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**Shelby A. Linton-Keddie**
Manager, State Regulatory Strategy and Senior Legal Counsel
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June 29, 2018

**E-FILED**

Ms. Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
2nd Floor, Room-N201
400 North Street
Harrisburg, PA 17120

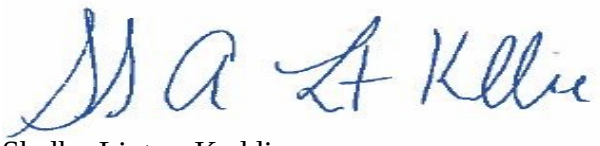
Re: **Duquesne Light Company 2015, 2016 and 2017 Annual Electric Reliability Report**
**Docket No. M-2016-2522508**

Dear Secretary Chiavetta:

Please find enclosed for filing Duquesne Light Company's 2015, 2016 and 2017 Annual Electric Reliability Reports reflecting updated metrics in sections (b)(3) and (b)(4).

If you have any questions regarding the information contained in this filing, please contact myself or Audrey Waldock at 412-393-6334 or awaldock@duqlight.com.

Sincerely,



Shelby Linton-Keddie
Manager, State Regulatory Strategy
And Senior Legal Counsel

Enclosure
c (w/ enc.):
Bureau of Technical Utility Services (dgill@pa.gov, dsearfoorc@pa.gov, dawashko@pa.gov)
Office of Consumer Advocate (TMcCloskey@paoca.org)
Office of Small Business Advocate (jorevan@pa.gov, swebb@pa.gov)

Duquesne Light
Our Energy…Your Power

# 2015 Annual Electric Reliability Report

# to the

# Pennsylvania Public Utility Commission

Duquesne Light Company
411 Seventh Avenue
Pittsburgh, PA 15219

April 28, 2016
*Update June 29, 2018*

**DUQUESNE LIGHT COMPANY**
**ANNUAL ELECTRIC RELIABILITY REPORT**

**Filed April 28, 2016**

**52 Pa Code §57.195 Reporting Requirements**

**(a)(2) The name, title, telephone number and e-mail address of the persons who have knowledge of the matters, and can respond to inquiries.**

Ken J. Kallis – Sr. Manager, Asset Management
(412) 393-8613, kkallis@duqlight.com

Shelby A. Linton-Keddie – Manager, State Regulatory Affairs and Sr. Legal Counsel
(412) 393-6231, slinton-keddie@duqlight.com

**(b)(1) An overall current assessment of the state of the system reliability in the electric distribution company's service territory including a discussion of the electric distribution company's current programs and procedures for providing reliable electric service.**

Duquesne Light Company's ("Duquesne Light" or "the Company") service territory covers approximately 817 square miles, with a well-developed distribution system throughout. Electric service reliability remains very consistent across the service territory. The combination of an effective outage restoration process and significant distribution automation allows the Company to quickly restore power to large numbers of customers in outage situations.

Achieving outstanding performance in system reliability continues to be one of Duquesne Light's most important long-term objectives. The Asset Management Group performs ongoing analysis of reliability indices, root cause analysis of outages, and tracking and monitoring of other performance measures. This is a long-term process to optimize reliability and to identify improvement opportunities. This includes making recommendations for capital projects such as circuit rehabilitation, new substations and distribution circuits. It also includes implementation of new advanced protection and coordination schemes on the distribution system that better localize customer outages and reduce momentary operations.

Duquesne Light continues its Emergent Work Process, which is used to identify problems, set priorities, and resolve reliability issues as quickly as possible. Each day, field personnel perform field inspections and any abnormalities are logged into a database. This database is reviewed regularly by the Emergent Work Team and any high priority problems are identified and a course of action is determined. Analysis at the device level is used to identify small areas where customers have experienced multiple outages. System level and even circuit level indices may mask these isolated

problems. This is the short-term process for real-time analysis and reliability improvement.

Scheduled preventative and predictive maintenance activities continue to reduce the potential for future service interruptions. Corrective maintenance is prioritized with the objective to reduce backlog in the most cost-efficient manner.

Several capital budget projects target distribution reliability improvements, including pole replacement, substation rehabilitation, circuit load relief and voltage improvement, URD rehabilitation, circuit rearrangement and installation of additional automated remotely controlled pole top devices.

Specific programs, procedures and ongoing maintenance activities that support Duquesne Light's commitment to service reliability include:

- An Infrared Inspection Program that systemically identifies circuit problems for remedial action in advance of failure.

- A Rights-of-Way Vegetation Management Maintenance Program with the goal of reducing tree and branch failures through proactive pruning and removal to manage proper clearances. Duquesne Light believes that this program will help to shorten the duration of outages by addressing targeted tree failure conditions that typically result in physical damage to our facilities.

- An all pulse-reclosing protection technology has been implemented on some 23kV circuits. This technology eliminates traditional "hard reclosing", thereby making it easier and faster to conduct repairs and restore circuits to normal operation, enabling customers to be restored more quickly. This technology also reduces stress and damage on the entire circuit since the breaker is no longer required to trip, also contributing to the reduction in momentary outages to customers.

- Line maintenance work of various types is regularly performed in order to maintain distribution plant. This work includes replacement of cross arms, arrestors, insulators, and other equipment on the overhead system as well as inspections and remedial work on the underground system.

- Storm Preparedness Training is conducted each year and Storm Review Meetings are held following major events. These meetings focus on the successes and failures of the most recent emergency service restoration effort. Service restoration process improvements are made as needed to improve response time and effectiveness during the next restoration effort.

**(b)(2) A description of each major event that occurred during the year being reported on, including the time and duration of the event, the number of customers affected, the cause of the event and any modified procedures adopted in order to avoid or minimize the impact of similar events in the future.**

No major events occurred during 2015.

**(b)(3) A table showing the actual values of each of the reliability indices (SAIFI, CAIDI, SAIDI, and if available, MAIFI) for the electric distribution company's service territory for each of the preceding 3 calendar years. The report shall include the data used in calculating the indices, namely the average number of customers served, the number of sustained customer minutes interruptions, the number of customers affected, and the minutes of interruption. If MAIFI values are provided, the number of customer momentary interruptions shall also be reported.**

**RELIABILITY BENCHMARKS AND STANDARDS**
**Duquesne Light Company**
**System Performance Measures with Major Events Excluded****

| | SAIDI | SAIFI | CAIDI | MAIFI |
|---|---|---|---|---|
| **2013** | 75 | 0.62 | 121 | * |
| **2014** | 63 | 0.62 | 102 | * |
| **2015** | 71 | 0.69 | 103 | * |
| **3 Year Average** | 70 | 0.64 | 109 | * |
| **Benchmark** | 126 | 1.17 | 108 | * |

* Sufficient information to calculate MAIFI is unavailable.

**Formulas Used in Calculating the Indices**

$$\text{SAIFI} = \frac{\text{(Total KVA interrupted) - (KVA impact of major events)}}{\text{System Connected KVA}}$$

$$\text{SAIDI} = \frac{\text{(Total KVA-minutes interrupted) - (KVA-minute impact of major events)}}{\text{System Connected KVA}}$$

**CAIDI = SAIDI/SAIFI**

**Data used in calculating the indices**

**2015**

| | | |
|---|---|---|
| Total KVA Interrupted for the Period | 4,962,496 | KVA |
| Total KVA-Minutes Interrupted | 510,091,766 | KVA Minutes |
| System Connected Load as of 12/31/15: | 7,203,346 | KVA |

**2014**

| | | |
|---|---|---|
| Total KVA Interrupted for the Period | 4,435,147 | KVA |
| Total KVA-Minutes Interrupted | 450,494,020 | KVA Minutes |
| System Connected Load as of 12/31/14: | 7,186,118 | KVA |

**2013**

| | | |
|---|---|---|
| Total KVA Interrupted for the Period (Excluding July 10, 2013 Major Event) | 4,432,987 | KVA |
| Total KVA-Minutes Interrupted (Excluding July 10, 2013 Major Event) | 536,328,687 | KVA-Minutes |
| System Connected Load as of 12/31/13: | 7,195,761 | KVA |

July 10, 2013 Major Event

(10% of System Load)
178,805,024 KVA-Minutes

**(b)(4) A breakdown and analysis of outage causes during the year being reported on, including the number and percentage of service outages 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.**

**January 1, 2015 through December 31, 2015 – No PUC Major Event Exclusions**

| CAUSE | NO. OF OUTAGES | OUTAGE PERCENTAGE | KVA TOTAL | KVA PERCENTAGE | KVA-MINUTE TOTAL | KVA-MINUTE PERCENTAGE |
|---|---|---|---|---|---|---|
| **Storms** | 291 | 10% | 614,246 | 12% | 82,017,113 | 16% |
| **Trees (Contact)** | 59 | 2% | 97,716 | 2% | 8,129,718 | 2% |
| **Trees (Falling)** | 698 | 25% | 1,168,309 | 24% | 162,078,574 | 32% |
| **Equipment Failures** | 836 | 30% | 1,653,653 | 33% | 158,051,996 | 31% |
| **Overloads** | 141 | 5% | 158,688 | 3% | 11,915,210 | 2% |
| **Vehicles** | 140 | 5% | 331,641 | 7% | 32,882,142 | 6% |
| **Other** | 610 | 22% | 938,243 | 19% | 55,017,013 | 11% |
| **TOTALS** | 2,775 | 99% | 4,962,496 | 100% | 510,091,766 | 100% |

**(b)(5) A list of remedial efforts taken to date and planned for circuits that have been on the worst performing 5% of circuits list for a year or more.**

Duquesne Light has 3 circuits that have been on the worst performing 5% of circuits list for four consecutive quarters. All of these circuits have received remedial action that is expected to improve their reliability in 2016. The Company will continue to monitor these circuits closely during 2016 to verify that the remedial actions taken have been successful and that reliability has improved. Many of the circuits have already shown improvement as indicated in the following detailed descriptions and have not seen a repeat outage for one or more quarters. Duquesne uses a sophisticated automated protection system on its 23kV circuits which utilize numerous 3-phase IntelliRupters, sectionalizers and reclosers on the main feeders and as ties to adjacent circuits. This automation technology with remote control generally allows circuit problems to be isolated and rerouted in less than 5 minutes. Only a small portion of the customers on a worst performing circuit generally experience reliability issues.

| Rank | Circuit | Name | Device | Remedial Actions Planned or Taken |
|---|---|---|---|---|
| 1 | 4478 | Hiawatha | Breaker | Six total outages:<br>• Five outages were due to a loss of supply; a cable failure, a tree fall-in, emergency safety steps, an unplanned operational outage and an unknown outage.<br>• One was due to cable failure.<br>Remedial Actions:<br>• The Company has installed an IntelliRupter on the overhead conductor side of the sub-transmission circuit feeding Hiawatha Substation to provide Auto Fault-Clearing functionality. This will lessen the impact of tree problems in this heavily wooded section of the circuit by automatically clearing tree faults and rerouting power to customers from the other side of the SS. The installation of the new IntelliRupter was completed at the end of the third quarterly of 2015.<br>• The company will continue to monitor this circuit for reliability issues. |

| Rank | Circuit | Name | Device | Remedial Actions Planned or Taken |
|---|---|---|---|---|
| 2 | 23710 | Pine Creek | R140 & WA913 | Four total outages on each device:<br>• R140 - Two outages were due to tree fall-ins.<br>• R140 - Two outages were due to a storm.<br>• WA913 - Four outages due to trees<br>Remedial Actions:<br>• Trees were mitigated during outage restoration.<br>• The Company will continue to monitor this circuit for reliability issues. |
| 3 | 23770 | Traverse Run | WR505 | Three total outages:<br>• Two outages were due to insulator failure.<br>• One outage was due to a transformer failure and an insulator failure.<br>Remedial Actions:<br>• Permanent repairs were made following each outage.<br>• The Company will continue to monitor this circuit for reliability issues. |

**(b)(6) A comparison of established transmission and distribution inspection and maintenance goals/objectives versus actual results achieved during the year being reported on. Explanations of any variances shall be included.**

**2015 Transmission and Distribution Goals and Objectives**

| **Program** Project | **Unit of Measurement** | **Target for 2015** | **YTD Actuals for 2015** | **Percent Complete** |
|---|---|---|---|---|
| **Communications Goals** | | | | |
| Communication Battery Maintenance | Batteries | 96 | 96 | 100% |
| **Overhead Distribution Goals** | | | | |
| Recloser Inspections | Circuits | 130 | 130 | 100% |
| Pole Inspections | Poles | 17,945 | 18,150 | 101% |
| OH Line Inspections | Circuits | 130 | 130 | 100% |
| OH Transformer Inspections | Circuits | 130 | 130 | 100% |
| Padmount & Below Grade Insp | Circuits | 81 | 81 | 100% |
| **Overhead Transmission Goals** | | | | |
| Helicopter Inspections | Number of Structures | 500 | 500 | 100% |
| Ground Inspections | Number of Structures | 350 | 358 | 102% |
| **Substations Goals** | | | | |
| Circuit Breaker Maintenance | Breakers | 725 | 806 | 111% |
| Station Transformer Maintenance | Transformers | 67 | 97 | 145% |
| Station Battery Maintenance | Batteries | 968 | 970 | 100% |
| Station Relay Maintenance | Relays | 615 | 876 | 142% |
| Station Inspections | Sites* | 2,067 | 2,056 | 99% |
| **Underground Distribution Goals** | | | | |
| Manhole Inspections | Manholes | 700 | 811 | 116% |
| Major Network Insp (Prot Relay) | Ntwk Protectors | 92 | 92 | 100% |
| Minor Network Visual Inspection (Transformer/Protector/Vault) | Ntwk Transformers | 573 | 573 | 100% |
| **Underground Transmission Goals** | | | | |
| Pressurization and Cathodic Protection Plant Inspection | Work Packages | 52 | 59 | 113% |
| **Vegetation Management Goals** | | | | |
| Overhead Line Clearance | Circuit Overhead Miles | 1,300 | 1,308 | 101% |

*Duquesne Light's goal for Substation Inspections was 2,067 inspections. The Company removed three stations in 2015 as follows: Morningside in May (7 inspections) and Allison Park in August (4 inspections). Consequently, the actual Substation Inspections goal for 2015 to be performed were reduced to 2,056.

**(b)(7) A comparison of budgeted versus actual transmission and distribution operation and maintenance expenses for the year being reported on. Explanations of any variances shall be included.**

**Budget Variance Recap – O&M Expenses**
**For the Twelve Months Ending December 31, 2015**
**Favorable/(Unfavorable)**

| | Total Actual | Total Budget | Variance |
|---|---|---|---|
| **Customer Care** | 56,633,138 | 52,303,055 | (4,330,082) |
| **Human Resources** | 15,562,339 | 15,050,967 | (511,372) |
| **Operations/Operation Services** | 66,864,785 | 71,346,012 | 4,481,227 |
| **Technology** | 54,612,785 | 45,163,838 | (9,448,946) |
| **General Corporate*** | 50,751,977 | 50,094,723 | (657,254) |
| **Total** | 244,425,023 | 233,958,595 | (10,466,428) |

* Includes Finance, Office of General Counsel and Senior Management Costs

The O&M expense overspend for the twelve months ended December 31, 2015 is attributable to increases in bad debt expense (Customer Care), hardware and software maintenance agreements (Technology) and all costs related to the newly formed project management office (Technology) in comparison to the budget. The aforementioned overspend was offset by favorability in Operations/Operation Services due to vacancies and professional service costs.

**(b)(8) A comparison of budgeted versus actual transmission and distribution capital expenditures for the year being reported on. Explanations of any variances shall be included.**

**Budget Variance Recap – Capital**
**For the Twelve Months Ending December 31, 2015**
**Favorable/(Unfavorable)**

| | Total Actual | Total Budget | Variance |
|---|---|---|---|
| **Customer Care** | 3,003,486 | 3,540,919 | 537,433 |
| **Human Resources** | 10,630,116 | 12,994,568 | 2,364,452 |
| **Operations/Operation Services** | 127,513,348 | 170,686,481 | 43,173,133 |
| **Technology** | 99,890,928 | 68,812,160 | (31,078,768) |
| **General Corporate*** | 31,296,573 | 30,309,834 | (986,739) |
| **Total** | 272,334,451 | 286,343,962 | 14,009,511 |

* Includes Finance, Office of General Counsel and Senior Management Costs

The capital underspend for the twelve months ended December 31, 2015 is attributable to lower storm restoration spending than budgeted and the timing of various projects. Significant material delays for a major capital project are the single largest driver to the capital underspend in Operations/Operation Services. This is offset by overspend in Technology related to CCI, Smart Meter and timing of other various projects.

**(b)(9) Quantified transmission and distribution inspection and maintenance goals/objectives for the current calendar year detailed by system area (i.e., transmission, substation, and distribution).**

**2016 Transmission and Distribution Goals and Objectives**

| **Program** Project | **Unit of Measurement** | **Target for Year 2016** |
|---|---|---|
| **Communications Goals** | | |
| Communication Battery Maintenance | Batteries | 96 |
| **Overhead Distribution Goals** | | |
| Recloser Inspections | Circuits | 130 |
| Pole Inspections | Poles | 17,945 |
| OH Line Inspections | Circuits | 130 |
| OH Transformer Inspections | Circuits | 130 |
| Padmount & Below Grade Insp | Circuits | 80 |
| **Overhead Transmission Goals** | | |
| Helicopter Inspections | Number of Structures | 500 |
| Ground Inspections | Number of Structures | 367 |
| **Substations Goals** | | |
| Circuit Breaker Maintenance | Breakers | 585 |
| Station Transformer Maintenance | Transformers | 84 |
| Station Battery Maintenance | Batteries | 940 |
| Station Relay Maintenance | Relays | 2,081 |
| Station Inspections | Sites | 2,040 |
| **Underground Distribution Goals** | | |
| Manhole Inspections | Manholes | 700 |
| Major Network Insp (Prot Relay) | Network Protectors | 92 |
| Minor Network Visual Inspection (Transformer/Protector/Vault) | Network Transformers | 573 |
| **Underground Transmission Goals** | | |
| Pressurization and Cathodic Protection Plant Inspection | Work Packages | 52 |
| **Vegetation Management Goals** | | |
| Overhead Line Clearance | Circuit Overhead Miles | 1,300 |

**(b)(10) Budgeted transmission and distribution operation and maintenance expenses for the current year in total and detailed by FERC account.**

| | **Total Budget** |
|---|---|
| Customer Care | $51,839,566 |
| Human Resources | 16,793,022 |
| Operations/ Operation Services | 70,938,773 |
| Technology | 60,027,967 |
| General Corporate* | $41,940,525 |
| Total | **$241,539,853** |

*Includes Finance, Supply Chain, Office of General Counsel and Senior Management Costs

**(b)(11) Budgeted transmission and distribution capital expenditures for the current year in total and detailed by FERC account.**

| | **Total Budget** |
|---|---|
| Customer Care | $2,865,991 |
| Human Resources | 11,669,755 |
| Operations/ Operation Services | 145,231,034 |
| Technology | 70,571,452 |
| General Corporate* | $20,107,287 |
| Total | **$250,445,519** |

*Includes Finance, Supply Chain, Office of General Counsel and Senior Management Costs

**(b)(12) Significant changes, if any, to the transmission and distribution inspection and maintenance programs previously submitted to the Commission.**

Duquesne Light has not made any significant changes to its transmission and distribution inspection and maintenance programs.


# 2016 Annual Electric Reliability Report to the

# Pennsylvania Public Utility Commission

Duquesne Light Company
411 Seventh Avenue
Pittsburgh, PA 15219

April 27, 2017
*Updated June 29, 2018*

# DUQUESNE LIGHT COMPANY
# ANNUAL ELECTRIC RELIABILITY REPORT

## Filed April 28, 2017

**52 Pa Code §57.195 Reporting Requirements**

**(a)(2) The name, title, telephone number and e-mail address of the persons who have knowledge of the matters, and can respond to inquiries.**

Ken J. Kallis – Sr. Manager, Asset Management
(412) 393-8613, kkallis@duqlight.com

Shelby A. Linton-Keddie – Manager, State Regulatory Affairs and Sr. Legal Counsel
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**(b)(1) An overall current assessment of the state of the system reliability in the electric distribution company's service territory including a discussion of the electric distribution company's current programs and procedures for providing reliable electric service.**

Duquesne Light Company's ("Duquesne Light" or "the Company") service territory covers approximately 817 square miles, with a well-developed distribution system throughout. Electric service reliability remains very consistent across the service territory. The combination of an effective outage restoration process and significant distribution automation allows the Company to quickly restore power to large numbers of customers in outage situations.

Achieving outstanding performance in system reliability continues to be one of Duquesne Light's most important long-term objectives. The Asset Management Group performs ongoing analysis of reliability indices, root cause analysis of outages, and tracking and monitoring of other performance measures. This is a long-term process designed to optimize reliability and to identify improvement opportunities. This includes making recommendations for capital projects such as circuit rehabilitation, new substations and distribution circuits. It also includes implementation of new advanced protection and coordination schemes on the distribution system that better localize customer outages and reduce momentary operations.

Duquesne Light continues its Emergent Work Process, which is used to identify problems, set priorities, and resolve reliability issues as quickly as possible. Each day, field personnel perform field inspections and any abnormalities are logged into a database. This database is reviewed regularly by the Emergent Work Team and any high priority problems are identified and a course of action is determined. Analysis at the device level is used to identify small areas where customers have experienced multiple outages. System level and even circuit level indices may mask these isolated problems. This is the short-term process for real-time analysis and reliability improvement.

Scheduled preventative and predictive maintenance activities continue to reduce the potential for future service interruptions. Corrective maintenance is prioritized with the objective to reduce backlog in the most cost-efficient manner.

Several capital budget projects target distribution reliability improvements, including pole replacement, substation rehabilitation, circuit load relief and voltage improvement, URD rehabilitation, circuit rearrangement and installation of additional automated remotely controlled pole top devices.

Specific programs, procedures and ongoing maintenance activities that support Duquesne Light's commitment to service reliability include:

- An Infrared Inspection Program that systemically identifies circuit problems for remedial action in advance of failure.

- A Rights-of-Way Vegetation Management Maintenance Program with the goal of reducing tree and branch failures through proactive pruning and removal to manage proper clearances. Duquesne Light believes that this program will help to shorten the duration of outages by addressing targeted tree failure conditions that typically result in physical damage to our facilities.

- An all pulse-reclosing protection technology has been implemented on some 23kV circuits. This technology eliminates traditional "hard reclosing", thereby making it easier and faster to conduct repairs and restore circuits to normal operation, enabling customers to be restored more quickly. This technology also reduces stress and damage on the entire circuit since the breaker is no longer required to trip, also contributing to the reduction in momentary outages to customers.

- Line maintenance work of various types is regularly performed in order to maintain distribution plant. This work includes replacement of cross arms, arrestors, insulators, and other equipment on the overhead system as well as inspections and remedial work on the underground system.

- Storm Preparedness Training is conducted each year and Storm Review Meetings are held following major events. These meetings focus on the successes and failures of the most recent emergency service restoration effort. Service restoration process improvements are made as needed to improve response time and effectiveness during the next restoration effort.

On April 20, 2017, the Commission adopted the Recommended Decision[1] approving the Company's amended LTIIP/DSIC and the Company has begun its accelerated infrastructure program.

[1] Petition of Duquesne Light Company for Approval of Its Long-Term Infrastructure Improvement Plan for period January 1, 2017 through December 31, 2022, Docket No. P-2016-2540046

**(b)(2) A description of each major event that occurred during the year being reported on, including the time and duration of the event, the number of customers affected, the cause of the event and any modified procedures adopted in order to avoid or minimize the impact of similar events in the future.**

No major events occurred during 2016.

**(b)(3) A table showing the actual values of each of the reliability indices (SAIFI, CAIDI, SAIDI, and if available, MAIFI) for the electric distribution company's service territory for each of the preceding 3 calendar years. The report shall include the data used in calculating the indices, namely the average number of customers served, the number of sustained customer minutes interruptions, the number of customers affected, and the minutes of interruption. If MAIFI values are provided, the number of customer momentary interruptions shall also be reported.**

**RELIABILITY BENCHMARKS AND STANDARDS**
**Duquesne Light Company**
**System Performance Measures with Major Events Excluded**

| | SAIDI | SAIFI | CAIDI | MAIFI |
|---|---|---|---|---|
| **2014** | 63 | 0.62 | 102 | * |
| **2015** | 71 | 0.69 | 103 | * |
| **2016** | 69 | 0.69 | 100 | * |
| **3 Year Average** | 68 | 0.67 | 102 | * |
| **Benchmark** | 126 | 1.17 | 108 | * |

***** Sufficient information to calculate MAIFI is unavailable.

Formulas Used in Calculating the Indices

$$SAIFI = \frac{\text{(Total KVA interrupted) - (KVA impact of major events)}}{\text{System Connected KVA}}$$

$$SAIDI = \frac{\text{(Total KVA-minutes interrupted) - (KVA-minute impact of major events)}}{\text{System Connected KVA}}$$

$$CAIDI = SAIDI/SAIFI$$

**Data used in calculating the indices**

**2016**

| | | |
|---|---|---|
| Total KVA Interrupted for the Period | 4,979,083 | KVA |
| Total KVA-Minutes Interrupted | 497,296,442 | KVA Minutes |
| System Connected Load as of 12/31/16: | 7,210,354 | KVA |

**2015**

| | | |
|---|---|---|
| Total KVA Interrupted for the Period | 4,962,496 | KVA |
| Total KVA-Minutes Interrupted | 510,091,766 | KVA Minutes |
| System Connected Load as of 12/31/15: | 7,203,346 | KVA |

**2014**

| | | |
|---|---|---|
| Total KVA Interrupted for the Period | 4,435,147 | KVA |
| Total KVA-Minutes Interrupted | 450,494,020 | KVA Minutes |
| System Connected Load as of 12/31/14: | 7,186,118 | KVA |

**(b)(4) A breakdown and analysis of outage causes during the year being reported on, including the number and percentage of service outages 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.**

**January 1, 2016 through December 31, 2016 – No PUC Major Event Exclusions**

| CAUSE | NO. OF OUTAGES | OUTAGE PERCENTAGE | KVA TOTAL | KVA PERCENTAGE | KVA-MINUTE TOTAL | KVA-MINUTE PERCENTAGE |
|---|---|---|---|---|---|---|
| **Storms** | 491 | 17% | 1,006,836 | 20% | 135,594,820 | 27% |
| **Trees (Contact)** | 28 | 1% | 6,082 | 0% | 648,798 | 0% |
| **Trees (Falling)** | 670 | 24% | 1,038,668 | 21% | 115,433,413 | 23% |
| **Equipment Failures** | 729 | 26% | 1,527,891 | 31% | 125,950,645 | 25% |
| **Overloads** | 68 | 2% | 37,171 | 1% | 2,579,611 | 1% |
| **Vehicles** | 191 | 7% | 443,562 | 9% | 49,774,645 | 10% |
| **Other** | 657 | 23% | 918,873 | 18% | 67,314,510 | 14% |
| **TOTALS** | **2,834** | **100%** | **4,979,083** | **100%** | **497,296,442** | **100%** |

**(b)(5) A list of remedial efforts taken to date and planned for circuits that have been on the worst performing 5% of circuits list for a year or more.**

Duquesne Light has 5 circuits that have been on the worst performing 5% of circuits list for four consecutive quarters. All of these circuits have received remedial actions or are scheduled for maintenance activities in 2017 that are expected to improve their reliability in 2017. The Company will continue to monitor these circuits closely during 2017 to verify that the remedial actions taken have been successful and that reliability has improved. Many of the circuits have already shown improvement as indicated in the following detailed descriptions and have not seen a repeat outage for one or more quarters.

Duquesne uses a sophisticated automated protection system on its 23kV circuits, which utilizes numerous 3-phase IntelliRupters, sectionalizers and reclosers on the main feeders and as ties to adjacent circuits. This automation technology with remote control generally allows circuit problems to be isolated and rerouted in less than 5 minutes. Generally, only a small portion of the customers on a worst performing circuit experience reliability issues.

| Rank, Circuit Name, Device | Outages | Remedial Actions Planned or Taken |
|---|---|---|
| 1<br><br>Midland-Cooks Ferry<br>22869<br><br>FUSE-65K | Seven Total Outages:<br>Fourth Quarter 2016 Outages:<br>• One outage was due to cutout failure.<br>• One outage was due to insulator failure.<br>• The cause of five outages are unknown.<br>Previous Outages:<br>• No outages. | • Permanent repairs were made following each outage as necessary.<br>• Routine vegetation maintenance was last performed in 2012 and is scheduled for 2017.<br>• The Company will continue to monitor this circuit for reliability issues. |
| 2<br><br>Sewickley<br>23631<br><br>WR723 | Four Total Outages:<br>Fourth Quarter 2016 Outages:<br>• Two outages were due to tree fall-ins.<br>• One outage was due to cutout failure.<br>Previous Outages:<br>• One outage was due to tree fall-in. | • Permanent repairs were made following each outage as necessary.<br>• The Company's Asset Management Department is going to replace the last Scadamate sectionalizer with an IntelliRupter recloser, which will improve its protection and reduce future circuit damage during faults making restoration simpler and faster. The installation of the new IntelliRupter will be completed at the end of the third quarter of 2017.<br>• Routine vegetation maintenance was last performed in 2013 and is scheduled for 2017. |

| | | |
|---|---|---|
| 3<br><br>Sewickley<br>23630<br><br>WA601 | Three Total Outages:<br><br>Fourth Quarter 2016 Outages:<br><br>• One outage was due to tree fall-in.<br><br>Previous Outages:<br><br>• Two outages were due to tree fall-ins. | • Permanent repairs were made following each outage as necessary.<br>• The Company's Asset Management Department recently converted this circuit to pulse-reclosing operation and is going to replace the Scadamate sectionalizer with IntelliRupter recloser, which should improve its protection and reduce future circuit damage during faults making restoration simpler and faster. The installation of the new IntelliRupter will be completed at the end of the second quarter of 2017.<br>• Routine vegetation maintenance was last performed 2013 and is scheduled for 2017. |
| 4<br><br>Mt. Nebo<br>23870<br><br>FUSE-80E | Three Total Outages:<br><br>Fourth Quarter 2016 Outages:<br><br>• The cause of one outage was unknown.<br><br>Previous Outages:<br><br>• Two outages were due to tree fall-ins. | • Permanent repairs were made following each outage as necessary.<br>• The Company's Asset Management Department is going to replace three Scadamate sectionalizers with three IntelliRupter reclosers, which will improve its protection and reduce future circuit damage during faults making restoration simpler and faster. The installation of the new IntelliRupter will be completed at the end of the third quarter of 2017.<br>• Routine vegetation maintenance was last performed in 2014 and is scheduled for 2017. |
| 5<br><br>Arsenal<br>23840<br><br>FUSE-80E | Two Total Outages:<br><br>Fourth Quarter 2016 Outages:<br><br>• No outages.<br><br>Previous Outages:<br><br>• The cause of one outage was unknown.<br>• One outage was due to tree fall-in during a storm. | • Permanent repairs were made following each outage as necessary.<br>• The Company will continue to monitor this circuit for reliability issues. |

**(b)(6) A comparison of established transmission and distribution inspection and maintenance goals/objectives versus actual results achieved during the year being reported on. Explanations of any variances shall be included.**

**2016 Transmission and Distribution Goals and Objectives**

| **Program** Project | **Unit of Measurement** | **Target for 2016** | **YTD Actuals for 2016** | **Percent Complete** |
|---|---|---|---|---|
| **Communications Goals** | | | | |
| Communication Battery Maintenance | Batteries[2] | 96 | 123 | 128% |
| **Overhead Distribution Goals** | | | | |
| Recloser Inspections | Circuits | 130 | 132 | 102% |
| Pole Inspections | Poles | 17,945 | 19,141 | 107% |
| OH Line Inspections | Circuits | 130 | 132 | 102% |
| OH Transformer Inspections | Circuits | 130 | 132 | 102% |
| Padmount & Below Grade Insp | Circuits | 80 | 80 | 100% |
| **Overhead Transmission Goals** | | | | |
| Helicopter Inspections[3] | Number of Structures | 500 | 626 | 125% |
| Ground Inspections | Number of Structures | 367 | 368 | 100% |
| **Substations Goals** | | | | |
| Circuit Breaker Maintenance | Breakers | 585 | 601 | 103% |
| Station Transformer Maintenance[4] | Transformers | 84 | 130 | 155% |
| Station Battery Maintenance | Batteries | 940 | 966 | 103% |
| Station Relay Maintenance | Relays | 2,081 | 2,173 | 104% |
| Station Inspections | Sites | 2,040 | 2,042 | 100% |
| **Underground Distribution Goals** | | | | |
| Manhole Inspections | Manholes | 700 | 706 | 101% |
| Major Network Insp (Prot Relay) | Ntwk Protectors | 92 | 94 | 102% |
| Minor Network Visual Inspection (Transformer/Protector/Vault)[3] | Ntwk Transformers | 573 | 640 | 112% |
| **Underground Transmission Goals** | | | | |
| Pressurization and Cathodic Protection Plant Inspection[5] | Work Packages | 52 | 64 | 123% |
| **Vegetation Management Goals** | | | | |
| Overhead Line Clearance | Circuit Overhead Miles | 1,300 | 1,307 | 101% |

[2] The actuals reported in 2016 reflect batteries that were in business offices and not in the scope of the maintenance and inspection plan.

[3] The target for helicopter inspections and network transformers is based on the entire system. Once the circuits and transformers to be inspected are identified the actual work performed may result in more units being inspected.

[4] The Company outperformed its planned 2016 maintenance and inspection goals for substation transformer maintenance as a result of opportunities to perform these planned tasks during a combination of emergent work, corrective repair, and confined space/vault safety checks. The Company's opportunistic strategy improves workforce utilization by reducing scheduled outages, work station set up and travel time.

[5] During 2016, the Company transitioned from tracking this inspection as a "work package" to a "work order" system, which accounts for the variance.

**(b)(7) A comparison of budgeted versus actual transmission and distribution operation and maintenance expenses for the year being reported on. Explanations of any variances shall be included.**

**Budget Variance Recap – O&M Expenses**
**For the Twelve Months Ending December 31, 2016**
**Favorable/(Unfavorable)**

| | Total Actual | Total Budget | Variance |
|---|---|---|---|
| **Customer Service[6]** | 60,290,202 | 52,500,875 | (7,789,327) |
| **Human Resources** | 15,280,790 | 15,584,747 | 303,956 |
| **Operations/Operation Services** | 64,759,085 | 66,039,896 | 1,280,811 |
| **Technology** | 48,185,327 | 57,401,689 | 9,216,362 |
| **General Corporate*** | 57,346,847 | 50,012,651 | (7,334,197) |
| **Total** | 245,862,253 | 241,539,858 | (4,322,395) |

* Includes Finance, Office of General Counsel and Senior Management Costs

The O&M expense overspend for the twelve months ended December 31, 2016 is attributable to increases in bad debt expense and increased costs associated with customer service system optimization projects (Customer Service), increased hardware and software maintenance agreements offset by favorability within surcharge expenses (Technology) and increased maintenance and compliance costs associated with Duquesne Light Company's closed Warwick Mine facilities.

**(b)(8) A comparison of budgeted versus actual transmission and distribution capital expenditures for the year being reported on. Explanations of any variances shall be included.**

**Budget Variance Recap – Capital**
**For the Twelve Months Ending December 31, 2016**
**Favorable/(Unfavorable)**

| | Total Actual | Total Budget | Variance |
|---|---|---|---|
| **Customer Service** | 6,378,143 | 6,652,143 | 274,000 |
| **Human Resources** | 11,021,486 | 11,669,755 | 648,269 |
| **Operations/Operation Services** | 136,338,522 | 141,444,881 | 5,106,359 |
| **Technology** | 75,570,610 | 70,571,452 | (4,999,158) |
| **General Corporate*** | 26,448,210 | 20,107,287 | (6,340,923) |
| **Total** | 255,756,971 | 250,445,518 | (5,311,453) |

* Includes Finance, Office of General Counsel and Senior Management Costs

The capital overspend for the twelve months ended December 31, 2016 is primarily attributable to the timing of the Company's spend on incentivized transmission projects partially offset by lower than historical restoration costs.

[6] Customer Care changed to Customer Service as part of an organizational change, the cost centers remain the same.

**(b)(9) Quantified transmission and distribution inspection and maintenance goals/objectives for the current calendar year detailed by system area (i.e., transmission, substation, and distribution).**

**2017 Transmission and Distribution Goals and Objectives**

| **Program**<br>Project | **Unit of Measurement** | **Target for Year 2017** |
|---|---|---|
| **Communications Goals** | | |
| Communication Battery Maintenance | Batteries | 100 |
| **Overhead Distribution Goals** | | |
| Recloser Inspections | Circuits | 130 |
| Pole Inspections | Poles | 17,945 |
| OH Line Inspections | Circuits | 130 |
| OH Transformer Inspections | Circuits | 130 |
| Padmount & Below Grade Insp | Circuits | 81 |
| **Overhead Transmission Goals** | | |
| Helicopter Inspections | Number of Structures | 625 |
| Ground Inspections | Number of Structures | 336 |
| **Substations Goals** | | |
| Circuit Breaker Maintenance | Breakers | 501 |
| Station Transformer Maintenance | Transformers | 78 |
| Station Battery Maintenance | Batteries | 936 |
| Station Relay Maintenance | Relays | 1,580 |
| Station Inspections | Sites | 2,040 |
| **Underground Distribution Goals** | | |
| Manhole Inspections | Manholes | 700 |
| Major Network Insp (Prot Relay) | Network Protectors | 92 |
| Minor Network Visual Inspection (Transformer/Protector/Vault) | Network Transformers | 562 |
| **Underground Transmission Goals** | | |
| Pressurization and Cathodic Protection Plant Inspection | Work Order | 371 |
| **Vegetation Management Goals** | | |
| Overhead Line Clearance | Circuit Overhead Miles | 1,300 |

**(b)(10) Budgeted transmission and distribution operation and maintenance expenses for the current year in total and detailed by FERC account.**

| | Total Budget |
|---|---|
| Customer Service | $ 55,816,676 |
| Human Resources | 16,335,411 |
| Operations/ Operation Services | 64,737,900 |
| Technology | 48,834,711 |
| General Corporate* | $ 53,897,359 |
| Total | $ 239,622,058 |

*Includes Finance, Supply Chain, Office of General Counsel and Senior Management Costs

**(b)(11) Budgeted transmission and distribution capital expenditures for the current year in total and detailed by FERC account.**

| | Total Budget |
|---|---|
| Customer Service | $ 8,192,738 |
| Human Resources | 10,897,845 |
| Operations/ Operation Services | 149,606,229 |
| Technology | 83,432,478 |
| General Corporate* | $ 20,405,771 |
| Total | $ 272,535,061 |

*Includes Finance, Supply Chain, Office of General Counsel and Senior Management Costs

**(b)(12) Significant changes, if any, to the transmission and distribution inspection and maintenance programs previously submitted to the Commission.**

Duquesne Light has not made any significant changes to its transmission and distribution inspection and maintenance programs.


# 2017 Annual Electric Reliability Report

# to the

# Pennsylvania Public Utility Commission

Duquesne Light Company
411 Seventh Avenue
Pittsburgh, PA 15219

April 30, 2018
*Updated June 29, 2018*

# DUQUESNE LIGHT COMPANY
# ANNUAL ELECTRIC RELIABILITY REPORT

## Filed April 30, 2018

**52 Pa Code §57.195 Reporting Requirements**

**(a)(2) The name, title, telephone number and e-mail address of the persons who have knowledge of the matters, and can respond to inquiries.**

Matthew G. Bucek – General Manager, Asset Management
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Shelby A. Linton-Keddie – Manager, State Regulatory Strategy and Sr. Legal Counsel
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**(b)(1) An overall current assessment of the state of the system reliability in the electric distribution company's service territory including a discussion of the electric distribution company's current programs and procedures for providing reliable electric service.**

Duquesne Light Company's ("Duquesne Light" or "the Company") service territory covers approximately 817 square miles, with a well-developed distribution system throughout. Electric service reliability remains very consistent across the service territory. The combination of an effective outage restoration process and significant distribution automation allows the Company to quickly restore power to large numbers of customers in outage situations.

Achieving outstanding performance in system reliability continues to be one of Duquesne Light's most important long-term objectives. The Asset Management Group performs ongoing analysis of reliability indices, root cause analysis of outages, and tracking and monitoring of other performance measures. This is a long-term process designed to optimize reliability and to identify improvement opportunities. This includes making recommendations for capital projects such as circuit rehabilitation, new substations and distribution circuits. It also includes implementation of new advanced protection and coordination schemes on the distribution system that better localize customer outages and reduce momentary operations.

Duquesne Light continues its Emergent Work Process, which is used to identify problems, set priorities, and resolve reliability issues as quickly as possible. Each day, field personnel perform field inspections and any abnormalities are logged into a database. This database is reviewed regularly by the Emergent Work Team and any high priority problems are identified and a course of action is determined. Analysis at the device level is used to identify small areas where customers have experienced multiple outages. System level and even circuit level indices may mask these isolated problems. This is the short-term process for real-time analysis and reliability improvement.

Scheduled preventative and predictive maintenance activities continue to reduce the potential for future service interruptions. Corrective maintenance is prioritized with the objective to reduce backlog in the most cost-efficient manner.

Several capital budget projects target distribution reliability improvements, including pole replacement, substation rehabilitation, circuit load relief and voltage improvement, URD

rehabilitation, circuit rearrangement and installation of additional automated remotely controlled pole top devices.

Specific programs, procedures and ongoing maintenance activities that support Duquesne Light's commitment to service reliability include:

- An Infrared Inspection Program that systemically identifies circuit problems for remedial action in advance of failure.

- A Rights-of-Way Vegetation Management Maintenance Program with the goal of reducing tree and branch failures through proactive pruning and removal to manage proper clearances. Duquesne Light believes that this program will help to shorten the duration of outages by addressing targeted tree failure conditions that typically result in physical damage to our facilities.

- An all pulse-reclosing protection technology has been implemented on some 23kV circuits. This technology eliminates traditional "hard reclosing", thereby making it easier and faster to conduct repairs and restore circuits to normal operation, enabling customers to be restored more quickly. This technology also reduces stress and damage on the entire circuit since the breaker is no longer required to trip, also contributing to the reduction in momentary outages to customers.

- Line maintenance work of various types is regularly performed in order to maintain distribution plant. This work includes replacement of cross arms, arrestors, insulators, and other equipment on the overhead system as well as inspections and remedial work on the underground system.

- Storm Preparedness Training is conducted each year and Storm Review Meetings are held following major events. These meetings focus on the successes and failures of the most recent emergency service restoration effort. Service restoration process improvements are made as needed to improve response time and effectiveness during the next restoration effort.

On April 20, 2017, the Commission adopted the Recommended Decision[1] approving the Company's amended LTIIP/DSIC and the Company has begun its accelerated infrastructure program.

[1] Petition of Duquesne Light Company for Approval of Its Long-Term Infrastructure Improvement Plan for period January 1, 2017 through December 31, 2022, Docket No. P-2016-2540046

**(b)(2) A description of each major event that occurred during the year being reported on, including the time and duration of the event, the number of customers affected, the cause of the event and any modified procedures adopted in order to avoid or minimize the impact of similar events in the future.**

No major events occurred during 2017.

**(b)(3) A table showing the actual values of each of the reliability indices (SAIFI, CAIDI, SAIDI, and if available, MAIFI) for the electric distribution company's service territory for each of the preceding 3 calendar years. The report shall include the data used in calculating the indices, namely the average number of customers served, the number of sustained customer minutes interruptions, the number of customers affected, and the minutes of interruption. If MAIFI values are provided, the number of customer momentary interruptions shall also be reported.**

**RELIABILITY BENCHMARKS AND STANDARDS**
**Duquesne Light Company**
**System Performance Measures with Major Events Excluded**

| | SAIDI | SAIFI | CAIDI | MAIFI |
|---|---|---|---|---|
| **2015** | 71 | 0.69 | 103 | * |
| **2016** | 69 | 0.69 | 100 | * |
| **2017** | 112 | 0.98 | 115 | * |
| **3 Year Average** | 84 | 0.79 | 106 | * |
| **Benchmark** | 126 | 1.17 | 108 | * |

***** Sufficient information to calculate MAIFI is unavailable.

Formulas Used in Calculating the Indices

$$\text{SAIFI} = \frac{\text{(Total KVA interrupted) - (KVA impact of major events)}}{\text{System Connected KVA}}$$

$$\text{SAIDI} = \frac{\text{(Total KVA-minutes interrupted) - (KVA-minute impact of major events)}}{\text{System Connected KVA}}$$

$$\text{CAIDI} = \text{SAIDI/SAIFI}$$

**Data used in calculating the indices**

**2017**

| | | |
|---|---|---|
| Total KVA Interrupted for the Period | 7,092,245 | KVA |
| Total KVA-Minutes Interrupted | 812,501,426 | KVA Minutes |
| System Connected Load as of 12/31/17: | 7,259,129 | KVA |

**2016**

| | | |
|---|---|---|
| Total KVA Interrupted for the Period | 4,979,083 | KVA |
| Total KVA-Minutes Interrupted | 497,296,442 | KVA Minutes |
| System Connected Load as of 12/31/16: | 7,210,354 | KVA |

**2015**

| | | |
|---|---|---|
| Total KVA Interrupted for the Period | 4,962,496 | KVA |
| Total KVA-Minutes Interrupted | 510,091,766 | KVA Minutes |
| System Connected Load as of 12/31/15: | 7,203,346 | KVA |

**(b)(4) A breakdown and analysis of outage causes during the year being reported on, including the number and percentage of service outages 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.**

**January 1, 2017 through December 31, 2017 – No PUC Major Event Exclusions**

| CAUSE | NO. OF OUTAGES | OUTAGE PERCENTAGE | KVA TOTAL | KVA PERCENTAGE | KVA-MINUTE TOTAL | KVA-MINUTE PERCENTAGE |
|---|---|---|---|---|---|---|
| **Storms** | 975 | 30% | 2,166,639 | 31% | 361,584,556 | 45% |
| **Trees (Contact)** | 27 | 1% | 2,208 | 1% | 283,764 | 1% |
| **Trees (Falling)** | 831 | 26% | 1,516,585 | 21% | 165,982,123 | 20% |
| **Equipment Failures** | 628 | 19% | 1,825,851 | 26% | 157,052,287 | 19% |
| **Overloads** | 35 | 1% | 88,258 | 1% | 7,090,861 | 1% |
| **Vehicles** | 164 | 5% | 510,456 | 7% | 57,480,472 | 7% |
| **Other** | 595 | 18% | 982,248 | 13% | 63,027,363 | 7% |
| **TOTALS** | **3,255** | **100%** | **7,092,245** | **100%** | **812,501,426** | **100%** |

**(b)(5) A list of remedial efforts taken to date and planned for circuits that have been on the worst performing 5% of circuits list for a year or more.**

Duquesne Light has 5 circuits that have been on the worst performing 5% of circuits list for four consecutive quarters. The majority of these circuits have received remedial actions or are scheduled for maintenance activities in 2018 that are expected to improve their reliability in 2018. The Company will continue to monitor these circuits closely during 2018 to verify that the remedial actions taken have been successful and that reliability has improved. Many of the circuits have already shown improvement as indicated in the following detailed descriptions.

Duquesne uses a sophisticated automated protection system on its 23kV circuits, which utilizes numerous 3-phase IntelliRupters, sectionalizers and reclosers on the main feeders and as ties to adjacent circuits. This automation technology with remote control generally allows circuit problems to be isolated and rerouted in less than 5 minutes. Generally, only a small portion of the customers on a worst performing circuit experience reliability issues.

| Rank, Circuit Name, Device | Outages | Remedial Actions Planned or Taken |
|---|---|---|
| 1<br><br>Traverse Run<br>23770<br><br>Recloser<br>100 | Five Total Outages:<br><br>Fourth Quarter 2017 Outages:<br><br>• One outage was caused by tree fall in.<br><br>Previous Outages:<br><br>• The cause of one outage was unknown, during a storm.<br>• One outage was caused by equipment failure, during a storm.<br>• Two outages were caused by tree fall in. | • Permanent repairs were made following each outage as necessary.<br>• The Company will continue to monitor this circuit for reliability issues.<br>• Vegetation Management addressed identified reliability concerns in Q4 2017.<br>• Protection Engineering will check this circuit for potential coordination issues by end of Q2 2018. |
| 2<br><br>Midland-Cooks Ferry<br>22869<br><br>WR875 | Four Total Outages:<br><br>Fourth Quarter 2017 Outages:<br><br>• Two outages were caused by tree fall in.<br><br>Previous Outages:<br><br>• One outage was caused by tree fall in.<br>• The cause of one outage was unknown. | • Permanent repairs were made following each outage as necessary.<br>• The Company will continue to monitor this circuit for reliability issues. |
| 3<br><br>Pine Creek<br>23714<br><br>80E | Four Total Outages:<br><br>Fourth Quarter 2017 Outages:<br><br>• One outage was caused by tree fall in.<br><br>Previous Outages:<br><br>• Two outages were caused by tree fall in, one during a storm.<br>• One outage was caused by excessive vine growth. | • Permanent repairs were made following each outage as necessary.<br>• The Company will continue to monitor this circuit for reliability issues.<br>• Routine vegetation maintenance was last performed in 2012 and is scheduled for 2018.<br>• Protection Engineering will check this circuit for potential coordination issues by end of Q2 2018. |

| | | |
|---|---|---|
| 4<br><br>Montour 23670<br><br>WA527 | Four Total Outages:<br>Fourth Quarter 2017 Outages:<br>• No outages.<br>Previous Outages:<br>• One outage was caused by equipment failure.<br>• One outage was caused by tree fall in.<br>• One outage was caused by contact with company equipment by vehicle.<br>• The cause of one outage was unknown, during a storm. | • Permanent repairs were made following each outage as necessary.<br>• The Company will continue to monitor this circuit for reliability issues.<br>• Protection Engineering will check this circuit for potential coordination issues by end of Q2 2018. |
| 5<br><br>Dravosburg 23750<br><br>65K | Three Total Outages:<br>Fourth Quarter 2017 Outages:<br>• No outages.<br>Previous Outages:<br>• Two outages were caused by tree fall in, one during a storm.<br>• One outage was caused by contact with company equipment by animal, bird, or reptile. | • Permanent repairs were made following each outage as necessary.<br>• The Company will continue to monitor this circuit for reliability issues.<br>• Protection Engineering will check this circuit for potential coordination issues by end of Q2 2018. |

**(b)(6) A comparison of established transmission and distribution inspection and maintenance goals/objectives versus actual results achieved during the year being reported on. Explanations of any variances shall be included.**

**2017 Transmission and Distribution Goals and Objectives**

| **Program** Project | **Unit of Measurement** | **Target for 2017** | **YTD Actuals for 2017** | **Percent Complete** |
|---|---|---|---|---|
| **Communications Goals** | | | | |
| Communication Battery Maintenance | Batteries | 100 | 101 | 101% |
| **Overhead Distribution Goals** | | | | |
| Recloser Inspections | Circuits | 130 | 130 | 100% |
| Pole Inspections[2] | Poles | 17,945 | 22,841 | 127% |
| OH Line Inspections | Circuits | 130 | 130 | 100% |
| OH Transformer Inspections | Circuits | 130 | 130 | 100% |
| Padmount & Below Grade Insp | Circuits | 81 | 81 | 100% |
| **Overhead Transmission Goals** | | | | |
| Helicopter Inspections[3] | Number of Structures | 625 | 693 | 111% |
| Ground Inspections | Number of Structures | 336 | 363 | 108% |
| **Substations Goals** | | | | |
| Circuit Breaker Maintenance[4] | Breakers | 501 | 602 | 120% |
| Station Transformer Maintenance[5] | Transformers | 78 | 88 | 113% |
| Station Battery Maintenance | Batteries | 936 | 977 | 104% |
| Station Relay Maintenance | Relays | 1,580 | 1,701 | 108% |
| Station Inspections | Sites | 2,040 | 2,050 | 100% |
| **Underground Distribution Goals** | | | | |
| Manhole Inspections | Manholes | 700 | 709 | 101% |
| Major Network Insp (Prot Relay) | Ntwk Protectors | 92 | 92 | 100% |
| Minor Network Visual Inspection (Transformer/Protector/Vault) | Ntwk Transformers | 562 | 601 | 107% |
| **Underground Transmission Goals** | | | | |
| Pressurization and Cathodic Protection Plant Inspection | Work Orders | 371 | 396 | 107% |
| **Vegetation Management Goals** | | | | |
| Overhead Line Clearance | Circuit Overhead Miles | 1,300 | 1,322 | 102% |

[2] Apart from DLC's normal inspection and maintenance schedule for pole inspections, in 2017 the Company engaged a third party contractor to inspect an additional 3,800 poles for quality assurance.

[3] The target for helicopter inspections is based on the entire system. Once the circuits to be inspected are identified the actual work performed may result in more units being inspected.

[4] The Company substation circuit breaker maintenance overage was the result of opportunistic work scheduling, as some tasks were completed ahead of time in conjunction with other field work activities.

[5] The Company substation transformer maintenance overage was the result of opportunistic work scheduling, as some tasks were completed ahead of time in conjunction with other field work activities.

**(b)(7) A comparison of budgeted versus actual transmission and distribution operation and maintenance expenses for the year being reported on. Explanations of any variances shall be included.**

Budget Variance Recap – O&M Expenses
For the Twelve Months Ending December 31, 2017
Favorable/(Unfavorable)

| | Total Actual | Total Budget | Variance |
|---|---|---|---|
| **Customer Service** | 55,524,764 | 55,970,179 | 445,415 |
| **Human Resources** | 14,853,712 | 16,335,411 | 1,481,699 |
| **Operations/Operation Services** | 60,077,388 | 64,737,900 | 4,660,512 |
| **Technology** | 50,836,699 | 48,834,711 | (2,001,988) |
| **General Corporate*** | 53,863,183 | 53,743,855 | (119,328) |
| **Total** | 235,155,746 | 239,622,056 | 4,466,310 |

* Includes Finance, Office of General Counsel and Senior Management Costs

The O&M expense underspend for the twelve months ended December 31, 2017 is attributable to a shift in the company's mix of vegetation management activities (Operations), favorable medical claims activity below industry trends (Human Resources), and slightly offset by unfavorability in the timing of spend related to surcharge program expense.

**(b)(8) A comparison of budgeted versus actual transmission and distribution capital expenditures for the year being reported on. Explanations of any variances shall be included.**

Budget Variance Recap – Capital
For the Twelve Months Ending December 31, 2017
Favorable/(Unfavorable)

| | Total Actual | Total Budget | Variance |
|---|---|---|---|
| **Customer Service** | 8,969,265 | 8,192,738 | (776,527) |
| **Human Resources** | 11,509,964 | 10,897,845 | (612,119) |
| **Operations/Operation Services** | 162,460,385 | 145,610,082 | (16,850,303) |
| **Technology** | 78,289,228 | 83,432,478 | 5,143,250 |
| **General Corporate*** | 24,864,217 | 24,401,918 | (462,299) |
| **Total** | 286,093,059 | 272,535,061 | (13,557,998) |

* Includes Finance, Office of General Counsel and Senior Management Costs

The capital spend overspend for the twelve months ended December 31, 2017 is attributable to both greater restoration costs associated with increased storm activities in 2017 and the timing of actual spend associated with some projects compared to their budgeted timing.

**(b)(9) Quantified transmission and distribution inspection and maintenance goals/objectives for the current calendar year detailed by system area (i.e., transmission, substation, and distribution).**

**2018 Transmission and Distribution Goals and Objectives**

| **Program**<br>Project | **Unit of Measurement** | **Target for Year 2018** |
|---|---|---|
| **Communications Goals** | | |
| Communication Battery Maintenance | Batteries | 124 |
| **Overhead Distribution Goals** | | |
| Recloser Inspections | Circuits | 130 |
| Pole Inspections | Poles | 17,393 |
| OH Line Inspections | Circuits | 130 |
| OH Transformer Inspections | Circuits | 130 |
| Padmount & Below Grade Insp | Circuits | 80 |
| **Overhead Transmission Goals** | | |
| Helicopter Inspections | Number of Structures | 533 |
| Ground Inspections | Number of Structures | 383 |
| **Substations Goals** | | |
| Circuit Breaker Maintenance | Breakers | 610 |
| Station Transformer Maintenance | Transformers | 52 |
| Station Battery Maintenance | Batteries | 988 |
| Station Relay Maintenance | Relays | 1,391 |
| Station Inspections | Sites | 2,016 |
| **Underground Distribution Goals** | | |
| Manhole Inspections | Manholes | 700 |
| Major Network Insp (Prot Relay) | Network Protectors | 92 |
| Minor Network Visual Inspection (Transformer/Protector/Vault) | Network Transformers | 576 |
| **Underground Transmission Goals** | | |
| Pressurization and Cathodic Protection Plant Inspection | Work Orders | 372 |
| **Vegetation Management Goals** | | |
| Overhead Line Clearance | Circuit Overhead Miles | 1,300 |

**(b)(10) Budgeted transmission and distribution operation and maintenance expenses for the current year in total and detailed by FERC account.**

| | Total Budget |
|---|---|
| Customer Service | $ 62,040,152 |
| Human Resources | 16,680,823 |
| Operations/ Operation Services | 63,683,038 |
| Technology | 51,498,196 |
| General Corporate* | $ 48,863,899 |
| **Total** | $ 242,766,108 |

*Includes Finance, Supply Chain, Office of General Counsel and Senior Management Costs

**(b)(11) Budgeted transmission and distribution capital expenditures for the current year in total and detailed by FERC account.**

| | Total Budget |
|---|---|
| Customer Service | $ 10,750,602 |
| Human Resources | 12,856,790 |
| Operations/ Operation Services | 230,131,752 |
| Technology | 58,977,693 |
| General Corporate* | $ 31,144,378 |
| **Total** | $ 343,861,215 |

*Includes Finance, Supply Chain, Office of General Counsel and Senior Management Costs

**(b)(12) Significant changes, if any, to the transmission and distribution inspection and maintenance programs previously submitted to the Commission.**

Duquesne Light has not made any significant changes to its transmission and distribution inspection and maintenance programs.