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FEDERAL EXPRESS

April 28, 2017

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, 2017
Docket No. ~~L-00030161~~
M-2016-2522508

Dear Ms. Chiavetta:

Enclosed for filing on behalf of PPL Electric Utilities Corporation ("PPL Electric") is an original of PPL Electric's Quarterly Reliability Report for the Period Ended March 31, 2017. Also enclosed, in a sealed envelope, is a copy of the report containing competitively sensitive and proprietary information. The Company hereby requests that the Commission treat that information, and the report containing the information, as privileged and confidential. The report is being filed pursuant to 52 Pa. Code § 57.195(d).

Pursuant to 52 Pa. Code § 1.11, the enclosed document is to be deemed filed on April 28, 2017, 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

Kimberly A. Klock

Enclosures

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

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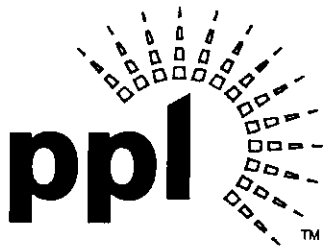

PPL Electric Utilities

PPL Electric Utilities Corporation

Quarterly Reliability Report

to the

Pennsylvania Public Utility Commission

April 2017

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

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

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

The following table provides data for the 12 months ending March 31, 2017.

SAIFI (Benchmark = 0.98; Rolling 12-month Std. = 1.18)	0.81
CAIDI (Benchmark = 145; Rolling 12-month Std. = 174)	123
SAIDI (Benchmark = 142; Rolling 12-month Std. = 205)	99
MAIFI[1]	7.3
Average Number of Customers Served[2]	1,410,686
Number of Sustained Customer Interruptions (Trouble Cases)	17,418
Number of Customers Affected[3]	1,135,814
Customer Minutes of Interruptions (CMI)	139,330,888
Number of Customer Momentary Interruptions	10,249,472

During the first quarter, there were no (0) PUC major events, four (4) PUC reportable events, and two (2) other storms that required the opening of one or more area emergency centers to manage restoration efforts.

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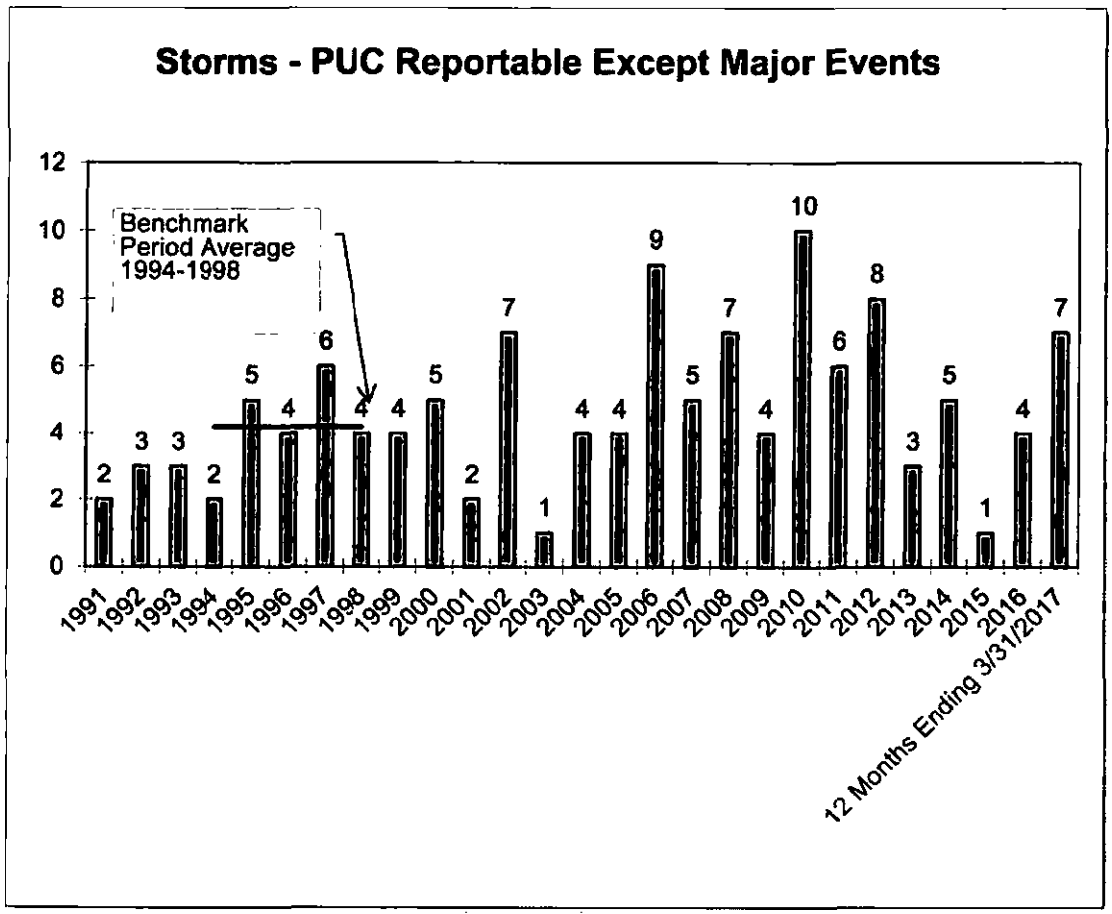
[1] MAIFI data is obtained at the substation breaker level and at certain reclosers. Because PPL Electric is enhancing its ability to identify momentaries, this metric is expected to increase in the near term.

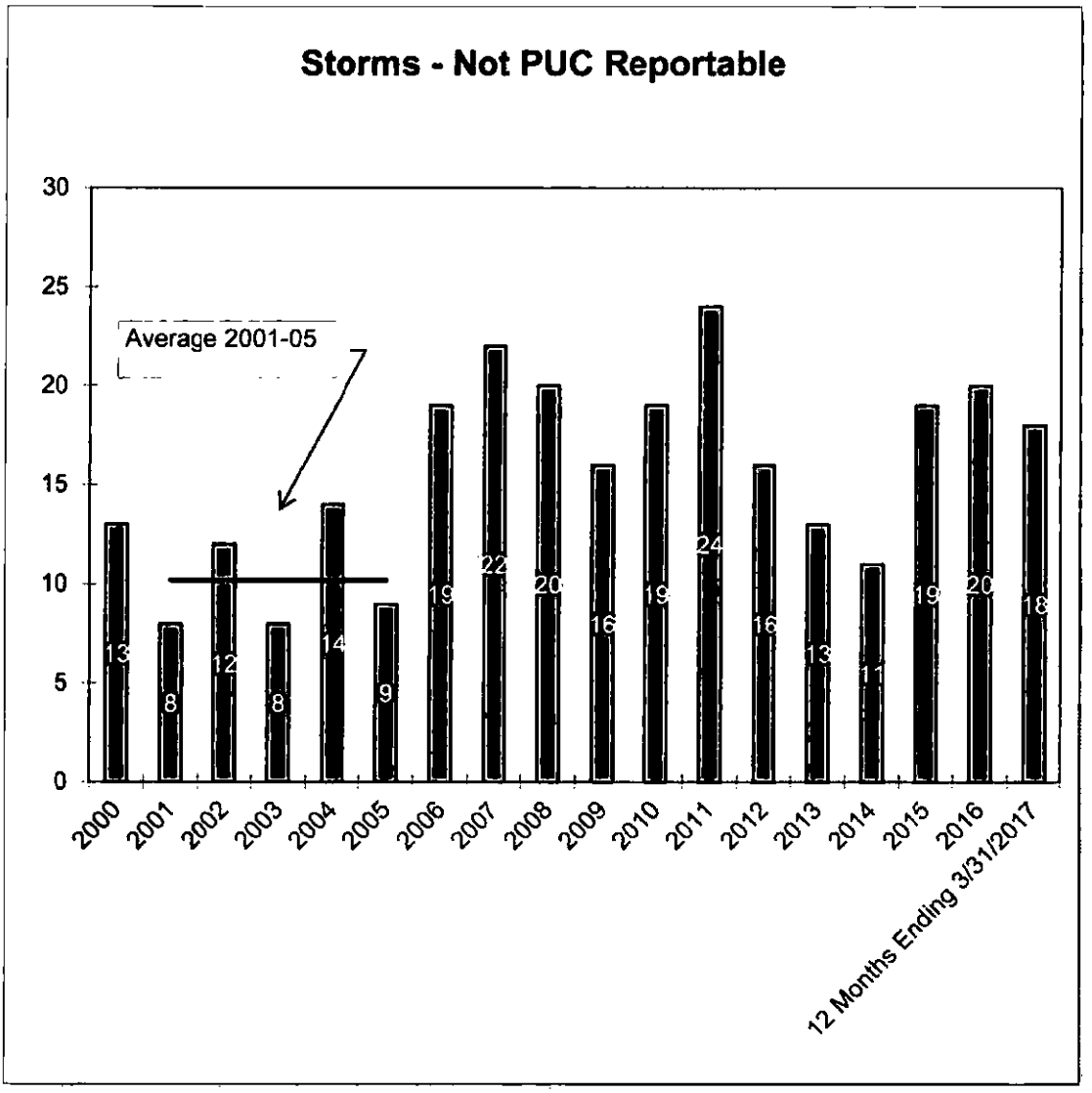
[2] PPL Electric calculates the annual indices using customers served at the end of period. This is consistent with the method used to calculate PPL Electric's benchmarks.

[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.

Specifically, during the 12-month reporting period, there were no (0) PUC major events and seven (7) PUC-reportable storms (≥ 2,500 customers interrupted for ≥ 6 hours) other than major events.



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



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

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

WPC Rank	Feeder ID	SAIDI	CAIDI	SAIFI	MAIFI	Customers	Cases of Trouble	Customer Minutes Interrupted (CMI)
1	28301	1116	252	4.4	23.2	2,270	119	2,533,343
2	64304	933	303	3.1	21.5	1,341	37	1,251,330
3	46702	960	333	2.9	12.1	1,270	44	1,218,857
4	52402	655	203	3.2	10.3	1,638	61	1,073,453
5	26402	939	192	4.9	24.1	1,075	63	1,009,533
6	52401	770	193	4.0	7.2	1,287	75	991,391
7	54101	627	163	3.9	12.2	1,556	51	975,173
8	18502	525	146	3.6	10.6	1,839	92	964,560
9	12601	427	231	1.9	2.6	2,173	38	928,582
10	44703	515	773	0.7	23.8	1,787	32	920,485
11	52403	724	229	3.2	13.1	1,246	50	902,491
12	67605	561	885	0.6	19.3	1,575	27	884,223
13	50106	396	203	2.0	14.3	2,213	21	876,520
14	26604	351	180	1.9	23.8	2,430	56	851,912
15	22601	792	410	1.9	15.3	1,072	40	848,673
16	26602	1222	416	2.9	3.5	684	11	835,787
17	46004	400	241	1.7	22.1	2,080	55	831,473
18	46903	540	110	4.9	16.7	1,516	25	818,347
19	26702	776	179	4.3	16.0	1,026	25	796,412
20	26401	357	166	2.1	37.4	2,176	81	775,803
21	45402	471	225	2.1	26.3	1,625	59	766,132
22	43108	776	439	1.8	21.1	984	13	763,842
23	58402	489	174	2.8	13.1	1,558	41	761,498
24	24401	583	157	3.7	35.2	1,259	66	734,625
25	61801	450	122	3.7	6.6	1,595	21	717,665

WPC Rank	Feeder ID	SAIDI	CAIDI	SAIFI	MAIFI	Customers	Cases of Trouble	Customer Minutes Interrupted (CMI)
26	26001	488	224	2.2	7.1	1,421	67	692,871
27	29501	644	156	4.1	7.2	1,074	26	691,703
28	29503	573	210	2.7	8.0	1,152	44	659,564
29	24502	590	206	2.9	13.5	1,107	34	653,403
30	66505	577	1238	0.5	17.3	1,128	14	650,946
31	26002	524	164	3.2	15.1	1,221	40	639,929
32	40602	278	175	1.6	2.0	2,282	31	633,805
33	65603	258	116	2.2	14.7	2,451	52	632,944
34	60903	502	457	1.1	3.0	1,260	10	632,011
35	11502	251	114	2.2	1.6	2,498	27	626,371
36	28002	523	163	3.2	6.3	1,197	31	625,886
37	42201	357	199	1.8	3.6	1,725	25	616,542
38	28602	316	230	1.4	2.4	1,933	21	611,414
39	51502	327	153	2.1	8.4	1,842	11	601,617
40	29701	531	310	1.7	5.7	1,125	39	597,692
41	20401	590	256	2.3	13.4	1,007	25	594,552
42	11506	450	136	3.3	6.9	1,304	49	587,049
43	59002	256	168	1.5	8.7	2,244	52	575,504
44	26703	305	291	1.0	3.0	1,889	48	575,465
45	25501	341	281	1.2	13.6	1,646	55	560,475
46	16402	444	143	3.1	19.2	1,254	64	557,307
47	47102	2914	107	27.1	3.3	188	2	547,782
48	28604	301	105	2.9	12.5	1,805	43	542,621
49	57401	293	91	3.2	21.2	1,850	28	542,620
50	46203	252	258	1.0	6.0	2,153	48	542,435
51	64201	291	131	2.2	13.8	1,847	30	536,571
52	28804	495	342	1.4	17.3	1,077	31	533,154
53	28101	337	61	5.6	16.0	1,578	66	532,164
54	12605	270	123	2.2	7.3	1,970	27	531,782
55	63304	283	128	2.2	2.3	1,823	11	516,402
56	10903	299	160	1.9	4.8	1,723	31	515,897
57	23401	301	148	2.0	11.3	1,715	49	515,888
58	24602	339	273	1.2	5.7	1,518	44	513,867
59	43102	514	1037	0.5	0.5	990	18	509,312
60	46504	257	112	2.3	3.2	1,925	40	494,396
61	46206	268	188	1.4	19.8	1,802	39	483,756
62	22003	339	135	2.5	2.0	1,425	55	483,290

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

01 Circuit 28301 -- NEWFOUNDLAND 83-01

Performance Analysis

The NEWFOUNDLAND 83-01 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

On November 20, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,858 customers for up to 1,506 minutes resulting in 1,592,438 CMI.

On December 18, 2016, during a period of heavy rain, an equipment failure occurred on a pole or pole arm causing a temporary open point to be interrupted. This outage affected 1,021 customers for up to 356 minutes resulting in 128,399 CMI.

In total, the NEWFOUNDLAND 83-01 circuit had 119 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (75); equipment failure (19); animal contacts (10); nothing found (7); other (4); contact or dig in (3); vehicles (1).

Remedial Actions

- In 2015, series fusing was installed.
- In 2016, Fault Isolation and System Restoration (FISR) automatic switching was enabled.
- In 2016, a Smart Grid recloser was installed.
- In 2016, a single-phase recloser was installed on this circuit.
- In 2016, additional single-phase fusing was installed at two locations.
- In 2017, full circuit trimming was performed.

- In 2017, a section of single-phase will be relocated and reconductored to increase road accessibility.

02 Circuit 64304 -- LINCOLN 43-04

Performance Analysis

The LINCOLN 43-04 circuit experienced three outages of over 100,000 CMI between April 2016 and March 2017.

On May 20, 2016, a vehicle made contact with a pole causing a circuit breaker to trip to lockout. This outage affected 1,334 customers for up to 205 minutes resulting in 106,899 CMI.

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

On February 25, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 681 customers for up to 2,852 minutes resulting in 578,743 CMI.

In total, the LINCOLN 43-04 circuit had 37 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (21); animal contacts (7); equipment failure (4); vehicles (4); other (1).

Remedial Actions

- In 2016, full circuit trimming was performed.
- In 2017, several fusing locations will be investigated.
- In 2017, the transfer of a section of single-phase line to a more reliable source will be investigated.
- In 2017, an Expanded Operational Review will be performed.

- In 2017, a new recloser will be evaluated for this circuit.
- In 2017, a tie line installation will be evaluated for this circuit.

03 Circuit 46702 -- RENOVO 67-02

Performance Analysis

The RENOVO 67-02 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

On July 31, 2016, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 613 customers for up to 1,231 minutes resulting in 411,655 CMI.

On August 13, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 849 customers for up to 1,652 minutes resulting in 495,705 CMI.

In total, the RENOVO 67-02 circuit had 44 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (30); equipment failure (5); nothing found (5); animal contacts (3); vehicles (1).

Remedial Actions

- In 2016, hot spot tree trimming was performed.
- In 2017, an existing recloser has been upgraded to a Smart Grid device.
- In 2017, a solid blade disconnect will be installed.
- In 2017, additional fusing will be installed on this circuit.
- In 2018, full circuit trimming will be performed.
- In 2018, a section of three-phase conductor that is susceptible to tree outages is scheduled for relocation.

04 Circuit 52402 -- GREEN PARK 24-02

Performance Analysis

The GREEN PARK 24-02 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

On September 18, 2016, during a period of heavy rain, an equipment failure occurred on an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,672 customers for up to 341 minutes resulting in 570,168 CMI.

On February 12, 2017, during a period of strong wind, a tree made contact with an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,670 customers for up to 122 minutes resulting in 202,337 CMI.

In total, the GREEN PARK 24-02 circuit had 61 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (36); equipment failure (19); animal contacts (2); nothing found (2); other (1); vehicles (1).

Remedial Actions

- In 2016, full circuit trimming was performed.
- In 2016, fusing control logic was analyzed and adjusted.
- In 2016, an additional Smart Grid device was installed.
- In 2016, a section of difficult-to-access three-phase was moved to a more accessible location.
- In 2016, the transmission arms and braces were replaced.
- In 2017, the installation of a single phase recloser will be investigated.
- In 2017, additional fusing will be investigated.
- In 2017, reconfiguring single phase taps to increase accessibility will be investigated.
- In 2017, four Smart Grid devices are planned for installation.

- In 2017, circuit breaker relays will be upgraded at the substation.
- In 2019, a transmission line servicing this circuit will have a double line rebuild.

05 Circuit 26402 -- INDIAN ORCHARD 64-02

Performance Analysis

The INDIAN ORCHARD 64-02 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

On February 25, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 406 customers for up to 539 minutes resulting in 218,586 CMI.

On February 25, 2017, during a period of strong wind, an unidentified issue occurred with an overhead switch causing a recloser to trip to lockout. This outage affected 374 customers for up to 298 minutes resulting in 111,302 CMI.

In total, the INDIAN ORCHARD 64-02 circuit had 63 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (27); animal contacts (13); equipment failure (11); nothing found (8); other (2); vehicles (2).

Remedial Actions

- In 2016, spot trimming was performed; full circuit trimming is scheduled in 2019.
- In 2016, FISR automatic switching was enabled.
- In 2017, a section of single-phase will be relocated to another circuit to reduce customer exposure.
- In 2017, a section of difficult-to-access single-phase line will be relocated to a more accessible location.
- In 2018, a solid blade disconnect will be installed at one location to improve sectionalizing capabilities.

- In 2018, a new sectionalizing device will be installed for better transfer capability.

06 Circuit 52401 -- GREEN PARK 24-01

Performance Analysis

The GREEN PARK 24-01 circuit experienced three outages of over 100,000 CMI between April 2016 and March 2017.

On September 18, 2016, during a period of heavy rain, an equipment failure occurred on an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,321 customers for up to 347 minutes resulting in 325,466 CMI.

On October 11, 2016, a vehicle made contact with a pole causing an interruption. This outage affected 433 customers for up to 325 minutes resulting in 136,027 CMI.

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

In total, the GREEN PARK 24-01 circuit had 75 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (50); equipment failure (13); animal contacts (8); nothing found (2); contact or dig in (1); vehicles (1).

Remedial Actions

- In 2016, an Expanded Operational Review was performed. As a result, several switches, cross-arms, and arrestors were replaced.
- In 2016, a recloser was replaced for improved protection coordination.
- In 2016, the transmission arms and braces were replaced.
- In 2017, the removal of an inaccessible section will be investigated.
- In 2017, eleven fusing locations will be investigated.

- In 2017, moving a difficult-to-access section to a more accessible location will be investigated.
- In 2017, full circuit trimming will be performed.
- In 2017, an additional new protective device will be evaluated for this circuit.
- In 2017, additional reclosers and fusing will be evaluated.
- In 2017, circuit breaker relays will be upgraded at the substation.
- In 2019, a transmission line servicing this circuit will have a double line rebuild.

07 Circuit 54101 -- S SHERMANSDALE 41-01

Performance Analysis

The S SHERMANSDALE 41-01 circuit experienced three outages of over 100,000 CMI between April 2016 and March 2017.

On September 18, 2016, during a period of heavy rain, an equipment failure occurred on an overhead transmission component causing a recloser to trip to lockout. This outage affected 1,574 customers for up to 84 minutes resulting in 132,216 CMI.

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

On February 12, 2017, during a period of strong wind, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 1,577 customers for up to 1,165 minutes resulting in 504,959 CMI.

In total, the S SHERMANSDALE 41-01 circuit had 51 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (21); equipment failure (18); animal contacts (8); contact or dig in (2); nothing found (2).

Remedial Actions

- In 2016, the transmission line servicing this circuit was patrolled by helicopter.
- In 2016, the transmission line access roads were rebuilt.
- In 2016, the transmission arms and braces were replaced.
- In 2017, two single phase reclosers will be replaced.
- In 2017, additional series fusing will be investigated.
- In 2017, an Expanded Operational Review will be performed.
- In 2017, full circuit trimming will be performed.
- In 2019, a transmission line servicing this circuit will have a double line rebuild.

08 Circuit 18502 -- CANADENSIS 85-02

Performance Analysis

The CANADENSIS 85-02 circuit experienced three outages of over 100,000 CMI between April 2016 and March 2017.

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

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

On December 27, 2016, an equipment failure occurred on an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,456 customers for up to 288 minutes resulting in 117,362 CMI.

In total, the CANADENSIS 85-02 circuit had 91 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (50); animal contacts (17); equipment failure (16); nothing found (5); vehicles (2); other (1).

Remedial Actions

- In 2016, several switches and fault indicators were installed.
- In 2016, FISR automatic switching was enabled.
- In 2016, full circuit trimming was performed.
- In 2016, an Expanded Operational Review was performed.
- In 2017, two sections of single-phase will be relocated to more accessible locations.
- In 2017, additional locations will receive animal guarding.
- In 2017, hazard tree removal was performed on this circuit.

09 Circuit 12601 -- MACADA 26-01

Performance Analysis

The MACADA 26-01 circuit experienced three outages of over 100,000 CMI between April 2016 and March 2017.

On June 15, 2016, an equipment failure occurred on a pole or pole arm causing a circuit breaker to trip to lockout. This outage affected 761 customers for up to 133 minutes resulting in 100,748 CMI.

On July 25, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 436 customers for up to 637 minutes resulting in 277,579 CMI.

On July 25, 2016, during a period of lightning, a tree made contact with a pole or pole arm causing a circuit breaker to trip to lockout. This outage affected 1,729 customers for up to 719 minutes resulting in 357,749 CMI.

In total, the MACADA 26-01 circuit had 38 outages between April 2016 and March 2017, with the causes breaking down as follows: animal contacts (14); tree related (14); equipment failure (8); nothing found (2).

Remedial Actions

- In 2017, additional animal guarding locations will be installed.
- In 2017, one electronic recloser will be converted to single phase operation.
- In 2017, investigation of new tie for 440 radial customers.
- In 2018 and 2019, two additional automated reclosers will be installed as part of the Smart Grid Initiative.
- In 2019, a new substation is planned in this area.

10 Circuit 44703 -- MUNCY 47-03

Performance Analysis

The MUNCY 47-03 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

On September 18, 2016, during a period of strong wind, a tree made contact with a pole or pole arm. This outage affected 627 customers for up to 2,041 minutes resulting in 808,663 CMI.

In total, the MUNCY 47-03 circuit had 32 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (18); equipment failure (6); animal contacts (5); other (2); nothing found (1).

Remedial Actions

- In 2016, three switches had settings changed to support additional sectionalizing capability.
- In 2016, FISR automatic switching was enabled.
- In 2016, an Expanded Operational Review was performed.
- In 2016, full circuit trimming was performed.
- In 2017, additional fusing will be installed at four locations.

11 Circuit 52403 -- GREEN PARK 24-03

Performance Analysis

The GREEN PARK 24-03 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

On September 18, 2016, an equipment failure occurred on an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,256 customers for up to 341 minutes resulting in 428,773 CMI.

On February 12, 2017, during a period of strong wind, a tree made contact with an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,257 customers for up to 124 minutes resulting in 154,711 CMI.

In total, the GREEN PARK 24-03 circuit had 50 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (32); equipment failure (11); animal contacts (2); vehicles (2); contact or dig in (1); nothing found (1); other (1).

Remedial Actions

- In 2016, an infrared scan was conducted.
- In 2016, two Smart Grid devices were installed.

- In 2016, the transmission line associated with the outage was patrolled by helicopter.
- In 2017, relocating a section of difficult-to-access single-phase will be evaluated.
- In 2017, circuit breaker relays will be upgraded at the GREEN PARK substation.
- In 2017, additional fusing will be evaluated for four locations on this circuit.
- In 2019, a transmission line supplying this circuit will go through a double line rebuild.

12 Circuit 67605 -- WARWICK 76-05

Performance Analysis

The WARWICK 76-05 circuit experienced three outages of over 100,000 CMI between April 2016 and March 2017.

On April 5, 2016, a vehicle made contact with a pole causing a circuit breaker to trip to lockout. This outage affected 3,230 customers for up to 228 minutes resulting in 305,449 CMI.

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

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

In total, the WARWICK 76-05 circuit had 28 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (15); equipment failure (6); animal contacts (3); vehicles (2); nothing found (1); other (1).

Remedial Actions

- In 2017, a patrol was performed on all single and three-phase lines affected by the February 25th storm. Several minor items were identified and will be corrected in 2017.
- In 2017, several locations will be evaluated for fusing.

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

Performance Analysis

The HARRISBURG 69 KV LINE 01-06 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

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

In total, the HARRISBURG 69 KV LINE 01-06 circuit had 21 outages between April 2016 and March 2017, with the causes breaking down as follows: equipment failure (5); tree related (5); nothing found (4); other (4); animal contacts (3).

Remedial Actions

- In 2016, six hot line clamps were replaced.
- In 2016, two Smart Grid devices were installed. A manual air break switch was replaced as part of this work.
- In 2016, infrared scanning was performed.
- In 2017, full circuit trimming will be performed.
- In 2017, an Expanded Operational Review will be performed.
- In 2017, fusing will be evaluated for several locations.
- In 2017, a three phase sectionalizing device will be evaluated.

14 Circuit 26604 -- BROOKSIDE 66-04

Performance Analysis

The BROOKSIDE 66-04 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

On November 19, 2016, during a period of ice/sleet/snow, an equipment failure occurred on an underground conductor causing a recloser to trip to lockout. This outage affected 1,207 customers for up to 432 minutes resulting in 332,934 CMI.

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

In total, the BROOKSIDE 66-04 circuit had 56 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (22); animal contacts (14); equipment failure (10); nothing found (5); vehicles (3); other (2).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2016, the substation was upgraded and all getaways were replaced.
- In 2017, several single-phase fuses will be installed.
- In 2017, an existing three phase recloser will be reprogrammed to single phase operation.
- In 2017, an existing section of difficult-to-access single phase conductor will be evaluated for relocation.

15 Circuit 22601 -- KIMBLES 26-01

Performance Analysis

The KIMBLES 26-01 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

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

In total, the KIMBLES 26-01 circuit had 40 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (13); equipment failure (11); animal contacts (10); nothing found (3); other (2); vehicles (1).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2016, full circuit trimming was performed.
- In 2016, a load break disconnect switch was installed.
- In 2017, six additional locations will be animal guarded.
- In 2017, several locations will receive fusing.
- In 2017, two existing reclosers will be replaced with Smart Grid devices. These reclosers will also be evaluated for single phase operation.
- In 2017, the addition of a new two-phase recloser will be evaluated.

16 Circuit 26602 -- BROOKSIDE 66-02

Performance Analysis

The BROOKSIDE 66-02 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

On November 20, 2016, during a period of strong wind, an equipment failure occurred on a pole or pole arm. This outage affected 1,205 customers for up to 1,221 minutes resulting in 671,065 CMI.

In total, the BROOKSIDE 66-02 circuit had 11 outages between April 2016 and March 2017, with the causes breaking down as follows: equipment failure (5); tree related (4); nothing found (1); vehicles (1).

Remedial Actions

- In 2016, a failed recloser was replaced with a remotely operable recloser.
- In 2016, FISR automatic switching was enabled.
- In 2016, the BROOKSIDE substation was upgraded and all getaways were replaced.
- In 2017, a tie to the BROOKSIDE 66-03 will be constructed.
- In 2017, a three phase recloser will be evaluated for single phase operation.
- In 2017, two additional switches and one additional fusing location will be evaluated.
- In 2018, full circuit trimming will be performed.

17 Circuit 46004 -- BERWICK 60-04

Performance Analysis

The BERWICK 60-04 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

On April 30, 2016, a vehicle made contact with a pole causing a recloser to trip to lockout. This outage affected 1,102 customers for up to 192 minutes resulting in 171,743 CMI.

On May 8, 2016, an equipment failure occurred on a pole or pole arm causing a recloser to trip to lockout. This outage affected 1,115 customers for up to 363 minutes resulting in 405,023 CMI.

In total, the BERWICK 60-04 circuit had 55 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (26); equipment failure (13); nothing found (8); animal contacts (4); other (2); vehicles (2).

Remedial Actions

- In 2016, an infrared scan was performed on this circuit.
- In 2016, FISR automatic switching was enabled.
- In 2016, an additional single-phase fuse was installed.
- In 2017, an Expanded Operational Review will be performed.
- In 2017, the circuit breaker will be replaced.
- In 2017, hot spot trimming will be performed at several locations.
- In 2018, full circuit trimming will be performed.

18 Circuit 46903 -- MONTGOMERY 69-03

Performance Analysis

The MONTGOMERY 69-03 circuit experienced three outages of over 100,000 CMI between April 2016 and March 2017.

On August 1, 2016, during a period of strong wind, an equipment failure occurred on an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,421 customers for up to 685 minutes resulting in 223,414 CMI.

On September 13, 2016, an animal interfered with a substation component causing a circuit breaker to trip to lockout. This outage affected 1,418 customers for up to 98 minutes resulting in 138,978 CMI.

On September 18, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,419 customers for up to 1,309 minutes resulting in 252,218 CMI.

In total, the MONTGOMERY 69-03 circuit had 25 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (11); equipment failure (8); animal contacts (5); vehicles (1).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2016, concrete barriers were installed to protect the substation from vehicle hits.
- In 2016, the MONTGOMERY substation was animal guarded.
- In 2016, additional fusing at five locations was completed.
- In 2017, additional fusing will be installed at four locations.
- In 2017, additional hazard tree removal will be performed.
- In 2017, three additional locations will receive fusing.

- In 2020, full circuit trimming will be performed.

19 Circuit 26702 -- HEMLOCK FARMS 67-02

Performance Analysis

The HEMLOCK FARMS 67-02 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

On August 13, 2016, during a period of lightning, an equipment failure occurred on an overhead conductor causing a recloser to trip to lockout. This outage affected 290 customers for up to 793 minutes resulting in 184,405 CMI.

On August 15, 2016, an equipment failure occurred on a substation component causing a circuit breaker to trip to lockout. This outage affected 2,917 customers for up to 135 minutes resulting in 395,982 CMI.

In total, the HEMLOCK FARMS 67-02 circuit had 24 outages between April 2016 and March 2017, with the causes breaking down as follows: animal contacts (10); equipment failure (8); nothing found (2); other (2); tree related (2).

Remedial Actions

- In 2016, an Expanded Operational Review was performed.
- In 2016, FISR automatic switching was enabled.
- In 2017, additional animal guarding was installed.
- In 2017, a circuit breaker will be replaced at the transmission substation source.
- In 2017, a new single-phase recloser installation will be evaluated.
- In 2017, an automated tie device will be installed.
- In 2017, additional locations will receive fusing.

20 Circuit 26401 -- INDIAN ORCHARD 64-01

Performance Analysis

The INDIAN ORCHARD 64-01 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

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

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

In total, the INDIAN ORCHARD 64-01 circuit had 81 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (49); animal contacts (13); equipment failure (9); nothing found (6); other (2); vehicles (2).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2016, full substation animal guarding was completed.
- In 2016, additional animal guarding was added to this circuit.
- In 2017, this circuit will be evaluated for danger tree removal.
- In 2017, an additional single phase recloser will be evaluated for this circuit.
- In 2018, full circuit trimming will be performed.

21 Circuit 45402 -- WEST BLOOMSBURG 54-02

Performance Analysis

The WEST BLOOMSBURG 54-02 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

On July 25, 2016, during a period of strong wind, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 530 customers for up to 837 minutes resulting in 443,991 CMI.

In total, the WEST BLOOMSBURG 54-02 circuit had 58 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (34); nothing found (10); equipment failure (9); other (2); vehicles (2); animal contacts (1).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2016, full circuit trimming and hazard tree removal were performed.
- In 2016, infrared scanning was performed.
- In 2017, a section of difficult-to-access conductor will be relocated to a more accessible location.

22 Circuit 43108 -- SOUTH MILTON 31-08

Performance Analysis

The SOUTH MILTON 31-08 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

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

In total, the SOUTH MILTON 31-08 circuit had 13 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (8); equipment failure (3); nothing found (1); vehicles (1).

Remedial Actions

- In 2017, as a result of a large outage, a targeted circuit patrol was performed, resulting in several lightning arrestors being replaced.
- In 2017, a single phase recloser will be installed.
- In 2017, an Expanded Operational Review will be performed.
- In 2017, several protective settings at the circuit breaker and several downstream reclosers were changed.
- In 2018, full circuit trimming will be performed.
- In 2018, a project to relocate a section of single phase tap will be performed.

23 Circuit 58402 -- MOUNT ROCK 84-02

Performance Analysis

The MOUNT ROCK 84-02 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

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

On February 12, 2017, 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 737 customers for up to 435 minutes resulting in 142,659 CMI.

In total, the MOUNT ROCK 84-02 circuit had 41 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (19); equipment failure (12); animal contacts (6); nothing found (2); vehicles (2).

Remedial Actions

- In 2016, infrared scanning was performed.
- In 2016, hot spot trimming was performed.
- In 2016, three fuses were installed.
- In 2016, full circuit trimming was performed.
- In 2016, a Smart Grid device was installed.
- In 2017, infrared scanning was performed.
- In 2018, the circuit breaker relays will be upgraded.

24 Circuit 24401 -- TINKER 44-01

Performance Analysis

The TINKER 44-01 circuit experienced three outages of over 100,000 CMI between April 2016 and March 2017.

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

On February 9, 2017, an equipment failure occurred on a pole or pole arm causing a circuit breaker to trip to lockout. This outage affected 1,260 customers for up to 278 minutes resulting in 143,975 CMI.

On February 13, 2017, during a period of strong wind, an equipment failure occurred on an overhead transmission component causing a circuit breaker to trip to lockout. This outage affected 1,261 customers for up to 147 minutes resulting in 185,165 CMI.

In total, the TINKER 44-01 circuit had 66 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (33); equipment failure (23); nothing found (7); other (2); animal contacts (1).

Remedial Actions

- In 2017, an Expanded Operational Review will be performed.
- In 2017, fusing will be evaluated for multiple locations.
- In 2017, a section of difficult-to-access conductor will be moved to a more accessible location.
- In 2017, an additional section of difficult-to-access conductor will be evaluated for relocation.
- In 2019, full circuit trimming will be performed.

25 Circuit 61801 -- E ELIZABETHTOWN 18-01

Performance Analysis

The E ELIZABETHTOWN 18-01 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

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

On August 16, 2016, an equipment failure occurred on a pole or pole arm. This outage affected 954 customers for up to 126 minutes resulting in 120,204 CMI.

In total, the E ELIZABETHTOWN 18-01 circuit had 21 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (11); equipment failure (5); animal contacts (3); vehicles (2).

Remedial Actions

- In 2016, single-phase fuses were added at multiple locations.
- In 2016, FISR automatic switching was enabled.
- In 2016, a tie line was built between EAST ELIZABETHTOWN 18-01 and RHEEMS 60-01 lines.
- In 2016, one manual switch was replaced with an automated vacuum recloser as part of the Smart Grid Initiative.
- In 2016, a new sectionalizing device was installed near the substation.
- In 2016, additional single-phase fusing was added at six locations.
- In 2016, new circuit breakers were installed on all circuits at this substation. New disconnect switches were also installed on the 18-01 getaway.
- In 2017, a section of single-phase line will be evaluated for re-sourcing.
- In 2018, full circuit trimming will be performed.
- In 2018-2019, 1.5 miles of copper conductor will be reconductored.

26 Circuit 26001 -- WEST DAMASCUS 60-01

Performance Analysis

The WEST DAMASCUS 60-01 circuit experienced no outages of over 100,000 CMI between April 2016 and March 2017.

In total, the WEST DAMASCUS 60-01 circuit had 67 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (36); equipment failure (12); animal contacts (10); nothing found (6); other (3).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2017, a Smart Grid device was installed.
- In 2017, full circuit trimming will be performed.
- In 2017, a new manual switch will be installed on a section of three-phase line to improve sectionalizing capabilities.
- In 2017, additional animal guards and cutout replacements will be installed at multiple locations.
- In 2017, an additional single phase recloser will be evaluated for this circuit.
- In 2017, additional fusing will be installed.
- In 2017, an additional Smart Grid device will be installed.
- In 2018, several cross-arms, switches, and lightning arrestors will be replaced.
- In 2018, a new recloser will be installed.

27 Circuit 29501 -- LEDGEDALE 95-01

Performance Analysis

The LEDGEDALE 95-01 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

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

On March 2, 2017, during a period of strong wind, a tree made contact with an overhead transformer causing a recloser to trip to lockout. This outage affected 178 customers for up to 826 minutes resulting in 106,592 CMI.

In total, the LEDGEDALE 95-01 circuit had 26 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (18); animal contacts (3); equipment failure (2); contact or dig in (1); nothing found (1); other (1).

Remedial Actions

- In 2016, a circuit breaker was replaced at the transmission substation that supplies this circuit.
- In 2017, full circuit trimming will be performed.
- In 2017, fusing will be evaluated at several locations.
- In 2017, a new switch will be installed.
- In 2019, a manual tie device will be replaced by a Smart Grid device.

28 Circuit 29503 -- LEDGEDALE 95-03

Performance Analysis

The LEDGEDALE 95-03 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

On November 20, 2016, during a period of strong wind, an equipment failure occurred on a pole or pole arm causing a recloser to trip to lockout. This outage affected 1,089 customers for up to 1,021 minutes resulting in 290,045 CMI.

In total, the LEDGEDALE 95-03 circuit had 44 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (24); equipment failure (8); animal contacts (6); other (4); nothing found (2).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2017, full circuit trimming will be performed.

- In 2017, additional fusing will be installed.
- In 2017, a new recloser will be investigated for a single-phase tap.
- In 2019, a new recloser will be investigated for additional sectionalizing capabilities.

29 Circuit 24502 -- GOULDSBORO 45-02

Performance Analysis

The GOULDSBORO 45-02 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

On July 25, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a load break fuse to operate. This outage affected 240 customers for up to 1,042 minutes resulting in 250,262 CMI.

In total, the GOULDSBORO 45-02 circuit had 33 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (19); equipment failure (9); nothing found (3); animal contacts (1); other (1).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2017, a large section of single-phase will be relocated and reconfigured to alleviate coordination issues and difficult-to-access sections.
- In 2017, a new two-phase hydraulic recloser will be installed.
- In 2017, additional fusing will be installed.
- In 2018, full circuit trimming will be performed.

30 Circuit 66505 -- SOUTH MANHEIM 65-05

Performance Analysis

The SOUTH MANHEIM 65-05 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

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

In total, the SOUTH MANHEIM 65-05 circuit had 15 outages between April 2016 and March 2017, with the causes breaking down as follows: other (5); equipment failure (4); tree related (3); animal contacts (2); contact or dig in (1).

Remedial Actions

- In 2016, full circuit trimming was performed.
- In 2016, new circuit breakers were installed at the substation.
- In 2017, a new recloser will be evaluated for this circuit.
- In 2017, additional fusing locations will be investigated.
- In 2018, a new vacuum recloser will be installed as part of the Smart Grid Initiative.

31 Circuit 26002 -- WEST DAMASCUS 60-02

Performance Analysis

The WEST DAMASCUS 60-02 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

On September 24, 2016, a vehicle made contact with a pole causing a recloser to trip to lockout. This outage affected 763 customers for up to 771 minutes resulting in 169,854 CMI.

On December 18, 2016, during a period of strong wind, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 1,392 customers for up to 97 minutes resulting in 101,404 CMI.

In total, the WEST DAMASCUS 60-02 circuit had 40 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (26); equipment failure (5); animal contacts (3); nothing found (3); vehicles (2); other (1).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2016, full circuit trimming was performed.
- In 2016, a large section of three-phase backbone was reconductored.
- In 2017, additional voltage regulators are being reviewed to improve transfer capabilities.
- In 2017, additional fusing will be installed at several locations.
- In 2017, several additional locations will be animal guarded.

32 Circuit 40602 -- PINE GROVE 06-02

Performance Analysis

The PINE GROVE 06-02 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

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

In total, the PINE GROVE 06-02 circuit had 31 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (11); equipment failure (8); animal contacts (5); vehicles (4); other (2); nothing found (1).

Remedial Actions

- In 2016, full circuit trimming was performed.
- In 2016, additional hazard tree removal was performed.
- In 2016, additional single-phase fusing was installed on this circuit.
- In 2016, single-phase fusing was installed at three locations.
- In 2016, concrete barriers were installed at the substation.
- In 2016, FISR automatic switching was enabled.
- In 2017, the substation will receive animal guarding.
- In 2017, an underground dip will be replaced.
- In 2017, an Expanded Operational Review will be performed.
- In 2017, an existing three phase sectionalizing device will be reprogrammed.

33 Circuit 65603 -- QUARRYVILLE 56-03

Performance Analysis

The QUARRYVILLE 56-03 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

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

On July 23, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,075 customers for up to 777 minutes resulting in 302,718 CMI.

In total, the QUARRYVILLE 56-03 circuit had 52 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (24); equipment failure (20); animal contacts (3); vehicles (3); nothing found (1); other (1).

Remedial Actions

- In 2016, FISR automatic switching was enabled for all circuits at this substation.
- In 2016, full circuit trimming was performed.
- In 2016, four locations received single-phase fuses.
- In 2016, additional underground cable testing and curing was performed.
- In 2016, an additional switch was installed on this circuit.
- In 2017, fusing will be added at three locations.
- In 2017, a new line and terminal will be constructed to split this circuit. This will also add an additional tie point.
- In 2017, two new Smart Grid devices will be installed.
- In 2017, underground cable curing will be performed.

- In 2017, new relays will be installed on all existing circuits.
- In 2017, a new recloser will be installed on one of the ties.

34 Circuit 60903 -- DONEGAL 09-03

Performance Analysis

The DONEGAL 09-03 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

On August 16, 2016, during a period of lightning, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,241 customers for up to 616 minutes resulting in 613,267 CMI.

In total, the DONEGAL 09-03 circuit had 10 outages between April 2016 and March 2017, with the causes breaking down as follows: equipment failure (5); tree related (3); animal contacts (2).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2016, all capacitors were inspected and one control was replaced.
- In 2016, an Expanded Operational Review was performed.
- In 2016, full circuit trimming and hazard tree removal were performed.
- In 2017, additional fusing will be installed.
- In 2017, new sectionalizing locations will be investigated.

35 Circuit 11502 -- FREEMANSBURG 15-02

Performance Analysis

The FREEMANSBURG 15-02 circuit experienced three outages of over 100,000 CMI between April 2016 and March 2017.

On July 18, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,694 customers for up to 256 minutes resulting in 116,336 CMI.

On July 18, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,177 customers for up to 255 minutes resulting in 176,641 CMI.

On July 18, 2016, during a period of heavy rain, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,279 customers for up to 174 minutes resulting in 222,111 CMI.

In total, the FREEMANSBURG 15-02 circuit had 27 outages between April 2016 and March 2017, with the causes breaking down as follows: animal contacts (8); equipment failure (8); tree related (7); nothing found (2); other (1); vehicles (1).

Remedial Actions

- In 2016, an Expanded Operational Review was performed.
- In 2017, an automated switch will be evaluated for upgrading to an automated recloser.
- In 2017, fourteen single-phase fuses will be installed.
- In 2018, full circuit trimming will be performed.

36 Circuit 28002 -- TAFTON 80-02

Performance Analysis

The TAFTON 80-02 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

On April 3, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 570 customers for up to 347 minutes resulting in 197,778 CMI.

On November 20, 2016, during a period of ice/sleet/snow, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 575 customers for up to 511 minutes resulting in 160,530 CMI.

In total, the TAFTON 80-02 circuit had 31 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (18); equipment failure (8); nothing found (3); animal contacts (2).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2017, additional animal guarding will be installed at three locations.
- In 2017, an additional single-phase tap fuse will be evaluated.

37 Circuit 42201 -- SHENANDOAH 22-01

Performance Analysis

The SHENANDOAH 22-01 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

On January 23, 2017, during a period of strong wind, an equipment failure occurred on a pole or pole arm causing a circuit breaker to trip to lockout. This outage affected 1,730 customers for up to 536 minutes resulting in 471,587 CMI.

In total, the SHENANDOAH 22-01 circuit had 25 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (9); equipment failure (6); animal contacts (5); other (2); vehicles (2); nothing found (1).

Remedial Actions

- In 2017, a hydraulic circuit recloser was replaced.
- In 2017, an Expanded Operational Review was performed.
- In 2017, as a result of a large outage, a targeted circuit line patrol was performed. As a result, several remedial actions were completed, including additional hot spot tree trimming.
- In 2017, full circuit trimming will be performed.
- In 2017, an existing hydraulic recloser is being upgraded and a new hydraulic recloser will be installed downstream.
- In 2017, three off cycle pole reviews were completed and identified for replacement.
- In 2018, five additional fusing jobs will be completed.

38 Circuit 28602 -- BLYTHEBURN 86-02

Performance Analysis

The BLYTHEBURN 86-02 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

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

In total, the BLYTHEBURN 86-02 circuit had 21 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (11); equipment failure (7); animal contacts (2); vehicles (1).

Remedial Actions

- In 2017, five additional unprotected taps will be fused.
- In 2017, an existing three phase recloser was upgraded to a telemetric recloser.
- In 2018, a three-phase automatic recloser will be installed as part of the Smart Grid Initiative.
- In 2018, full circuit trimming will be performed.
- In 2019, an Expanded Operational Review will be performed.

39 Circuit 51502 -- SWATARA 15-02

Performance Analysis

The SWATARA 15-02 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

On December 28, 2016, an equipment failure occurred on an overhead conductor causing a temporary open point to be interrupted. This outage affected 3,099 customers for up to 625 minutes resulting in 507,177 CMI.

In total, the SWATARA 15-02 circuit had 11 outages between April 2016 and March 2017, with the causes breaking down as follows: animal contacts (4); equipment failure (4); tree related (2); vehicles (1).

Remedial Actions

- In 2016, a set of disconnect switches were replaced.
- In 2016, full circuit trimming was performed.
- In 2016, a new Smart Grid device was installed.
- In 2017, four Smart Grid devices will be installed, along with one replacement in 2018.
- In 2017, a section of this circuit will be reconductored.
- In 2018, two additional Smart Grid devices will be installed.

40 Circuit 29701 -- ANGELS 91-01

Performance Analysis

The ANGELS 91-01 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

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

In total, the ANGELS 91-01 circuit had 39 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (21); equipment failure (8); animal contacts (3); contact or dig in (2); nothing found (2); other (2); vehicles (1).

Remedial Actions

- In 2017, additional animal guarding will be installed.
- In 2017, an additional three phase switch will be evaluated.
- In 2017, hot spot trimming will be evaluated.

41 Circuit 20401 -- ASHFIELD 04-01

Performance Analysis

The ASHFIELD 04-01 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

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

In total, the ASHFIELD 04-01 circuit had 25 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (13); animal contacts (5); equipment failure (5); nothing found (1); other (1).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2016, full circuit trimming was performed.
- In 2016, concrete security barriers were installed at the ASHFIELD substation.
- In 2017, a recloser was installed as part of the Smart Grid Initiative.
- In 2017, ten additional single-phase fuses will be installed.
- In 2018, a single-phase recloser will be relocated and a fuse installed.
- In 2018, a fuse will be replaced with a recloser.
- In 2018, a tie line with the WEISSPORT 75-04 line will be constructed.

42 Circuit 11506 -- FREEMANSBURG 15-06

Performance Analysis

The FREEMANSBURG 15-06 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

On July 18, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,301 customers for up to 195 minutes resulting in 252,615 CMI.

In total, the FREEMANSBURG 15-06 circuit had 48 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (28); equipment failure (8); animal contacts (5); nothing found (5); contact or dig in (1); other (1).

Remedial Actions

- In 2016, two single-phase fuses were installed.
- In 2017, one single-phase fuse was installed.
- In 2017, a single-phase recloser was installed.
- In 2017, reconductoring and relocating a section of single-phase line will be investigated.
- In 2017, an Expanded Operational Review will be performed.
- In 2017, hot spot tree trimming will be evaluated for a section of single phase.
- In 2018, full circuit trimming will be performed.

43 Circuit 59002 -- MIFFLINTOWN 90-02

Performance Analysis

The MIFFLINTOWN 90-02 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

On December 11, 2016, an equipment failure occurred on an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 2,262 customers for up to 265 minutes resulting in 305,250 CMI.

In total, the MIFFLINTOWN 90-02 circuit had 52 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (31); equipment failure (9); animal contacts (6); nothing found (3); contact or dig in (2); other (1).

Remedial Actions

- In 2016, a single-phase fuse was installed.
- In 2016, full circuit trimming was performed.
- In 2017, replacing a fuse with a recloser to enable downstream fusing will be evaluated.
- In 2017, replacing a recloser to enable downstream fusing will be investigated.

- In 2018, two vacuum reclosers will be installed.
- In 2019, an additional Smart Grid device will be installed.
- In 2020, a new line-and-terminal is planned.

44 Circuit 26703 -- HEMLOCK FARMS 67-03

Performance Analysis

The HEMLOCK FARMS 67-03 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

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

On January 24, 2017, during a period of ice/sleet/snow, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 867 customers for up to 777 minutes resulting in 151,226 CMI.

In total, the HEMLOCK FARMS 67-03 circuit had 48 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (23); animal contacts (12); equipment failure (6); nothing found (5); other (1); vehicles (1).

Remedial Actions

- In 2017 an additional Smart Grid device will be added to this circuit.
- In 2017, multiple locations will be evaluated for fusing.
- In 2017, multiple additional disconnect switches will be evaluated for this circuit.
- In 2017, additional animal guarding will be evaluated for this circuit.

45 Circuit 25501 -- MADISONVILLE 55-01

Performance Analysis

The MADISONVILLE 55-01 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

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

In total, the MADISONVILLE 55-01 circuit had 55 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (29); nothing found (8); equipment failure (7); animal contacts (5); other (4); contact or dig in (1); vehicles (1).

Remedial Actions

- In 2017, an Expanded Operational Review will be performed.
- In 2017, fusing will be evaluated in multiple locations.
- In 2017, a section of difficult-to-access single phase will be evaluated for relocation.

46 Circuit 16402 -- MOUNT POCONO 64-02

Performance Analysis

The MOUNT POCONO 64-02 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

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

On February 25, 2017, during a period of strong wind, a tree made contact with a pole or pole arm causing a circuit breaker to trip to lockout. This outage affected 1,430 customers for up to 1,610 minutes resulting in 128,345 CMI.

In total, the MOUNT POCONO 64-02 circuit had 64 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (44); equipment failure (13); animal contacts (3); nothing found (2); vehicles (2).

Remedial Actions

- In 2016, a section of difficult-to-access line was relocated to a more accessible location, and reconductored.
- In 2016, FISR automatic switching was enabled.
- In 2016, a section of line was reconductored to remove copper conductor.
- In 2016, full circuit trimming was performed.
- In 2017, three load-break disconnect switches and fault indicators will be installed.
- In 2017, a new single-phase fuse will be installed.
- In 2018, relocating a long single-phase tap to eliminate a difficult-to-access section will be evaluated.

47 Circuit 47102 -- MARLIN 71-02

Performance Analysis

The MARLIN 71-02 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

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

In total, the MARLIN 71-02 circuit had 2 outages between April 2016 and March 2017, with the causes breaking down as follows: nothing found (1); vehicles (1).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2016, a failed lightning arrestor inside the substation was replaced.
- In 2017, an additional Smart Grid device will be installed on this circuit.
- In 2017, three-phase fusing will be installed at one location.
- In 2019, full circuit trimming will be performed.

48 Circuit 28604 -- BLYTHEBURN 86-04

Performance Analysis

The BLYTHEBURN 86-04 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

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

On December 31, 2016, an equipment failure occurred on an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,405 customers for up to 98 minutes resulting in 137,704 CMI.

In total, the BLYTHEBURN 86-04 circuit had 43 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (20); equipment failure (11); animal contacts (6); nothing found (3); vehicles (3).

Remedial Actions

- In 2015, full circuit trimming was performed.
- In 2015, single-phase fusing was installed at multiple locations.
- In 2016, FISR automatic switching was enabled.
- In 2016, an Expanded Operational Review was performed. As a result, four locations will receive additional fusing in 2017.
- In 2017, a new manual switch will be installed on a section of three-phase line to improve sectionalizing capabilities.
- In 2018, a section of difficult-to-access single-phase will be relocated and fed from a different source.
- In 2018, two new manual switches will be installed on a section of three-phase line to improve sectionalizing capabilities.
- In 2018, a solid blade disconnect switch will be added for sectionalizing capability.

49 Circuit 57401 -- SPANGLER 74-01

Performance Analysis

The SPANGLER 74-01 circuit experienced three outages of over 100,000 CMI between April 2016 and March 2017.

On April 3, 2016, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 2,581 customers for up to 321 minutes resulting in 149,098 CMI.

On May 15, 2016, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,169 customers for up to 196 minutes resulting in 146,410 CMI.

On February 12, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,597 customers for up to 578 minutes resulting in 180,982 CMI.

In total, the SPANGLER 74-01 circuit had 28 outages between April 2016 and March 2017, with the causes breaking down as follows: animal contacts (13); tree related (8); equipment failure (7).

Remedial Actions

- In 2017, an underground feed will be rerouted.
- In 2017, additional animal guarding on four taps will be evaluated.
- In 2017, eight fusing locations will be evaluated.

50 Circuit 46203 -- DANVILLE 62-03

Performance Analysis

The DANVILLE 62-03 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

On December 18, 2016, during a period of heavy rain, a vehicle made contact with a pole causing a recloser to trip to lockout. This outage affected 676 customers for up to 528 minutes resulting in 243,899 CMI.

In total, the DANVILLE 62-03 circuit had 48 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (17); equipment failure (12); animal contacts (6); vehicles (6); nothing found (5); other (2).

Remedial Actions

- In 2016, full circuit trimming was performed.
- In 2016, two automated reclosers were installed as part of the Smart Grid Initiative.
- In 2016, and Expanded Operational Review was performed.

51 Circuit 64201 -- KINZER 42-01

Performance Analysis

The KINZER 42-01 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

On July 23, 2016, during a period of strong wind, an equipment failure occurred on a pole or pole arm causing a recloser to trip to lockout. This outage affected 837 customers for up to 864 minutes resulting in 224,164 CMI.

In total, the KINZER 42-01 circuit had 30 outages between April 2016 and March 2017, with the causes breaking down as follows: equipment failure (15); vehicles (5); animal contacts (4); tree related (3); nothing found (2); other (1).

Remedial Actions

- In 2016, a new sectionalizing device was installed on this circuit.
- In 2016, FISR automatic switching was enabled.
- In 2016, a voltage regulator was replaced on this circuit.
- In 2016, a manual switch was replaced with an automated vacuum recloser as part of the Smart Grid Initiative.
- In 2016, single-phase fuses were added at multiple locations.
- In 2017, an Expanded Operational Review will be performed.
- In 2017, the installation of guide rails to reduce vehicle-hit exposure will be investigated.
- In 2018, full circuit trimming and hazard tree removal will be performed.
- In 2018, a non-automated hydraulic recloser will be replaced with an automated model.
- In 2019, a new line and terminal at a neighboring substation will improve tie capability.

52 Circuit 28804 -- LAKEVILLE 88-04

Performance Analysis

The LAKEVILLE 88-04 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

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

In total, the LAKEVILLE 88-04 circuit had 31 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (20); animal contacts (4); equipment failure (4); nothing found (2); other (1).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2016, hot spot trimming was performed.
- In 2017, additional animal guarding will be evaluated.

53 Circuit 28101 -- TWIN LAKES 81-01

Performance Analysis

The TWIN LAKES 81-01 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

On March 3, 2017, a vehicle made contact with a pole causing a circuit breaker to trip to lockout. This outage affected 2,662 customers for up to 392 minutes resulting in 188,577 CMI.

In total, the TWIN LAKES 81-01 circuit had 66 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (27); animal contacts (16); equipment failure (13); nothing found (7); vehicles (3).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2016, hot spot trimming was performed.
- In 2017, an existing three-phase recloser will be evaluated for single phase operation.
- In 2017, additional animal guarding will be evaluated for this circuit.
- In 2019, an existing air break will be replaced with a Smart Grid device.

54 Circuit 12605 -- MACADA 26-05

Performance Analysis

The MACADA 26-05 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

On July 25, 2016, during a period of lightning, an unidentified issue occurred with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,967 customers for up to 381 minutes resulting in 440,816 CMI.

In total, the MACADA 26-05 circuit had 27 outages between April 2016 and March 2017, with the causes breaking down as follows: animal contacts (9); equipment failure (9); tree related (5); nothing found (2); other (2).

Remedial Actions

- In 2016, the substation was converted to a more reliable configuration and had communication capability upgraded.
- In 2017, three manual switches will be upgraded to automated switches as part of the Smart Grid initiative.
- In 2017, an Expanded Operational Review will be performed.
- In 2017, several three-phase and single-phase fuses will be installed.
- In 2017, full circuit trimming will be performed.

55 Circuit 63304 -- GREENLAND 33-04

Performance Analysis

The GREENLAND 33-04 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

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

In total, the GREENLAND 33-04 circuit had 11 outages between April 2016 and March 2017, with the causes breaking down as follows: equipment failure (7); contact or dig in (2); nothing found (1); vehicles (1).

Remedial Actions

- In 2016, a new tie line was installed between the GREENLAND 33-04 and the GREENLAND 33-01 lines.
- In 2016, the GREENLAND 33-04 getaway was replaced.
- In 2016, an additional manual switch was installed.

- In 2016, a new Smart Grid device was added.
- In 2016, additional single-phase fuses were installed at several locations.
- In 2016, two sections of underground cable were replaced.
- In 2016, an underground getaway cable was replaced.
- In 2017, an additional Smart Grid device will be added, and one existing device will be upgraded to a Smart Grid device.
- In 2017, additional underground cable curing will be performed.
- In 2018, full circuit trimming will be performed.

56 Circuit 10903 -- COOPERSBURG 09-03

Performance Analysis

The COOPERSBURG 09-03 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

On August 12, 2016, during a period of heavy rain, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 2,135 customers for up to 262 minutes resulting in 399,098 CMI.

In total, the COOPERSBURG 09-03 circuit had 31 outages between April 2016 and March 2017, with the causes breaking down as follows: equipment failure (9); tree related (9); animal contacts (7); nothing found (3); vehicles (3).

Remedial Actions

- In 2016, single-phase fusing was installed.
- In 2016, three locations received three-phase fusing or disconnect switch installations.
- In 2017, relocating four spans of overhead line and an underground rebuild will be investigated.
- In 2017, an additional recloser or three phase fusing is being investigated.

57 Circuit 23401 -- HONESDALE 34-01

Performance Analysis

The HONESDALE 34-01 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

On October 27, 2016, during a period of lightning, a contact or dig occurred on an overhead conductor causing a load break fuse to operate. This outage affected 490 customers for up to 1,202 minutes resulting in 111,594 CMI.

On February 25, 2017, during a period of strong wind, an equipment failure occurred on an overhead transformer causing a recloser to trip to lockout. This outage affected 488 customers for up to 266 minutes resulting in 119,378 CMI.

In total, the HONESDALE 34-01 circuit had 49 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (17); animal contacts (12); equipment failure (12); other (5); contact or dig in (1); nothing found (1); vehicles (1).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2016, a section of difficult-to-access single phase conductor was relocated to a more accessible location.
- In 2017, new three-phase voltage regulators will be installed.
- In 2017, full circuit trimming will be performed.
- In 2017, fusing and cutout installations will be completed at 80 locations.
- In 2017, an existing switch will be replaced with a Smart Grid device.
- In 2019, a non-automated device will be replaced with a Smart Grid device.

58 Circuit 24602 -- VARDEN 46-02

Performance Analysis

The VARDEN 46-02 circuit experienced one outage of over 100,000 CMI between April 2016 and March 2017.

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

In total, the VARDEN 46-02 circuit had 44 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (18); animal contacts (7); equipment failure (7); nothing found (5); other (4); vehicles (3).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2016, new fusing was installed at nine locations.
- In 2016, an Expanded Operational Review was performed.
- In 2017, animal guarding was installed at several locations.
- In 2017, a sectionalizing device with remote operational capability will be installed as part of the Smart Grid Initiative.
- In 2017, a new switch and fault indicator will be evaluated for this circuit.
- In 2017, a section of difficult-to-access single phase will be evaluated for relocation.
- In 2018, full circuit trimming will be performed.

59 Circuit 43102 -- SOUTH MILTON 31-02

Performance Analysis

The SOUTH MILTON 31-02 circuit experienced two outages of over 100,000 CMI between April 2016 and March 2017.

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

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

In total, the SOUTH MILTON 31-02 circuit had 19 outages between April 2016 and March 2017, with the causes breaking down as follows: equipment failure (11); tree related (4); animal contacts (2); nothing found (1); other (1).

Remedial Actions

- In 2017, an Expanded Operational Review will be performed.
- In 2017, full circuit trimming will be performed.

60 Circuit 46504 -- LOCK HAVEN 65-04

Performance Analysis

The LOCK HAVEN 65-04 circuit experienced no outages of over 100,000 CMI between April 2016 and March 2017.

In total, the LOCK HAVEN 65-04 circuit had 40 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (21); animal contacts (7); equipment failure (5); nothing found (3); other (2); vehicles (2).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2016, hot spot tree trimming was performed.
- In 2016, an Expanded Operational Review was performed and three additional fusing locations and two animal guarding locations were identified. These remediations will be completed in 2017.
- In 2017, additional single-phase load break disconnects will be installed.
- In 2017, an additional Smart Grid device will be installed.
- In 2017, full circuit trimming will be performed.

61 Circuit 46206 -- DANVILLE 62-06

Performance Analysis

The DANVILLE 62-06 circuit experienced no outages of over 100,000 CMI between April 2016 and March 2017.

In total, the DANVILLE 62-06 circuit had 39 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (23); animal contacts (7); nothing found (5); other (3); equipment failure (1).

Remedial Actions

- In 2016, the protection settings on this circuit were evaluated and adjusted.
- In 2016, FISR automatic switching was enabled.
- In 2016, full circuit trimming was performed.
- In 2016, additional hazard tree removal was performed on this circuit.
- In 2016, a triple-single recloser was installed.
- In 2016, an additional Smart Grid device was installed.
- In 2017, a tie line between the DANVILLE 62-06 and DANVILLE 62-02 circuits, on the transmission crossing, will be evaluated.

62 Circuit 22003 -- BOHEMIA 20-03

Performance Analysis

The BOHEMIA 20-03 circuit experienced no outages of over 100,000 CMI between April 2016 and March 2017.

In total, the BOHEMIA 20-03 circuit had 55 outages between April 2016 and March 2017, with the causes breaking down as follows: tree related (24); animal contacts (12); equipment failure (12); nothing found (6); other (1).

Remedial Actions

- In 2016, FISR automatic switching was enabled.
- In 2016, hazard spot tree trimming was performed.
- In 2017, aerial cable will be installed from the substation.
- In 2017, a new three-phase voltage regulator will be installed.
- In 2017, multiple automated capacitors will be upgraded with telemetry.
- In 2018, 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. PPL Electric's maintenance programs focus on corrective actions to address controllable service interruptions (e.g., trees and equipment failure).

Cause Description	Trouble Cases	Percent of Trouble Cases	Customer Interruptions	Percent of Customer Interruptions	Customer Minutes	Percent of Customer Minutes
Animals	3,481	20.0%	49,408	4.4%	3,448,824	2.5%
Contact / Dig-In	160	0.9%	16,156	1.4%	1,078,487	0.8%
Directed by Non-PPL Authority	184	1.1%	10,793	1.0%	750,044	0.5%
Equipment Failures	4,968	28.5%	364,111	32.1%	38,295,083	27.5%
Improper Design	-	0.0%	-	0.0%	-	0.0%
Improper Installation	19	0.1%	22,014	1.9%	326,372	0.2%
Improper Operation	8	0.0%	6,453	0.6%	150,572	0.1%
Nothing Found	1,121	6.4%	65,376	5.8%	4,928,796	3.5%
Other Controllable	123	0.7%	27,361	2.4%	1,051,612	0.8%
Other Non Control	264	1.5%	16,924	1.5%	1,980,034	1.4%
Other Public	54	0.3%	4,272	0.4%	264,748	0.2%
Tree Related	6,330	36.3%	429,701	37.8%	75,503,706	54.2%
Unknown	1	0.0%	1,240	0.1%	118,383	0.1%
Vehicles	705	4.0%	122,005	10.7%	11,434,228	8.2%
Total	**17,418**	**100.0%**	**1,135,814**	**100.0%**	**139,330,889**	**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 49% of cases, 53% of customer interruptions, and 70% of CMI.

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

Animals: Animals accounted for approximately 20% of PPL Electric's cases of trouble. Although this represents a significant number of cases, the effect on SAIFI and CAIDI is small because approximately 78% of the number of cases of trouble was associated with individual distribution transformers. However, when animal contacts affect substation equipment, the effect may be widespread and potentially can interrupt thousands of customers on multiple circuits. In addition to guarding new distribution transformers and substations, in 2009, PPL Electric initiated distribution and substation animal guarding programs to focus systematically on protecting existing facilities most at risk of incurring animal-caused interruptions. All substations are scheduled to be animal guarded by 2017.

Vehicles: Although vehicles cause a small percentage of the number of cases of trouble, they accounted for a large percentage of customer interruptions and customer minutes, because main distribution lines generally are located along major thoroughfares with higher traffic densities. In addition, vehicle-related cases often result in extended repair times to replace broken poles. Service interruptions due to vehicles are on the rise as a result of an increasing number of drivers and vehicles on the road. PPL Electric has a program to identify and relocate poles that are subject to multiple vehicle hits.

Equipment Failure: Equipment failure is one of the largest single contributors to the number of cases of trouble, customer interruptions and customer minutes. However, approximately 42% of the cases of trouble, 47% of the customer interruptions and 51% 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 poles)	354	87	77	87	77
Transmission arm replacements (# of sets)	749	180	283	180	283
Transmission air break switch inspections (# of switches)	0	0	4	0	4
Transmission lightning arrester installations (# of sets)	0	0	0	0	0
Transmission structure inspections (# of activities)	33,291	16,645	8,438	16,645	8,438
Transmission tree side trim-Bulk Power (linear feet)	N/A	N/A			
Transmission herbicide-Bulk Power (# of acres)	N/A	N/A			
Transmission reclearing (# of miles) BES Only	0	0	0	0	0
Transmission reclearing (# of miles) 69 kV	0	0	0	0	0
Transmission reclearing (# of miles) 138 kV	0	0	0	0	0
Transmission danger tree removals-Bulk Power (# of trees)	0	0	0	0	0
Substation					
Substation batteries (# of activities)	660	241	408	241	408
Circuit breakers (# of activities)	980	77	173	77	173
Substation inspections (# of activities)	3,953	818	1,350	818	1,350
Transformer maintenance (# of activities)	169	22	38	22	38

Inspection & Maintenance Goals/Objectives	Annual Budget	4th Quarter		Year-to-date	
		Budget	Actual	Budget	Actual
Distribution					
Distribution C-tag poles replaced (# of poles)	1,480	417	276	417	276
C-truss distribution poles (# of poles)	3,160	0	0	0	0
Capacitor (MVAR added)	404	291	242	291	242
OCR Replacements (# of)	78	54	45	54	45
Distribution pole inspections (# of poles)	60,080	100	568	100	568
Distribution line inspections (hours)	6,761	2,030	3,160	2,030	3,160
Group re-lamping (# of lamps)	13,994	0	0	0	0
Test sections of underground distribution cable	N/A	307	307	307	307
Distribution tree trimming (# of miles)	4,997	1,084	1,365	1,084	1,365
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)	426	105	209	105	209
LTN vault inspections (# of)	767	120	181	120	181
LTN network protector overhauls (# of)	50	2	8	2	8
LTN reverse power trip testing (# of)	35	6	5	6	5

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	1,097	1,716	1,097	1,716
Vegetation Management	12,506	12,775	12,506	12,775
Customer Response	10,401	18,986	10,401	18,986
Reliability Maintenance	8,901	11,100	8,901	11,100
System Upgrade	(2,723)	1,932	(2,723)	1,932
Customer Service/Accounts	30,736	25,849	30,736	25,849
Others	9,159	10,619	9,159	10,619
Total O&M Expenses	**70,076**	**82,976**	**70,076**	**82,976**

*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.***

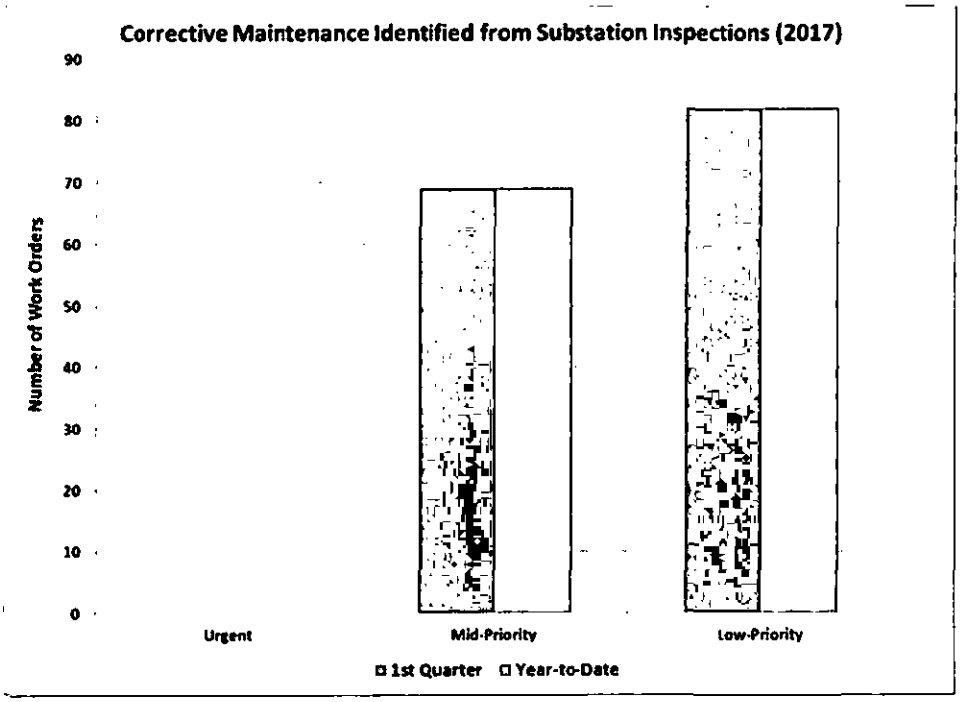
The following table provides the capital expenditures for PPL Electric, as a whole, which includes transmission and distribution ("T&D") activities.

Activity	1st Quarter		Year-to-date	
	Budget ($000)	Actual ($000)	Budget ($000)	Actual ($000)
New Service/Revenue	16,809	24,916	16,809	24,916
System Upgrade	135,726	129,205	135,726	129,205
Reliability & Maintenance	100,261	93,316	100,261	93,316
Customer Response	1,206	3,223	1,206	3,223
Other	4,473	3,714	4,473	3,714
Total	**258,475**	**254,374**	**258,475**	**254,374**

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

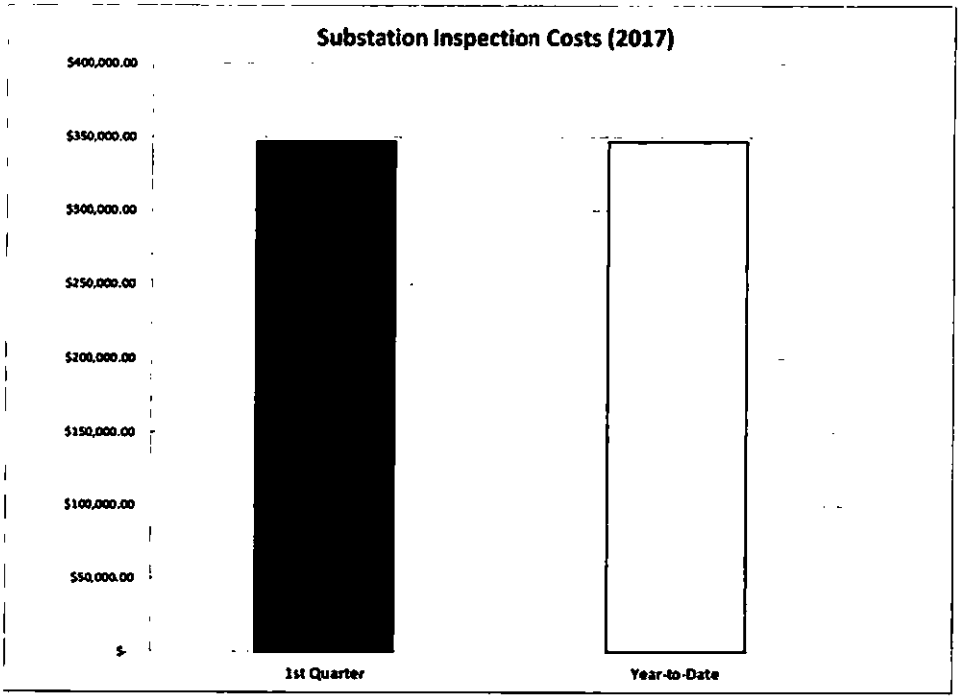
(a) The Number of Corrective Work Orders by Type (Low-Priority, Mid-Priority, Urgent)

During 1st Quarter 2017, 151 corrective work orders were created with the following breakdown by priority.



(b) The Amount Spent on Substation Inspections

During 1st Quarter 2017, PPL Electric spent approximately $347,000 on substation inspections. This amount also represents the Year-to-Date total, as shown in the figure below.

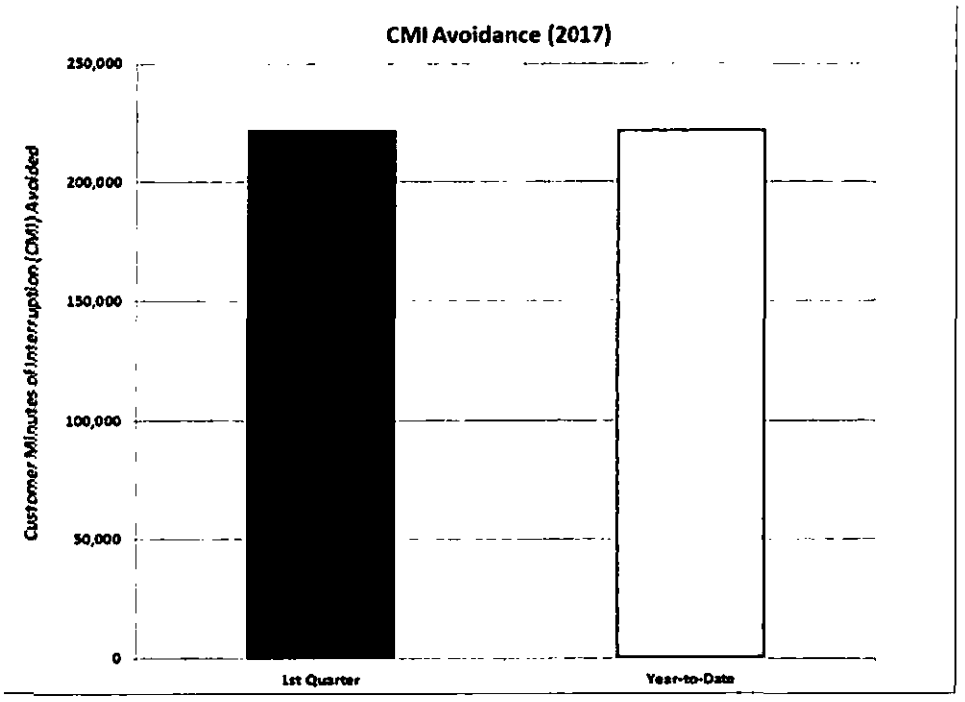


(c) The Amount Spent on Vegetation Management

Please refer to Section 7 for vegetation management expenses, for the 1st Quarter and Year-to-Date.

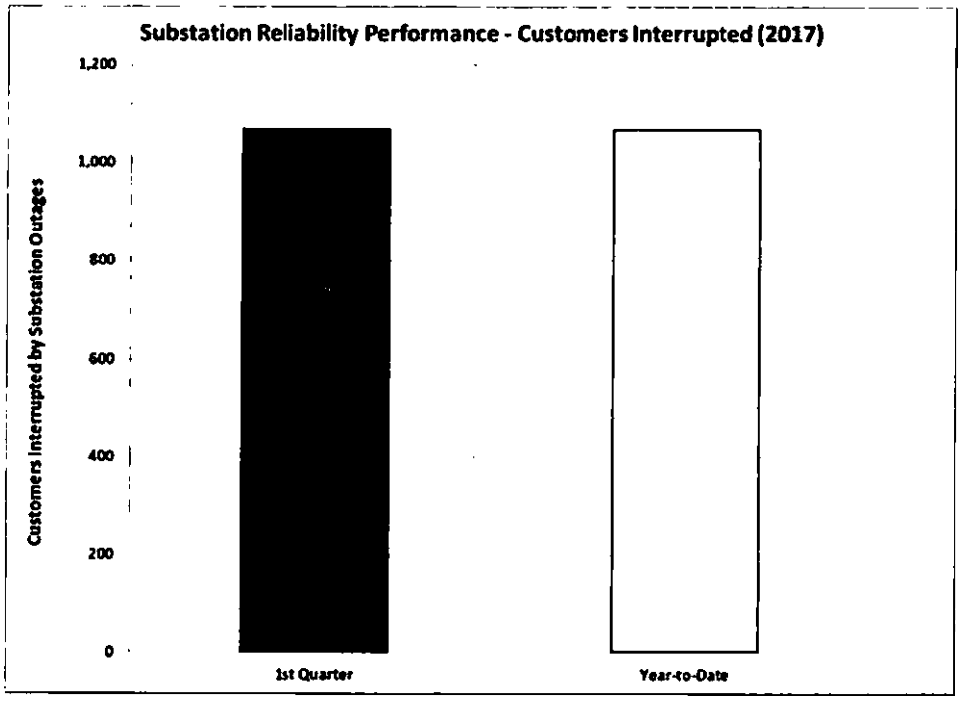
(d) The Projected CMI Avoidance due to Substation Inspections

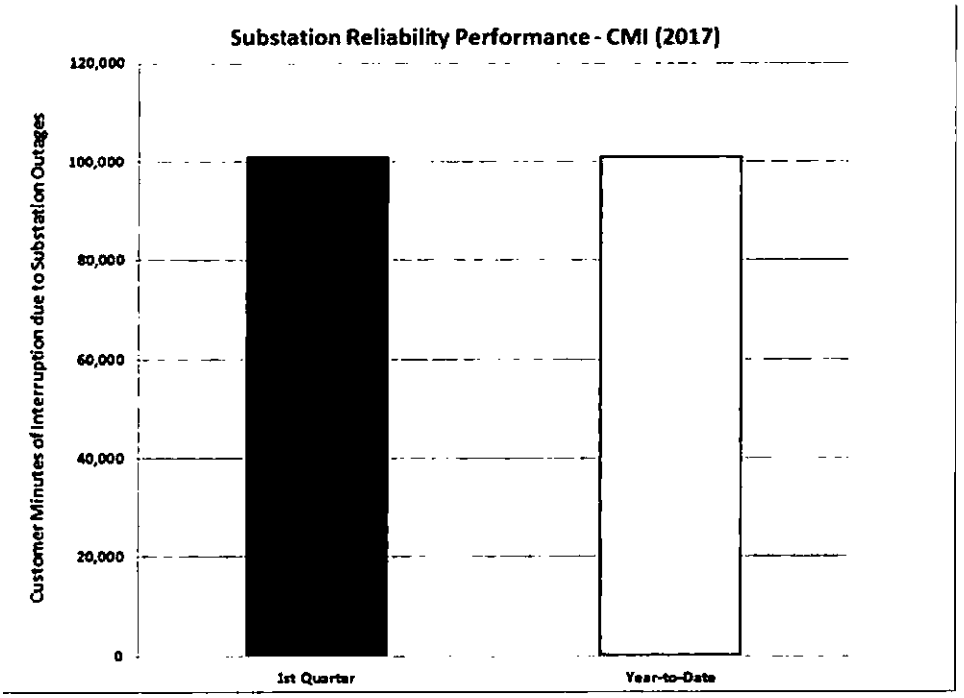
The figure below shows the amount that PPL Electric has the estimated CMI avoidance, for the 1st Quarter and Year-to-Date. During 1st Quarter 2017, PPL Electric has potentially avoided around 222,000 CMI.



(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 1st Quarter 2017, the company interrupted just over 1,000 customers for a total of approximately 101K CMI. The figures below show these results for the number of customers interrupted and CMI experienced, respectively.





(f) Substation SAIFI Contribution

Overall, substation outages have contributed to around 0.5% of the total SAIFI experienced by PPL Electric customers in the 1st Quarter of 2017. Historically, PPL Electric has ranked in the 1st Quartile for Substation SAIFI performance, 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.

Substation Count	1st Quarter	Year-to-Date
Substations with Remote Monitoring	351	351
Total Number of Substations	353	353

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	58
Journeyman Lineman	224
Journeyman Lineman-Trainee	29
Helper	12
Groundhand	5
Troubleman	52
T&D Total	**380**
Electrical	
Elect Leaders-UG	4
Elect Leaders-Net	11
Elect Leaders-Sub	24
Journeyman Elect-UG	19
Journeyman Elect-Net	33
Journeyman Elect-Sub	59
Journeyman Elect Trainee-UG	1
Journeyman Elect Trainee-Net	1
Journeyman Elect Trainee-Sub	16
Helper	0
Laborer-Network	0
Laborer-Substation	0
Electrical Total	**168**
Overall Total	**548**

Appendix A

PPL Electric Utilities Corporation

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

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

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

Appendix B

PPL Electric Utilities Corporation

Job Descriptions

Transmission and Distribution

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

Electrical

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

Appendix B

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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