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CONFIDENTIAL

FEDERAL EXPRESS

April 30, 2019

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 March 31, 2019
Docket No. 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 March 31, 2019. 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 April 30, 2019, 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.

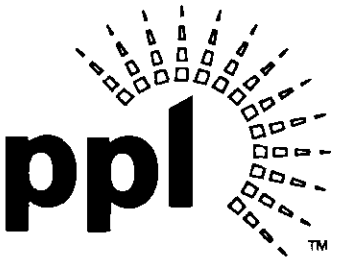
If you have any questions regarding this document, please call me or B. Kathryn Frazier, PPL Electric's Regulatory Affairs Manager at (610) 774-3372.

Very truly yours,

Kimberly A. Klock

Enclosures

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



PPL Electric Utilities

PPL Electric Utilities Corporation

Quarterly Reliability Report

to the

Pennsylvania Public Utility Commission

April 2019

*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.***

No major events occurred during the first quarter of 2019.

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 March 31, 2019.

SAIFI (Benchmark = 0.98; Rolling 12-month Std. = 1.18)	0.91
CAIDI (Benchmark = 145; Rolling 12-month Std. = 174)	177
SAIDI (Benchmark = 142; Rolling 12-month Std. = 205)	161
MAIFI[1]	6.4
Average Number of Customers Served[2]	1,425,583
Number of Sustained Customer Interruptions (Trouble Cases)	22,107
Number of Customers Affected[3]	1,300,196
Customer Minutes of Interruptions (CMI)	229,829,899
Number of Customer Momentary Interruptions	9,111,529

During the first quarter, there were no (0) PUC major events, one (1) PUC reportable event, and two (2) other storms that required the opening of one or more area emergency centers to manage restoration efforts. The PUC reportable storm of May 15, 2018 approached major event status, with 8.6% of the customer base interrupted. At over 1,500 trouble cases, this was a top 15 all-time storm as measured by cases. Had this event been excludable, the reliability index values would have been 0.83 for SAIFI; 130 for CAIDI; and 107 for SAIDI, all well below benchmark level.

Additionally, approximately 43,000 of PPL Electric's customer interruptions in the four quarters ending March 31, 2019 were the result of forced outages due to UGI gas leaks.

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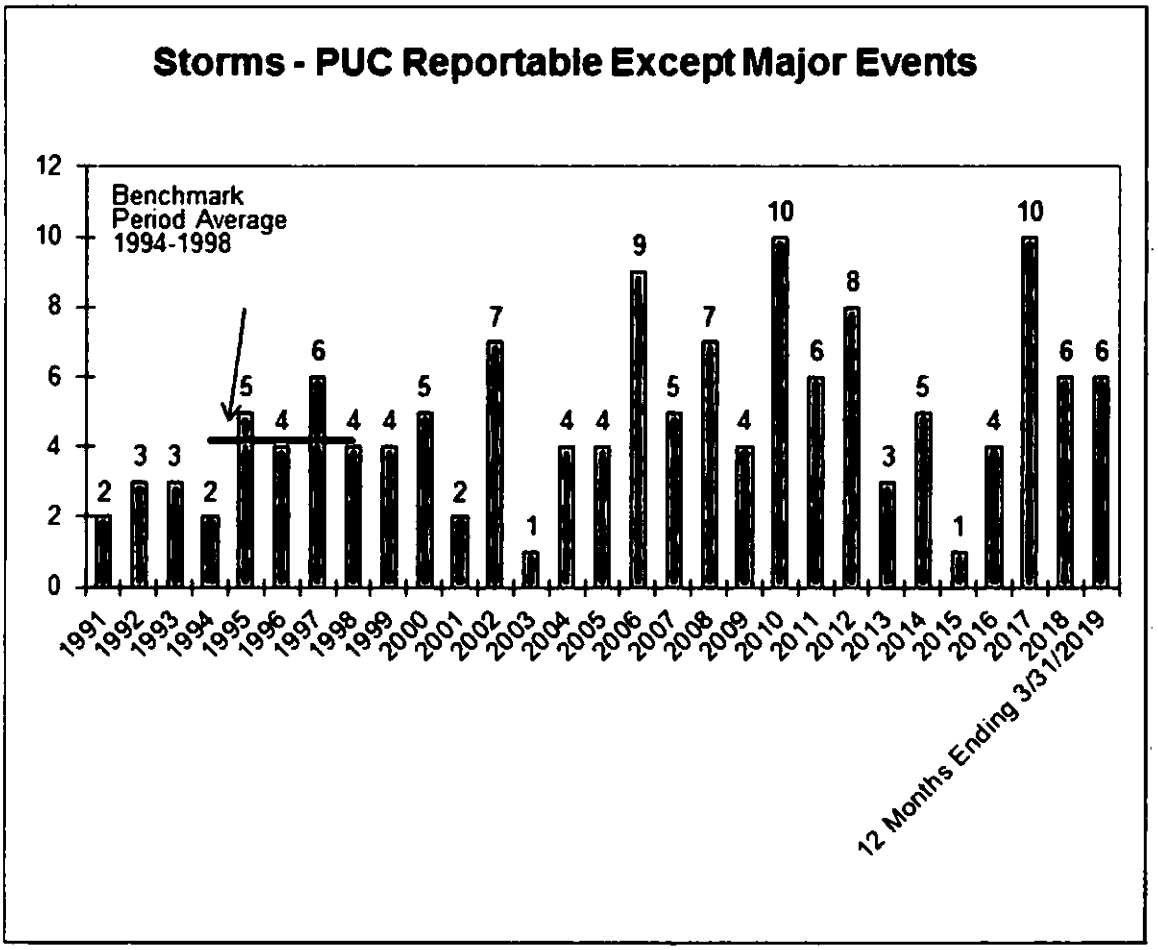
[1] MAIFI data is obtained at the substation breaker level and at certain reclosers. Because PPL Electric is enhancing its ability to identify momentaries, this metric is expected to increase in the near term.

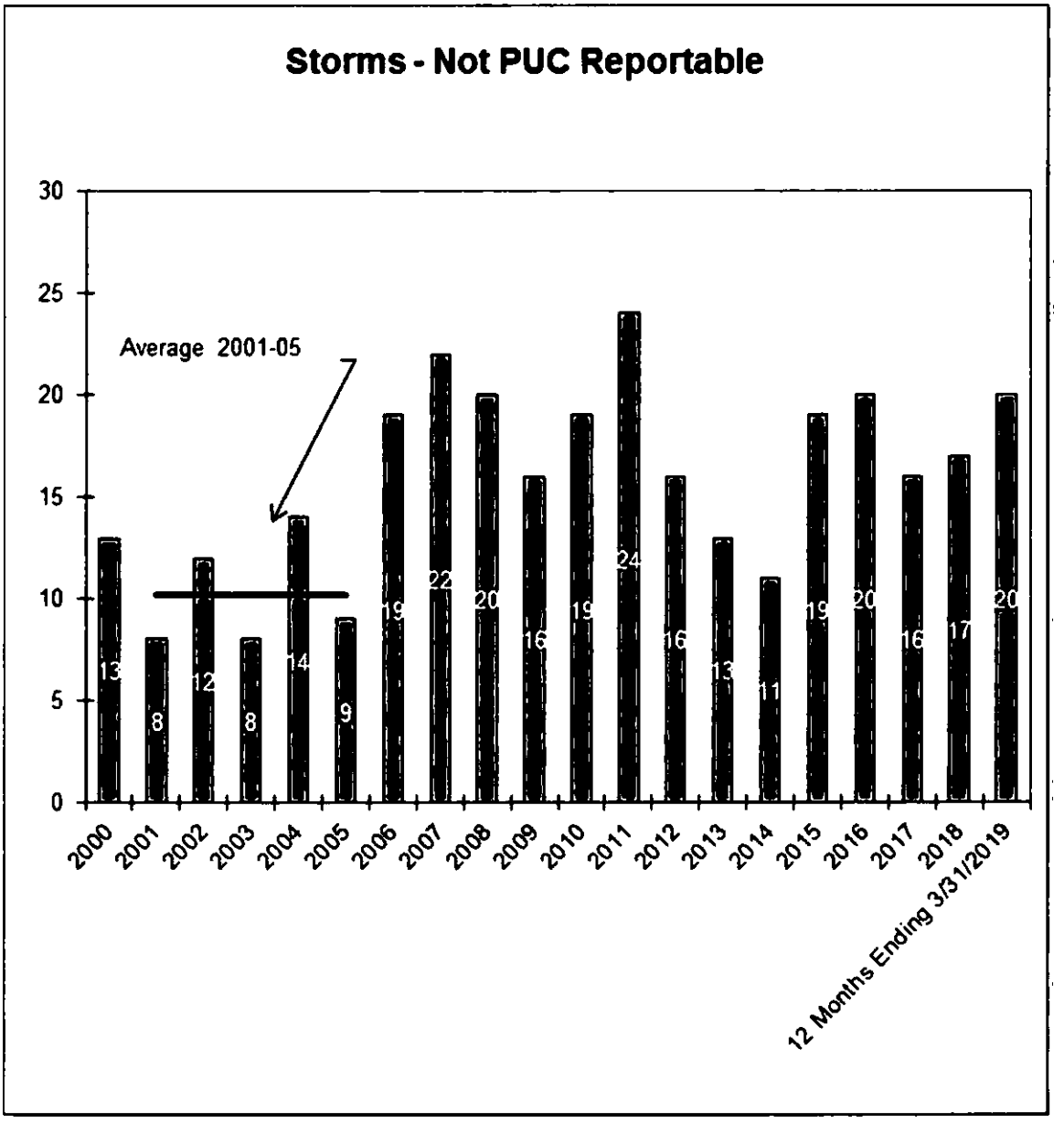
[2] PPL Electric calculates the annual indices using customers served at the end of period. This is consistent with the method used to calculate PPL Electric's benchmarks.

[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 six (6) PUC-reportable storms.



In addition, there were twenty (20) 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	26401	2455	1191	2.1	32.1	2,177	133	5,343,587
2	23401	2007	539	3.7	8.7	1,711	87	3,434,232
3	15601	2938	1753	1.7	22.5	1,101	38	3,234,407
4	16402	2411	603	4.0	15.6	1,264	92	3,047,760
5	17802	1552	530	2.9	26.5	1,923	83	2,984,954
6	15604	2068	879	2.4	23.0	1,370	81	2,833,092
7	46302	2417	579	4.2	6.3	1,086	99	2,625,329
8	26402	2015	1048	1.9	12.1	1,078	52	2,172,334
9	28602	1002	379	2.6	1.9	1,934	36	1,937,855
10	16504	844	312	2.7	5.9	2,213	42	1,867,618
11	20402	920	330	2.8	9.3	1,892	37	1,739,740
12	17902	1708	421	4.1	5.4	1,016	40	1,735,245
13	45602	1031	381	2.7	13.3	1,620	54	1,669,484
14	18502	889	593	1.5	10.8	1,838	100	1,633,255
15	15704	1201	607	2.0	10.5	1,284	54	1,542,473
16	45302	1174	565	2.1	10.1	1,217	56	1,428,283
17	16801	846	361	2.3	11.4	1,640	57	1,387,083
18	56501	572	288	2.0	16.2	2,398	58	1,370,691
19	53602	2231	154	14.4	83.7	609	135	1,358,563
20	16802	1553	912	1.7	17.3	873	49	1,355,469
21	47704	940	236	4.0	10.4	1,379	73	1,296,695
22	17801	587	223	2.6	24.5	2,156	59	1,265,858
23	22001	780	403	1.9	4.8	1,581	77	1,232,645
24	40201	734	284	2.6	17.3	1,662	119	1,220,107

WPC Rank	Feeder ID	SAIDI	CAIDI	SAIFI	MAIFI	Customers	Cases of Trouble	Customer Minutes Interrupted (CMI)
25	15702	744	386	1.9	10.1	1,614	37	1,200,747
26	47001	479	196	2.4	7.5	2,496	88	1,196,298
27	23902	816	499	1.6	25.7	1,465	57	1,195,591
28	46206	653	405	1.6	4.1	1,825	65	1,191,738
29	21203	948	241	3.9	10.9	1,232	42	1,167,415
30	22003	825	448	1.8	6.7	1,385	58	1,142,661
31	28301	500	227	2.2	7.5	2,284	117	1,141,581
32	40602	498	162	3.1	4.7	2,291	62	1,140,711
33	44301	557	332	1.7	7.4	2,043	79	1,137,417
34	23403	629	277	2.3	2.9	1,794	42	1,129,130
35	24901	496	281	1.8	7.9	2,272	55	1,126,810
36	24603	714	426	1.7	15.2	1,575	61	1,125,048
37	52402	667	215	3.1	14.3	1,662	100	1,109,313
38	45303	798	640	1.2	12.7	1,337	57	1,066,854
39	26601	780	445	1.8	2.4	1,324	38	1,033,343
40	55001	807	230	3.5	33.1	1,280	84	1,032,505
41	25801	558	216	2.6	7.2	1,822	54	1,017,548
42	22805	427	196	2.2	7.0	2,351	11	1,003,222
43	43401	1016	272	3.7	25.8	977	56	992,689
44	22002	1187	337	3.5	23.5	836	28	992,036
45	26001	681	328	2.1	13.9	1,425	85	970,922
46	56801	557	194	2.9	10.3	1,657	65	922,468
47	26703	485	271	1.8	2.2	1,890	67	916,084
48	28805	772	411	1.9	4.2	1,179	37	909,795
49	45402	540	553	1.0	22.9	1,630	77	880,733
50	59202	517	151	3.4	18.6	1,701	66	878,774
51	20403	458	143	3.2	13.2	1,918	76	878,284
52	24703	544	310	1.8	7.0	1,585	28	861,554
53	54001	766	477	1.6	4.6	1,120	39	858,194
54	42701	588	152	3.9	4.3	1,457	113	856,593
55	44902	507	354	1.4	63.3	1,635	38	828,832
56	20601	559	414	1.3	26.5	1,471	38	822,082
57	25402	445	277	1.6	18.2	1,809	47	805,463
58	44904	976	326	3.0	21.2	817	40	797,508
59	26603	714	265	2.7	16.3	1,104	53	788,306
60	41602	911	193	4.7	14.3	842	85	766,870
61	16501	1110	621	1.8	9.0	681	17	756,008
62	13704	478	136	3.5	11.7	1,568	45	750,148
63	41802	1369	266	5.2	31.3	524	47	717,429

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

01 Circuit 26401 -- INDIAN ORCHARD 64-01

Performance Analysis

The INDIAN ORCHARD 64-01 circuit experienced more than ten outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 1,116 customers for up to 5,499 minutes resulting in 1,155,857 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 37 customers for up to 4,350 minutes resulting in 155,397 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 79 customers resulting in 285,976 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 122 customers for up to 4,352 minutes resulting in 453,133 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 78 customers for up to 1,511 minutes resulting in 117,830 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break disconnect switch to be interrupted. This outage affected 38 customers resulting in 235,113 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 47 customers resulting in 147,054 CMI.

On May 15, 2018, during a period of heavy rain, a tree contacted an overhead switch causing a recloser to trip to lockout. This outage affected 64 customers resulting in 260,250 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a transformer to be interrupted. This outage affected 92 customers resulting in 261,790 CMI.

On May 16, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break disconnect switch to be interrupted. This outage affected 274 customers for up to 5,143 minutes resulting in 1,073,188 CMI.

On May 17, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 52 customers for up to 2,806 minutes resulting in 111,673 CMI.

In total, the INDIAN ORCHARD 64-01 circuit had 133 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (93); equipment failure (14); animal contacts (12); nothing found (10); other (3); vehicles (1).

Remedial Actions

- In 2018, ten locations received animal guarding; additional animal guarding will be installed in 2019.
- In 2019, several sections of difficult-to-access single-phase line will be relocated.
- In 2019, full circuit trimming will be performed.
- In 2019, hazard tree removal will be performed.
- In 2019, Hendrix cable will be evaluated for a section of conductor.
- In 2019, two additional single-phase reclosers will be evaluated.
- In 2021, several telemetric single-phase reclosers will be installed.
- In 2021, several sections of single-phase will be relocated.
- In 2021, several sections of single-phase will be reconductored.
- In 2021, a section of difficult-to-access three-phase will be relocated.
- In 2021, several single-phase ties and one three-phase tie will be constructed.

02 Circuit 23401 -- HONESDALE 34-01

Performance Analysis

The HONESDALE 34-01 circuit experienced eight outages of over 100,000 CMI between April 2018 and March 2019.

On May 4, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 745 customers for up to 346 minutes resulting in 257,576 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 887 customers for up to 752 minutes resulting in 640,096 CMI.

On May 15, 2018, during a period of heavy rain, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 384 customers for up to 1,775 minutes resulting in 654,276 CMI.

On May 16, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a temporary open point to be interrupted. This outage affected 387 customers for up to 2,423 minutes resulting in 435,651 CMI.

On May 16, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 59 customers for up to 3,450 minutes resulting in 166,478 CMI.

On May 16, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 113 customers for up to 2,263 minutes resulting in 146,298 CMI.

On May 17, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 78 customers for up to 1,689 minutes resulting in 131,695 CMI.

On February 25, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 822 customers for up to 697 minutes resulting in 247,192 CMI.

In total, the HONESDALE 34-01 circuit had 87 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (59); animal contacts (10); equipment failure (9); nothing found (8); other (1).

Remedial Actions

- In 2018, additional single-phase fusing was installed.
- In 2018, animal guarding was installed at several locations.
- In 2018, several capacitor banks were upgraded.
- In 2019, several sectionalizing devices will be replaced or upgraded.
- In 2019, an additional load break disconnect switch will be installed.
- In 2019, a section of conductor will be relocated to underground.
- In 2019, an additional tie to EAST CARBONDALE 01 will be built.
- In 2019, a new reliability substation will be sited.
- In 2019, two sections of difficult-to-access single-phase will be relocated.
- In 2019, full circuit trimming will be performed.
- In 2019, additional animal guarding will be installed.
- In 2021, a single-phase recloser will be installed on this circuit.

03 Circuit 15601 -- NO STROUDSBURG 56-01

Performance Analysis

The NO STROUDSBURG 56-01 circuit experienced eight outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 114 customers for up to 1,452 minutes resulting in 157,002 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break disconnect switch to be interrupted. This outage affected 195 customers for up to 2,542 minutes resulting in 495,102 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 52 customers resulting in 163,277 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 36 customers resulting in 100,505 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 133 customers for up to 2,998 minutes resulting in 381,319 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted a pole or pole arm causing a load break disconnect switch to be interrupted. This outage affected 39 customers resulting in 170,091 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break disconnect switch to be interrupted. This outage affected 438 customers for up to 4,486 minutes resulting in 1,432,740 CMI.

On August 18, 2018, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 430 customers for up to 21 minutes resulting in 102,584 CMI.

In total, the NO STROUDSBURG 56-01 circuit had 38 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (24); animal contacts (9); equipment failure (2); nothing found (2); vehicles (1).

Remedial Actions

- In 2018, additional animal guarding was installed at several locations.
- In 2018, additional single-phase fusing was installed.
- In 2018, several capacitor banks were upgraded.
- In 2020, several sectionalizing devices will be replaced or upgraded.
- In 2020, an additional recloser will be installed on this circuit.
- In 2021, a section of difficult-to-access single-phase will be relocated.
- In 2021, full circuit trimming will be performed.

04 Circuit 16402 -- MOUNT POCONO 64-02

Performance Analysis

The MOUNT POCONO 64-02 circuit experienced four outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 897 customers for up to 2,599 minutes resulting in 1,438,140 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing an air break to be interrupted. This outage affected 110 customers resulting in 307,004 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 26 customers resulting in 114,773 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 70 customers for up to 4,260 minutes resulting in 298,200 CMI.

In total, the MOUNT POCONO 64-02 circuit had 92 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (74); equipment failure (9); animal contacts (4); vehicles (3); contact or dig in (1); nothing found (1).

Remedial Actions

- In 2018, the substation cross yard ties were replaced.
- In 2018, additional animal guarding was installed.
- In 2019, additional single-phase fusing will be installed at multiple locations.
- In 2019, additional animal guarding will be installed at four locations.
- In 2019, additional fusing will be evaluated.
- In 2020, a section of difficult-to-access single-phase will be relocated.
- In 2020, a section of single-phase will be reconductored with protective cable.
- In 2020, an additional Smart Grid device will be added.

- In 2021, several sections of three-phase will be relocated.
- In 2021, two single-phase ties with single-phase Smart Grid devices will be added.
- In 2021, full circuit trimming will be performed.

05 Circuit 17802 -- GILBERT 78-02

Performance Analysis

The GILBERT 78-02 circuit experienced seven outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 1,466 customers for up to 750 minutes resulting in 879,183 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead fuse causing a recloser to trip to lockout. This outage affected 173 customers for up to 2,357 minutes resulting in 226,188 CMI.

On May 16, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 233 customers for up to 3,613 minutes resulting in 727,252 CMI.

On May 16, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 73 customers for up to 3,405 minutes resulting in 248,534 CMI.

On May 16, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 60 customers for up to 1,880 minutes resulting in 112,783 CMI.

On August 4, 2018, an equipment failure occurred on an overhead switch causing a recloser to trip to lockout. This outage affected 612 customers for up to 198 minutes resulting in 153,606 CMI.

On February 25, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 1,451 customers for up to 295 minutes resulting in 191,997 CMI.

In total, the GILBERT 78-02 circuit had 83 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (48); equipment failure (24); animal contacts (7); nothing found (4).

Remedial Actions

- In 2018, hot spot tree trimming was performed.
- In 2018, additional animal guarding was installed.
- In 2018, numerous porcelain cutouts were replaced with polymer cutouts. More will be replaced in 2019 and 2020.
- In 2019, additional animal guarding will be installed.
- In 2019, a section of difficult-to-access single-phase conductor will be relocated.
- In 2019, approximately 40 poles will be replaced.
- In 2019, an additional sectionalizing device will be evaluated.
- In 2019, voltage regulators will be evaluated for this circuit.
- In 2019, the addition of a new substation will be evaluated.
- In 2020, an existing recloser will be upgraded.
- In 2020, several sections of difficult-to-access conductor will be relocated.
- In 2020, an existing non-telemetered device will be replaced with a telemetered device.

06 Circuit 15604 -- NO STROUDSBURG 56-04

Performance Analysis

The NO STROUDSBURG 56-04 circuit experienced eight outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 36 customers for up to 4,220 minutes resulting in 149,596 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead component causing a recloser to trip to lockout. This outage affected 549 customers for up to 3,957 minutes resulting in 140,724 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an underground conductor causing a recloser to trip to lockout. This outage affected 53 customers for up to 3,865 minutes resulting in 204,828 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 28 customers resulting in 131,768 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 26 customers resulting in 113,890 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 530 customers for up to 2,678 minutes resulting in 1,255,063 CMI.

On May 17, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 129 customers for up to 1,164 minutes resulting in 139,806 CMI.

On May 17, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 113 customers for up to 1,441 minutes resulting in 149,593 CMI.

In total, the NO STROUDSBURG 56-04 circuit had 81 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (48); equipment failure (19); animal contacts (9); nothing found (2); vehicles (2); other (1).

Remedial Actions

- In 2018, additional animal guarding was installed, and more installations will occur in 2019.
- In 2019, hazard tree removal was performed, and additional removals will be evaluated.
- In 2020, a new single-phase tie will be constructed for this circuit.
- In 2020, a section of single-phase conductor will be relocated and reconductored.
- In 2020, a section of single-phase conductor will be extended and re-sourced.
- In 2021, full circuit trimming will be performed.

07 Circuit 46302 -- ROHRSBURG 63-02

Performance Analysis

The ROHRSBURG 63-02 circuit experienced four outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 149 customers for up to 1,647 minutes resulting in 245,403 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 321 customers for up to 3,227 minutes resulting in 617,175 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 192 customers for up to 2,703 minutes resulting in 379,937 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 404 customers for up to 1,839 minutes resulting in 585,341 CMI.

In total, the ROHRSBURG 63-02 circuit had 99 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (74); equipment failure (13); animal contacts (6); nothing found (5); other (1).

Remedial Actions

- In 2018, an existing three-phase recloser was converted to single-phase operation.
- In 2018, an Expanded Operation Review was performed with 35 minor remediations performed.
- In 2018, hot spot trimming was performed.
- In 2019, an additional Smart Grid device will be installed on this circuit.
- In 2019, additional fusing will be evaluated for this circuit.
- In 2019, additional trimming right-of-way will be sought in areas with high tree outage concentrations.
- In 2019, several sections of difficult-to-access conductor will be evaluated for relocation.
- In 2019, the trim cycle length will be re-evaluated for this circuit.
- In 2019, full circuit trimming will be performed.

08 Circuit 26402 -- INDIAN ORCHARD 64-02

Performance Analysis

The INDIAN ORCHARD 64-02 circuit experienced five outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing an interruption. This outage affected 186 customers for up to 1,288 minutes resulting in 239,422 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 41 customers for up to 3,302 minutes resulting in 135,365 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 54 customers for up to 5,540 minutes resulting in 177,886 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 160 customers for up to 5,679 minutes resulting in 420,795 CMI.

On May 16, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 160 customers for up to 4,859 minutes resulting in 777,360 CMI.

In total, the INDIAN ORCHARD 64-02 circuit had 52 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (36); equipment failure (8); animal contacts (3); nothing found (3); other (1); vehicles (1).

Remedial Actions

- In 2019, a new Smart Grid device was installed.
- In 2019, a section of difficult-to-access single-phase conductor will be relocated and evaluated for resourcing.
- In 2019, hazard tree removal will be performed.
- In 2019, full circuit trimming will be performed.
- In 2021, a loop feed and additional fusing will be installed for a section of this circuit.

09 Circuit 28602 -- BLYTHEBURN 86-02

Performance Analysis

The BLYTHEBURN 86-02 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On April 4, 2018, during a period of strong wind, a tree contacted an overhead conductor causing an interruption. This outage affected 385 customers for up to 1,349 minutes resulting in 384,816 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,934 customers for up to 2,932 minutes resulting in 1,176,216 CMI.

In total, the BLYTHEBURN 86-02 circuit had 36 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (20); equipment failure (6); animal contacts (4); other (3); vehicles (2); nothing found (1).

Remedial Actions

- In 2018, a three-phase recloser was installed as part of the Smart Grid program.
- In 2018, multiple porcelain cutout fuses were replaced.
- In 2018, a single-phase tap fuse was installed.
- In 2019, full circuit trimming was performed.
- In 2019, two additional switches will be installed.
- In 2019, an additional single-phase recloser will be installed.
- In 2019, a substation conversion will be evaluated.
- In 2019, a tie line to the BLYTHEBURN 86-04 will be evaluated.
- In 2019, an Expanded Operational Review will be performed.
- In 2020, an additional Smart Grid device will be installed.
- In 2020, a section of difficult-to-access single-phase will be relocated.

10 Circuit 16504 -- STROUDSBURG 65-04

Performance Analysis

The STROUDSBURG 65-04 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of lightning, a tree contacted an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 2,326 customers for up to 957 minutes resulting in 407,639 CMI.

On May 16, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a temporary open point to be interrupted. This outage affected 421 customers for up to 3,435 minutes resulting in 1,117,105 CMI.

On May 16, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 68 customers for up to 2,446 minutes resulting in 166,281 CMI.

In total, the STROUDSBURG 65-04 circuit had 42 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (19); equipment failure (15); animal contacts (4); nothing found (3); vehicles (1).

Remedial Actions

- In 2018, full circuit tree trimming was performed.
- In 2018, an existing sectionalizing device was upgraded to a Smart Grid device.
- In 2018, additional single-phase fusing was installed.
- In 2018, additional animal guarding was installed.
- In 2019, a section of conductor will be re-sourced and receive additional fusing.
- In 2019, an existing sectionalizing device will be upgraded to a Smart Grid device.
- In 2020, an additional Smart Grid device will be added to this circuit.

11 Circuit 20402 -- ASHFIELD 04-02

Performance Analysis

The ASHFIELD 04-02 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 1,886 customers for up to 1,081 minutes resulting in 1,309,814 CMI.

On February 25, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 272 customers for up to 568 minutes resulting in 154,368 CMI.

In total, the ASHFIELD 04-02 circuit had 37 outages between April 2018 and March 2019, with the causes breaking down as follows: equipment failure (16); tree related (12); animal contacts (7); nothing found (1); vehicles (1).

Remedial Actions

- In 2018, an existing three-phase recloser was reprogrammed to single-phase operation.
- In 2018, 36 porcelain cutouts were replaced.
- In 2018, two additional Smart Grid devices were added to this circuit.
- In 2018, five additional fuses were added to this circuit, and further fusing will be evaluated.
- In 2018, an Expanded Operation Review was performed, with three cross-arms replaced as a result.
- In 2019, a section of difficult-to-access conductor will be reconfigured.
- In 2019, two additional single-phase reclosers will be installed, one with remote operability.
- In 2019, additional fusing will be installed on this circuit.

12 Circuit 17902 -- BARTONSVILLE 79-02

Performance Analysis

The BARTONSVILLE 79-02 circuit experienced four outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, an equipment failure occurred on an overhead conductor causing a recloser to trip to lockout. This outage affected 415 customers for up to 1,611 minutes resulting in 531,985 CMI.

On May 15, 2018, during a period of heavy rain, an equipment failure occurred on an overhead conductor causing a load break fuse to operate. This outage affected 42 customers resulting in 128,025 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 105 customers resulting in 281,293 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 96 customers resulting in 255,405 CMI.

In total, the BARTONSVILLE 79-02 circuit had 40 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (22); equipment failure (8); animal contacts (7); nothing found (1); other (1); vehicles (1).

Remedial Actions

- In 2018, full circuit tree trimming was performed.
- In 2019, additional animal guarding will be installed.
- In 2019, additional fusing will be evaluated.
- In 2020, a section of difficult-to-access conductor will be relocated.
- In 2021, a single-phase tie to TANNERSVILLE 57-01 will be built.

13 Circuit 45602 -- WOOLRICH 56-02

Performance Analysis

The WOOLRICH 56-02 circuit experienced four outages of over 100,000 CMI between April 2018 and March 2019.

On July 25, 2018, during a period of heavy rain, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 426 customers for up to 447 minutes resulting in 164,430 CMI.

On August 7, 2018, during a period of heavy rain, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 703 customers for up to 1,036 minutes resulting in 727,794 CMI.

On September 21, 2018, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 983 customers for up to 348 minutes resulting in 253,174 CMI.

On February 24, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 983 customers for up to 1,474 minutes resulting in 372,932 CMI.

In total, the WOOLRICH 56-02 circuit had 54 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (25); equipment failure (13); animal contacts (10); nothing found (4); other (1); vehicles (1).

Remedial Actions

- In 2018, a line inspection of a difficult-to-access section of conductor was performed. As a result, several minor items were identified and will be remediated.
- In 2019, additional animal guarding will be installed.
- In 2019, an Expanded Operational Review will be performed.
- In 2019, an additional Smart Grid device will be installed on this circuit.
- In 2019, a tie to the WOOLRICH 56-01 will be evaluated.
- In 2019, non-wire backup solutions will be evaluated for this circuit.

14 Circuit 18502 -- CANADENSIS 85-02

Performance Analysis

The CANADENSIS 85-02 circuit experienced four outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 90 customers for up to 2,656 minutes resulting in 238,953 CMI.

On May 15, 2018, during a period of strong wind, an equipment failure occurred on an overhead conductor causing a temporary open point to be interrupted. This outage affected 71 customers for up to 2,637 minutes resulting in 187,227 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 58 customers for up to 2,860 minutes resulting in 165,868 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 43 customers for up to 2,795 minutes resulting in 120,175 CMI.

In total, the CANADENSIS 85-02 circuit had 100 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (62); equipment failure (20); animal contacts (14); nothing found (2); vehicles (2).

Remedial Actions

- In 2019, a new Smart Grid device will be installed.
- In 2020, additional animal guarding will be installed.
- In 2020, multiple single-phase ties will be constructed.
- In 2020, a three-phase tie to the CANADENSIS 85-01 will be built.
- In 2020, several sections of line will be reconductored.
- In 2020, five additional Smart Grid devices will be installed.
- In 2020, additional sectionalizing devices will be installed.
- In 2020, a section of three-phase conductor will be extended to feed several single-phase taps.
- In 2021, a substation conversion will be performed.
- In 2021, full circuit trimming will be performed.

15 Circuit 15704 -- TANNERSVILLE 57-04

Performance Analysis

The TANNERSVILLE 57-04 circuit experienced one outage of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing an interruption. This outage affected 647 customers for up to 1,739 minutes resulting in 1,060,903 CMI.

In total, the TANNERSVILLE 57-04 circuit had 54 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (33); animal contacts (9); equipment failure (7); nothing found (2); vehicles (2); other (1).

Remedial Actions

- In 2018, an additional sectionalizing device was installed.
- In 2018, a capacitor bank was upgraded.
- In 2019, full circuit tree trimming was performed.
- In 2019, additional fusing will be installed.
- In 2020, additional animal guarding will be installed on this circuit.
- In 2020, a section of difficult-to-access conductor will be relocated.
- In 2020, protective cable will be installed on a section single-phase.
- In 2020, a section of single-phase will be evaluated for reconductoring.
- In 2021 a single-phase tie to the LONG POND 08-01 will be constructed.

16 Circuit 45302 -- WEST BERWICK 53-02

Performance Analysis

The WEST BERWICK 53-02 circuit experienced four outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead switch causing a recloser to trip to lockout. This outage affected 319 customers for up to 1,427 minutes resulting in 450,101 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 123 customers resulting in 198,828 CMI.

On May 16, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 119 customers for up to 1,059 minutes resulting in 125,969 CMI.

On May 22, 2018, during a period of heavy rain, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 434 customers for up to 608 minutes resulting in 140,866 CMI.

In total, the WEST BERWICK 53-02 circuit had 56 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (39); equipment failure (10); nothing found (4); animal contacts (3).

Remedial Actions

- In 2019, a recloser was replaced with a telemetric triple-single operation recloser.
- In 2019, a tie to the BERWICK 60-02 will be evaluated.
- In 2019, several sections of single-phase will be evaluated for reconductoring.
- In 2019, a section of difficult-to-access conductor will be evaluated for relocation.

17 Circuit 16801 -- WAGNERS 68-01

Performance Analysis

The WAGNERS 68-01 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On April 4, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 253 customers resulting in 108,790 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 1,461 customers for up to 381 minutes resulting in 350,479 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing an interruption. This outage affected 269 customers for up to 1,386 minutes resulting in 372,586 CMI.

In total, the WAGNERS 68-01 circuit had 57 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (42); equipment failure (11); animal contacts (3); nothing found (1).

Remedial Actions

- In 2018, additional animal guarding was installed. More animal guards will be installed in 2019 and 2020.
- In 2018, multiple capacitor banks were upgraded.
- In 2019, a new voltage regulating device will be installed.
- In 2020, a section of single-phase will be reconductored and have several new Smart Grid devices installed.
- In 2021, a single-phase tie will be constructed for this circuit.

- In 2021, a single-phase tie will be constructed, and several new Smart Grid devices installed.

18 Circuit 56501 -- ROCKVILLE 65-01

Performance Analysis

The ROCKVILLE 65-01 circuit experienced four outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor. This outage affected 642 customers for up to 1,643 minutes resulting in 352,397 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead switch causing a recloser to trip to lockout. This outage affected 642 customers for up to 364 minutes resulting in 231,548 CMI.

On May 15, 2018, during a period of strong wind, an equipment failure occurred on an overhead conductor causing a recloser to trip to lockout. This outage affected 795 customers for up to 596 minutes resulting in 229,380 CMI.

On July 21, 2018, a tree contacted a pole or pole arm causing a recloser to trip to lockout. This outage affected 1,043 customers for up to 214 minutes resulting in 222,930 CMI.

In total, the ROCKVILLE 65-01 circuit had 58 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (35); animal contacts (10); equipment failure (10); nothing found (1); other (1); vehicles (1).

Remedial Actions

- In 2018, infrared scanning was performed. As a result, several minor repairs were completed.
- In 2018, an additional single-phase fuse was installed.
- In 2018 through 2019, full circuit tree trimming was performed.
- In 2018, an existing recloser was upgraded.
- In 2019, a new substation will be evaluated to reduce load on this circuit.
- In 2020, an additional Smart Grid device will be installed on this circuit.
- In 2020, an additional tie point will be added to this circuit.
- In 2019, voltage support devices will be installed to increase tie capability.
- In 2019, a single-phase tie with single phase Smart Grid device will be evaluated.

19 Circuit 53602 -- DALMATIA 36-02

Performance Analysis

The DALMATIA 36-02 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 354 customers for up to 16 minutes resulting in 285,442 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 178 customers for up to 1,132 minutes resulting in 154,096 CMI.

In total, the DALMATIA 36-02 circuit had 135 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (84); equipment failure (27); nothing found (14); animal contacts (6); vehicles (2); contact or dig in (1); other (1).

Remedial Actions

- In 2018, right-of-way was expanded for a section of this circuit to allow for more effective tree trimming.
- In 2018, the MEISERVILLE substation was built to provide load support for this circuit and reduce outage exposure.
- In 2018, two single-phase fuses were installed.
- In 2018, infrared scanning was performed.
- In 2018 through 2019, full circuit tree trimming was performed.
- In 2019, a section of single-phase line will be relocated and re-sourced.
- In 2019, single phase sectionalizing will be evaluated.

20 Circuit 16802 -- WAGNERS 68-02

Performance Analysis

The WAGNERS 68-02 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing an interruption. This outage affected 156 customers for up to 3,014 minutes resulting in 429,819 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 80 customers for up to 1,500 minutes resulting in 107,118 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 84 customers for up to 4,196 minutes resulting in 329,662 CMI.

In total, the WAGNERS 68-02 circuit had 49 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (41); equipment failure (6); animal contacts (1); nothing found (1).

Remedial Actions

- In 2018, an existing sectionalizing device was upgraded to a Smart Grid device.
- In 2018, additional animal guarding was installed.
- In 2019, hazard tree removal will be evaluated.
- In 2019, an additional single-phase recloser will be evaluated for this circuit.
- In 2021, several sections of single-phase will be reconductored.
- In 2021, two single-phase ties will be constructed.

21 Circuit 47704 -- BLOOMSBURG 77-04

Performance Analysis

The BLOOMSBURG 77-04 circuit experienced four outages of over 100,000 CMI between April 2018 and March 2019.

On April 4, 2018, during a period of strong wind, an equipment failure occurred on a substation component causing a circuit breaker to trip to lockout. This outage affected 1,373 customers for up to 103 minutes resulting in 138,691 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 155 customers for up to 2,804 minutes resulting in 138,292 CMI.

On September 9, 2018, during a period of heavy rain, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 403 customers for up to 571 minutes resulting in 229,855 CMI.

On February 25, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 93 customers for up to 1,693 minutes resulting in 123,351 CMI.

In total, the BLOOMSBURG 77-04 circuit had 73 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (42); equipment failure (18); nothing found (6); animal contacts (5); other (1); vehicles (1).

Remedial Actions

- In 2018, the circuit breaker was replaced.
- In 2019, line reconfiguration will be performed on a section of single-phase line.
- In 2019, two sections of difficult-to-access conductor will be evaluated for relocation.
- In 2019, construction of a new substation will be evaluated.
- In 2020, full circuit trimming will be performed.

22 Circuit 17801 -- GILBERT 78-01

Performance Analysis

The GILBERT 78-01 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 1,499 customers for up to 21 minutes resulting in 364,257 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted a pole or pole arm causing a recloser to trip to lockout. This outage affected 122 customers for up to 1,320 minutes resulting in 160,983 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a sectionalizing device to be interrupted. This outage affected 127 customers for up to 1,200 minutes resulting in 152,393 CMI.

In total, the GILBERT 78-01 circuit had 59 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (31); equipment failure (15); animal contacts (6); vehicles (4); nothing found (3).

Remedial Actions

- In 2018, additional animal guarding was installed.
- In 2018, multiple porcelain cut-outs were replaced with polymer.
- In 2019, an existing non-telemetered recloser was upgraded to telemetered.
- In 2019, several reclosers were programmed to triple-single operation.
- In 2019, a difficult-to-access section of single-phase conductor will be relocated.
- In 2019, a new line and terminal will be constructed.
- In 2021, a single-phase tie line will be constructed, including additional Smart Grid devices.
- In 2021, full circuit trimming will be performed.

23 Circuit 22001 -- BOHEMIA 20-01

Performance Analysis

The BOHEMIA 20-01 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 54 customers for up to 3,066 minutes resulting in 165,547 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a sectionalizing device to be interrupted. This outage affected 162 customers for up to 2,649 minutes resulting in 428,980 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 54 customers for up to 4,502 minutes resulting in 243,063 CMI.

In total, the BOHEMIA 20-01 circuit had 77 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (29); animal contacts (22); equipment failure (14); nothing found (10); contact or dig in (1); other (1).

Remedial Actions

- In 2018, ten locations received animal guarding; the remainder of the circuit will be patrolled for additional animal guarding opportunities.
- In 2018, full circuit trimming was performed.
- In 2018 an existing recloser was reprogrammed for single-phase operation.
- In 2019, an existing recloser will be evaluated for replacement.
- In 2019, six locations will receive fusing.
- In 2019, reconductoring a section of single-phase to three-phase will be evaluated.
- In 2021, three sections of difficult-to-access single-phase will be relocated and reconductored.
- In 2021, a section of single-phase will be extended.

24 Circuit 40201 -- BEAR GAP 02-01

Performance Analysis

The BEAR GAP 02-01 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 79 customers for up to 1,491 minutes resulting in 117,733 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 109 customers for up to 1,330 minutes resulting in 144,877 CMI.

On February 24, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 109 customers for up to 2,499 minutes resulting in 204,668 CMI.

In total, the BEAR GAP 02-01 circuit had 119 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (79); equipment failure (18); nothing found (12); animal contacts (10).

Remedial Actions

- In 2017, an Expanded Operational Review was performed on this circuit. Several items were identified and remediated, including a pole replacement and 13 cross arm replacements.
- In 2019, additional fusing will be installed at eight locations on this circuit.
- In 2019, an additional single-phase tie will be evaluated for this circuit.
- In 2020, full circuit trimming will be performed.
- In 2020, a section of existing conductor will be relocated and reconductored.

25 Circuit 15702 -- TANNERSVILLE 57-02

Performance Analysis

The TANNERSVILLE 57-02 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 824 customers for up to 985 minutes resulting in 811,640 CMI.

On February 24, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 874 customers for up to 737 minutes resulting in 146,745 CMI.

In total, the TANNERSVILLE 57-02 circuit had 37 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (19); animal contacts (8); equipment failure (7); nothing found (1); other (1); vehicles (1).

Remedial Actions

- In 2018, additional animal guarding was installed.
- In 2018, the circuit protection settings were reviewed.
- In 2019, new load break disconnect switch will be installed.
- In 2019, a new three-phase tie to BARTONSVILLE 79-03 will be constructed.
- In 2022, a new substation, CRANBERRY CREEK, will be constructed.

26 Circuit 47001 -- HUGHESVILLE 70-01

Performance Analysis

The HUGHESVILLE 70-01 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On May 2, 2018, a vehicle contacted a pole causing a recloser to trip to lockout. This outage affected 1,102 customers for up to 546 minutes resulting in 120,981 CMI.

On July 14, 2018, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 826 customers for up to 339 minutes resulting in 214,817 CMI.

In total, the HUGHESVILLE 70-01 circuit had 88 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (48); equipment failure (17); animal contacts (11); nothing found (5); vehicles (3); contact or dig in (2); other (2).

Remedial Actions

- In 2019, additional fusing was installed.
- In 2019, additional animal guarding was installed.
- In 2019, several porcelain cutouts were replaced with polymer.
- In 2019, four additional single-phase reclosers will be installed on this circuit.
- In 2019, three sections of difficult-to-access conductor will be relocated.
- In 2019, an additional Smart Grid device will be installed.
- In 2020, a section of difficult-to-access conductor will be relocated.
- In 2020, an additional Smart Grid device will be installed.

27 Circuit 23902 -- EFFORT MOUNTAIN 39-02

Performance Analysis

The EFFORT MOUNTAIN 39-02 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break disconnect switch to be interrupted. This outage affected 194 customers for up to 1,523 minutes resulting in 283,786 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 147 customers for up to 2,902 minutes resulting in 391,046 CMI.

On October 29, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 224 customers for up to 639 minutes resulting in 137,911 CMI.

In total, the EFFORT MOUNTAIN 39-02 circuit had 57 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (36); equipment failure (15); animal contacts (4); nothing found (1); vehicles (1).

Remedial Actions

- In 2018, additional animal guarding was installed.
- In 2018, several porcelain cut-outs were replaced with polymer.
- In 2019, full circuit trimming will be performed.
- In 2019, hazard tree removal will be performed.
- In 2019, a single-phase tap will be reconfigured.
- In 2020, a section of two-phase conductor will be reconfigured.

28 Circuit 46206 -- DANVILLE 62-06

Performance Analysis

The DANVILLE 62-06 circuit experienced four outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 112 customers for up to 1,226 minutes resulting in 115,292 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 83 customers for up to 1,548 minutes resulting in 111,618 CMI.

On June 18, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 425 customers for up to 264 minutes resulting in 112,008 CMI.

On July 25, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 111 customers for up to 1,392 minutes resulting in 106,636 CMI.

In total, the DANVILLE 62-06 circuit had 65 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (41); equipment failure (11); animal contacts (6); nothing found (5); other (1); vehicles (1).

Remedial Actions

- In 2018, a one-mile section of difficult-to-access conductor was relocated.
- In 2018, hot spot trimming was performed.
- In 2019, two additional single-phase reclosers will be installed on this circuit.
- In 2019, a section of single-phase conductor will be rebuilt to underground.
- In 2019, the trim cycle for this circuit will be re-evaluated.
- In 2019, a new distribution river crossing will be evaluated.
- In 2019, a tie to the DANVILLE 62-04 will be constructed.

29 Circuit 21203 -- EAST CARBONDALE 12-03

Performance Analysis

The EAST CARBONDALE 12-03 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On May 3, 2018, during a period of strong wind, an equipment failure occurred on an overhead conductor causing a recloser to trip to lockout. This outage affected 884 customers for up to 29 minutes resulting in 160,153 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 886 customers for up to 615 minutes resulting in 528,092 CMI.

In total, the EAST CARBONDALE 12-03 circuit had 42 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (23); equipment failure (11); animal contacts (6); nothing found (1); other (1).

Remedial Actions

- In 2018, additional animal guarding was installed.
- In 2018, several porcelain cutouts were replaced with polymer.
- In 2019, a three-phase tie to the HONESDALE 34-01 will be constructed.
- In 2019, several sections of single-phase will be evaluated for extension and reconductoring.
- In 2019, several sections of three-phase will be evaluated for relocation.
- In 2019, full circuit tree trimming will be performed.
- In 2019, an additional sectionalizing switch will be evaluated for this circuit.
- In 2020, over 100 porcelain cutouts will be replaced with polymer.
- In 2020, additional animal guarding will be installed.

30 Circuit 22003 -- BOHEMIA 20-03

Performance Analysis

The BOHEMIA 20-03 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 169 customers for up to 2,801 minutes resulting in 473,203 CMI.

On May 18, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 549 customers for up to 533 minutes resulting in 275,701 CMI.

On June 14, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 565 customers for up to 254 minutes resulting in 105,064 CMI.

In total, the BOHEMIA 20-03 circuit had 58 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (26); equipment failure (13); animal contacts (12); nothing found (7).

Remedial Actions

- In 2018, an existing capacitor was upgraded.
- In 2018, full circuit trimming was performed.
- In 2019, additional animal guarding will be installed at several locations.
- In 2019, 10 or more locations will receive fusing.
- In 2019, an additional recloser will be added to the circuit.
- In 2019, an existing recloser will be replaced.
- In 2019, additional sectionalizing switches will be added to the circuit.
- In 2020, a three-phase tie line to the TWIN LAKES 81-02 will be constructed.
- In 2021, a section of single-phase will be reconductored.
- In 2021, a new Smart Grid device will be installed on this circuit.

31 Circuit 28301 -- NEWFOUNDLAND 83-01

Performance Analysis

The NEWFOUNDLAND 83-01 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On April 4, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 883 customers for up to 394 minutes resulting in 190,214 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 360 customers for up to 379 minutes resulting in 136,231 CMI.

On February 25, 2019, during a period of strong wind, a tree contacted a pole or pole arm causing a recloser to trip to lockout. This outage affected 358 customers for up to 365 minutes resulting in 130,637 CMI.

In total, the NEWFOUNDLAND 83-01 circuit had 117 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (74); equipment failure (18); animal contacts (14); nothing found (6); other (4); vehicles (1).

Remedial Actions

- In 2018, 24 additional animal guards were installed.
- In 2019, a section of single-phase will be reconductored.
- In 2019, a section of three-phase will be reconductored.
- In 2019, a two-phase line extension will be evaluated.
- In 2019, a new single-phase tie will be built.
- In 2019, a new line and terminal will be constructed.
- In 2020, an additional Smart Grid device will be installed on this circuit.

32 Circuit 40602 -- PINE GROVE 06-02

Performance Analysis

The PINE GROVE 06-02 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On August 1, 2018, during a period of heavy rain, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 415 customers for up to 1,093 minutes resulting in 254,995 CMI.

On October 17, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 416 customers for up to 318 minutes resulting in 103,421 CMI.

On December 21, 2018, a vehicle contacted a pole causing a motor operated switch to be interrupted. This outage affected 1,875 customers for up to 413 minutes resulting in 192,541 CMI.

In total, the PINE GROVE 06-02 circuit had 62 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (34); equipment failure (15); animal contacts (5); vehicles (4); nothing found (3); other (1).

Remedial Actions

- In 2019, an additional Smart Grid device was installed on this circuit.
- In 2019, ten additional locations will receive fusing.
- In 2020, an additional Smart Grid device will be installed on this circuit.
- In 2020, a section of single-phase line will be reconductored, and the protection scheme will be upgraded.
- In 2021, full circuit trimming will be performed.

33 Circuit 44301 -- BEAVERTOWN 43-01

Performance Analysis

The BEAVERTOWN 43-01 circuit experienced one outage of over 100,000 CMI between April 2018 and March 2019.

On February 24, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 2,034 customers for up to 407 minutes resulting in 827,838 CMI.

In total, the BEAVERTOWN 43-01 circuit had 78 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (47); equipment failure (22); nothing found (4); animal contacts (2); other (2); vehicles (1).

Remedial Actions

- In 2019, a section of difficult-to-access single-phase will be relocated.
- In 2019, additional fusing will be installed on this circuit.
- In 2019, 40 or more poles will be replaced.
- In 2019, a section of three-phase will be evaluated for relocation.
- In 2019, a tie to the BEAVERTOWN 43-02 will be evaluated.
- In 2020, full circuit trimming will be performed.
- In 2021, a new tie line will be constructed for this circuit.

34 Circuit 23403 -- HONESDALE 34-03

Performance Analysis

The HONESDALE 34-03 circuit experienced four outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,795 customers for up to 120 minutes resulting in 415,362 CMI.

On May 15, 2018, an unidentified issue occurred with an overhead conductor causing a recloser to trip to lockout. This outage affected 597 customers for up to 195 minutes resulting in 116,295 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 93 customers for up to 1,563 minutes resulting in 109,064 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a temporary open point to be interrupted. This outage affected 97 customers for up to 2,837 minutes resulting in 275,189 CMI.

In total, the HONESDALE 34-03 circuit had 42 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (27); equipment failure (5); vehicles (4); animal contacts (3); nothing found (2); other (1).

Remedial Actions

- In 2019, additional animal guarding will be installed.
- In 2020, full circuit trimming will be performed.
- In 2020, an existing hydraulic recloser will be relocated and upgraded to a Smart Grid device.
- In 2020, an additional Smart Grid device will be installed.
- In 2021, a section of single-phase conductor will be relocated.

35 Circuit 24901 -- WHITE HAVEN 49-01

Performance Analysis

The WHITE HAVEN 49-01 circuit experienced five outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 66 customers for up to 1,969 minutes resulting in 115,951 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 103 customers for up to 1,273 minutes resulting in 122,369 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 152 customers for up to 662 minutes resulting in 199,542 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 180 customers for up to 1,370 minutes resulting in 246,580 CMI.

On May 16, 2018, during a period of strong wind, an equipment failure occurred on an overhead conductor causing a recloser to trip to lockout. This outage affected 142 customers for up to 1,557 minutes resulting in 129,819 CMI.

In total, the WHITE HAVEN 49-01 circuit had 55 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (26); equipment failure (19); animal contacts (6); nothing found (2); other (1); vehicles (1).

Remedial Actions

- In 2018, an existing switch was upgraded to a Smart Grid device.
- In 2018, additional animal guarding was installed.
- In 2018, additional fusing was installed at fifteen locations.
- In 2019, a single-phase recloser will be installed.
- In 2020, a section of three-phase line will be reconfigured.
- In 2020, a section of three-phase line will be extended and made more accessible.
- In 2020, full circuit trimming will be performed.
- In 2020, an additional Smart Grid device will be installed.
- In 2020, an Expanded Operational Review will be performed.

36 Circuit 24603 -- VARDEN 46-03

Performance Analysis

The VARDEN 46-03 circuit experienced one outage of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, an equipment failure occurred on an overhead conductor causing an interruption. This outage affected 195 customers for up to 5,891 minutes resulting in 648,225 CMI.

In total, the VARDEN 46-03 circuit had 61 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (34); equipment failure (14); animal contacts (9); other (2); nothing found (1); vehicles (1).

Remedial Actions

- In 2019, several single-phase tie lines will be built.
- In 2019, three sections of difficult-to-access single-phase conductor will be relocated.
- In 2019, a tie line to the EAST CARBONDALE 12-01 will be constructed.
- In 2019, full circuit trimming will be performed.
- In 2019, additional animal guarding will be installed.
- In 2019 and 2020, 21 porcelain cutouts will be replaced with polymer cutouts.
- In 2021, an existing recloser will be replaced with a Smart Grid device.
- In 2021, a new Smart Grid device will be installed on this circuit.

37 Circuit 52402 -- GREEN PARK 24-02

Performance Analysis

The GREEN PARK 24-02 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 253 customers for up to 1,563 minutes resulting in 245,836 CMI.

On February 24, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 253 customers for up to 917 minutes resulting in 180,194 CMI.

In total, the GREEN PARK 24-02 circuit had 100 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (58); equipment failure (24); nothing found (8); animal contacts (6); other (2); vehicles (2).

Remedial Actions

- In 2018, a significant number of hazard trees were removed.
- In 2018, numerous single-phase fuses were installed.
- In 2018, a section of three-phase conductor was replaced.
- In 2019, additional animal guarding was installed.
- In 2019, six sections of conductor will be relocated.
- In 2019, a second transmission source into the distribution substation will be constructed.
- In 2019, two additional sectionalizers will be installed.
- In 2020, two sections of difficult-to-access conductor will be relocated.
- In 2019, a single-phase sectionalizing device will be installed.
- In 2019, additional single-phase sectionalizing will be evaluated.
- In 2019, coordination of protective devices will be reviewed.
- In 2021, two sections of single phase will be re-sourced to reduce exposure.

38 Circuit 45303 -- WEST BERWICK 53-03

Performance Analysis

The WEST BERWICK 53-03 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted a pole or pole arm causing a load break fuse to operate. This outage affected 63 customers for up to 3,011 minutes resulting in 124,681 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 117 customers for up to 2,780 minutes resulting in 317,868 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 55 customers for up to 3,084 minutes resulting in 128,192 CMI.

In total, the WEST BERWICK 53-03 circuit had 57 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (39); equipment failure (8); nothing found (5); animal contacts (2); other (2); vehicles (1).

Remedial Actions

- In 2018, hazard tree removal was performed on this circuit.
- In 2019, additional fusing was installed on this circuit.
- In 2019, an additional switch will be installed on this circuit.
- In 2019, two additional single-phase reclosers will be installed on this circuit.
- In 2019, three difficult-to-access locations will be evaluated for relocation.
- In 2020, full circuit trimming will be performed.

39 Circuit 26601 -- BROOKSIDE 66-01

Performance Analysis

The BROOKSIDE 66-01 circuit experienced one outage of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, an unidentified issue occurred with an overhead conductor causing a recloser to trip to lockout. This outage affected 854 customers for up to 1,265 minutes resulting in 671,660 CMI.

In total, the BROOKSIDE 66-01 circuit had 38 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (27); equipment failure (5); animal contacts (4); nothing found (1); other (1).

Remedial Actions

- In 2018, fusing was installed at five locations.
- In 2018, 21 poles were replaced.
- In 2018, addition animal guarding was installed on this circuit.
- In 2019, a single-phase recloser will be installed on this circuit.
- In 2019, several porcelain cutouts will be replaced with polymer.
- In 2019, reconductoring several sections of single-phase will be evaluated.
- In 2020, full circuit trimming will be performed.
- In 2021, a section of single-phase conductor will be extended.

40 Circuit 55001 -- NEWPORT 50-01

Performance Analysis

The NEWPORT 50-01 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On November 16, 2018, during a period of ice/sleet/snow, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 324 customers for up to 1,474 minutes resulting in 228,901 CMI.

On February 25, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 211 customers for up to 968 minutes resulting in 142,146 CMI.

On March 3, 2019, during a period of ice/sleet/snow, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 325 customers for up to 427 minutes resulting in 122,821 CMI.

In total, the NEWPORT 50-01 circuit had 84 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (57); equipment failure (13); animal contacts (7); nothing found (5); vehicles (2).

Remedial Actions

- In 2019, a smart grid device will be installed.
- In 2019, a reliability focused prototype battery energy storage system was installed.
- In 2019, substation conversion will be completed.
- In 2019, protection coordination will be evaluated.
- In 2019, a new single-phase tie will be evaluated to remove an inaccessible section of line.
- In 2019, single phase sectionalizing will be evaluated.
- In 2020, full circuit tree trimming will be performed.

41 Circuit 25801 -- SULLIVAN TRAIL 58-01

Performance Analysis

The SULLIVAN TRAIL 58-01 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted a pole or pole arm causing a recloser to trip to lockout. This outage affected 392 customers for up to 745 minutes resulting in 286,585 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing an interruption. This outage affected 246 customers for up to 516 minutes resulting in 126,876 CMI.

In total, the SULLIVAN TRAIL 58-01 circuit had 54 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (31); equipment failure (14); animal contacts (4); other (3); nothing found (1); vehicles (1).

Remedial Actions

- In 2018, an Expanded Operational Review was performed. As a result, six cross arms were replaced, and three additional minor repairs were completed.
- In 2019, additional fusing will be evaluated for this circuit.
- In 2019, two single-phase ties will be evaluated for this circuit.
- In 2019, additional single-phase reclosers will be evaluated for this circuit.
- In 2019, two Smart Grid devices will be upgraded to improve communication capability.
- In 2021, full circuit trimming will be performed.

42 Circuit 22805 -- HAUTO 28-05

Performance Analysis

The HAUTO 28-05 circuit experienced one outage of over 100,000 CMI between April 2018 and March 2019.

On June 14, 2018, an unidentified issue occurred with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 4,727 customers for up to 1,353 minutes resulting in 934,520 CMI.

In total, the HAUTO 28-05 circuit had 11 outages between April 2018 and March 2019, with the causes breaking down as follows: equipment failure (3); tree related (3); nothing found (2); vehicles (2); animal contacts (1).

Remedial Actions

- In 2018, an existing Smart Grid device was replaced.
- In 2018, a drone patrol identified several minor items, which were remediated.
- In 2018, an Expanded Operation Review was performed.
- In 2018, six additional fuses were installed.
- In 2019, additional disconnect switches will be installed on this circuit.
- In 2019, a section of difficult-to-access conductor will be evaluated for reconfiguration.
- In 2020, full circuit trimming will be performed.

43 Circuit 43401 -- BENTON 34-01

Performance Analysis

The BENTON 34-01 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On April 4, 2018, during a period of strong wind, an equipment failure occurred on a pole or pole arm causing a recloser to trip to lockout. This outage affected 97 customers for up to 1,173 minutes resulting in 105,807 CMI.

On August 13, 2018, during a period of heavy rain, a tree contacted an overhead component causing an interruption. This outage affected 508 customers for up to 481 minutes resulting in 100,560 CMI.

In total, the BENTON 34-01 circuit had 56 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (38); equipment failure (8); nothing found (6); animal contacts (4).

Remedial Actions

- In 2018, a section of difficult-to-access conductor was relocated.
- In 2018, an additional sectionalizing device was installed.
- In 2019, an additional single-phase recloser will be installed on this circuit.
- In 2019, two sections of difficult-to-access conductor will be evaluated for relocation.
- In 2019, an Expanded Operational Review will be performed on this circuit.
- In 2020, full circuit trimming will be performed.

44 Circuit 22002 -- BOHEMIA 20-02

Performance Analysis

The BOHEMIA 20-02 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 208 customers for up to 1,971 minutes resulting in 414,128 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 628 customers for up to 1,967 minutes resulting in 299,409 CMI.

On July 14, 2018, an equipment failure occurred on an underground conductor causing a recloser to trip to lockout. This outage affected 590 customers for up to 237 minutes resulting in 101,058 CMI.

In total, the BOHEMIA 20-02 circuit had 28 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (15); animal contacts (5); equipment failure (4); nothing found (2); contact or dig in (1); vehicles (1).

Remedial Actions

- In 2018, the protection settings for a section of single-phase line were reviewed and optimized.
- In 2018, animal guarding was installed.
- In 2019, additional animal guarding will be installed.
- In 2019, several devices will be replaced at an underground residential development.
- In 2019, several sections of underground cable will be replaced.
- In 2019, several sections of single-phase will be evaluated for relocation.
- In 2019, a section of single-phase will be evaluated for reconductoring
- In 2020, a new Smart Grid device will be installed.
- In 2021, two new Smart Grid devices will be installed.
- In 2021, an additional singe-phase recloser will be installed.

45 Circuit 26001 -- WEST DAMASCUS 60-01

Performance Analysis

The WEST DAMASCUS 60-01 circuit experienced one outage of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 239 customers for up to 1,275 minutes resulting in 274,834 CMI.

In total, the WEST DAMASCUS 60-01 circuit had 85 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (46); equipment failure (22); animal contacts (10); nothing found (6); contact or dig in (1).

Remedial Actions

- In 2018, animal guarding was installed at several locations.
- In 2019, a new reliability substation will be evaluated.
- In 2019, additional locations will receive animal guarding.
- In 2019, several sections of single-phase will be evaluated for extension and re-sourcing.
- In 2019, an additional Smart Grid device will be installed.
- In 2020, a section of difficult-to-access conductor will be relocated.
- In 2021, a section of three-phase line will be reconductored.
- In 2021, a section of three-phase line will be relocated.
- In 2021, new voltage regulators will be installed.
- In 2021, 7 devices will be upgraded to telemetric capability.

- In 2021, multiple sections of difficult-to-access single-phase will be relocated to more accessible locations.
- In 2021, an automated single-phase tie will be constructed.

46 Circuit 56801 -- BENVENUE 68-01

Performance Analysis

The BENVENUE 68-01 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an unknown component causing a recloser to trip to lockout. This outage affected 114 customers for up to 1,114 minutes resulting in 126,920 CMI.

On February 24, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 114 customers for up to 906 minutes resulting in 103,325 CMI.

In total, the BENVENUE 68-01 circuit had 65 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (38); equipment failure (14); animal contacts (9); vehicles (3); nothing found (1).

Remedial Actions

- In 2018, the circuit breaker relays were upgraded.
- In 2018, the circuit breaker was replaced.
- In 2019, hazard tree removal will be evaluated.
- In 2019, additional single-phase ties were evaluated for this circuit.
- In 2019, two single-phase fuses will be installed.
- In 2019, an Expanded Operational Review will be performed.
- In 2019, single phase sectionalizing will be evaluated.

47 Circuit 26703 -- HEMLOCK FARMS 67-03

Performance Analysis

The HEMLOCK FARMS 67-03 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On April 16, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 141 customers for up to 911 minutes resulting in 124,964 CMI.

On February 24, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 823 customers for up to 2,602 minutes resulting in 436,304 CMI.

On February 25, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,796 customers for up to 141 minutes resulting in 253,236 CMI.

In total, the HEMLOCK FARMS 67-03 circuit had 67 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (30); equipment failure (18); animal contacts (13); nothing found (6).

Remedial Actions

- In 2019, several sections of single phase will be reconfigured and extended.
- In 2019, three additional single-phase reclosers will be installed.
- In 2019, an additional Smart Grid device will be installed.
- In 2020, full circuit trimming will be performed.

48 Circuit 28805 -- LAKEVILLE 88-05

Performance Analysis

The LAKEVILLE 88-05 circuit experienced one outage of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 402 customers for up to 1,819 minutes resulting in 637,210 CMI.

In total, the LAKEVILLE 88-05 circuit had 37 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (15); animal contacts (12); equipment failure (9); vehicles (1).

Remedial Actions

- In 2018, full circuit trimming was performed.
- In 2018, the protection settings for four sections of single-phase were reviewed and optimized.
- In 2019, a new recloser was installed on this circuit.
- In 2019, additional fusing was installed on this circuit.
- In 2019, additional animal guards will be installed.
- In 2020, additional fusing will be installed.
- In 2020, a section of line will be re-sourced and divided into sections.
- In 2022, a new Smart Grid device will be installed.

49 Circuit 45402 -- WEST BLOOMSBURG 54-02

Performance Analysis

The WEST BLOOMSBURG 54-02 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 72 customers for up to 1,489 minutes resulting in 102,644 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 88 customers for up to 1,335 minutes resulting in 117,429 CMI.

In total, the WEST BLOOMSBURG 54-02 circuit had 77 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (56); equipment failure (12); nothing found (5); animal contacts (4).

Remedial Actions

- In 2018, hot spot trimming was performed on this circuit.
- In 2018, numerous porcelain cutouts were replaced with polymer cutouts.
- In 2018, several additional locations received animal guarding.
- In 2019, three sections of difficult-to-access conductor will be evaluated for relocation.
- In 2020, a section of difficult-to-access single-phase will be relocated.

50 Circuit 59202 -- THOMPSONTOWN 92-02

Performance Analysis

The THOMPSONTOWN 92-02 circuit experienced one outage of over 100,000 CMI between April 2018 and March 2019.

On February 25, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a sectionalizing device to be interrupted. This outage affected 888 customers for up to 239 minutes resulting in 212,232 CMI.

In total, the THOMPSONTOWN 92-02 circuit had 66 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (42); equipment failure (15); nothing found (6); animal contacts (1); other (1); vehicles (1).

Remedial Actions

- In 2019, single phase sectionalizing will be evaluated.
- In 2019, a Smart Grid device will be installed.

- In 2020, a three-phase protective device will be upgraded to a Smart Grid device.
- In 2019, a sectionalizing single-phase device will be installed.
- In 2019, a section of inaccessible conductor will be relocated.
- In 2019, two sections of conductor will be reconductored with covered conductor.
- In 2019, a single-phase tie will be evaluated.
- In 2019, additional single-phase fusing will be evaluated.
- In 2019, a section of conductor will be evaluated to be reconductored.

51 Circuit 20403 -- ASHFIELD 04-03

Performance Analysis

The ASHFIELD 04-03 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On September 25, 2018, during a period of heavy rain, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 454 customers for up to 405 minutes resulting in 172,510 CMI.

On October 23, 2018, an equipment failure occurred on an overhead conductor causing a recloser to trip to lockout. This outage affected 1,422 customers for up to 257 minutes resulting in 114,663 CMI.

In total, the ASHFIELD 04-03 circuit had 76 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (41); equipment failure (17); animal contacts (10); vehicles (3); nothing found (2); other (2); contact or dig in (1).

Remedial Actions

- In 2018, an Expanded Operational Review was performed on this circuit.
- In 2018, approximately 20 cross arms were replaced on this circuit.
- In 2019, an additional Smart Grid device will be added to this circuit.
- In 2019, an additional single-phase recloser will be installed.
- In 2019, full circuit trimming will be performed.
- In 2019, a section of difficult-to-access conductor will be relocated.
- In 2019, two miles of three-phase line will be reconductored.
- In 2019, additional fusing will be added at 14 locations.

52 Circuit 24703 -- FREELAND 47-03

Performance Analysis

The FREELAND 47-03 circuit experienced one outage of over 100,000 CMI between April 2018 and March 2019.

On April 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 1,030 customers for up to 562 minutes resulting in 578,324 CMI.

In total, the FREELAND 47-03 circuit had 28 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (18); equipment failure (6); vehicles (2); animal contacts (1); other (1).

Remedial Actions

- In 2018, additional fusing was installed on this circuit.
- In 2019, several spans of single-phase conductor were rebuilt to three-phase, and reconfiguration was performed.
- In 2019, an additional Smart Grid device will be installed on this circuit.
- In 2019, a tie to the SAINT JOHNS 30-02 will be evaluated.

53 Circuit 54001 -- SHERMANSDALE 40-01

Performance Analysis

The SHERMANSDALE 40-01 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 488 customers for up to 548 minutes resulting in 267,204 CMI.

On May 16, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 158 customers for up to 1,172 minutes resulting in 132,312 CMI.

In total, the SHERMANSDALE 40-01 circuit had 39 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (25); equipment failure (9); animal contacts (2); nothing found (2); vehicles (1).

Remedial Actions

- In 2018, triple-single operation was enabled on an existing recloser.
- In 2018, three additional single-phase fuses were installed, and the coordination scheme improved.

- In 2019, an Expanded Operational Review will be performed.
- In 2019, a single-phase sectionalizing device will be installed.
- In 2019, two fuses will be installed.
- In 2021, full circuit trimming will be performed.
- In 2019, hot spot tree trimming will be performed.

54 Circuit 42701 -- AUGUSTAVILLE 27-01

Performance Analysis

The AUGUSTAVILLE 27-01 circuit experienced one outage of over 100,000 CMI between April 2018 and March 2019.

On July 24, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 159 customers for up to 1,176 minutes resulting in 114,667 CMI.

In total, the AUGUSTAVILLE 27-01 circuit had 113 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (65); equipment failure (21); animal contacts (12); nothing found (9); other (3); vehicles (3).

Remedial Actions

- In 2018, an Expanded Operational Review was performed. Additional fusing was installed as a result.
- In 2019, full circuit trimming will be performed.
- In 2019, a section of multi-phase conductor will be replaced.
- In 2019, a section of difficult-to-access conductor will be evaluated for relocation.
- In 2019, two additional single-phase reclosers will be installed.
- In 2019, a section of single-phase will be evaluated for relocation.
- In 2019, an additional Smart Grid device will be installed on this circuit.
- In 2020, a section of difficult-to-access conductor will be removed.
- In 2020, an additional Smart Grid device will be installed on this circuit.

55 Circuit 44902 -- SCOTT 49-02

Performance Analysis

The SCOTT 49-02 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a load break fuse to operate. This outage affected 87 customers for up to 1,845 minutes resulting in 160,466 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 93 customers for up to 1,590 minutes resulting in 147,804 CMI.

On July 22, 2018, during a period of heavy rain, an equipment failure occurred on an overhead switch causing a recloser to trip to lockout. This outage affected 735 customers for up to 597 minutes resulting in 322,744 CMI.

In total, the SCOTT 49-02 circuit had 38 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (25); equipment failure (7); animal contacts (2); nothing found (2); other (1); vehicles (1).

Remedial Actions

- In 2019, two sections of difficult-to-access three-phase conductor will be evaluated for relocation.
- In 2019, additional fusing will be installed.
- In 2019, several cross arms will be replaced.
- In 2019, several switches will be replaced on this circuit.
- In 2019, the protection scheme was reviewed and optimized for this circuit.
- In 2019, a new Smart Grid device was installed on this circuit with a second device also scheduled for 2019.
- In 2019, an Expanded Operational Review will be performed.
- In 2019, a section of difficult-to-access single-phase will be evaluated for relocation.

56 Circuit 20601 -- GREENWOOD 06-01

Performance Analysis

The GREENWOOD 06-01 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of heavy rain, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 455 customers for up to 1,071 minutes resulting in 475,600 CMI.

On June 13, 2018, a vehicle contact occurred causing a recloser to trip to lockout. This outage affected 455 customers for up to 301 minutes resulting in 136,955 CMI.

In total, the GREENWOOD 06-01 circuit had 38 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (18); equipment failure (13); animal contacts (5); vehicles (2).

Remedial Actions

- In 2018, an additional switch was installed.
- In 2019, two spans of conductor were reconductored.
- In 2019, a full circuit drone inspection will be conducted.
- In 2019, additional fusing will be installed.
- In 2019, a new substation will be evaluated.
- In 2019, two additional single-phase reclosers will be installed, along with additional fusing.
- In 2019, a section of difficult-to-access single-phase will be evaluated for relocation.
- In 2019, an Expanded Operational Review will be performed on this circuit.
- In 2019, a section of three-phase conductor will be evaluated for a rebuild.
- In 2020, full circuit trimming will be performed.

57 Circuit 25402 -- LAKE HARMONY 54-02

Performance Analysis

The LAKE HARMONY 54-02 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On April 16, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 808 customers for up to 427 minutes resulting in 281,329 CMI.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 96 customers for up to 3,059 minutes resulting in 178,945 CMI.

In total, the LAKE HARMONY 54-02 circuit had 47 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (29); equipment failure (13); animal contacts (3); nothing found (1); vehicles (1).

Remedial Actions

- In 2018, a three-phase tie to the LONG POND 08-02 was constructed.
- In 2019, full circuit trimming will be performed.
- In 2019, an Expanded Operational Review will be performed.

58 Circuit 44904 -- SCOTT 49-04

Performance Analysis

The SCOTT 49-04 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of heavy rain, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 108 customers for up to 1,565 minutes resulting in 156,229 CMI.

On February 24, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 109 customers for up to 1,213 minutes resulting in 132,157 CMI.

In total, the SCOTT 49-04 circuit had 40 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (24); equipment failure (9); animal contacts (5); nothing found (1); other (1).

Remedial Actions

- In 2019, full circuit trimming will be performed.
- In 2019, an Expanded Operational Review will be performed on this circuit.
- In 2019, additional single-phase reclosers will be evaluated for this circuit.
- In 2019, a section of difficult-to-access single-phase will be evaluated for relocation.

59 Circuit 26603 -- BROOKSIDE 66-03

Performance Analysis

The BROOKSIDE 66-03 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On April 16, 2018, during a period of strong wind, a tree contacted a pole or pole arm causing a recloser to trip to lockout. This outage affected 676 customers for up to 939 minutes resulting in 347,849 CMI.

On February 24, 2019, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 60 customers for up to 2,119 minutes resulting in 107,666 CMI.

In total, the BROOKSIDE 66-03 circuit had 53 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (35); equipment failure (8); animal contacts (4); nothing found (2); other (2); vehicles (2).

Remedial Actions

- In 2019, full circuit trimming will be performed.
- In 2019, additional fusing will be installed.
- In 2019, a section of three-phase will be reconductored and relocated.
- In 2019, a new single-phase tie will be evaluated.
- In 2020, numerous porcelain cutouts will be replaced with polymer.

60 Circuit 41602 -- CLEVELAND 16-02

Performance Analysis

The CLEVELAND 16-02 circuit experienced one outage of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead conductor causing an interruption. This outage affected 126 customers for up to 1,431 minutes resulting in 154,400 CMI.

In total, the CLEVELAND 16-02 circuit had 85 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (64); animal contacts (10); equipment failure (6); nothing found (5).

Remedial Actions

- In 2018 and 2019, hazard tree removal was performed.
- In 2019, a new Smart Grid device will be added to this circuit.
- In 2019, a new single-phase recloser will be installed on this circuit.
- In 2019, undergrounding several sections of single-phase will be evaluated.
- In 2019, aerial and Hendrix cable will be evaluated for sections of this circuit.
- In 2020, the CLEVELAND substation will be rebuilt.
- In 2020, an Expanded Operational Review will be performed.

61 Circuit 16501 -- STROUDSBURG 65-01

Performance Analysis

The STROUDSBURG 65-01 circuit experienced one outage of over 100,000 CMI between April 2018 and March 2019.

On May 15, 2018, during a period of strong wind, a tree contacted an overhead switch causing a load break fuse to operate. This outage affected 163 customers for up to 3,290 minutes resulting in 536,266 CMI.

In total, the STROUDSBURG 65-01 circuit had 17 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (10); equipment failure (4); animal contacts (2); other (1).

Remedial Actions

- In 2018, additional animal guarding was installed.
- In 2018, a sectionalizing device was upgraded.
- In 2018, full circuit tree trimming was performed.
- In 2019, several poles will be replaced.
- In 2019, several sections of single-phase will be reconductored.
- In 2020, a three-phase tie to the STROUDSBURG 65-03 will be constructed.

62 Circuit 13704 -- SCHNECKSVILLE 37-04

Performance Analysis

The SCHNECKSVILLE 37-04 circuit experienced three outages of over 100,000 CMI between April 2018 and March 2019.

On April 2, 2018, during a period of ice/sleet/snow, a vehicle contacted a pole causing a recloser to trip to lockout. This outage affected 485 customers for up to 288 minutes resulting in 129,336 CMI.

On April 16, 2018, during a period of strong wind, a tree contacted an overhead conductor causing a recloser to trip to lockout. This outage affected 589 customers for up to 340 minutes resulting in 200,006 CMI.

On August 9, 2018, a vehicle contacted a pole causing a recloser to trip to lockout. This outage affected 652 customers for up to 554 minutes resulting in 205,164 CMI.

In total, the SCHNECKSVILLE 37-04 circuit had 45 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (17); equipment failure (13); animal contacts (8); nothing found (4); vehicles (3).

Remedial Actions

- In 2019, full circuit trimming will be performed.
- In 2019, hazard tree removal will be performed.
- In 2019, additional fusing and disconnect switches will be installed on this circuit.
- In 2019, an additional Smart Grid device will be installed on this circuit.
- In 2019, three additional single-phase reclosers will be installed on this circuit.
- In 2019, additional fusing will be installed on this circuit.
- In 2019, additional animal guarding will be evaluated for this circuit.

63 Circuit 41802 -- GOWEN CITY 18-02

Performance Analysis

The GOWEN CITY 18-02 circuit experienced two outages of over 100,000 CMI between April 2018 and March 2019.

On April 16, 2018, during a period of strong wind, an unidentified issue occurred with a pole or pole arm causing a recloser to trip to lockout. This outage affected 508 customers for up to 384 minutes resulting in 194,828 CMI.

On October 8, 2018, an animal interfered with an overhead switch causing a circuit breaker to trip to lockout. This outage affected 523 customers for up to 385 minutes resulting in 193,721 CMI.

In total, the GOWEN CITY 18-02 circuit had 47 outages between April 2018 and March 2019, with the causes breaking down as follows: tree related (31); nothing found (6); equipment failure (4); animal contacts (3); other (3).

Remedial Actions

- In 2018, an Expanded Operational Review was completed. Five minor remediations were performed in 2018, and five more are scheduled for 2019.
- In 2018, the circuit breaker for this circuit was replaced.
- In 2019, numerous hazard trees were removed.
- In 2019, a substation conversion will be evaluated.
- In 2019, a tie to the GOWEN CITY 18-01 will be evaluated.
- In 2019, additional single-phase ties will be evaluated for this circuit.
- In 2020, an existing recloser will be replaced.
- In 2021, the substation will be upgraded.
- In 2021, full circuit trimming will be performed.

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

The following table shows a breakdown of service interruption causes for the 12 months ended at the current quarter.

Cause Description	Trouble Cases	Percent of Trouble Cases	Customer Interruptions	Percent of Customer Interruptions	Customer Minutes	Percent of Customer Minutes
Animals	3,186	14.4%	41,632	3.2%	3,096,808	1.3%
Contact / Dig-In	156	0.7%	11,395	0.9%	925,813	0.4%
Directed by Non-PPL Authority	86	0.4%	15,951	1.2%	1,664,950	0.7%
Equipment Failures	6,469	29.3%	411,687	31.7%	42,345,550	18.4%
Improper Design	5	0.0%	5,142	0.4%	92,515	0.0%
Improper Installation	4	0.0%	573	0.0%	69,268	0.0%
Improper Operation	5	0.0%	5,551	0.4%	42,962	0.0%
Nothing Found	1,242	5.6%	65,118	5.0%	6,513,520	2.8%
Other Controllable	120	0.5%	13,990	1.1%	736,291	0.3%
Other Non Control	297	1.3%	27,536	2.1%	2,427,684	1.1%
Other Public	35	0.2%	5,448	0.4%	451,464	0.2%
Tree Related	9,684	43.8%	555,081	42.7%	160,767,931	69.7%
Unknown	-	0.0%	-	0.0%	-	0.0%
Vehicles	760	3.4%	97,943	7.5%	9,824,153	4.3%
Forced Due to UGI Gas Leaks	58	0.3%	43,149	3.3%	1,713,299	0.7%
Total	**22,107**	**100.0%**	**1,300,196**	**100.0%**	**230,672,208**	**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 56% of cases, 62% of customer interruptions, and 82% of CMI.

Tree Related: As of 2013, PPL Electric has implemented a more aggressive trimming strategy.

Animals: Animals accounted for approximately 14% 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 76% 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 PPL Electric substations have received animal guarding.

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. 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 46% of the cases of trouble, 53% of the customer interruptions and 61% 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	1st Quarter		Year-to-date	
		Budget	Actual	Budget	Actual
Transmission					
Transmission C-tag poles (# of structures)	661	55	91	55	91
Transmission arm replacements (# of arms)	20	7	8	7	8
Transmission air break switch inspections (# of switches)	0	0	0	0	0
Transmission surge arrester installations (# of sets)	0	0	0	0	0
Transmission structure inspections (# of activities)	33,243	7,549	8,088	7,549	8,088
Transmission tree side trim-Bulk Power (linear feet)	N/A				
Transmission herbicide-Bulk Power (# of acres)	N/A				
Transmission reclearing (# of miles) BES Only	654	62	165	62	165
Transmission reclearing (# of miles) 69 kV	1,581	147	120	147	120
Transmission reclearing (# of miles) 138 kV	196	34	13	34	13
Transmission danger tree removals-Bulk Power (# of trees)	N/A				
Substation					
Substation batteries (# of activities)	456	426	437	426	437
Circuit breakers (# of activities)	95	2	84	2	84
Substation inspections (# of activities)	775	685	694	685	694
Transformer maintenance (# of activities)	41	3	36	3	36

Inspection & Maintenance Goals/Objectives	Annual Budget	1st Quarter		Year-to-date	
		Budget	Actual	Budget	Actual
Distribution					
Distribution C-tag poles replaced (# of poles)	3,418	1,084	797	1,084	797
C-truss distribution poles (# of poles)	0	0	7	0	7
Capacitor (MVAR added)	5,094	282	382	282	382
OCR Replacements (# of)	31	22	17	22	17
Distribution pole inspections (# of poles)	90,000	5,794	6,548	5,794	6,548
Distribution line inspections (hours)	10,459	1,843	2,078	1,843	2,078
Group re-lamping (# of lamps)	13,434	0	0	0	0
Test sections of underground distribution cable	N/A	181	181	181	181
Distribution tree trimming (# of miles)	5,967	1,326	1,323	1,326	1,323
Distribution herbicide (# of acres)	N/A				
Distribution >18" removals within R/W (# of trees)	N/A				
Distribution hazard tree removals outside R/W (# of trees)	N/A				
LTN manhole inspections (# of)	271	0	232	0	232
LTN vault inspections (# of)	230	121	196	121	196
LTN network protector overhauls (# of)	16	1	14	1	14
LTN reverse power trip testing (# of)	8	0	8	0	8

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	1st Quarter		Year-to-date	
	Budget ($000)	Actual ($000)	Budget ($000)	Actual ($000)
Provide Electric Service	1,551	1,602	1,551	1,602
Vegetation Management	8,643	9,119	8,643	9,119
Customer Response	11,747	17,256	11,747	17,256
Reliability Maintenance	8,340	7,543	8,340	7,543
System Upgrade	3,097	1,790	3,097	1,790
Customer Service/Accounts	25,852	23,698	25,852	23,698
Others	6,750	20,565	6,750	20,565
Total O&M Expenses	**65,980**	**81,572**	**65,980**	**81,572**

*8) **Quarterly and year-to-date information on budgeted versus actual transmission and distribution capital expenditures in total and detailed by the EDC's own functional account code or FERC account code as available.***

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

Activity	1st Quarter		Year-to-date	
	Budget ($000)	Actual ($000)	Budget ($000)	Actual ($000)
New Service/Revenue	19,323	21,363	19,323	21,363
System Upgrade	159,079	114,709	159,079	114,709
Reliability & Maintenance	106,355	86,695	106,355	86,695
Customer Response	3,340	9,613	3,340	9,613
Other	4,013	2,477	4,013	2,477
Total	**292,110**	**234,857**	**292,110**	**234,857**

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 first quarter of 2019, 217 corrective work orders were created with the following breakdown by priority.

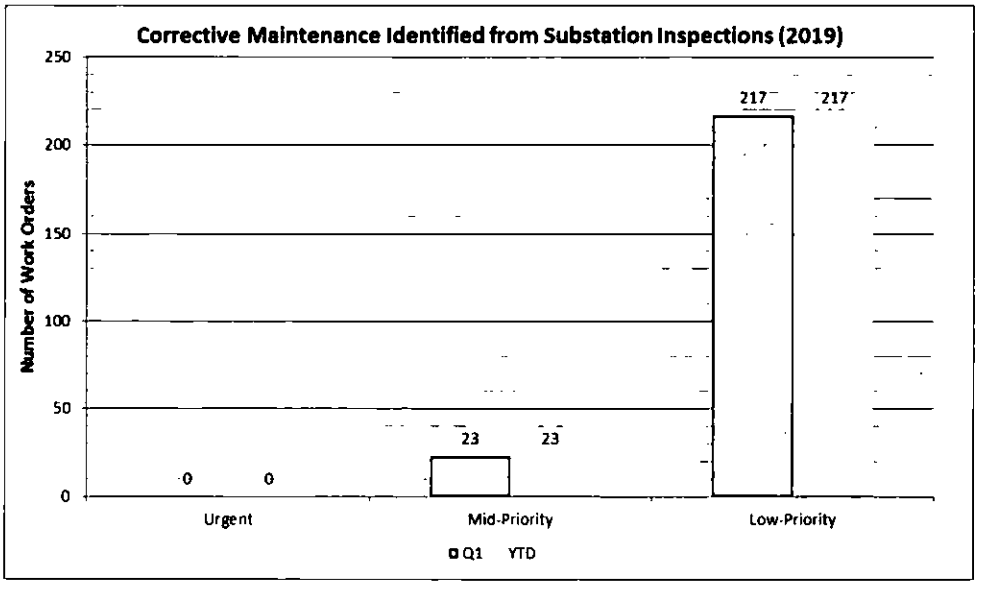


Figure 1: Corrective Maintenance Work Orders by Priority Level for first quarter and year-to-date 2019

(b) The Amount Spent on Substation Inspections

During the first quarter of 2019, PPL Electric spent approximately $132,000 on substation inspections.

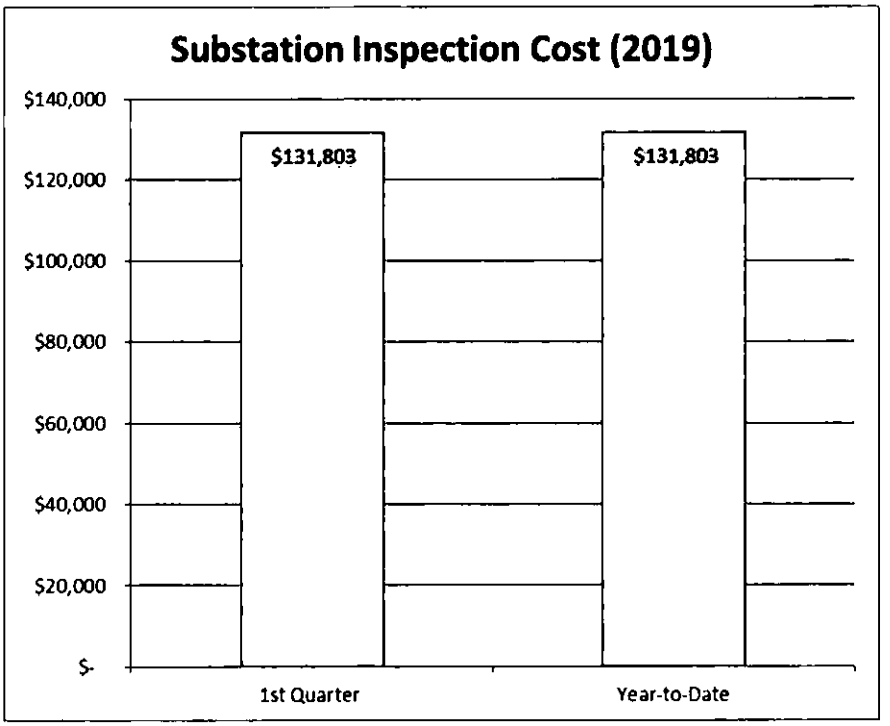


Figure 2: Substation Inspection Costs for first quarter and year-to-date 2019.

(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 of CMI avoidance that PPL Electric has estimated for the first quarter and year-to-date. During first quarter of 2019, PPL Electric avoided a projected 506,000 CMI.

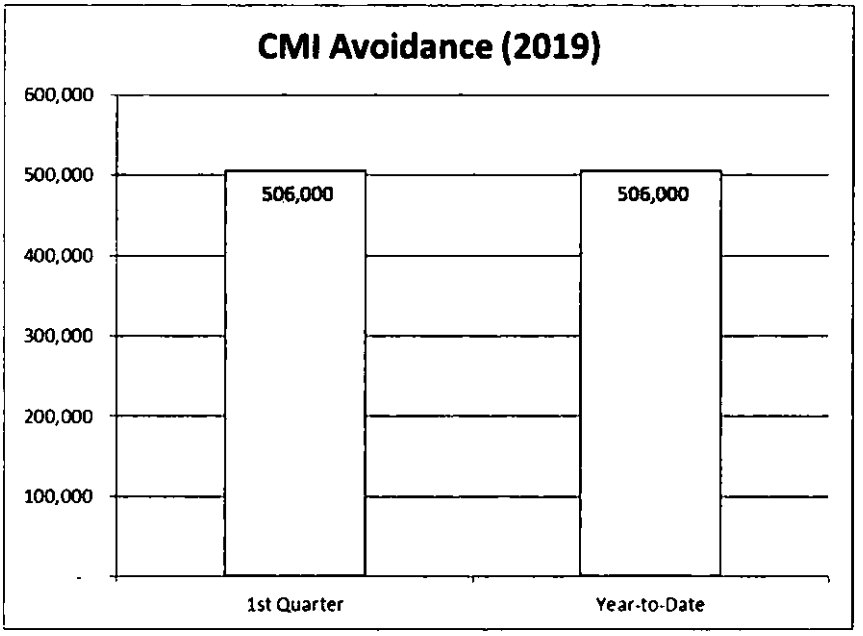


Figure 3: CMI Avoidance Due to Inspections for first quarter and year-to-date 2019

(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 first quarter of 2019, the Company interrupted about 22,935 customers for a total of approximately 989,431CMI. The figures below show these results for the number of customers interrupted and CMI experienced, respectively.

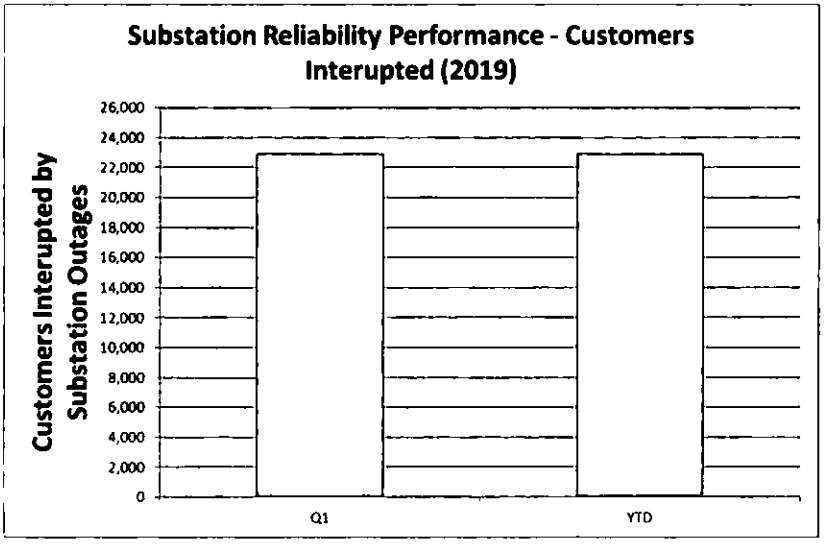


Figure 4: Substation Customers Interrupted for first quarter and year-to-date 2019

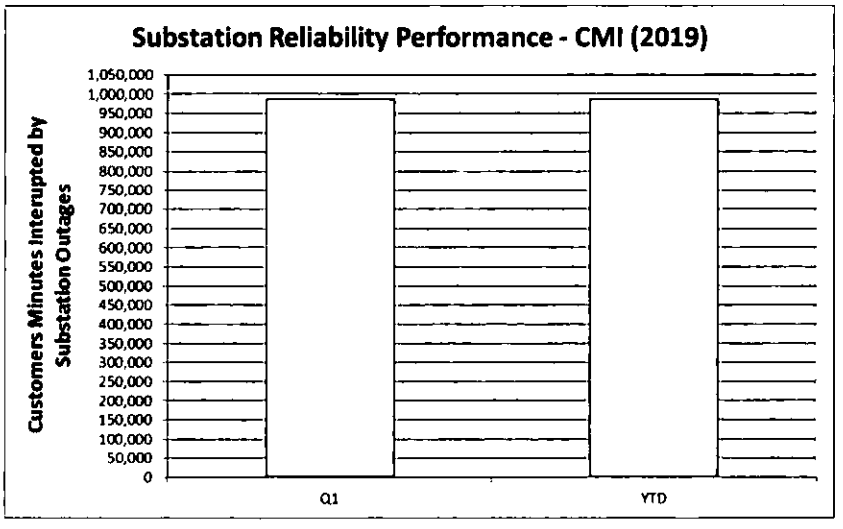


Figure 5: Substation Customer Minutes of Interruption for first quarter and year-to-date 2019

(f) Substation SAIFI Contribution

Overall, substation outages contributed approximately 11% of the total SAIFI experienced by PPL Electric customers in the first quarter of 2019. 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.

	1st Quarter	Year-to-Date
Substations with Remote Monitoring	354	354
Total Number of Substations	356	356

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	60
Journeyman Lineman	212
Journeyman Lineman-Trainee	26
Helper	5
Groundhand	2
Troubleman	51
T&D Total	**356**
Electrical	
Elect Leaders-UG	2
Elect Leaders-Net	9
Elect Leaders-Sub	22
Journeyman Elect-UG	13
Journeyman Elect-Net	32
Journeyman Elect-Sub	68
Journeyman Elect Trainee-UG	0
Journeyman Elect Trainee-Net	0
Journeyman Elect Trainee-Sub	0
Helper	0
Laborer-Network	0
Laborer-Substation	0
Electrical Total	**146**
Overall Total	**502**

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, program, 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, program, 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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