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**FEDERAL EXPRESS**

April 30, 2018

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



**Re: PPL Electric Utilities Corporation**
**Quarterly Reliability Report for the**
**Period Ended March 31, 2018**
**Docket No. ~~L-00030161~~**

Dear Ms. Chiavetta: M-2016-2522508

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, 2018. Also enclosed, in a sealed envelope, is a copy of the report containing competitively sensitive and proprietary information. The Company hereby requests that the Commission treat that information, and the report containing the information, as privileged and confidential. The report is being filed pursuant to 52 Pa. Code § 57.195(d).

Pursuant to 52 Pa. Code § 1.11, the enclosed document is to be deemed filed on April 30, 2018, which is the date it was deposited with an overnight express delivery service as shown on the delivery receipt attached to the mailing envelope.

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

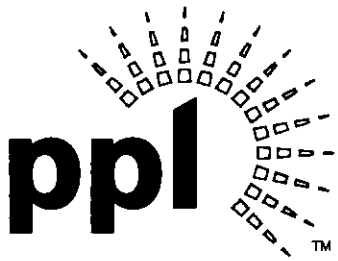
If you have any questions regarding this document, please call me or B. Kathryn Frazier, PPL Electric's Regulatory Affairs Manager at (610) 774-3372.

Very truly yours,

Kimberly A. Klock

Enclosures

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




PPL Electric Utilities

# PPL Electric Utilities Corporation

# Quarterly Reliability Report

# to the

# Pennsylvania Public Utility Commission

*April 2018*

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

In the early morning hours of March 2, 2018, wind storm Riley entered the PPL Electric's service territory. Hazardous winds on March 2 and March 3 produced approximately 16 hours of 40+ mile per hour (MPH) gusts, with peak gusts of up to 60 MPH. The wind caused large trees and branches from outside PPL Electric's rights-of-way to make contact with transmission and distribution facilities, resulting in many downed conductors and broken poles. In most areas, restoration efforts early in the storm were hampered by the heavy wind because bucket trucks cannot operate safely in high winds.

On March 7, with Riley restorations still underway, a second winter storm (Quinn) impacted the service territory with 8 to 12 inches of snow and wind gusts of 25 to 30 MPH. The large amount of snow and wind gusts significantly slowed ongoing restorations.

PPL Electric's entire service territory experienced sustained customer service interruptions. The territory experienced a total of 2,801 cases of trouble resulting in 261,326 customer service interruptions. The first case of trouble was reported on Friday, March 2, at approximately 0145. New service interruptions continued to be reported throughout the week. A total of 136,367 customers experienced a service interruption lasting longer than six hours; 120,661 customers were without service for more than 12 hours; and, 91,227 customers were without service for 24 hours or longer. The last customers were returned to service at 0245 on Saturday, March 10. Wind storm Riley was the ninth most damaging storm event to impact PPL Electric's service territory since records have been kept.

Modifications that will be implemented as a result of storm Riley include:

- Reducing the number of command centers across the service territory.
- Enhancing the process of acquiring external resources.
- Expanding the circuit owner process.
- Creating a key logistics position for more streamlined logistics activities.
- Enhancing the automated work plan process to create more consistency among reports.
- Creating a bench of individuals with various roles that can be activated as required.

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, 2018.

| | |
|---|---|
| SAIFI (Benchmark = 0.98; Rolling 12-month Std. = 1.18) | 0.65 |
| CAIDI (Benchmark = 145; Rolling 12-month Std. = 174) | 137 |
| SAIDI (Benchmark = 142; Rolling 12-month Std. = 205) | 90 |
| MAIFI[1] | 7.0 |
| Average Number of Customers Served[2] | 1,422,879 |
| Number of Sustained Customer Interruptions (Trouble Cases) | 16,953 |
| Number of Customers Affected[3] | 930,756 |
| Customer Minutes of Interruptions (CMI) | 127,828,088 |
| Number of Customer Momentary Interruptions | 9,933,643 |

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

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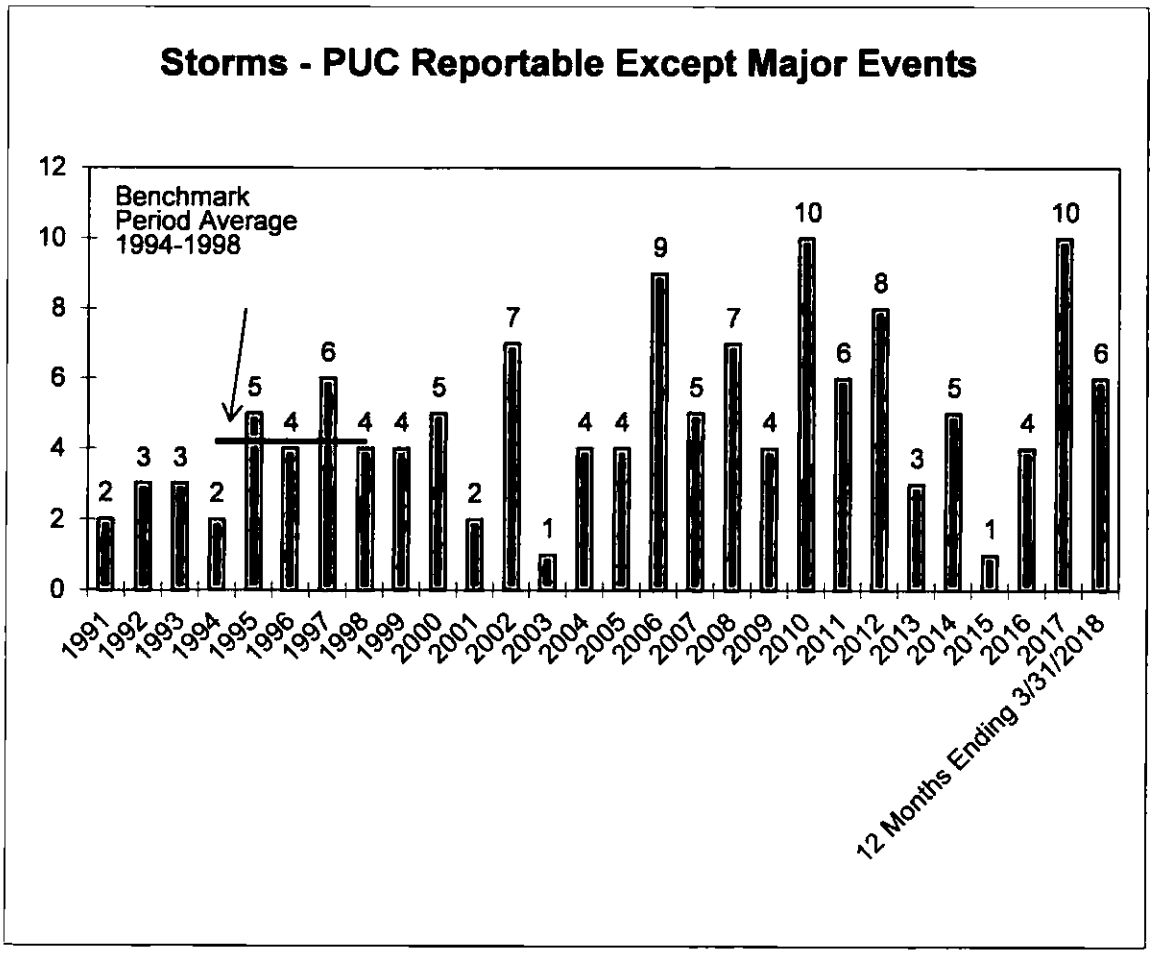
[1] MAIFI data is obtained at the substation breaker level and at certain reclosers. Because PPL Electric is enhancing its ability to identify momentaries, this metric is expected to increase in the near term.

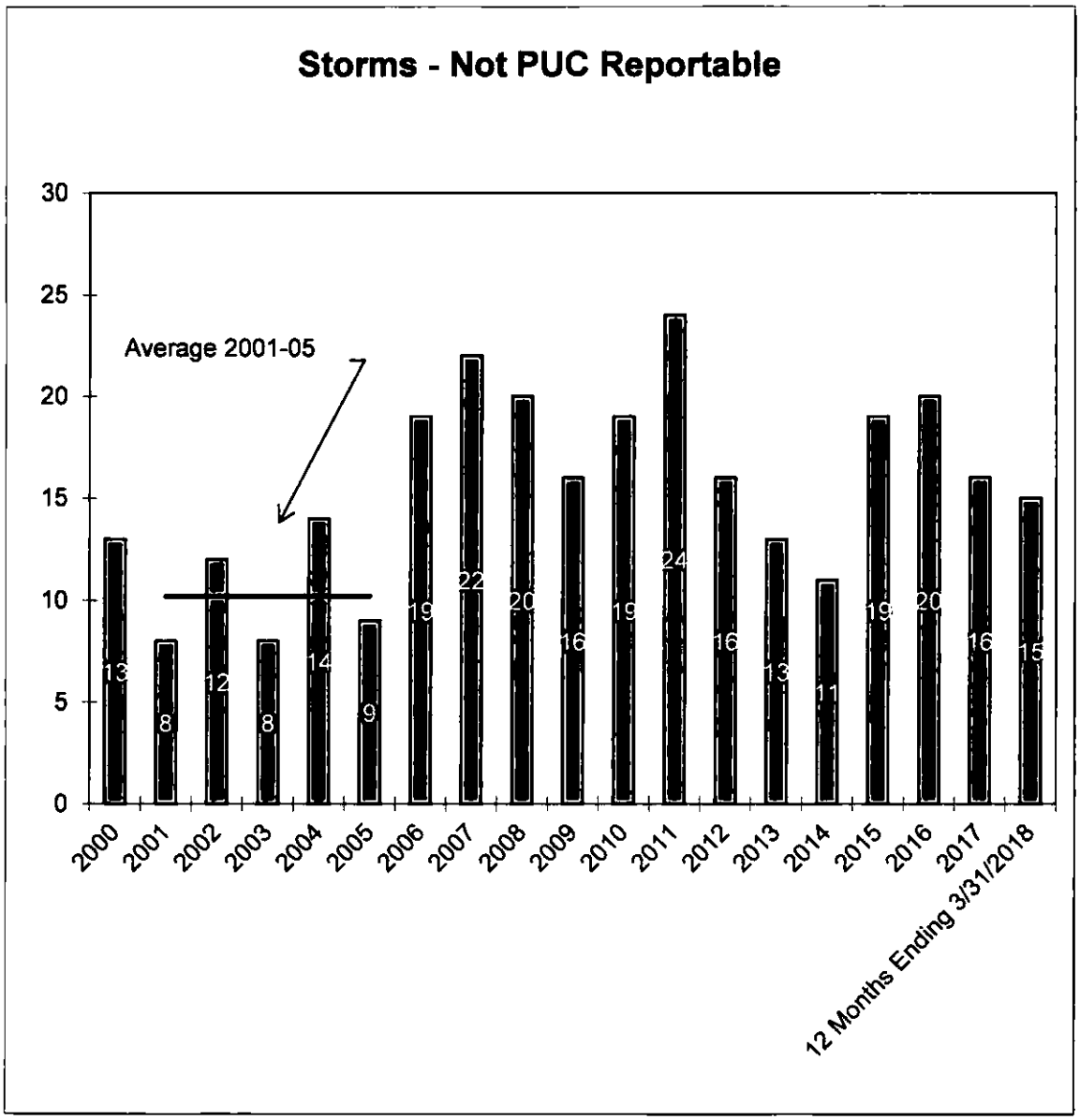
[2] PPL Electric calculates the annual indices using customers served at the end of period. This is consistent with the method used to calculate PPL Electric's benchmarks.

[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.

During the 12-month reporting period, there was one (1) PUC major events and six (6) PUC-reportable storms other than major events.



In addition, there were fifteen (15) storms that were not reportable, but which did require the opening of one or more area emergency centers to manage restoration efforts.



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

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

| WPC Rank | Feeder ID | SAIDI | CAIDI | SAIFI | MAIFI | Customers | Cases of Trouble | Customer Minutes Interrupted (CMI) |
|---|---|---|---|---|---|---|---|---|
| 1 | 46602 | 1768 | 708 | 2.5 | 14.6 | 1,442 | 81 | 2,549,527 |
| 2 | 40902 | 889 | 577 | 1.5 | 27.5 | 2,317 | 74 | 2,059,555 |
| 3 | 40603 | 1368 | 370 | 3.7 | 9.8 | 1,416 | 41 | 1,937,015 |
| 4 | 26604 | 642 | 164 | 3.9 | 6.0 | 2,432 | 68 | 1,562,043 |
| 5 | 47001 | 597 | 411 | 1.5 | 14.7 | 2,491 | 78 | 1,486,927 |
| 6 | 42201 | 739 | 414 | 1.8 | 7.8 | 1,723 | 30 | 1,273,837 |
| 7 | 45702 | 761 | 621 | 1.2 | 20.4 | 1,668 | 72 | 1,269,334 |
| 8 | 65802 | 637 | 300 | 2.1 | 16.1 | 1,903 | 39 | 1,212,317 |
| 9 | 42001 | 702 | 495 | 1.4 | 19.0 | 1,659 | 62 | 1,164,271 |
| 10 | 54504 | 676 | 109 | 6.2 | 17.6 | 1,433 | 7 | 968,522 |
| 11 | 56501 | 393 | 195 | 2.0 | 6.0 | 2,392 | 38 | 939,272 |
| 12 | 26602 | 1275 | 377 | 3.4 | 9.7 | 689 | 23 | 878,248 |
| 13 | 53501 | 394 | 276 | 1.4 | 9.9 | 2,148 | 51 | 846,801 |
| 14 | 26603 | 744 | 319 | 2.3 | 5.1 | 1,118 | 48 | 832,325 |
| 15 | 24602 | 517 | 634 | 0.8 | 4.5 | 1,520 | 34 | 785,781 |
| 16 | 41701 | 776 | 335 | 2.3 | 2.0 | 998 | 41 | 774,110 |
| 17 | 45002 | 395 | 293 | 1.3 | 21.2 | 1,960 | 54 | 773,275 |
| 18 | 55103 | 687 | 346 | 2.0 | 16.7 | 1,125 | 13 | 773,160 |
| 19 | 42701 | 524 | 137 | 3.8 | 6.3 | 1,444 | 89 | 756,847 |
| 20 | 43504 | 362 | 350 | 1.0 | 5.7 | 2,018 | 18 | 731,448 |
| 21 | 58702 | 316 | 211 | 1.5 | 5.5 | 2,242 | 15 | 707,494 |
| 22 | 59301 | 485 | 310 | 1.6 | 12.0 | 1,452 | 51 | 704,202 |
| 23 | 56504 | 343 | 239 | 1.4 | 7.7 | 2,000 | 81 | 685,411 |
| 24 | 46801 | 600 | 391 | 1.5 | 10.0 | 1,106 | 39 | 663,713 |
| 25 | 46504 | 340 | 222 | 1.5 | 1.0 | 1,945 | 46 | 660,754 |

| WPC Rank | Feeder ID | SAIDI | CAIDI | SAIFI | MAIFI | Customers | Cases of Trouble | Customer Minutes Interrupted (CMI) |
|---|---|---|---|---|---|---|---|---|
| 26 | 44203 | 346 | 115 | 3.0 | 3.8 | 1,879 | 27 | 649,292 |
| 27 | 47704 | 464 | 139 | 3.3 | 7.5 | 1,383 | 43 | 642,278 |
| 28 | 46702 | 499 | 209 | 2.4 | 8.6 | 1,273 | 42 | 635,039 |
| 29 | 51304 | 691 | 442 | 1.6 | 3.9 | 898 | 11 | 620,768 |
| 30 | 16005 | 541 | 352 | 1.5 | 10.0 | 1,141 | 31 | 617,310 |
| 31 | 52004 | 517 | 253 | 2.0 | 12.9 | 1,162 | 49 | 600,931 |
| 32 | 59402 | 684 | 521 | 1.3 | 7.2 | 877 | 36 | 599,985 |
| 33 | 40702 | 579 | 391 | 1.5 | 9.1 | 1,015 | 13 | 587,796 |
| 34 | 52403 | 462 | 120 | 3.9 | 9.3 | 1,273 | 51 | 587,490 |
| 35 | 47401 | 433 | 198 | 2.2 | 12.7 | 1,348 | 27 | 583,310 |
| 36 | 65702 | 314 | 362 | 0.9 | 20.3 | 1,835 | 38 | 577,029 |
| 37 | 40101 | 267 | 204 | 1.3 | 5.0 | 2,120 | 37 | 565,767 |
| 38 | 41202 | 387 | 570 | 0.7 | 4.2 | 1,458 | 58 | 564,116 |
| 39 | 28602 | 284 | 216 | 1.3 | 6.0 | 1,934 | 23 | 549,634 |
| 40 | 55002 | 211 | 165 | 1.3 | 14.4 | 2,566 | 79 | 541,796 |
| 41 | 52402 | 310 | 162 | 1.9 | 21.4 | 1,692 | 73 | 523,790 |
| 42 | 46506 | 321 | 284 | 1.1 | 22.7 | 1,617 | 42 | 519,257 |
| 43 | 24204 | 540 | 766 | 0.7 | 0.6 | 919 | 5 | 496,070 |
| 44 | 59002 | 216 | 206 | 1.0 | 12.2 | 2,275 | 57 | 491,688 |
| 45 | 22003 | 356 | 112 | 3.2 | 2.6 | 1,369 | 44 | 488,023 |
| 46 | 47002 | 245 | 245 | 1.0 | 6.2 | 1,987 | 78 | 485,885 |
| 47 | 59401 | 272 | 114 | 2.4 | 6.1 | 1,786 | 53 | 485,885 |
| 48 | 45602 | 291 | 170 | 1.7 | 14.1 | 1,618 | 40 | 471,384 |
| 49 | 28102 | 428 | 189 | 2.3 | 17.7 | 1,093 | 52 | 467,701 |
| 50 | 12505 | 149 | 137 | 1.1 | 5.2 | 3,146 | 26 | 467,224 |
| 51 | 53602 | 213 | 163 | 1.3 | 29.9 | 2,192 | 87 | 466,061 |
| 52 | 66102 | 229 | 119 | 1.9 | 21.6 | 2,021 | 22 | 461,895 |
| 53 | 59202 | 266 | 145 | 1.8 | 11.5 | 1,723 | 66 | 457,623 |
| 54 | 52401 | 348 | 315 | 1.1 | 18.8 | 1,314 | 74 | 457,409 |
| 55 | 53601 | 410 | 170 | 2.4 | 6.5 | 1,110 | 35 | 455,426 |
| 56 | 26601 | 342 | 436 | 0.8 | 7.0 | 1,326 | 31 | 453,272 |
| 57 | 25601 | 392 | 529 | 0.7 | 16.3 | 1,141 | 21 | 447,453 |
| 58 | 61304 | 276 | 187 | 1.5 | 6.9 | 1,614 | 25 | 446,191 |
| 59 | 52002 | 228 | 92 | 2.5 | 10.2 | 1,937 | □A | 440,875 |
| 60 | 24901 | 192 | 236 | 0.8 | 9.8 | 2,280 | 52 | 437,710 |
| 61 | 43802 | 205 | 436 | 0.5 | 18.2 | 2,135 | 33 | 436,903 |
| 62 | 40601 | 506 | 191 | 2.7 | 0.0 | 853 | 19 | 431,622 |
| 63 | 46802 | 221 | 329 | 0.7 | 8.5 | 1,930 | 90 | 426,882 |

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

# 01 Circuit 46602 -- LARRYS CREEK 66-02

Performance Analysis

The LARRYS CREEK 66-02 circuit experienced four outages of over 100,000 CMI between April 2017 and March 2018.

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

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

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

On August 4, 2017, during a period of strong wind, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 842 customers for up to 1,909 minutes resulting in 1,133,615 CMI.

In total, the LARRYS CREEK 66-02 circuit had 80 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (43); equipment failure (15); animal contacts (13); nothing found (5); vehicles (3); other (1).

Remedial Actions

- In 2017, three existing three-phase reclosers were configured for single-phase operation.
- In 2017, a dead-end insulator was replaced.
- In 2017, three underground primary cables were replaced.
- In 2018, two switches were replaced with Smart Grid devices.
- In 2018, a new tie line to the JERSEY SHORE 09-01 will be evaluated.
- In 2018, eleven spans of difficult-to-access conductor were relocated to a more accessible location.
- In 2018, additional animal guarding will be installed.
- In 2018, eight poles will be replaced.
- In 2018, an existing solid blade disconnect will be replaced with a fuse.
- In 2018, an existing three-phase recloser will be replaced as part of the Smart Grid Program.
- In 2018, over 25 porcelain cutouts will be replaced with polymer cutouts.
- In 2018, resourcing a section of single-phase line will be investigated.

- In 2019, full circuit tree trimming will be performed.

## 02 Circuit 40902 -- JERSEY SHORE 09-02

Performance Analysis

The JERSEY SHORE 09-02 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

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

On October 30, 2017, during a period of strong wind, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 581 customers for up to 195 minutes resulting in 113,254 CMI.

In total, the JERSEY SHORE 09-02 circuit had 73 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (36); equipment failure (16); animal contacts (15); nothing found (2); other (2); vehicles (2).

Remedial Actions

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

## 03 Circuit 40603 -- PINE GROVE 06-03

Performance Analysis

The PINE GROVE 06-03 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

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

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

In total, the PINE GROVE 06-03 circuit had 41 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (24); equipment failure (9); other (4); animal contacts (3); vehicles (1).

Remedial Actions

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

## 04 Circuit 26604 -- BROOKSIDE 66-04

Performance Analysis

The BROOKSIDE 66-04 circuit experienced three outages of over 100,000 CMI between April 2017 and March 2018.

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

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

On March 10, 2018, during a period of strong wind, an equipment failure occurred on an overhead conductor causing a temporary open point to be interrupted. This outage affected 726 customers for up to 237 minutes resulting in 138,015 CMI.

In total, the BROOKSIDE 66-04 circuit had 68 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (30); equipment failure (19); animal contacts (13); other (4); nothing found (2).

Remedial Actions

- In 2017, an existing three-phase recloser was reprogrammed to single-phase operation.
- In 2018, one hundred and five poles will be replaced.
- In 2018, hazard tree removal will be performed.
- In 2018, a motor operated air break was replaced with a recloser as part of the Smart Grid Program.
- In 2018, two fuses will be installed.
- In 2018, several porcelain cutouts will be replaced with polymer cutouts.
- In 2018, a set of smart fault indicators will be installed.
- In 2018, a project to build a new reliability substation will be evaluated.
- In 2018, thirty-eight additional locations will receive animal guarding.
- In 2018, a new line and terminal will be evaluated for this circuit.

## 05 Circuit 47001 -- HUGHESVILLE 70-01

Performance Analysis

The HUGHESVILLE 70-01 circuit experienced three outages of over 100,000 CMI between April 2017 and March 2018.

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

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

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

In total, the HUGHESVILLE 70-01 circuit had 78 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (42); equipment failure (17); animal contacts (11); nothing found (5); contact or dig in (1); other (1); vehicles (1).

Remedial Actions

- In 2017, several devices were upgraded to remote operability to expedite sectionalizing capability.
- In 2017, additional fusing was installed.
- In 2018, relocating a section of difficult-to-access conductor will be evaluated.
- In 2018, an existing device will be upgraded to a Smart Grid device.
- In 2018, an Expanded Operational Review will be performed.
- In 2018, nine fuse cut-outs will be replaced.

- In 2018, hazard danger tree removal will be evaluated for this circuit.
- In 2019, a section of single-phase line will be reconductored.
- In 2019, two sections of difficult-to-access conductor will be relocated to more accessible locations.

## 06 Circuit 42201 -- SHENANDOAH 22-01

Performance Analysis

The SHENANDOAH 22-01 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

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

On August 5, 2017, during a period of heavy rain, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 1,022 customers for up to 454 minutes resulting in 464,672 CMI.

In total, the SHENANDOAH 22-01 circuit had 30 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (11); equipment failure (9); nothing found (5); animal contacts (3); other (1); vehicles (1).

Remedial Actions

- In 2017, a hydraulic circuit recloser was replaced.
- In 2017, a targeted circuit line patrol was performed. As a result, several actions were completed, including additional hot spot tree trimming.
- In 2017, full circuit tree trimming was performed.
- In 2017, an existing hydraulic recloser was upgraded to a Smart Grid device, and a new hydraulic recloser was installed.
- In 2017, three off-cycle pole reviews were completed and replacements identified.
- In 2017, tap fuses were installed at three locations.
- In 2018, two non-communicating devices were replaced with Smart Grid devices.
- In 2018, two additional locations will receive fusing.
- In 2018, a section of difficult to access conductor will be relocated.
- In 2018, distribution under-build on the transmission line will be evaluated.
- In 2019, a new Smart Grid device will be installed.
- In 2019, a section of difficult-to-access conductor will be relocated to a more accessible location.

# 07 Circuit 45702 -- LINDEN 57-02

Performance Analysis

The LINDEN 57-02 circuit experienced six outages of over 100,000 CMI between April 2017 and March 2018.

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

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

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

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

On May 1, 2017, during a period of strong wind, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 226 customers for up to 2,623 minutes resulting in 364,403 CMI.

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

In total, the LINDEN 57-02 circuit had 72 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (38); equipment failure (14); animal contacts (12); nothing found (4); other (2); contact or dig in (1); vehicles (1).

Remedial Actions

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

# 08 Circuit 65802 -- ROHRERSTOWN 58-02

Performance Analysis

The ROHRERSTOWN 58-02 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

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

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

In total, the ROHRERSTOWN 58-02 circuit had 39 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (18); animal contacts (7); equipment failure (7); vehicles (4); nothing found (2); other (1).

Remedial Actions

- In 2017, an Expanded Operational Review was performed. As a result, six locations received additional fusing.
- In 2017, a single-phase break disconnect switch was installed.
- In 2017, the protection scheme for the circuit breaker was modified to reduce customer exposure to momentary outages.
- In 2017, fusing was installed at five locations.
- In 2018, fusing was installed at two locations.
- In 2018, a deteriorated primary pole was replaced.
- In 2018, an infrared scan was performed. Several failing transformer connections were identified and will be remediated.
- In 2018, additional fusing will be installed at two locations.
- In 2018, a deteriorated transformer fuse will be replaced.
- In 2018, full circuit tree trimming will be performed.
- In 2018, an existing three-phase switch will be converted to a telemetered protective device, and the circuit will be reconfigured.
- In 2018, two additional primary poles will be replaced.
- In 2018, a single-phase recloser will be installed.
- In 2018, two additional load break switches will be installed.
- In 2018, a section of difficult-to-access conductor will be evaluated for relocation to a more accessible location.
- In 2018, five poles will be relocated.
- In 2019, a new telemetered recloser will be installed as part of the Smart Grid program.

## 09 Circuit 42001 -- MONTOURSVILLE 20-01

Performance Analysis

The MONTOURSVILLE 20-01 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On May 1, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,658 customers for up to 2,871 minutes resulting in 1,047,841 CMI.

In total, the MONTOURSVILLE 20-01 circuit had 62 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (27); animal contacts (15); equipment failure (15); nothing found (3); other (1); vehicles (1).

Remedial Actions

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

## 10 Circuit 54504 -- ENOLA 45-04

Performance Analysis

The ENOLA 45-04 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

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

In total, the ENOLA 45-04 circuit had 7 outages between April 2017 and March 2018, with the causes breaking down as follows: animal contacts (3); equipment failure (2); tree related (2).

Remedial Actions

- In 2017, the circuit breakers at the ENOLA substation were overhauled and repaired.
- In 2018, the getaway for this circuit was replaced.
- In 2018, infrared scanning was performed with no emergent repairs noted.

- In 2018, a single-phase fuse installation will be evaluated.
- In 2019, full circuit tree trimming will be performed.
- In 2020, the substation will receive circuit breaker replacements and Smart relaying installations.
- In 2020, an Expanded Operational Review will be performed.

# 11 Circuit 56501 -- ROCKVILLE 65-01

Performance Analysis

The ROCKVILLE 65-01 circuit experienced three outages of over 100,000 CMI between April 2017 and March 2018.

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

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

On January 3, 2018, an equipment failure occurred on an underground conductor causing a circuit breaker to trip to lockout. This outage affected 2,375 customers for up to 215 minutes resulting in 414,106 CMI.

In total, the ROCKVILLE 65-01 circuit had 36 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (20); equipment failure (10); animal contacts (5); vehicles (1).

Remedial Actions

- In 2017, one Smart Grid device was repaired.
- In 2017, a mechanical breaker modification was performed.
- In 2018, infrared scanning was performed and several minor repairs were completed.
- In 2018, full circuit tree trimming will be performed.
- In 2018, two additional single-phase fuses will be installed.
- In 2018, a section of the SUMMERDALE 46-01 is being evaluated for re-conductoring to support load from this circuit.
- In 2018, an additional tie point is being evaluated for this circuit.
- In 2018, locations for Smart fault indicator locations will be evaluated.
- In 2018, an additional recloser will be evaluated for automation.
- In 2019, additional Smart Grid devices will be evaluated for this circuit.

## 12 Circuit 26602 -- BROOKSIDE 66-02

Performance Analysis

The BROOKSIDE 66-02 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

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

In total, the BROOKSIDE 66-02 circuit had 23 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (14); equipment failure (6); nothing found (2); other (1).

Remedial Actions

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

## 13 Circuit 53501 -- ELIZABETHVILLE 35-01

Performance Analysis

The ELIZABETHVILLE 35-01 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On October 29, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 2,120 customers for up to 571 minutes resulting in 698,588 CMI.

In total, the ELIZABETHVILLE 35-01 circuit had 51 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (26); equipment failure (15); animal contacts (5); nothing found (3); other (1); vehicles (1).

Remedial Actions

- In 2017, the circuit breaker received maintenance and mechanical upgrading.
- In 2018, sixteen single-phase fuses will be installed.
- In 2018, a full single-phase protection review will be completed.
- In 2018, two motor operated air break switches will receive Smart fault indication.
- In 2019, full circuit tree trimming will be performed.

- In 2019, infrared scanning will be performed.

## 14 Circuit 26603 -- BROOKSIDE 66-03

Performance Analysis

The BROOKSIDE 66-03 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

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

In total, the BROOKSIDE 66-03 circuit had 48 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (24); equipment failure (13); animal contacts (5); nothing found (2); other (2); Improper Operation (1); vehicles (1).

Remedial Actions

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

## 15 Circuit 24602 -- VARDEN 46-02

Performance Analysis

The VARDEN 46-02 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On July 20, 2017, during a period of strong wind, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 345 customers for up to 1,699 minutes resulting in 482,867 CMI.

In total, the VARDEN 46-02 circuit had 34 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (16); animal contacts (9); equipment failure (7); contact or dig in (1); vehicles (1).

Remedial Actions

- In 2018, a new load break disconnect switch will be installed.
- In 2018, sections of single and two-phase conductor will be reviewed for protection strategy.
- In 2018, a motor operated air break switch will have Smart fault indicators installed.
- In 2018, full circuit tree trimming will be performed.
- In 2018, a new line and terminal will be evaluated for this circuit.
- In 2018, a tie line to the HAMLIN 87-02 will be evaluated.
- In 2018, five locations will receive fusing.
- In 2018, nine additional locations will receive animal guarding.
- In 2018, an existing recloser will be upgraded.

# 16 Circuit 41701 -- LOGANTON 17-01

Performance Analysis

The LOGANTON 17-01 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

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

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

In total, the LOGANTON 17-01 circuit had 41 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (24); animal contacts (7); equipment failure (6); nothing found (2); vehicles (2).

Remedial Actions

- In 2017, a new Smart Grid device was added to this circuit.
- In 2017 an Expanded Operational Review was performed. Several minor repairs were completed as a result.
- In 2017, additional animal guarding was added to this circuit.
- In 2017, two locations received fusing.
- In 2018, hot spot tree trimming will be evaluated for this circuit.
- In 2018, the circuit breaker will be replaced.
- In 2019, the LOGANTON substation will undergo an update.
- In 2019, a tie line to this circuit will be automated.

## 17 Circuit 45002 -- LIMESTONE 50-02

Performance Analysis

The LIMESTONE 50-02 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On January 3, 2018, during a period of extreme temperatures, an equipment failure occurred on an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,441 customers for up to 456 minutes resulting in 422,378 CMI.

In total, the LIMESTONE 50-02 circuit had 54 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (27); animal contacts (13); equipment failure (12); nothing found (2).

Remedial Actions

- In 2018, an infrared scan was performed; several minor items were identified and remediated.
- In 2018, extending a section of three-phase conductor will be evaluated.
- In 2018, load balancing will be performed.
- In 2018, several sections of difficult-to-access conductor will be evaluated for relocation.
- In 2019, a new Smart Grid device will be added to this circuit.
- In 2019, seven spans of difficult-to-access conductor will be relocated.

## 18 Circuit 55103 -- WERTZVILLE 51-03

Performance Analysis

The WERTZVILLE 51-03 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

On October 29, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,047 customers for up to 955 minutes resulting in 413,404 CMI.

On January 13, 2018, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 1,050 customers for up to 348 minutes resulting in 303,576 CMI.

In total, the WERTZVILLE 51-03 circuit had 13 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (7); animal contacts (3); equipment failure (3).

Remedial Actions

- In 2018, a three-phase recloser was replaced.
- In 2018, full circuit tree trimming will be performed.
- In 2018, a single-phase fuse will be installed.
- In 2018, a new tie line with the KINGSTON 81-02 line will be evaluated.

## 19 Circuit 42701 -- AUGUSTAVILLE 27-01

Performance Analysis

The AUGUSTAVILLE 27-01 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On March 23, 2018, an equipment failure occurred on an overhead conductor causing a temporary open point to be interrupted. This outage affected 838 customers for up to 244 minutes resulting in 154,686 CMI.

In total, the AUGUSTAVILLE 27-01 circuit had 89 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (41); equipment failure (27); animal contacts (8); vehicles (6); other (4); nothing found (3).

Remedial Actions

- In 2018, an Expanded Operational Review was performed; as a result two additional fuses will be installed.
- In 2018, an additional single phase recloser will be installed.
- In 2018, an existing device will be upgraded to Smart Grid capability.
- In 2018, multiple difficult-to-access conductor segments will be evaluated for relocation.

## 20 Circuit 43504 -- W WILLIAMSPORT 35-04

Performance Analysis

The W WILLIAMSPORT 35-04 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On May 1, 2017, during a period of strong wind, a tree made contact with a pole or pole arm causing a circuit breaker to trip to lockout. This outage affected 1,594 customers for up to 2,788 minutes resulting in 508,903 CMI.

In total, the W WILLIAMSPORT 35-04 circuit had 18 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (9); animal contacts (3); equipment failure (3); nothing found (2); other (1).

Remedial Actions

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

# 21 Circuit 58702 -- ROSEMONT 87-02

Performance Analysis

The ROSEMONT 87-02 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

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

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

In total, the ROSEMONT 87-02 circuit had 15 outages between April 2017 and March 2018, with the causes breaking down as follows: equipment failure (6); tree related (5); animal contacts (2); other (1); vehicles (1).

Remedial Actions

- In 2018, full circuit tree trimming will be performed.
- In 2018, a new remotely operable switch will be installed.
- In 2018, three single-phase fuses will be installed.

# 22 Circuit 59301 -- MC ALISTERVILLE 93-01

Performance Analysis

The MC ALISTERVILLE 93-01 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

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

In total, the MC ALISTERVILLE 93-01 circuit had 51 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (29); equipment failure (14); animal contacts (4); nothing found (2); vehicles (2).

Remedial Actions

- In 2018, an Expanded Operational Review will be performed.
- In 2018, one Smart Grid device will be evaluated for conversion to triple-single operation.
- In 2018, a tie point to the MIFFLINTOWN 90-2 will be evaluated.
- In 2018, the circuit will be evaluated for accelerated tree-trimming.
- In 2018, three potential single-phase fusing locations will be evaluated.
- In 2019, full circuit tree trimming will be performed.

## 23 Circuit 56504 -- ROCKVILLE 65-04

Performance Analysis

The ROCKVILLE 65-04 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On October 29, 2017, during a period of strong wind, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 250 customers for up to 2,600 minutes resulting in 324,402 CMI.

In total, the ROCKVILLE 65-04 circuit had 81 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (41); equipment failure (17); animal contacts (16); nothing found (3); other (2); Improper Operation (1); vehicles (1).

Remedial Actions

- In 2017, additional animal guarding was installed.
- In 2017, full circuit tree trimming was performed.
- In 2017, hazard tree trimming was performed.
- In 2017, an infrared scan was performed.
- In 2017, a single-phase tap fuse was installed.
- In 2018, a section of single-phase will be reconductored, with a portion being relocated.
- In 2018, two additional single-phase fuse locations will be evaluated.

## 24 Circuit 46801 -- HEPBURN 68-01

Performance Analysis

The HEPBURN 68-01 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On May 1, 2017, during a period of heavy rain, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 374 customers for up to 2,822 minutes resulting in 497,892 CMI.

In total, the HEPBURN 68-01 circuit had 39 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (18); animal contacts (7); equipment failure (6); nothing found (4); other (2); contact or dig in (1); vehicles (1).

Remedial Actions

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

## 25 Circuit 46504 -- LOCK HAVEN 65-04

Performance Analysis

The LOCK HAVEN 65-04 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

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

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

In total, the LOCK HAVEN 65-04 circuit had 46 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (31); equipment failure (10); animal contacts (2); nothing found (1); other (1); vehicles (1).

Remedial Actions

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

## 26 Circuit 44203 -- POINT 42-03

Performance Analysis

The POINT 42-03 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On August 4, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,879 customers for up to 210 minutes resulting in 393,575 CMI.

In total, the POINT 42-03 circuit had 27 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (14); animal contacts (5); equipment failure (5); vehicles (3).

Remedial Actions

- In 2017, additional three-phase fusing was installed.
- In 2017, full circuit tree trimming was performed.
- In 2017, two existing devices were upgraded to Smart Grid devices.
- In 2017, an additional Smart Grid device was added to this circuit.
- In 2018, an additional Smart Grid device will be added to this circuit.
- In 2018, a tie line to the DANVILLE 62-04 will be evaluated.
- In 2018, an Expanded Operation Review will be performed on this circuit.

## 27 Circuit 47704 -- BLOOMSBURG 77-04

Performance Analysis

The BLOOMSBURG 77-04 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

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

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

In total, the BLOOMSBURG 77-04 circuit had 43 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (18); equipment failure (15); animal contacts (4); vehicles (3); other (2); nothing found (1).

Remedial Actions

- In 2017, maintenance was performed on the circuit breaker.
- In 2017, additional fault indicators and disconnect switches were added to this circuit.
- In 2017, hazard tree removal was performed.
- In 2018, the circuit breaker will be replaced.
- In 2018, line reconfiguration will be performed on a section of single-phase line.
- In 2019, full circuit tree trimming will be performed.

## 28 Circuit 46702 -- RENOVO 67-02

Performance Analysis

The RENOVO 67-02 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

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

In total, the RENOVO 67-02 circuit had 42 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (28); animal contacts (7); equipment failure (7).

Remedial Actions

- In 2017, an existing recloser was upgraded to a Smart Grid device.
- In 2017, a solid blade disconnect was installed.
- In 2017, additional fusing was installed.
- In 2017, a line patrol was performed with several minor remediations identified to be performed in 2018.
- In 2018, a section of three-phase conductor will be relocated.
- In 2018, two Smart Grid devices will be installed.
- In 2018, full circuit trimming will be performed.
- In 2018, three additional fuses will be installed.
- In 2018, hazard tree trimming will be evaluated for this circuit.

## 29 Circuit 51304 -- WINDSOR 13-04

Performance Analysis

The WINDSOR 13-04 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On October 29, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 891 customers for up to 919 minutes resulting in 536,021 CMI.

In total, the WINDSOR 13-04 circuit had 11 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (4); animal contacts (3); equipment failure (3); vehicles (1).

Remedial Actions

- In 2017, full circuit tree trimming was performed.
- In 2018, a new set of disconnect switches will be installed.
- In 2019, infrared scanning will be performed.

## 30 Circuit 16005 -- DORNEYVILLE 60-05

Performance Analysis

The DORNEYVILLE 60-05 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On July 1, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,133 customers for up to 1,202 minutes resulting in 465,221 CMI.

In total, the DORNEYVILLE 60-05 circuit had 31 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (19); animal contacts (7); nothing found (3); equipment failure (1); other (1).

Remedial Actions

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

## 31 Circuit 52004 -- LINGLESTOWN 20-04

Performance Analysis

The LINGLESTOWN 20-04 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

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

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

In total, the LINGLESTOWN 20-04 circuit had 49 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (33); animal contacts (6); equipment failure (5); vehicles (4); nothing found (1).

Remedial Actions

- In 2018, two additional single-phase fuses will be installed.
- In 2018, this circuit will be evaluated for accelerated tree trimming.
- In 2018, additional hazard tree removal will be evaluated.
- In 2019, full circuit tree trimming will be performed.

## 32 Circuit 59402 -- RICHFIELD 94-02

Performance Analysis

The RICHFIELD 94-02 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

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

In total, the RICHFIELD 94-02 circuit had 36 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (19); equipment failure (8); animal contacts (4); vehicles (4); nothing found (1).

Remedial Actions

- In 2018, four additional fusing locations will be evaluated.
- In 2018, one solid blade disconnect switch will be installed.
- In 2018, infrared scanning will be performed.
- In 2018, an Expanded Operational Review will be performed.

## 33 Circuit 40702 -- FAIRFIELD 07-02

Performance Analysis

The FAIRFIELD 07-02 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On May 1, 2017, during a period of heavy rain, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,016 customers for up to 3,022 minutes resulting in 525,586 CMI.

In total, the FAIRFIELD 07-02 circuit had 13 outages between April 2017 and March 2018, with the causes breaking down as follows: equipment failure (7); tree related (3); nothing found (2); animal contacts (1).

Remedial Actions

- In 2017, full circuit tree trimming was performed.
- In 2018, a section of difficult-to-access conductor will be relocated to a more accessible location.
- In 2018, three existing devices were upgraded to Smart Grid devices.
- In 2018, an Expanded Operation Review will be performed on this circuit.
- In 2018, additional fusing will be installed.
- In 2018, additional animal guarding will be installed.

## 34 Circuit 52403 -- GREEN PARK 24-03

Performance Analysis

The GREEN PARK 24-03 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

On August 11, 2017, during a period of heavy rain, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 1,150 customers for up to 179 minutes resulting in 125,756 CMI.

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

In total, the GREEN PARK 24-03 circuit had 51 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (30); equipment failure (14); nothing found (3); animal contacts (2); vehicles (2).

Remedial Actions

- In 2017, additional fusing was installed at multiple locations.
- In 2017, circuit breaker relays were upgraded at the GREEN PARK substation.
- In 2018, full circuit tree trimming will be performed.
- In 2018, four single-phase fuses will be installed.
- In 2018, one additional single-phase fuse location will be evaluated.
- In 2019, the circuit breaker and getaway cable will be replaced.

- In 2019, a second transmission source into the distribution substation will be constructed.
- In 2020, a section of difficult-to-access single-phase will be relocated.

## 35 Circuit 47401 -- PENNS 74-01

Performance Analysis

The PENNS 74-01 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

On May 5, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 667 customers for up to 545 minutes resulting in 161,596 CMI.

On March 7, 2018, during a period of strong wind, a tree made contact with a cut-out causing a circuit breaker to trip to lockout. This outage affected 491 customers for up to 672 minutes resulting in 130,119 CMI.

In total, the PENNS 74-01 circuit had 27 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (13); animal contacts (7); equipment failure (4); nothing found (2); other (1).

Remedial Actions

- In 2018, a new Smart Grid device was installed on this circuit.
- In 2018, a new disconnect switch will be evaluated for this circuit.
- In 2018, additional animal guarding will be evaluated for this circuit.

## 36 Circuit 65702 -- ROSEVILLE 57-02

Performance Analysis

The ROSEVILLE 57-02 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

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

In total, the ROSEVILLE 57-02 circuit had 38 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (16); equipment failure (12); animal contacts (8); nothing found (1); vehicles (1).

Remedial Actions

- In 2017, a new telemetered recloser was installed.
- In 2017, an Expanded Operational Review was performed. As a result, fusing was installed at six locations.
- In 2017, five primary poles were replaced.
- In 2017, a section of single-phase underground was reconductored.
- In 2017, settings were changed on a protective device to remediate momentary interruptions.
- In 2018, a new single-phase recloser was installed.
- In 2018, additional fusing was installed.
- In 2018, an additional single-phase recloser will be installed.
- In 2018, four additional locations will receive fusing.
- In 2018, an additional primary pole will be replaced.
- In 2018, three transformer cutouts will be replaced.
- In 2018, a three-phase pole will be reconfigured to provide additional clearance.
- In 2018, two three-phase cross arms will be replaced.
- In 2018, full circuit tree trimming will be performed.
- In 2018, ten trip-saver locations will be installed.

## 37 Circuit 40101 -- HUNTER 01-01

Performance Analysis

The HUNTER 01-01 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On July 29, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 2,121 customers for up to 486 minutes resulting in 445,982 CMI.

In total, the HUNTER 01-01 circuit had 37 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (15); equipment failure (11); animal contacts (6); nothing found (3); other (1); vehicles (1).

Remedial Actions

- In 2017, hazard tree trimming was performed.
- In 2018, two non-communicating devices were upgraded to Smart Grid devices.
- In 2018, pole arms were replaced at five locations.
- In 2018, fusing will be installed at one location.
- In 2018, reconductoring will be evaluated.
- In 2018, a new tie line will be evaluated.
- In 2018, obtaining additional trimming right of way near the substation will be pursued.
- In 2018, an Expanded Operational Review will be conducted.

## 38 Circuit 41202 -- KENMAR 12-02

Performance Analysis

The KENMAR 12-02 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

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

In total, the KENMAR 12-02 circuit had 58 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (30); equipment failure (14); animal contacts (10); nothing found (3); vehicles (1).

Remedial Actions

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

## 39 Circuit 28602 -- BLYTHEBURN 86-02

Performance Analysis

The BLYTHEBURN 86-02 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

On July 24, 2017, during a period of heavy rain, a tree made contact with a pole or pole arm causing a recloser to trip to lockout. This outage affected 345 customers for up to 609 minutes resulting in 166,436 CMI.

On March 23, 2018, an equipment failure occurred on an overhead conductor causing a recloser to trip to lockout. This outage affected 767 customers for up to 263 minutes resulting in 201,721 CMI.

In total, the BLYTHEBURN 86-02 circuit had 23 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (14); equipment failure (5); vehicles (2); animal contacts (1); contact or dig in (1).

Remedial Actions

- In 2017, five additional taps were fused.
- In 2017, a new load break switch was installed.
- In 2017, an existing three-phase recloser was upgraded to a telemetric recloser.

- In 2018, a three-phase automatic recloser was installed as part of the Smart Grid program.
- In 2018, multiple porcelain cutout fuses were replaced.
- In 2018, three additional switches will be installed.
- In 2018, a tie line to the BLYTHEBURN 86-04 will be evaluated.
- In 2018, a single-phase tap fuse will be installed.
- In 2019, an additional Smart Grid device will be installed.

## 40 Circuit 55002 -- NEWPORT 50-02

Performance Analysis

The NEWPORT 50-02 circuit experienced no outages of over 100,000 CMI between April 2017 and March 2018.

In total, the NEWPORT 50-02 circuit had 79 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (44); equipment failure (16); animal contacts (11); nothing found (5); vehicles (2); other (1).

Remedial Actions

- In 2018, full circuit tree trimming will be performed.
- In 2018, the substation will be upgraded and the power transformers will be replaced.
- In 2018, substation relaying will be upgraded to provide enhanced fault indication.
- In 2018, a new line and terminal will be constructed.
- In 2018, two single-phase fuses will be installed.
- In 2018, additional animal guarding will be evaluated.

## 41 Circuit 52402 -- GREEN PARK 24-02

Performance Analysis

The GREEN PARK 24-02 circuit experienced no outages of over 100,000 CMI between April 2017 and March 2018.

In total, the GREEN PARK 24-02 circuit had 73 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (44); equipment failure (22); animal contacts (3); nothing found (3); vehicles (1).

Remedial Actions

- In 2017, a Smart Grid devices device was converted to triple-single operation.
- In 2017, circuit breaker relays were upgraded at the GREEN PARK substation.
- In 2018, two single-phase fuse locations will be evaluated.
- In 2018, enabling triple-single operation at three automated reclosers is being evaluated.
- In 2018, a targeted conductor conversion is being evaluated.

- In 2018, infrared scanning will be evaluated.
- In 2019, a second transmission source into the distribution substation will be constructed.

## 42 Circuit 46506 -- LOCK HAVEN 65-06

Performance Analysis

The LOCK HAVEN 65-06 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

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

In total, the LOCK HAVEN 65-06 circuit had 41 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (15); equipment failure (12); animal contacts (10); nothing found (2); contact or dig in (1); other (1).

Remedial Actions

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

## 43 Circuit 24204 -- PROVIDENCE 42-04

Performance Analysis

The PROVIDENCE 42-04 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On July 20, 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 576 customers for up to 1,587 minutes resulting in 491,378 CMI.

In total, the PROVIDENCE 42-04 circuit had 4 outages between April 2017 and March 2018, with the causes breaking down as follows: animal contacts (3); equipment failure (1).

Remedial Actions

- In 2017, an Expanded Operation Review was performed. Several minor repairs were performed as a result.
- In 2018, additional sectionalizing devices were installed.
- In 2018, additional fusing will be evaluated for this circuit.

- In 2018, thirty-two additional animal guards will be installed.

## 44 Circuit 59002 -- MIFFLINTOWN 90-02

Performance Analysis

The MIFFLINTOWN 90-02 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

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

In total, the MIFFLINTOWN 90-02 circuit had 57 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (24); equipment failure (19); animal contacts (7); nothing found (6); vehicles (1).

Remedial Actions

- In 2017, a recloser was upgraded to a Smart Grid device.
- In 2018, a fuse was replaced with a recloser, and additional downstream fusing was installed.
- In 2018, a recloser will be replaced.
- In 2018, a motor operated air break switch will received Smart fault indication.
- In 2018, a new tie line will be evaluated.
- In 2018, eighteen single-phase fuses will be installed.
- In 2018, one fuse will be replaced with a solid blade disconnect.
- In 2018, an Expanded Operational Review will be performed.
- In 2018, infrared scanning will be performed.
- In 2019, an additional Smart Grid device will be evaluated.

## 45 Circuit 22003 -- BOHEMIA 20-03

Performance Analysis

The BOHEMIA 20-03 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

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

On November 18, 2017, a vehicle made contact with a pole causing a recloser to trip to lockout. This outage affected 348 customers for up to 320 minutes resulting in 111,499 CMI.

In total, the BOHEMIA 20-03 circuit had 43 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (15); animal contacts (12); equipment failure (10); nothing found (3); other (2); vehicles (1).

Remedial Actions

- In 2018, full circuit tree trimming will be performed.
- In 2018, an Expanded Operation Review will be performed.
- In 2018, an existing capacitor will be automated.
- In 2018, ten additional locations will receive fusing.
- In 2018, a section of difficult-to-access single-phase conductor will be relocated to a more accessible location.
- In 2018, a new line and terminal will be evaluated.
- In 2019, additional animal guarding will be installed at several locations.
- In 2020, a tie line will be constructed between the TWIN LAKES 81-02 and the BOHEMIA 20-03.

## 46 Circuit 47002 -- HUGHESVILLE 70-02

Performance Analysis

The HUGHESVILLE 70-02 circuit experienced no outages of over 100,000 CMI between April 2017 and March 2018.

In total, the HUGHESVILLE 70-02 circuit had 78 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (42); equipment failure (18); animal contacts (10); nothing found (3); vehicles (3); other (2).

Remedial Actions

- In 2018, an Expanded Operational Review will be performed.
- In 2018, an existing recloser will be replaced.
- In 2018, four locations will receive animal guarding.
- In 2018, three fuse cutouts will be replaced.
- In 2018, a section of difficult-to-access conductor will be relocated to a more accessible location.
- In 2018, hazard tree trimming will be evaluated for this circuit.

## 47 Circuit 59401 -- RICHFIELD 94-01

Performance Analysis

The RICHFIELD 94-01 circuit experienced no outages of over 100,000 CMI between April 2017 and March 2018.

In total, the RICHFIELD 94-01 circuit had 52 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (22); equipment failure (11); animal contacts (10); nothing found (7); vehicles (2).

Remedial Actions

- In 2017, an existing three-phase recloser was replaced.
- In 2018, several fusing locations will be evaluated.
- In 2018, additional animal guarding locations will be evaluated.

# 48 Circuit 45602 -- WOOLRICH 56-02

Performance Analysis

The WOOLRICH 56-02 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

On October 11, 2017, during a period of heavy rain, an equipment failure occurred on an overhead conductor causing a recloser to trip to lockout. This outage affected 713 customers for up to 158 minutes resulting in 112,005 CMI.

On March 1, 2018, 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 427 customers for up to 288 minutes resulting in 111,144 CMI.

In total, the WOOLRICH 56-02 circuit had 40 outages between April 2017 and March 2018, with the causes breaking down as follows: animal contacts (15); tree related (15); equipment failure (9); nothing found (1).

Remedial Actions

- In 2017, full circuit tree trimming was performed.
- In 2018, an existing recloser was upgraded to a Smart Grid device.
- In 2018, additional animal guarding will be installed.
- In 2018, a tie line to the WOOLRICH 56-01 will be evaluated.

# 49 Circuit 28102 -- TWIN LAKES 81-02

Performance Analysis

The TWIN LAKES 81-02 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

On July 20, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a load break disconnect switch to be interrupted. This outage affected 157 customers for up to 796 minutes resulting in 124,940 CMI.

On November 1, 2017, during a period of heavy rain, a vehicle contact occurred causing a recloser to trip to lockout. This outage affected 432 customers for up to 604 minutes resulting in 181,296 CMI.

In total, the TWIN LAKES 81-02 circuit had 51 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (20); animal contacts (15); equipment failure (8); nothing found (5); vehicles (2); contact or dig in (1).

Remedial Actions

- In 2018, nine locations will receive animal guarding.
- In 2018, four locations will receive fusing.
- In 2018, thirteen poles will be replaced in this circuit.
- In 2018, hazard tree trimming will be performed.
- In 2018, a section of single-phase conductor will be evaluated for resourcing.
- In 2020, a tie line will be constructed between the TWIN LAKES 81-02 and the BOHEMIA 20-03.

## 50 Circuit 12505 -- MINSI TRAIL 25-05

Performance Analysis

The MINSI TRAIL 25-05 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On June 28, 2017, an equipment failure occurred on an overhead splice causing a circuit breaker to trip to lockout. This outage affected 1,880 customers for up to 571 minutes resulting in 406,149 CMI.

In total, the MINSI TRAIL 25-05 circuit had 25 outages between April 2017 and March 2018, with the causes breaking down as follows: equipment failure (9); animal contacts (8); tree related (7); other (1).

Remedial Actions

- In 2018, two additional Smart Grid devices will be installed.
- In 2018, additional animal guarding will be installed.
- In 2018, an Expanded Operational Review will be performed.
- In 2018, full circuit tree trimming will be performed.
- In 2019, an additional Smart Grid device will be installed.

## 51 Circuit 53602 -- DALMATIA 36-02

Performance Analysis

The DALMATIA 36-02 circuit experienced no outages of over 100,000 CMI between April 2017 and March 2018.

In total, the DALMATIA 36-02 circuit had 87 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (60); animal contacts (11); equipment failure (6); nothing found (3); other (3); vehicles (3); contact or dig in (1).

Remedial Actions

- In 2017, right-of-way was expanded for a section of this circuit to allow for more effective tree trimming.
- In 2017, hot spot tree trimming was performed.
- In 2018, the MEISERVILLE substation will be built to provide load support for this circuit.
- In 2018, full circuit tree trimming will be performed.
- In 2018, two single-phase fuses will be installed.
- In 2018, infrared scanning will be performed.
- In 2018, a section of single-phase line will be relocated and refed from an alternate source.

## 52 Circuit 66102 -- REAMSTOWN 61-02

Performance Analysis

The REAMSTOWN 61-02 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

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

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

In total, the REAMSTOWN 61-02 circuit had 21 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (9); equipment failure (5); animal contacts (3); nothing found (2); vehicles (2).

Remedial Actions

- In 2017, two existing three-phase reclosers were replaced as part of the Smart Grid program.
- In 2017, an existing telemetered three-phase reclose was configured for single-phase operation.
- In 2017, three underground primary cables were replaced.
- In 2017, thirty-two porcelain cutouts were replaced with polymer cutouts.
- In 2018, a dead-end insulator was replaced.
- In 2018, an existing solid blade disconnect was replaced with a fuse.
- In 2018, additional fusing will be installed at sixteen locations.

- In 2018, two poles will be replaced.
- In 2018, a new three-phase tie line will be constructed.
- In 2018, a transmission line will be extended to provide an additional source for this substation.

## 53 Circuit 59202 -- THOMPSONTOWN 92-02

Performance Analysis

The THOMPSONTOWN 92-02 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

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

In total, the THOMPSONTOWN 92-02 circuit had 66 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (40); equipment failure (19); animal contacts (6); vehicles (1).

Remedial Actions

- In 2017, an underground dip was replaced.
- In 2018, an additional single-phase fuse will be installed.
- In 2018, four additional single-phase fuse locations will be evaluated.
- In 2018, an additional recloser will be evaluated.
- In 2018, a section of single-phase will be relocated.
- In 2018, a motor operated air break switch will receive Smart fault indication.

## 54 Circuit 52401 -- GREEN PARK 24-01

Performance Analysis

The GREEN PARK 24-01 circuit experienced no outages of over 100,000 CMI between April 2017 and March 2018.

In total, the GREEN PARK 24-01 circuit had 74 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (37); animal contacts (16); equipment failure (13); nothing found (7); other (1).

Remedial Actions

- In 2017, full circuit tree trimming was performed.
- In 2017, two fuses were installed on this circuit.
- In 2017, circuit breaker relays were upgraded at the substation.
- In 2018, additional reclosers and fusing will be installed on this circuit.

- In 2018, an additional new protective device will be evaluated.
- In 2018, additional animal guarding will be installed at two locations.

## 55 Circuit 53601 -- DALMATIA 36-01

Performance Analysis

The DALMATIA 36-01 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On February 26, 2018, during a period of heavy rain, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 322 customers for up to 396 minutes resulting in 127,267 CMI.

In total, the DALMATIA 36-01 circuit had 35 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (18); equipment failure (11); animal contacts (3); vehicles (3).

Remedial Actions

- In 2017, hot-spot tree trimming was performed.
- In 2017, a single-phase fuse was installed.
- In 2018, an additional single-phase fuse location will be evaluated.

## 56 Circuit 26601 -- BROOKSIDE 66-01

Performance Analysis

The BROOKSIDE 66-01 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On August 4, 2017, a tree made contact with an overhead conductor causing a recloser to trip to lockout. This outage affected 566 customers for up to 1,588 minutes resulting in 268,724 CMI.

In total, the BROOKSIDE 66-01 circuit had 31 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (18); animal contacts (5); equipment failure (4); nothing found (3); vehicles (1).

Remedial Actions

- In 2018, hazard tree removal will be performed.
- In 2018, addition animal guarding will be evaluated for this circuit.
- In 2018, fusing will be installed at five locations.
- In 2018, twenty-one poles will be replaced.

## 57 Circuit 25601 -- ARROWHEAD 56-01

Performance Analysis

The ARROWHEAD 56-01 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On December 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 550 customers for up to 742 minutes resulting in 408,100 CMI.

In total, the ARROWHEAD 56-01 circuit had 20 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (9); animal contacts (4); equipment failure (4); nothing found (2); vehicles (1).

Remedial Actions

- In 2018, an Expanded Operational Review will be performed.
- In 2018, a three-phase tie line will be evaluated.
- In 2019, two single-phase reclosers will be installed.
- In 2019, three single-phase tap fuses will be installed.

## 58 Circuit 61304 -- EARL 13-04

Performance Analysis

The EARL 13-04 circuit experienced two outages of over 100,000 CMI between April 2017 and March 2018.

On May 1, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,566 customers for up to 387 minutes resulting in 202,496 CMI.

On October 23, 2017, a vehicle contact occurred causing a recloser to trip to lockout. This outage affected 380 customers for up to 476 minutes resulting in 181,051 CMI.

In total, the EARL 13-04 circuit had 25 outages between April 2017 and March 2018, with the causes breaking down as follows: animal contacts (10); equipment failure (6); tree related (3); nothing found (2); vehicles (2); contact or dig in (1); other (1).

Remedial Actions

- In 2018, full circuit tree trimming was performed.
- In 2018, additional fusing will be installed at thirteen locations.
- In 2018, a new single-phase recloser will be installed.
- In 2018, hazard tree trimming will be performed.
- In 2018, two additional single-phase switches will be installed.

- In 2018, a new, automated single-phase tie line will be evaluated.
- In 2018, a new three-phase tie line will be evaluated.
- In 2018, additional animal guarding will be evaluated.

## 59 Circuit 52002 -- LINGLESTOWN 20-02

Performance Analysis

The LINGLESTOWN 20-02 circuit experienced three outages of over 100,000 CMI between April 2017 and March 2018.

On August 2, 2017, during a period of heavy rain, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 673 customers for up to 214 minutes resulting in 104,495 CMI.

On August 18, 2017, during a period of heavy rain, a vehicle contact occurred. This outage affected 1,234 customers for up to 98 minutes resulting in 108,570 CMI.

On October 29, 2017, during a period of strong wind, a tree made contact with an overhead conductor causing a circuit breaker to trip to lockout. This outage affected 1,199 customers for up to 1,634 minutes resulting in 108,085 CMI.

In total, the LINGLESTOWN 20-02 circuit had 12 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (5); equipment failure (4); animal contacts (1); nothing found (1); vehicles (1).

Remedial Actions

- In 2018, infrared scanning will be performed.
- In 2018, an existing motor operated air break will be replaced with a Smart Grid device.
- In 2018, replacing an existing fuse with a single-phase recloser will be evaluated.

## 60 Circuit 24901 -- WHITE HAVEN 49-01

Performance Analysis

The WHITE HAVEN 49-01 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

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

In total, the WHITE HAVEN 49-01 circuit had 52 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (31); equipment failure (11); animal contacts (7); nothing found (2); vehicles (1).

Remedial Actions

- In 2017, infrared scanning was performed. Several minor items were identified and remediated.
- In 2018, an existing switch was upgraded to a Smart Grid device.
- In 2018, a new line and terminal will be evaluated.
- In 2018, animal guarding will be installed at four locations.
- In 2018, a hydraulic recloser will be evaluated for replacement.
- In 2018, additional fuses will be installed.
- In 2019, a section of three-phase line will be relocated and reconductored.
- In 2019, a section of three-phase line will be extended and made more accessible.

## 61 Circuit 43802 -- S WILLIAMSPORT 38-02

Performance Analysis

The S WILLIAMSPORT 38-02 circuit experienced no outages of over 100,000 CMI between April 2017 and March 2018.

In total, the S WILLIAMSPORT 38-02 circuit had 33 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (17); animal contacts (6); equipment failure (3); nothing found (3); vehicles (2); contact or dig in (1); other (1).

Remedial Actions

- In 2017, full circuit tree trimming was performed.
- In 2018, two cutouts were replaced on this circuit.
- In 2018, a new single phase recloser was installed.
- In 2018, five additional fuses were installed on this circuit.
- In 2018, an Expanded Operational Review will be performed.

## 62 Circuit 40601 -- PINE GROVE 06-01

Performance Analysis

The PINE GROVE 06-01 circuit experienced one outage of over 100,000 CMI between April 2017 and March 2018.

On April 9, 2017, a vehicle made contact with a pole causing an interruption. This outage affected 650 customers for up to 503 minutes resulting in 137,547 CMI.

In total, the PINE GROVE 06-01 circuit had 19 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (9); animal contacts (3); equipment failure (3); vehicles (3); other (1).

Remedial Actions

- In 2018, an Expanded Operational Review will be conducted.
- In 2018, upgrading a recloser and installing additional fusing will be evaluated.
- In 2018, a three-phase tie line will be evaluated.
- In 2018, a new substation will be evaluated.

## 63 Circuit 46802 -- HEPBURN 68-02

Performance Analysis

The HEPBURN 68-02 circuit experienced no outages of over 100,000 CMI between April 2017 and March 2018.

In total, the HEPBURN 68-02 circuit had 89 outages between April 2017 and March 2018, with the causes breaking down as follows: tree related (46); animal contacts (20); equipment failure (18); nothing found (2); vehicles (2); other (1).

Remedial Actions

- In 2017, a new three-phase recloser and five fuses were installed on this circuit.
- In 2018, seven locations will receive animal guarding.
- In 2018, an existing cut-out will be replaced on this circuit.
- In 2018, additional fusing will be installed on this circuit.
- In 2019, a new recloser will be installed on this circuit.
- In 2019, full circuit tree 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** | 3,561 | 21.0% | 46,830 | 5.0% | 2,524,922 | 2.0% |
| **Contact / Dig-In** | 141 | 0.8% | 13,820 | 1.5% | 900,066 | 0.7% |
| **Directed by Non-PPL Authority** | 93 | 0.5% | 37,539 | 4.0% | 1,914,148 | 1.5% |
| **Equipment Failures** | 4,921 | 29.0% | 269,284 | 28.9% | 27,738,403 | 21.7% |
| **Improper Design** | 2 | 0.0% | 136 | 0.0% | 2,040 | 0.0% |
| **Improper Installation** | 6 | 0.0% | 2,254 | 0.2% | 213,419 | 0.2% |
| **Improper Operation** | 5 | 0.0% | 1,228 | 0.1% | 37,567 | 0.0% |
| **Nothing Found** | 927 | 5.5% | 46,935 | 5.0% | 3,662,001 | 2.9% |
| **Other Controllable** | 98 | 0.6% | 15,469 | 1.7% | 453,608 | 0.4% |
| **Other Non Control** | 241 | 1.4% | 26,651 | 2.9% | 1,923,209 | 1.5% |
| **Other Public** | 37 | 0.2% | 10,373 | 1.1% | 539,440 | 0.4% |
| **Tree Related** | 6,180 | 36.5% | 349,369 | 37.5% | 77,312,924 | 60.5% |
| **Unknown** | - | 0.0% | - | 0.0% | - | 0.0% |
| **Vehicles** | 741 | 4.4% | 110,868 | 11.9% | 10,606,341 | 8.3% |
| **Total** | 16,953 | 100.0% | 930,756 | 100.0% | 127,828,088 | 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 46% of cases, 52% of customer interruptions, and 71% 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.

**Animals:** Animals accounted for approximately 21% of PPL Electric's cases of trouble. Although this represents a significant number of cases, the effect on SAIFI and CAIDI is small because approximately 76% of the number of cases of trouble was associated with individual distribution transformers. However, when animal contacts affect substation equipment, the effect may be widespread and potentially can interrupt thousands of customers on multiple circuits. In addition to guarding new distribution transformers and substations, in 2009, PPL Electric initiated distribution and substation animal guarding programs to focus systematically on protecting existing facilities most at risk of incurring animal-caused interruptions. All substations are scheduled to be animal guarded by 2018.

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

**Equipment Failure:** Equipment failure is one of the largest single contributors to the number of cases of trouble, customer interruptions and customer minutes. However, approximately 39% of the cases of trouble, 46% of the customer interruptions and 56% 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) | 456 | 35 | 35 | 35 | 35 |
| Transmission arm replacements (# of sets) | 103 | 25 | 25 | 25 | 25 |
| Transmission air break switch inspections (# of switches) | 0 | 0 | 0 | 0 | 0 |
| Transmission surge arrester installations (# of sets) | 0 | 0 | 0 | 0 | 0 |
| Transmission structure inspections (# of activities) | 33,291 | 8,323 | 2,493 | 8,323 | 2,493 |
| Transmission tree side trim-Bulk Power (linear feet) | N/A | N/A | N/A | | |
| Transmission herbicide-Bulk Power (# of acres) | N/A | N/A | N/A | | |
| Transmission reclearing (# of miles) BES Only | 548.87 | 325.83 | 381.23 | 325.83 | 381.23 |
| Transmission reclearing (# of miles) 69 kV | 860.62 | 205.25 | 299.67 | 205.25 | 299.67 |
| Transmission reclearing (# of miles) 138 kV | 60.12 | 22.01 | 38.61 | 22.01 | 38.61 |
| Transmission danger tree removals-Bulk Power (# of trees) | N/A | N/A | N/A | N/A | N/A |
| **Substation** | | | | | |
| Substation batteries (# of activities) | 673 | 431 | 378 | 431 | 378 |
| Circuit breakers (# of activities) | 639 | 50 | 117 | 50 | 117 |
| Substation inspections (# of activities) | 1797 | 685 | 587 | 685 | 587 |
| Transformer maintenance (# of activities) | 175 | 30 | 27 | 30 | 27 |

| Inspection & Maintenance Goals/Objectives | Annual Budget | 4th Quarter | | Year-to-date | |
|---|---|---|---|---|---|
| | | Budget | Actual | Budget | Actual |
| **Distribution** | | | | | |
| Distribution C-tag poles replaced (# of poles) | 3,490 | 716 | 460 | 716 | 460 |
| C-truss distribution poles (# of poles) | 3,442 | 830 | 1,008 | 830 | 1,008 |
| Capacitor (MVAR added) | 0 | 0 | 25 | 0 | 25 |
| OCR Replacements (# of) | 40 | 16 | 24 | 16 | 24 |
| Distribution pole inspections (# of poles) | 60,021 | 12,449 | 14,007 | 12,449 | 14,007 |
| Distribution line inspections (hours) | 9,742 | 983 | 1017 | 983 | 1017 |
| Group re-lamping (# of lamps) | 13,152 | 0 | 0 | 0 | 0 |
| Test sections of underground distribution cable | N/A | 130 | 130 | 130 | 130 |
| Distribution tree trimming (# of miles) | 4,420 | 983 | 692 | 983 | 692 |
| Distribution herbicide (# of acres) | 0 | 0 | 0 | 0 | 0 |
| Distribution >18" removals within R/W (# of trees) | 0 | 0 | 0 | 0 | 0 |
| Distribution hazard tree removals outside R/W (# of trees) | 0 | 0 | 0 | 0 | 0 |
| LTN manhole inspections (# of) | 300 | 27 | 108 | 27 | 108 |
| LTN vault inspections (# of) | 637 | 177 | 259 | 177 | 259 |
| LTN network protector overhauls (# of) | 65 | 9 | 11 | 9 | 11 |
| LTN reverse power trip testing (# of) | 23 | 3 | 9 | 3 | 9 |

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 | 1,786 | 1,364 | 1,786 | 1,364 |
| Vegetation Management | 8,742 | 7,571 | 8,742 | 7,571 |
| Customer Response | 8,541 | 19,824 | 8,541 | 19,824 |
| Reliability Maintenance | 9,059 | 7,043 | 9,059 | 7,043 |
| System Upgrade | 2,226 | 2,374 | 2,226 | 2,374 |
| Customer Service/Accounts | 29,008 | 27,611 | 29,008 | 27,611 |
| Others | 7,520 | 9,397 | 7,520 | 9,397 |
| **Total O&M Expenses** | **66,884** | **75,183** | **66,884** | **75,183** |

*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 | 20,783 | 23,643 | 20,783 | 23,643 |
| System Upgrade | 152,120 | 118,904 | 152,120 | 118,904 |
| Reliability & Maintenance | 103,112 | 99,678 | 103,112 | 99,678 |
| Customer Response | 2,020 | 18,893 | 2,020 | 18,893 |
| Other | 5,380 | 2,564 | 5,380 | 2,564 |
| **Total** | **283,415** | **263,681** | **283,415** | **263,681** |

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

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

During the first quarter of 2018, 162 corrective work orders were created with the following breakdown by priority.

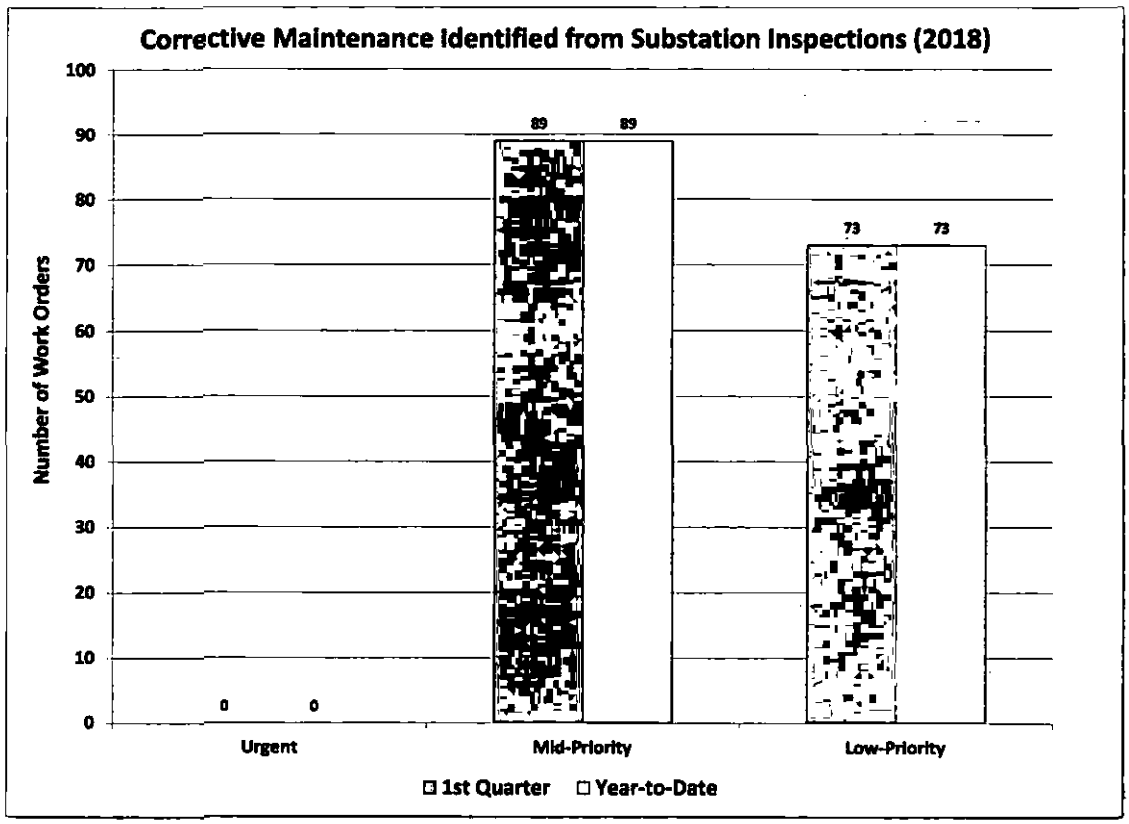



Figure 1: Corrective Maintenance Work Orders by Priority Level for first quarter and year-to-date 2018

## (b) The Amount Spent on Substation Inspections

During the first quarter of 2018, PPL Electric spent approximately $111,000 on substation inspections.

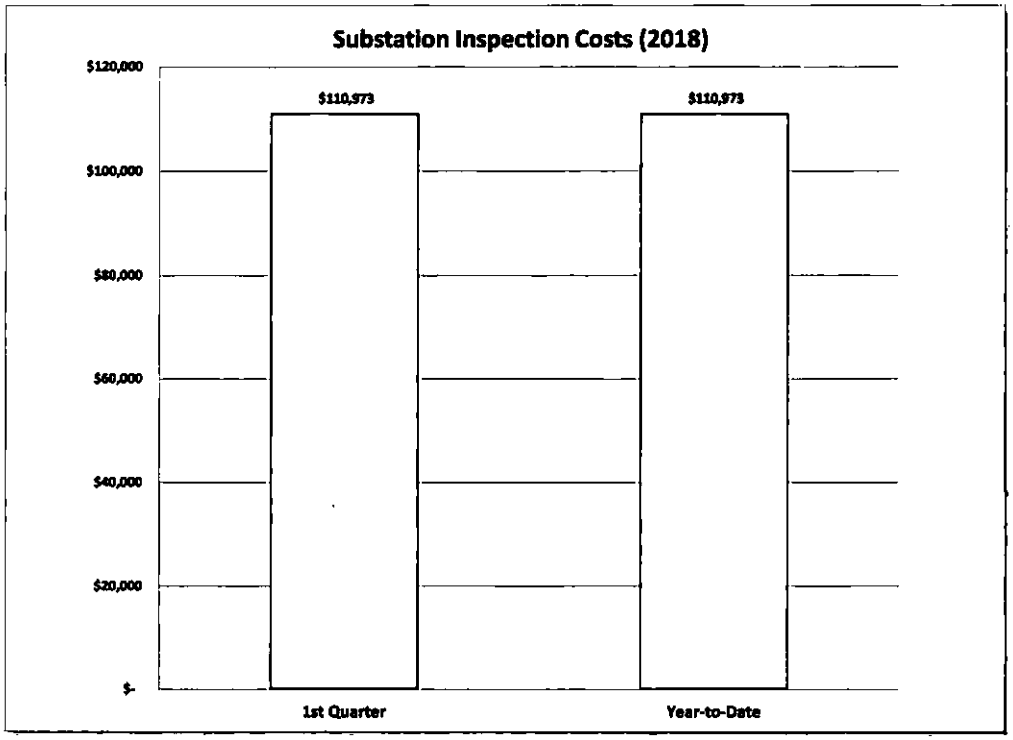



**Figure 2: Substation Inspection Costs for first quarter and year-to-date 2018.**

## (c) The Amount Spent on Vegetation Management

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

## (d) The Projected CMI Avoidance Due to Substation Inspections

The figure below shows the amount of CMI avoidance that PPL Electric has estimated for the first quarter and year-to-date. During first quarter of 2018, PPL Electric avoided a projected 493,000 CMI.

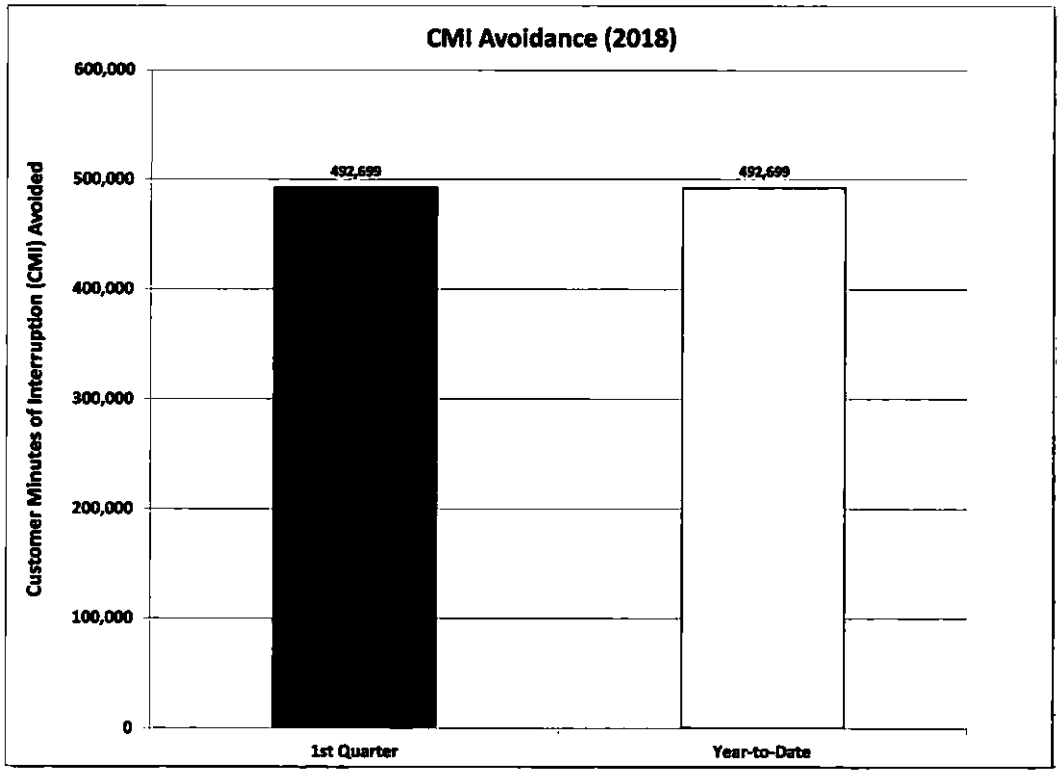



**Figure 3: CMI Avoidance Due to Inspections for first quarter and year-to-date 2018**

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

In the past three years, distribution substations have contributed a small amount toward the reliability metrics. During the first quarter of 2018, the Company interrupted about 1,142 customers for a total of approximately 17K CMI. The figures below show these results for the number of customers interrupted and CMI experienced, respectively.

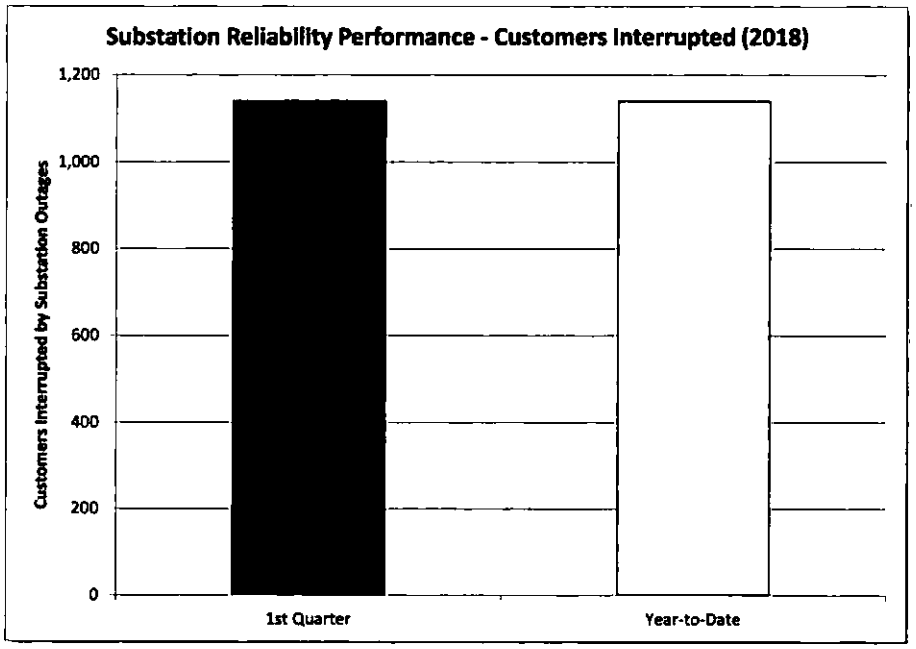



Figure 4: Substation Customers Interrupted for first quarter and year-to-date 2018

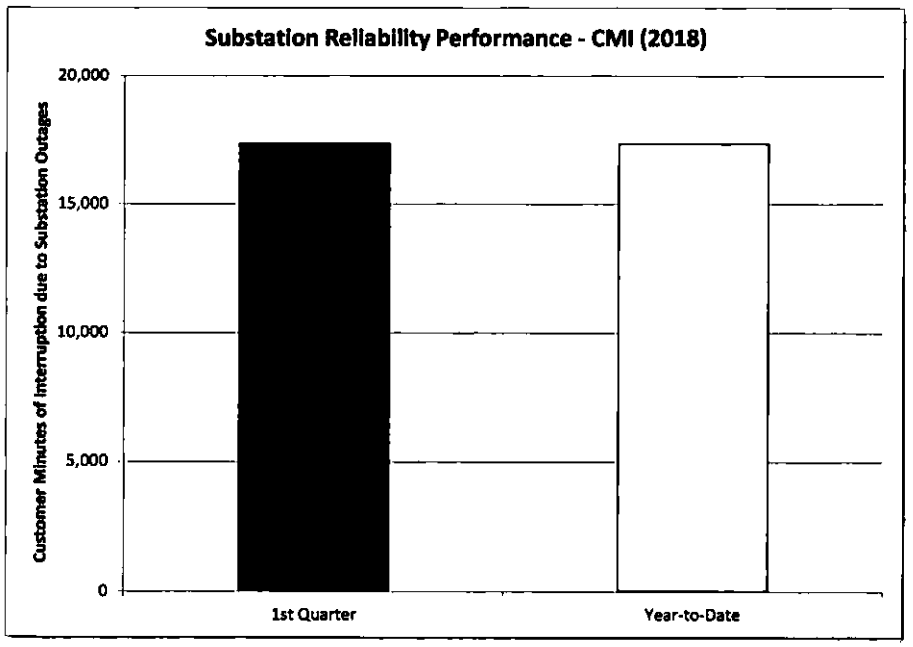



Figure 5: Substation Customer Minutes of Interruption for first quarter and year-to-date 2018

**(f) Substation SAIFI Contribution**

Overall, substation outages contributed less than 1% of the total SAIFI experienced by PPL Electric customers in the first quarter of 2018. Historically, PPL Electric has ranked in the first quartile for Substation SAIFI performance on the Southeastern Electric Exchange (SEE) Survey, and is on-track to maintain its ranking among other electric utilities.

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

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

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

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

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

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

| Transmission and Distribution(T&D) | |
|---|---|
| Lineman Leader | 60 |
| Journeyman Lineman | 210 |
| Journeyman Lineman-Trainee | 27 |
| Helper | 12 |
| Groundhand | 2 |
| Troubleman | 50 |
| **T&D Total** | **361** |
| Electrical | |
| Elect Leaders-UG | 2 |
| Elect Leaders-Net | 11 |
| Elect Leaders-Sub | 25 |
| Journeyman Elect-UG | 15 |
| Journeyman Elect-Net | 33 |
| Journeyman Elect-Sub | 60 |
| Journeyman Elect Trainee-UG | 0 |
| Journeyman Elect Trainee-Net | 0 |
| Journeyman Elect Trainee-Sub | 12 |
| Helper | 0 |
| Laborer-Network | 0 |
| Laborer-Substation | 0 |
| **Electrical Total** | 158 |
| | |
| **Overall Total** | 519 |

**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*

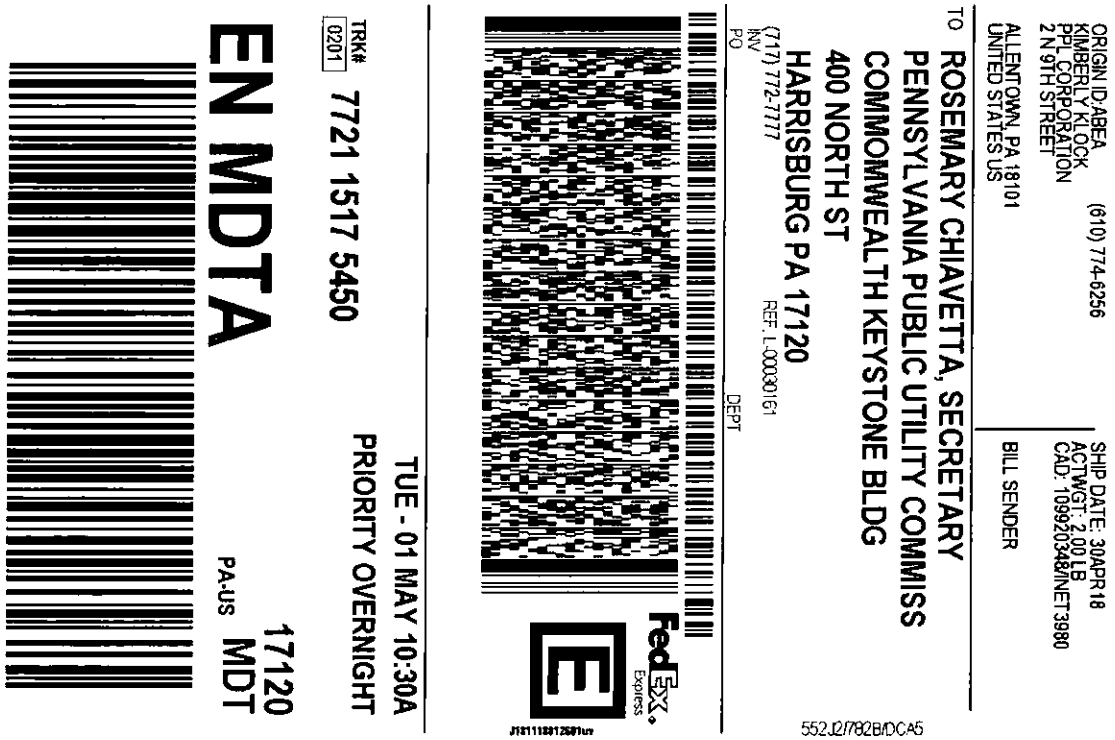
***Transmission and Distribution***

| | |
|---|---|
| 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.<br>• Engage in and perform work along with providing the necessary leadership, all-around knowledge, program, judgment, and experience to produce a quality job.<br>• 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<br>- Substation<br>- Network<br>- 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.<br>• Engage in and perform work along with providing the necessary leadership, all-around knowledge, program, judgment, and experience to produce a quality job.<br>• Performs all direct duties of the Journeyman Electrician when not acting as a leader. |
| Helper<br>- Substation<br>- Network<br>- 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<br>- Substation<br>- Network<br>- Underground | • Performs manual labor and assists employees in higher job classifications. |
| Journeyman Electrician<br>- Substation<br>- Network<br>- 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.<br>• Uses microprocessor based equipment for troubleshooting and revising relay logic and its control systems related to the field services electrical discipline. |

| | |
|---|---|
| Journeyman<br>Electrician - Trainee<br>- Substation<br>- Network<br>- 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.<br>• 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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