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FEDERAL EXPRESS

July 29, 2016

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

**Re: PPL Electric Utilities Corporation
Quarterly Reliability Report for the
Period Ended June 30, 2016
Docket No. L-00030161**

RECEIVED
JUL 29 2016
PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

M-2016-2522508

Dear Ms. Chiavetta:

Enclosed for filing on behalf of PPL Electric Utilities Corporation ("PPL Electric") is an original of PPL Electric's Quarterly Reliability Report for the Period Ended June 30, 2016. Also enclosed, in a sealed envelope, is a copy of the report containing competitively sensitive and proprietary information. The Company hereby requests that the Commission treat that information, and the report containing the information, as privileged and confidential. The report is being filed pursuant to 52 Pa. Code § 57.195(d).

Pursuant to 52 Pa. Code § 1.11, the enclosed document is to be deemed filed on July 29, 2016, which is the date it was deposited with an overnight express delivery service as shown on the delivery receipt attached to the mailing envelope.

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

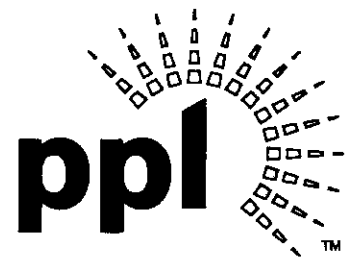
If you have any questions regarding this document, please call me or B. Kathryn Frazier, PPL Electric's Regulatory Affairs Manager at (610) 774-3372.

Very truly yours,


Paul E. Russell

Enclosures

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



PPL Electric Utilities

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

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

There were no major events during the second quarter of 2016.

2) Rolling 12-month reliability index values (SAIFI, CAIDI, SAIDI, and if available, MAIFI) for the EDC's service territory for the preceding quarter. The report shall include the data used in calculating the indices, namely the average number of customers served, the number of sustained customer interruptions, the number of customers affected, and the customer minutes of interruption. If MAIFI values are provided, the report shall also include the number of customer momentary interruptions.

The following table provides data for the 12 months ending June 30, 2016.

SAIFI (Benchmark = 0.98; Rolling 12-month Std. = 1.18)	0.72
CAIDI (Benchmark = 145; Rolling 12-month Std. = 174)	118
SAIDI (Benchmark = 142; Rolling 12-month Std. = 205)	85
MAIFI ¹	5.8
Average Number of Customers Served ²	1,407,660
Number of Sustained Customer Interruptions (Trouble Cases)	16,566
Number of Customers Affected ³	1,009,798
Customer Minutes of Interruptions (CMI)	119,359,733
Number of Customer Momentary Interruptions	8,224,844

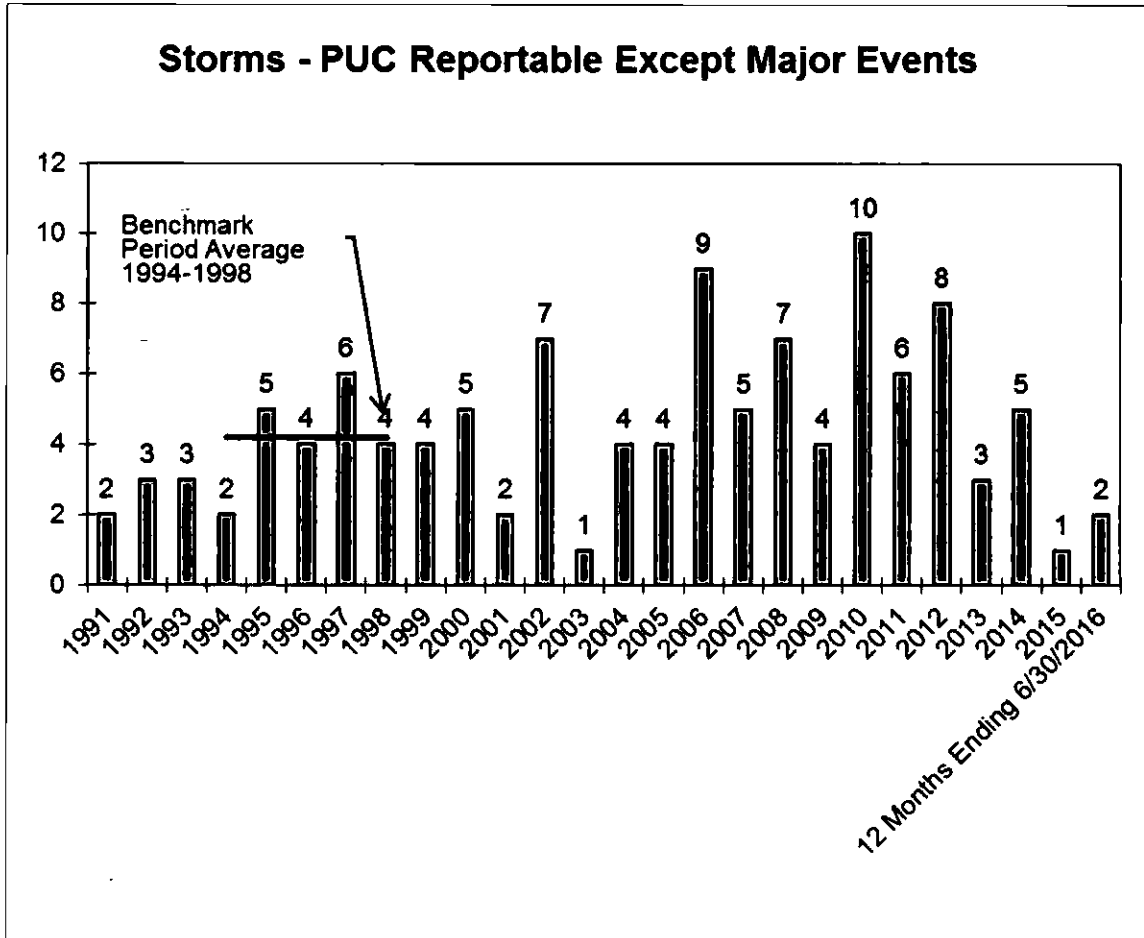
During the second quarter, there were no (0) PUC major events, one (1) PUC reportable storm, and five (5) other storms that required the opening of one or more area emergency centers to manage restoration efforts.

¹ MAIFI data is obtained at the substation breaker level and at certain reclosers.

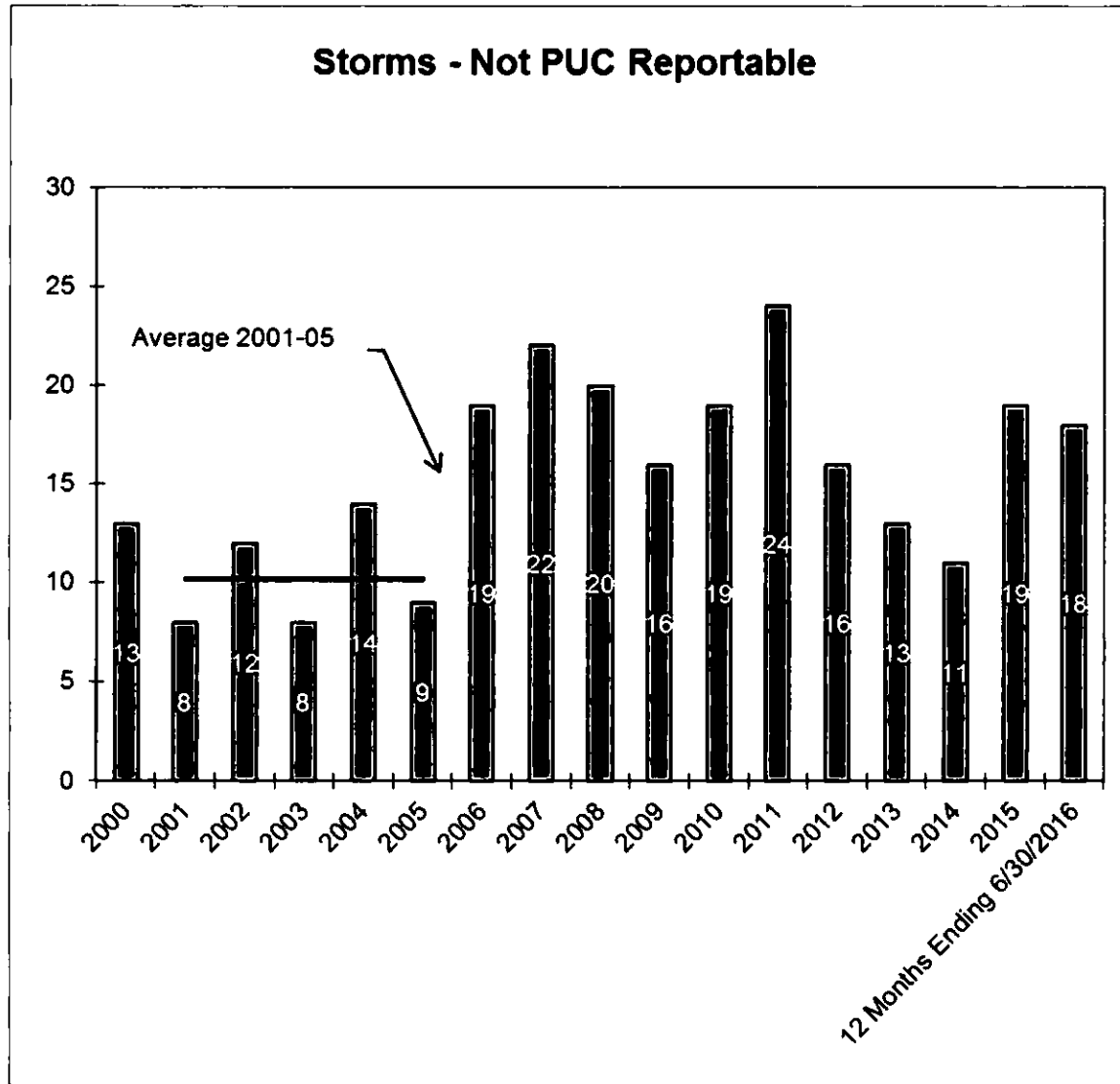
² PPL Electric calculates the annual indices using customers served at the end of period. This is consistent with the method used to calculate PPL Electric's benchmarks.

³ The data reflects the number of customers interrupted for each interruption event summed for all events, also known as customer interruptions. If a customer is affected by three separate cases of trouble, that customer represents three customer interruptions, but only one customer interrupted.

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



In addition, there were eighteen (18) storms that were not reportable, but which did require the opening of one or more area emergency centers to manage restoration efforts.



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

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

WPC Rank	Feeder ID	SAIDI	CAIDI	SAIFI	MAIFI	Customers	Cases of Trouble	Customer Minutes Interrupted (CMI)
1	14403	507	125	4.1	8.9	2,543	55	1,288,897
2	12701	693	173	4.0	10.1	1,536	60	1,063,811
3	13101	470	187	2.5	7.9	2,261	40	1,062,021
4	21206	407	191	2.1	6.1	2,492	12	1,013,289
5	28301	440	312	1.4	13.7	2,275	105	1,002,016
6	22601	808	569	1.4	9.9	1,065	58	860,603
7	45602	512	317	1.6	9.9	1,608	43	823,515
8	50106	371	268	1.4	7.4	2,217	18	822,271
9	65603	322	65	4.9	12.2	2,456	51	790,739
10	65202	281	96	2.9	0.2	2,801	7	787,038
11	66504	399	112	3.6	17.8	1,881	26	750,880
12	29502	918	157	5.8	4.1	793	38	727,746
13	25801	385	116	3.3	6.3	1,822	46	701,138
14	40602	306	131	2.3	2.6	2,278	32	697,669
15	16102	324	225	1.4	7.5	2,123	25	687,579
16	46004	331	240	1.4	13.0	2,075	27	687,560
17	18502	372	112	3.3	12.9	1,818	79	675,940
18	24602	434	170	2.5	2.6	1,509	54	654,543
19	28804	587	340	1.7	9.3	1,082	52	634,704
20	56801	386	115	3.4	16.0	1,639	43	633,348
21	10903	368	313	1.2	7.7	1,715	25	630,303
22	25402	362	282	1.3	19.7	1,730	44	626,683
23	28803	480	257	1.9	10.2	1,301	45	624,094
24	20403	327	114	2.9	15.6	1,900	38	621,013
25	20401	617	257	2.4	9.6	1,006	28	620,338

WPC Rank	Branch ID	SAIDI	CAIDI	SAIFI	MAIFI	Customers	Cases of Trouble	Customer Minutes Interrupted (CMI)
26	42401	839	138	6.1	3.2	727	22	609,856
27	47102	3141	112	28.0	7.1	194	7	609,331
28	64201	308	90	3.4	12.8	1,850	23	570,308
29	28801	424	266	1.6	5.7	1,335	43	565,941
30	44904	707	135	5.2	3.4	798	16	563,929
31	61801	339	512	0.7	17.9	1,610	31	545,335
32	27403	220	99	2.2	11.7	2,416	12	531,084
33	26402	490	198	2.5	13.6	1,072	49	525,641
34	58402	335	183	1.8	21.2	1,544	37	516,866
35	14801	279	136	2.0	10.5	1,850	43	516,637
36	27502	176	254	0.7	4.9	2,927	17	514,227
37	46001	207	284	0.7	1.4	2,357	32	487,081
38	40201	294	171	1.7	8.3	1,655	53	486,308
39	63304	264	121	2.2	4.2	1,815	8	478,803
40	16402	382	200	1.9	17.1	1,248	65	477,222
41	16801	285	115	2.5	6.1	1,610	34	458,576
42	59002	198	98	2.0	16.2	2,261	49	446,790
43	67804	221	123	1.8	10.4	2,022	11	446,432
44	45501	308	135	2.3	10.6	1,427	41	439,297
45	41801	525	436	1.2	2.0	836	24	439,238
46	43401	443	187	2.4	4.9	990	27	438,590
47	42601	203	148	1.4	10.2	2,159	18	438,373
48	55001	334	82	4.1	15.9	1,290	45	431,206
49	13103	172	96	1.8	4.2	2,485	8	426,845
50	46206	239	174	1.4	27.0	1,788	37	426,670
51	21901	167	160	1.0	7.7	2,519	33	420,405
52	26001	300	229	1.3	11.3	1,399	58	419,065
53	22003	293	137	2.1	3.5	1,425	52	417,842
54	67401	302	395	0.8	12.8	1,365	37	411,709
55	42201	234	79	3.0	4.0	1,720	24	402,920
56	17001	265	148	1.8	7.8	1,510	55	399,587
57	64802	312	152	2.0	24.3	1,279	38	399,045
58	17802	206	207	1.0	15.4	1,903	55	392,573
59	26401	172	165	1.0	33.2	2,178	87	374,460
60	28604	207	195	1.1	10.9	1,802	50	372,664
61	23401	214	156	1.4	7.9	1,739	52	371,955
62	16803	335	61	5.5	10.2	1,108	43	370,785

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

01 Circuit 14403 -- SOUTH SLATINGTON 44-03

Performance Analysis

The SOUTH SLATINGTON 44-03 circuit experienced four outages of over 100,000 CMI between July 2015 and June 2016.

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

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

On October 28, 2015, during a period of heavy rain, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 637 customers for up to 165 minutes resulting in 105,410 CMI.

On March 28, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 888 customers for up to 472 minutes resulting in 148,561 CMI.

In total, the SOUTH SLATINGTON 44-03 circuit had 55 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (24); equipment failure (12); animal contacts (7); nothing found (7); other (3); vehicles (2).

Remedial Actions

- In 2015, a single-phase tap was reviewed and a broken cross arm was repaired.
- In 2015, several spans of conductor having excess slack were repaired to prevent the conductors from coming together due to wind.
- In 2015, additional fuses and solid blade disconnects were installed.
- In 2015 a line inspection was performed and a number of minor improvements were identified for remediation in 2016.
- In 2016, two large single-phase taps will be reviewed for improved sectionalizing.
- In 2016, additional fusing will be installed.
- In 2016, the circuit will receive hotspot tree trimming.
- In 2016, Fault Isolation and System Restoration (FISR) was activated on this circuit.
- In 2016, two single-phase locations for line extensions will be investigated to split up customer counts on this circuit.
- In 2018, full circuit tree trimming will be performed.

- In 2018, two sections of difficult-to-access conductor will be relocated to more accessible locations.

02 Circuit 12701 -- MACUNGIE 27-01

Performance Analysis

The MACUNGIE 27-01 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On September 1, 2015, a vehicle contact occurred causing a transformer to be interrupted. This outage affected 1,421 customers for up to 549 minutes resulting in 171,428 CMI.

On April 3, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,534 customers for up to 261 minutes resulting in 402,478 CMI.

In total, the MACUNGIE 27-01 circuit had 61 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (24); equipment failure (18); animal contacts (10); vehicles (5); nothing found (3); other (1).

Remedial Actions

- In 2015, full circuit tree trimming was performed.
- In 2016, FISR was activated on this circuit.
- In 2016, a new reliability substation was built in Zionsville to split the MACUNGIE 27-01 and reduce customer outage exposure. Additional remote sectionalizing devices will also be installed.
- In 2016, a Smart Grid device was installed on this circuit.
- In 2016, several poles that had multiple vehicle strikes will be evaluated for relocation.
- In 2016, additional fusing will be installed.
- In 2016, an additional single-phase recloser or single-phase enabled three-phase recloser will be investigated.
- In 2018, a section of three-phase conductor will be relocated to a more accessible location.

03 Circuit 13101 -- NORTHAMPTON 31-01

Performance Analysis

The NORTHAMPTON 31-01 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On February 25, 2016, during a period of strong wind, an equipment failure occurred on a pole or pole arm causing a circuit breaker to trip to lockout. This outage affected 1,470 customers for up to 167 minutes resulting in 245,254 CMI.

On March 7, 2016, an equipment failure occurred on an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 2,250 customers for up to 413 minutes resulting in 591,390 CMI.

In total, the NORTHAMPTON 31-01 circuit had 40 outages between July 2015 and June 2016, with the causes breaking down as follows: equipment failure (20); animal contacts (12); tree related (7); nothing found (1).

Remedial Actions

- In 2016, a recloser was replaced with a communicating device.
- In 2016, FISR was activated on this circuit.
- In 2016, additional animal guarding will be investigated.
- In 2016, the addition of a single-phase recloser and three-phase Smart Grid device will be investigated.
- In 2016, this circuit will undergo an Expanded Operational Review.
- In 2016, a project will be evaluated to tie an underground development to an adjacent circuit.
- In 2017, three automated switches will be installed as a part of the Smart Grid initiative.

04 Circuit 21206 -- EAST CARBONDALE 12-06

Performance Analysis

The EAST CARBONDALE 12-06 circuit experienced three outages of over 100,000 CMI between July 2015 and June 2016.

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

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

On April 3, 2016, during a period of strong wind, a tree made contact with a pole or pole arm causing a circuit breaker to trip to lockout. This outage affected 630 customers for up to 1,954 minutes resulting in 119,889 CMI.

In total, the EAST CARBONDALE 12-06 circuit had 13 outages between July 2015 and June 2016, with the causes breaking down as follows: equipment failure (9); tree related (2); animal contacts (1); improper design (1).

Remedial Actions

- In 2015, full circuit tree trimming was performed.
- In 2015, an Expanded Operation Review was performed.
- In 2015, a tap fuse was added to this circuit.
- In 2016, several dead ends and switches were replaced.
- In 2016, several aluminum crimps on copper conductor were replaced.
- In 2016, fault indicators will be installed on an underground residential development to allow for faster fault location and restoration.
- In 2016, automated switching by the FISR computer system went live on this circuit.
- In 2016, in support of load growth in the area, an existing tie line will transfer approximately 780 customers.
- In 2018, a new line will be built off of the GREENVILLE 71-03 line to pick up load from the EAST CARBONDALE 12-06 line to reduce loading off this circuit.

05 Circuit 28301 -- NEWFOUNDLAND 83-01

Performance Analysis

The NEWFOUNDLAND 83-01 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On April 3, 2016, during a period of strong wind, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 1,864 customers for up to 394 minutes resulting in 327,156 CMI.

In total, the NEWFOUNDLAND 83-01 circuit had 106 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (57); animal contacts (20); equipment failure (16); nothing found (6); other (5); contact or dig in (1); vehicles (1).

Remedial Actions

- In 2015, series fusing was installed to reduce exposure to approximately 160 customers.
- In 2016, FISR automatic switching was enabled.
- In 2016, a Smart Grid recloser was installed.
- In 2016, hot spot trimming will be evaluated.
- In 2016, additional single-phase fusing locations are being evaluated.
- In 2016, additional animal guarding will be evaluated.
- In 2016, a project is being evaluated to build a tie to the HAMLIN 87-01 circuit.
- In 2017, full circuit tree trimming will be performed.

06 Circuit 22601 -- KIMBLES 26-01

Performance Analysis

The KIMBLES 26-01 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On April 3, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 447 customers for up to 1,722 minutes resulting in 769,327 CMI.

In total, the KIMBLES 26-01 circuit had 57 outages between July 2015 and June 2016, with the causes breaking down as follows: animal contacts (23); tree related (19); equipment failure (5); nothing found (5); other (4); contact or dig in (1).

Remedial Actions

- In 2014, an Expanded Operational Review was performed.
- In 2016, hot spot trimming was performed.
- In 2016, FISR was activated on this circuit.
- In 2016, full circuit tree trimming will be performed.
- In 2016, the installation of a load break disconnect switch is being evaluated along a difficult-to-access stretch.
- In 2016, several locations are being evaluated for animal guarding.
- In 2016, single-phase fusing is being evaluated.

07 Circuit 45602 -- WOOLRICH 56-02

Performance Analysis

The WOOLRICH 56-02 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

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

In total, the WOOLRICH 56-02 circuit had 43 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (20); equipment failure (12); animal contacts (7); other (2); nothing found (1); vehicles (1).

Remedial Actions

- In 2015, an Expanded Operational Review was performed on this circuit. As a result minor repairs were performed at five locations.
- In 2016, a Smart Grid device was added to this circuit.
- In 2016, hazard tree removal and hotspot trimming was completed.
- In 2016, thirteen locations received fusing.
- In 2016, additional single-phase fusing will be installed.
- In 2016, FISR was activated on this circuit.
- In 2017, full circuit tree trimming will be performed.
- In 2017, an additional Smart Grid device will be added to this circuit.
- In 2017, three-phase fusing will be installed.

08 Circuit 50106 -- HARRISBURG 69 KV LINE 01-06

Performance Analysis

The HARRISBURG 69 KV LINE 01-06 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On April 3, 2016, an equipment failure occurred on an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 2,217 customers for up to 622 minutes resulting in 742,143 CMI.

In total, the HARRISBURG 69 KV LINE 01-06 circuit had 18 outages between July 2015 and June 2016, with the causes breaking down as follows: animal contacts (6); equipment failure (5); nothing found (3); tree related (3); other (1).

Remedial Actions

- In 2016, two hot line clamps were replaced.
- In 2016, a manual airbreak was replaced with a communicating device as part of the Smart Grid initiative.
- In 2016, FISR was activated on this circuit.
- In 2016, additional animal guarding will be evaluated for this circuit.
- In 2017, full circuit tree trimming will be performed.

09 Circuit 65603 -- QUARRYVILLE 56-03

Performance Analysis

The QUARRYVILLE 56-03 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

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

On June 8, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,028 customers for up to 152 minutes resulting in 112,311 CMI.

In total, the QUARRYVILLE 56-03 circuit had 50 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (26); equipment failure (13); vehicles (4); animal contacts (3); other (3); nothing found (1).

Remedial Actions

- In 2015, all aluminum crimps on copper conductor were replaced on three-phase lines.
- In 2015, improvements were made to several distribution capacitors to improve voltage regulation.
- In 2016, a single-phase fuse was added to this circuit.
- In 2016, FISR was activated on this circuit.
- In 2016, full circuit tree trimming will be performed.
- In 2016, a new Smart Grid device will be installed on this circuit.
- In 2016, two locations will receive single-phase fuses.
- In 2017, four new Smart Grid devices will be installed on this circuit.
- In 2017, a manual switch and a recloser will be replaced with automated vacuum reclosers as part of the Smart Grid Initiative.
- In 2017, a new line and terminal is planned.

10 Circuit 65202 -- PRINCE 52-02

Performance Analysis

The PRINCE 52-02 circuit experienced three outages of over 100,000 CMI between July 2015 and June 2016.

On November 13, 2015, an unidentified issue occurred with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 2,804 customers for up to 170 minutes resulting in 275,967 CMI.

On November 14, 2015, during a period of strong wind, an equipment failure occurred on a substation component causing a circuit breaker to trip to lockout. This outage affected 2,804 customers for up to 135 minutes resulting in 310,003 CMI.

On June 7, 2016, an equipment failure occurred on a substation component causing a circuit breaker to trip to lockout. This outage affected 2,526 customers for up to 110 minutes resulting in 178,504 CMI.

In total, the PRINCE 52-02 circuit had 7 outages between July 2015 and June 2016, with the causes breaking down as follows: equipment failure (4); animal contacts (2); nothing found (1).

Remedial Actions

- In 2015, animal guarding was added at several locations.
- In 2016, all three-phase line protection schemes were evaluated.
- In 2016, the PRINCE 52-02 circuit breaker will be replaced.
- In 2016, animal guarding was upgraded on a manual switch.
- In 2016, FISR was activated on this circuit.
- In 2016, five manual switches will be replaced with automated vacuum reclosers as part of the Smart Grid Initiative.
- In 2016, an Expanded Operational Review will be performed.
- In 2016, a tie line will be built between the PRINCE 52-02 line and the ENGLSIDE 26-06.
- In 2017, one manual switch will be replaced with an automated vacuum recloser, and one automated vacuum recloser will be added as part of the Smart Grid Initiative.
- In 2017, single-phase fuses will be added in multiple locations.

11 Circuit 66504 -- SOUTH MANHEIM 65-04

Performance Analysis

The SOUTH MANHEIM 65-04 circuit experienced three outages of over 100,000 CMI between July 2015 and June 2016.

On September 30, 2015, during a period of heavy rain, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,834 customers for up to 499 minutes resulting in 385,110 CMI.

On October 9, 2015, during a period of heavy rain, a tree made contact with an overhead switch causing an interruption. This outage affected 1,951 customers for up to 93 minutes resulting in 133,081 CMI.

On June 18, 2016, an equipment failure occurred on an overhead switch causing a recloser to trip to lockout. This outage affected 903 customers for up to 185 minutes resulting in 145,928 CMI.

In total, the SOUTH MANHEIM 65-04 circuit had 26 outages between July 2015 and June 2016, with the causes breaking down as follows: equipment failure (13); nothing found (4); tree related (4); animal contacts (3); other (2).

Remedial Actions

- In 2015, full circuit tree trimming was performed.
- In 2015, all aluminum crimps on three-phase copper conductors were replaced.
- In 2016, FISR was activated on this circuit.
- In 2016, underground cable curing was performed in an area that had experienced previous outages.
- In 2016, the SOUTH MANHEIM 65-04 circuit breaker will be replaced.
- In 2016, four additional locations were animal guarded.
- In 2016 and 2017 additional animal guarding will be added to this circuit.
- In 2017, five new Smart Grid devices will be installed on this circuit.
- In 2017, a new single-phase recloser will be installed.

12 Circuit 29502 -- LEDGEDALE 95-02

Performance Analysis

The LEDGEDALE 95-02 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On October 28, 2015, during a period of heavy rain, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,944 customers for up to 134 minutes resulting in 202,789 CMI.

On October 29, 2015, during a period of heavy rain, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,941 customers for up to 386 minutes resulting in 402,133 CMI.

In total, the LEDGEDALE 95-02 circuit had 38 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (19); animal contacts (10); nothing found (4); other (3); equipment failure (2).

Remedial Actions

- In 2016, multiple recloser controllers were upgraded with new controls.
- In 2016, FISR was activated on this circuit.
- In 2016, additional tap fusing will be installed at several locations.
- In 2016, additional animal guarding locations are being evaluated for this circuit.
- In 2016, additional tree trimming right of way will be pursued.
- In 2017, full circuit tree trimming will be performed.
- In 2018, a tie line will be automated to improve reliability.

13 Circuit 25801 -- SULLIVAN TRAIL 58-01

Performance Analysis

The SULLIVAN TRAIL 58-01 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On December 29, 2015, during a period of ice/sleet/snow, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 633 customers for up to 333 minutes resulting in 210,789 CMI.

On June 13, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a sectionalizing device to be interrupted. This outage affected 1,674 customers for up to 421 minutes resulting in 157,956 CMI.

In total, the SULLIVAN TRAIL 58-01 circuit had 46 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (22); animal contacts (11); equipment failure (9); vehicles (2); nothing found (1); other (1).

Remedial Actions

- In 2016, full circuit tree trimming was performed.
- In 2016, FISR was activated on this circuit.
- In 2016, a three-phase solid-blade disconnect switch was installed.
- In 2016, a new sectionalizing device with remote operational capability will be installed on this circuit as part of the Smart Grid initiative.
- In 2016, a manual switch will be replaced with a sectionalizing device with remote operational capability as part of the Smart Grid Initiative.
- In 2016, automating two reclosers will be evaluated.
- In 2018, a three-phase solid-blade disconnect switch installation is being evaluated for this circuit.
- In 2018, locations for fault indicators on the SULLIVAN TRAIL 58-01 line were identified to improve troubleshooting during outages.

14 Circuit 40602 -- PINE GROVE 06-02

Performance Analysis

The PINE GROVE 06-02 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On April 4, 2016, during a period of heavy rain, a vehicle made contact with a pole causing a circuit breaker to trip to lockout. This outage affected 196 customers for up to 535 minutes resulting in 104,860 CMI.

On June 16, 2016, an animal interfered with a substation component causing a circuit breaker to trip to lockout. This outage affected 2,279 customers for up to 157 minutes resulting in 318,038 CMI.

In total, the PINE GROVE 06-02 circuit had 32 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (13); animal contacts (8); equipment failure (6); vehicles (3); nothing found (1); other (1).

Remedial Actions

- In 2015, a tie between the PINE GROVE 06-02 and PINE GROVE 06-05 circuits was installed.
- In 2015, two three-phase automated reclosers were installed.
- In 2015, multiple locations had fuses installed.
- In 2016, full circuit tree trimming was performed.
- In 2016, single-phase fusing will be installed at three locations.
- In 2016, upgrading the substation will be evaluated.
- In 2016, FISR was activated on this circuit.
- In 2016, installing a recloser will be evaluated.
- In 2016, building a tie PINE GROVE-01 will be evaluated.
- In 2017, the substation will have animal guarding installed.

15 Circuit 16102 -- BINGEN 61-02

Performance Analysis

The BINGEN 61-02 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On February 24, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 598 customers for up to 1,026 minutes resulting in 529,864 CMI.

In total, the BINGEN 61-02 circuit had 25 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (10); equipment failure (9); animal contacts (3); contact or dig in (1); nothing found (1); vehicles (1).

Remedial Actions

- In 2016, FISR was activated on this circuit.
- In 2016, two switches will be evaluated for upgrade to protective devices.
- In 2016, fusing will be installed at five locations.
- In 2016, fusing or disconnect switches will be evaluated for two three-phase locations.
- In 2016, a project to transfer customers on a long single-phase radial tap to the BINGEN 61-01 will be investigated.
- In 2017, an automated normally open switch will be installed as part of the Smart Grid Initiative.

16 Circuit 46004 -- BERWICK 60-04

Performance Analysis

The BERWICK 60-04 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On April 30, 2016, a vehicle made contact with a pole causing a recloser to trip to lockout. This outage affected 1,102 customers for up to 192 minutes resulting in 173,871 CMI.

On May 8, 2016, an equipment failure occurred on a pole or pole arm causing a recloser to trip to lockout. This outage affected 1,115 customers for up to 364 minutes resulting in 405,860 CMI.

In total, the BERWICK 60-04 circuit had 27 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (15); equipment failure (7); animal contacts (3); nothing found (1); vehicles (1).

Remedial Actions

- In 2016, an infrared scan was completed.
- In 2016, FISR was activated on this circuit.
- In 2016, single-phase fusing will be evaluated.
- In 2016, hot spot tree trimming will be evaluated.
- In 2016, building a tie line between the BERWICK 60-04 and the BERWICK 60-02 will be evaluated.

17 Circuit 18502 -- CANADENSIS 85-02

Performance Analysis

The CANADENSIS 85-02 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On April 3, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 2,279 customers for up to 2,313 minutes resulting in 170,034 CMI.

On April 3, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 296 customers for up to 676 minutes resulting in 200,051 CMI.

In total, the CANADENSIS 85-02 circuit had 78 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (38); equipment failure (14); animal contacts (13); nothing found (11); other (1); vehicles (1).

Remedial Actions

- In 2016, several switches and fault indicators were installed.
- In 2016, FISR was activated on this circuit.
- In 2016, full circuit tree trimming was performed.
- In 2016, an Expanded Operational Review will be performed.
- In 2016, two sections of single-phase will be relocated to more accessible locations.

18 Circuit 24602 -- VARDEN 46-02

Performance Analysis

The VARDEN 46-02 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On November 19, 2015, a vehicle contact occurred causing a recloser to trip to lockout. This outage affected 2,099 customers for up to 105 minutes resulting in 168,665 CMI.

On April 3, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a load break fuse to operate. This outage affected 53 customers for up to 2,321 minutes resulting in 122,999 CMI.

In total, the VARDEN 46-02 circuit had 54 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (22); equipment failure (13); animal contacts (7); nothing found (5); other (4); vehicles (3).

Remedial Actions

- In 2015, two sectionalizing devices with remote operational capability were installed as part of the Smart Grid Initiative.
- In 2015, single-phase fuses were added in multiple locations.
- In 2015, a three-phase disconnect switch was added.
- In 2015 and 2016, multi-phase fusing was added.
- In 2016, FISR was activated on this circuit.
- In 2016, a visual line patrol will be performed.
- In 2016, a section of single-phase line will be relocated to a more accessible location.
- In 2017, a sectionalizing device with remote operational capability will be installed as part of the Smart Grid Initiative.

19 Circuit 28804 -- LAKEVILLE 88-04

Performance Analysis

The LAKEVILLE 88-04 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On April 3, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 153 customers for up to 797 minutes resulting in 121,876 CMI.

In total, the LAKEVILLE 88-04 circuit had 52 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (25); animal contacts (17); equipment failure (4); nothing found (4); other (2).

Remedial Actions

- In 2015, full circuit tree trimming was performed.
- In 2016, FISR was activated on this circuit.
- In 2016, hot spot trimming will be performed.
- In 2016, a single-phase sectionalizing device installation is being evaluated.

20 Circuit 56801 -- BENVENUE 68-01

Performance Analysis

The BENVENUE 68-01 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On December 3, 2015, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 917 customers for up to 269 minutes resulting in 227,791 CMI.

On April 3, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a load break fuse to operate. This outage affected 1,635 customers for up to 913 minutes resulting in 196,860 CMI.

In total, the BENVENUE 68-01 circuit had 43 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (21); animal contacts (10); equipment failure (9); nothing found (2); vehicles (1).

Remedial Actions

- In 2015, several cross arms were replaced.
- In 2016, a communicating vacuum recloser was installed as part of the Smart Grid initiative.
- In 2016, full circuit tree trimming will be performed.
- In 2016, FISR was activated on this circuit.
- In 2016, the addition of a reliability substation will be evaluated.
- In 2017, a communicating vacuum recloser will be installed and single-phase tripping will be enabled.
- In 2017, two additional communicating devices will be installed as part of the Smart Grid Initiative.
- In 2017, several transformer cutouts will be replaced.

21 Circuit 10903 -- COOPERSBURG 09-03

Performance Analysis

The COOPERSBURG 09-03 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On March 28, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 211 customers for up to 1,106 minutes resulting in 167,107 CMI.

On April 3, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 210 customers for up to 931 minutes resulting in 171,997 CMI.

In total, the COOPERSBURG 09-03 circuit had 27 outages between July 2015 and June 2016, with the causes breaking down as follows: equipment failure (9); tree related (9); animal contacts (7); vehicles (2).

Remedial Actions

- In 2015, full circuit tree trimming was performed.
- In 2016, FISR was activated on this circuit.
- In 2016, single-phase fusing will be installed.
- In 2016, three locations will be evaluated for three-phase fusing or disconnect switches.
- In 2016, acceleration of a hydraulic device replacement with an automated device will be investigated.
- In 2018, a new Smart Grid device will be installed on this circuit as part of the Smart Grid initiative.

22 Circuit 25402 -- LAKE HARMONY 54-02

Performance Analysis

The LAKE HARMONY 54-02 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On February 24, 2016, during a period of strong wind, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 908 customers for up to 361 minutes resulting in 279,133 CMI.

On February 24, 2016, during a period of strong wind, a tree made contact with an overhead splice causing a recloser to trip to lockout. This outage affected 182 customers for up to 855 minutes resulting in 155,473 CMI.

In total, the LAKE HARMONY 54-02 circuit had 44 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (20); equipment failure (10); animal contacts (8); nothing found (4); other (1); vehicles (1).

Remedial Actions

- In 2015, an Expanded Operation Review was conducted with various minor items remediated.
- In 2016, protection settings were reviewed and modified for improved coordination.
- In 2016, FISR was activated on this circuit.
- In 2016, an additional tie line will be evaluated.
- In 2017, a Smart Grid device will be added to this circuit.
- In 2018, full circuit tree trimming will be performed.

23 Circuit 28803 -- LAKEVILLE 88-03

Performance Analysis

The LAKEVILLE 88-03 circuit experienced three outages of over 100,000 CMI between July 2015 and June 2016.

On September 28, 2015, an unidentified issue occurred with an underground component causing a recloser to trip to lockout. This outage affected 610 customers for up to 233 minutes resulting in 142,142 CMI.

On March 28, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 688 customers for up to 299 minutes resulting in 205,257 CMI.

On April 3, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 687 customers for up to 993 minutes resulting in 142,539 CMI.

In total, the LAKEVILLE 88-03 circuit had 45 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (20); animal contacts (10); equipment failure (9); nothing found (5); other (1).

Remedial Actions

- In 2016, thirty-six porcelain transformer fuse cutouts were replaced.
- In 2016, FISR was activated on this circuit.
- In 2017, full circuit tree trimming will be completed.
- In 2017, an automated recloser will be installed.

24 Circuit 20403 -- ASHFIELD 04-03

Performance Analysis

The ASHFIELD 04-03 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On February 24, 2016, during a period of heavy rain, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 1,857 customers for up to 720 minutes resulting in 339,456 CMI.

In total, the ASHFIELD 04-03 circuit had 38 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (15); equipment failure (11); animal contacts (7); nothing found (3); other (1); vehicles (1).

Remedial Actions

- In 2015, single-phase fusing was installed at multiple locations.
- In 2016, feeding a long span of radial single-phase line from a different source will be evaluated.
- In 2016, a framing issue was remediated.
- In 2016, FISR was activated on this circuit.
- In 2017, single-phase fusing will be installed at multiple locations.
- In 2017, three-phase fusing will be installed at one location.

25 Circuit 20401 -- ASHFIELD 04-01

Performance Analysis

The ASHFIELD 04-01 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On April 3, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 962 customers for up to 558 minutes resulting in 485,589 CMI.

In total, the ASHFIELD 04-01 circuit had 28 outages between July 2015 and June 2016, with the causes breaking down as follows: animal contacts (14); tree related (7); equipment failure (5); nothing found (1); vehicles (1).

Remedial Actions

- In 2016, FISR was activated on this circuit.
- In 2016, full circuit tree trimming will be performed.
- In 2016, single-phase fusing locations will be evaluated.
- In 2016, a tie line will be evaluated for the ASHFIELD 04-01.
- In 2017, ten additional single-phase fuses will be installed.
- In 2017, a recloser will be installed as part of the Smart Grid Initiative.
- In 2018, a single-phase recloser will be relocated and a fuse installed.
- In 2018, a fuse will be replaced with a recloser.

26 Circuit 42401 -- GIRARD MANOR 24-01

Performance Analysis

The GIRARD MANOR 24-01 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On October 28, 2015, during a period of heavy rain, an unidentified issue occurred with an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 727 customers for up to 196 minutes resulting in 142,492 CMI.

On October 28, 2015, during a period of strong wind, an unidentified issue occurred with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,072 customers for up to 1,090 minutes resulting in 435,964 CMI.

In total, the GIRARD MANOR 24-01 circuit had 21 outages between July 2015 and June 2016, with the causes breaking down as follows: animal contacts (6); equipment failure (5); tree related (5); nothing found (2); other (2); vehicles (1).

Remedial Actions

- In 2015, full circuit tree trimming was performed.
- In 2015, three-phase fusing was installed in one location.
- In 2016, FISR was activated on this circuit.
- In 2016, an existing sectionalizing device will be automated as part of the Smart Grid Initiative.
- In 2016, an Expanded Operational Review will be performed.
- In 2016, a full substation rebuild will be performed.
- In 2016, hazard tree trimming will be performed.
- In 2018, a new manual switch will be installed on a section of three-phase line to improve sectionalizing capabilities.

27 Circuit 47102 -- MARLIN 71-02

Performance Analysis

The MARLIN 71-02 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On May 18, 2016, an unidentified issue occurred with an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 4,992 customers for up to 112 minutes resulting in 540,480 CMI.

In total, the MARLIN 71-02 circuit had seven outages between July 2015 and June 2016, with the causes breaking down as follows: animal contacts (2); equipment failure (2); nothing found (1); other (1); vehicles (1).

Remedial Actions

- At the time of the transmission outage referenced above, this circuit was abnormally configured – it is now back in normal configuration.
- In 2016, FISR was activated on this circuit.
- In 2016, additional single-phase fusing will be evaluated for multiple locations.
- In 2016, additional three-phase fusing will be evaluated for one location.

28 Circuit 64201 -- KINZER 42-01

Performance Analysis

The KINZER 42-01 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On December 27, 2015, during a period of heavy rain, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 771 customers for up to 223 minutes resulting in 103,855 CMI.

On January 28, 2016, a vehicle made contact with a pole causing a recloser to trip to lockout. This outage affected 770 customers for up to 444 minutes resulting in 133,752 CMI.

In total, the KINZER 42-01 circuit had 23 outages between July 2015 and June 2016, with the causes breaking down as follows: equipment failure (11); tree related (4); vehicles (4); animal contacts (2); nothing found (1); other (1).

Remedial Actions

- In 2015, a recloser was replaced with an automated vacuum recloser with additional animal guarding.
- In 2015, a tie line was built between the KINZER 42-01 line and the KINZER 42-02.
- In 2016, a new sectionalizing device will be installed on this circuit.
- In 2016, FISR was activated on this circuit.
- In 2016, improved tie line capabilities will be evaluated for this circuit.
- In 2017, single-phase fuses will be added at multiple locations.
- In 2017, a manual switch will be replaced with an automated vacuum recloser as part of the Smart Grid Initiative.

29 Circuit 28801 -- LAKEVILLE 88-01

Performance Analysis

The LAKEVILLE 88-01 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On April 3, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 698 customers for up to 195 minutes resulting in 135,823 CMI.

In total, the LAKEVILLE 88-01 circuit had 43 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (18); animal contacts (16); equipment failure (7); nothing found (2).

Remedial Actions

- In 2016, FISR was activated on this circuit.
- In 2016, full circuit tree trimming will be performed.
- In 2016, a single-phase sectionalizing device installation will be evaluated.
- In 2017, two three-phase reclosers will be installed as part of the Smart Grid Initiative.

30 Circuit 44904 -- SCOTT 49-04

Performance Analysis

The SCOTT 49-04 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On October 28, 2015, an unidentified issue occurred with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 2,043 customers for up to 763 minutes resulting in 429,978 CMI.

In total, the SCOTT 49-04 circuit had 17 outages between July 2015 and June 2016, with the causes breaking down as follows: other (4); tree related (4); animal contacts (3); equipment failure (2); nothing found (2); vehicles (2).

Remedial Actions

- In 2015, Bloomsburg University service was moved to another circuit which transferred load from the SCOTT 49-02 to the BLOOMSBURG 77-06.
- In 2015, the underground getaway for this circuit was replaced with a new over-head getaway.
- In 2016, FISR was activated on this circuit.
- In 2017, full circuit tree trimming will be performed.

31 Circuit 61801 -- EAST ELIZABETHTOWN 18-01

Performance Analysis

The EAST ELIZABETHTOWN 18-01 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On January 25, 2016, an equipment failure occurred on an overhead splice causing a circuit breaker to trip to lockout. This outage affected 744 customers for up to 479 minutes resulting in 203,691 CMI.

On April 2, 2016, during a period of strong wind, a tree made contact with an underground conductor causing an interruption. This outage affected 201 customers for up to 2,296 minutes resulting in 311,471 CMI.

In total, the EAST ELIZABETHTOWN 18-01 circuit had 31 outages between July 2015 and June 2016, with the causes breaking down as follows: equipment failure (14); animal contacts (6); tree related (6); other (2); vehicles (2); nothing found (1).

Remedial Actions

- In 2015, all aluminum crimps on copper conductor were replaced on three-phase lines.
- In 2016, an additional sectionalizing device will be installed in a heavily wooded area.
- In 2016, single-phase fuses were added at multiple locations.
- In 2016, FISR was activated on this circuit.
- In 2016, a section of single-phase line will be evaluated for re-sourcing.
- In 2016, a tie line will be built between EAST ELIZABETHTOWN 18-01 and RHEEMS 60-01 lines.
- In 2016, 1.5 miles of copper conductor will be reconducted.
- In 2016, a new sectionalizing device will be installed near the substation.
- In 2017, additional single-phase fusing will be added at multiple locations.
- In 2017, two manual switches will be replaced with automated vacuum reclosers as part of the Smart Grid Initiative.

32 Circuit 27403 -- KEYSER AVENUE 74-03

Performance Analysis

The KEYSER AVENUE 74-03 circuit experienced three outages of over 100,000 CMI between July 2015 and June 2016.

On October 12, 2015, a vehicle contact occurred causing a recloser to trip to lockout. This outage affected 1,203 customers for up to 245 minutes resulting in 113,611 CMI.

On October 29, 2015, during a period of strong wind, an unidentified issue occurred with an overhead switch causing a recloser to trip to lockout. This outage affected 1,203 customers for up to 125 minutes resulting in 124,872 CMI.

On February 24, 2016, during a period of strong wind, an equipment failure occurred on an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 666 customers for up to 210 minutes resulting in 139,700 CMI.

In total, the KEYSER AVENUE 74-03 circuit had 12 outages between July 2015 and June 2016, with the causes breaking down as follows: equipment failure (7); nothing found (2); other (2); vehicles (1).

Remedial Actions

- In 2016, FISR was activated on this circuit.
- In 2016, additional fusing opportunities will be installed.
- In 2016, an automated recloser will be installed to operate as a tie point.
- In 2017, an automated recloser will be installed.
- In 2018, an automated recloser will be installed to operate as a tie point.
- In 2018, a tie line between the CEDAR AVENUE 15-01 and KEYSER AVENUE 74-03 circuits will be completed.
- In 2019, full circuit tree trimming will be performed.

33 Circuit 26402 -- INDIAN ORCHARD 64-02

Performance Analysis

The INDIAN ORCHARD 64-02 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On April 3, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 507 customers for up to 292 minutes resulting in 109,768 CMI.

In total, the INDIAN ORCHARD 64-02 circuit had 49 outages between July 2015 and June 2016, with the causes breaking down as follows: equipment failure (18); tree related (16); animal contacts (9); nothing found (5); other (1).

Remedial Actions

- In 2016, FISR was activated on this circuit.
- In 2016, the addition of a single-phase recloser is being evaluated.
- In 2017, a section of single-phase line will be relocated to a more accessible area and reconductored.
- In 2017, a project is planned to relocate 30 customers to another line.
- In 2019, a new reliability substation build is planned.

34 Circuit 58402 -- MOUNT ROCK 84-02

Performance Analysis

The MOUNT ROCK 84-02 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On April 2, 2016, during a period of strong wind, a tree made contact with a pole or pole arm causing a circuit breaker to trip to lockout. This outage affected 1,547 customers for up to 1,013 minutes resulting in 340,157 CMI.

In total, the MOUNT ROCK 84-02 circuit had 36 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (11); equipment failure (10); animal contacts (5); nothing found (4); contact or dig in (2); other (2); vehicles (2).

Remedial Actions

- In 2016, FISR was activated on this circuit.
- In 2016, a section of line received infrared inspection.
- In 2016, hot spot tree trimming will be performed on this circuit.
- In 2016, additional fusing will be installed on this circuit.

35 Circuit 14801 -- TREICHLERS 48-01

Performance Analysis

The TREICHLERS 48-01 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On April 3, 2016, during a period of strong wind, a tree made contact with an overhead switch causing a recloser to trip to lockout. This outage affected 1,415 customers for up to 206 minutes resulting in 246,156 CMI.

In total, the TREICHLERS 48-01 circuit had 43 outages between July 2015 and June 2016, with the causes breaking down as follows: animal contacts (18); tree related (11); equipment failure (6); nothing found (6); other (1); vehicles (1).

Remedial Actions

- In 2016, FISR was activated on this circuit.
- In 2016, an automated device was installed as part of the Smart Grid Initiative.
- In 2016, a project to relocate a section of three spans of inaccessible line will be investigated.
- In 2016, replacement of a manual airbreak with an automated device will be investigated.
- In 2016, additional animal guarding will be investigated.
- In 2017, a new automated device will be installed as part of the Smart Grid Initiative.

36 Circuit 27502 -- WEISSPORT 75-02

Performance Analysis

The WEISSPORT 75-02 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

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

In total, the WEISSPORT 75-02 circuit had 17 outages between July 2015 and June 2016, with the causes breaking down as follows: animal contacts (6); tree related (5); equipment failure (2); other (2); nothing found (1); vehicles (1).

Remedial Actions

- In 2015, an Expanded Operational Review was performed. Several improvements were identified and completed.
- In 2015, a river crossing pole was remediated.
- In 2016, FISR was activated on this circuit.
- In 2016, the conductor crossing the river between East Jim Thorpe and West Jim Thorpe will be rebuilt. The wood pole structure will be replaced with steel poles, and the existing conductor will be upgraded to a heavier conductor.

37 Circuit 46001 -- BERWICK 60-01

Performance Analysis

The BERWICK 60-01 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On December 30, 2015, a vehicle made contact with a pole causing a recloser to trip to lockout. This outage affected 949 customers for up to 546 minutes resulting in 262,392 CMI.

In total, the BERWICK 60-01 circuit had 32 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (12); equipment failure (7); animal contacts (6); vehicles (4); nothing found (3).

Remedial Actions

- In 2015, one new remotely operable sectionalizing device was added and one hydraulic switch was replaced with a recloser.
- In 2016, FISR was activated on this circuit.
- In 2016, full circuit tree trimming will be performed.
- In 2016, a tie line to the BERWICK 60-03 will be evaluated.
- In 2017, a hydraulic recloser will be replaced with a triple-single recloser.
- In 2017, two new remotely operable sectionalizing devices will be added to this circuit.

38 Circuit 40201 -- BEAR GAP 02-01

Performance Analysis

The BEAR GAP 02-01 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On August 18, 2015, an unidentified issue occurred with a pole or pole arm causing a recloser to trip to lockout. This outage affected 1,642 customers for up to 475 minutes resulting in 168,936 CMI.

In total, the BEAR GAP 02-01 circuit had 53 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (30); equipment failure (9); nothing found (7); animal contacts (5); other (1); vehicles (1).

Remedial Actions

- In 2015, full circuit tree trimming was performed.
- In 2015, a new sectionalizing device with remote operational capability was installed as part of the Smart Grid Initiative.
- In 2015, single and three-phase fusing was installed in multiple locations.
- In 2016, FISR was activated on this circuit.
- In 2016, a single-phase recloser was replaced.
- In 2016, a manual sectionalizing switch was replaced with an automated vacuum recloser as part of the Smart Grid Initiative.
- In 2016, a solid-blade disconnect is being evaluated for a long span of single-phase.

39 Circuit 63304 -- GREENLAND 33-04

Performance Analysis

The GREENLAND 33-04 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On May 29, 2016, an equipment failure occurred on an overhead conductor causing a recloser to trip to lockout. This outage affected 2,644 customers for up to 279 minutes resulting in 397,091 CMI.

In total, the GREENLAND 33-04 circuit had 8 outages between July 2015 and June 2016, with the causes breaking down as follows: equipment failure (5); animal contacts (1); contact or dig in (1); other (1).

Remedial Actions

- In 2016, a new tie line was installed between the GREENLAND 33-04 and the GREENLAND 33-01 lines.
- In 2016, FISR was activated on this circuit.
- In 2016, the GREENLAND 33-04 getaway will be replaced.
- In 2017, two new Smart Grid devices will be added to this circuit, and one existing device will be upgraded to a Smart Grid device.
- In 2018, full circuit tree trimming will be performed.

40 Circuit 16402 -- MOUNT POCONO 64-02

Performance Analysis

The MOUNT POCONO 64-02 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On April 3, 2016, during a period of strong wind, an equipment failure occurred on a pole or pole arm causing a recloser to trip to lockout. This outage affected 142 customers for up to 1,608 minutes resulting in 106,402 CMI.

In total, the MOUNT POCONO 64-02 circuit had 65 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (38); equipment failure (10); animal contacts (9); nothing found (5); vehicles (3).

Remedial Actions

- In 2015, an Expanded Operational Review was performed.
- In 2016, a section of difficult-to-access line was relocated to a more accessible location, and reconnected.
- In 2016, FISR was activated on this circuit.
- In 2016, a section of line was reconnected to remove copper conductor.
- In 2016, full circuit tree trimming will be performed.

41 Circuit 16801 -- WAGNERS 68-01

Performance Analysis

The WAGNERS 68-01 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

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

In total, the WAGNERS 68-01 circuit had 34 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (23); equipment failure (8); animal contacts (2); nothing found (1).

Remedial Actions

- In 2015, single-phase fuses were added at multiple locations.
- In 2015, a switch was reprogrammed to function as a protective device.
- In 2015, the WAGNERS substation was upgraded to improve reliability and make the substation less susceptible to transmission outages.
- In 2016, FISR was activated on this circuit.
- In 2016, single-phase fuses will be added at two locations.
- In 2017, additional single-phase reclosers will be added to this circuit.
- In 2018, full circuit tree trimming will be performed.
- In 2019, a new line and terminal project is planned which will reduce exposure and customer counts on this circuit.

42 Circuit 59002 -- MIFFLINTOWN 90-02

Performance Analysis

The MIFFLINTOWN 90-02 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On December 18, 2015, a vehicle contact occurred causing a recloser to trip to lockout. This outage affected 876 customers for up to 246 minutes resulting in 142,958 CMI.

In total, the MIFFLINTOWN 90-02 circuit had 49 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (23); equipment failure (14); animal contacts (7); vehicles (3); nothing found (2).

Remedial Actions

- In 2015, several aluminum crimps on copper conductor were replaced.
- In 2016, FISR was activated on this circuit.
- In 2016, additional fusing was installed at several locations.
- In 2016, capacitors on this circuit will be upgraded.
- In 2016, full circuit tree trimming will be performed.
- In 2016, the addition of a three-phase recloser will be investigated.
- In 2019, an existing three-phase hydraulic recloser will be upgraded as part of the Smart Grid Initiative.

43 Circuit 67804 -- WEST LANCASTER 78-04

Performance Analysis

The WEST LANCASTER 78-04 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On July 20, 2015, an equipment failure occurred on an underground conductor causing a circuit breaker to trip to lockout. This outage affected 2,030 customers for up to 77 minutes resulting in 101,545 CMI.

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

In total, the WEST LANCASTER 78-04 circuit had 11 outages between July 2015 and June 2016, with the causes breaking down as follows: equipment failure (5); animal contacts (3); tree related (2); nothing found (1).

Remedial Actions

- In 2015, all aluminum crimps on copper conductor were replaced on three-phase lines.
- In 2015, two reclosers were replaced with automated vacuum reclosers as part of the Smart Grid Initiative.
- In 2015, single-phase fuses were added at multiple locations.
- In 2016, FISR was activated on this circuit.
- In 2016, underground cable curing was performed on the development that experienced the failure on 7/20/2015.
- In 2017, full circuit tree trimming will be performed.
- In 2017, a new Smart Grid device will be installed on this circuit.
- In 2017, a manual switch will be replaced with an automated vacuum recloser as part of the Smart Grid Initiative.

44 Circuit 45501 -- DERRY 55-01

Performance Analysis

The DERRY 55-01 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On October 28, 2015, an equipment failure occurred on an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,430 customers for up to 158 minutes resulting in 225,539 CMI.

In total, the DERRY 55-01 circuit had 41 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (13); equipment failure (9); animal contacts (8); nothing found (6); vehicles (3); other (2).

Remedial Actions

- In 2015, a new manual disconnect switch was installed at the head of a radial tap.
- In 2015, a new sectionalizing device with remote operational capability was installed as part of the Smart Grid Initiative.
- In 2016, FISR was activated on this circuit.
- In 2016, additional fusing will be installed.
- In 2016, solid blade disconnects will be installed on a three-phase tap.
- In 2016, an Expanded Operational Review will be conducted.
- In 2017, full circuit tree trimming will be performed.
- In 2017, 500 feet of new single-phase will be built to replace a section of difficult-to-access conductor.
- In 2017, a new recloser will be installed.

45 Circuit 41801 -- GOWEN CITY 18-01

Performance Analysis

The GOWEN CITY 18-01 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On February 16, 2016, during a period of strong wind, an equipment failure occurred on a pole or pole arm causing a recloser to trip to lockout. This outage affected 389 customers for up to 550 minutes resulting in 159,239 CMI.

On February 24, 2016, during a period of heavy rain, a tree made contact with an overhead switch causing a recloser to trip to lockout. This outage affected 387 customers for up to 1,547 minutes resulting in 184,411 CMI.

In total, the GOWEN CITY 18-01 circuit had 24 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (8); animal contacts (6); equipment failure (6); nothing found (2); contact or dig in (1); vehicles (1).

Remedial Actions

- In 2016, full circuit tree trimming was performed.
- In 2016, FISR was activated on this circuit.
- In 2016, a non-communicating sectionalizing device was replaced with an automated vacuum recloser as part of the Smart Grid Initiative.
- In 2016, single-phase fusing will be installed at multiple locations.
- In 2016, a recloser was replaced.
- In 2016, cross arms and poles were replaced at multiple locations.

46 Circuit 43401 -- BENTON 34-01

Performance Analysis

The BENTON 34-01 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On October 28, 2015, an equipment failure occurred on an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 989 customers for up to 160 minutes resulting in 157,607 CMI.

On April 3, 2016, during a period of strong wind, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 622 customers for up to 338 minutes resulting in 209,962 CMI.

In total, the BENTON 34-01 circuit had 27 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (9); equipment failure (7); animal contacts (4); nothing found (4); other (3).

Remedial Actions

- In 2015, a visual line patrol was performed.
- In 2015, a tie line was constructed.
- In 2015, an Expanded Operational Review was performed
- In 2016, FISR was activated on this circuit.
- In 2016, an existing device will be evaluated for replacement with an OCR.
- In 2016, an additional OCR installation will be evaluated.

47 Circuit 42601 -- TUSCARORA 26-01

Performance Analysis

The TUSCARORA 26-01 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On October 28, 2015, during a period of strong wind, an unidentified issue occurred with a pole or pole arm causing a circuit breaker to trip to lockout. This outage affected 2,163 customers for up to 429 minutes resulting in 286,122 CMI.

On February 24, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 598 customers for up to 1,415 minutes resulting in 114,933 CMI.

In total, the TUSCARORA 26-01 circuit had 18 outages between July 2015 and June 2016, with the causes breaking down as follows: equipment failure (9); tree related (5); animal contacts (2); other (2).

Remedial Actions

- In 2015, SCADA was installed at the substation.
- In 2016, an existing disconnect switch was automated as part of the Smart Grid Initiative.
- In 2016, FISR was activated on this circuit.
- In 2016, additional single-phase fusing will be evaluated.
- In 2017, single-phase fusing will be installed at 11 locations.
- In 2018, full circuit tree trimming will be performed.

48 Circuit 55001 -- NEWPORT 50-01

Performance Analysis

The NEWPORT 50-01 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On March 28, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,700 customers for up to 100 minutes resulting in 108,609 CMI.

In total, the NEWPORT 50-01 circuit had 45 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (26); equipment failure (16); animal contacts (2); nothing found (1).

Remedial Actions

- In 2016, a line patrol was performed on this circuit. Various minor repairs were remediated. Repairs/ upgrades made to several sectionalizing devices
- In 2016, FISR was activated on this circuit.
- In 2016, an infrared inspection will be performed on this circuit.
- In 2016, an Expanded Operational Review will be performed.
- In 2016, additional fusing will be evaluated for this circuit.

49 Circuit 13103 -- NORTHAMPTON 31-03

Performance Analysis

The NORTHAMPTON 31-03 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On January 23, 2016, during a period of ice/sleet/snow, an equipment failure occurred on a pole or pole arm causing a recloser to trip to lockout. This outage affected 1,845 customers for up to 245 minutes resulting in 378,868 CMI.

In total, the NORTHAMPTON 31-03 circuit had eight outages between July 2015 and June 2016, with the causes breaking down as follows: equipment failure (5); contact or dig in (1); nothing found (1); vehicles (1).

Remedial Actions

- In 2015, full circuit tree trimming was performed.
- In 2016, FISR was activated on this circuit.
- In 2016, additional fusing will be installed.
- In 2016, additional Smart Grid devices will be evaluated for this circuit.
- In 2017, a tie line will be constructed to the NORTHAMPTON 31-02, and two additional Smart Grid devices will be added.

50 Circuit 46206 -- DANVILLE 62-06

Performance Analysis

The DANVILLE 62-06 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On February 26, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 305 customers for up to 540 minutes resulting in 164,517 CMI.

In total, the DANVILLE 62-06 circuit had 37 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (21); equipment failure (7); animal contacts (6); nothing found (1); other (1); vehicles (1).

Remedial Actions

- In 2016, FISR was activated on this circuit.
- In 2016, full circuit tree trimming will be performed.
- In 2016, a triple-single recloser will be installed.
- In 2016, the addition of a reliability substation will be investigated.
- In 2016, a tie line between the DANVILLE 62-06 and DANVILLE 62-02 circuits, on the transmission crossing, will be evaluated.

51 Circuit 21901 -- HUMBOLDT 19-01

Performance Analysis

The HUMBOLDT 19-01 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On October 9, 2015, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,661 customers for up to 79 minutes resulting in 130,504 CMI.

On May 21, 2016, during a period of heavy rain, a vehicle made contact with a pole causing a circuit breaker to trip to lockout. This outage affected 2,487 customers for up to 480 minutes resulting in 116,435 CMI.

In total, the HUMBOLDT 19-01 circuit had 34 outages between July 2015 and June 2016, with the causes breaking down as follows: equipment failure (13); tree related (13); animal contacts (5); nothing found (2); vehicles (1).

Remedial Actions

- In 2016, a line inspection was performed. Several minor items were identified and immediately remediated.
- In 2016, FISR was activated on this circuit.
- In 2016, single-phase fuses will be installed at five locations.
- In 2016, an Expanded Operational Review will be completed.

52 Circuit 26001 -- WEST DAMASCUS 60-01

Performance Analysis

The WEST DAMASCUS 60-01 circuit experienced no outages of over 100,000 CMI between July 2015 and June 2016.

In total, the WEST DAMASCUS 60-01 circuit had 60 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (24); equipment failure (13); animal contacts (9); nothing found (7); other (5); contact or dig in (1); vehicles (1).

Remedial Actions

- In 2016, FISR was activated on this circuit.
- In 2016, additional fusing will be added at several locations.
- In 2017, full circuit tree trimming will be performed.
- In 2018, several cross-arms, switches, and lightning arrestors will be replaced.

53 Circuit 22003 -- BOHEMIA 20-03

Performance Analysis

The BOHEMIA 20-03 circuit experienced no outages of over 100,000 CMI between July 2015 and June 2016.

In total, the BOHEMIA 20-03 circuit had 52 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (22); animal contacts (17); equipment failure (8); nothing found (5).

Remedial Actions

- In 2016, FISR was activated on this circuit.
- In 2016, hot spot tree trimming is being evaluated.
- In 2016, additional fusing locations are being evaluated.
- In 2016, obtaining additional tree trimming right of way will be investigated.
- In 2018, full circuit tree trimming will be performed.

54 Circuit 67401 -- WAKEFIELD 74-01

Performance Analysis

The WAKEFIELD 74-01 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On February 24, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a load break fuse to operate. This outage affected 81 customers for up to 1,373 minutes resulting in 100,603 CMI.

On February 24, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 158 customers for up to 1,228 minutes resulting in 110,723 CMI.

In total, the WAKEFIELD 74-01 circuit had 37 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (18); equipment failure (12); animal contacts (3); other (2); nothing found (1); vehicles (1).

Remedial Actions

- In 2015, single-phase fuses were added in multiple locations.
- In 2015, a single-phase recloser and several new load break disconnect switches were installed.
- In 2016, FISR was activated on this circuit.
- In 2015, all aluminum crimps on copper conductor were replaced on the three-phase line.
- In 2016, a new tie line was constructed between the WAKEFIELD 74-01 and WAKEFIELD 74-02 circuits.
- In 2016, single-phase fuses will be added at multiple locations.
- In 2017, full circuit tree trimming will be performed.
- In 2017, four new Smart Grid devices will be installed on this circuit.

55 Circuit 42201 -- SHENANDOAH 22-01

Performance Analysis

The SHENANDOAH 22-01 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On October 28, 2015, during a period of heavy rain, an unidentified issue occurred with an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,724 customers for up to 66 minutes resulting in 113,473 CMI.

On November 11, 2015, an equipment failure occurred on an overhead switch causing a recloser to trip to lockout. This outage affected 1,026 customers for up to 608 minutes resulting in 176,378 CMI.

In total, the SHENANDOAH 22-01 circuit had 24 outages between July 2015 and June 2016, with the causes breaking down as follows: animal contacts (8); tree related (8); equipment failure (4); nothing found (2); other (2).

Remedial Actions

- In 2015, additional fusing was installed on several three-phase taps.
- In 2016, additional fusing was installed on single-phase taps.
- In 2016, FISR was activated on this circuit.
- In 2016, animal guarding installations will be installed in multiple locations.
- In 2017, a new manual switch will be installed on a section of single and three-phase line to improve sectionalizing capabilities.
- In 2017, full circuit tree trimming will be performed.
- In 2017, fusing will be installed in multiple locations.
- In 2017, a difficult-to-access section of line will be relocated to a more accessible location.

56 Circuit 17001 -- RIDGE ROAD 70-01

Performance Analysis

The RIDGE ROAD 70-01 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On December 19, 2015, an equipment failure occurred on an overhead conductor. This outage affected 775 customers for up to 311 minutes resulting in 108,873 CMI.

On December 24, 2015, an equipment failure occurred on an overhead conductor causing a recloser to trip to lockout. This outage affected 782 customers for up to 237 minutes resulting in 113,298 CMI.

In total, the RIDGE ROAD 70-01 circuit had 55 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (30); equipment failure (11); animal contacts (7); nothing found (5); vehicles (2).

Remedial Actions

- In 2016, a protection review on the circuit was performed and modifications to device settings were made.
- In 2016, FISR was activated on this circuit.
- In 2016, full circuit tree trimming will be performed.
- In 2016, additional fusing will be installed on this circuit.
- In 2016, a project to extend single-phase and transfer customers to a more reliable section of line will be evaluated.
- In 2016, a project to reconductor a section of line will be evaluated.
- In 2016, additional hazard tree trimming will be evaluated.

57 Circuit 64802 -- MOUNT NEBO 48-02

Performance Analysis

The MOUNT NEBO 48-02 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On September 30, 2015, during a period of heavy rain, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 579 customers for up to 8 minutes resulting in 101,900 CMI.

In total, the MOUNT NEBO 48-02 circuit had 38 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (24); equipment failure (8); animal contacts (4); nothing found (1); vehicles (1).

Remedial Actions

- In 2016, FISR was activated on this circuit.
- In 2016, additional fusing will be added at several additional locations.
- In 2016, an existing manual device will be replaced with a remotely operable device.
- In 2016, an additional three-phase sectionalizing device will be added to this circuit.

58 Circuit 17802 -- GILBERT 78-02

Performance Analysis

The GILBERT 78-02 circuit experienced two outages of over 100,000 CMI between July 2015 and June 2016.

On August 30, 2015, an equipment failure occurred on an overhead conductor causing a recloser to trip to lockout. This outage affected 596 customers for up to 222 minutes resulting in 132,729 CMI.

On September 13, 2015, during a period of heavy rain, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 596 customers for up to 191 minutes resulting in 114,324 CMI.

In total, the GILBERT 78-02 circuit had 55 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (28); equipment failure (12); animal contacts (7); nothing found (5); other (2); vehicles (1).

Remedial Actions

- In 2015, an Expanded Operational Review was conducted. As a result several cross-arms and switches were replaced.
- In 2016, FISR was activated on this circuit.
- In 2016, full circuit tree trimming will be performed.
- In 2016, automated switching by the FISR system will go live on this circuit.
- In 2018, a section of difficult-to-access line will be relocated and reconductored.

59 Circuit 26401 -- INDIAN ORCHARD 64-01

Performance Analysis

The INDIAN ORCHARD 64-01 circuit experienced no outages of over 100,000 CMI between July 2015 and June 2016.

In total, the INDIAN ORCHARD 64-01 circuit had 86 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (40); animal contacts (23); equipment failure (16); nothing found (4); other (2); vehicles (1).

Remedial Actions

- In 2016, FISR was activated on this circuit.
- In 2016, an automated recloser will be installed to operate as a tie point.
- In 2017, a section of difficult-to-access single-phase line will be relocated and reconductored.
- In 2019, full circuit tree trimming will be performed.

60 Circuit 28604 -- BLYTHEBURN 86-04

Performance Analysis

The BLYTHEBURN 86-04 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On June 5, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 396 customers for up to 501 minutes resulting in 111,225 CMI.

In total, the BLYTHEBURN 86-04 circuit had 50 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (21); animal contacts (14); equipment failure (7); nothing found (6); contact or dig in (2).

Remedial Actions

- In 2015, full circuit tree trimming was performed.
- In 2015, single-phase fusing was installed at multiple locations.
- In 2016, FISR was activated on this circuit.
- In 2016, additional fusing and animal guarding locations will be evaluated.
- In 2016, an Expanded Operational Review will be performed.
- In 2017, a new manual switch will be installed on a section of three-phase line to improve sectionalizing capabilities.
- In 2018, a section of difficult-to-access single-phase will be relocated and fed from a different source.

61 Circuit 23401 -- HONESDALE 34-01

Performance Analysis

The HONESDALE 34-01 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On January 10, 2016, during a period of heavy rain, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 739 customers for up to 151 minutes resulting in 111,034 CMI.

In total, the HONESDALE 34-01 circuit had 52 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (19); animal contacts (13); equipment failure (12); nothing found (5); other (2); vehicles (1).

Remedial Actions

- In 2016, FISR was activated on this circuit.
- In 2016, several locations for fusing are being evaluated.
- In 2016, the installation of a load break disconnect will be evaluated.
- In 2017, full circuit tree trimming will be performed.

62 Circuit 16803 -- WAGNERS 68-03

Performance Analysis

The WAGNERS 68-03 circuit experienced one outage of over 100,000 CMI between July 2015 and June 2016.

On August 19, 2015, an equipment failure occurred on an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 3,514 customers for up to 71 minutes resulting in 249,423 CMI.

In total, the WAGNERS 68-03 circuit had 43 outages between July 2015 and June 2016, with the causes breaking down as follows: tree related (29); equipment failure (9); animal contacts (4); nothing found (1).

Remedial Actions

- In 2015, the WAGNERS substation was converted to a more reliable type.
- In 2016, FISR was activated on this circuit.
- In 2017, full circuit tree trimming will be performed.
- In 2017, an Expanded Operational Review will be performed.

5) *A rolling 12-month breakdown and analysis of outage causes during the preceding quarter, including the number and percentage of service outages, the number of customers interrupted, and customer interruption minutes categorized by outage cause such as equipment failure, animal contact, tree related, and so forth. Proposed solutions to identified service problems shall be reported.*

The following table shows a breakdown of service interruption causes for the 12 months ended at the current quarter. PPL Electric's maintenance programs focus on corrective actions to address controllable service interruptions (e.g., trees and equipment failure).

Cause Description	Trouble Cases	Percent of Trouble Cases	Customer Interruptions	Percent of Customer Interruptions	Customer Minutes	Percent of Customer Minutes
Animals	3,878	23.4%	56,474	5.6%	3,972,828	3.3%
Contact / Dig-In	168	1.0%	18,250	1.8%	1,012,524	0.8%
Directed by Non-PPL Authority	247	1.5%	22,321	2.2%	2,188,774	1.8%
Equipment Failures	4,881	29.5%	303,240	30.0%	31,487,402	26.4%
Improper Design	3	0.0%	1,856	0.2%	245,849	0.2%
Improper Installation	1	0.0%	28	0.0%	3,662	0.0%
Improper Operation	3	0.0%	916	0.1%	223,515	0.2%
Nothing Found	1,192	7.2%	64,155	6.4%	4,992,917	4.2%
Other Controllable	100	0.6%	10,987	1.1%	318,465	0.3%
Other Non Control	247	1.5%	49,945	4.9%	4,578,968	3.8%
Other Public	66	0.4%	11,139	1.1%	1,329,213	1.1%
Tree Related	5,034	30.4%	327,563	32.4%	54,518,695	45.7%
Vehicles	746	4.5%	142,924	14.2%	14,486,921	12.1%
Total	16,566	100.0%	1,009,798	100.0%	119,359,733	100.0%

Analysis of causes contributing to the majority of service interruptions:

Weather Conditions: PPL Electric records weather conditions, such as wind or lightning, as contributing factors to service interruptions, but does not code them as direct interruption causes. Therefore, some fluctuations in cause categories, especially tree- and equipment-related causes, are attributable to weather variations. For the current reporting period, weather was considered a significant contributing cause in 40% of cases, 45% of customer interruptions, and 57% of CMI.

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

Animals: Animals accounted for approximately 23% 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 80% 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 37% of the cases of trouble, 33% of the customer interruptions and 37% of the customer minutes attributed to equipment failure were weather-related and, as such, are not considered to be strong indicators of equipment condition or performance.

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

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

Inspection & Maintenance Goals/Objectives	Annual Budget	2nd Quarter		Year-to-date	
		Budget	Actual	Budget	Actual
Transmission					
Transmission C-tag poles (# of poles)	195	14	14	20	20
Transmission arm replacements (# of sets)	150	20	20	20	20
Transmission air break switch inspections (# of switches)	78	20	0	39	2
Transmission lightning arrester installations (# of sets)	1,716	803	704	1,103	1,212
Transmission structure inspections (# of structures)	1,862	783	880	783	880
Transmission tree side trim-Bulk Power (linear feet)	N/A				
Transmission herbicide-Bulk Power (# of acres)	N/A				
Transmission reclearing (# of miles) BES Only	326	0	0	326	321
Transmission reclearing (# of miles) 69 kV	769	214	307	303	627
Transmission reclearing (# of miles) 138 kV	59	17	21	22	40
Transmission danger tree removals-Bulk Power (# of trees)	N/A				
Substation					
Substation batteries (# of activities)	654	64	65	483	492
Circuit breakers (# of activities)	579	231	158	321	384
Substation inspections (# of activities)	4,545	1,074	1,077	2,421	2,427
Transformer maintenance (# of activities)	1,430	319	330	739	671

Inspection & Maintenance Goals/Objectives	Annual Budget	1st Quarter		Year-to-date	
		Budget	Actual	Budget	Actual
Distribution					
Distribution C-tag poles replaced (# of poles)	1,424	412	388	673	728
C-truss distribution poles (# of poles)	4,325	1,079	1,122	1,349	1,392
Capacitor (MVAR added)	25	5	13	10	18
OCR Replacements (# of)	99	47	59	96	91
Distribution pole inspections (# of poles)	68,237	17,320	15,729	17,320	15,729
Distribution line inspections (hours)	12,944	2,000	2,509	6,511	6,148
Group re-lamping (# of lamps)	16,151	5,850	6,321	7,650	7,533
Test sections of underground distribution cable	N/A	263	263	436	436
Distribution tree trimming (# of miles)	6,123	1,673	1,846	3,206	3,518
Distribution herbicide (# of acres)	N/A				
Distribution >18" removals within R/W (# of trees)	N/A				
Distribution hazard tree removals outside R/W (# of trees)	N/A				
LTN manhole inspections (# of)	553	143	120	344	326
LTN vault inspections (# of)	821	21	17	42	43
LTN network protector overhauls (# of)	91	25	22	35	32
LTN reverse power trip testing (# of)	51	201	183	436	423

- 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.*

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

Activity	2nd Quarter		Year-to-date	
	Budget (\$000)	Actual (\$000)	Budget (\$000)	Actual (\$000)
Provide Electric Service	1,533	1,777	3,007	3,533
Vegetation Management	14,943	16,915	26,324	30,033
Customer Response	17,317	15,964	30,123	31,282
Reliability Maintenance	12,347	11,269	25,136	22,583
System Upgrade	741	1,500	1,370	3,594
Customer Service/Accounts	29,229	28,408	58,094	57,202
Others	10,704	11,579	21,296	23,390
Total O&M Expenses	86,813	87,412	165,351	171,617

- 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.*

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

Activity	1st Quarter		Year-to-date	
	Budget (\$000)	Actual (\$000)	Budget (\$000)	Actual (\$000)
New Service/Revenue	21,707	15,673	44,865	38,795
System Upgrade	127,546	98,522	261,923	194,886
Reliability & Maintenance	99,092	85,835	222,035	178,617
Customer Response	2,859	3,027	4,440	6,200
Other	6,840	7,111	13,294	12,375
Total	258,044	210,167	546,557	430,872

- 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	66
Journeyman Lineman	230
Journeyman Lineman-Trainee	31
Helper	7
Groundhand	6
Troubleman	51
T&D Total	391
Electrical	
Elect Leaders-UG	5
Elect Leaders-Net	9
Elect Leaders-Sub	25
Journeyman Elect-UG	18
Journeyman Elect-Net	33
Journeyman Elect-Sub	58
Journeyman Elect Trainee-UG	3
Journeyman Elect Trainee-Net	3
Journeyman Elect Trainee-Sub	24
Helper	0
Laborer-Network	0
Laborer-Substation	0
Electrical Total	178
Overall Total	569

PPL Electric Utilities Corporation

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

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

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

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Job Descriptions

Transmission and Distribution

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

Appendix B

Electrical

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

Appendix B

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