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FEDERAL EXPRESS

January 31, 2018

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 December 31, 2017
Docket No. ~~L-00030161~~ 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 December 31, 2017. Also enclosed, in a sealed envelope, is a copy of the report containing competitively sensitive and proprietary information. The Company hereby requests that the Commission treat that information, and the report containing the information, as privileged and confidential. The report is being filed pursuant to 52 Pa. Code § 57.195(d).

Pursuant to 52 Pa. Code § 1.11, the enclosed document is to be deemed filed on January 31, 2018, 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,

Kimberly A. Klock

Enclosures

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

bc: G. N. Dudkin - Email
K. Frazier - Email
S. Raymond - Email
B. Dainauski - Email
D. Bonenberger - Email
C. Lauver - Email
S. Gelatko - Email

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PPL Electric Utilities

PPL Electric Utilities Corporation

Quarterly Reliability Report

to the

Pennsylvania Public Utility Commission

January 2018

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

There were no major events during the fourth quarter of 2017.

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 December 31, 2017.

SAIFI (Benchmark = 0.98; Rolling 12-month Std. = 1.18)	0.71
CAIDI (Benchmark = 145; Rolling 12-month Std. = 174)	146
SAIDI (Benchmark = 142; Rolling 12-month Std. = 205)	104
MAIFI[1]	6.5
Average Number of Customers Served[2]	1,417,978
Number of Sustained Customer Interruptions (Trouble Cases)	17,388
Number of Customers Affected[3]	1,009,780
Customer Minutes of Interruptions (CMI)	147,223,228
Number of Customer Momentary Interruptions	9,178,611

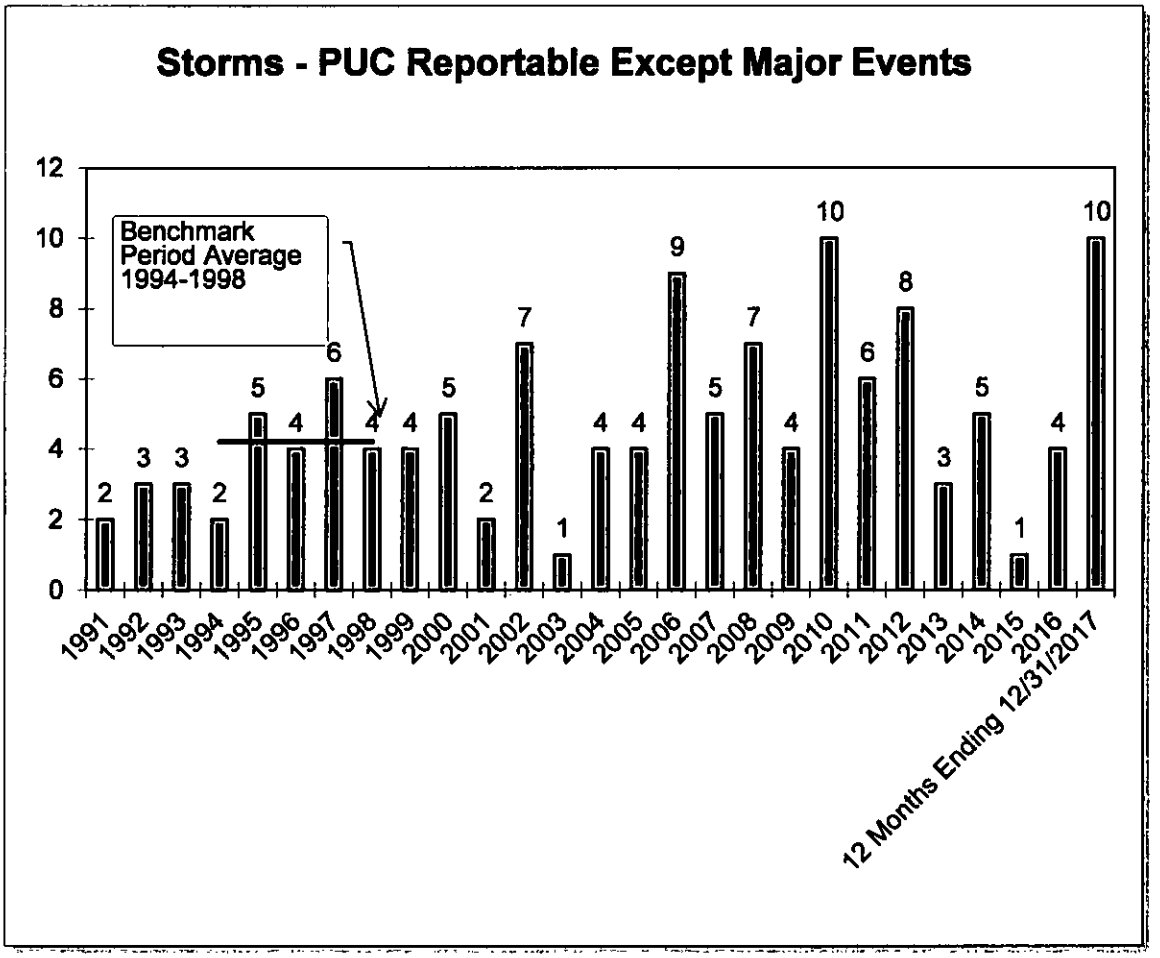
During the fourth quarter, there were no (0) PUC major events, two (2) PUC reportable events, and three (3) other storms that required the opening of one or more area emergency centers to manage restoration efforts.

[1] MAIFI data is obtained at the substation breaker level and at certain reclosers. Because PPL Electric is enhancing its ability to identify momentaries, this metric is expected to increase in the near term.

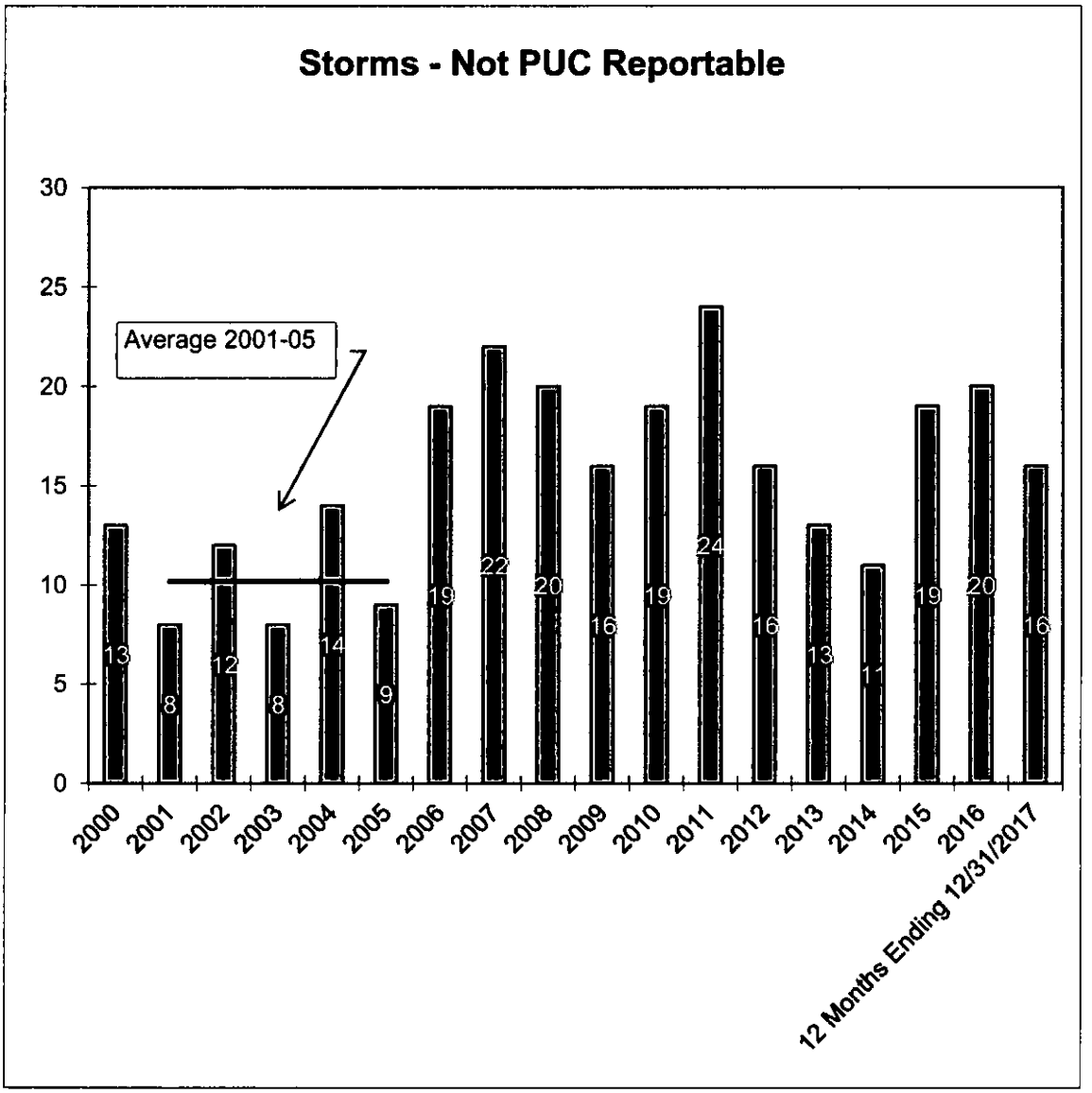
[2] PPL Electric calculates the annual indices using customers served at the end of period. This is consistent with the method used to calculate PPL Electric's benchmarks.

[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.

During the 12-month reporting period, there were no (0) PUC major events and ten (10) PUC-reportable storms other than major events.



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



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

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

WPC Rank	Feeder ID	SAIDI	CAIDI	SAIFI	MAIFI	Customers	Cases of Trouble	Customer Minutes Interrupted (CMI)
1	46602	1789	707	2.5	16.3	1,435	87	2,566,757
2	40902	895	585	1.5	26.0	2,317	70	2,072,697
3	40603	1352	388	3.5	9.9	1,410	41	1,906,681
4	26604	730	154	4.7	5.7	2,418	75	1,765,388
5	42201	1014	364	2.8	7.7	1,731	35	1,755,543
6	47001	609	419	1.5	14.3	2,487	78	1,513,888
7	45702	769	602	1.3	22.0	1,669	74	1,283,564
8	65802	652	296	2.2	19.4	1,898	41	1,237,340
9	42001	704	494	1.4	13.2	1,660	62	1,168,044
10	54101	648	157	4.1	12.2	1,587	47	1,028,992
11	26602	1394	338	4.1	9.1	687	24	957,868
12	43108	955	480	2.0	22.6	987	30	943,075
13	54504	661	111	6.0	23.6	1,427	5	942,635
14	52403	691	169	4.1	12.5	1,257	57	868,477
15	28602	446	234	1.9	5.2	1,934	18	863,108
16	24602	555	526	1.1	2.4	1,518	36	841,731
17	26603	758	316	2.4	4.9	1,105	52	837,436
18	53501	386	276	1.4	11.1	2,139	46	826,529
19	47704	590	139	4.3	6.9	1,383	49	816,390
20	67702	1054	377	2.8	10.5	768	18	809,440
21	41701	783	364	2.2	2.0	996	50	780,191
22	43504	366	349	1.0	1.5	2,009	18	734,358
23	44203	383	120	3.2	2.0	1,873	38	717,145
24	40101	335	192	1.7	9.4	2,129	40	713,556
25	58702	321	213	1.5	4.2	2,200	12	706,140

WPC Rank	Feeder ID	SAIDI	CAIDI	SAIFI	MAIFI	Customers	Cases of Trouble	Customer Minutes Interrupted (CMI)
26	64304	510	278	1.8	16.7	1,361	21	693,553
27	56504	349	239	1.5	8.5	1,985	85	693,054
28	67605	437	422	1.0	26.5	1,580	41	690,112
29	59301	474	345	1.4	11.8	1,445	54	684,743
30	26703	356	207	1.7	4.2	1,892	58	673,577
31	46504	346	213	1.6	1.0	1,940	45	671,692
32	43102	667	260	2.6	5.1	990	22	659,922
33	46801	598	385	1.6	11.1	1,102	40	658,869
34	59202	382	142	2.7	12.4	1,718	77	656,111
35	52401	498	214	2.3	18.1	1,311	79	653,376
36	46702	512	209	2.5	8.5	1,274	42	652,914
37	52004	545	260	2.1	8.9	1,165	52	634,356
38	51304	709	432	1.6	5.9	894	13	633,686
39	40702	617	222	2.8	10.1	1,014	18	625,662
40	25501	365	243	1.5	14.3	1,659	50	606,051
41	16005	532	384	1.4	7.0	1,138	24	605,029
42	44301	293	111	2.6	14.9	2,052	54	600,494
43	29701	531	341	1.6	4.1	1,129	25	599,943
44	13503	406	406	1.0	18.1	1,458	28	591,815
45	65702	323	367	0.9	20.6	1,827	40	590,675
46	55002	230	192	1.2	13.6	2,552	94	586,664
47	52402	350	150	2.3	23.3	1,672	76	585,405
48	41202	397	559	0.7	4.7	1,457	61	577,937
49	26401	262	335	0.8	24.3	2,177	79	571,099
50	59402	640	693	0.9	3.9	871	31	557,507
51	46506	342	265	1.3	22.8	1,622	45	554,555
52	53601	493	122	4.0	7.6	1,103	38	543,930
53	56501	229	218	1.1	6.7	2,359	39	541,240
54	22003	373	126	3.0	1.0	1,442	43	537,495
55	55001	417	219	1.9	22.7	1,289	86	537,158
56	59002	236	220	1.1	10.2	2,272	63	535,569
57	53602	238	175	1.4	28.3	2,182	87	519,780
58	56802	337	156	2.2	33.6	1,512	41	509,776
59	24901	223	223	1.0	11.2	2,281	54	507,704
60	59401	285	110	2.6	7.0	1,769	51	504,300
61	64302	472	952	0.5	8.5	1,064	29	502,571
62	66102	250	126	2.0	23.5	2,011	17	501,895

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

01 Circuit 46602 -- LARRYS CREEK 66-02

Performance Analysis

The LARRYS CREEK 66-02 circuit experienced four outages of over 100,000 CMI between January 2017 and December 2017.

On April 22, 2017, a vehicle made contact with a pole causing a recloser to trip to lockout. This outage affected 845 customers for up to 348 minutes resulting in 278,593 CMI.

On May 1, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 67 customers for up to 1,820 minutes resulting in 121,898 CMI.

On May 1, 2017, during a period of heavy rain, a tree made contact with a pole or pole arm causing a motor operated switch to be interrupted. This outage affected 312 customers for up to 3,902 minutes resulting in 624,942 CMI.

On August 4, 2017, 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 842 customers for up to 1,909 minutes resulting in 1,133,615 CMI.

In total, the LARRYS CREEK 66-02 circuit had 87 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (54); animal contacts (13); equipment failure (12); nothing found (4); vehicles (3); other (1).

Remedial Actions

- In 2017, hazard tree removal was performed on this circuit.
- In 2017, animal guarding was installed at 11 locations.
- In 2017, two sections of single-phase were relocated to more accessible locations.
- In 2017, several capacitor bank controllers were automated.
- In 2018, twelve additional locations will be animal guarded.
- In 2018, two fuse cutouts will be replaced.
- In 2018, two existing devices will be replaced with Smart Grid devices.
- In 2019, a section of difficult-to-access single-phase line will be relocated.

02 Circuit 40902 -- JERSEY SHORE 09-02

Performance Analysis

The JERSEY SHORE 09-02 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On May 1, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,678 customers for up to 3,517 minutes resulting in 1,782,473 CMI.

On October 30, 2017, 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 581 customers for up to 195 minutes resulting in 113,254 CMI.

In total, the JERSEY SHORE 09-02 circuit had 70 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (39); equipment failure (12); animal contacts (11); nothing found (3); vehicles (3); other (2).

Remedial Actions

- In 2017, full circuit tree trimming was performed.
- In 2017, an Expanded Operational Review was performed.
- In 2017 and 2018, seventeen porcelain cutouts were or will be replaced.
- In 2018, five additional locations will receive fusing.
- In 2018, a section of single-phase is being evaluated for splitting into two separate sections.
- In 2018, eight additional animal guards will be installed on this circuit.
- In 2018, an additional Smart Grid recloser will be added to this circuit.
- In 2018, a project to move a section of this circuit to another source will be evaluated.
- In 2018, an additional single phase recloser will be evaluated for this circuit.
- In 2019, two new Smart Grid devices will be added to this circuit.
- In 2019, eight additional locations will receive fusing.
- In 2019, a section of difficult-to-access conductor will be relocated to a more accessible location.

03 Circuit 40603 -- PINE GROVE 06-03

Performance Analysis

The PINE GROVE 06-03 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On October 29, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 348 customers for up to 927 minutes resulting in 214,067 CMI.

On November 8, 2017, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 3,691 customers for up to 469 minutes resulting in 1,557,570 CMI.

In total, the PINE GROVE 06-03 circuit had 41 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (25); equipment failure (8); animal contacts (3); other (2); vehicles (2); nothing found (1).

Remedial Actions

- In 2017, the substation was upgraded, and animal guarding was installed.
- In 2018, new Smart fault indicators will be evaluated.
- In 2017, an Expanded Operational Review was performed. As a result several minor pieces of equipment were replaced and 10 additional locations were fused.
- In 2018, a tie will be evaluated for this circuit.
- In 2018, rebuilding a section of two phase to three phase and resourcing a section of single phase will be evaluated.
- In 2019, a new Smart Grid tie will be added to this circuit.

04 Circuit 26604 -- BROOKSIDE 66-04

Performance Analysis

The BROOKSIDE 66-04 circuit experienced three outages of over 100,000 CMI between January 2017 and December 2017.

On March 10, 2017, an equipment failure occurred on an overhead switch causing a circuit breaker to trip to lockout. This outage affected 2,432 customers for up to 31 minutes resulting in 282,479 CMI.

On June 19, 2017, a tree made contact with a pole or pole arm causing a circuit breaker to trip to lockout. This outage affected 2,419 customers for up to 61 minutes resulting in 139,481 CMI.

On July 24, 2017, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 2,422 customers for up to 977 minutes resulting in 887,484 CMI.

In total, the BROOKSIDE 66-04 circuit had 75 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (38); equipment failure (17); animal contacts (14); nothing found (3); other (3).

Remedial Actions

- In 2017, an existing three-phase recloser was reprogrammed to single-phase operation.
- In 2018, two fuses will be installed on this circuit.
- In 2018, a motor operated air break will be replaced with a recloser as part of the Smart Grid Initiative.
- In 2018, several porcelain cutouts will be replaced with polymer cutouts.
- In 2018, a project to build a new reliability substation will be evaluated.
- In 2018, additional animal guarding locations will be evaluated for this circuit.
- In 2020, full circuit trimming will be performed.

05 Circuit 42201 -- SHENANDOAH 22-01

Performance Analysis

The SHENANDOAH 22-01 circuit experienced three outages of over 100,000 CMI between January 2017 and December 2017.

On January 23, 2017, 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 1,730 customers for up to 536 minutes resulting in 471,587 CMI.

On May 31, 2017, during a period of heavy rain, an equipment failure occurred on an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,723 customers for up to 654 minutes resulting in 752,188 CMI.

On August 5, 2017, 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 1,022 customers for up to 454 minutes resulting in 464,672 CMI.

In total, the SHENANDOAH 22-01 circuit had 35 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (14); equipment failure (11); animal contacts (3); nothing found (3); other (2); vehicles (2).

Remedial Actions

- In 2017, a hydraulic circuit recloser was replaced.
- In 2017, a targeted circuit line patrol was performed. As a result, several actions were completed, including additional hot spot tree trimming.
- In 2017, full circuit tree trimming was performed.
- In 2017, an existing hydraulic recloser was upgraded to a Smart Grid device, and a new hydraulic recloser was installed.
- In 2017, three off-cycle pole reviews were completed and replacements identified.
- In 2017, tap fuses were installed at three locations.
- In 2018, two additional locations will receive fusing.
- In 2018, two non-communicating devices will be replaced with Smart Grid devices.

- In 2018, a section of difficult to access conductor will be relocated.
- In 2018, distribution under-build on the transmission line will be evaluated.
- In 2019, a new Smart Grid device will be installed.
- In 2019, a section of difficult to access conductor will be relocated to a more accessible location.

06 Circuit 47001 -- HUGHESVILLE 70-01

Performance Analysis

The HUGHESVILLE 70-01 circuit experienced three outages of over 100,000 CMI between January 2017 and December 2017.

On May 1, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,105 customers for up to 2,621 minutes resulting in 371,749 CMI.

On May 5, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 823 customers for up to 1,863 minutes resulting in 615,887 CMI.

On November 19, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 572 customers for up to 386 minutes resulting in 220,557 CMI.

In total, the HUGHESVILLE 70-01 circuit had 78 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (41); equipment failure (18); animal contacts (9); nothing found (5); other (3); contact or dig in (1); vehicles (1).

Remedial Actions

- In 2017, several devices were upgraded to remote operability to expedite sectionalizing capability.
- In 2017, additional fusing was installed.
- In 2018, an existing device will be upgraded to a Smart Grid device.
- In 2018, an Expanded Operational Review will be performed on this circuit.
- In 2018, nine fuse cut-outs will be replaced.
- In 2018, hazard danger tree removal will be evaluated for this circuit.
- In 2018, remediations will be evaluated for a group of customers in a wooded area at the far end of the circuit.
- In 2019, a section of single phase line will be reconductored.
- In 2019, two sections of difficult-to-access conductor will be relocated to more accessible locations.

07 Circuit 45702 -- LINDEN 57-02

Performance Analysis

The LINDEN 57-02 circuit experienced six outages of over 100,000 CMI between January 2017 and December 2017.

On May 1, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 99 customers for up to 2,088 minutes resulting in 123,237 CMI.

On May 1, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a load break fuse to operate. This outage affected 65 customers for up to 1,928 minutes resulting in 118,249 CMI.

On May 1, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a load break fuse to operate. This outage affected 40 customers for up to 3,389 minutes resulting in 110,647 CMI.

On May 1, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 110 customers for up to 1,371 minutes resulting in 138,447 CMI.

On May 1, 2017, 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 226 customers for up to 2,623 minutes resulting in 364,403 CMI.

On November 19, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing an interruption. This outage affected 453 customers for up to 292 minutes resulting in 132,271 CMI.

In total, the LINDEN 57-02 circuit had 74 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (42); equipment failure (17); animal contacts (9); nothing found (3); other (2); vehicles (1).

Remedial Actions

- In 2017, additional animal guarding was installed at several locations.
- In 2017, additional fusing was installed at five locations.
- In 2018, full circuit tree trimming will be performed.
- In 2018, two additional Smart Grid reclosers will be added to this circuit.
- In 2019, additional animal guarding will be installed on this circuit.

08 Circuit 65802 -- ROHRERSTOWN 58-02

Performance Analysis

The ROHRERSTOWN 58-02 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On September 5, 2017, during a period of heavy rain, a tree made contact with a pole or pole arm causing a circuit breaker to trip to lockout. This outage affected 1,882 customers for up to 1,915 minutes resulting in 762,240 CMI.

On December 3, 2017, a vehicle made contact with a pole causing a recloser to trip to lockout. This outage affected 459 customers for up to 555 minutes resulting in 122,583 CMI.

In total, the ROHRERSTOWN 58-02 circuit had 41 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (22); equipment failure (7); animal contacts (5); vehicles (4); nothing found (2); other (1).

Remedial Actions

- In 2017, an Expanded Operational Review was performed. As a result, five locations received additional fusing.
- In 2017, a load break disconnect switch was installed.
- In 2017, the protection scheme for the circuit breaker was modified to reduce customer exposure to momentary outages.
- In 2018, full circuit tree trimming will be performed.
- In 2018, an existing switch will be converted to a protective device and the circuit will be reconfigured.
- In 2018, fusing will be installed at four additional locations.
- In 2018, infrared scanning will be performed.
- In 2018, two additional load break switches will be installed.
- In 2018, a section of difficult-to-access conductor will be evaluated for relocation to a more accessible location.

09 Circuit 42001 -- MONTOURSVILLE 20-01

Performance Analysis

The MONTOURSVILLE 20-01 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On May 1, 2017, 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 1,658 customers for up to 2,871 minutes resulting in 1,047,841 CMI.

In total, the MONTOURSVILLE 20-01 circuit had 62 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (28); animal contacts (15); equipment failure (14); nothing found (3); other (1); vehicles (1).

Remedial Actions

- In 2017, full circuit tree trimming was performed.
- In 2017, an Expanded Operational Review was performed. As a result, five additional fuses and five additional animal guards will be installed in 2018, and two transformer cutouts will be replaced.
- In 2017, additional fusing was installed on this circuit at six locations.
- In 2017, several fuse cutouts were replaced on this circuit.
- In 2018, additional animal guarding will be installed on this circuit.
- In 2018, an existing device will be upgraded to a Smart Grid device.
- In 2019, two sections of difficult-to-access conductor will be relocated to a more accessible location.

10 Circuit 54101 -- S SHERMANSDALE 41-01

Performance Analysis

The S SHERMANSDALE 41-01 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On February 12, 2017, during a period of strong wind, a tree made contact with an overhead transmission component causing a recloser to trip to lockout. This outage affected 1,578 customers for up to 110 minutes resulting in 173,580 CMI.

On February 12, 2017, 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 1,577 customers for up to 1,165 minutes resulting in 504,959 CMI.

In total, the S SHERMANSDALE 41-01 circuit had 47 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (26); equipment failure (10); animal contacts (5); nothing found (4); contact or dig in (1); vehicles (1).

Remedial Actions

- In 2017, two single-phase reclosers were replaced.
- In 2017, one three-phase recloser was upgraded to a Smart Grid device.
- In 2017, an Expanded Operational Review was performed.
- In 2017, full circuit tree trimming was performed.
- In 2017, a new single-phase recloser was installed.
- In 2018, additional series fusing will be evaluated.
- In 2018, a tie point will be evaluated for automation on this circuit.
- In 2019, a tie point will be automated on this circuit
- In 2019, a recloser will be upgraded to a Smart Grid device.

- In 2018, a new line and terminal will be evaluated for construction at the substation.

11 Circuit 26602 -- BROOKSIDE 66-02

Performance Analysis

The BROOKSIDE 66-02 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On July 24, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,468 customers for up to 1,682 minutes resulting in 743,686 CMI.

In total, the BROOKSIDE 66-02 circuit had 24 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (14); equipment failure (7); nothing found (2); other (1).

Remedial Actions

- In 2017, a tie to the BROOKSIDE 66-03 was constructed.
- In 2017, additional porcelain cutouts were replaced with polymer cutouts.
- In 2018, an additional Smart Grid device will be installed.
- In 2018, section of conductor will be refed to an alternate source.
- In 2018, hot spot trimming will be evaluated.
- In 2018, several porcelain cutouts will be replaced with polymer cutouts.
- In 2019, full circuit tree trimming will be performed.

12 Circuit 43108 -- SOUTH MILTON 31-08

Performance Analysis

The SOUTH MILTON 31-08 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On March 27, 2017, an equipment failure occurred on an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 987 customers for up to 624 minutes resulting in 615,888 CMI.

On August 19, 2017, during a period of strong wind, a tree made contact with a pole or pole arm causing a load break disconnect switch to be interrupted. This outage affected 151 customers for up to 862 minutes resulting in 130,127 CMI.

In total, the SOUTH MILTON 31-08 circuit had 30 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (17); equipment failure (6); animal contacts (5); nothing found (1); other (1).

Remedial Actions

- In 2017, a targeted circuit patrol was performed, resulting in several lightning arrestors being replaced.
- In 2017, several protective settings at the circuit breaker and several downstream reclosers were changed.
- In 2017, a recloser was upgraded to a Smart Grid device.
- In 2017, a new single-phase recloser was installed.
- In 2017, an Expanded Operational Review was performed.
- In 2018, full circuit tree trimming will be performed.
- In 2019, a new tie line will be constructed for this circuit.
- In 2019, two sections of difficult-to-access conductor will be relocated to more accessible locations.

13 Circuit 54504 – ENOLA 45-04

Performance Analysis

The ENOLA 45-04 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On August 4, 2017, during a period of lightning, an equipment failure occurred on a substation component causing a circuit breaker to trip to lockout. This outage affected 8,195 customers for up to 637 minutes resulting in 913,677 CMI.

In total, the ENOLA 45-04 circuit had 11 outages between January 2017 and December 2017, with the causes breaking down as follows: equipment failure (5); animal contacts (4); other (1); tree related (1).

Remedial Actions

- In 2017, the circuit breakers in this substation were overhauled and repaired to maintain reliability.
- In 2018, the getaway for this circuit will be replaced.
- In 2020, the substation will receive circuit breaker replacements and Smart relaying installations to improve performance.

14 Circuit 52403 -- GREEN PARK 24-03

Performance Analysis

The GREEN PARK 24-03 circuit experienced three outages of over 100,000 CMI between January 2017 and December 2017.

On February 12, 2017, during a period of strong wind, a tree made contact with an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,257 customers for up to 121 minutes resulting in 152,210 CMI.

On August 11, 2017, 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 1,150 customers for up to 179 minutes resulting in 125,756 CMI.

On October 30, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 500 customers for up to 678 minutes resulting in 160,366 CMI.

In total, the GREEN PARK 24-03 circuit had 57 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (39); equipment failure (12); nothing found (3); vehicles (2); animal contacts (1).

Remedial Actions

- In 2017, additional fusing was installed at multiple locations.
- In 2017, circuit breaker relays were upgraded at the GREEN PARK substation.
- In 2018, relocating a section of difficult-to-access single-phase will be evaluated.
- In 2018, full circuit tree trimming will be performed.
- In 2018, additional fusing will be evaluated for this circuit.
- In 2018, a single-phase section of this circuit will be evaluated for a re-conductoring.

15 Circuit 28602 -- BLYTHEBURN 86-02

Performance Analysis

The BLYTHEBURN 86-02 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On January 22, 2017, during a period of heavy rain, a vehicle made contact with a pole causing a circuit breaker to trip to lockout. This outage affected 1,933 customers for up to 581 minutes resulting in 516,687 CMI.

On July 24, 2017, 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 345 customers for up to 609 minutes resulting in 166,436 CMI.

In total, the BLYTHEBURN 86-02 circuit had 18 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (13); equipment failure (2); vehicles (2); contact or dig in (1).

Remedial Actions

- In 2017, five additional taps were fused.
- In 2017, a load break switch was installed to improve sectionalizing capability.
- In 2017, an existing three-phase recloser was upgraded to a telemetric recloser.
- In 2017, a new tie between this circuit and the WRIGHT 36-04 was evaluated.
- In 2018, a three-phase automatic recloser will be installed as part of the Smart Grid Initiative.
- In 2018, three additional switches will be installed on this circuit.
- In 2018, a tie to the BLYTHEBURN 86-04 will be evaluated.
- In 2019, a smart grid device will replace a normally open air break switch.

16 Circuit 24602 -- VARDEN 46-02

Performance Analysis

The VARDEN 46-02 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On July 20, 2017, 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 345 customers for up to 1,699 minutes resulting in 482,867 CMI.

In total, the VARDEN 46-02 circuit had 36 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (19); animal contacts (9); equipment failure (7); contact or dig in (1).

Remedial Actions

- In 2018, two new load break disconnects will be installed.
- In 2018, sections of single and two phase conductor will be reviewed for protection strategy.
- In 2018, a motor operated air break switch will have Smart fault indicators installed as part of the Smart Grid Initiative.
- In 2018, full circuit tree trimming will be performed.
- In 2020, a section of single phase conductor will be relocated closer to the road to reduce exposure to vegetation.

17 Circuit 26603 -- BROOKSIDE 66-03

Performance Analysis

The BROOKSIDE 66-03 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On July 24, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 984 customers for up to 1,536 minutes resulting in 431,166 CMI.

In total, the BROOKSIDE 66-03 circuit had 52 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (29); equipment failure (14); animal contacts (3); nothing found (2); other (2); improper operation (1); vehicles (1).

Remedial Actions

- In 2017, a three phase recloser was replaced.
- In 2018, additional fusing will be added to this circuit as a result of an Expanded Operational Review performed in 2017.
- In 2018, a motor operated air break switch will be replaced with a recloser as part of the Smart Grid Initiative.
- In 2018, a section three phase conductor will be replaced.
- In 2018, several porcelain cutouts will be replaced with polymer cutouts.
- In 2018, additional animal guarding locations will be evaluated.
- In 2019, full circuit tree trimming will be performed.

18 Circuit 53501 -- ELIZABETHVILLE 35-01

Performance Analysis

The ELIZABETHVILLE 35-01 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On October 29, 2017, 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 2,120 customers for up to 571 minutes resulting in 698,588 CMI.

In total, the ELIZABETHVILLE 35-01 circuit had 46 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (26); equipment failure (12); animal contacts (5); nothing found (2); vehicles (1).

Remedial Actions

- In 2018, additional single-phase fusing will be evaluated for this circuit.
- In 2018, several locations will be evaluated for Smart Grid device installations.
- In 2018, this circuit will be evaluated for hot spot trimming.

19 Circuit 47704 -- BLOOMSBURG 77-04

Performance Analysis

The BLOOMSBURG 77-04 circuit experienced three outages of over 100,000 CMI between January 2017 and December 2017.

On January 26, 2017, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 983 customers for up to 256 minutes resulting in 119,482 CMI.

On April 11, 2017, an unidentified issue occurred with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,374 customers for up to 360 minutes resulting in 151,674 CMI.

On April 19, 2017, an unidentified issue occurred with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,243 customers for up to 345 minutes resulting in 203,623 CMI.

In total, the BLOOMSBURG 77-04 circuit had 49 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (22); equipment failure (16); animal contacts (6); other (2); vehicles (2); nothing found (1).

Remedial Actions

- In 2017, maintenance was performed on the circuit breaker.
- In 2017, additional fault indicators and disconnect switches were added to this circuit.
- In 2017, hazard tree removal was performed on this circuit.
- In 2018, line reconfiguration will be performed in a vulnerable section of single-phase.

20 Circuit 67702 -- WERNERSVILLE 77-02

Performance Analysis

The WERNERSVILLE 77-02 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On February 25, 2017, during a period of strong wind, a tree made contact with an overhead switch causing a recloser to trip to lockout. This outage affected 626 customers for up to 1,365 minutes resulting in 605,193 CMI.

In total, the WERNERSVILLE 77-02 circuit had 18 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (14); animal contacts (2); equipment failure (1); vehicles (1).

Remedial Actions

- In 2017, a motor operated air break switch was upgraded with fault indication technology.
- In 2017, three additional locations received single-phase fusing.
- In 2017, a deteriorating primary pole was replaced.
- In 2018, a section of single phase line was resourced to the REINHOLDS 12-02 line.
- In 2018, two solid blade disconnects will be replaced with fuses.
- In 2018, infrared scanning will be performed.
- In 2018, an existing recloser will be replaced.
- In 2018, a three phase infrared scan will be performed.

21 Circuit 41701 -- LOGANTON 17-01

Performance Analysis

The LOGANTON 17-01 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On May 1, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 132 customers for up to 2,796 minutes resulting in 219,896 CMI.

On November 19, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 997 customers for up to 347 minutes resulting in 345,470 CMI.

In total, the LOGANTON 17-01 circuit had 50 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (32); equipment failure (9); animal contacts (7); nothing found (2).

Remedial Actions

- In 2017, a new Smart Grid device was added to this circuit.
- In 2017 an Expanded Operational Review was performed on this circuit.
- In 2017, additional animal guarding was added to this circuit.
- In 2017, two locations received fusing.
- In 2018, hot spot trimming will be evaluated for this circuit.
- In 2018, the circuit breaker will be replaced.
- In 2019, the substation will undergo an update.

22 Circuit 43504 -- W WILLIAMSPORT 35-04

Performance Analysis

The W WILLIAMSPORT 35-04 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On May 1, 2017, 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 1,594 customers for up to 2,788 minutes resulting in 508,903 CMI.

In total, the W WILLIAMSPORT 35-04 circuit had 18 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (9); equipment failure (3); nothing found (3); animal contacts (2); other (1).

Remedial Actions

- In 2017, animal guarding was installed at 20 locations.
- In 2017, an additional recloser was installed on this circuit.
- In 2017, additional fusing was installed on this circuit.
- In 2017, full circuit tree trimming was performed on this circuit.
- In 2018, an Expanded Operational Review will be performed on this circuit.

23 Circuit 44203 -- POINT 42-03

Performance Analysis

The POINT 42-03 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On August 4, 2017, 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 1,879 customers for up to 210 minutes resulting in 393,575 CMI.

In total, the POINT 42-03 circuit had 38 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (16); equipment failure (12); animal contacts (6); vehicles (4).

Remedial Actions

- In 2017, additional three phase fusing was installed.
- In 2017, full circuit trimming was performed.
- In 2017, two existing devices were upgraded to Smart Grid devices.
- In 2017, an additional Smart Grid device was added to this circuit.
- In 2018, an additional Smart Grid device will be added to this circuit.
- In 2018, a new line and terminal will be evaluated for this circuit.

24 Circuit 40101 -- HUNTER 01-01

Performance Analysis

The HUNTER 01-01 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On February 1, 2017, an equipment failure occurred on an overhead conductor causing a recloser to trip to lockout. This outage affected 905 customers for up to 147 minutes resulting in 132,301 CMI.

On July 29, 2017, 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 2,121 customers for up to 486 minutes resulting in 445,982 CMI.

In total, the HUNTER 01-01 circuit had 40 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (18); equipment failure (12); animal contacts (6); nothing found (3); other (1).

Remedial Actions

- In 2017, hazard trees were removed from this circuit.
- In 2018, fusing will be installed at one location.
- In 2018, two non-communicating devices will be upgraded to Smart Grid devices.
- In 2018, pole arms will be replaced at five locations.
- In 2018, reconductoring will be evaluated.
- In 2018, a new tie line will be evaluated.
- In 2018, obtaining additional right of way will be sought in order to trim trees further back from the line directly outside the substation.

25 Circuit 58702 -- ROSEMONT 87-02

Performance Analysis

The ROSEMONT 87-02 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On August 7, 2017, a vehicle made contact with a pole causing a recloser to trip to lockout. This outage affected 694 customers for up to 417 minutes resulting in 175,257 CMI.

On November 19, 2017, during a period of strong wind, a tree made contact with an overhead conductor. This outage affected 2,207 customers for up to 376 minutes resulting in 494,646 CMI.

In total, the ROSEMONT 87-02 circuit had 12 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (5); equipment failure (3); animal contacts (2); other (1); vehicles (1).

Remedial Actions

- In 2018, full circuit trimming will be performed for this circuit.
- In 2019, a telemetered three-phase gang-operated switch will be installed on this circuit.

26 Circuit 64304 -- LINCOLN 43-04

Performance Analysis

The LINCOLN 43-04 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On February 25, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 682 customers for up to 2,718 minutes resulting in 453,725 CMI.

On July 1, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 673 customers for up to 343 minutes resulting in 158,132 CMI.

In total, the LINCOLN 43-04 circuit had 21 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (10); equipment failure (5); animal contacts (4); other (1); vehicles (1).

Remedial Actions

- In 2016, full circuit tree trimming was performed.
- In 2017, a post-storm patrol was performed on this circuit. Several minor items were identified and corrected in 2017.
- In 2017, an Expanded Operational Review was performed. As a result additional fusing was installed at six locations.
- In 2017, a new telemetered recloser was installed as part as the Smart Grid Initiative.
- In 2017, two underground residential developments received cable curing.
- In 2017, a dead-end insulator was replaced.
- In 2018, additional fusing will be installed at two locations.
- In 2018, a new single phase recloser with additional downstream fusing will be installed.
- In 2018, a three phase infrared scan will be performed.
- In 2018, reconfiguring a difficult-to-access section of single phase will be evaluated.
- In 2019, a section of difficult-to-access single-phase will be transferred to an alternate source.

27 Circuit 56504 -- ROCKVILLE 65-04

Performance Analysis

The ROCKVILLE 65-04 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On October 29, 2017, 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 250 customers for up to 2,600 minutes resulting in 324,402 CMI.

In total, the ROCKVILLE 65-04 circuit had 84 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (46); animal contacts (17); equipment failure (17); nothing found (2); Improper Operation (1); other (1).

Remedial Actions

- In 2017, additional animal guards were installed on this circuit.
- In 2017, full circuit trimming was performed.
- In 2017, hazard trimming was performed on this circuit.
- In 2017, an infrared scan was performed on this circuit.
- In 2017, a single-phase tap fuse was installed on his circuit.

28 Circuit 67605 -- WARWICK 76-05

Performance Analysis

The WARWICK 76-05 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On February 25, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 579 customers for up to 491 minutes resulting in 149,811 CMI.

On February 25, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 209 customers for up to 2,841 minutes resulting in 326,871 CMI.

In total, the WARWICK 76-05 circuit had 41 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (22); equipment failure (11); animal contacts (4); nothing found (2); other (2).

Remedial Actions

- In 2017, a post-storm patrol was performed on this circuit. Several minor items were identified and have been corrected in 2017.
- In 2017, two solid blade disconnect switches were replaced with fuses.

- In 2017, two additional locations received fusing.
- In 2017, a new load break disconnect switch was installed.
- In 2017, a failing load break disconnect switch was replaced.
- In 2017, hot spot tree trimming was performed.
- In 2018, a new telemetered recloser will be installed as part as the Smart Grid Initiative.
- In 2018, a three phase infrared scan will be performed.

29 Circuit 59301 -- MC ALISTERVILLE 93-01

Performance Analysis

The MC ALISTERVILLE 93-01 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On August 19, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 227 customers for up to 500 minutes resulting in 113,293 CMI.

In total, the MC ALISTERVILLE 93-01 circuit had 54 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (33); equipment failure (11); animal contacts (6); nothing found (2); vehicles (2).

Remedial Actions

- In 2018, one Smart Grid device will be evaluated for conversion to triple-single operation.
- In 2018, a tie point to the MIFFLINTOWN 90-2 will be evaluated for this circuit.
- In 2018, this circuit will be evaluated for accelerated tree-trimming.

30 Circuit 26703 -- HEMLOCK FARMS 67-03

Performance Analysis

The HEMLOCK FARMS 67-03 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On January 23, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 141 customers for up to 967 minutes resulting in 121,275 CMI.

On January 24, 2017, 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 867 customers for up to 777 minutes resulting in 151,226 CMI.

In total, the HEMLOCK FARMS 67-03 circuit had 58 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (28); equipment failure (14); animal contacts (12); nothing found (2); vehicles (2).

Remedial Actions

- In 2018, multiple locations will be fused.
- In 2018, additional animal guarding will be installed.
- In 2018, additional hazard tree removal will be evaluated.
- In 2019, an additional Smart Grid device will be installed.
- In 2019, an Expanded Operation Review will be performed.

31 Circuit 46504 -- LOCK HAVEN 65-04

Performance Analysis

The LOCK HAVEN 65-04 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On May 2, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 243 customers for up to 671 minutes resulting in 140,203 CMI.

On August 4, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 243 customers for up to 1,556 minutes resulting in 122,406 CMI.

In total, the LOCK HAVEN 65-04 circuit had 45 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (29); equipment failure (10); animal contacts (3); nothing found (1); other (1); vehicles (1).

Remedial Actions

- In 2017, an Expanded Operational Review was performed and three additional fusing locations and two animal guarding locations were identified and remediated.
- In 2017, additional single-phase load break disconnects were installed.
- In 2017, an additional Smart Grid device was installed.
- In 2017, full circuit tree trimming was performed.
- In 2018, a section of overhead through a heavily wooded area will be converted to underground.

32 Circuit 43102 -- SOUTH MILTON 31-02

Performance Analysis

The SOUTH MILTON 31-02 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On March 27, 2017, during a period of heavy rain, an equipment failure occurred on an overhead transmission component causing a motor operated switch to be interrupted. This outage affected 335 customers for up to 371 minutes resulting in 124,285 CMI.

On March 27, 2017, during a period of heavy rain, an equipment failure occurred on an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 988 customers for up to 628 minutes resulting in 354,802 CMI.

In total, the SOUTH MILTON 31-02 circuit had 22 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (9); equipment failure (8); animal contacts (5).

Remedial Actions

- In 2017, fusing was added at three locations.
- In 2017, foreign utilities were notified to replace three deteriorating poles.
- In 2018, a section of difficult-to-access conductor will be relocated to a more accessible location.
- In 2018, hot spot trimming will be evaluated for this circuit.

33 Circuit 46801 -- HEPBURN 68-01

Performance Analysis

The HEPBURN 68-01 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On May 1, 2017, 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 374 customers for up to 2,822 minutes resulting in 497,892 CMI.

In total, the HEPBURN 68-01 circuit had 40 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (19); animal contacts (7); equipment failure (5); nothing found (5); other (2); contact or dig in (1); vehicles (1).

Remedial Actions

- In 2017, animal guarding was added at two locations.
- In 2018, fusing will be installed at three locations.
- In 2018, additional animal guarding will be installed on this circuit.
- In 2019, a new line and terminal will split this circuit into smaller customer blocks.
- In 2019, the substation will undergo a full upgrade.

34 Circuit 59202 -- THOMPSONTOWN 92-02

Performance Analysis

The THOMPSONTOWN 92-02 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On October 30, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 83 customers for up to 2,097 minutes resulting in 163,583 CMI.

In total, the THOMPSONTOWN 92-02 circuit had 77 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (47); equipment failure (21); animal contacts (6); nothing found (2); vehicles (1).

Remedial Actions

- In 2017, an underground dip was replaced.
- In 2018, additional fusing opportunities will be evaluated.
- In 2018, an additional recloser will be considered for advancement for this circuit.

35 Circuit 52401 -- GREEN PARK 24-01

Performance Analysis

The GREEN PARK 24-01 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On February 12, 2017, during a period of strong wind, a tree made contact with an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,324 customers for up to 122 minutes resulting in 161,528 CMI.

In total, the GREEN PARK 24-01 circuit had 79 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (44); animal contacts (14); equipment failure (14); nothing found (6); contact or dig in (1).

Remedial Actions

- In 2017, full circuit tree trimming was performed.
- In 2017, two fuses were installed on this circuit.
- In 2017, circuit breaker relays were upgraded at the substation.
- In 2018, additional reclosers and fusing will be installed on this circuit.
- In 2018, an additional new protective device will be evaluated.
- In 2018, multiple locations will be evaluated for animal guarding.

36 Circuit 46702 -- RENOVO 67-02

Performance Analysis

The RENOVO 67-02 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On August 4, 2017, during a period of strong wind, a tree made contact with an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,273 customers for up to 1,725 minutes resulting in 426,141 CMI.

In total, the RENOVO 67-02 circuit had 42 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (29); animal contacts (6); equipment failure (6); nothing found (1).

Remedial Actions

- In 2017, an existing recloser was upgraded to a Smart Grid device.
- In 2017, a solid blade disconnect was installed.
- In 2017, additional fusing was installed on this circuit.
- In 2018, a section of three-phase conductor that is susceptible to tree outages will be relocated.
- In 2018, two Smart Grid devices will be installed on this circuit.
- In 2018, full circuit tree trimming will be performed.
- In 2018, three additional fuses will be installed.

37 Circuit 52004 -- LINGLESTOWN 20-04

Performance Analysis

The LINGLESTOWN 20-04 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On October 29, 2017, during a period of strong wind, a tree made contact with an overhead fuse causing a circuit breaker to trip to lockout. This outage affected 1,647 customers for up to 757 minutes resulting in 147,269 CMI.

On October 29, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 215 customers for up to 1,983 minutes resulting in 235,932 CMI.

In total, the LINGLESTOWN 20-04 circuit had 53 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (33); equipment failure (7); animal contacts (5); vehicles (4); nothing found (3); other (1).

Remedial Actions

- In 2018, additional sectionalizing devices will be evaluated for this circuit.
- In 2018, this circuit will be evaluated for accelerated full circuit trimming.
- In 2018, this circuit will be evaluated for hot spot tree trimming.

38 Circuit 51304 -- WINDSOR 13-04

Performance Analysis

The WINDSOR 13-04 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On October 29, 2017, 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 891 customers for up to 919 minutes resulting in 536,021 CMI.

In total, the WINDSOR 13-04 circuit had 13 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (5); equipment failure (4); animal contacts (3); vehicles (1).

Remedial Actions

- In 2017, full circuit tree-trimming was performed.
- In 2018, a new set of disconnect switches will be evaluated for this circuit.
- In 2018, additional animal guarding will be installed on this circuit.

39 Circuit 40702 -- FAIRFIELD 07-02

Performance Analysis

The FAIRFIELD 07-02 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On May 1, 2017, 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 1,016 customers for up to 3,022 minutes resulting in 525,586 CMI.

In total, the FAIRFIELD 07-02 circuit had 18 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (8); equipment failure (6); nothing found (3); animal contacts (1).

Remedial Actions

- In 2018, a section of difficult-to-access conductor will be relocated to a more accessible location.
- In 2018, three existing devices will be upgraded to Smart Grid devices.
- In 2019, full circuit trimming will be performed.

40 Circuit 25501 -- MADISONVILLE 55-01

Performance Analysis

The MADISONVILLE 55-01 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On March 2, 2017, during a period of strong wind, a tree made contact with an overhead conductor. This outage affected 468 customers for up to 568 minutes resulting in 139,531 CMI.

In total, the MADISONVILLE 55-01 circuit had 50 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (27); equipment failure (8); animal contacts (6); nothing found (6); vehicles (2); contact or dig in (1).

Remedial Actions

- In 2018, multiple locations will be animal guarded.
- In 2018, a single phase recloser will be replaced.
- In 2018, additional fusing will be installed.
- In 2018, multiple lightning arrestors will be replaced as the result of an Expanded Operational Review performed in 2017.

41 Circuit 16005 -- DORNEYVILLE 60-05

Performance Analysis

The DORNEYVILLE 60-05 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On July 1, 2017, 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 1,133 customers for up to 1,202 minutes resulting in 465,221 CMI.

In total, the DORNEYVILLE 60-05 circuit had 24 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (16); animal contacts (3); nothing found (3); equipment failure (1); other (1).

Remedial Actions

- In 2017, a new line and terminal was installed.
- In 2017, additional animal guarding was installed.
- In 2017, a recloser was updated to triple/single operation.
- In 2017, the protection settings on a Smart Grid device were optimized.
- In 2018, additional animal guarding will be installed.
- In 2018, an Expanded Operational Review will be performed on this circuit and the protection scheme will be reviewed.
- In 2019, a new Smart Grid device will be added to this circuit.

42 Circuit 44301 -- BEAVERTOWN 43-01

Performance Analysis

The BEAVERTOWN 43-01 circuit experienced no outages of over 100,000 CMI between January 2017 and December 2017.

In total, the BEAVERTOWN 43-01 circuit had 54 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (29); equipment failure (12); vehicles (6); nothing found (4); animal contacts (2); other (1).

Remedial Actions

- In 2018, a new Smart Grid device will be added to this circuit.
- In 2018, automation of a tie to this circuit will be evaluated.
- In 2020, full circuit trimming will be performed.

43 Circuit 29701 -- ANGELS 91-01

Performance Analysis

The ANGELS 91-01 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On March 2, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 562 customers for up to 832 minutes resulting in 436,784 CMI.

On December 25, 2017, during a period of strong wind, a vehicle made contact with a pole causing a recloser to trip to lockout. This outage affected 888 customers for up to 513 minutes resulting in 136,460 CMI.

In total, the ANGELS 91-01 circuit had 25 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (13); equipment failure (6); animal contacts (5); vehicles (1).

Remedial Actions

- In 2018, an additional switch will be installed.
- In 2018, an Expanded Operational Review will be performed.
- In 2018, additional animal guarding will be installed.

44 Circuit 13503 -- MC MICHAELS 35-03

Performance Analysis

The MC MICHAELS 35-03 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On February 9, 2017, during a period of ice/sleet/snow, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 467 customers for up to 824 minutes resulting in 341,267 CMI.

On August 10, 2017, a vehicle made contact with a pole causing a recloser to trip to lockout. This outage affected 650 customers for up to 444 minutes resulting in 187,679 CMI.

In total, the MC MICHAELS 35-03 circuit had 28 outages between January 2017 and December 2017, with the causes breaking down as follows: equipment failure (10); tree related (9); animal contacts (6); nothing found (1); other (1); vehicles (1).

Remedial Actions

- In 2018, a section of three phase line will be reconfigured to support load transfer to another line.
- In 2018, installation of a new single phase recloser will be evaluated.
- In 2018, four additional locations will receive animal guarding.
- In 2019, a three-phase recloser will be replaced.

45 Circuit 65702 -- ROSEVILLE 57-02

Performance Analysis

The ROSEVILLE 57-02 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On September 5, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 189 customers for up to 1,154 minutes resulting in 159,922 CMI.

In total, the ROSEVILLE 57-02 circuit had 40 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (16); equipment failure (12); animal contacts (9); nothing found (2); vehicles (1).

Remedial Actions

- In 2017, two new telemetered reclosers were installed as part of the Smart Grid Initiative.
- In 2017, an Expanded Operational Review was performed. As a result, several fusing opportunities were identified
- In 2017, additional fusing was installed at five locations.
- In 2017, three deteriorated primary poles were replaced.
- In 2017, a section of single phase underground was reconductored.
- In 2017, settings were changed on a protective device to reduce momentary interruptions.
- In 2018, two new single phase reclosers will be installed.
- In 2018, seven additional locations will receive fusing.
- In 2018, a three phase infrared scan will be performed.
- In 2018, two deteriorating three phase cross arms will be replaced
- In 2018, full circuit tree trimming will be performed.
- In 2018, an additional single-phase recloser will be installed.

46 Circuit 55002 -- NEWPORT 50-02

Performance Analysis

The NEWPORT 50-02 circuit experienced no outages of over 100,000 CMI between January 2017 and December 2017.

In total, the NEWPORT 50-02 circuit had 94 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (56); equipment failure (22); animal contacts (11); nothing found (3); other (1); vehicles (1).

Remedial Actions

- In 2017, a section of single-phase line will be evaluated for transferring to an alternate source.
- In 2018, full circuit tree trimming will be performed.
- In 2018, the substation will be upgraded and the power transformers will be replaced.
- In 2018, substation relaying will be upgraded to provide enhanced fault indication for this circuit.
- In 2018, new line and terminal will be built out of the substation to reduce load on this circuit.

47 Circuit 52402 -- GREEN PARK 24-02

Performance Analysis

The GREEN PARK 24-02 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On February 12, 2017, during a period of strong wind, a tree made contact with an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,670 customers for up to 119 minutes resulting in 198,997 CMI.

In total, the GREEN PARK 24-02 circuit had 76 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (48); equipment failure (21); nothing found (3); animal contacts (2); vehicles (2).

Remedial Actions

- In 2017, four Smart Grid devices were evaluated for triple-single operation, one of these was converted.
- In 2017, circuit breaker relays were upgraded at the substation.
- In 2018, several locations will be evaluated for fuse-checking.

48 Circuit 41202 -- KENMAR 12-02

Performance Analysis

The KENMAR 12-02 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On May 1, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 124 customers for up to 1,453 minutes resulting in 130,184 CMI.

In total, the KENMAR 12-02 circuit had 61 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (32); animal contacts (12); equipment failure (12); nothing found (4); vehicles (1).

Remedial Actions

- In 2017, full circuit tree trimming was performed.
- In 2017, an Expanded Operational Review was performed.
- In 2017, a new Smart Grid device was installed on this circuit.
- In 2018, animal guarding will be installed at six locations on this circuit.
- In 2019, the tie device will be upgraded to a Smart Grid device.

49 Circuit 26401 -- INDIAN ORCHARD 64-01

Performance Analysis

The INDIAN ORCHARD 64-01 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On February 25, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 185 customers for up to 846 minutes resulting in 145,280 CMI.

In total, the INDIAN ORCHARD 64-01 circuit had 79 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (44); animal contacts (16); equipment failure (10); nothing found (7); contact or dig in (1); other (1).

Remedial Actions

- In 2018, additional animal guarding will be installed.
- In 2018, a difficult-to-access section of three-phase conductor will be relocated.
- In 2019, full circuit trimming will be performed.
- In 2019, an Expanded Operational Review will be performed.

50 Circuit 59402 -- RICHFIELD 94-02

Performance Analysis

The RICHFIELD 94-02 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On October 30, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 165 customers for up to 2,371 minutes resulting in 371,603 CMI.

In total, the RICHFIELD 94-02 circuit had 31 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (15); equipment failure (8); animal contacts (4); vehicles (3); nothing found (1).

Remedial Actions

- In 2018, this circuit will be considered for accelerated tree-trimming.
- In 2018, additional fusing will be evaluated for this circuit.
- In 2018, several locations will be evaluated for solid blade disconnect installations.

51 Circuit 46506 -- LOCK HAVEN 65-06

Performance Analysis

The LOCK HAVEN 65-06 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On May 1, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 399 customers for up to 784 minutes resulting in 311,798 CMI.

In total, the LOCK HAVEN 65-06 circuit had 45 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (17); animal contacts (13); equipment failure (12); contact or dig in (1); nothing found (1); other (1).

Remedial Actions

- In 2018, full circuit trimming will be performed.
- In 2018, four locations will receive animal guarding.
- In 2018, eight additional fuses will be installed on this circuit.
- In 2018, eleven fuse cut-outs will be replaced.
- In 2018, splitting a single phase tap will be evaluated.

52 Circuit 53601 -- DALMATIA 36-01

Performance Analysis

The DALMATIA 36-01 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On February 12, 2017, during a period of heavy rain, an equipment failure occurred on a pole or pole arm causing a circuit breaker to trip to lockout. This outage affected 1,108 customers for up to 139 minutes resulting in 154,012 CMI.

In total, the DALMATIA 36-01 circuit had 38 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (19); equipment failure (13); animal contacts (3); vehicles (3).

Remedial Actions

- In 2017, hot-spot trimming was performed on this circuit.
- In 2018, additional animal guarding will be installed on this circuit.
- In 2019, full circuit trimming will be performed on this circuit.

53 Circuit 56501 -- ROCKVILLE 65-01

Performance Analysis

The ROCKVILLE 65-01 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On August 19, 2017, during a period of heavy rain, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 342 customers for up to 495 minutes resulting in 168,954 CMI.

On December 6, 2017, during a period of heavy rain, an equipment failure occurred on an overhead switch causing a recloser to trip to lockout. This outage affected 633 customers for up to 213 minutes resulting in 134,309 CMI.

In total, the ROCKVILLE 65-01 circuit had 39 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (21); equipment failure (10); animal contacts (7); vehicles (1).

Remedial Actions

- In 2017, one Smart Grid device was repaired on this circuit to improve reliability.
- In 2018, a section of the SUMMERDALE 46-01 is being evaluated for re-conductoring to support load from this circuit.
- In 2018, an additional tie point is being evaluated for this circuit.
- In 2018, locations for Smart fault indicator locations will be evaluated.
- In 2018, one recloser will be evaluated for automation.
- In 2018, one new recloser will be evaluated for installation.
- In 2019, additional Smart Grid devices will be evaluated for this circuit.

54 Circuit 22003 -- BOHEMIA 20-03

Performance Analysis

The BOHEMIA 20-03 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On April 17, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 342 customers for up to 400 minutes resulting in 137,124 CMI.

On November 18, 2017, a vehicle made contact with a pole causing a recloser to trip to lockout. This outage affected 348 customers for up to 322 minutes resulting in 111,843 CMI.

In total, the BOHEMIA 20-03 circuit had 43 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (14); animal contacts (13); equipment failure (10); nothing found (3); other (2); vehicles (1).

Remedial Actions

- In 2018, full circuit trimming will be performed.
- In 2018, additional animal guarding will be evaluated.
- In 2018, an Expanded Operation Review will be performed.
- In 2018, an existing capacitor will be automated.

55 Circuit 55001 -- NEWPORT 50-01

Performance Analysis

The NEWPORT 50-01 circuit experienced no outages of over 100,000 CMI between January 2017 and December 2017.

In total, the NEWPORT 50-01 circuit had 86 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (62); equipment failure (17); animal contacts (4); nothing found (3).

Remedial Actions

- In 2018, this substation will have power transformers upgraded, smart relaying installed, and a new line & terminal constructed.
- In 2018, five reclosers will be replaced to improve protection coordination on this circuit.
- In 2019, full circuit trimming will be performed.

56 Circuit 59002 -- MIFFLINTOWN 90-02

Performance Analysis

The MIFFLINTOWN 90-02 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On December 20, 2017, an equipment failure occurred on an overhead conductor causing a recloser to trip to lockout. This outage affected 882 customers for up to 254 minutes resulting in 160,390 CMI.

In total, the MIFFLINTOWN 90-02 circuit had 63 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (32); equipment failure (18); animal contacts (7); nothing found (5); vehicles (1).

Remedial Actions

- In 2018, a fuse will be replaced with a recloser and additional downstream fusing will be evaluated.
- In 2018, replacing an additional recloser will be investigated.
- In 20187, reconfiguring single-phase fusing will be investigated.
- In 2018, an additional Smart Grid device will be installed.
- In 2018, a new tie line will be evaluated.
- In 2018, a recloser will be upgraded to a Smart Grid device.
- In 2018, several locations will be evaluated for fusing.
- In 2018, one fuse will be evaluated for replacement with a solid blade disconnect on this circuit.
- In 2019, an additional Smart Grid device will be installed.

57 Circuit 53602 -- DALMATIA 36-02

Performance Analysis

The DALMATIA 36-02 circuit experienced no outages of over 100,000 CMI between January 2017 and December 2017.

In total, the DALMATIA 36-02 circuit had 87 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (66); animal contacts (10); equipment failure (6); nothing found (2); contact or dig in (1); other (1); vehicles (1).

Remedial Actions

- In 2017, a section of this circuit had its right-of-way expanded to allow for more effective tree-trimming.
- In 2017, hot-spot trimming was performed on this circuit.
- In 2018, the MEISERVILLE substation will be built to provide load support for this circuit.
- In 2018, full circuit tree trimming will be performed.

58 Circuit 56802 -- BENVENUE 68-02

Performance Analysis

The BENVENUE 68-02 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On February 12, 2017, during a period of strong wind, a tree made contact with an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,512 customers for up to 325 minutes resulting in 199,969 CMI.

In total, the BENVENUE 68-02 circuit had 41 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (18); equipment failure (17); animal contacts (6).

Remedial Actions

- In 2018, the circuit breaker will be replaced, and will be equipped with Smart relaying.
- In 2018, 11 locations will be animal guarded on this circuit.
- In 2018, one recloser will be evaluated for upgrading to a Smart Grid device.

59 Circuit 24901 -- WHITE HAVEN 49-01

Performance Analysis

The WHITE HAVEN 49-01 circuit experienced one outage of over 100,000 CMI between January 2017 and December 2017.

On July 20, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a sectionalizing device to be interrupted. This outage affected 589 customers for up to 577 minutes resulting in 251,021 CMI.

In total, the WHITE HAVEN 49-01 circuit had 54 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (34); equipment failure (11); animal contacts (5); nothing found (4).

Remedial Actions

- In 2017, this circuit was infrared scanned, and several minor repairs were completed.
- In 2018, an existing switch will be upgraded to a Smart Grid device.
- In 2018, the addition of a line and terminal will be evaluated.
- In 2018, reconductoring and extending a section of three phase line will be evaluated.
- In 2018, tap fuses will be installed on this circuit.
- In 2019, a section of three-phase line will be extended and made more accessible.

60 Circuit 59401 -- RICHFIELD 94-01

Performance Analysis

The RICHFIELD 94-01 circuit experienced no outages of over 100,000 CMI between January 2017 and December 2017.

In total, the RICHFIELD 94-01 circuit had 51 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (24); equipment failure (12); animal contacts (8); nothing found (6); vehicles (1).

Remedial Actions

- In 2018, two single-phase reclosers will be evaluated for upgrading to a single Smart Grid device.
- In 2018, animal guarding will be performed at four locations on this circuit.
- In 2018, one hydraulic recloser will be evaluated for replacement.

61 Circuit 64302 -- LINCOLN 43-02

Performance Analysis

The LINCOLN 43-02 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On February 25, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing an interruption. This outage affected 161 customers for up to 2,699 minutes resulting in 310,906 CMI.

On February 25, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 90 customers for up to 1,390 minutes resulting in 113,204 CMI.

In total, the LINCOLN 43-02 circuit had 29 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (18); equipment failure (6); animal contacts (3); nothing found (1); other (1).

Remedial Actions

- In 2017, a post-storm patrol was performed on this circuit. Several minor items were identified and corrected.
- In 2017, an Expanded Operational Review was performed. As a result nine locations received additional fusing.
- In 2017, full circuit tree trimming was performed.
- In 2017, three primary poles were replaced.
- In 2017, a Smart Grid device was reprogrammed to a single phase trip operation.
- In 2018, a section of inaccessible single-phase conductor will be removed resourced from a more reliable location.
- In 2018, a three phase infrared scan will be performed.
- In 2018, two sections of single-phase will be evaluated for re-sourcing.
- In 2019, an additional Smart Grid device will be installed.

62 Circuit 66102 -- REAMSTOWN 61-02

Performance Analysis

The REAMSTOWN 61-02 circuit experienced two outages of over 100,000 CMI between January 2017 and December 2017.

On May 17, 2017, a vehicle made contact with a pole causing a circuit breaker to trip to lockout. This outage affected 2,005 customers for up to 72 minutes resulting in 121,441 CMI.

On August 18, 2017, during a period of heavy rain, an equipment failure occurred on an overhead conductor causing an interruption. This outage affected 1,410 customers for up to 262 minutes resulting in 287,472 CMI.

In total, the REAMSTOWN 61-02 circuit had 17 outages between January 2017 and December 2017, with the causes breaking down as follows: tree related (7); equipment failure (5); vehicles (3); animal contacts (1); nothing found (1).

Remedial Actions

- In 2017, three existing three phase reclosers were configured for single-phase operation.
- In 2017, a dead-end insulator was replaced.
- In 2017, three underground primary cables were replaced.
- In 2018, a section of three-phase line will be reconfigured.
- In 2018, an existing solid blade disconnect will be replaced with a fuse.
- In 2018, an existing three-phase recloser will be replaced as part of the Smart Grid Initiative.
- In 2018, over 25 porcelain cutouts will be replaced with polymer cutouts.
- In 2018, resourcing a section of single phase line will be investigated.

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	3,333	19.2%	44,790	4.4%	2,271,560	1.5%
Contact / Dig-In	158	0.9%	14,259	1.4%	965,006	0.7%
Directed by Non-PPL Authority	85	0.5%	30,430	3.0%	1,635,557	1.1%
Equipment Failures	4,889	28.1%	291,220	28.8%	32,244,525	21.9%
Improper Design	2	0.0%	136	0.0%	2,040	0.0%
Improper Installation	7	0.0%	2,816	0.3%	222,979	0.2%
Improper Operation	6	0.0%	1,229	0.1%	37,778	0.0%
Nothing Found	918	5.3%	50,519	5.0%	3,925,667	2.7%
Other Controllable	87	0.5%	13,430	1.3%	443,340	0.3%
Other Non Control	253	1.5%	30,208	3.0%	2,148,652	1.5%
Other Public	39	0.2%	8,271	0.8%	491,099	0.3%
Tree Related	6,913	39.8%	407,804	40.4%	91,986,604	62.5%
Unknown	-	0.0%	-	0.0%	-	0.0%
Vehicles	698	4.0%	114,668	11.4%	10,848,421	7.4%
Total	**17,388**	**100.0%**	**1,009,780**	**100.0%**	**147,223,228**	**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 50% of cases, 57% of customer interruptions, and 75% 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 19% of PPL Electric's cases of trouble. Although this represents a significant number of cases, the effect on SAIFI and CAIDI is small because approximately 77% 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 2018.

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 41% of the cases of trouble, 51% of the customer interruptions and 60% 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	4th Quarter		Year-to-date	
		Budget	Actual	Budget	Actual
Transmission					
Transmission C-tag poles (# of poles)	422	184	90	422	328
Transmission arm replacements (# of sets)	191	50	61	191	202
Transmission air break switch inspections (# of switches)	0	0	0	0	4
Transmission surge arrester installations (# of sets)	0	0	0	0	0
Transmission structure inspections (# of activities)	33,291	8,323	12,716	33,291	33,291
Transmission tree side trim-Bulk Power (linear feet)	0	0	0	0	0
Transmission herbicide-Bulk Power (# of acres)	0	0	0	0	0
Transmission reclearing (# of miles) BES Only	596	30	30	596	596
Transmission reclearing (# of miles) 69 kV	1,389	338	338	1,389	1,389
Transmission reclearing (# of miles) 138 kV	185	67	67	185	185
Transmission danger tree removals-Bulk Power (# of trees)	0	0	0	0	0
Substation					
Substation batteries (# of activities)	660	228	53	660	673
Circuit breakers (# of activities)	980	163	76	980	901
Substation inspections (# of activities)	3,953	1,349	917	3,953	4,213
Transformer maintenance (# of activities)	169	47	15	169	106

Inspection & Maintenance Goals/Objectives	Annual Budget	4th Quarter		Year-to-date	
		Budget	Actual	Budget	Actual
Distribution					
Distribution C-tag poles replaced (# of poles)	1,480	837	422	2,654	1,864
C-truss distribution poles (# of poles)	3,696	1,323	1,205	3,696	3,577
Capacitor (MVAR added)	404	268	72	909	610
OCR Replacements (# of)	78	29	23	121	100
Distribution pole inspections (# of poles)[4]	60,080	27,561	28,204	96,822	97,522
Distribution line inspections (hours)	6,761	1283	1139	8436	7604
Group re-lamping (# of lamps)	13,994	661	1,293	13,994	12,617
Test sections of underground distribution cable	N/A	391	391	1,312	1,312
Distribution tree trimming (# of miles)	3,985	720	690	3,985	3,985
Distribution herbicide (# of acres)	0	0	0	0	0
Distribution >18" removals within R/W (# of trees)	0	0	0	0	0
Distribution hazard tree removals outside R/W (# of trees)	0	0	0	0	0
LTN manhole inspections (# of)	426	125	48	426	394
LTN vault inspections (# of)	767	211	96	767	646
LTN network protector overhauls (# of)	50	7	15	50	44
LTN reverse power trip testing (# of)	35	12	8	35	29

[4] Due to a 2017 acceleration of work, approximately 90,000 poles will be inspected this year.

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	4th Quarter		Year-to-date	
	Budget ($000)	Actual ($000)	Budget ($000)	Actual ($000)
Provide Electric Service	1,419	1,853	5,218	7,017
Vegetation Management	12,864	9,680	53,672	45,105
Customer Response	15,091	8,223	59,332	55,522
Reliability Maintenance	8,707	7,426	35,386	36,607
System Upgrade	181	3,518	(1,026)	10,849
Customer Service/Accounts	33,309	30,713	128,214	111,110
Others	8,867	10,035	36,844	40,166
Total O&M Expenses	**80,439**	**71,450**	**317,638**	**306,376**

*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	4th Quarter		Year-to-date	
	Budget ($000)	Actual ($000)	Budget ($000)	Actual ($000)
New Service/Revenue	19,316	27,587	74,357	93,556
System Upgrade	152,603	156,337	637,015	641,119
Reliability & Maintenance	78,430	124,693	408,571	451,688
Customer Response	3,110	10,542	11,854	21,082
Other	5,808	8,594	16,292	19,315
Total	**259,267**	**327,753**	**1,148,089**	**1,226,760**

9) Quarterly and year-to-date information on distribution substation inspections and reliability metrics.

(a) The Number of Corrective Work Orders by Type (Low-Priority, Mid-Priority, Urgent)

During the fourth quarter of 2017, 73 corrective work orders were created with the following breakdown by priority.

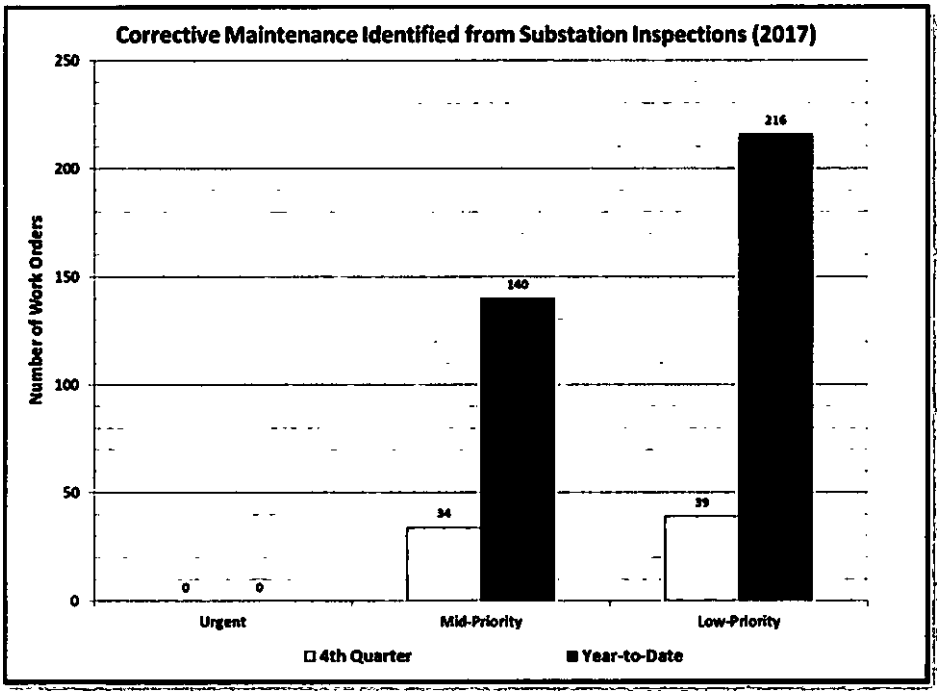


Figure 1: Corrective Maintenance Work Orders by Priority Level for fourth quarter and year-to-date 2017

(b) The Amount Spent on Substation Inspections

During the fourth quarter of 2017, PPL Electric spent approximately $307,000 on substation inspections.

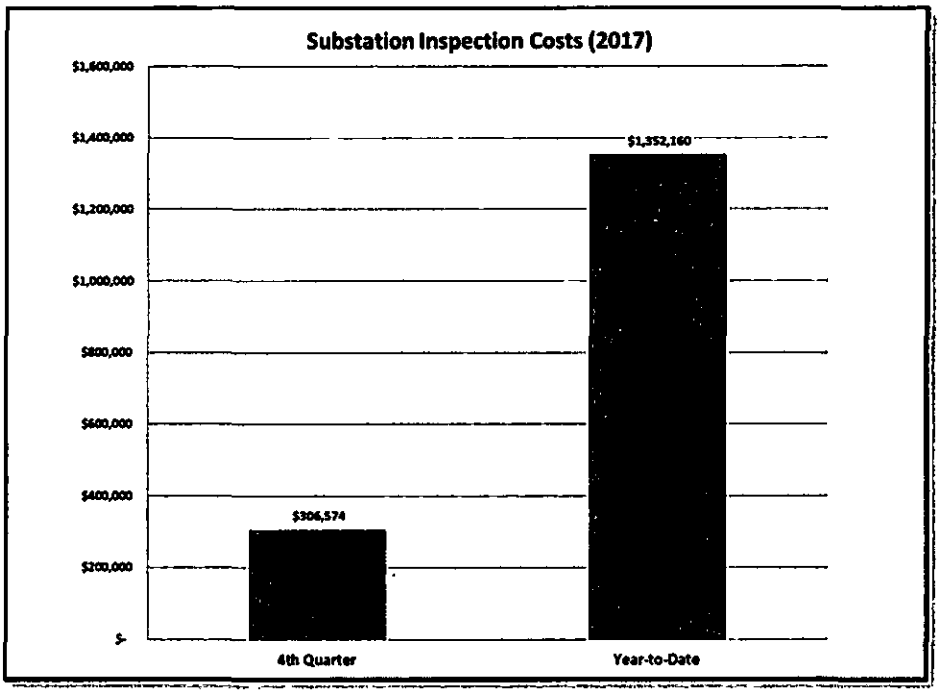


Figure 2: Substation Inspection Costs for third quarter and year-to-date 2017.

(c) The Amount Spent on Vegetation Management

Please refer to Section 7 for vegetation management expenses, for the fourth quarter and year-to-date.

(d) The Projected CMI Avoidance Due to Substation Inspections

The figure below shows the amount that PPL Electric has the estimated CMI avoidance, for the fourth quarter and year-to-date. During fourth quarter of 2017, PPL Electric performed this follow-up work, but registered no potentially avoided CMI due to the low criticality of the work performed as a result of inspections

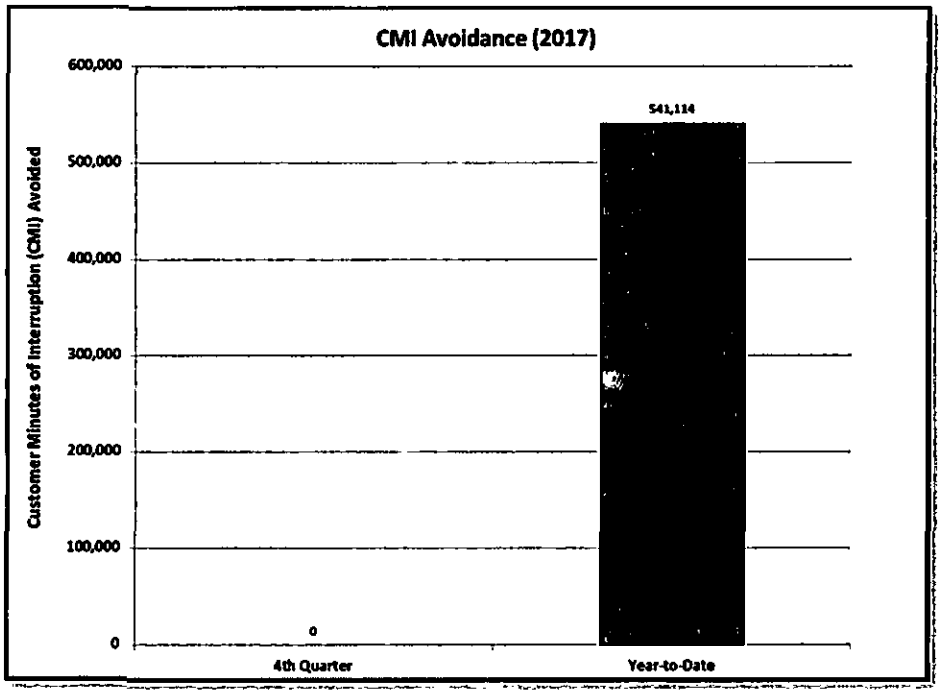


Figure 3: CMI Avoidance Due to Inspections for fourth quarter and year-to-date 2017

(e) Customer Minutes and Number of Customers Affected Due to Substation Sustained Outages

In the past three years, distribution substations have contributed a small amount toward the reliability metrics. During the fourth quarter of 2017, the Company interrupted about 2,271 customers for a total of approximately 269K CMI. The figures below show these results for the number of customers interrupted and CMI experienced, respectively.

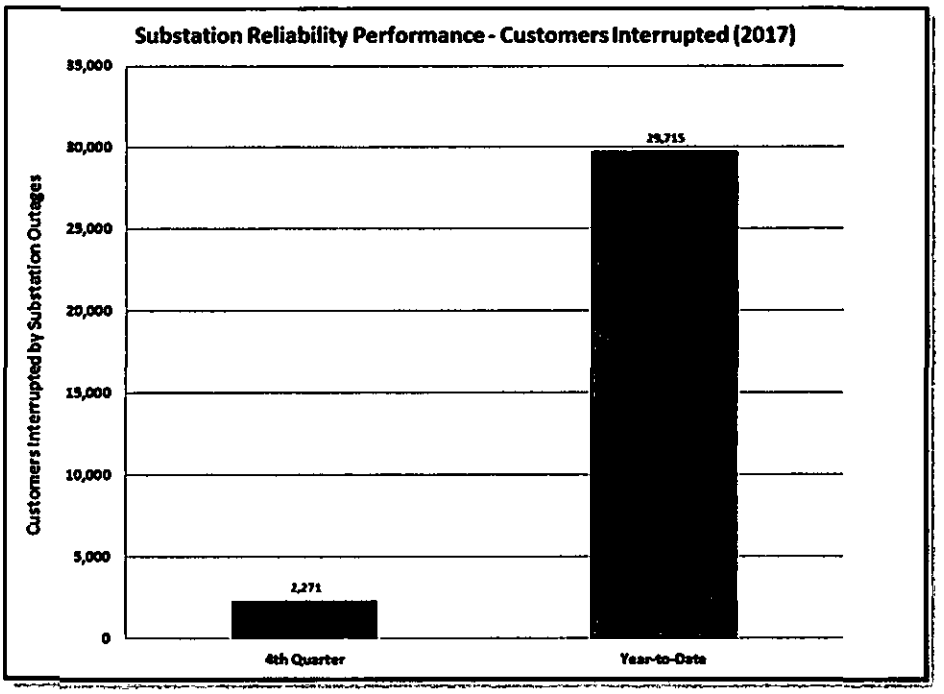


Figure 4: Substation Customers Interrupted for fourth quarter and year-to-date 2017

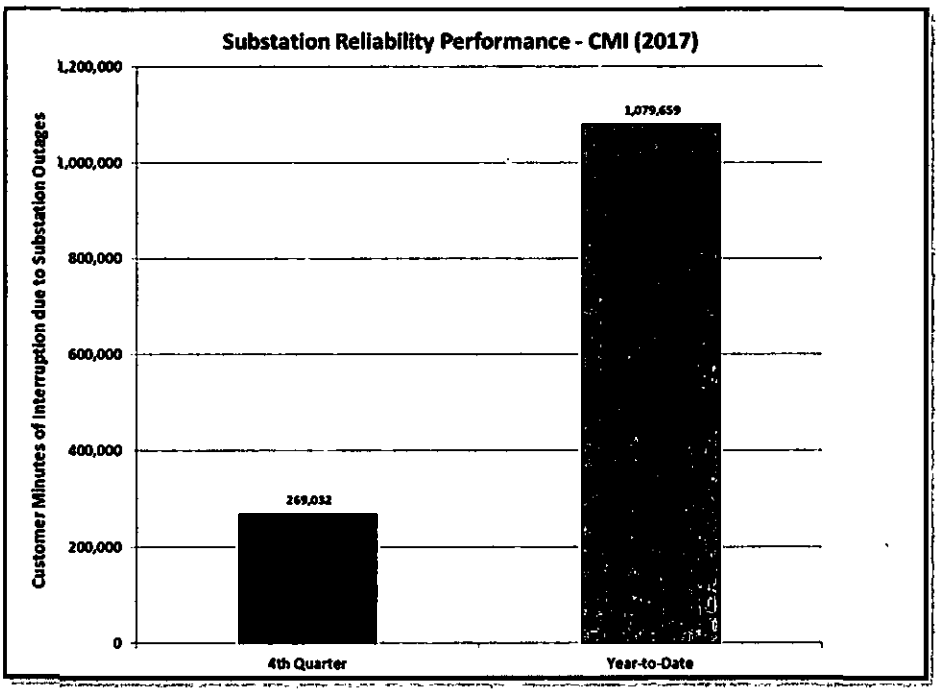


Figure 5: Substation Customer Minutes of Interruption for fourth quarter and year-to-date 2017

(f) Substation SAIFI Contribution

Overall, substation outages contributed 1.3% of the total SAIFI experienced by PPL Electric customers in the fourth quarter of 2017. Historically, PPL Electric has ranked in the first quartile for Substation SAIFI performance on the Southeastern Electric Exchange (SEE) Survey, and is on-track to maintain its ranking among other electric utilities.

(g) Number of Substations with Remote Monitoring and Communication Technologies

PPL Electric has the capability of remotely monitoring its distribution substations through SCADA installations and through other telemetered equipment. This equipment allows PPL Electric to closely track the performance of its substation assets and respond to any trouble that is experienced on the distribution system. The table below shows the number of distribution substations that have this functionality.

	4th Quarter	Year-to-Date
Substations with Remote Monitoring	351	351
Total Number of Substations	353	353

PPL Electric has launched a project to install smart relaying onto all 12kV circuit breakers at its Distribution substations. These relays will allow the company to quickly perform automated switching for lesser system impact during an outage event, and better-estimate fault locations for quicker system restoration. By 2022, the Company expects all 12kV circuit breakers to have these functionalities in order to enhance reliability performance.

10) ***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	56
Journeyman Lineman	217
Journeyman Lineman-Trainee	27
Helper	15
Groundhand	3
Troubleman	50
T&D Total	**368**
Electrical	
Elect Leaders-UG	2
Elect Leaders-Net	11
Elect Leaders-Sub	24
Journeyman Elect-UG	16
Journeyman Elect-Net	33
Journeyman Elect-Sub	60
Journeyman Elect Trainee-UG	0
Journeyman Elect Trainee-Net	0
Journeyman Elect Trainee-Sub	14
Helper	0
Laborer-Network	0
Laborer-Substation	0
Electrical Total	**160**
Overall Total	**528**

Appendix A

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.

Appendix B

PPL Electric Utilities Corporation

Job Descriptions

Transmission and Distribution

Groundhand	• Performs manual labor and assists employees in higher job classifications.
Helper	• Performs semi-skilled labor at any work location on de-energized overhead and underground transmission, and distribution facilities to prepare the employee for entrance into the Journeyman Lineman Apprenticeship Program.
Journeyman Lineman	• Works 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	• 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	• Responsible for completing assigned work by directing one or multiple groups of employees involved in the maintenance, operation, and construction activities of the transmission and distribution systems associated with, but not limited to, PPL Electric facilities. • Engage in and perform work along with providing the necessary leadership, all-around knowledge, initiative, judgment, and experience to produce a quality job. • Performs all the direct duties of the Journeyman Lineman when not acting as a Lineman Leader.
Troubleman	• Investigates and resolves trouble calls, voltage abnormalities on transmission and distribution systems associated with, but not limited to, PPL Electric facilities.

Electrical

Electrician Leader - Substation - Network - Underground	• Responsible for completing assigned work by directing one or multiple groups of employees involved in the construction and maintenance activities of the transmission and distribution systems associated with, but not limited to, PPL Electric facilities. • Engage in and perform work along with providing the necessary leadership, all-around knowledge, initiative, judgment, and experience to produce a quality job. • Performs all direct duties of the Journeyman Electrician when not acting as a leader.
Helper - Substation - Network - Underground	• Performs manual labor at any work location including those areas containing non-exposed energized electrical equipment, and to prepare the employee for entrance into the Apprenticeship Program.
Laborer - Substation - Network - Underground	• Performs manual labor and assists employees in higher job classifications.
Journeyman Electrician - Substation - Network - Underground	• Normally under limited supervision performs and is responsible for work associated with, but not limited to, PPL Electric facilities involving the highest degree of skill in construction and maintenance work associated with substations, LTN or underground distribution and transmission. • Uses microprocessor based equipment for troubleshooting and revising relay logic and its control systems related to the field services electrical discipline.

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

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