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FEDERAL EXPRESS

January 31, 2014

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

Re: PPL Electric Utilities Corporation
Quarterly Reliability Report for the
Period Ended December 31, 2013
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 December 31, 2013. 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 January 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.

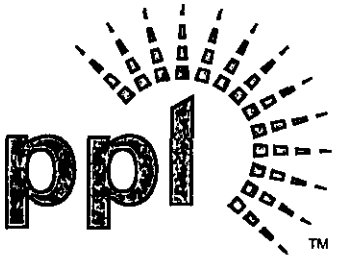
If you have any questions regarding this document, please call me or B. Kathryn Frazier, PPL Electric's Regulatory Affairs Manager at (610) 774-3372.

Very truly yours,

Paul E. Russell

Enclosures

cc: Mr. Paul Diskin
Mr. Daniel Searfoorce
Tanya J. McCloskey, Esquire
Mr. Darren Gill
Mr. John R. Evans



PPL Electric Utilities

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

January 2014

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 fourth quarter of 2013.

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 ended December 31, 2013[1].

SAIFI (Benchmark = 0.98; Rolling 12-month Std. = 1.18)	0.82
CAIDI (Benchmark = 145; Rolling 12-month Std. = 174)	108
SAIDI (Benchmark = 142; Rolling 12-month Std. = 205)	89
MAIFI[2]	3.54
Average Number of Customers Served[3]	1,395,325
Number of Sustained Customer Interruptions (Trouble Cases)	14,400
Number of Customers Affected[4]	1,140,583
Customer Minutes of Interruptions	123,601,330
Number of Customer Momentary Interruptions	4,936,544

During the 4th 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.

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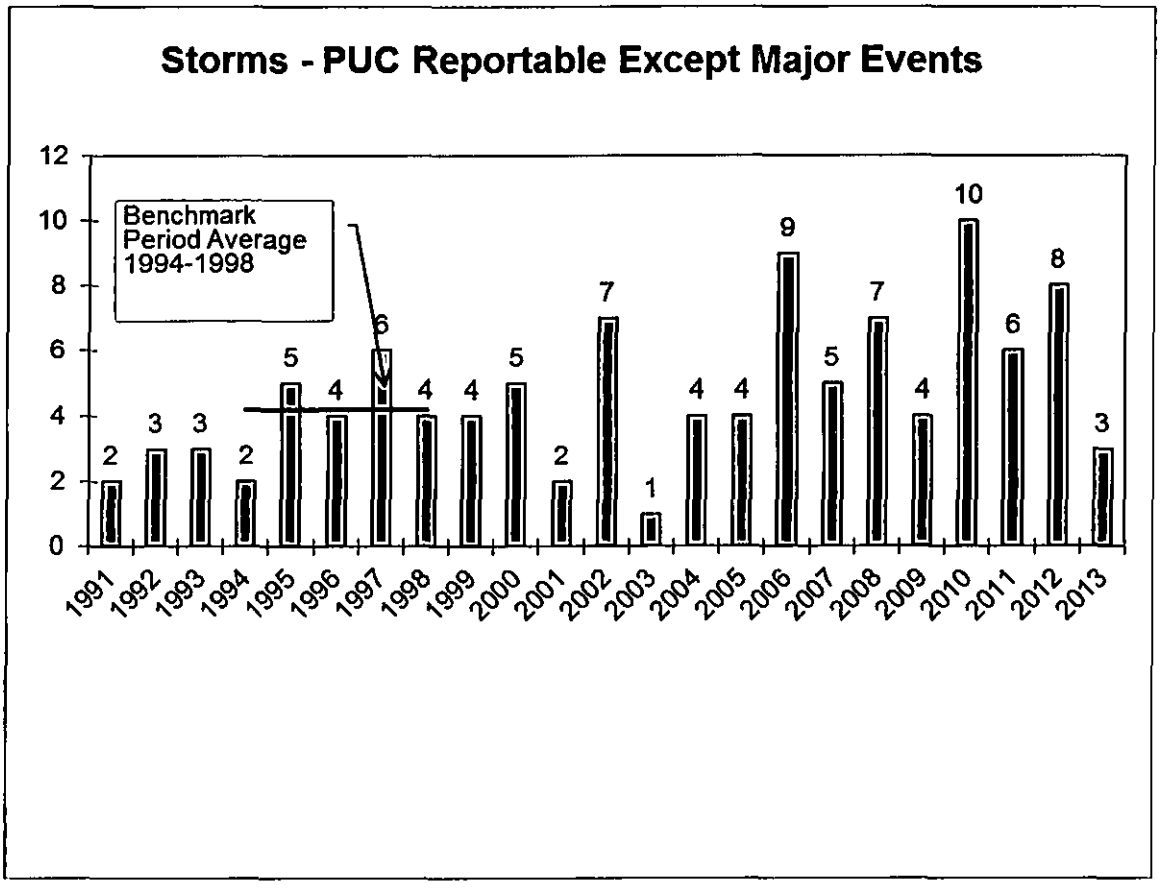
[1] Non-PPL Electric problems are excluded here, but may be found in Item 5.

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

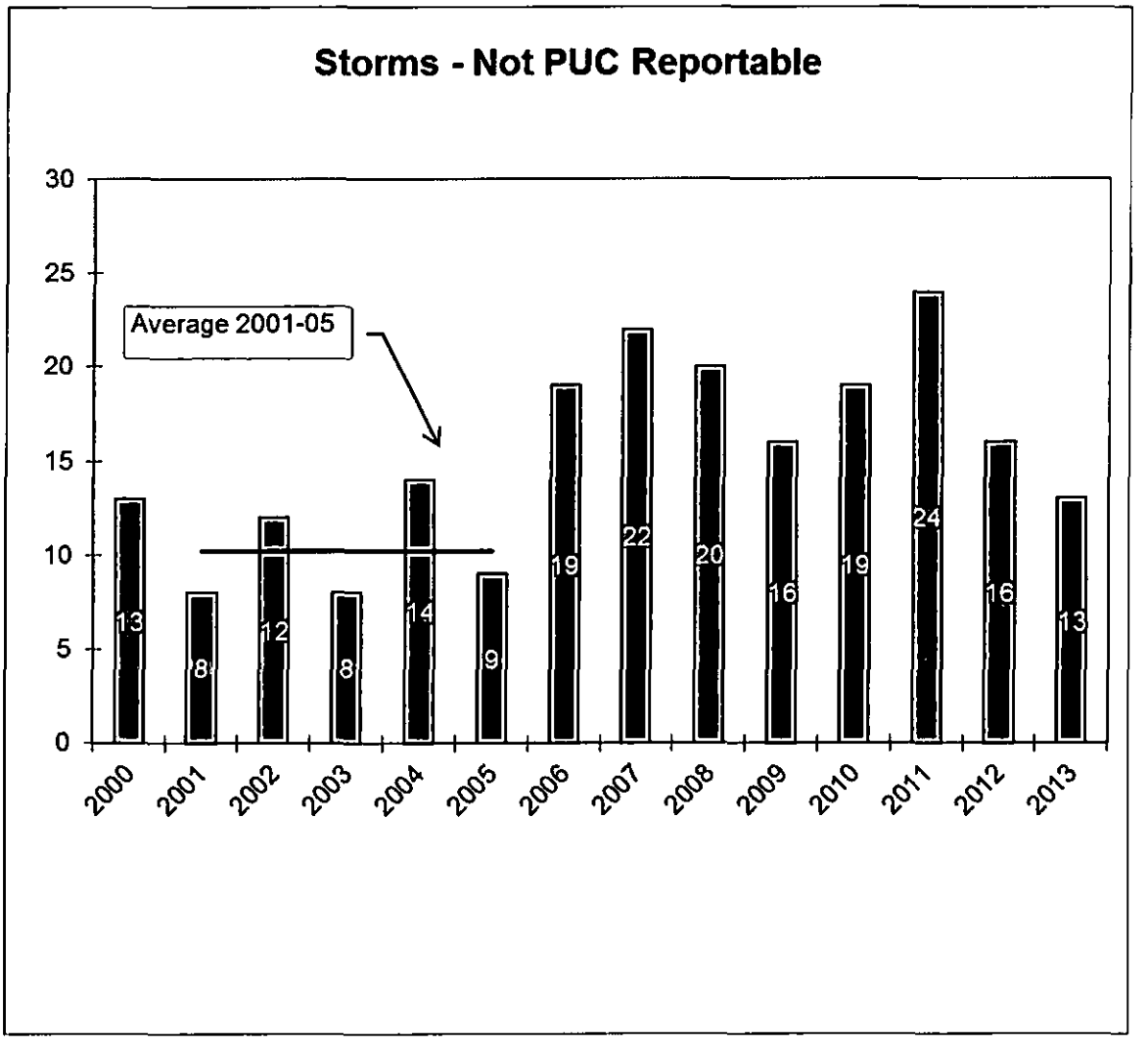
[3] PPL Electric calculates the annual indices using customers served at the end of the period. This is consistent with the method used to calculate PPL Electric's benchmarks.

[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 three (3) PUC-reportable storms (≥2,500 customers interrupted for ≥6 hours) other than major events.



In addition, there were thirteen (13) 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 5% of the circuits in the system for the 12 months ended at the current quarter. An explanation of how PPL Electric defines its worst performing circuits is included in Appendix A.

WPC Rank	Feeder ID	SAIFI	CAIDI	SAIDI	MAIFI[5]	Customers	Cases of Trouble[6]	Customer Minutes Interrupted
1	25601	5.44	348.6	1,896	3.13	1,116	13	2,115,580
2	45002	2.11	402.6	848	0.00	1,940	46	1,645,548
3	47001	3.81	149.1	568	7.28	2,445	47	1,388,597
4	59401	4.45	118.0	525	1.07	2,606	55	1,367,389
5	46802	1.79	346.1	619	0.00	1,944	43	1,203,248
6	22403	2.72	474.0	1,288	9.28	923	11	1,188,362
7	44301	2.05	279.4	574	3.17	2,046	42	1,173,999
8	52402	2.89	247.0	713	3.45	1,638	48	1,167,097
9	41902	2.09	385.1	806	8.48	1,309	39	1,055,274
10	53601	3.43	245.2	840	4.33	1,109	36	931,776
11	53602	2.85	145.8	415	11.22	2,185	60	907,084
12	14602	3.08	173.0	533	3.03	1,671	10	891,301
13	46702	1.70	408.5	694	1.12	1,283	34	890,476
14	21702	1.60	228.0	364	3.31	2,217	10	806,615
15	28302	1.71	285.1	488	5.04	1,640	51	800,926
16	40602	1.42	241.1	343	2.16	2,307	32	791,487
17	22905	1.28	156.7	200	2.18	3,787	27	756,780
18	24901	3.16	105.2	332	0.00	2,263	38	751,897
19	57505	1.55	168.1	260	10.20	2,820	25	733,287
20	21206	1.62	167.2	271	0.00	2,525	20	684,074
21	28301	2.75	105.5	290	4.82	2,256	59	653,389
22	12505	1.54	132.8	205	5.09	3,119	30	639,920
23	12402	9.26	122.1	1,131	15.95	560	43	633,332
24	11203	3.16	115.4	364	13.15	1,720	16	626,012
25	15406	2.94	136.0	400	0.73	1,486	18	593,831
26	20105	2.90	134.9	391	1.06	1,475	8	576,199
27	41801	1.36	504.2	683	3.14	830	25	567,229
28	22001	3.11	115.3	359	3.08	1,525	70	547,258

[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
29	17802	2.67	107.1	286	5.12	1,886	47	538,929
30	10101	2.37	84.7	201	1.11	2,658	21	534,618
31	10103	2.13	137.9	293	1.04	1,784	13	522,739
32	42903	2.26	230.1	521	6.19	1,000	17	520,959
33	46001	2.22	98.7	219	6.29	2,352	31	514,697
34	22901	1.13	205.6	232	2.18	2,201	8	509,724
35	15001	3.71	102.1	379	3.04	1,328	31	502,701
36	24603	2.07	155.1	321	1.05	1,549	39	496,490
37	45001	1.40	202.4	283	6.22	1,745	33	493,075
38	17801	1.35	167.5	225	9.46	2,090	36	470,746
39	21705	1.18	142.7	168	1.12	2,796	15	469,522
40	63501	2.28	108.0	246	14.94	1,893	46	466,409
41	41304	1.82	155.9	284	4.50	1,603	12	455,276
42	42901	2.25	168.2	378	6.34	1,199	24	453,020
43	21703	0.65	295.6	191	1.04	2,358	15	451,118
44	54203	2.07	150.4	311	8.06	1,443	13	448,397
45	58702	1.09	125.5	137	2.08	3,240	14	444,634
46	41503	1.90	185.7	354	2.24	1,232	5	435,760
47	47704	4.71	125.1	589	6.26	735	27	432,862
48	12202	1.41	259.7	365	2.09	1,182	20	431,415
49	50503	1.93	161.0	310	4.81	1,385	16	429,794
50	11504	1.55	106.4	165	4.19	2,583	15	426,168
51	55002	1.28	130.2	167	7.45	2,554	54	425,711
52	60803	1.83	121.1	222	7.52	1,916	17	425,182
53	11506	2.95	108.7	321	7.22	1,315	55	421,518
54	27101	2.00	112.16	224	2.10	1,878	37	421,194
55	54701	1.42	158.86	225	3.11	1,867	32	420,671
56	13202	1.28	154.25	197	0.00	2,006	15	395,517
57	14402	1.69	150.68	254	3.15	1,524	19	387,104
58	43202	1.41	236.28	334	2.09	1,152	24	384,428
59	25603	1.76	191.67	337	2.14	1,130	14	381,246

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

01 CIRCUIT 25601 ARROWHEAD 56-01

Performance Analysis

On June 03, 2013, an animal made contact with a substation transformer and caused the circuit breaker to trip to lockout. The outage affected approximately 6,020 customers for up to 695 minutes, resulting in 2,103,939 CMI.

In total, the Arrowhead 56-01 circuit had 13 outages between January, 2013 and December, 2013. The causes of these outages include: equipment failures (5), tree related (3), vehicles (2), animal contacts (2), and nothing found (1).

Remedial Actions

- Animal guarding was installed at the substation.
- Four devices were upgraded to remotely operable sectionalizing devices under the 2013 Smart Grid program.
- Hazard tree trimming was performed on this circuit in 2013.
- The substation will undergo maintenance in 2014.
- Herbicide work will be completed by the end of the third quarter in 2014.
- The circuit has been reviewed under an expanded operational review this quarter. As a result four jobs have been created. These jobs include one job to balance load, two jobs to install additional fusing, and one job to install fault indicators.
- A full circuit tree trim will be performed in the second quarter of 2014.
- A job was created to build a new tie line between the Arrowhead 56-01 and Arrowhead 56-02 lines. This will improve transfer capability of both circuits and help customer restoration during outages.

02 Circuit 45002 LIMESTONE 50-02

Performance Analysis

On July 07, 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 more than 90% of the total CMI over the past 12 months.

In total, the Limestone 50-02 circuit had 46 outages between January 2013 and December 2013. The causes of these outages include: tree related (18), equipment failures (15), animal contacts (8), nothing found (3), vehicle (1), and other (1).

Remedial Actions

- Tree crews began trimming this circuit in January 2014 as part of its vegetation management cycle and expect to complete trimming this circuit in February.
- In January 2014 select trouble areas on this circuit were trimmed and hazard trees were removed.
- The manually operated switch between the Limestone 50-02 and the Laurelton 10-01 was upgraded to a remotely operable switch in April, 2013.
- A work order has been initiated to upgrade a manual operated recloser to a remotely operable recloser. This work is scheduled for 2014.
- A new remotely operable recloser will be installed on this circuit in 2014.
- A portion of inaccessible line along Walbash road will be relocated in 2015.

03 Circuit 47001 HUGHESVILLE 70-01

Performance Analysis

On April 10, 2013, while 261 additional customers were transferred to this circuit, the Hughesville 70-01 circuit breaker operated to lock out during storm activity. The outage affected approximately 2,810 customers for up to 1,525 minutes, resulting in 461,347 CMI. 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 three outages account for more than 85% of the total CMI over the past 12 months.

In total, the Hughesville 70-01 circuit had 47 outages between January 2013 and December 2013. The causes of these outages include: tree related (23), equipment failures (12), animal contacts (11), and nothing found (1).

Remedial Actions

- This circuit is being evaluated for hot-spot trimming and hazard tree removal.
- Under the circuit SAIFI initiative, 10 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.
- A work order has been initiated to install a new manually operable switch along State Route 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.

- 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 8,500 feet 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 the fourth quarter of 2015.

04 Circuit 59401 RICHFIELD 94-01

Performance Analysis

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

On June 25, 2013, high winds blew a phase conductor tie loose and two conductors made contact, interrupting the circuit breaker. This outage affected approximately 2,710 customers for up to 315 minutes, resulting in 453,771 CMI.

On June 25, 2013, a tree contact interrupted the circuit breaker. The outage affected approximately 2,710 customers for up to 185 minutes, resulting in 201,512 CMI.

On June 25, 2013, a vehicle pole hit caused the circuit breaker to trip to lockout. The outage affected approximately 2,710 customers for up to 85 minutes, resulting in 180,999 CMI.

On June 28, 2013, a vehicle pole hit caused the circuit breaker to trip to lockout. The outage affected approximately 2,710 customers for up to 285 minutes, resulting in 295,701 CMI.

In total, the Richfield 94-01 circuit had 55 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (20), tree related (15), nothing found (6), other (5), animal contacts (5), and vehicles (4).

Remedial Actions

- The Richfield 94-01 circuit is scheduled to be trimmed in 2014 as part of its vegetation management cycle.
- Additional remote operator controlled devices are scheduled to be added to the circuit in 2014. The devices will allow for faster sectionalizing in the event of an outage.
- Several older reclosers on this circuit are scheduled for replacement in 2014.
- A new circuit is scheduled to be installed at Richfield substation in 2015. The new circuit will reduce the customers, circuit miles, and exposure on the Richfield 94-01.

- A second transformer is scheduled to be installed at Richfield substation in 2015. The new transformer will add redundancy and decrease the exposure for extended outages.
- SCADA is scheduled to be installed at Richfield substation in 2015.
- A thermography inspection was completed on the overhead two and three phase sections of the circuit in March 2013. Two minor crimp and regulator repairs were made.
- Two single phase reclosers were relocated in September 2013 in order to reduce customer exposure.
- Additional fusing was installed in five locations during September 2013 in order to reduce customer exposure.

05 Circuit 46802 HEPBURN 68-02

Performance Analysis

During a period of severe weather on April 10, 2013, approximately 2,080 customers on this circuit were out of service for up to 1,483 minutes due to multiple devices operating to lockout, resulting in 1,040,301 CMI. The outage on April 10, 2013 accounted for more than 85% of the total CMI over the last 12 months.

In total, the Hepburn 68-02 circuit had 43 outages between January 2013 and December 2013. The causes of these outages include: tree related (20), equipment failures (10), nothing found (6), animal contacts (6), and vehicle (1).

Remedial Actions

- Vegetation was sprayed with herbicide and the circuit was trimmed in 2013.
- SCADA was installed at the Hepburn substation in February 2013.
- A project was developed to improve the reliability for 121 customers on the radial Crescent Tap. The Crescent Tap project will relocate inaccessible line, replace #6 copper weld conductor, and install an additional recloser. This project is scheduled to be completed by December, 2014.
- Work orders have been created to install solid blade disconnects at four locations and to add additional slot fusing at two locations. This work is scheduled for 2014 and 2015.
- Work orders have been created to relocate inaccessible line at two locations and to split a large single phase tap into two separate taps. This work is scheduled for 2014 and 2015.
- As part of the Smart Grid Initiative two existing sectionalizing devices and a normally open tie device will be upgraded to remotely operable devices. This work is planned for 2015.
- A project has been developed that will increase the reliability for customers served by the Hepburn distribution substation. Remotely operable switches will be installed on both of the 69kV transmission sources, a second 69/12kV power transformer will be added at the substation, and a new 12kV bus tie breaker will be added that will transfer customers automatically in the event of a transmission outage. This project is scheduled to be completed by May, 2016.

06 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 11 outages between January 2013 and December 2013. The causes of these outages include: animal contacts (5), tree related (4), vehicle (1), and equipment failure (1).

Remedial Actions

- In 2013, a thermal scan on the Morgan 24-03 line identified equipment that had a high probability of failure. This equipment was replaced promptly after identification. The actions taken from this review will reduce future equipment failures, which will improve overall line reliability.
- In 2014, an expanded operational review (EOR) will be conducted on the entire Morgan 24-03 line in order to identify circuit improvements to reduce the potential for future outages.
- A midline switch will be replaced with an automated recloser in 2014 as part of the Smart Grid project plan. This automated device will help to reduce customer exposure to outages and reduce future outage durations.
- 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 automated devices will improve sectionalizing capabilities and reduce future outage durations.
- In 2016, Vegetation Management plans to trim the entire Morgan 24-03 circuit in order to reduce future tree related outages.
- 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 future reliability for all customers on the Morgan 24-03 line.

07 Circuit 44301 BEAVERTOWN 43-01

Performance Analysis

On February 2, 2013 a vehicle strike caused 1,200 customers downstream of the McClure Tap recloser to lose service for up to 254 minutes, resulting in 303,966 CMI. On July 07, 2013, a tree made contact with the Sunbury – Middleburg 69kV transmission line and caused the circuit breaker to trip to lockout. This outage affected approximately 2,140 customers for up to 307 minutes, resulting in 656,587 CMI. These two outages accounted for more than 80% of the total CMI over the past 12 months.

In total, the Beavertown 43-01 circuit had 42 outages between January 2013 and December 2013. The causes of these outages include: tree related (15), equipment failures (9), animal contacts (8), vehicles (3), nothing found (3), other (2), and contact/dig-in (2).

Remedial Actions

- SCADA was installed at the Beavertown substation in June, 2013.
- The Sunbury – Middleburg 69kV transmission line is scheduled to be trimmed in 2014.
- A work order was initiated to build 900 feet of new single phase along Ettinger Road so that inaccessible line can be removed. This work is scheduled for 2014.
- As part of the Circuit SAIDI initiative, a remotely operable sectionalizing device will be added. This work is scheduled for 2014.
- As part of the Smart Grid initiative, two reclosers will be upgraded to remotely operable devices. This work is planned for 2015. This will improve sectionalizing and reduce the number of customers affected by future outages.

08 Circuit 52402 GREEN PARK 24-02

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 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.

In total, the Green Park 24-02 circuit had 48 outages between January 2013 and December 2013. The causes of these outages include: tree related (19), equipment failures (14), animal contacts (8), other (4), and nothing found (3).

Remedial Actions

- The Green Park 24-02 getaway is scheduled to be reconductored in 2014 to alleviate cold load pick up concerns.
- Two vintage oil circuit reclosers are scheduled for replacement in 2014.
- Two failed reclosers were replaced in late 2013.
- The Green Park 24-02 was last trimmed in 2012 as part of its vegetation management cycle.

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 June 25, 2013, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 300 customers for up to 1,209 minutes, resulting in 301,218 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 39 outages between January 2013 and December 2013. The causes of these outages include: tree related (15), equipment failures (13), animal contacts (6), other (3), vehicle (1), and nothing found (1).

Remedial Actions

- The Reed 19-2 was reviewed under CEMI tree trimming to target any danger trees. This trimming is scheduled to be completed in 2014.
- Two remotely operable sectionalizing devices will be installed in the first quarter of 2014 under the Smart Grid program. This will improve sectionalizing and reduce the number of customers affected by future outages.
- Two jobs were completed to install solid blades and fault indicators at the end of 2013. This will allow for easier sectionalizing and quicker identification of fault locations.
- The circuit is scheduled to have all copperweld copper conductor replaced by 2014. Portions were replaced at the end of 2013 and the remaining spans will be replaced by the end of 2014. This will improve the load and transfer capability of the circuit.

10 Circuit 53601 DALMATIA 36-01

Performance Analysis

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

On June 27, 2013, the Sunbury-Dauphin 69kV circuit tripped to lockout at the due to a broken transmission pole caused by a tree falling on a guy wire. This outage affected approximately 13,100 customers at Dalmatia, Elizabethville, Lykens, Gratz, and Williamstown substations. Approximately 1,200 customers on the Dalmatia 36-01 were interrupted for up to 447 minutes, resulting in 444,278 CMI.

On January 16, 2013, a squirrel caused a pole top fire after making contact with a distribution transformer. The pole top fire caused the circuit breaker to trip and interrupted approximately 1,200 customers for up to 223 minutes, resulting in 155,894 CMI.

On November 02, 2013, 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 386 minutes, resulting in 137,921 CMI.

On July 12, 2013, 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 561 minutes, resulting in 105,344 CMI.

In total, the Dalmatia 36-01 circuit had 36 outages between January 2013 and December 2013. The causes of these outages include: tree related (14), equipment failures (11), animal contacts (5), nothing found (3), vehicles (2), and other (1).

Remedial Actions

- The Dalmatia to Dauphin section of the Sunbury-Dauphin 69 kV circuit is scheduled for trimming in 2014.
- 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.
- The Dalmatia 36-01 circuit is scheduled to be trimmed in 2015 as part of its vegetation management cycle.
- A new three phase tie with the Penns 74-01 circuit is planned for 2016. The tie will provide transfer capability to approximately 800 radial customers.
- A comprehensive helicopter patrol of the Sunbury-Dauphin 69 kV circuit was completed on June 21, 2012. Nineteen sets of critical pole arms were identified and replaced by July 25, 2012. An additional 68 sets of heavy rot arms were also identified and replaced by December 14, 2012.
- In October 2012, a patrol was completed on a 3 mile section of circuit along Route 147 near Herndon to identify possible locations for sectionalizing devices. No new sectionalizing locations were found. The customer count distribution and most common

trouble locations limit potential reliability savings. Three phase outages are limited to 350 customers on this particular three mile radial tap.

- Spot trimming along a high CEMI customer tap was completed in late September 2013.
- Additional single phase fusing was installed on a problematic tap in June 2013.
- A failed recloser was replaced in early 2013.

11 Circuit 53602 DALMATIA 36-02

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 June 27, 2013, the Sunbury-Dauphin 69kV circuit tripped to lockout due to a broken transmission pole caused by a tree falling on a guy wire. This outage affected approximately 13,100 customers at Dalmatia, Elizabethville, Lykens, Gratz, and Williamstown substations. Approximately 2,355 customers on the Dalmatia 36-02 were interrupted for up to 447 minutes, resulting in 380,496 CMI.

On April 10, 2013, an equipment failure occurred on an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 390 customers for up to 356 minutes, resulting in 82,576 CMI.

On March 22, 2013, a customer house fire required a switch to be opened for fire fighter safety. The outage affected approximately 360 customers for up to 493 minutes, resulting in 74,499 CMI.

In total, the Dalmatia 36-02 circuit had 60 outages between January 2013 and December 2013. The causes of these outages include: tree related (25), equipment failures (21), other (5), nothing found (5), animal contacts (3), and vehicle (1).

Remedial Actions

- 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 2014 as part of its vegetation management cycle.
- Four separate vintage oil circuit reclosers are scheduled for replacement in 2014.
- The Dalmatia to Dauphin section of the Sunbury-Dauphin 69 kV circuit is scheduled for trimming in 2014.
- 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.
- A comprehensive helicopter patrol of the Sunbury-Dauphin 69 kV circuit was completed on June 21, 2012. 19 sets of critical pole arms were identified and replaced by July 25, 2012. An additional 68 sets of heavy arms were also identified and replaced by December 14, 2012.
- About half a dozen various distribution equipment repairs were identified and completed after circuit patrols in late 2012. The work included replacing a cross arm, guy wire, bolts, and a strand of damaged primary.
- A thermography inspection was completed on the overhead two and three phase sections of the circuit in March 2013. A transformer stem connector repair was made.
- Additional fusing was installed in two locations during September 2013 in order to reduce customer exposure.

12 Circuit 14602 SOUTH WHITEHALL 46-02

Performance Analysis

In the past twelve months, the South Whitehall 46-02 has had three circuit breaker lockouts. In addition, there have been several small, isolated outages which have contributed to the circuit's performance.

On February 19, 2013, a vehicle pole hit caused the circuit breaker to trip to lockout. The outage affected approximately 1,670 customers for up to 638 minutes, resulting in 354,637 CMI.

On November 01, 2013, a report of a pole fire caused the system operator 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.

In total, the So Whitehall 46-02 circuit had 12 outages between January 2013 and December 2013. The causes of these outages include: vehicles (3), nothing found (3), equipment failures (2), animal contacts (2), and tree related (2).

Remedial Actions

- Four new sectionalizing devices, two Smart Grid enabled and two normally open ties are planned for this circuit.

- A new line and terminal out of Mickleys substation will go into service in 2016, and will pick up approximately 750 customers, allowing fewer customers to be affected by future outages.

13 Circuit 46702, RENOVO 67-02

Performance Analysis

On April 10, 2013, during heavy thunderstorm activity there were four separate cases of trouble on this circuit that affected approximately 200 customers for up to 1,729 minutes, resulting in 268,429 CMI. On May 22, 2013, the North Bend Tap recloser operated to lock out when trees fell on conductors during a period of thunder and lightning affecting 670 customers for up to 1,155 minutes, resulting in 306,052 CMI. On June 13, 2013, the North Bend Tap recloser operated to lock out when trees fell on conductors during a period of thunder and lightning affecting 670 customers for up to 236 minutes, resulting in 158,339 CMI. These three events accounted for approximately 70% of the total customer minutes interrupted over the past 12 months.

In total, the Renovo 67-02 circuit had 34 outages between January 2013 and December 2013. The causes of these outages include: tree related (21), equipment failures (6), animal contacts (4), nothing found (2), and other (1).

The Renovo 67-02 was last trimmed in 2013.

Remedial Actions

- An Expanded Operational Review of this circuit was completed in 2013.
- Under the circuit SAIFI initiative, 17 slot fuses were installed in 2013.
- Additional slot fusing was installed at six locations. This work was completed in 2013.
- As part of the Smart Grid Initiative two remotely operable sectionalizing devices will be installed and a normally open tie device will be upgraded to remotely operable device. This work is planned for 2014.
- Part 2 of the Young Womans Creek CEMI project to rebuild 2.3 miles of single-phase #2 ACSR conductor with #1/0 ACSR XLP protected by a static overhead wire. This CEMI project is scheduled for 2014.
- A work order has been initiated to rebuild a section of three phase along Renovo Road. This project will relocate a section of the line to reduce the exposure to trees and add sectionalizing devices. This work is scheduled for 2015.
- A work order has been initiated to rebuild 0.7 miles of two phase along Route 120. This work is scheduled for 2015.

14 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.

In total, the Suburban Yard 17-02 circuit had 10 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (4), tree related (3), animal contacts (2), and other (1).

Remedial Actions

- In November, 2013, a section of existing three-phase conductor was re-phased 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, the Suburban 17-02 to Providence 42-02 tie switch was automated. The automation will allow for improved sectionalizing capability and reduced outage durations in the future.
- In 2014, an expanded operational review (EOR) will be conducted on the entire Suburban 17-02 line in order to identify circuit improvements to reduce the potential for future outages.
- In 2014, a midline recloser will be replaced with an automated 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 automated 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 automated 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, Vegetation Management plans to trim the entire Suburban 17-02 circuit in order to reduce future tree related outages.

15 Circuit 28302 NEWFOUNDLAND 83-02

Performance Analysis

On December 9, 2012 a vehicle came in contact with an overhead primary conductor pole causing the upstream midline recloser to trip to lockout. The outage affected 1,724 customers for up to 680 minutes. The outage contributed 1,098,974 to the circuits total CMI.

On April 19, 2013 a tree came in contact with the overhead primary conductor causing the upstream midline recloser to trip to lockout. The outage affected a maximum of 254 customers for up to 759 minutes. The outage contributed 192,623 to the circuits total CMI.

On March 29, 2013, a vehicle came in contact with PPL's overhead primary conductor pole caused the upstream midline recloser to trip to lockout. The outage affected approximately 660 customers for up to 475 minutes, resulting in 107,411 CMI.

On July 23, 2013, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 170 customers for up to 511 minutes, resulting in 88,239 CMI.

In total, the Newfoundland 83-02 circuit had 51 outages between January 2013 and December 2013. The causes of these outages include: tree related (26), equipment failures (15), animal contacts (5), vehicles (4), and other (1).

Remedial Actions

- In June 2013, a the Newfoundland 83-02 to Tafton 80-01 tie line was built. This new tie will improve sectionalizing capability and reduce customer outage durations on both circuits.
- In June 2013, the new Ledgedale Substation was completed. This project transferred approximately 1,181 customers off of the Newfoundland 83-02 circuit. The new substation will provide new sectionalizing capabilities and reduce customer exposure to outages.
- In 2013, Vegetation Management trimmed a mile of single phase line that has had several tree related outages in the past year in order to prevent future tree related outages.
- In 2014, a project will relocate 79 customers that experienced eight outages in the past year. This project will move these customers to a more reliable source off of the North Coolbaugh 88-01 line.
- In 2014, a midline hydraulic recloser with be replaced by a new automated recloser as part of the Smart Grid project plan. This automated recloser will reduce future outage durations and improve sectionalizing capabilities.
- In May 2015, the new Angels Substation will be constructed. This substation will relieve approximately 662 customers off the Newfoundland 83-02 circuit. The new substation will provide new sectionalizing capabilities and reduce customer exposure to outages.
- In 2015, Vegetation Management plans to trim the entire Newfoundland 83-02 circuit in order to reduce tree related outages.

16 Circuit 40602 PINE GROVE 06-02

Performance Analysis

On March 08, 2013, a vehicle pole hit caused the circuit breaker to trip to lockout. The outage affected approximately 2,480 customers for up to 282 minutes, resulting in 608,384 CMI.

On March 24, 2013, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 460 customers for up to 608 minutes, resulting in 105,564 CMI.

In total, the Pine Grove 06-02 circuit had 32 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (13), vehicles (5), tree related (4), nothing found (4), animal contacts (4), and other (2).

Remedial Actions

- An expanded operational review and line maintenance inspection was completed on the Pine Grove 06-02 in 2013. As a result of this review the circuit will undergo further fusing beginning in the first quarter of 2014.
- Two jobs were completed at the end of 2013 to install fault indicators.
- Two new remotely operable sectionalizing devices will be installed under the 2014 Smart Grid program.
- One recloser will be upgraded to a remotely operable sectionalizing device under the 2014 Smart Grid program.
- A super project is scheduled to be completed by 2016. The project will tie the Pine Grove 06-02 to the Pine Grove 06-03. The new tie along with new remote devices will increase sectionalizing capability and reduce the number of radial customers on both circuits. This project is being reviewed for earlier construction.

17 Circuit 22905 HARWOOD 29-05

Performance Analysis

On June 09, 2013, an improper design caused the circuit breaker to trip to lockout. The outage affected approximately 4,160 customers for up to 170 minutes, resulting in 704,071 CMI.

In total, the Harwood 29-05 circuit had 27 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (18), other (5), nothing found (2), tree related (1), and improper design (1).

Remedial Actions

- Three remotely operable sectionalizing devices were installed in 2013 under the Circuit SAIDI program.

- Harwood 29-05 will receive four sectionalizing device upgrades under the 2014 Smart Grid program.
- A line maintenance inspection was completed in August of 2013. Two work orders were created for the findings, and these findings will be corrected in early 2014.
- A section of line was experiencing vandalism that was causing outages at the Harwood Substation. In response to this, a recloser was installed to prevent customers from experiencing the outages. A project was also completed in Q3 of 2013 to serve the customers directly upstream of this section from a more reliable source.
- Security measures are currently being taken to further address the vandalism issues in this area. This is currently being investigated by local law enforcement.

18 Circuit 24901 WHITE HAVEN 49-01

Performance Analysis

On September 12, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 2,400 customers for up to 112 minutes, resulting in 197,200 CMI.

On May 24, 2013, an equipment failure occurred on an overhead transformer and caused a recloser to trip to lockout. The outage affected approximately 380 customers for up to 405 minutes, resulting in 149,270 CMI.

On December 02, 2013, an unknown occurrence caused multiple devices to operate. The outage affected approximately 610 customers for up to 279 minutes, resulting in 124,546 CMI.

On July 05, 2013, an equipment failure occurred on an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 450 customers for up to 251 minutes, resulting in 111,011 CMI.

On June 09, 2013, an unknown occurrence caused a recloser to trip to lockout. The outage affected approximately 380 customers for up to 168 minutes, resulting in 62,342 CMI.

On June 18, 2013, an unknown occurrence caused the circuit breaker to trip to lockout. The outage affected approximately 2,390 customers for up to 25 minutes, resulting in 59,825 CMI.

In total, the White Haven 49-01 circuit had 38 outages between January 2013 and December 2013. The causes of these outages include: tree related (12), nothing found (9), equipment failures (8), animal contacts (6), and other (3).

Remedial Actions

- A line inspection was performed on the circuit in July 2013. As a result eight work orders were initiated and completed at the end of 2013. These work orders replaced equipment that was identified as potential problems.

- A new telemetric recloser will be installed in the first quarter of 2014. This will help to sectionalize and restore customers in the case of a breaker outage.
- A third line and terminal is being investigated to split the customer count on the White Haven 49-1. This will help reduce the customers affected by a circuit breaker outage.
- A fourth line and terminal is being investigated to further split the customer count on the White Haven 49-1 and reconfigure the existing circuits out of the White Haven substation.

19 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 25 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (10), tree related (8), vehicles (3), animal contacts (2), other (1), and nothing found (1).

Remedial Actions

- Three existing sectionalizing and tie devices will be automated in 2014 as part of the Smart Grid initiative.
- A thermography inspection was completed on the overhead two and three phase sections of the circuit in March 2013. A minor connector repair was made.
- Additional fusing was installed at one location during September 2013 in order to reduce customer exposure.
- The Lawnton 75-05 was last trimmed in 2012 as part of its vegetation management cycle.

20 Circuit 21206 EAST CARBONDALE 12-06

Performance Analysis

On January 28, 2013 a downstream equipment failure caused the upstream midline recloser to trip to lockout. The outage affected a maximum of 1,969 customers up to 646 minutes. The outage contributed 639,855 to the circuits total CMI.

On June 12, 2013, an equipment failure occurred on an overhead primary conductor insulator. Crew found conductor burning on pole and opened the upstream recloser to perform repairs. The outage affected approximately 1,970 customers for up to 17 minutes, resulting in 34,543 CMI.

In total, the East Carbondale 12-06 circuit had 20 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (11), vehicles (3), tree related (2), nothing found (2), and animal contacts (2).

Remedial Actions

- In 2013, System Reliability conducted a radio frequency pilot program for several circuits including the East Carbondale 12-06 line in order to identify potential equipment failures. Upon review of the data however, no equipment was identified for replacement.
- In 2014, a new midline automated recloser which will be installed to reduce outages and outage durations.
- In 2014, a new tie line is planned between the Greenfield 71-01 and East Carbondale 12-06 line under the Reliability Preservation program. The new tie will improve sectionalizing capability and reduce future outage durations.
- In 2014, a new project will be started to help reduce future outages for customers currently on the East Carbondale 12-06 line.
- In 2015, Vegetation Management plans to trim the entire East Carbondale 12-06 circuit in order to reduce future tree related outages.

21 Circuit 28301 NEWFOUNDLAND 83-01

Performance Analysis

On May 22, 2013, a tree came in contact with the overhead primary conductor causing the upstream midline recloser to trip to lockout. The outage affected a maximum of 2,635 customers up to 86 minutes. The outage contributed 177,872 to the circuits total CMI.

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 59 outages between January 2013 and December 2013. The causes of these outages include: tree related (40), equipment failures (7), animal contacts (7), nothing found (4), and other (1).

Remedial Actions

- In 2012, Vegetation Management trimmed the entire Newfoundland 83-01 circuit in order to reduce tree related outages.
- In June 2013, the new Ledgedale Substation was completed. This project transferred approximately 1,181 customers off of the Newfoundland 83-02 circuit. The new substation will provide new sectionalizing capabilities and reduce customer exposure to outages.
- In 2013, two miles of single phase conductor was spot trimmed in order to reduce tree related outages in line sections that historically had numerous tree contacts.
- In 2014, the Hamlin 87-01 to Newfoundland 83-01 manual tie switch will be replaced with an automated switch as part of its smart grid project plan. This automated device is anticipated to significantly reduce future outage durations and improve sectionalizing capabilities.
- In 2014, a single phase line relocation will improve reliability for approximately sixty CEMI 6 customers on the circuit.
- In 2015, an existing midline sectionalizer will be replaced with a new automated recloser in order to significantly reduce future outage exposure and durations.
- In 2015, a new automated sectionalizing device will be added 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 future tree related outages.

22 Circuit 12505 MINSI TRAIL 25-05

Performance Analysis

In the past twelve months, the Minsi Trail 25-02 has had one circuit breaker lockouts and one additional large outage. In addition, there have been several small, isolated outages which have contributed to the circuit's performance rating.

On April 05, 2013, an equipment failure occurred on an overhead switch and caused a recloser to trip to lockout. The outage affected approximately 1,270 customers for up to 212 minutes, resulting in 233,759 CMI.

On November 21, 2013, a vehicle pole hit caused the circuit breaker to trip to lockout. The outage affected approximately 3,170 customers for up to 579 minutes, resulting in 354,432 CMI.

In total, the Minsi Trail 25-05 circuit had 36 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (16), animal contacts (9), tree related (5), vehicles (3), other (2), and nothing found (1).

Remedial Actions

- In 2015 new reclosing devices will be installed to split the line into approximately 500 customer blocks to limit the effect and duration of outages.
- A midline Smart Grid device will be added in 2014.
- The ability to tie to the Minsi Trail 25-02 line is currently being analyzed.
- A new line and terminal to split customer count is being investigated.

23 Circuit 12402 MILFORD 24-02

Performance Analysis

During the past twelve months, there have been two circuit breaker lockouts that interrupted all 1,490 customers on this line. There have also been three lockouts of a recloser that feeds 410 customers.

On March 16, 2013, an unknown issue caused a recloser to trip to lockout. The outage affected approximately 410 customers for up to 20 minutes, resulting in 7,980 CMI.

On March 18, 2013, an equipment failure occurred on an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 410 customers for up to 221 minutes, resulting in 90,336 CMI.

On May 11, 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 180 customers for up to 351 minutes, resulting in 62,088 CMI.

On June 07, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,490 customers for up to 167 minutes, resulting in 85,413 CMI.

On June 11, 2013, an equipment failure occurred on an overhead switch and caused a recloser to trip to lockout. The outage affected approximately 560 customers for up to 34 minutes, resulting in 19,086 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 54 outages between January 2013 and December 2013. The causes of these outages include: tree related (21), equipment failures (18), vehicles (5), animal contacts (4), other (3), nothing found (2), and contact/dig-in (1).

Remedial Actions

- A new substation has been constructed nearby which significantly reduced the customer count and length of the feeder. This substation went into in-service in October 2013.

- Comprehensive tree trimming will be performed in January 2014
- Three new single phases tap fuses will be installed in 2014.
- Two new load break air switches will be installed in 2014.
- This circuit will receive Distribution Automation in the second half of 2014.

24 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 as well, which have contributed to the circuit's performance.

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 21 outages between January 2013 and December 2013. The causes of these outages include: tree related (7), equipment failures (5), animal contacts (3), vehicles (2), other (2), and nothing found (2).

Remedial Actions

- There are plans to transfer the section of the line south of the river to the Elliott Heights 12-04 after the completion of Fountain Hill substation in mid-2014.
- Two new reclosing devices will be added to split the line into approximately 500 customer blocks in mid-2014. This will limit the effect and duration of outages.
- A Smart Grid switch will be installed in 2014 (OCR / Midline)
- Hot spot tree trimming was performed in December 2013.
- There are plans to extend three phase service and build a tie between Elliott Height 12-03 and East Allentown 42-01 in 2015, and to add a normally open Smart Grid device.
- An inaccessible portion of line will be reconductored in 2016.

25 Circuit 15406 WEST ALLENTOWN 54-06

Performance Analysis

In the past twelve months, there have been two circuit breaker lockouts on the West Allentown 54-06 that affected all 1,970 customers. Additionally, several smaller, more isolated outages have contributed to the circuit's performance.

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 19 outages between January 2013 and December 2013. The causes of these outages include: vehicles (5), equipment failures (5), tree related (3), animal contacts (3), other (2), and nothing found (1).

Remedial Actions

- Comprehensive tree trimming was performed in 2013.
- There are plans to install two new Smart Grid reclosers and one new Smart Grid switch on this line in mid-2014.
- Fault indicators will be added on along the three phase tap in mid-2014.
- A three phase tie to Crackersport 05-01 will be constructed with a Smart Grid device in 2014.

26 Circuit 20105 AVOCA 01-05

Performance Analysis

On April 25, 2013, an equipment failure occurred on an overhead transformer and caused the circuit breaker to trip to lockout. The outage affected approximately 4,180 customers for up to 266 minutes, resulting in 568,778 CMI.

In total, the Avoca 01-05 circuit had eight outages between January 2013 and December 2013. The causes of these outages include: equipment failures (3), animal contacts (3), and nothing found (2).

Remedial Actions

- The Avoca 01-05 was reviewed under the Radio Frequency inspection pilot program in 2013. The pilot is to determine the capability of proactively identifying failing equipment. The equipment on the Avoca 01-05 will be tested for performance and replaced according to the findings of this program.
- Two remotely operable sectionalizing devices will be upgraded under the 2014 Smart Grid program.
- The circuit will have a remotely operable midline and normally open device installed under the 2015 Smart Grid program.

27 Circuit 41801 GOWEN CITY 18-01

Performance Analysis

On January 25, 2013, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 870 customers for up to 687 minutes, resulting in 507,017 CMI.

In total, the Gowen City 18-01 circuit had 25 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (7), tree related (6), vehicles (4), animal contacts (4), nothing found (3), and other (1).

Remedial Actions

- The entire Gowen City 18-01 was patrolled and studied under an expanded operational review in 2013.
- Seven work orders were created in response to reviews. Two work orders have been completed with the remaining scheduled to be completed in 2014. The remaining work orders will be installing eight new fuse locations, performing maintenance on six pole locations, and replacing failed sectionalizing at one location.
- 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.

28 Circuit 22001 BOHEMIA 20-01

Performance Analysis

On July 30, 2013, a predicted 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.

In total, the Bohemia 20-01 circuit had 70 outages between January 2013 and December 2013. The causes of these outages include: animal contacts (31), equipment failures (16), nothing found (10), tree related (7), and other (6).

Remedial Actions

- In 2013, Vegetation Management trimmed the entire Bohemia 20-01 line in order to reduce tree related outages.
- In February 2014, a new line out of the Bohemia substation will be constructed. This line will relieve approximately 779 customers off of the Bohemia 20-01 line and will help improve sectionalizing capability and significantly reduce customer outage durations.
- In 2018, Vegetation Management plans to trim the entire Bohemia 20-01 line in order to reduce future tree related outages.

29 Circuit 17802 GILBERT 78-02

Performance Analysis

On January 31, 2013, a tree came in contact with the overhead primary conductor causing the upstream midline recloser to trip to lockout. The outage affected a maximum of 1,440 customers for up to 386 minutes. The outage contributed 276,375 to the circuits total CMI.

On February 11, 2013, a ridge pin insulator broke and caused the primary conductor to come in contact with the cross arm and caused the upstream midline recloser to trip to lockout. The outage affected approximately 570 customers for up to 126 minutes, resulting in 71,517 CMI.

On December 21, 2013, construction equipment came in contact with a primary distribution pole and caused the circuit breaker to trip to lockout. The outage affected approximately 2,000 customers for up to 13 minutes, resulting in 26,074 CMI.

In total, the Gilbert 78-02 circuit had 47 outages between January 2013 and December 2013. The causes of these outages include: tree related (18), equipment failures (14), animal contacts (9), nothing found (3), vehicles (2), and other (1).

Remedial Actions

- In December 2013, a total of nine devices on the Gilbert 78-02 line were automated as part of PPL's smart grid project plan. These devices will improve sectionalizing capability and reduce customer outage durations in the future.
- In 2013, an expanded operational review (EOR) was conducted for the Gilbert 78-02 line. In the review a few operational improvements were identified and will be initiated by March 2013.

- By April 2013, Distribution Planning will review the reliability benefits of increasing the capacity of the existing Little Gap 04-01 to Gilbert 78-02 tie line.
- In 2014, automation will be placed on the Little Gap 04-01 to Gilbert 78-02 tie switch under the Reliability Preservation program. The new switch will help improve sectionalizing capabilities and reduce future outage durations on both the Gilbert 78-02 and Little Gap 04-01 line.
- In 2016, Vegetation Management plans to trim the entire Gilbert 78-02 line in order to reduce tree related outages.

30 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 which have contributed to the circuit's performance.

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 on an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 2,960 customers for up to 136 minutes, resulting in 273,085 CMI.

In total, the Allentown 01-01 circuit had 26 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (18), animal contacts (3), tree related (2), other (2), and nothing found (1).

Remedial Actions

- Two Smart Grid devices will be installed in 2015.
- With the planned Riverfront project, one new VCR will be installed, and approximately 1,200 customers will be transferred to the Allentown 01-09 in 2015.
- Following the Planned Riverfront Project, two additional Smart Grid VCRs will be installed and part of the line will be relocated.

31 Circuit 10103 ALLENTOWN 01-03

Performance Analysis

In the past twelve months, the Allentown 01-03 circuit breaker has tripped to lockout twice. In addition, there have been several small, isolated outages which have contributed to the circuit's performance.

On March 01, 2013, a contact was made with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,800 customers for up to 316 minutes, resulting in 490,914 CMI.

On May 13, 2013, a contact was made with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,810 customers for up to 8 minutes, resulting in 14,536 CMI.

In total, the Allentown 01-03 circuit had 15 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (7), tree related (2), other (2), contact/dig-ins (2), and animal contacts (2).

Remedial Actions

- There are plans to install three new Smart Grid VCRs, and one new Smart Grid switch, during 2014.
- A new tie to Mickleys 28-03 is being investigated for 2016.
- There are plans to extend the three phase service in 2016.

32 Circuit 42903 MIDDLEBURG 29-03

Performance Analysis

On July 07, 2013, a tree contacted the Sunbury-Middleburg 69kV and caused the 69kV circuit breaker at Sunbury to trip to lock out. 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 17 outages between January 2013 and December 2013. The causes of these outages include: tree related (7), equipment failures (7), vehicle (1), other (1), and animal contact (1).

Remedial Actions

- A work order was initiated to add automation to a manually operable sectionalizing device. This work is scheduled to be completed in January, 2014.
- A work order has been initiated to remove inaccessible line and to relocate along Dock Hill Road. This work is scheduled for to be completed by December, 2015.
- Load break disconnect switches and fault indicators were installed on October 15, 2013, to provide additional sectionalizing.

33 Circuit 46001 BERWICK 60-01

Performance Analysis

On February 09, 2013, the circuit breaker was intentionally opened by Distribution System Operators since the circuit breaker tripped and reclosed multiple times. A line patrol was conducted and nothing was found. The outage affected approximately 2,460 customers for up to 297 minutes, resulting in 441,271 CMI. On June 11, 2013, the circuit breaker was intentionally opened by Distribution System Operators under the direction of the Transmission Control Center due to low voltage on the Harwood – Berwick 69kV. The outage affected approximately 2,470 customers for up to eight minutes, resulting in 21,094 CMI.

In total, the Berwick 60-1 circuit had 31 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (10), animal contacts (7), tree related (5), vehicles (3), nothing found (3), other (2), and contact/dig-in (1).

Remedial Actions

- Following the February 9, 2013 outage, multiple line patrols were conducted. Damaged insulators and melted dead ends were found and were promptly replaced.
- Fault indicators were installed at the Susquehanna River crossing, aerial cable terminations, and other strategic locations. This work was completed in May, 2013.
- Load break disconnect switches were installed at aerial cable terminations. This work was completed in May, 2013.
- An Expanded Operational Review of this circuit was completed in 2013.
- A project has been planned to improve the reliability for customers on West Hollow Road that have experience multiple interruptions. This work is scheduled to be completed in December, 2014.
- As part of the Smart Grid initiative, a remotely operable sectionalizing device will be added and two existing devices will be upgraded to remotely operable devices. This work is planned for 2015.

34 Circuit 22901 HARWOOD 29-01

Performance Analysis

On June 09, 2013, an improper design caused the circuit breaker to trip to lockout. The outage affected approximately 2,390 customers for up to 206 minutes, resulting in 492,494 CMI.

In total, the Harwood 29-01 circuit had 8 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (4), tree related (1), other (1), improper design (1), and animal contact (1).

Remedial Actions

- A full circuit tree trim will be completed in 2014.
- An expanded operational review will be completed in 2014.
- A section of line was experiencing vandalism that was causing outages at the Harwood Substation. In response to this, a recloser was installed to prevent customers from experiencing the outages. A project was also completed in the third quarter of 2013 to serve the customers directly upstream of this section from a more reliable source.
- Security measures are currently being taken to further address the vandalism issues in this area. This is currently being investigated by local law enforcement.
- A CEMI project was completed in August of 2013 to transfer 12 CEMI customers to a more reliable section of the Harwood 29-01 circuit.
- A super project was evaluated to tie the Harwood 29-1 to the East Hazleton 41-1. This will increase the sectionalizing capability of the Harwood 29-1 and improve outage restoration. This project will be completed in 2015.
- The circuit will have a remotely operable midline and normally open point installed under the Smart Grid 2015 program.
- A project is being evaluated to tie the Harwood 29-01 to the Tamanend 3-01. This will decrease the number of radial customers and improve the sectionalizing capability and outage restoration of the Harwood 29-01.

35 Circuit 15001 BLUE MOUNTAIN 50-01

Performance Analysis

During the past twelve months, there have been three outages that affected all 1,340 customers on the Blue Mountain 50-01.

On February 19, 2013, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 280 customers for up to 615 minutes, resulting in 51,765 CMI.

On June 08, 2013, an equipment malfunction caused a recloser to trip to lockout. The outage affected approximately 1,340 customers for up to 70 minutes, resulting in 93,625 CMI.

On June 16, 2013, a tree made contact with an overhead switch and caused a recloser to trip to lockout. The outage affected approximately 1,340 customers for up to 72 minutes, resulting in 97,682 CMI.

On June 18, 2013, an equipment malfunction caused a recloser to trip to lockout. The outage affected approximately 1,340 customers for up to 85 minutes, resulting in 108,311 CMI.

In total, the Blue Mountain 50-01 circuit had 36 outages between January 2013 and December 2013. The causes of these outages include: tree related (9), animal contacts (9), equipment failures (8), nothing found (6), vehicles (3), and contact/dig-in (1).

Remedial Actions

- A protection issue on this line was corrected.
- There are plans to install multiple single phase fuses in mid-2014.
- Off-road single phase sections of line will be relocated to the road in 2016.
- A four mile tie to Treichlers 48-02 is being evaluated.

36 Circuit 24603 VARDEN 46-03

Performance Analysis

On April 10, 2013, a tree made contact with an overhead primary conductor and caused the upstream recloser to trip to lockout. The outage affected approximately 103 customers for up to 1196 minutes, resulting in 106,910 CMI.

On November 11, 2013, a predicted momentary contact of the overhead primary conductor caused an upstream recloser to trip to lockout. Crews investigated the line and could not find the cause of the outage. System operators closed the recloser and it did not trip back to lockout. The outage affected approximately 871 customers for up to 551 minutes, resulting in 203,734 CMI.

In total, the Varden 46-03 circuit had 31 outages between January 2013 and December 2013. The causes of these outages include: tree related (15), equipment failures (10), and animal contacts (6).

Remedial Actions

- In 2014, Vegetation Management plans to trim the entire Varden 46-03 line in order to reduce tree related outages.
- In 2014, a midline recloser will be replaced with an automated recloser. Additionally a new automated recloser will be installed in order to improve sectionalizing capabilities and reduce future outage durations on the Varden 46-03 line.
- In 2016, a new tie between the Honesdale 34-01, East Carbondale 12-03, and Varden 46-03 lines will be constructed in order to improve sectionalizing capability. The additional sectionalizing capability will help reduce outage durations for customers on the Varden 46-03 line.

37 Circuit 45001 LIMESTONE 50-01

Performance Analysis

On March 29, 2013, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 500 customers for up to 169 minutes, resulting in 81,113 CMI. On May 22, 2013, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 120 customers for up to 1,050 minutes, resulting in 95,193 CMI. 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.

In total, the Limestone 50-01 circuit had 33 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (15), tree related (12), vehicles (3), other (1), nothing found (1), and animal contact (1).

Remedial Actions

- Hot spot trimming was completed and hazard trees were removed downstream of the Wildwood Tap Fuse. This work was completed in July, 2013.
- As part of the Smart Grid Initiative an existing mid-line recloser and a normally open tie device will be upgraded to remotely operable devices. This work is planned for 2015.
- In April, 2013 an existing tie with the Laurelton 41001 was upgraded to a remotely operable device.
- Under the circuit SAIDI initiative an existing recloser will be upgraded to a remotely operable device and a new remotely operable sectionalizing device will be added. This work is scheduled for 2014.
- A project has been initiated to rebuild 0.5 miles of single phase downstream of the Graybill tap recloser to 2-phase. The project will relocate several spans of conductor to along the road, replace several spans of #6 copper weld 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.
- A work order has been initiated to install a new remotely operable recloser and to automate an existing tie. This work is scheduled to be completed by December, 2015.
- A work order has been initiated to remove inaccessible line and to relocate along Walnut Acres Rd and Wildwood Road. This work is scheduled for to be completed by December, 2015.

38 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 18, 2012, an equipment failure at a single-phase tap caused the upstream three-phase midline recloser to trip to lockout. The outage affected approximately 440 customers for up to 234 minutes, resulting in 71,285 CMI.

In total, the Gilbert 78-01 circuit had 36 outages between January 2013 and December 2013. The causes of these outages include: tree related (13), equipment failures (9), animal contacts (8), nothing found (4), and vehicles (2).

Remedial Actions

- In December 2013, six new automated devices were placed on the Gilbert 78-01 line as part of the Smart Grid project plan. These devices will improve sectionalizing capability and reduce outage durations in the future.
- In 2016, Vegetation Management plans to trim the entire Gilbert 78-01 line in order to reduce future tree related outages.
- By April 2013, Distribution Planning 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.

39 Circuit 21705 SUBURBAN 17-05

On September 11, 2013, an equipment failure occurred on an overhead primary conductor and caused the Suburban 17-05 circuit breaker to trip to lockout. The outage affected approximately 3,120 customers for up to 239 minutes, resulting in 441,845 CMI.

In total, the Suburban 17-05 circuit had 15 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (5), tree related (3), nothing found (3), animal contacts (2), vehicle (1), and contact/dig-in (1).

Remedial Actions

- On September 14, 2013, approximately 924 customers were transferred off of the Suburban 17-05 line in order to reduce the amount of customers exposed to outages on the Suburban 17-05 line.
- In 2014, Vegetation Management plans to trim the entire Suburban 17-05 line in order to reduce tree related outages.

- In 2014, an expanded operational review (EOR) will be conducted on the entire Suburban 17-05 line in order to identify circuit improvements to reduce the potential for future outages.
- In 2014, a manual switch will be automated as part of the Circuit SAIDI program. This device will help by reducing customer exposure to future outages and reduce future outage durations.
- In 2014, fault indicators will be installed in order to help crews assess future outages and reduce outage durations.
- In 2015, two midline reclosers and two tie switches will be automated as part of the Smart Grid project plan. The device automation is anticipated to significantly reduce future outage durations.
- A project is being evaluated to further reduce customer exposure to outages and help improve sectionalizing capabilities in the future.

40 Circuit 63501 HEIDELBERG 35-01

Performance Analysis

The circuit experienced the following two major outages which strongly influenced the current ranking of this circuit on the WPC list.

On February 19, 2013, the circuit breaker tripped to lockout. No cause for the interruption was found. The outage affected approximately 1,893 customers for up to 71 minutes, resulting in 114,742 CMI.

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.

In total, the Heidelberg 35-01 circuit had 61 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (23), tree related (16), animal contacts (10), contact/dig-ins (5), vehicles (3), nothing found (3), and other (1).

Remedial Actions

- The circuit was last trimmed in mid-2013. 50 hazard trees were identified and removed during the tree trimming.
- Full circuit tree trimming is scheduled for 2017.
- SCADA was installed on the Heidelberg Substation in 2013.
- A thermography inspection on the overhead two and three phase sections of the circuit was completed in February 2013. Several minor issues were found and these were all completed at the end of 2013.
- An Expanded Operational Review on the circuit will be completed in the early part of 2014.

- Line patrols were initiated after the last two momentary outages. Nothing was found as a result of the inspections.
- A new circuit will be extended out of the substation in 2016. This new circuit will split the existing 35-1 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.
- A project will be completed in late 2014 that will sectionalize a long, single phase tap that has experienced multiple outages. 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.
- Existing sectionalizing and tie devices will be automated in 2014 as part of PPL's Smart Grid program.
- All three substation transformers are scheduled to be replaced in 2016 as part of PPL EU's Asset Optimization Strategy.
- Due to the large number of equipment failures on the line, an investigation will be performed in order to determine the causes of equipment failures and remedial actions.
- A review of a project to strengthen the tie to Lavino will be performed.
- A review of a project to create a tie to the North Manheim 05-01 will be performed.

41 Circuit 41304 FISHBACH 13-04

Performance Analysis

On July 02, 2013, 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 816 minutes, resulting in 222,284 CMI.

On March 09, 2013, an equipment failure occurred on the substation circuit breaker and caused the circuit breaker to trip to lockout. The outage affected approximately 1,800 customers for up to 97 minutes, resulting in 174,697 CMI.

In total, the Fishbach 13-04 circuit had 12 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (6), vehicles (2), other (2), tree related (1), and animal contact (1).

Remedial Actions

- A job is scheduled for 2014 to install a new automated recloser to further sectionalize the Fishbach 13-4 circuit.
- A job has been started, and scheduled for completion this year, to relocate a section of inaccessible line between the Fishbach 13-04 and the Cressona 5-04 lines.
- The circuit will have a remotely operable midline and normally open point installed under the Smart Grid 2015 program.
- Further sectionalizing is currently being identified.

42 Circuit 42901 MIDDLEBURG 29-01

Performance Analysis

On July 07, 2013, a tree contacted the Sunbury-Middleburg 69kV and caused the 69kV circuit breaker at Sunbury to trip to lock out. This transmission outage affected approximately 1,260 customers for up to 80 minutes, resulting in 100,985 CMI. On July 12, 2013, an equipment failure occurred on an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,270 customers for up to 620 minutes, resulting in 300,757 CMI. These two outages accounted for approximately 90% of the total CMI over the past 12 months.

In total, the Middleburg 29-01 circuit had 24 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (10), tree related (7), other (3), animal contacts (3), and nothing found (1).

The Middleburg 29-01 is scheduled to be trimmed in 2014.

Remedial Actions

- A work order was initiated to install 900A load break disconnect switches and fault indicators. This work is scheduled for January 31, 2014.
- Work orders have been initiated to install a new remotely operable sectionalizing device and to add automation to two manually operable tie switches.

43 Circuit 21703 SUBURBAN 17-03

On September 11, 2013, an equipment failure occurred on an overhead primary conductor and required a temporary sectionalizing open point to be opened for repairs. The outage affected approximately 1,250 customers for up to 772 minutes, resulting in 429,927 CMI.

In total, the Suburban 17-03 circuit had 15 outages between January 2013 and December 2013. The causes of these outages include: tree related (6), animal contacts (6), equipment failures (2), and nothing found (1).

Remedial Actions

- In 2014, Vegetation Management plans to trim the entire Suburban 17-03 line in order to reduce tree related outages.
- In 2014, an expanded operational review (EOR) will be conducted on the entire Suburban 17-03 line in order to identify circuit improvements to reduce the potential for future outages.
- In 2015, a manual midline switch and a tie switch will be automated as part of the Smart Grid project plan. The device automation is anticipated to significantly reduce future outage durations.

- A project is being evaluated to further reduce customer exposure to outages and help improve sectionalizing capabilities in the future.

44 Circuit 54203 PENNSBORO 42-03

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 09, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,460 customers for up to 402 minutes, resulting in 306,309 CMI.

On December 09, 2013, a vehicle pole hit caused the circuit breaker to trip to lockout. The outage affected approximately 1,460 customers for up to 409 minutes, resulting in 119,208 CMI.

In total, the Pennsboro 42-03 circuit had 13 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (6), tree related (4), animal contacts (2), and vehicle (1).

Remedial Actions

- The Pennsboro 42-03 circuit is scheduled to be trimmed in 2014 as part of its vegetation management cycle.
- An additional recloser will be installed in 2014 as part of the Smart Grid initiative to limit customer exposure. The device would have limited the June 2013 outage to fewer than 350 customers.
- A vintage oil circuit recloser is scheduled for replacement in 2014.

45 Circuit 58702 ROSEMONT 87-02

Performance Analysis

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

On June 27, 2013, the West Shore-Harrisburg 69kV circuit tripped to lockout due to a vehicle pole hit. This outage affected approximately 13,500 customers at Rosemont and Spangler substations. Approximately 3,370 customers on the Rosemont 87-02 were interrupted for up to 129 minutes, resulting in 435,101 CMI.

In total, the Rosemont 87-02 circuit had 14 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (8), animal contacts (2), vehicle (1), tree related (1), other (1), and nothing found (1).

Remedial Actions

- Five automated sectionalizing and tie devices, including two new, will be installed in 2014 as part of the Smart Grid initiative.
- A re-sectionalizing project is scheduled for late 2014 to balance loading and customer counts in the Rosemont and White Hill area. The customer count on the Rosemont 87-2 is expected to be reduced by approximately 1,000 customers.
- Animal guarding is scheduled to be installed on the transformers of approximately 120 customers in early 2014.
- Four remote operator controlled switches are scheduled to be installed on the Harrisburg – West Shore 1&2 69 kV circuits in 2015. The switches would have allowed operators to quickly sectionalize and limit the impact of the June 2013 outage to several minutes.
- The Rosemont 87-02 was last trimmed in 2013 as part of its vegetation management cycle.

46 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.

On November 26, 2013, an equipment failure occurred on an overhead primary conductor and required a temporary sectionalizing open point to be opened for repairs. The outage affected approximately 830 customers for up to 239 minutes, resulting in 99,439 CMI.

In total, the Fairview 15-03 circuit had 5 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (2), animal contacts (2), and tree related (1).

Remedial Actions

- One new remotely operable sectionalizing device will be installed under the 2014 Smart Grid program.
- Three existing devices will be upgraded to remotely operable sectionalizing devices. This will improve sectionalizing and reduce the number of customers affected by future outages.

47 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. These three events accounted for more than 70% of the total customer minutes interrupted over the past 12 months.

In total, the Bloomsburg 77-04 circuit had 27 outages between January 2013 and December 2013. The causes of these outages include: tree related (11), equipment failures (8), animal contacts (4), nothing found (2), other (1), and contact/dig-in (1).

Remedial Actions

- A project will add a new ROCS 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.
- On February 11, 2013, an infrared inspection of this circuit was completed. There were no reliability concerns identified.
- A project was developed to improve the reliability for 10 customers on the Davenport Tap. The Mellick Hollow Road CEMI project will relocate inaccessible line and replace #6 CW conductor. The project is scheduled to be completed by December 2014.

48 Circuit 12202 FOGELSVILLE 22-02

Performance Analysis

In the past twelve months, the Fogelsville 22-02 has had one circuit breaker lockout and one additional large outage. In addition, there have been several small, isolated outages which have contributed to the circuit's performance.

On January 22, 2013, a vehicle pole hit caused the circuit breaker to trip to lockout. The outage affected approximately 1,260 customers for up to 529 minutes, resulting in 313,272 CMI.

On November 19, 2013, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 260 customers for up to 492 minutes, resulting in 91,647 CMI.

In total, the Fogelsville 22-02 circuit had 22 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (8), tree related (7), vehicles (4), animal contacts (2), and nothing found (1).

Remedial Actions

- There are plans to add three Smart Grid VCRs and one Smart Grid switch.
- A tie to the Schnecksville 37-04 line is being evaluated.
- An extension of the three phase line is being evaluated to aid in load balancing.

49 Circuit 50503, Mechanicsburg 05-03

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 07, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,320 customers for up to 302 minutes, resulting in 332,058 CMI.

On January 11, 2013, a pole top fire occurred on a tap fuse pole and caused the circuit breaker to trip to lockout. The outage affected approximately 1,260 customers for up to 182 minutes, resulting in 90,667 CMI.

In total, the Mechanicsburg 05-03 circuit had 16 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (8), animal contacts (3), tree related (2), nothing found (2), and vehicle (1).

Remedial Actions

- Two new automated sectionalizing devices will be installed in 2014 as part of the Smart Grid and Circuit SAIDI initiatives. The devices would have significantly reduced the impact of the January and July outages.
- The Mechanicsburg 05-03 was last trimmed in 2012 as part of its vegetation management cycle.

50 – Circuit 11504 FREEMANSBURG 15-04

Performance Analysis

During the past twelve months, the Freemansburg 15-04 has experienced three large scale outages. Additionally, several smaller outages have contributed to the circuit's performance.

On January 04, 2013, a vehicle pole hit caused the circuit breaker to trip to lockout. The outage affected approximately 930 customers for up to 602 minutes, resulting in 35,981 CMI.

On September 12, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 2,660 customers for up to 641 minutes, resulting in 347,644 CMI.

In total, the Freemansburg 15-04 circuit had 17 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (9), vehicles (3), tree related (3), and animal contacts (2).

Remedial Actions

- There are plans to install new Smart Grid VCR to replace an existing load break air switch.
- Comprehensive tree trimming will be conducted in 2015.
- One new single phase tap fuse will be installed in 2014.
- The Fountain Hill Substation project will transfer 1,100 customers away from this feeder and will be completed in mid-2014.
- A new line and terminal is being constructed at Freemansburg in 2014 which will transfer approximately 200 customers to the new line.

51 Circuit 55002, Newport 50-02

Performance Analysis

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

On May 14, 2013, a customer house fire required nearby facilities to be temporarily de-energized for fire fighter safety. The outage affected approximately 1,450 customers for up to 272 minutes, resulting in 180,046 CMI.

On April 20, 2013, a phase connector burned open on an overhead switch and required a temporary sectionalizing open point to be opened for repairs. The outage affected approximately 1,160 customers for up to 187 minutes, resulting in 66,665 CMI.

In total, the Newport 50-02 circuit had 54 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (23), tree related (13), nothing found (10), animal contacts (4), other (3), and vehicle (1).

Remedial Actions

- Two vintage oil circuit reclosers are scheduled for replacement in 2014.
- Two existing sectionalizing and tie devices will be automated in 2015 as part of the Smart Grid initiative.
- The Newport 50-02 was trimmed in 2013 as part of its vegetation management cycle.
- Additional fusing was installed in two locations during September 2013 in order to reduce customer exposure.

- A failed motor operated air break was replaced in 2013.

52 Circuit 60803, BUCK 08-03

Performance Analysis

The circuit experienced the following two major outages which strongly influenced the current ranking of this circuit on the WPC list.

On June 06, 2013, a vehicle hit a pole that caused a recloser to trip to lockout. The outage affected approximately 1,460 customers for up to 335 minutes, resulting in 172,791 CMI.

On January 05, 2013, a different pole was hit by a vehicle that caused that same recloser to trip to lockout. The outage affected approximately 1,460 customers for up to 146 minutes, resulting in 121,307 CMI.

In total, the Buck 8-03 circuit had 20 outages between January 2013 and December 2013. The causes of these outages include: tree related (7), equipment failures (6), animal contacts (4), and vehicles (3).

Remedial Actions

- Full circuit tree trimming is scheduled for the second quarter of 2014.
- A line inspection on the overhead two and three phase sections of the circuit was completed in April 2013. A few minor issues were found and will be corrected by the end of 2014.
- A thermography inspection on the overhead two and three phase sections of the circuit is scheduled for February, 2014.
- A field patrol of the circuit will be performed in late January, 2014.
- Fault indicators were installed at various locations along the circuit in April, 2013 to help identify fault locations more quickly. This will shorten the duration of future outages.
- An Expanded Operational Review on the circuit was completed in December, 2013. Nothing significant was found.
- In August, 2013, a single phase line was transferred over to the Quarryville 56-3 line that will greatly improve the overall reliability to the 90 customers on this section of line.
- The circuit will be re-configured in November, 2014 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 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.
- Existing sectionalizing and tie devices will be automated in 2014 as part of PPL's Smart Grid program.
- The vehicle pole hits were investigated but no opportunities were found that would reduce the number of pole hits and/or outages.

- A project is being planned for 2016 to extend the three phase along Truce Road and remove the inaccessible three phase in the right of way.

53 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 December 17, 2012, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 330 customers for up to 124 minutes, resulting in 40,534 CMI.

On December 22, 2012, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 570 customers for up to 103 minutes, resulting in 52,283 CMI.

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 to 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.

In total, the Freemansburg 15-06 circuit had 59 outages between October 2012 and September 2013. The causes of these outages include: tree related (21), equipment failures (18), nothing found (8), animal contacts (8), vehicles (3), and contact/dig-in (1).

Remedial Actions

- Spot trimming will be performed in 2014.
- A new Smart Grid switch will be installed in 2015.
- In 2015, single phase will be reconductored to three phase taps.

54 Circuit 27101 GREENFIELD 71-01

Performance Analysis

On April 12, 2013, a tree made contact with the overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,920 customers for up to 87 minutes, resulting in 164,732 CMI.

On June 29, 2013, a vehicle pole hit caused an upstream recloser to trip to lockout. The outage affected approximately 170 customers for up to 546 minutes, resulting in 63,712 CMI.

On November 01, 2013, a failure of the leads on a primary overhead distribution transformer caused an upstream recloser to trip to lockout. The outage affected approximately 1,410 customers for up to 94 minutes, resulting in 131,321 CMI.

In total, the Greenfield 71-01 circuit had 37 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (16), tree related (11), animal contacts (6), nothing found (2), vehicle (1), and other (1).

Remedial Actions

- In 2014, a new project will begin in order to help reduce future outages for customers currently on the Greenfield 71-01 line.
- In 2014, a new tie line is planned between the Greenfield 71-01 and East Carbondale 12-06 line. The new tie will improve sectionalizing capability in the future, which will reduce future outage durations.
- In 2014, a new fuse and a new recloser will be added as part of its reliability preservation scope. These sectionalizing devices will help reduce customer outage exposure and reduce outage durations.
- In 2015, Vegetation Management plans to trim the entire Greenfield 71-01 line in order to reduce future tree related outages. This line will receive trimming priority over other non WPC circuits scheduled to be trimmed in 2015.
- In 2015, three manual switches will be automated as part of the Smart Grid project plan. The device automation is anticipated to significantly reduce future outage durations.

55 Circuit 54701 NEW BLOOMFIELD 47-01

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 May 22, 2013, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 1,940 customers for up to 533 minutes, resulting in 304,131 CMI.

In total, the New Bloomfield 47-01 circuit had 32 outages between January 2013 and December 2013. The causes of these outages include: tree related (16), animal contacts (8), equipment failures (4), nothing found (3), and vehicle (1).

Remedial Actions

- A new line and terminal out of Green Park substation is scheduled to be constructed in 2014. The line will reduce the customer count and circuit mile exposure on New Bloomfield by roughly half and provide increased transfer capability in the area.
- The New Bloomfield 47-01 circuit is scheduled to be trimmed in 2015 as part of its vegetation management cycle.

56 Circuit 13202 PALMERTON 32-02

Performance Analysis

In the past twelve months, the Palmerton 32-02 has had one circuit breaker lockout. In addition, there have been several small, isolated outages which have contributed to the circuit's performance.

On June 23, 2013, old, abandoned transmission lines fell causing the circuit breaker to trip to lockout. The outage affected approximately 2,070 customers for up to 518 minutes, resulting in 310,260 CMI.

In total, the Palmerton 32-02 circuit had 20 outages between January 2013 and December 2013. The causes of these outages include: animal contacts (7), equipment failures (5), tree related (4), other (3), and vehicle (1).

Remedial Actions

- Animal guarding is being evaluated.
- There are plans to install three new Smart Grid midline devices and three new Smart Grid tie switches during 2014.
- A new line and terminal is being evaluated to transfer approximately 800 customers.

57 Circuit 14402 SOUTH SLATINGTON 44-02

Performance Analysis

In the past twelve months, the South Slatington 44-02 has had two circuit breaker lockouts. In addition, there have been several small, isolated outages which have contributed to the circuit's performance.

On February 15, 2013, an equipment failure occurred on an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,620 customers for up to 346 minutes, resulting in 198,438 CMI.

On October 31, 2013, a vehicle pole hit caused a recloser to trip to lockout. The outage affected approximately 760 customers for up to 713 minutes, resulting in 130,098 CMI.

In total, the South Slatington 44-02 circuit had 23 outages between January 2013 and December 2013. The causes of these outages include: tree related (7), equipment failures (5), animal contacts (3), vehicles (2), other (2), nothing found (2), and contact/dig-in (1).

Remedial Actions

- There is a project to install two Smart Grid VCRs and one Smart Grid switch in early 2015.
- There are plans to install multiple single phase fuses in 2014.
- A new line and terminal is being evaluated to potentially split the north and south sections of the line into separate feeders.

58 Circuit 43202 MILLVILLE 32-02

Performance Analysis

On July 07, 2013, a tree made contact with an overhead primary conductor and caused a recloser to trip to lockout. The outage affected approximately 900 customers for up to 1,294 minutes, resulting in 297,448 CMI. This one event accounted for more than 75% of the total customer minutes interrupted over the past 12 months.

In total, the Millville 32-02 circuit had 24 outages between January 2013 and December 2013. The causes of these outages include: tree related (8), equipment failures (5), animal contacts (5), nothing found (4), and vehicles (2).

The Millville 32-02 was last trimmed in 2012.

Remedial Actions

- A project was completed in December, 2013 that extended the three phase backbone of the Millville 32-02 and created a remotely operable tie with the Hughesville 70-01. The tie will be automated and two additional remotely operable sectionalizing devices will be installed. This project is scheduled to be completed in 2014.
- A project has been initiated to build approximately 2,100 feet of new single phase along Hall RD to serve customers that experience frequent interruptions from a more reliable tap, and remove inaccessible line. This project is scheduled to be completed by December 2014.
- A project has been developed to rebuild the three phase backbone of the Millville 32-02. Approximately 8,500 feet 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.

59 Circuit 25603 ARROWHEAD 56-03

Performance Analysis

On January 31, 2013, a tree made contact with an overhead primary conductor and caused the circuit breaker to trip to lockout. The outage affected approximately 1,210 customers for up to 184 minutes, resulting in 226,415 CMI.

On January 16, 2013, an equipment failure occurred on an overhead pole arm attachment and caused a recloser to trip to lockout. The outage affected approximately 630 customers for up to 354 minutes, resulting in 136,936 CMI.

In total, the Arrowhead 56-03 circuit had 14 outages between January 2013 and December 2013. The causes of these outages include: equipment failures (5), tree related (4), nothing found (3), vehicle (1), and animal contact (1).

Remedial Actions

- A full circuit tree trim will be completed in the first quarter of 2014.
- Herbicide work will be completed by the end of the third quarter of 2014.
- The circuit is currently being reviewed under an Expanded Operational Review. To date four areas have been identified for improvement. These improvements include moving inaccessible line, installing fault indicators, and adding sectionalizing capability. The work will be scheduled once fully identified.
- A project is planned to balance the Arrowhead 56-03. This will help better split the customer counts as well as improve transfer capability.

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	2,967	20.60%	64,503	5.66%	5,692,006	4.61%
Contact/Dig-In	146	1.01%	22,593	1.98%	2,008,018	1.62%
Directed by Non-PPL Authority	261	1.81%	9,270	0.81%	1,028,689	0.83%
Equipment Failures	4,905	34.06%	340,750	29.88%	32,934,266	26.65%
Improper Design	12	0.08%	16,704	1.46%	1,825,948	1.48%
Improper Installation	3	0.01%	776	0.01%	81,829	0.06%
Improper Operation	2	0.01%	1,654	0.15%	87,219	0.07%
Nothing Found	1,135	7.88%	99,103	8.69%	5,844,239	4.73%
Other-Controllable	136	0.94%	56,677	4.97%	3,185,064	2.58%
Other-Non Control	289	2.01%	40,397	3.54%	2,541,035	2.06%
Other-Public	53	0.37%	6,369	0.56%	1,032,547	0.84%
Tree Related	3,694	25.65%	298,285	26.15%	48,669,905	39.38%
Vehicles	797	5.53%	183,502	16.09%	18,670,567	15.11%
Total	14,400	100.00%	1,140,583	100.00%	123,601,330	100.00%

[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 is currently implementing a more aggressive trimming strategy.

Animals: Animals accounted for about 20.6% 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 36% of the cases of trouble, 34% of the customer interruptions and 30% 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. In 2009, to help reduce the risk of incurring interruptions due to equipment failures, PPL Electric initiated an Asset Optimization Strategy project to assess equipment health and generate a long-term plan for proactive infrastructure replacement and enhanced maintenance practices. It is anticipated that, over time, this strategy will improve reliability performance as it pertains to PPL Electric's distribution, substation and transmission assets.

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	4th Quarter		Year-to-date	
		Budget	Actual	Budget	Actual
Transmission					
Transmission C-tag poles (# of poles)	312	98	127	312	335
Transmission arm replacements (# of sets)	104	24	50	104	96
Transmission air break switch inspections (# of switches)	51	14	29	51	49
Transmission lightning arrester installations (# of sets)	0	0	0	0	0
Transmission structure inspections (# of structures)	1,600	0	0	1,600	1,406
Transmission tree side trim-Bulk Power (linear feet)	N/A				
Transmission herbicide-Bulk Power (# of acres)	N/A				
Transmission reclearing (# of miles) BES Only	400.09	41.26	65.58	400.09	400.09
Transmission reclearing (# of miles) 69 kV	954.74	313.27	306.93	954.74	931.50
Transmission reclearing (# of miles) 138 kV	0	0	0	0	0
Transmission danger tree removals-Bulk Power (# of trees)	N/A				
Substation					
Substation batteries (# of activities)	623	45	39	623	651
Circuit breakers (# of activities)	970	91	494	970	1,357
Substation inspections (# of activities)	4,396	1,064	1,075	4,396	4,505
Transformer maintenance (# of activities)	1,393	350	335	1,393	1,432
Distribution					
Distribution C-tag poles replaced (# of poles)	1,344	296	287	1,344	1,286
C-truss distribution poles (# of poles)	3,851	1,204	1,206	3,851	4,002
Capacitor (MVAR added)	20	0	2	20	29
OCR replacements (# of)[9]	750	92	77	750	697
Distribution pole inspections (# of poles)	90,000	28,866	28,349	90,000	90,093
Distribution line inspections (hours)	6,560	796	796	6,560	6,447
Group re-lamping (# of lamps)	18,379	6,000	6,493	18,379	18,885
Test sections of underground distribution cable	800	200	237	800	1,035
Distribution tree trimming (# of miles)	6545.63	1698.04	2316.27	6545.63	6530.33
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		4,929		14,614
LTN manhole inspections (# of)	706	83	155	706	723

[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	4th Quarter		Year-to-date	
		Budget	Actual	Budget	Actual
LTN vault inspections (# of)	741	168	167	741	739
LTN network protector overhauls (# of)	62	6	14	62	60
LTN reverse power trip testing (# of)	140	35	35	140	129

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).

	4th Quarter		Year-to-date	
Activity	**Budget ($000)**	**Actual ($000)**	**Budget ($000)**	**Actual ($000)**
Provide Electric Service	2,629	2,253	10,220	8,755
Vegetation Management	8,101	17,950	37,616	52,026
Customer Response	18,329	11,833	71,242	53,501
Reliability & Maintenance	12,636	18,537	62,977	71,797
System Upgrade	59	750	524	1,309
Customer Services/Accounts	32,237	33,568	125,104	125,576
Others	17,559	16,594	71,482	55,348
Total O&M Expenses	**91,550**	**101,485**	**379,165**	**368,312**

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.

	4th Quarter		Year-to-date	
	Budget ($1,000s)	**Actual ($1,000s)**	**Budget ($1,000s)**	**Actual ($1,000s)**
New Service/Revenue	18,515	19,427	78,420	80,777
System Upgrade	140,935	151,708	520,546	538,269
Reliability & Maintenance	72,389	47,899	273,278	273,471
Customer Response	4,057	1,582	15,228	9,903
Other	8,358	7,344	22,923	21,628
Total	**244,254**	**227,960**	**910,395**	**924,048**

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

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

Transmission and Distribution (T&D)	
Lineman Leader	71
Journeyman Lineman	222
Journeyman Lineman-Trainee	70
Helper	0
Groundhand	3
Troubleman	50
T&D Total	**416**
Electrical	
Elect Leaders-UG	6
Elect Leaders-Net	9
Elect Leaders-Sub	23
Journeyman Elect-UG	24
Journeyman Elect-Net	14
Journeyman Elect-Sub	55
Journeyman Elect Trainee-UG	2
Journeyman Elect Trainee-Net	17
Journeyman Elect Trainee	27
Helper	10
Laborer-Network	0
Laborer-Substation	0
Electrical Total	**187**
Overall Total	**603**

Appendix A

PPL Electric Utilities Corporation
Worst Performing Circuit Definition / Comparison under old and new 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 simpler and more transparent, therefore allowing WPCs to be identified and remediated on a shorter timetable.

The following table illustrates the 5% worst performing circuits for Q4 2013 under the previous CPI system, their rank under the new system, and the reason for the change. Approximately half of the circuits remain WPCs under the change to CMI.

Appendix A

Feeder	Rank by Previous CPI	Rank by New CPI	Explanation of Variance
50833	1	201	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high circuit SAIFI contribution. This circuit has 2 customers.
43501	2	347	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high circuit SAIFI contribution. This circuit has 15 customers.
12402	3	23	Remains on list.
29302	4	75	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high CEMI >3 contribution. This circuit is considered a CEMI 9 circuit on a rolling four quarters basis.
25601	5	1	Remains on list.
59401	6	4	Remains on list.
47704	7	47	Remains on list.
65203	8	181	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high CEMI >3 contribution. This circuit is considered a CEMI 5 circuit on a rolling four quarters basis.
53601	9	10	Remains on list.
47706	10	685	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high CEMI >3 contribution. This circuit is considered a CEMI 4 circuit on a rolling four quarters basis.
22403	11	6	Remains on list.
25603	12	59	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high CEMI >3 contribution. This circuit is considered a CEMI 6 circuit on a rolling four quarters basis.
45101	13	759	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high circuit SAIFI contribution. This circuit has 21 customers.
13605	14	388	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high circuit SAIFI contribution. This circuit has 247 customers.
47001	15	3	Remains on list.
57402	16	71	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high CEMI >3 contribution. This circuit is considered a CEMI 6 circuit on a rolling four quarters basis.
41902	17	9	Remains on list.
60902	18	410	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high CEMI >3 contribution. This circuit is considered a CEMI 5 circuit on a rolling four quarters basis.
15001	19	35	Remains on list.
52402	20	8	Remains on list.
45002	21	2	Remains on list.
11506	22	53	Remains on list.
10803	23	540	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high circuit SAIDI contribution. This circuit has 63 customers.
18501	24	116	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high CEMI >3 contribution. This circuit is considered a CEMI 6 circuit on a rolling four quarters basis.
44301	25	7	Remains on list.
64203	26	68	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high CEMI >3 contribution. This circuit is considered a CEMI 5 circuit on a rolling four quarters basis.
46702	27	13	Remains on list.
47401	28	87	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high CEMI >3 contribution. This circuit is considered a CEMI 6 circuit on a rolling four quarters basis.

Appendix A

Feeder	Rank by Previous CPI	Rank by New CPI	Explanation of Variance
13601	29	187	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high CEMI >3 contribution. This circuit is considered a CEMI 6 circuit on a rolling four quarters basis.
41801	30	27	Remains on list.
14602	31	12	Remains on list.
42903	32	32	Remains on list.
53602	33	11	Remains on list.
42204	34	66	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high duration >4 hours contribution.
24901	35	18	Remains on list.
46802	36	5	Remains on list.
21906	37	894	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high circuit SAIDI contribution. This circuit has 13 customers.
13606	38	73	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high CEMI >3 contribution. This circuit is considered a CEMI 8 circuit on a rolling four quarters basis.
51305	39	74	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high CEMI >3 contribution. This circuit is considered a CEMI 5 circuit on a rolling four quarters basis.
63501	40	40	Remains on list.
28001	41	276	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high circuit SAIFI contribution. This circuit has 486 customers.
53502	42	92	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high CEMI >3 contribution. This circuit is considered a CEMI 5 circuit on a rolling four quarters basis.
28302	43	15	Remains on list.
43201	44	83	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high circuit SAIDI contribution. This circuit has 958 customers.
44302	45	192	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high duration >4 hours contribution.
46302	46	60	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high circuit SAIDI contribution. This circuit has 1080 customers.
42901	47	42	Remains on list.
45601	48	173	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high CEMI >3 contribution. This circuit is considered a CEMI 7 circuit on a rolling four quarters basis.
67605	49	62	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high CEMI >3 contribution. This circuit is considered a CEMI 7 circuit on a rolling four quarters basis.
25903	50	911	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high duration >4 hours contribution.
22103	51	164	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high circuit SAIDI contribution. This circuit has 696 customers.
15406	52	25	Remains on list.
12006	53	191	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high duration >4 hours contribution.
16802	54	134	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high circuit SAIDI contribution. This circuit has 863 customers.
40602	55	16	Remains on list.
10103	56	31	Remains on list.
50503	57	49	Remains on list.
63403	58	80	This circuit would have ranked among the worst 5% of circuits by the old CPI, due to a high circuit SAIFI contribution. This circuit has 1441 customers.
50503	59	49	Remains on list.

Appendix B

PPL Electric Utilities Corporation
Job Descriptions

Transmission and Distribution

Groundhand	• Performs manual labor and assists employees in higher job classifications.
Helper	• 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	• 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	• 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	• 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	• Investigates and resolves trouble calls, voltage abnormalities on transmission and distribution systems associated with, but not limited to, PPL Electric facilities.

Electrical

Electrician Leader - Substation - Network - Underground	• 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	• 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	• Performs manual labor and assists employees in higher job classifications.
Journeyman Electrician - Substation - Network - Underground	• 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	• Normally under limited supervision performs and is responsible for work associated with, but not limited to, PPL Electric facilities involving the highest degree of skill in construction and maintenance work associated with substations, LTN or underground distribution and transmission. • Uses microprocessor based equipment for troubleshooting and revising relay logic and its control systems related to the Field Services electrical discipline.

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PPL Corporation
2 N 9th Street

Allentown, PA 18101

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