	25	23	71	55
LTN reverse power trip testing (# of)	136	35	22	70	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 expenses for PPL Electric, as a whole, which includes the work identified in response to Item (6).

Activity	2nd Quarter		Year-to-date	
	Budget (\$1,000s)	Actual (\$1,000s)	Budget (\$1,000s)	Actual (\$1,000s)
Provide Electric Service	2,313	2,089	4,565	3,624
Vegetation Management	11,611	13,939	21,083	26,282
Customer Response	16,269	14,638	29,903	40,900
Reliability & Maintenance	14,312	14,874	28,491	29,281
System Upgrade	190	500	283	278
Customer Services/Accounts	28,403	28,823	56,691	55,107
Others	10,108	10,291	20,809	20,221
Total O&M Expenses	83,206	85,154	161,825	175,693

- 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.

	2nd Quarter		Year-to-date	
	Budget (\$1,000s)	Actual (\$1,000s)	Budget (\$1,000s)	Actual (\$1,000s)
New Service/Revenue	17,347	19,843	37,437	37,519
System Upgrade	142,944	160,520	286,159	296,235
Reliability & Maintenance	78,605	72,612	148,135	120,900
Customer Response	2,398	1,744	4,838	7,592
Other	5,814	5,351	12,858	10,965
Total	247,108	260,071	489,428	473,212

- 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)	
Lincman Leader	66
Journeyman Lineman	219
Journeyman Lineman-Trainee	62
Helper	0
Groundhand	4
Troubleman	47
T&D Total	398
Electrical	
Elect Leaders-UG	5
Elect Leaders-Net	9
Elect Leaders-Sub	23
Journeyman Elect-UG	24
Journeyman Elect-Net	18
Journeyman Elect-Sub	52
Journeyman Elect Trainee-UG	2
Journeyman Elect Trainee-Net	17
Journeyman Elect Trainee	24
Helper	0
Laborer-Network	0
Laborer-Substation	1
Electrical Total	175
Overall Total	573

***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 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.

***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 by himself 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 by himself 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.

Appendix B

Electrical

Electrician Leader - 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.
Helper - 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.
Laborer - Substation - Network - Underground	<ul style="list-style-type: none">• Performs manual labor and assists employees in higher job classifications.
Journeyman Electrician - 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.
Journeyman Electrician - Trainee - 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.

From: (610) 774-4254
Paul E Russell
PPL Corporation
2 N 9th Street

Origin ID: ABEA



Allentown, PA 18101

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JUL 31 2014

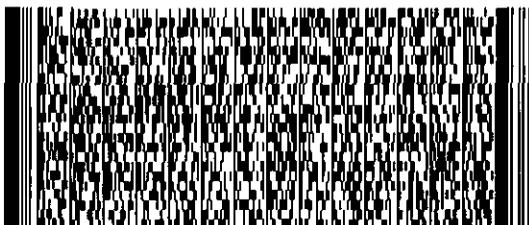
Ref # PER 205 734268-005
Invoice #
PO #
Dept #

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

SHIP TO: (717) 772-7777 BILL SENDER
ROSEMARY CHIAVETTA, SECRETARY
PA Public Utility Commission
400 NORTH ST
COMMONWEALTH KEYSTONE BUILDING
HARRISBURG, PA 17120

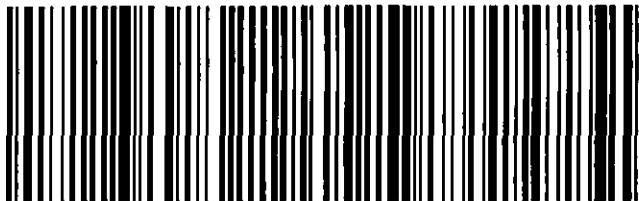
FRI - 01 AUG 10:30A
PRIORITY OVERNIGHT

TRK# 7707 3415 1305
0201



EN MDTA

17120
PA-US
MDT



522G2/ED4F8A00

After printing this label:

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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