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E FILED

September 29, 2016

Ms. Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
P. O. Box 3265
Harrisburg, PA 17120

RE: **Biennial Inspection, Maintenance, Repair and Replacement Plan of Duquesne Light Company Docket No. M-2009-2094773**

Dear Secretary Chiavetta:

Enclosed for filing and approval please find Duquesne Light Company's proposed Biennial Inspection, Maintenance, Repair and Replacement Plan for the period of January 1, 2018-December 31, 2019 ("I&M Plan"). Duquesne Light submits this filing in accordance with 52 Pa. Code §57.198 governing Inspection and Maintenance Standards, as well as the Commission's Implementation Order at Docket No. M-2009-2094773. Please note that the 2018-2019 I&M Plan contains no changes from previously submitted filings.

Duquesne respectfully requests Commission review and consent to the waivers as detailed in the attached I&M Plan.

If you have any questions regarding the information contained in this filing, please contact the undersigned.

Sincerely,

Shelby A. Linton-Keddie
Manager, State Regulatory Affairs
And Senior Legal Counsel

Enclosure
c: David Washko (dwashko@pa.gov) w/ enc.

Biennial Inspection, Maintenance, Repair and Replacement Plan of Duquesne Light Company For the period of January 1, 2018 – December 31, 2019

Submitted by:
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Dated: September 29, 2016

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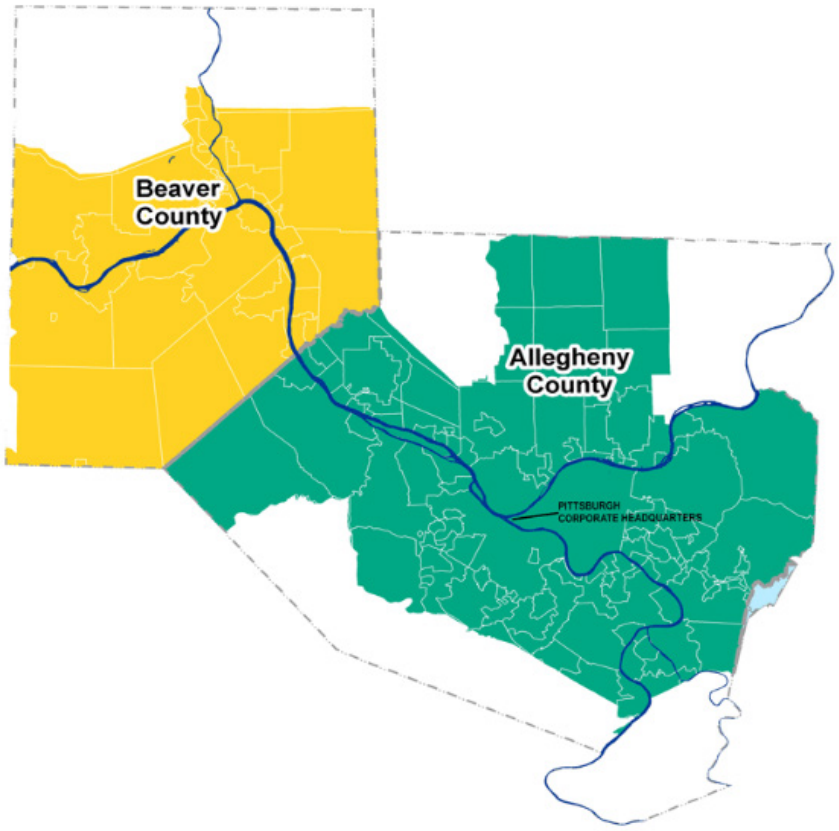
Introduction

Duquesne Light Company ("Duquesne Light" or "Company") delivers electricity to approximately 590,000 customers within the Company's service territory which consists of approximately 817 square miles. Duquesne Light owns and operates transmission and distribution facilities located in two counties, Allegheny and Beaver Counties, in southwestern Pennsylvania. A graphical representation of the Company's service territory is shown below:



This 2018–2019 Biennial Inspection, Maintenance, Repair and Replacement Plan (the "Biennial Plan") was prepared in accordance with the requirements of Pennsylvania Utility Commission's Inspection and Maintenance Standards pursuant to 52 Pa. Code §57.198 (the "Inspection and Maintenance Standards"). The Biennial Plan will be in effect from January 1, 2018 through December 31, 2019 and satisfies the performance benchmarks and standards requirements under the Inspection and Maintenance Standards, as further provided herein. The Company's Biennial Plan addresses its particular infrastructure within Duquesne Light's service territory and seeks to maintain and to improve the safety and reliability of the Company's distribution system.

Overall, the Company's Biennial Plan and inspection and maintenance practices are based on generally accepted utility practices as well as the Company's experience gained over years of maintenance activities performed on the distribution assets in the Company's service territory. Duquesne Light continues to deploy distribution assets that are automated and which remotely report on their status and condition eliminating the need for field inspections. In addition, the

Company uses advanced testing devices that allow for a more informative review and efficient use of resources to identify potential reliability or safety issues. The intent of Duquesne Light's inspection and maintenance programs as provided herein are to proactively identify potential issues that could affect the reliability and safety of the distribution system and reduce the risk of outages.

Plan Consistency

As required under 52 Pa. Code § 57.198(b), Duquesne Light's Biennial Plan is consistent with the National Electrical Safety Code ("NESC"), Codes and Practices of the Institute of Electrical and Electronic Engineers ("IEEE"), Federal Energy Regulatory Commission ("FERC") Regulations and the provisions of the American National Standards Institute, Inc. ("ANSI"), as applicable to the work performed under the Biennial Plan.

Record Keeping

Section 57.198(m). Recordkeeping. *An EDC shall maintain records of its inspection and maintenance activities sufficient to demonstrate compliance with its distribution facilities inspection, maintenance, repair and replacement programs as required by subsection (n).*

Duquesne Light uses a combination of handheld computers, software packages and paper inspection and maintenance documents for scheduling and recording of inspection and maintenance activities. With respect to the Company's electronic inspection forms, the following information is contained in the records: the type of work that was performed (*i.e.*, inspection, repair, maintenance, or replacement), the applicable date of the activity as well as the employee number or name to indicate the employee performing the inspection or corrective maintenance are also included. To the extent paper records are used, the information contained above is included as well as the employee's signature or initials. The Company maintains sufficient records to demonstrate compliance with the Inspection and Maintenance Standards.

Duquesne Light currently does not use contractors for any inspection activities. When contractors are used for vegetation or construction activities, the Company can show when and what type of work was completed by the contractor. For vegetation, signatures of the Company's Vegetation Management Supervisors are placed on the time cards of vegetation contractor's time cards to verify the hours worked by each contractor. For construction, the Project Manager approves the work authorization detailing the work required prior to commencement of construction and then approves payment of the respective invoice after work is complete. The documentation for vegetation and construction contractors is stored and maintained by the Project Management Team.

Changes in the Biennial Plan from 2016-2017 Plan

No changes are being proposed in the Biennial Plan from the 2016-2017 Biennial Plan.

Waivers Requested

Consistent with the Company's existing plan, Duquesne Light is requesting the continuance of certain waivers for the following items:

- Pole Inspections Drill Tests at and Below Ground Level – Page 10
- Pole Inspections Loading Calculations – Page 10
- Distribution Overhead Line Inspection Interval – Page 12
  (This also includes the Recloser Inspections)
- Distribution Overhead Transformer Inspection Interval – Page 15
- Distribution Pad-mounted Transformer Inspection Interval – Page 15

Justification for Waivers

Duquesne Light has established and implemented an inspection and maintenance plan designed to control costs, prioritize repairs and maintenance, and focus on reliable service. The Company has established and implemented processes to prioritize inspection and maintenance, and has achieved positive results.

The specific methodologies and processes utilized by Duquesne Light for inspection and maintenance of its distribution assets remain unchanged from those provided in the Company's existing plan. As provided under the Company's existing plan, specific justifications for each program are also contained below. Further, as stated in the NESC, 121.A, "lines and equipment shall be inspected at such intervals as experience has shown to be necessary," and the Company believes that these waivers do not impact reliability or safety and are justified based on the estimated costs that would be incurred by the Company to satisfy these requirements and as otherwise provided below. Moreover, Duquesne Light's PUC reliability indices confirm that the existing inspection and maintenance programs are effective. See the charts below for the Company's reliability indices:

Equipment Failure Contribution to SAIFI Indices

	2010	2011	2012	2013	2014	2015
Transformer	0.036	0.028	0.021	0.019	0.027	0.024
Capacitor	0.000	0.000	0.000	0.000	0.000	0.000
Recloser	0.000	0.002	0.000	0.000	0.000	0.000
Sectionalizer	0.009	0.000	0.002	0.000	0.001	0.003
Lightning Arrestor	0.010	0.009	0.003	0.002	0.004	0.010
Sectionalizing Switch	0.004	0.006	0.001	0.001	0.003	0.002
Cutout	0.006	0.002	0.001	0.001	0.003	0.002
Substation Equipment	0.034	0.046	0.008	0.005	0.013	0.011
Voltage Regulator	0.004	0.000	0.001	0.001	0.000	0.001
Cable	0.106	0.082	0.059	0.058	0.045	0.076
Cable Joint or Splice	0.010	0.016	0.007	0.007	0.012	0.012
Termination	0.023	0.016	0.006	0.011	0.015	0.012
Tower/H Frame/Pole	0.011	0.006	0.005	0.001	0.012	0.008
Insulator	0.056	0.058	0.029	0.022	0.030	0.033
Guy/Msg/Grnd Wire	0.000	0.002	0.000	0.001	0.000	0.000
Crossarm	0.008	0.009	0.001	0.003	0.000	0.004
Connector/Jumper	0.088	0.069	0.042	0.037	0.044	0.055
Total	0.405	0.350	0.186	0.170	0.210	0.252

System SAIFI	**1.09**	**0.93**	**0.67**	**0.62**	**0.62**	**0.75**
Benchmark	1.17	1.17	1.17	1.17	1.17	1.17

Equipment Failure Contributions to SAIDI Indices

	2010	2011	2012	2013	2014	2015
Transformer	4.42	4.33	2.48	2.26	3.02	2.80
Capacitor	0.00	0.09	0.00	0.00	0.00	0.00
Recloser	0.11	0.16	0.09	0.00	0.02	0.00
Sectionalizer	1.82	0.00	0.20	0.00	0.00	0.39
Lightning Arrestor	0.77	0.62	1.04	0.20	0.35	0.38
Sectionalizing Switch	1.06	1.45	0.09	0.07	0.54	0.17
Cutout	0.47	0.37	0.24	0.24	0.27	0.19
Substation Equipment	3.35	1.38	0.29	0.58	1.22	0.90
Voltage Regulator	0.06	0.06	0.10	0.05	0.04	0.03
Cable	8.04	7.98	6.94	7.03	3.66	7.33
Cable Joint or Splice	1.25	1.21	0.35	0.65	1.14	0.52
Termination	2.95	1.22	0.93	1.25	1.34	1.88
Tower/H Frame/Pole	2.19	0.62	0.45	0.18	1.90	0.74
Insulator	5.33	4.98	3.54	2.83	2.77	2.71
Guy/Msg/Grnd Wire	0.01	0.06	0.00	0.06	0.01	0.00
Crossarm	0.52	0.86	0.09	0.48	0.03	0.82
Connector/Jumper	9.64	5.19	3.61	4.24	2.99	3.26
Total	41.99	30.59	20.46	20.12	19.31	22.12

System SAIDI	**87**	**99**	**79**	**76**	**63**	**71**
Benchmark	126	126	126	126	126	126

Vegetation Management

Section 57.198(n)(1). Vegetation Management. *The Statewide minimum inspection and treatment cycle for vegetation management is between 4-8 years for distribution facilities. An EDC shall submit a condition-based plan for vegetation management for its distribution system facilities explaining its treatment cycle.*

Program Description

Duquesne Light professionally manages a comprehensive vegetation program utilizing industry best management practices to provide safe and reliable distribution service. This extensive program is specifically defined for the management of vegetation on Duquesne Light's rights-of-way for the dependable operation of its distribution (4kV, 23kV, and 23TkV) system and includes: (i) select tree pruning and removal within the rights-of-way ("ROW"), (ii) hazard tree assessment and the removal of defective, dead, or diseased trees within or along the ROW, and (iii) the selective mechanical and/or chemical control of incompatible tall-growing brush within the ROW. Specific methods for line clearance are chosen based on the type of work involved while achieving it in a professional, economical, and environmentally sound manner.

This year-round operation ensures that the safety and reliability of approximately 7,000 distribution circuit miles complies with regulatory standards. The present frequency of vegetation management activities for the distribution system ranges between 4 - 6 years. Annually scheduled maintenance activities involve the application of the most recent Company specifications to achieve a minimum of 4-years clearance for all overhead distribution circuits. Clearance varies with species of tree. Vegetation on the ROW floor is managed to ensure that incompatible brush is selectively controlled and access is maintained.

The identification of conditions associated with individual circuits, or portions of circuits, helps to determine the proper frequency of scheduled maintenance efforts to ensure reliability. Dynamic vegetative factors that are considered include tree species, tree structural condition, growth rates, site characteristics, proximity to energized facilities, and time elapsed since the last maintenance effort. Factors such as legal maintenance rights, pole heights, conductor configurations, voltages, circuits involved, kVA, and critical customers are also identified and considered. Selection and prioritization of circuits for annual maintenance are analyzed considering all of these factors and derived by applying a combination of conditions and time-based cycles.

In areas where ROW's are more developed and involve, for example, individual trees in street ROW, yards, and parks, cycle frequencies are generally shorter due to shorter pole heights, reliability concerns, tall-growing incompatible tree species planted beneath and adjacent to overhead utility lines, and concern over the impact of pruning on involved trees. These circuits, or portions of circuits, are typically managed on a 4 - 5 year cycle.

For those circuits, or portions of circuits, where vegetative growth can be managed to a more stable state and does not present a threat to the safety or reliability of the involved circuit(s), the maintenance cycle may potentially be extended out to the maximum length of up to 8 years. These areas tend to be more remote, where the management sites are larger and involve forest

stands rather than individually-owned trees typical of more populated areas. Stable areas are typically managed on a 4 - 6 year cycle.

For maintenance efforts, circuits are typically grouped according to geographical location and worked together as a "project" on an optimal schedule determined by the project's characteristics. However, sometimes certain ROW conditions impact the ability to manage a project to a specific frequency that will maintain reliability expectations. For example, individual trees or stands of trees specific to a particular location may require more frequent maintenance than the remainder of the project because these specific trees / sites result in higher interruptions due to their characteristics. Identification of these reliability-based conditions leads to the targeted inspection and identification of vegetative conditions for mitigation on an as-needed basis outside of the scheduled maintenance activities.

Inspection Plan	**Inspections and Treatments Planned** *Distribution Circuit Miles*	
	2018	**2019**
Duquesne Light Company *7,000 Total Distribution Circuit Miles*	1,300	1,300

Justification

Duquesne Light's vegetation management plan complies with the inspection and maintenance standards set forth in 52 Pa. Code § 57.198(n)(1). A waiver is not being requested for this section.

Pole Inspections

Section 57.198(n)(2). Pole Inspections. *Distribution poles shall be inspected at least as often as every 10-12 years except for the new southern yellow pine creosoted utility poles which shall be initially inspected within 25 years, then within 12 years annually after the initial inspection. Pole inspections must include:*

(i) Drill tests at and below ground level.
(ii A shell test.
(iii) Visual inspection for holes or evidence of insect infestation.
(iv) Visual inspection for evidence of unauthorized backfilling or excavation near the pole.
(v) Visual inspection for signs of lightning strikes.
(vi) A load calculation.

Program Description

Duquesne Light visually inspects distribution wood poles on a 12 year cycle. The purpose of the inspection of distribution wood poles is to identify and repair wood poles that would affect the reliability and safety of the Company's distribution assets for its employees and customers. This inspection cycle also meets the Inspection and Maintenance Standards, as noted above, and the NESC for inspection of wood poles.

Inspection Process

Duquesne Light's distribution wood pole inspection process includes visually inspecting from ground level to the top of the pole to identify any abnormal conditions and hammer-sounding at the ground level. These techniques are useful for identifying the following conditions:

- Bird and insect infestation
- Damage – broken or leaning
- Holes
- Burn marks and lightning strikes
- Deteriorated top of the pole
- Testing for decay or shell rot
- Review of the ground around the base of the pole for unauthorized backfilling or excavation

All poles are currently hammer-sounded and tested with PoleTest™[1] equipment which utilizes a sound wave traveling through the pole to determine the bending strength of each pole. If the hammer-sounding is suspect or the PoleTest™[2] equipment fails to provide anticipated results, the pole is drilled and measured for deficiencies.

[1] A description PoleTest methodology is included on page 10.
[2] Duquesne Light continually reviews the available technology in the marketplace for this activity and could potentially change to another process during this Biennial Plan.

Any pole with abnormal shell depth or that fails the PoleTest™ inspection will be flagged for replacement. The pole inspector uses handheld GPS device to record their results for each pole inspection; thus, providing the exact location of a pole. Upon returning to the office, this data is downloaded and entered into the Company's GIS Database. A work order in the Work and Asset Management software is generated for any pole that needs replacement, which is sent to the engineering department for design and to obtain the necessary permits. Once the design is complete and permits are obtained the work order is sent to the T&D field employees for replacement.

Inspection Plan	**Pole Inspections Planned** *(Number of Poles)*	
	2018	**2019**
Duquesne Light Company *Total Number of Poles is 215,351*	17,945	17,945

Section 57.198(n)(3). Pole inspection failure*. If a pole fails the ground line inspection and shows dangerous conditions that are an immediate risk to public or employee safety or conditions affecting the integrity of the circuit, the pole shall be replaced within 30 days of the date of inspection.*

Corrective Maintenance

Duquesne Light maintains an appropriate level of inventory of poles, crossarms, wires and cable to replace any pole within 30 days if it determines that a particular pole meets the definition found in 52 Pa. Code §57.198(n)(3). All other poles identified as needing replacement will be replaced under the Company's pole replacement program.

Justification

Section 57.198(c). Time frames*. The plan must comply with the inspection and maintenance standards in subsection (n). A justification for the inspection and maintenance time frames selected shall be provided, even if the time frame falls within the intervals prescribed in subsection (n). However, an EDC may propose a plan that, for a given standard, uses intervals outside the Commission standard, provided that the deviation can be justified by the EDC's unique circumstances or a cost/benefit analysis to support an alternative approach that will still support the level of reliability required by law.*

Time Interval

Duquesne Light's proposed 12 year cycle for inspection and maintenance of wood poles complies with inspection and maintenance standards set forth in 52 Pa. Code § 57.198(n) and is within generally accepted utility practice.

Pole Inspection (Waiver Requests)

a) **Drill tests at and below ground level**. Duquesne Light is requesting a waiver of the requirement regarding *Drill tests at and below ground level*. Duquesne Light performs strength evaluations by a nondestructive evaluation method using PoleTest™ devices developed by Engineering Data Management, Inc. ("EDM") with direct involvement by the Electric Power Research Institute ("EPRI") and cooperating utilities. EPRI's testing was based on standards developed by the NESC and the American National Standards Institute ("ANSI"). The PoleTest™ equipment measurement provides a finite measurement for determining conditions; a drill test is still used in situations where results are inconclusive (common on very large diameter poles). Duquesne Light finds this method to provide more consistent results and to be less destructive than drill testing, which is best for providing the longest life of the asset. This method is consistent with past practices and the current Inspection and Maintenance Plan. To the extent a waiver is needed from the regulations, the Company requests the same.

b) **Pole Loading Calculations**. Duquesne Light is requesting a waiver of the pole loading calculation which would be a continuation of the existing approved waiver for this requirement under its current plan under the PUC's Inspection and Maintenance Standards. Duquesne Light substantially meets all of the pole inspection criteria set forth above other than this requirement. Duquesne Light does not perform such load calculations because of the conservative safety factors used in its engineering designs for heavy loading under the NESC, and the limited number of pole failures that affect the safety and reliability of the Company's distribution system. A review of Duquesne Light's reliability statistics show that pole failures contribute only 0.007 (average) to the overall SAIFI Index during the last 6 years. Thus, pole failures have had a negligible effect on reliability, and failure data does not justify the considerable costs that the Company would incur to satisfy the load calculations requirement.

Distribution Overhead Line Inspections

Section 198.(n)(4). Distribution overhead line inspections. *Distribution lines shall be inspected by ground patrol a minimum of once every 1-2 years. A visual inspection must include checking for:*

(i) Broken insulators.
(ii) Conditions that may adversely affect operation of the overhead distribution line.
(iii) Other conditions that may adversely affect operation of the overhead distribution line.

Program Description

Duquesne Light uses Infrared Technology[3] and visual inspections to inspect its distribution lines and associated equipment on a 5-year cycle. These inspection methods provide a vast amount of information on the operating condition of the Company's lines and equipment with specific focus on the following:

- Bad connections on transformers, secondary and service lines
- Bad primary (automatic or compression) splice connections
- Bad connections on primary and secondary jumpers
- Defective transformers that are nearing failure
- Switches that have bad connections or are approaching failure
- Broken transformer arrestors
- Broken crossarms
- Cracked or broken insulators that are approaching failure
- Bad grounding and neutral connections

Duquesne Light has used Infrared Technology since 2000 and has been very successful at identifying potential distribution line and associated equipment issues before failure occurs to ensure the reliability and safety of the Company's overall distribution system. Moreover, the use of Infrared Technology in the inspection process provides information about the conditions of the assets that an ordinary visual inspection could not detect.

Inspection Process

Duquesne Light identifies approximately one fifth of its distribution circuits each year for inspection. A two person crew typically drives each circuit (walking the ROW portions) and records the information generated from an infrared camera. Upon returning to the office, any visual observations, the infrared pictures and digital photos captured are noted and downloaded and a work order is created in the Company's Work and Asset Management ("WAM") software to track and address any deficiency or repairs needed. Each deficiency is assigned a priority based on the condition and type of equipment identified. A report, including the pictures, a description of each deficiency item and the work order are then sent to the T&D field personnel to schedule repairs.

[3] See Footnote 2, page 8.

Inspection Plan	**Overhead Line Inspections Planned** *(Number of Circuits)*	
	2018	**2019**
Duquesne Light Company *Total Circuits (648)* [4]	130	130

Section 57.198(n)(5). Inspection failure. *If critical maintenance problems are found that affect the integrity of the circuits, they shall be repaired or replaced no later than 30 days from discovery.*

Corrective Maintenance

Problems identified in the distribution overhead line inspections that Duquesne Light reasonably expects will affect the integrity of the circuits, will be repaired or replaced within 30 days. All other deficiencies are addressed on a case- by- case basis.

Justification

Section 57.198(c). Time frames*. The plan must comply with the inspection and maintenance standards in subsection (n). A justification for the inspection and maintenance time frames selected shall be provided, even if the time frame falls within the intervals prescribed in subsection (n). However, an EDC may propose a plan that, for a given standard, uses intervals outside the Commission standard, provided that the deviation can be justified by the EDC's unique circumstances or a cost/benefit analysis to support an alternative approach that will still support the level of reliability required by law.*

Time Interval (Waiver Request)

Duquesne Light is requesting a waiver of the distribution overhead line inspection time interval which would be a continuation of the existing approved waiver for this requirement under its current plan and requests the continued use of the Company's existing five (5) year cycle. The Company's five (5) year inspection cycle for distribution overhead lines and associated equipment is based on (i) accepted utility practice, (ii) the Company's experience in inspecting and maintaining the distribution system and (iii) the Company's use of Infrared Technology to identify problems and perform repairs or replacements before they adversely affect the reliability and safety of the distribution system. Infrared Technology represents a much more thorough inspection practice than just using visual inspections by employees, as this technology can identify problems, such as hot connections, not seen by the naked eye. In addition, as part of identifying worst performing circuits and to resolve individual customer issues, Duquesne Light will infrared either segments or entire circuits of the distribution system out of cycle. Duquesne Light's experience has shown that the effectiveness of its Infrared Technology (on a five year cycle) in the identification of potential problems is superior to doing just visual inspections on a

[4] Commencing in 2017 and for the six year period covered by the Company's LTIIP, the number of circuits inspected will change annually corresponding to work completed under the Company's LTIIP filed at Docket No. P-2016-2540046.

more frequent basis. Moreover, it is not reasonable to presume that issues would be spotted by visual inspection as the distance from the ground to the facilities is too great to be able to spot possible equipment failures. Infrared Technology picks up things that the eye cannot see. Thus, the Company's use of this technology supports this alternative approach to the 1-2 year inspection requirement.

Section 121(A) of the NESC states that "Electric equipment shall be inspected and maintained at such intervals as experience has shown to be necessary." Based on the historical operating experience of the Company and its current PUC Reliability Indices, the Company's five year inspection cycle supports and maintains the reliability of its distribution system.

Finally, a more frequent inspection schedule does not warrant the considerable costs that would be incurred, if a waiver is not granted. The additional cost to conduct these inspections does not justify the benefits that may be achieved as the items that would be identified through this inspection process such as lightning arrestors, cutouts, insulators, ground wires, crossarms, and connectors contribute only 0.107 (average) to the overall SAIFI Index during the last 6 years a number so small that it is not noticed by Duquesne Light's customers.

For all the reasons described above, the Company requests a continuation of the existing waiver of the inspection time intervals for the overhead distribution line inspections and requests continued use of the Company's existing five (5) year cycle.

Distribution Transformer Inspections

Section 57.198(n)(6). Distribution transformer inspections*. Overhead distribution transformers shall be visually inspected as part of the distribution line inspection every 1-2 years. Above-ground pad-mounted transformers shall be inspected at least as often as every 5 years and below-ground transformers shall be inspected at least as often as every 8 years. An inspection must include checking for:*

(i) Rust, dents or other evidence of contact.
(ii) Leaking oil.
(iii) Installation of fences or shrubbery that could adversely affect access to and operation of the transformer.
(iv) Unauthorized excavation or changes in grade near the transformer.

Program Description

Duquesne Light will inspect its overhead transformers by circuit on a five (5) year cycle at the same time the Company performs its overhead distribution line inspections. By conducting this inspection in conjunction with the Company's overhead distribution line inspections the Company will gain efficiencies in its inspection and maintenance plan. Moreover and as described above, the use of Infrared Technology identifies deficiencies and issues that could not be seen in a visual inspection and could potentially lead to reliability and safety issues that could adversely affect the operation of the distribution system.

With respect to above-ground pad mounted transformers and below-ground transformers, Duquesne Light will visually inspect these types of transformers by circuit on an eight (8) year cycle to gain efficiencies with the Company's underground inspection cycles . The purpose of this inspection cycle is to identify issues that would affect the reliability and safety of these transformer assets.

Inspection Process

*Overhead Distribution Transformers***.** Duquesne Light's overhead transformer inspection program will include the use of infrared technology along with a visual inspection to identify the transformers overall condition including, arrestors, rust and leaking oil.

Pad-Mounted Transformers. Duquesne Light's pad-mounted transformer inspection will include a visual inspection to identify rust, leaking oil, accessibility and unauthorized excavation or changes in grade.

*Below-Ground Transformers***.** Duquesne Light's below-grade transformer inspection will include a visual inspection to identify accessibility, unauthorized excavation near or around manhole covers and any transformer rust or leaking oil.

Inspection Plan	Type	Transformer Inspections Planned by Circuit *(Number of Circuits inspected)*	
		2018	2019
Duquesne Light Company *Total Circuits (648[5])*	Overhead Transformers (5-Year cycle by circuit)	130	130
	Pad-mounted and Below-Ground Transformers (8-Year Cycle by circuit)	81	81

Justification

Section 57.198(c). Time frames*. The plan must comply with the inspection and maintenance standards in subsection (n). A justification for the inspection and maintenance time frames selected shall be provided, even if the time frame falls within the intervals prescribed in subsection (n). However, an EDC may propose a plan that, for a given standard, uses intervals outside the Commission standard, provided that the deviation can be justified by the EDC's unique circumstances or a cost/benefit analysis to support an alternative approach that will still support the level of reliability required by law.*

Time Interval (Waiver Request)

a) **Overhead Transformers.** Duquesne Light is requesting a waiver of the distribution overhead transformer inspection time interval which would be a continuation of the existing approved waiver under its current plan and requests that it continue to use a five (5) year cycle by circuit. The Company's justification for its five year inspection cycle of its overhead distribution transformers is the same as those provided above under the Justification section for the overhead distribution line inspections time interval. Thus, the Company seeks a waiver of the time interval for overhead transformer inspections for the same reasons set forth above.

b) **Pad-Mounted Transformers.** Duquesne Light is requesting a waiver that would be a continuation of the existing approved waiver under its current plan for the above ground pad mount transformer visual inspection time interval and requests that it continue to use an eight (8) year cycle by circuit. An eight year inspection cycle coincides with the below-ground distribution transformer inspection cycle as provided under the PUC's Inspection and Maintenance Standards, 52 Pa. Code §57.198(n)(6), and it is more cost effective to combine the inspection cycles of the Company's underground transformer plant by circuit into one program under the eight (8) year cycle by circuit requirement. The eight (8) year inspection cycle by circuit is based on accepted utility practice and the Company's experience with its underground transformer distribution assets.

Moreover, the additional cost does not justify the benefit that would be gained in the Company's reliability indices as all transformers (pad-mounted, below-grade and

[5] See Footnote 4, page 12.

overhead) contribute less than 0.025 on average to the overall SAIFI Index during the last 6 years. It is also more effective to combine the inspection cycles because of the unique skill sets required to do these types of inspections. In addition, Section 121(A) of the NESC states that "Electric equipment shall be inspected and maintained at such intervals as experience has shown to be necessary." Based on the historical operating experience of the Company and its current PUC Reliability Indices, an 8 year cycle by circuit will support the continued reliability of these assets on the distribution system.

For all the reasons described above, the Company requests a continuation of the existing waivers of the time intervals for the overhead distribution transformers and pad-mounted transformers inspections.

Recloser Inspections

Section 57.198(n)(7). Recloser inspections. *Three-phase reclosers shall be inspected on a cycle of 8 years or less. Single-phase reclosers shall be inspected as part of the EDC's individual distribution line inspection plan.*

Program Description

Duquesne Light's recloser inspection plan consists of two types of inspections. First, Duquesne Light's 23kV reclosers are equipped with communication devices that report on the status and the condition of the devices to the Company's distribution operating center. Because the 23kv reclosers have this feature, the Company uses the automated self-reporting provided by each device to determine if issues exist on a real time basis. Second, three-phase and single-phase reclosers are inspected both visually and with the use of Infrared Technology as part of the overhead distribution line inspections described above.

Inspection Process

23kV reclosers are equipped with communication devices that report on the status and the condition of the devices to the Company's distribution operating center.

Three-phase and single-phase reclosers are inspected both visually and with the use of Infrared Technology as part of the overhead distribution line inspections described above.

Inspection Plan	**Recloser Inspections Planned** *(Number of Circuits)*	
	2018	**2019**
Duquesne Light Company *Total Circuits (648[6])*	130	130

Justification

*Single-Phase***.** To the extent a waiver is required for single-phase recloser inspections because such inspections are conducted as part of the Company's overhead distribution line inspections program, Duquesne Light is requesting a waiver which would be a continuation of the existing waiver of this requirement under its current plan, as single phase reclosers are inspected on a five (5) year cycle by circuit. The Company's justification for its five year inspection cycle is the same as those provided above under the Justification section above for the overhead distribution line inspections time interval.

*Three-Phase***.** Based on the historical operating experience of the Company, devices are automated and provide real-time status and operating condition, which allows the Company to identify and correct equipment issues before they adversely affect the reliability and safety of the distribution system and assets. The 23kV reclosers are providing an "inspection" to Duquesne Light at all times by communicating with the distribution operating center. In addition to the

[6] See Footnote 4, page 12.

self-reporting feature of the 23kV reclosers, all reclosers, regardless of voltage are visually and infrared inspected as part of the Company's overhead distribution line inspections on a five (5) year cycle by circuit. Thus, the Company's three-phase recloser inspection program complies with the inspection and maintenance standards set forth in 52 Pa. Code § 57.198(n)(7).

Substation Inspections

Section 57.198(n)(8). Substation inspections*. Substation equipment, structures and hardware shall be inspected on a cycle of 5 weeks or less.*

Program Description

Duquesne Light inspects its distribution substations twelve times annually. The purpose of the substation inspections is to identify any emerging issues within the substation so they can be corrected in a timely manner.

Inspection Process

Duquesne Light field personnel perform a distribution substation inspection using a check list of items. Once the inspection is complete, the field personnel provide the checklist to the Company's work planning group and they enter follow-up items into the Company's maintenance database. Specific groups are assigned to investigate and resolve each issue based on equipment type and condition reported. Items are given a priority from 1-10 with 10 being the most critical. The criticality of reported problems may be adjusted once an engineering review is conducted and an action plan is generated to either repair or replace.

Specific items that are checked during these inspections include the following:

- Stolen or defective grounds
- Check gauges, batteries, chargers and valves for abnormal readings
- Unauthorized entry and/or fencing, signage issues
- Check relay and major equipment for any abnormal or unusual conditions
- Review integrity of structures

Inspection Plan	**Substation Inspections Planned** *(Number of Company Stations) (x 12 times annually)*	
	2018	**2019**
Duquesne Light Company *Total Stations (170[7])*	2,040	2,040

Justification

Duquesne Light's inspection of its distribution substations twelve times annually is based on accepted utility standards and its experience with performing these inspections. Duquesne Light complies with the inspection and maintenance standards for substations set forth in 52 Pa. Code § 57.198(n)(8). A waiver is not being requested for this section.

[7] The number of substations varies from the 2016-2017 Biennial Plan as several substations have been taken out of service as part of Duquesne Light's on-going infrastructure upgrades. In addition, commencing in 2017 and for the six year period covered by the Company's LTIIP, the number of substations inspected will change annually in relation to work completed throughout the duration of the LTIIP.