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March 1, 2018

**VIA ELECTRONIC FILING**

Rosemary Chiavetta, Secretary  
Pennsylvania Public Utility Commission  
Commonwealth Keystone Building, 2<sup>nd</sup> Floor  
400 North Street  
Harrisburg, PA 17120

Re: Duquesne Light Company's Annual Asset Optimization Plan  
Docket No. M-2018-\_\_\_\_\_

Dear Secretary Chiavetta:

Enclosed please find Duquesne Light Company's Annual Asset Optimization Plan. Should you have any questions please contact me.

Respectfully Submitted,

A handwritten signature in blue ink, appearing to read "Tishekia Williams", with a long horizontal flourish extending to the right.

Tishekia E. Williams  
Attorney ID#208997

Enclosures

CC: Certificate of Service

## CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing has been served upon the following persons, in the manner indicated, in accordance with the requirements of 52 Pa. § 1.54

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Dated: March 1, 2018



**Duquesne Light Company**  
**Annual Asset Optimization Plan**  
**March 1, 2018**

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## **INTRODUCTION**

Pursuant to 66 Pa.C.S. §1356, Duquesne Light Company (“DLC or the Company”) hereby files its Annual Asset Optimization Plan (“AAO Plan”). Section 1356 provides that utilities with an approved distribution system improvement charge (“DSIC”) and long-term infrastructure improvement plan (“LTIIIP”) are required to file an AAO Plan that includes:

- 1) A description that specifies all eligible property repaired, improved and replaced in the immediately preceding 12-month period pursuant to the utility’s long-term infrastructure improvement plan and prior year’s asset optimization plan; and
- 2) A detailed description of all the facilities to be improved in the upcoming 12-month period.

In the AAO, the Company provides details regarding the actual and projected repair, improvement and replacement of aging infrastructure in 2017 and 2018. The Company’s LTIIIP performance is an important part of its plan to ensure that its distribution system continues operate in a safe and reliable manner.

## **BACKGROUND**

Duquesne Light Company is a public utility as that term is defined under Section 102 of the Public Utility Code, 66 Pa. C.S. § 102, certificated by the Pennsylvania PUC to provide electric service in the City of Pittsburgh and in Allegheny and Beaver Counties in Pennsylvania. DLC is also an EDC as that term is defined under Section 2803 of the Public Utility Code, 66 Pa. C.S. § 2803. DLC provides electric distribution service to approximately 590,000 customers within its service territory that covers approximately 817 square miles.

DLC filed an LTIIIP, on April 15, 2016. In preparing its LTIIIP, DLC followed the guidelines established in the Commission’s August 2, 2012 Final Implementation Order. The LTIIIP provides for accelerated replacement of DSIC eligible property to support the modernization of the DLC electric distribution system. As such, it provides an opportunity to support and fulfill the goals of Act 11, which are aimed at constructing, installing, rehabilitating, improving and replacing portions of the Pennsylvania electric distribution system in an accelerated time frame to the betterment of Pennsylvania electricity customers. The LTIIIP will support and enhance DLC’s continuing efforts to sustain its high level of reliability and safety that could otherwise suffer due to normal degradation of facilities that occurs with time and natural environmental stresses.

The Company's LTIP was approved as filed on September 15, 2016. On May 26, 2016, DLC filed a petition seeking approval of a DSIC. By Order entered April 20, 2017, the Commission approved DLC's DSIC at docket number P-2016-2540046.

Duquesne Light's Commission approved LTIP includes five (5) asset programs and nine (9) initiatives.<sup>1</sup> Details on each of the asset programs included factors used to identify the need for the project, average age of the asset, scope of the project including the number of units to be replaced or improved over the next six years, the approximate location by geographic region for the projects and the yearly expenditures for six years, 2017 to 2022, for each asset class. The asset programs address DLC's areas of aged infrastructure, which are approaching the end of their expected useful life.

### **EXECUTIVE SUMMARY**

In developing its AAO Plan, DLC has included all of the five (5) asset programs and nine (9) initiatives originally included in its Commission-approved LTIP. The AAO Plan provides projected and actual replacement numbers for 2017 and projections for 2018. The project description included the AAO are consistent with those provided in the LTIP. The Company has added information to describe the progress of the programs and to explain deviations from the original projections as necessary and appropriate. While some programs spending forecasts have been adjusted due to changing circumstances, DLC does not propose to eliminate any of its programs at this time.

The increased spending in 2017 was the result of budget modifications that were made between the date the LTIP Filing was prepared and the finalization of the 2017 capital budget. The chart below details the Company's LTIP plan as filed, as well as the Company's actual 2017 performance and projected performance for 2018.

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<sup>1</sup>Duquesne Light's LTIP included an explanation that the Company planned to develop a Microgrid to improve the reliability of the portion of its distribution system that serves its Woods Run Operations facilities and its Preble Avenue Service Center. The LTIP did not provide a specific proposal for the Woods Run Microgrid, did not include any proposed budget or funding for the Woods Run Microgrid and specifically stated that the Company would file an Amended LTIP to provide such information.<sup>1</sup> Upon further consideration, the Company did not petition to amend its LTIP. Accordingly, the Microgrid is not included in the Company's LTIP, or addressed in this AAO.

## Duquesne Light Company 2017-2018 Actual and Projected LTIP Spend.

<i>All figures in \$ millions</i>	2017 Plan	2017 Actual	2018 Plan	2018 Forecast	'17 plan + '18 plan	Actual + '18 Forecast
<b>4kV Program</b>						
4kV Substation Elimination	13.0	12.3	28.0	26.3	41.00	38.57
Stepdown Transformer Conversion	1.1	1.8	6.1	6.8	7.15	8.54
Modular Integrated Transformer System	2.0	7.2	8.0	5.8	10.00	13.02
<b>Total 4kV Program</b>	16.1	21.3	42.1	38.9	58.2	60.1
<b>Overhead Program</b>						
Aerial Cable Replacement	1.2	5.2	9.7	7.6	10.95	12.79
<b>Total Overhead Program</b>	1.2	5.2	9.7	7.6	11.0	12.8
<b>Underground Program</b>						
Underground Cable Replacement	5.0	9.5	3.5	1.7	8.50	11.23
Network Transformer and Protector Replacement	2.8	3.2	5.8	3.8	8.64	7.02
Underground Residential Distribution Rehabilitation	0.9	2.1	5.9	5.9	6.74	8.04
<b>Total Underground Program</b>	8.7	14.9	15.2	11.4	23.9	26.3
<b>Substations Program</b>						
Breaker & Switch Replacements	1.4	4.1	5.4	2.8	6.72	6.91
Substation Upgrades	-	0.3	3.0	1.9	3.00	2.20
<b>Total Substations Program</b>	1.4	4.4	8.4	4.7	9.7	9.1
<b>Highway Relocation Program</b>						
Unreimbursed Highway Relocations	2.8	1.2	2.8	1.3	5.60	2.55
<b>Total Highway Relocations Program</b>	2.8	1.2	2.8	1.3	5.6	2.5
<b>TOTAL</b>	30.2	47.0	78.1	63.9	108.3	110.9

### Distribution Assets

The following pages set forth actual results for calendar year 2017 and revised projections for calendar year 2018. These assets include, but are not limited to, the following:

- Structures
  - Poles
  - Crossarms
  - Vaults
  - Manholes
- Overhead Conductors and Hardware
- Underground Cables and Hardware
- Disconnect Switches
- Protective Devices
  - Fuses

- Reclosers
- Network Protectors
- Lightning Arresters
- Transformers

## **4 KV Program**

The Substation Elimination Initiative and the Stepdown Conversion Initiative are intended to replace the aged, 4kV infrastructure on DLC’s system. In certain instances, renewal of the 4kV substation infrastructure may be prudent, as opposed to substation elimination or conversion. In those instances, DLC will replace the substation equipment.

### *I. Substation Elimination Initiative* **Program Description and Purpose**

The Substation Elimination Initiative will convert a substation’s 4kV load to 23kV operation. By removing the 4kV equipment and upgrading to 23kV, this initiative will permit the decommissioning of 4kV substations.

#### Scope

Replacement in Units (circuits)				
<b>LTIIIP Initiative</b>	<b>2017 Plan</b>	<b>2017 Actual</b>	<b>2018 Plan</b>	<b>2018 Forecast</b>
4kV Substation Elimination	3.0	3.0	7.0	6.0

#### Locations

Areas generally outside of downtown Pittsburgh.

#### Actual/Planned Annual Expenditures

Replacement Spending (\$ in millions)				
<b>LTIIIP Initiative</b>	<b>2017 Plan</b>	<b>2017 Actual</b>	<b>2018 Plan</b>	<b>2018 Forecast</b>
4kV Substation Elimination	13.0	12.3	28.0	26.3

#### Comments:

2017 spending and 2018 forecasted spending are consistent with the plan forecasts.

*II. Stepdown Conversion Initiative*

Program Description and Purpose

The 4kV Stepdown Conversions Initiative will convert 4kV load fed from a stepdown to 23kV. By eliminating 4kV stepdown and upgrading the associated infrastructure to 23kV, this initiative will permit the decommissioning of the 4kV system.

Scope

Replacement in Units (three phase transformer set)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Stepdown Transformer Conversion	1.0	2.0	5.0	7.0

Locations

Areas generally outside of downtown Pittsburgh.

Actual/Planned Annual Expenditures

Replacement Spending (\$ in millions)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Stepdown Transformer Conversion	1.1	1.8	6.1	6.8

Comments

Spending in this initiative in 2017 included higher spending than originally planned to address design engineering for work to be performed in 2018. The 2018 spending forecast includes two additional units of work based on updated replacement plans.

*III. Modular Integrated Transformer System Initiative (“MITS”)*

Program Description and Purpose

MITS are packaged 23kV – 4kV substations containing transformers, breakers, switches, and regulators. When the condition of the current substation is deteriorating and is approaching the end of expected useful life, a MITS may be installed. Due to its modular design, when the 4kV is ultimately converted to 23kV, this unit can be relocated to other locations as necessary. As a result, MITS involve minimal design time and cost and using MITS substantially reduces construction cost. The MITS initiative is complementary to the 4kV Substation Elimination Initiative.

Scope

Replacement in Units (units)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Modular Integrated Transformer System	2.0	5.0	8.0	6.0

Locations

All areas of DLC System.

Actual/Planned Annual Expenditures

Replacement Spending (\$ in millions)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Modular Integrated Transformer System	2.0	7.2	8.0	5.8

Comments

Additional 4kV substation transformers were replaced in 2017 as compared to the original plan due to transformer condition or transformer failure. With the acceleration of transformer replacements into 2017, the plan in 2018 has been adjusted to result in approximately same amount of replacements over the two year period.

In 2018 Duquesne Light plans to complete the replacement of aged substation transformers at one substations with two MITS units and to replace another four aged substation transformers with a conventional solution consisting of individual components

as opposed to the modular integrated solution. The conventional solutions that will be used in 2018 is functionally equivalent, and cost-effective. Duquesne Light will evaluate future 4kV substation transformer replacements to determine the best solution for each location, and we plan to continue our accelerated replacement of aged 4kV substation transformers and associated equipment in this initiative.

## **Overhead Program**

DLC's Overhead Program addresses aerial cable and other eligible property on the overhead distribution system approaching the end of its expected useful life.

### *I. Aerial Cable Replacement Initiative* Program Description and Purpose

Aerial cable is used when multiple circuits are on the same pole. It is also used through rights-of-way with trees that may cause interference. Aerial cable is used principally on the 23kV sub-transmission and distribution circuits. This initiative focuses on the replacement of aged, failure-prone aerial cable to maintain DLC's current high level of reliability and reduce the likelihood of failures.

#### Scope

Replacement in Units (miles)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Aerial Cable Replacement	1.5	5.2	12.5	5.6

#### Locations

Areas generally outside of downtown Pittsburgh.

#### Actual/Planned Annual Expenditures

Replacement Spending (\$ in millions)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Aerial Cable Replacement	1.2	5.2	9.7	7.6

Comments:

2017 spending on Aerial Cable replacement was higher than originally planned in order to accelerate replacement of cable on a critical circuit.

**Underground Program**

DLC’s Underground Program replaces, rehabilitates, and improves obsolete, eligible property approaching the end of its expected useful life.

*I. Underground Cable Replacement Initiative*  
Program Description and Purpose

DLC’s underground cable has served the system for several years, but it is approaching the end of its expected useful life. This initiative focuses on the replacement of underground cable to maintain the current high level of reliability and reduce the likelihood of future failures.

Scope

Replacement in Units (miles)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Underground Cable Replacement	2.4	7.7	1.7	1.7

Locations

Areas generally inside of downtown Pittsburgh.

Actual/Planned Annual Expenditures

Replacement Spending (\$ in millions)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Underground Cable Replacement	5.0	9.5	3.5	1.7

## Comments

Spending on this initiative in 2017 was higher than the original plan due to the timing of execution of a large project that was placed in service in November 2017. Also, the underground cable scope associated with an accelerated aerial cable replacement project was included in this Underground Cable Replacement initiative.

## *II. Network Transformers & Protector Replacement Initiative* Program Description and Purpose

The majority of network transformers and protectors are located in downtown Pittsburgh in sidewalk vaults. Many of these vaults are exposed to natural and human elements that may lead to corrosion. These factors contribute to the deterioration of the transformers. This initiative focuses on the rehabilitation of network transformer and protector installations in downtown Pittsburgh to maintain the current high level of reliability and reduce the likelihood of failures.

## Scope

Replacement in Units (transformers)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Network Transformer and Protector Replacement	25.0	30.0	50.0	30.0

## Location

Areas generally inside of downtown Pittsburgh.

## Actual/Planned Annual Expenditures

Replacement Spending (\$ in millions)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Network Transformer and Protector Replacement	2.8	3.2	5.8	3.8

Comments

2017 spending was slightly higher than plan as additional units were identified for replacement in 2017. The 2018 forecast has been adjusted, however, the plan for 2018 still includes replacing approximately 30 network transformers.

III. *Underground Residential Distribution Rehabilitation Initiative*  
Program Description and Purpose

DLC installed a significant number of Underground Residential Distribution (URD) facilities in housing developments in the 1970s. This equipment is approaching the end of expected useful life. Some of this equipment is below grade. The equipment has been exposed to wet conditions due to rain runoff. In addition, chemicals from lawn treatment in the water in below-grade vaults further deteriorate the equipment. The deteriorated equipment includes transformers, primary cable, splices, bushing junctions, elbows, brackets, and the vaults themselves.

This initiative focuses on the rehabilitation of the failure-prone underground residential (URD) system in order to maintain the current high level of reliability and reduce the likelihood of future failures.

Scope

Replacement in Units (transformers)				
LTIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Underground Residential Distribution Rehabilitation	29.0	72.0	196.0	205.0

Locations

Areas generally outside of downtown Pittsburgh.

Actual/Planned Annual Expenditures

Replacement Spending (\$ in millions)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Underground Residential Distribution Rehabilitation	0.9	2.1	5.9	5.9

Comments:

Additional URD plans were added to the 2017 capital plan to further accelerate replacement of aged infrastructure in this asset category.

**Substations Program**

DLC’s Substations Program addresses eligible property associated with its substations that are approaching the end of expected useful life. The eligible property under this LTIIIP includes circuit breakers, associated switches, line protection devices, and substation infrastructure.

*I. Breaker & Switch Replacement Initiative*  
Program Description and Purpose

The 23kV distribution infrastructure is the backbone of DLC’s delivery system. As part of that system, substation breakers are important for reliable operation. The line protection of the system must also work as appropriate and in coordination with other protective devices such as IntelliRupters and line fuses. Currently, there are approximately 500 oil circuit breakers that can be replaced with vacuum circuit breakers. The line and bus disconnect switches will be changed while the breakers are being replaced. The disconnect switches are used to establish a valid clearance for a visual break, allowing construction crews to perform line work safely.

Scope

Replacement in Units (breakers)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Breaker & Switch Replacements	11.0	13.0	44.0	24.0

Locations

All areas of DLC System.

Actual/Planned Annual Expenditures

Replacement Spending (\$ in millions)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Breaker & Switch Replacements	1.4	4.1	5.4	2.8

Comments

Spending on this initiative in 2017 included completing 2 additional units of work and also engineering and procurement associated with 2018 planned breaker replacements. The estimated cost for the Breaker and Switch Replacement Initiative included in the LTIIIP are low as compared to the actual costs incurred by the Company following a competitive procurement process. The reduction in the units replaced is a result of the higher costs.

II. *Substation Upgrades Initiative*  
Program Description and Purpose

The Substation Upgrades Initiative replaces substation infrastructure that is approaching the end of expected useful life. Within the substation, DLC has identified several pieces of equipment and/or systems that need to be replaced or rehabilitated. The infrastructure principally includes, but is not limited to transformers, relays, substation structures, system control equipment, foundations, ground grid systems, and battery systems.

Scope

Replacement in Units (projects)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Substation Upgrades	0.0	0.0	5.0	11.0

Locations

All areas of DLC System.

Actual/Planned Annual Expenditures

Replacement Spending (\$ in millions)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Substation Upgrades	0.0	0.3	3.0	1.9

Comments

The Substations Upgrades initiatives includes work orders that vary significantly in scope of work, and therefore the planned work for 2018 includes more units of work (work order or job) with less capital investment forecasted to complete the work.

**Highway Relocation Program**

The Highway Relocation Program consists of work that arises during the course of normal operations required by the State of Pennsylvania, PennDot, counties, cities, municipalities, or other government agencies. As part of unreimbursed road and bridge projects, DLC is required to relocate its distribution facilities. During these relocations, there is the potential for system improvements. Due to the nature of how these relocation projects are scheduled, DLC cannot definitively determine the annual expenditures or number of projects that will be required during the LTIIIP period. DLC will include eligible costs as part of its LTIIIP.

Actual/Planned Annual Expenditures

Replacement Spending (\$ in millions)				
LTIIIP Initiative	2017 Plan	2017 Actual	2018 Plan	2018 Forecast
Highway Relocation Program	2.8	1.2	2.8	1.3

**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Duquesne Light Company Annual Asset  
Optimization Plan

Docket No. M-2018-

**VERIFICATION**

I, Scott Ward, hereby state that the facts set forth above are true and correct to the best of my knowledge, information and belief, and I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).



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Scott Ward

Dated: March 1, 2018