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November 1, 2012

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**VIA OVERNIGHT DELIVERY**

Ms. Rosemary Chiavetta, Secretary  
Pennsylvania Public Utility Commission  
Commonwealth Keystone Building  
400 North Street  
Harrisburg, PA 17120-0200

PA PUBLIC UTILITY COMMISSION  
SECRETARY'S BUREAU

**Re: Duquesne Light Company  
2012 Third Quarter Electric Reliability Report; Request to Revise The  
Company's Biennial Inspection, Maintenance, Repair and Replacement  
Plan and Request for Waiver in the Event the Plan Revisions Are Not  
Approved**

Dear Secretary Chiavetta:

Enclosed for filing is the Third Quarter Electric Reliability Report of Duquesne Light Company ("Duquesne Light" or the "Company"), in accordance with the Commission's Order at L-00030161, entered March 20, 2006. Duquesne is submitting both a public version [all information except subsection (e)(10)] and a confidential version. The confidential version includes all of the information required by 52 Pa. Code § 57.195, is marked "confidential and proprietary" and is enclosed in a sealed envelope.

Duquesne respectfully requests the "confidential and proprietary" version not be made available to the public.

Duquesne Light also notes that it is requesting three proposed revisions to its current Biennial Inspection, Maintenance, Repair and Replacement Plan ("Inspection and Maintenance Plan" or "Plan"), pursuant to 52 Pa. Code § 57.198(1). The proposed revisions are to (1) combine the two separate benchmark requirements, by county, into a single benchmark requirement; (2) increase the 4 kV recloser benchmark to reflect the actual number of 4 kV reclosers on the Company's distribution system; and (3) update and modify the information contained in the Inspection and Maintenance Plan relating to the "Reference Documents."

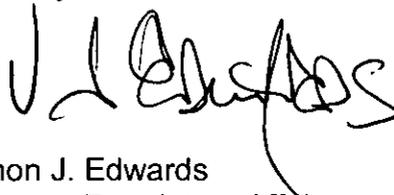
Under 52 Pa. Code § 57.198(1), electric distribution companies may request revisions to their Inspection and Maintenance Plan by submitting an Addendum to their quarterly reliability reports that describes the proposed revisions to the Plan and provides a discussion of the reasons for the revisions. Consistent with 52 Pa. Code § 57.198(1),

Duquesne Light is submitting an Addendum to this quarterly reliability report that contains a statement explaining the reasons for the revisions, as well as a black-lined and unmarked version of the Company's Inspection and Maintenance Plan reflecting the proposed changes.

In addition, in the event that the Commission does not approve the proposed revisions to the Plan, Duquesne Light requests a waiver of the separate county vegetation management benchmark requirement for 2012, to allow the Company to combine the two vegetation management benchmarks for Beaver and Allegheny Counties into one overall benchmark. This request is further explained in the Addendum to the quarterly reliability report.

If you have any questions regarding the information provided, please contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'V. J. Edwards', written in a cursive style.

Vernon J. Edwards  
Manager, Regulatory Affairs

Enclosures

cc: (Public Version):

Mr. W. Williams – Bureau of CEEP

Ms. Y. Snowberger – Bureau of CEEP

Mr. I. A. Popowsky – Office of Consumer Advocate

Office of Small Business Advocate



*Duquesne Light Company*  
*3<sup>rd</sup> Quarter 2012*  
*Electric Reliability Report*  
*to the*  
*Pennsylvania Public Utility Commission*

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SECRETARY'S BUREAU

*November 1, 2012*

**DUQUESNE LIGHT COMPANY  
Third Quarter 2012 – Electric Reliability Report**

**Filed November 1, 2012**

**57.195 Reporting Requirements**

**(d)(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 Kallis – Manager, Asset Management  
(412) 393-8613, kkallis@duqlight.com

Vernon J. Edwards – Manager, Regulatory Affairs  
(412) 393-3662, vedwards@duqlight.com

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

No major events occurred during the third quarter of 2012.



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

With respect to the Company's worst performing circuits, the Company goes through the following evaluation to make that determination:

Circuits are evaluated based on a rolling twelve-month count of lockouts of protective devices (circuit breakers, sectionalizers and line reclosers). Circuits that experience four or more lockouts for a device in each quarterly rolling twelve-month period are identified and reported, because customer surveys show that a significant drop in satisfaction occurs when customers experience four or more interruptions in a year, and that threshold was therefore used as a basis for this evaluation method.

Next, the list is ranked first by the date of the most recent outage, with a secondary sort based on number of lockouts. This places a higher priority on circuits experiencing problems in the most recent quarter. Circuits that have not seen recent outages fall to a lower priority, but remain on the list for monitoring.

Finally, circuits that appear on the list for more than a year will be targeted for remediation based on a review of outage records for root cause identification, field evaluations, and engineering analysis.

This circuit analysis method requires timely review by in-house staff and provides a true representation of the dynamic nature of the Company's distribution system. The report will capture all circuits that have experienced four or more lockouts which may produce a result greater or less than 5% of the total circuits in the system. Reports will be issued on all circuits that violate the four-lockout threshold, even if the total is greater than 5% of the number of circuits on the system.

See Attachment A for a listing of the Company's worst performing circuits as described above, including circuit reliability values and service centers associated with each such circuit.

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

**Third Quarter Rolling 12 Months**

Rank	Circuit	Name	Service Center	Remedial Actions Planned or Taken
1	23733	Universal	Penn Hills	Outages resulted from 1) a primary conductor downed by a fallen tree, 2) a tree blown on to a cross arm from outside the R/W, 3) a wire down caused by equipment failure and 4) an accidental fault caused while crew was pulling new conductor with EA686 in Hot Line Tag. The downed wire conditions were permanently repaired. The VM problems were deemed non-preventable as they were both healthy trees that were damaged by high winds that blew them into the conductor R/W. Both tree issues were resolved at the time the outages were restored. No further VM action is required at this time.
2	23903	Plum –EA12	Penn Hills	Outages resulted from 1) two incidents where trees fell across 3-Phase primary, 2) a 611 insulator failure and 3) C-Phase conductor downed during a storm. The 611 failure and wire down condition were permanently repaired and all tree issues were resolved at the time the outages were restored. (Note: This is a separate branch of the circuit and these outages did not affect customers beyond EA622.)
		Plum – EA622	Penn Hills	Outages resulted from 1) an incident where A & B Phase conductors wrapped together and had to be separated by a troubleshooter, 2) a broken pole due to vehicle accident, 3) a storm and 4) an outage of unknown cause as no problem was ever found. The broken pole was replaced and storm damage repaired. (Note: This is a separate branch of the circuit and these outages did not affect customers beyond EA12.)
3	22869	Midland-Cooks Ferry	Raccoon	Outages resulted from 1) a jumper failure while carrying a portion of another circuit, 2) A-Phase conductor downed due to lightning, 3) primary down in multiple locations during a storm, 4) a jumper burned open, 5) 4/0 conductor burned down outside Midland Sub during a storm, and 6) Breaker lockout due to unknown causes. Permanent repairs have been made for all outages. Also, automatic protection device settings have been improved to assure that they adequately protect downstream lines and trip before the breaker for all downstream faults. VM is currently working the entire circuit as part of its scheduled maintenance program for 2012 and this work will be completed before the end of the year. All tree-related issues on the circuit are being addressed. Engineering completed a visual & an infrared survey of the circuit and identified a number of connector & lightning arrester problems. Construction will make noted repairs during the 4th QTR of 2012. Also, Asset Management is evaluating the need to re-conductor portions of this circuit.
4	4266	Grant	Preble	All 4 outages were cable related. 1st outage was due to cable damage sustained when an adjacent cable on circuit 4264 failed. 2nd outage due to cable failure on a terminal pole under U-Guard. Last two outages were only temporary and circuit went back each time. An intermittent cable fault was suspected. Rerouted suspect bad cable section from an adjacent circuit to test. Found the bad cable section and made permanent repairs. No additional cable problems are expected.
5	23870	Mt Nebo	Raccoon	All 5 Outages were due to tree related problems. In two of the incidents, an insulator was broken. The damaged insulators were repaired. The tree issues involved were addressed at the time of the outage incidents and VM had reviewed the affected portion of the circuit and found no additional immediate tree issues to address. VM is currently working the entire circuit during the 4th quarter as part of VM's scheduled maintenance program. This work is expected to be completed before the end of 2012, which will address any additional tree issues on other sections of the circuit.

- (e)(5) **A rolling 12-month breakdown and analysis of outage causes during the preceding quarter, including the number and percentage of service outages, the number of customers interrupted, and customer interruption minutes categorized by outage cause such as equipment failure, animal contact, tree related, and so forth. Proposed solutions to identified service problems shall be reported.**

**October 1, 2011 through September 30, 2012 – No PUC Major Event Exclusions**

CAUSE	NO. OF OUTAGES	OUTAGE PERCENTAGE	KVA TOTAL	KVA PERCENTAGE	KVA-MINUTE TOTAL	KVA-MINUTE PERCENTAGE
Storms	541	17%	980,292	20%	130,552,124	23%
Trees (Contact)	71	2%	107,359	2%	8,866,506	2%
Trees (Falling)	688	22%	1,318,006	26%	179,909,277	32%
Equipment Failures	844	27%	1,469,612	29%	155,967,094	27%
Overloads	381	12%	256,255	5%	18,075,167	3%
Vehicles	151	5%	356,935	7%	43,846,790	8%
Other	429	15%	519,203	11%	31,158,147	5%
<b>TOTALS</b>	<b>3,105</b>	<b>100%</b>	<b>5,007,662</b>	<b>100%</b>	<b>568,375,105</b>	<b>100%</b>

- (e)(6) **Quarterly and year-to-date information on progress toward meeting transmission and distribution inspection and maintenance goals/ objectives.**

2012 Transmission and Distribution Goals and Objectives		Target for 2012 3Q	Actual for 2012 3Q	Percent Complete	Targets for Year 2012	YTD Actuals Year 2012	Percent Complete
<b>Program Project</b>	<b>Unit of Measurement</b>						
<b>Communications Goals</b>							
Communication Battery Maintenance	Batteries	24	24	100%	96	72	75%
<b>Overhead Distribution Goals</b>							
Sectionalizer and Reclosers	Devices	247	250	101%	497	500	101%
<b>Overhead Transmission Goals</b>							
Tower Helicopter Inspections	Number of Towers	0	500	N/A	500	500	100%
Tower Ground Detail Inspections	Number of Towers	125	134	107%	300	327	109%
<b>Substations Goals</b>							
Breaker Maintenance	Breakers	225	188	84%	828	650	79%
Transformer Maintenance	Transformers	10	5	50%	74	61	82%
Station Battery Maintenance	Batteries	245	245	100%	980	734	75%
Station Relay Maintenance	Relays	800	1058	132%	2,783	2,204	79%
<b>Underground Distribution Goals</b>							
Manhole Inspections	Manholes	200	133	67%	750	717	96%
Network Vault Inspections	Network Vault Sites	60	0	0%	238	238	100%
Network Protector Inspections	Network Protectors	150	0	0%	586	586	100%
Network Transformer Inspections	Network Transformers	150	0	0%	586	586	100%
<b>Underground Transmission Goals</b>							
Pressurization and Cathodic Protection Plant Inspection	Work Packages	13	13	100%	52	39	75%
<b>Vegetation Management Goals</b>							
Overhead Line Clearance	Circuit Overhead Miles	365	409	112%	1,300	909	70%
<b>Total Units</b>		<b>2,614</b>	<b>2,959</b>	<b>113%</b>	<b>9,570</b>	<b>8,123</b>	<b>85%</b>

- (e)(7) **Quarterly and year-to-date information on budgeted versus actual transmission and distribution operation and maintenance expenditures in total and detailed by the EDC's own functional account code or FERC account code as available.**

Operating and Maintenance	2012 Budget	3 <sup>rd</sup> Qtr. Actual	3 <sup>rd</sup> Qtr. Budget	YTD Actual	YTD Budget
Total	\$195,089,585	\$50,213,210	\$50,971,666	\$136,319,204	\$142,799,376

- (e)(8) **Quarterly and year-to-date information on budgeted versus actual transmission and distribution capital expenditures in total and detailed by the EDC's own functional account code or FERC account code as available.**

Capital	2012 Budget	3 <sup>rd</sup> Qtr. Actual	3 <sup>rd</sup> Qtr. Budget	YTD Actual	YTD Budget
Total	\$187,595,649	\$43,770,967	\$43,794,214	\$142,623,451	\$147,296,042

Duquesne Light Company's Transmission and Distribution Operating and Maintenance (e)(7) and Transmission and Distribution Capital (e)(8) Budgets and Expenditures consist of the following work elements:

- o Restoration of Service costs includes expenses to restore service to customers during storm-related events, and restoration from outages caused by system and component equipment failures.
- o Customer Commitment costs includes expenses to satisfy residential, commercial, industrial and governmental initiated work requests.
- o System Maintenance costs include expenses for programmed preventive and corrective maintenance work.
- o System Improvement costs include expenses incurred to provide load relief in growth areas identified through system assessment, as well as continued targeted replacement of systems and components based on maintenance findings and trended useful life.
- o Utility costs required to enhance and maintain systems and processes necessary in support of the utility operations including metering systems, technology development to satisfy hardware and system application needs, transmission and distribution planning, all revenue cycle processes and all Operations support and Administrative and General expenses.

(e)(9) Dedicated staffing levels for transmission and distribution operation and maintenance at the end of the quarter, in total and by specific category (e.g. linemen, technician, and electrician).

<b>Telecom</b>	Electronic Technician	7	
	Sr. Electronic Tech	11	
	Telecom Splicer/Trouble	6	
	<b>Total</b>	<b>24</b>	
<b>Substation</b>	Electrical Equipment Tech	24	
	Protection & Control Tech	27	
	Sr. Elec. Equipment Tech	9	
	<b>Total</b>	<b>60</b>	
<b>Underground</b>	Journey Apprentice	13	
	Driver Helper	0	
	UG Inspector	4	
	Journey UG Splicer	13	
	Sr. UG Splicer	5	
	UG Cable Tester/Installer	10	
	UG Mechanic	5	
	Network Operator	7	
	<b>Total</b>	<b>57</b>	
<b>Overhead</b>	Apprentice T&D	41	
	Rigger Specialist	5	
	Equipment Attendant	1	
	Equipment Material Handler	6	
	Field Inspector	5	
	Journey Lineworker	82	
	Restricted HS Lineworker	7	
	Rigger Crew Leader	1	
	Service Crew Leader	5	
	Shop Mechanic 2 Rigger	1	
	Yard Group Leader	4	
	Sr. Lineworker	58	
	Distribution Tech	6	
	<b>Total</b>	<b>222</b>	
	<b>Street Light Changers</b>	<b>Total</b>	<b>6</b>
	<b>Mobile Worker</b>	<b>Total</b>	<b>2</b>

**(e)(9) (Continued)**

<b>Engineering</b>	Drafter	0
	General Clerk - Grad	11
	GIS Technician B	4
	Head File Record Clerk	1
	Survey Instrument	3
	Right of Way Agent A	4
	Sr. Technician	7
	T&D Mobile Worker	8
	Technician A	2
	Technician B	7
	Technician C	5
	Test Technician, Mobile	5
	<b>Total</b>	<b>57</b>
<b>Service Center Technician</b>	Sr. Technician	7
	Technician	5
	<b>Total</b>	<b>12</b>
<b>Traveling Operator/Troubleshooter</b>	Senior Operator	35
	Traveling Operator	7
	Troubleshooter 1/C	2
	Troubleshooter	11
	<b>Total</b>	<b>55</b>
<b>Load Dispatcher</b>	<b>Total</b>	<b>9</b>
<b>Meter Technician</b>	Meter Technician	3
	Sr. Meter Technician	26
	<b>Total</b>	<b>29</b>
<b>Meter Reader</b>	<b>Total</b>	<b>14</b>
<b>Customer Service Representatives</b>	Autodialing Operator	7
	Customer Service Rep	107
	Word Processing Clerk	2
	Sr. Customer Service	3
	<b>Total</b>	<b>119</b>
<b>Admin/Supervisory/Mgmt</b>	<b>Total</b>	<b>390</b>
<b>TOTAL</b>		<b>1,056</b>

**(e)(10) Quarterly and year-to-date information on contractor hours and dollars for transmission and distribution operation and maintenance.**

(Confidential information redacted)

**3<sup>rd</sup> Quarter 2012**

Contractor Dollars:

Contractor Hours:

**YTD 2012**

Contractor Dollars:

Contractor Hours:

In preparing the 3<sup>rd</sup> Quarter report, a discrepancy was found in the 1<sup>st</sup> Quarter and 2<sup>nd</sup> Quarter reported contractor hours. The contractor dollars reported were correct. Please see below for the revised contractor hours.

**1<sup>st</sup> Quarter**

Contractor Hours

1<sup>st</sup> Quarter YTD

**2<sup>nd</sup> Quarter**

Contractor Hours

2<sup>nd</sup> Quarter YTD

**(e)(11) Monthly call-out acceptance rate for transmission and distribution maintenance workers presented in terms of both the percentage of accepted call-outs and the amount of time it takes the EDC to obtain the necessary personnel. A brief description of the EDC's call-out procedure should be included when appropriate.**

**Call-Out Acceptance Rate – 3<sup>rd</sup> Quarter 2012**

Month	Accepts	Refusals	Total	Percentage
July	241	581	822	29%
August	171	431	602	28%
September	276	719	995	28%

**Amount of Time it Takes to Obtain the Necessary Personnel – 3<sup>rd</sup> Quarter 2012**

Month	Total Callout Events	Necessary Personnel Accepting	Average Minutes per Calling Event	Average Minutes to Obtain Necessary Personnel
July	108	241	14.2 : 1,536/108	6.4 : 1,536/241
August	67	171	14.0 : 941/67	5.5 : 941/171
September	104	276	11.1 : 1,150/104	4.2 : 1,150/276
<b>3<sup>rd</sup> Quarter 2012</b>	<b>279</b>	<b>688</b>	<b>13.0 : 3,627/279</b>	<b>5.3 : 3,627/688</b>
<b>YTD</b>	<b>755</b>	<b>1,909</b>	<b>16.0 : 12,180/755</b>	<b>6.4 : 12,180/1,909</b>

The numerator in the above equations equals the total number of minutes all of the callouts took during the given month/quarter/year. The denominator in the above

equations equals the total number of callout events or the total number of workers accepting during the given month/quarter/year.

As an example, during the month of July, on average, it took Duquesne Light, 6.4 minutes, per worker, to obtain 241 accepts during the 108 callouts. It took Duquesne Light, on average, 14.2 total minutes to obtain the necessary personnel for each of its 108 callouts.

**ATTACHMENT A**  
**Worst Performing Circuits**

Circuit	Name	Service Center	Device	Lockouts	Connected KVA	Last Outage	Total KVA-Minutes	Total KVA Interrupted	SAIDI	SAIFI	CAIDI
23733	Universal	Penn Hills	EA686	4	26,095	7/24/12	3,901,598	63,110	150	2.42	62
23903	Plum	Penn Hills	EA12, EA622	8	28,245	7/26/12	8,822,337	85,835	312	3.04	103
22869	Midland-Cooks Ferry	Raccoon	BKR	6	34,481	9/12/12	20,853,612	68,961	605	2.00	302
4266	Grant	Preble	BKR	4	5,879	9/26/12	3,396,896	28,180	578	4.79	121
23870	Mt. Nebo	Raccoon	WA551	5	26,795	9/27/12	16,149,097	104,706	603	3.91	154

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## **ADDENDUM**

### **DUQUESNE LIGHT COMPANY REASONS FOR MODIFYING ITS BIENNIAL INSPECTION, MAINTENANCE, REPAIR AND REPLACEMENT PLAN AND ALTERNATIVE REQUEST FOR WAIVER IF THE REVISIONS ARE NOT APPROVED**

#### **I. INTRODUCTION**

Pursuant to 52 Pa. Code § 57.198(l), Duquesne Light Company (“Duquesne Light” or the “Company”) requests that the Pennsylvania Public Utility Commission (“Commission”) approve revisions to the Company’s Biennial Inspection, Maintenance, Repair and Replacement Plan (“Inspection and Maintenance Plan” or “Plan”). Under 52 Pa. Code § 57.198(l), if an electric distribution company (“EDC”) seeks to amend its Inspection and Maintenance Plan, the EDC is required to submit an Addendum to its quarterly reliability report which contains the revisions to the EDC’s Inspection and Maintenance Plan, along with an explanation of the reasons for the revisions. Below, Duquesne Light explains the revisions to its Plan and the reasons why such revisions are appropriate. In addition, a redlined version of the Company’s Inspection and Maintenance Plan is provided in this Addendum.

In the event that the Company’s proposed plan revisions are not approved, the Company is also requesting a waiver of the separate Allegheny and Beaver county vegetation management inspection benchmarks for 2012. This request for waiver is explained in more detail below.

#### **II. PROPOSED REVISIONS**

The Company proposes three revisions to its Inspection and Maintenance Plan. The first proposed revision relates to the Company’s inspection benchmarks.<sup>1</sup> The Company has separate inspection benchmarks for Beaver and Allegheny Counties, the only two counties in which the

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<sup>1</sup> The inspection benchmarks are (1) line clearance and vegetation management, by miles; (2) pole inspections, by number of poles; (3) overhead line inspection, by number of circuits; (4) transformer inspections, by number of circuits; (5) recloser inspections, by number of circuits; and (6) substation inspections, by number of substations.

Company provides service. In this filing, the Company is proposing to combine the two benchmarks into one.

The Company organizes all of its inspection and maintenance activities out of one location for both counties. The Company has found that performing inspection and maintenance work on a county basis is administratively burdensome and complicated because the Company conducts inspection and maintenance activities by circuit, and the Company's distribution circuits are not separated by county. Moreover, this change will also provide Duquesne Light with more flexibility to adjust maintenance plans to address "Worst Performing Circuits" in its service territory and to coordinate and conduct inspection and maintenance work in conjunction with any capital work on the distribution system.

With this proposed revision, Duquesne Light Company's inspection and maintenance activities will continued to be distributed across the service territory to maintain reliability and safety over its entire distribution system. This change does not impact or affect the quantity, frequency or methods that the Company employs to inspect and maintain its distribution system, but simply captures the way in which the Company deploys work and does business.

The second proposed revision is to increase the recloser inspections benchmark to reflect the 4 kV reclosers on the 23 kV distribution systems, as these 4 kV reclosers were inadvertently omitted from the benchmark under the current Plan. Duquesne Light notes that the change is administrative only because the Company has been inspecting all reclosers as part of its Overhead Distribution Line Inspection Program.

Finally, the third proposed revision is to modify and update the information in the Inspection and Maintenance Plan relating to the "Reference Documents" information.

In summary, the Company's proposed revisions to its Inspection and Maintenance Plan should be approved because they do not reduce the Company's overall inspection requirements, but allow the Company to better meet its operational and reliability requirements. The Company also notes that these revisions are consistent with the Company's proposed Inspection and Maintenance Plan for 2014-2015 that was filed on October 1, 2012 at Docket No. M-2009-2094773.

### **III. REQUEST FOR WAIVER**

In the event that the Commission does not approve the Company's proposed Inspection and Maintenance Plan revisions, the Company respectfully requests that the Commission grant the Company a waiver of the separate Allegheny and Beaver county benchmarks as they relate to vegetation management for 2012. The Company will meet and currently estimates that it may possibly exceed the 1,300 miles of vegetation management benchmark in the Inspection and Maintenance Plan for 2012. The Company has varied from the individual county requirements in order to proactively address those circuits in most need of vegetation work. For these reasons, and the reasons explained above, Duquesne Light requests a waiver of the separate county benchmark requirements for its Vegetation Management Plan for 2012, to the extent necessary.

Marked and Clean Copies of the 2012- 2013 Biennial  
Inspection, Maintenance, Repair and Replacement Plan

**Biennial Inspection, Maintenance, Repair and Replacement Plan  
Of Duquesne Light Company  
For the period of January 1, 2012 – December 31, 2013**

Submitted by:

Ken Kallis

2839 New Beaver Avenue

Pittsburgh, PA 15233

(412) 393-8613

kkallis@duqlight.com

Deleted: Pamela L. Niehaus

Deleted: 8446

Deleted: pnichaus

Dated: October 1, 2010

Amended: November 1, 2012

**Request and Justification for amendments to existing Inspection and Maintenance Plan:**

Duquesne Light Company (the "Company" or "Duquesne Light") proposes three revisions to its Inspection and Maintenance Plan. The first proposed revision relates to the Company's inspection benchmarks.<sup>1</sup> The Company has separate inspection benchmarks for Beaver and Allegheny Counties, the only two counties in which the Company provides service, and is proposing to combine the two benchmarks into one.

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The Company organizes all of its inspection and maintenance activities out of one location for both counties. The Company has found that performing inspection and maintenance work on a county basis is administratively burdensome and complicated because the Company conducts inspection and maintenance activities by circuit, and the Company's distribution circuits are not separated by county. Moreover, this change will also provide Duquesne Light with more flexibility to adjust maintenance plans to address "Worst Performing Circuits" in its service territory and to coordinate and conduct inspection and maintenance work in conjunction with any capital work on the distribution system.

With this proposed revision, Duquesne Light Company's inspection and maintenance activities will continued to be distributed across the service territory to maintain reliability and safety over its entire distribution system. This change does not impact or affect the quantity, frequency or methods that the Company employs to inspect and maintain its distribution system, but simply captures the way in which the Company deploys work and does business.

The second proposed revision is to increase the recloser inspections benchmark to reflect the 4 kV reclosers on the 23 kV distribution systems, as these 4 kV reclosers were inadvertently omitted from the benchmark under the current Plan. Duquesne Light notes that the change is administrative only because the Company has been inspecting all reclosers as part of its Overhead Distribution Line Inspection Program.

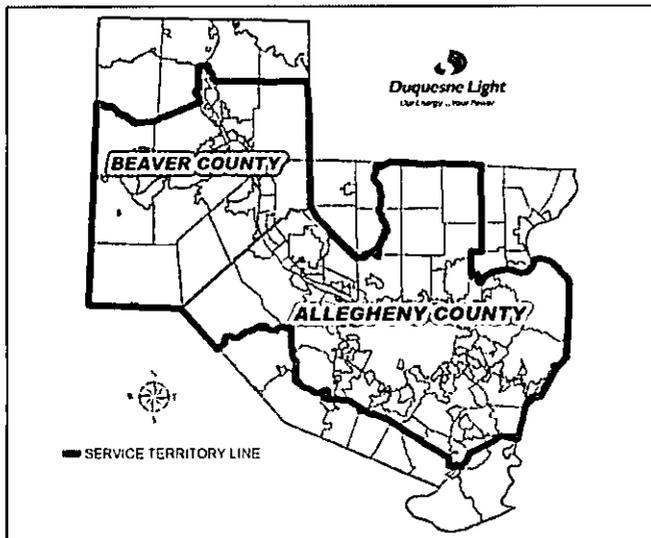
Finally, the third proposed revision is to modify and update the information in the Inspection and Maintenance Plan relating to the "Reference Documents" information.

In summary, the Company's proposed revisions to its Inspection and Maintenance Plan do not reduce the Company's overall inspection requirements, but allow the Company to better meet its operational and reliability requirements. The Company also notes that these revisions are consistent with the Company's proposed Inspection and Maintenance Plan for 2014-2015 that was filed on October 1, 2012 at Docket No. M-2009-2094773.

<sup>1</sup> The inspection benchmarks are (1) line clearance and vegetation management, by miles; (2) pole inspections, by number of poles; (3) overhead line inspection, by number of circuits; (4) transformer inspections, by number of circuits; (5) recloser inspections, by number of circuits; and (6) substation inspections, by number of substations.

## Introduction

Duquesne Light delivers electricity to approximately 588,000 customers within our service territory 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 our territory is shown below:



The following pages are submitted as Duquesne Light's biannual Inspection and Maintenance Program to meet the recently enacted Pennsylvania Utility Commission's Inspection and Maintenance Standards per Pennsylvania 52 Pa. Code § 57.198. The Duquesne Light Inspection and Maintenance Program as described in this document will be in effect from January 1, 2012 through December 31, 2013 and meets the requirements and intent of the new PUC Inspection and Maintenance Standards which is to ensure the safety and reliability of our Distribution Assets.

In addition to this newly developed inspection and maintenance program, Duquesne Light has existing Inspection and Maintenance Programs for breakers, switches, batteries, substation transformers and other critical transmission and underground assets. All of the company's Inspection and Maintenance Standards and practices are based on generally accepted utility practices and our experience gained over years of maintenance activities performed on our distribution assets. Duquesne Light continues to deploy more automated distribution assets that report on the operation and the condition of devices, which eliminates the need for field personnel visual inspections. In addition, Duquesne Light 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 are to identify potential issues that could affect the reliability and safety of our assets and repair or replace based on condition and potential impact.

### **Record Keeping**

Duquesne Light uses a combination of hand held computers, software packages and paper inspection and maintenance documents for scheduling and recording of information. With our electronic inspection forms, a date, employee number and name are provided to indicate the employee performing the inspection or corrective maintenance. For our paper records, a date and employee signature or initials are provided.

### **Waivers Requested**

Duquesne Light is requesting waivers for the following items:

- Pole Loading Calculations – Section 2
- Distribution Line Inspection Interval – Section 4
- Distribution Overhead Transformer Inspection Interval – Section 6
- Distribution above ground pad-mounted Transformer Inspection Interval – Section 6

### **Justification for Waivers**

As stated in the National Electrical Safety Code (NESC), 121.A, "lines and equipment shall be inspected at such intervals as experience has shown to be necessary," which in the case of each waiver requested above, our experience has shown these items have minimal impact on the reliability and safety of our distribution system. A review of our reliability indices for all equipment failures relates to less than 1/3 of our SAIFI and SAIDI Indices, therefore, the amount of money to increase the Inspection Intervals on the items noted above does not provide a cost benefit analysis which is favorable to Duquesne Light or its customers. Duquesne Light estimates that at a minimum it would cost \$10 million to accommodate the items noted above if a waiver is not granted. See the charts below:



Figure DLC-1

Equipment Failure Contribution to SAIFI Indices

	2009	2008	2007	2006	2005	2004
	SAIFI	SAIFI	SAIFI	SAIFI	SAIFI	SAIFI
Transformer	0.020	0.026	0.041	0.031	0.024	0.032
Capacitor	0.000	0.001	0.001	0.001	0.000	0.000
Recloser	0.000	0.007	0.001	0.000	0.000	0.000
Sectionalizer	0.012	0.002	0.009	0.002	0.005	0.000
Lightning Arrestor	0.004	0.014	0.010	0.013	0.014	0.012
Sectionalizing Switch	0.006	0.001	0.002	0.009	0.011	0.011
Cutout	0.002	0.003	0.011	0.005	0.001	0.001
Substation Equipment	0.026	0.061	0.014	0.022	0.027	0.071
Voltage Regulator	0.012	0.000	0.001	0.000	0.000	0.000
Cable	0.090	0.110	0.061	0.062	0.075	0.082
Cable Joint or Splice	0.022	0.011	0.013	0.018	0.019	0.031
Termination	0.021	0.020	0.020	0.014	0.018	0.013
Tower/H Frame/Pole	0.004	0.007	0.004	0.006	0.004	0.002
Insulator	0.061	0.040	0.031	0.042	0.061	0.065
Guy/Msg/Grnd Wire	0.000	0.000	0.002	0.000	0.000	0.000
Crossarm	0.001	0.012	0.003	0.002	0.004	0.005
Connector/Jumper	0.090	0.068	0.068	0.066	0.083	0.095
	0.372	0.382	0.288	0.293	0.345	0.420
System SAIFI	0.97	0.990	0.800	0.800	0.990	1.030

**Figure DLC-2**
**Equipment Failure Contributions to SAIDI Indices**

	2009	2008	2007	2006	2005	2004
	SAIDI	SAIDI	SAIDI	SAIDI	SAIDI	SAIDI
Transformer	2.46	2.68	4.47	2.93	3.28	3.20
Capacitor	0.00	0.04	0.08	0.03	0.00	0.00
Recloser	0.01	0.25	0.24	0.01	0.05	0.02
Sectionalizer	0.41	0.36	0.49	0.29	0.26	0.00
Lightning Arrestor	0.54	0.84	0.51	1.00	0.72	0.84
Sectionalizing Switch	0.57	0.33	0.67	1.26	0.91	0.45
Cutout	0.23	0.22	0.41	0.33	0.12	0.15
Substation Equipment	1.60	6.34	0.67	0.66	1.35	3.30
Voltage Regulator	0.17	0.00	0.03	0.00	0.00	0.00
Cable	8.10	7.12	5.56	7.80	7.45	9.02
Cable Joint or Splice	1.18	0.73	1.20	1.52	2.01	2.42
Termination	1.73	1.74	2.06	1.64	1.90	2.31
Tower/H Frame/Pole	0.47	1.10	0.75	0.25	0.31	0.41
Insulator	10.60	4.06	3.79	4.06	6.40	6.74
Guy/Msg/Grnd Wire	0.01	0.11	0.22	0.03	0.00	0.00
Crossarm	0.07	1.15	0.15	0.17	0.41	2.91
Connector/Jumper	7.13	7.09	5.99	5.18	6.26	6.03
	35.29	34.15	27.29	27.16	31.42	37.81
System SAIDI	82	98	86	82	97	95

Duquesne Light's PUC reliability indices confirm that our existing inspection and maintenance are effective as SAIFI has been below PUC Benchmark since 2004 and CAIDI has been below PUC benchmark since 1998.

*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 Company professionally manages a comprehensive vegetation program utilizing industry best management practices to provide the safe and reliable distribution of electrical energy. This extensive program, including select tree pruning and removal within the rights-of-way (ROW), hazard tree assessment and removal of defective, dead, or diseased trees within or along the ROW targeting the facilities, and the selective mechanical and/or chemical control of incompatible tall-growing brush within the ROW, is specifically defined for the management of vegetation on the Company's rights-of-way for the dependable operation of its distribution (4kV - 23kV, and 23Tkv) system. 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.

The year-round operation ensures that the safety and reliability of approximately 6,466 distribution circuit miles complies with regulatory standards and meets customer expectations. 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. This clearance specification is tree species specific. 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 considered include tree species, tree structural condition, growth rates, site characteristics, proximity to energized facilities, and time elapsed since the last maintenance effort. Static 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 is analyzed considering all of these factors and derived by applying a combination of condition- and time-based cycles.

In areas where ROW's are more developed and involve, for example, individual trees in street lawns, 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 8 years in the future. Currently, it is 4-6 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.

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. Sometimes certain ROW conditions impact the ability to manage a project to a specific frequency and 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 scheduled maintenance activities.

For specific details on Duquesne Light's Vegetation Management Program, reference the following most recent administrative documents which may be obtained from the Vegetation Management Department Coordinator:

- Technical Specifications for Line Clearance and Vegetation Management of Rights-of-Way
- Scope of Work

**Inspection Plan**

	Area	Inspections and Treatments Planned	
		Distribution Circuit Miles	
		2012	2013
<b>Duquesne Light Co.</b> <i>6,466 Total Distribution Circuit Miles</i>	<u>Service Territory</u>	<u>1,300</u>	<u>1,300</u>

Deleted: § Area
Deleted: Inspections and Treatments Planned§ Total Annual Distribution Circuit Miles
Deleted: 2012
Deleted: 2013
Deleted: Duquesne Light Co.§ 6,466 Total Distribution Circuit Miles
Deleted: Allegheny County (4591)
Deleted: 923
Deleted: 923
Deleted: Beaver County (1875)
Deleted: 377
Deleted: 377
Deleted: Total Circuit Miles
Deleted: 1,300
Deleted: 1,300

**Justification**

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

*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 Company will visually inspect 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 our distribution assets for our employees and customers. This inspection cycle would also meet the Pennsylvania Utility Commissions' regulation as noted above and the National Electrical Safety Code for inspection of wood poles.

### **Inspection Process**

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

- Bird and insect infestation
- Damage – broken or leaning
- Burn Marks
- Deteriorated top of the pole
- Testing for decay

All poles are hammer-sounded and tested with PoleTest™ 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™ equipment fails to provide anticipated results, the pole is bored and measured for deficiencies. Any pole with abnormal shell depth or that fails the PoleTest™ inspection will be flagged for replacement. The pole inspector uses hand held GPS devices to record their results of each pole inspection thus providing the exact location of each pole. Upon returning to the office, this data is downloaded and entered into our GIS Pole Database. A work order in our Work Management system is generated for any pole that needs replaced, which is sent to our 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 our T&D field employees for replacement.

Duquesne Light meets (i) through (v) above as part of its inspection program. However, Duquesne Light does not perform load calculations during our pole inspections and is requesting a waiver from performing such calculations. Duquesne Light does not perform such load calculations because of the conservative safety factors used in our engineering designs for heavy loading under the NESC, the limited number of pole failures that affect the safety and reliability of our distribution system, and our



**Distribution Pole Inspections**

requirement that any third party attaching to our poles must perform load strength calculations. In addition, the cost to perform this type of calculation for an estimated 20,000 poles per year is estimated to be \$4 million which is cost prohibited based on the limited benefit. A review of Duquesne Light's reliability statistics show that pole failures average 11 incidents per year and account on average 0.005 in our SAIFI Index.

**Reference Documents**

The Duquesne Light Company Procedure Number ESI-003 – Procedures for the Inspection and Maintenance of Wood Poles is located in our Engineering Office at our Woods Run Facility.

**Inspection Plan**

	Area	Pole Inspections Planned (Number of Poles)	
		2012	2013
<b>Duquesne Light Company</b> <i>Total Number of Poles is 212,257</i>	Service Territory	17,689	17,689

Deleted: § Area
Deleted: Pole Inspections Planned§ (Number of Poles, Line Miles, etc.)
Deleted: 2012
Deleted: 2013
Deleted: § Duquesne Light Company§ Total Number of Poles is 212,257
Deleted: Allegheny County (150,702 poles)
Deleted: 12,559
Deleted: 12,559
Deleted: Beaver County (61,555 poles)
Deleted: 5,130
Deleted: 5,130

*Section 57.198(n)(3). Pole inspection failure. If a pole fails the groundline 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 the company determines it could reasonably affect the reliability and safety of our distribution assets. All other poles will be replaced under our pole replacement program within our annual work plan.

*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.*

### **Justification**

The Duquesne Light proposed 12 year cycle for inspection and maintenance of wood poles complies with the Pennsylvania Utility Commissions Section 57.198 (n) for the Inspection and Maintenance Standards and is within generally accepted utility practice.

Duquesne Light is requesting a waiver on the load calculation requirement under the Pennsylvania Utility Commission Inspection and Maintenance Standards as it is unduly burdensome and uneconomical. Duquesne Light estimates the cost to perform load calculations to be approximately \$4 million. Our experience has shown that pole failures have a negligible effect on the reliability and safety of our distribution system and assets. A review of our reliability statistics show that pole failures average 11 per year and contribute on average only 0.005 in our SAIFI Indices. In addition, as stated in the National Electrical Safety Code (NESC), 121.A, "lines and equipment shall be inspected at such intervals as experience has shown to be necessary," which in this case our experience has shown pole failures have no real negative impact on our distribution system reliability or safety. In addition, Duquesne Light field personnel review our pole facilities informally as they perform their daily routines such as meter technicians, engineering technicians, communication technicians, T&D Line workers etc. and they routinely report abnormal pole conditions to their supervision, which assists us in the identification of pole issues. In this case the benefit of doing this additional pole load testing does not outweigh the anticipated costs of approximately \$4 million.

*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 to inspect its Distribution Lines and equipment on a 5-year cycle. The purpose of using infrared technology provides a vast amount of information on the operating condition of our lines and equipment with specific focus on the following:

- Bad connections on transformers, secondary and service lines
- 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 over the past 10 years or more and has been very successful at identifying potential distribution line and equipment problems before failure to ensure the reliability and safety of our overall distribution system.

### **Inspection Process**

Duquesne Light identifies approximately one fifth of its feeder portion of the Distribution Circuits on a yearly basis for Infrared Technology Inspection. A two man crew typically drives each circuit (walking the ROW portions) and records the information generated from our infrared camera. Upon returning to the office the infrared pictures and digital photos captured are downloaded and a work order is created in our Work Management System for identified repairs. Each repair item is assigned a priority based on the type of equipment identified and the condition represented by the infrared camera. A report including the pictures, a description of each repair item and the work order are then sent to the T&D field personnel to schedule for repairs.

The lateral portions of each circuit will be visually inspected with data captured in a GPS device for location and details of any deficiencies found.

### **Reference Documents**

For more information, please see Duquesne Light's Procedure Number ESI-001 – Infrared Testing Procedure – a copy of which is located in the Company's Engineering Office.

**Deleted:** The Duquesne Light Company Procedure Number ESI-002 – Procedures for the Inspection and Maintenance Distribution Circuits is located in our Engineering Office at our Woods Run Facility.

**Inspection Plan**

	Area	Overhead Line Inspections Planned (Number of Circuits)	
		2012	2013
<b>Duquesne Light Company</b> <i>Total Circuits (663)</i>	<u>Service Territory</u>	<u>133</u>	<u>133</u>

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Deleted: Overhead Line Inspections Planned (Number of Circuits)
Deleted: 2012
Deleted: 2013
Deleted: 1 Duquesne Light Company Total Circuits (663)
Deleted: Allegheny ( 554 circuits)
Deleted: 111
Deleted: 111
Deleted: Beaver ( 109 circuits)
Deleted: 22
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*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 that Duquesne Light reasonably believes will affect the reliability or safety of our Distribution Assets will be repaired or replaced within 30 days. All other problems are repaired under our yearly maintenance program.

*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.*

**Justification**

Duquesne Light is requesting a waiver for a 1-2 year cycle for Overhead Line Inspections and requests using our current five (5) year cycle. Our five (5) year inspection cycle for Distribution Lines and Equipment is based on accepted utility practice and the company's experience in our ability to effectively use Infrared Technology to identify problems and perform repairs or replacements before they adversely affect the reliability and safety of our distribution system. Infrared Technology is 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 our Distribution System on a more frequent basis. Our experience has



**Duquesne Light**

*Our Energy...Your Power*

**Distribution Overhead Line Inspections**

shown that the effectiveness of our Infrared Technology in the identification of potential problems is much more effective (both from a success rate of identifying problems and from a cost perspective) on a five (5) year cycle than doing visual inspections on a more frequent basis.

Section 121(A) of the National Electrical Safety Code (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 our current PUC Reliability Indices, our five year cycle supports the very high reliability of our distribution system.

Duquesne Light estimates it will cost approximately \$2 million per year to change its current 5 year cycle to a 1-2 year cycle as requested under Section 198.(n)(4) of the Pennsylvania Utility Commission's new Inspection and Maintenance Standards. The cost of approximately \$2 million does not justify the benefits that may be achieved as the items that would be identified through this inspection process such as insulators, crossarms, lightning arrestors, ground wires and cutouts contributes on average 0.148 to our SAIFI index, a number so small that it is not noticed by our customers. Moreover, it is not reasonable to presume that we would or could spot all of these problems by visual inspection to reduce these outages. The distance from ground to facilities is too great to be able to spot possible equipment failures. The infrared Technology is much more valuable and picks up things that the visual eye cannot see.

*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 we perform our Infrared Technology inspection of our Distribution Lines and Equipment. The purpose of the inspection of overhead transformers in conjunction with our distribution lines is to gain efficiency in our inspection and maintenance plan that will identify potential reliability and safety issues that could adversely affect the operation of our 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 of our underground transformer plant condition. The purpose of this inspection cycle will be to identify issues that would affect the reliability and safety of these transformer assets.

### **Inspection Process**

The Duquesne Light overhead transformer inspection program will include a visual inspection to identify the transformers overall condition including, arrestors, rust and leaking oil.

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

The Duquesne Light 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.

### **Reference Documents**

For more information, please see Duquesne Light's Procedure Number ESI-004 – Pad Mounted Transformer Inspection Procedure and ESI-005 Submersible Transformer Inspection Procedure – copies of which are located in the Company's Engineering Office.

**Deleted:** The Duquesne Light Company Procedure Number ESI-004 – Procedures for the Inspection and Maintenance Distribution Transformers is located in our Engineering Office at our Woods Run Facility.

**Inspection Plan**


	Area	Type	Transformer Inspections Planned (Number of Circuits)	
			2012	2013
Duquesne Light Company Total Circuits (663)	Service Territory	Overhead Transformers (5-year cycle by circuit)	133	133
		Pad-mounted and Below-Grade Transformers (8-year cycle by circuit)	83	83

- Deleted: ¶ Area
- Deleted: Type
- Deleted: Transformer Inspections Planned¶ (Number of Circuits)
- Deleted: 2012
- Deleted: 2013
- Deleted: ¶ Duquesne Light Company¶ Total Circuits (663)
- Deleted: Allegheny (554 circuits)
- Deleted: Overhead Transformers (5-year cycle by circuit)
- Deleted: 111
- Deleted: 111
- Deleted: Allegheny (554 circuits)
- Deleted: Pad-mounted and Below-Grade Transformers¶ (8-Year Cycle by circuit)
- Deleted: 69
- Deleted: 69
- Deleted: Beaver ¶ (109 circuits)
- Deleted: Overhead Transformers¶ (5-year cycle by circuit)
- Deleted: 22
- Deleted: 22
- Deleted: Beaver ¶ (109 circuits)
- Deleted: Pad-mounted and Below-Grade Transformers¶ (8-year cycle by circuit)
- Deleted: 14
- Deleted: 14

**Justification**

Duquesne Light is requesting a waiver for a 1-2 year cycle for Overhead Transformer Inspections as it provides greater cost efficiency in our inspection and maintenance program for our Overhead Plant by doing these inspections by circuit at the same time we perform our Overhead Line Inspections, which is a five (5) year cycle. Our five (5) year inspection cycle for Distribution Lines and Equipment is based on accepted utility practice and the company's experience in our ability to effectively use Infrared Technology to identify problems and perform repairs or replacements before they adversely affect the reliability and safety of our distribution system. Our experience has shown that the effectiveness of our Infrared Technology in conjunction with a visual inspection of the Overhead Transformers for the identification of potential problems is much more effective on a five (5) year cycle by circuit than doing visual inspections on a more frequent basis. Increasing the cycle from (5) years by circuit to a 1-2 year cycle by circuit for Overhead transformer inspections would cost Duquesne Light approximately \$2 million per year with no real contribution to reliability or safety. [This cost does not justify the benefit that would be gained in our reliability indices as ALL (pad-mounted, below-grade and overhead) transformers only contribute approximately 3% to our SAIFI index on an average yearly basis. See Figure DLC- 2. Most customers would not experience or realize this very small effect on our SAIFI index.

Duquesne Light is requesting a waiver for the five (5) year cycle by circuit for the above ground transformer visual inspections to an eight (8) year cycle by circuit, which will coincide with the below-

grade transformer inspections. The eight (8) year cycle by circuit is a requirement for below-grade transformers under the Pennsylvania Utility Commissions new Inspection and Maintenance Standards, Section 57.198(n)(6). It is more cost effective to combine the inspection cycles of our 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 our underground transformer assets. Duquesne Light estimates that the approximate cost to increase the inspection cycle from 8 years to 5 years for our above-grade transformers at \$2 million per year. This cost does not justify the benefit that would be gained in our reliability indices as ALL (pad-mounted, below-grade and overhead) transformers only contribute approximately 3% to our SAIFI index on an average yearly basis. The increase in inspection cycle from 8 years to 5 years would yield no real improvement in the SAIFI index. Most customers would not experience or realize this very small effect on our SAIFI index. It is also more effective to combine the inspection cycles because we have more pad-mounted transformers than most other Pennsylvania utilities because of the urban area we serve.

Section 121(A) of the National Electrical Safety Code (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 our current PUC Reliability Indices, an 8 year cycle by circuit will support the very high reliability of our Above-grade and Below-grade Transformer Assets on our distribution system required by law.

*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 will complete the replacement of approximately 520 reclosers and sectionalizers on its distribution system by March of 2011. These reclosers and sectionalizers were legacy type devices, which required a considerable amount of maintenance and were not supported with spare parts from vendors. During the replacement program all new devices were equipped with communication devices that report on the status and the condition of the device to our Distribution Operating Center. Our fleet of three-phase 23 kV reclosers communicates with our Distribution Operating Center; therefore, we plan to use the automated self reporting provided by each device instead of operating on an 8 year inspection cycle for our 23 kV recloser equipment.

Duquesne Light plans to visually inspect 4 kV Three-Phase and Single-Phase Reclosers by circuit during our distribution line inspection program on a five (5) year cycle. These units are self-contained hydraulic oil units without counters and are not suitable for repair. Duquesne Light practice is to replace these units rather than repair any unit showing signs of oil leakage or other visual damage, such as excessive rust. Duquesne meets the standard of 8 years or less.

**Reference Documents**

For more information, please see Duquesne Light's Procedure Number ESI-001 – Infrared Testing Procedure – a copy of which is located in the Company's Engineering Office.

**Deleted:** The Duquesne Light Company Procedure for the Inspection and Maintenance of 4 kV Reclosers is located in our Engineering Office at our Woods Run Facility.

**Inspection Plan**


**Deleted:** Area

**Deleted:** Recloser Inspections Planned (Number of Circuits)

**Deleted:** 2012

**Deleted:** 2013

**Deleted:** Duquesne Light Company Total 4 kV Circuits (271)

**Deleted:** Allegheny (228 circuits)

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**Deleted:** Beaver (43 circuits)

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	<u>Area</u>	<u>Recloser Inspections Planned</u> <i>(Number of Circuits)</i>	
		<u>2012</u>	<u>2013</u>
<u>Duquesne Light Company</u> <i>Total Circuits (663)</i>	<u>Service Territory</u>	<u>133</u>	<u>133</u>

**Justification**

Based on the historical operating experience of the Company, our devices are automated and provide status and condition, which has proven to identify and correct equipment issues before they adversely affect the reliability and safety of our distribution system and assets. The 23kV reclosers are providing an "inspection" to Duquesne at all times by communicating with the Distribution Operating Center. Therefore we believe it meets the inspection requirements. If the Commission feels that the constant communication does not meet the inspection standards, then we request a waiver for these 23 kV reclosers. Using employees to visually inspect 23 kV reclosers is not cost effective or prudent as the units will automatically report a problem to our Distribution Operating Center.

Duquesne Light proposes to visually inspect our 4 kV three-phase and single-phase reclosers on a five (5) year cycle by circuit during our Overhead Lines Inspection exceeds the requirement under the Pennsylvania Utility Commissions new Inspection and Maintenance Standards, Section 57.198(n)(7).

*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 Company 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 our work planning group and they enter follow-up items into our maintenance database Maximo and specific groups are assigned to investigate and resolve each issue based on condition as 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

### **Reference Documents**

For more information, please see Duquesne Light's Training Reference CS009609 – Monthly Inspections (Company Substations) – a copy of which is located in the Company's Engineering Office.

**Deleted:** The Duquesne Light company practices and standards on the inspection and maintenance of "Substation Inspections" are located in our Engineering Office at our Woods Run Facility.

**Inspection Plan**

	Area	Substation Inspections Planned (Number of Substations)	
		2012	2013
<b>Duquesne Light Company</b> <i>Total Substations (172)</i>	<u>Service Territory</u>	<u>172</u>	<u>172</u>

Deleted: 1 Area
Deleted: Substation Inspections Planned (Number of Substations)
Deleted: 2012
Deleted: 2013
Deleted: 1 Duquesne Light Company Total Substations (172)
Deleted: Allegheny (139)
Deleted: 139
Deleted: 139
Deleted: Beaver (33)
Deleted: 33
Deleted: 33

*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.*

**Justification**

Duquesne Light's inspection of its distribution substations on a monthly basis is based on accepted utility standards and on our experience with performing these inspections. Given the remote location of some of our distribution substation assets, having a trained field person walk through and review a specific check list of items has proven over the years to identify problems that are not found through remote monitoring or security devices. Duquesne Light has been able to find and resolve issues before they degraded our reliability or the integrity of our assets. Duquesne Light meets the inspection requirements for substations and will abide by its monthly standard.

**Biennial Inspection, Maintenance, Repair and Replacement Plan  
Of Duquesne Light Company  
For the period of January 1, 2012 – December 31, 2013**

**Submitted by:  
Ken Kallis  
2839 New Beaver Avenue  
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(412) 393-8613  
kkallis@duqlight.com**

**Dated: October 1, 2010  
Amended: November 1, 2012**

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**Request and Justification for amendments to existing Inspection and Maintenance Plan:**

Duquesne Light Company (the “Company” or “Duquesne Light”) proposes three revisions to its Inspection and Maintenance Plan. The first proposed revision relates to the Company’s inspection benchmarks.<sup>1</sup> The Company has separate inspection benchmarks for Beaver and Allegheny Counties, the only two counties in which the Company provides service, and is proposing to combine the two benchmarks into one.

The Company organizes all of its inspection and maintenance activities out of one location for both counties. The Company has found that performing inspection and maintenance work on a county basis is administratively burdensome and complicated because the Company conducts inspection and maintenance activities by circuit, and the Company’s distribution circuits are not separated by county. Moreover, this change will also provide Duquesne Light with more flexibility to adjust maintenance plans to address “Worst Performing Circuits” in its service territory and to coordinate and conduct inspection and maintenance work in conjunction with any capital work on the distribution system.

With this proposed revision, Duquesne Light Company’s inspection and maintenance activities will continued to be distributed across the service territory to maintain reliability and safety over its entire distribution system. This change does not impact or affect the quantity, frequency or methods that the Company employs to inspect and maintain its distribution system, but simply captures the way in which the Company deploys work and does business.

The second proposed revision is to increase the recloser inspections benchmark to reflect the 4 kV reclosers on the 23 kV distribution systems, as these 4 kV reclosers were inadvertently omitted from the benchmark under the current Plan. Duquesne Light notes that the change is administrative only because the Company has been inspecting all reclosers as part of its Overhead Distribution Line Inspection Program.

Finally, the third proposed revision is to modify and update the information in the Inspection and Maintenance Plan relating to the “Reference Documents” information.

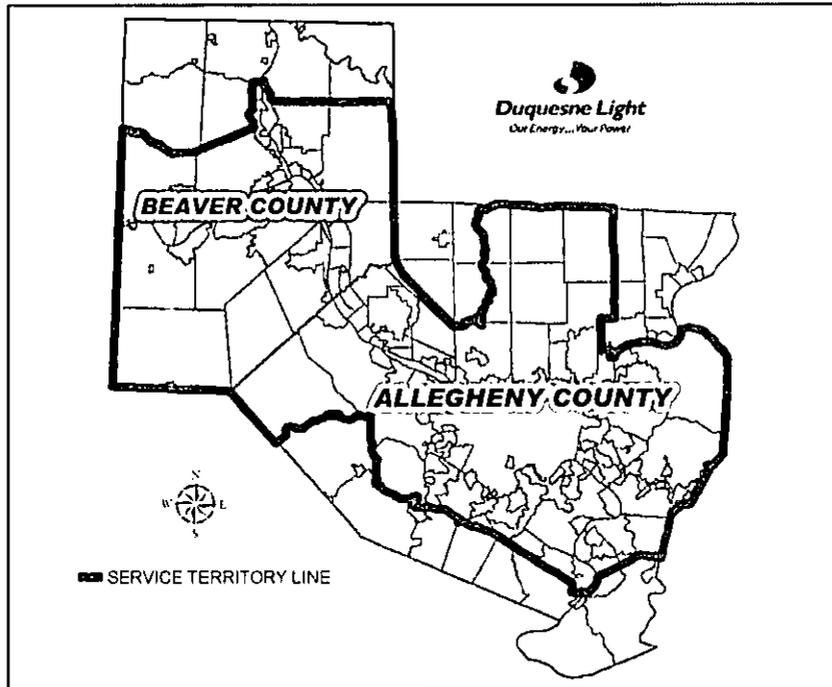
In summary, the Company’s proposed revisions to its Inspection and Maintenance Plan do not reduce the Company’s overall inspection requirements, but allow the Company to better meet its operational and reliability requirements. The Company also notes that these revisions are consistent with the Company’s proposed Inspection and Maintenance Plan for 2014-2015 that was filed on October 1, 2012 at Docket No. M-2009-2094773.

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<sup>1</sup> The inspection benchmarks are (1) line clearance and vegetation management, by miles; (2) pole inspections, by number of poles; (3) overhead line inspection, by number of circuits; (4) transformer inspections, by number of circuits; (5) recloser inspections, by number of circuits; and (6) substation inspections, by number of substations.

**Introduction**

Duquesne Light delivers electricity to approximately 588,000 customers within our service territory 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 our territory is shown below:



The following pages are submitted as Duquesne Light’s biannual Inspection and Maintenance Program to meet the recently enacted Pennsylvania Utility Commission’s Inspection and Maintenance Standards per Pennsylvania 52 Pa. Code § 57.198. The Duquesne Light Inspection and Maintenance Program as described in this document will be in effect from January 1, 2012 through December 31, 2013 and meets the requirements and intent of the new PUC Inspection and Maintenance Standards which is to ensure the safety and reliability of our Distribution Assets.

In addition to this newly developed inspection and maintenance program, Duquesne Light has existing Inspection and Maintenance Programs for breakers, switches, batteries, substation transformers and other critical transmission and underground assets. All of the company’s Inspection and Maintenance Standards and practices are based on generally accepted utility practices and our experience gained over years of maintenance activities performed on our distribution assets. Duquesne Light continues to deploy more automated distribution assets that report on the operation and the condition of devices, which eliminates the need for field personnel visual inspections. In addition, Duquesne Light 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 are to identify potential issues that could affect the reliability and safety of our assets and repair or replace based on condition and potential impact.

### **Record Keeping**

Duquesne Light uses a combination of hand held computers, software packages and paper inspection and maintenance documents for scheduling and recording of information. With our electronic inspection forms, a date, employee number and name are provided to indicate the employee performing the inspection or corrective maintenance. For our paper records, a date and employee signature or initials are provided.

### **Waivers Requested**

Duquesne Light is requesting waivers for the following items:

- Pole Loading Calculations – Section 2
- Distribution Line Inspection Interval – Section 4
- Distribution Overhead Transformer Inspection Interval – Section 6
- Distribution above ground pad-mounted Transformer Inspection Interval – Section 6

### **Justification for Waivers**

As stated in the National Electrical Safety Code (NESC), 121.A, “lines and equipment shall be inspected at such intervals as experience has shown to be necessary,” which in the case of each waiver requested above, our experience has shown these items have minimal impact on the reliability and safety of our distribution system. A review of our reliability indices for all equipment failures relates to less than 1/3 of our SAIFI and SAIDI Indices, therefore, the amount of money to increase the Inspection Intervals on the items noted above does not provide a cost benefit analysis which is favorable to Duquesne Light or its customers. Duquesne Light estimates that at a minimum it would cost \$10 million to accommodate the items noted above if a waiver is not granted. See the charts below:

**Figure DLC-1**
**Equipment Failure Contribution to SAIFI Indices**

	2009	2008	2007	2006	2005	2004
	SAIFI	SAIFI	SAIFI	SAIFI	SAIFI	SAIFI
Transformer	0.020	0.026	0.041	0.031	0.024	0.032
Capacitor	0.000	0.001	0.001	0.001	0.000	0.000
Recloser	0.000	0.007	0.001	0.000	0.000	0.000
Sectionalizer	0.012	0.002	0.009	0.002	0.005	0.000
Lightning Arrestor	0.004	0.014	0.010	0.013	0.014	0.012
Sectionalizing Switch	0.006	0.001	0.002	0.009	0.011	0.011
Cutout	0.002	0.003	0.011	0.005	0.001	0.001
Substation Equipment	0.026	0.061	0.014	0.022	0.027	0.071
Voltage Regulator	0.012	0.000	0.001	0.000	0.000	0.000
Cable	0.090	0.110	0.061	0.062	0.075	0.082
Cable Joint or Splice	0.022	0.011	0.013	0.018	0.019	0.031
Termination	0.021	0.020	0.020	0.014	0.018	0.013
Tower/H Frame/Pole	0.004	0.007	0.004	0.006	0.004	0.002
Insulator	0.061	0.040	0.031	0.042	0.061	0.065
Guy/Msg/Grnd Wire	0.000	0.000	0.002	0.000	0.000	0.000
Crossarm	0.001	0.012	0.003	0.002	0.004	0.005
Connector/Jumper	0.090	0.068	0.068	0.066	0.083	0.095
	0.372	0.382	0.288	0.293	0.345	0.420
System SAIFI	0.97	0.990	0.800	0.800	0.990	1.030

Figure DLC-2

Equipment Failure Contributions to SAIDI Indices

	2009	2008	2007	2006	2005	2004
	SAIDI	SAIDI	SAIDI	SAIDI	SAIDI	SAIDI
Transformer	2.46	2.68	4.47	2.93	3.28	3.20
Capacitor	0.00	0.04	0.08	0.03	0.00	0.00
Recloser	0.01	0.25	0.24	0.01	0.05	0.02
Sectionalizer	0.41	0.36	0.49	0.29	0.26	0.00
Lightning Arrestor	0.54	0.84	0.51	1.00	0.72	0.84
Sectionalizing Switch	0.57	0.33	0.67	1.26	0.91	0.45
Cutout	0.23	0.22	0.41	0.33	0.12	0.15
Substation Equipment	1.60	6.34	0.67	0.66	1.35	3.30
Voltage Regulator	0.17	0.00	0.03	0.00	0.00	0.00
Cable	8.10	7.12	5.56	7.80	7.45	9.02
Cable Joint or Splice	1.18	0.73	1.20	1.52	2.01	2.42
Termination	1.73	1.74	2.06	1.64	1.90	2.31
Tower/H Frame/Pole	0.47	1.10	0.75	0.25	0.31	0.41
Insulator	10.60	4.06	3.79	4.06	6.40	6.74
Guy/Msg/Gnd Wire	0.01	0.11	0.22	0.03	0.00	0.00
Crossarm	0.07	1.15	0.15	0.17	0.41	2.91
Connector/Jumper	7.13	7.09	5.99	5.18	6.26	6.03
	35.29	34.15	27.29	27.16	31.42	37.81
System SAIDI	82	98	86	82	97	95

Duquesne Light's PUC reliability indices confirm that our existing inspection and maintenance are effective as SAIFI has been below PUC Benchmark since 2004 and CAIDI has been below PUC benchmark since 1998.

*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 Company professionally manages a comprehensive vegetation program utilizing industry best management practices to provide the safe and reliable distribution of electrical energy. This extensive program, including select tree pruning and removal within the rights-of-way (ROW), hazard tree assessment and removal of defective, dead, or diseased trees within or along the ROW targeting the facilities, and the selective mechanical and/or chemical control of incompatible tall-growing brush within the ROW, is specifically defined for the management of vegetation on the Company's rights-of-way for the dependable operation of its distribution (4kV - 23kV, and 237kV) system. 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.

The year-round operation ensures that the safety and reliability of approximately 6,466 distribution circuit miles complies with regulatory standards and meets customer expectations. 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. This clearance specification is tree species specific. 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 considered include tree species, tree structural condition, growth rates, site characteristics, proximity to energized facilities, and time elapsed since the last maintenance effort. Static 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 is analyzed considering all of these factors and derived by applying a combination of condition- and time-based cycles.

In areas where ROW's are more developed and involve, for example, individual trees in street lawns, 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 8 years in the future. Currently, it is 4-6 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.

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. Sometimes certain ROW conditions impact the ability to manage a project to a specific frequency and 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 scheduled maintenance activities.

For specific details on Duquesne Light's Vegetation Management Program, reference the following most recent administrative documents which may be obtained from the Vegetation Management Department Coordinator:

- Technical Specifications for Line Clearance and Vegetation Management of Rights-of-Way
- Scope of Work

**Inspection Plan**

	Area	Inspections and Treatments Planned <i>Distribution Circuit Miles</i>	
		2012	2013
<b>Duquesne Light Co.</b> <i>6,466 Total Distribution Circuit Miles</i>	Service Territory	1,300	1,300

**Justification**

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

**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 Company will visually inspect 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 our distribution assets for our employees and customers. This inspection cycle would also meet the Pennsylvania Utility Commissions' regulation as noted above and the National Electrical Safety Code for inspection of wood poles.

### **Inspection Process**

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

- Bird and insect infestation
- Damage – broken or leaning
- Burn Marks
- Deteriorated top of the pole
- Testing for decay

All poles are hammer-sounded and tested with PoleTest™ 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™ equipment fails to provide anticipated results, the pole is bored and measured for deficiencies. Any pole with abnormal shell depth or that fails the PoleTest™ inspection will be flagged for replacement. The pole inspector uses hand held GPS devices to record their results of each pole inspection thus providing the exact location of each pole. Upon returning to the office, this data is downloaded and entered into our GIS Pole Database. A work order in our Work Management system is generated for any pole that needs replaced, which is sent to our 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 our T&D field employees for replacement.

Duquesne Light meets (i) through (v) above as part of its inspection program. However, Duquesne Light does not perform load calculations during our pole inspections and is requesting a waiver from performing such calculations. Duquesne Light does not perform such load calculations because of the conservative safety factors used in our engineering designs for heavy loading under the NESC, the limited number of pole failures that affect the safety and reliability of our distribution system, and our

requirement that any third party attaching to our poles must perform load strength calculations. In addition, the cost to perform this type of calculation for an estimated 20,000 poles per year is estimated to be \$4 million which is cost prohibited based on the limited benefit. A review of Duquesne Light's reliability statistics show that pole failures average 11 incidents per year and account on average 0.005 in our SAIFI Index.

**Reference Documents**

The Duquesne Light Company Procedure Number ESI-003 – Procedures for the Inspection and Maintenance of Wood Poles is located in our Engineering Office at our Woods Run Facility.

**Inspection Plan**

	Area	Pole Inspections Planned <i>(Number of Poles)</i>	
		2012	2013
<b>Duquesne Light Company</b> <i>Total Number of Poles is 212,257</i>	Service Territory	17,689	17,689

*Section 57.198(n)(3). Pole inspection failure. If a pole fails the groundline 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 the company determines it could reasonably affect the reliability and safety of our distribution assets. All other poles will be replaced under our pole replacement program within our annual work plan.

*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.*

### **Justification**

The Duquesne Light proposed 12 year cycle for inspection and maintenance of wood poles complies with the Pennsylvania Utility Commissions Section 57.198 (n) for the Inspection and Maintenance Standards and is within generally accepted utility practice.

Duquesne Light is requesting a waiver on the load calculation requirement under the Pennsylvania Utility Commission Inspection and Maintenance Standards as it is unduly burdensome and uneconomical. Duquesne Light estimates the cost to perform load calculations to be approximately \$4 million. Our experience has shown that pole failures have a negligible effect on the reliability and safety of our distribution system and assets. A review of our reliability statistics show that pole failures average 11 per year and contribute on average only 0.005 in our SAIFI Indices. In addition, as stated in the National Electrical Safety Code (NESC), 121.A, "lines and equipment shall be inspected at such intervals as experience has shown to be necessary," which in this case our experience has shown pole failures have no real negative impact on our distribution system reliability or safety. In addition, Duquesne Light field personnel review our pole facilities informally as they perform their daily routines such as meter technicians, engineering technicians, communication technicians, T&D Line workers etc. and they routinely report abnormal pole conditions to their supervision, which assists us in the identification of pole issues. In this case the benefit of doing this additional pole load testing does not outweigh the anticipated costs of approximately \$4 million.

**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 to inspect its Distribution Lines and equipment on a 5-year cycle. The purpose of using infrared technology provides a vast amount of information on the operating condition of our lines and equipment with specific focus on the following:

- Bad connections on transformers, secondary and service lines
- 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 over the past 10 years or more and has been very successful at identifying potential distribution line and equipment problems before failure to ensure the reliability and safety of our overall distribution system.

### **Inspection Process**

Duquesne Light identifies approximately one fifth of its feeder portion of the Distribution Circuits on a yearly basis for Infrared Technology Inspection. A two man crew typically drives each circuit (walking the ROW portions) and records the information generated from our infrared camera. Upon returning to the office the infrared pictures and digital photos captured are downloaded and a work order is created in our Work Management System for identified repairs. Each repair item is assigned a priority based on the type of equipment identified and the condition represented by the infrared camera. A report including the pictures, a description of each repair item and the work order are then sent to the T&D field personnel to schedule for repairs.

The lateral portions of each circuit will be visually inspected with data captured in a GPS device for location and details of any deficiencies found.

### **Reference Documents**

For more information, please see Duquesne Light's Procedure Number ESI-001 – Infrared Testing Procedure – a copy of which is located in the Company's Engineering Office.

**Inspection Plan**

	Area	Overhead Line Inspections Planned (Number of Circuits)	
		2012	2013
<b>Duquesne Light Company</b> Total Circuits (663)	Service Territory	133	133

*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 that Duquesne Light reasonably believes will affect the reliability or safety of our Distribution Assets will be repaired or replaced within 30 days. All other problems are repaired under our yearly maintenance program.

*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.*

**Justification**

Duquesne Light is requesting a waiver for a 1-2 year cycle for Overhead Line Inspections and requests using our current five (5) year cycle. Our five (5) year inspection cycle for Distribution Lines and Equipment is based on accepted utility practice and the company's experience in our ability to effectively use Infrared Technology to identify problems and perform repairs or replacements before they adversely affect the reliability and safety of our distribution system. Infrared Technology is 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 our Distribution System on a more frequent basis. Our experience has shown that the effectiveness of our Infrared Technology in the identification of potential problems is much more effective (both from a success rate of identifying problems and from a cost perspective) on a five (5) year cycle than doing visual inspections on a more frequent basis.

Section 121(A) of the National Electrical Safety Code (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 our current PUC Reliability Indices, our five year cycle supports the very high reliability of our distribution system.

Duquesne Light estimates it will cost approximately \$2 million per year to change its current 5 year cycle to a 1-2 year cycle as requested under Section 198.(n)(4) of the Pennsylvania Utility Commission’s new Inspection and Maintenance Standards. The cost of approximately \$2 million does not justify the benefits that may be achieved as the items that would be identified through this inspection process such as insulators, crossarms, lightning arrestors, ground wires and cutouts contributes on average 0.148 to our SAIFI index, a number so small that it is not noticed by our customers. Moreover, it is not reasonable to presume that we would or could spot all of these problems by visual inspection to reduce these outages. The distance from ground to facilities is too great to be able to spot possible equipment failures. The infrared Technology is much more valuable and picks up things that the visual eye cannot see.

*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 we perform our Infrared Technology inspection of our Distribution Lines and Equipment. The purpose of the inspection of overhead transformers in conjunction with our distribution lines is to gain efficiency in our inspection and maintenance plan that will identify potential reliability and safety issues that could adversely affect the operation of our 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 of our underground transformer plant condition. The purpose of this inspection cycle will be to identify issues that would affect the reliability and safety of these transformer assets.

### **Inspection Process**

The Duquesne Light overhead transformer inspection program will include a visual inspection to identify the transformers overall condition including, arrestors, rust and leaking oil.

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

The Duquesne Light 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.

### **Reference Documents**

For more information, please see Duquesne Light's Procedure Number ESI-004 – Pad Mounted Transformer Inspection Procedure and ESI-005 Submersible Transformer Inspection Procedure – copies of which are located in the Company's Engineering Office.

**Inspection Plan**

	Area	Type	Transformer Inspections Planned <i>(Number of Circuits)</i>	
			2012	2013
<b>Duquesne Light Company</b> <i>Total Circuits (663)</i>	Service Territory	Overhead Transformers (5-year cycle by circuit)	133	133
		Pad-mounted and Below-Grade Transformers (8-year cycle by circuit)	83	83

**Justification**

Duquesne Light is requesting a waiver for a 1-2 year cycle for Overhead Transformer Inspections as it provides greater cost efficiency in our inspection and maintenance program for our Overhead Plant by doing these inspections by circuit at the same time we perform our Overhead Line Inspections, which is a five (5) year cycle. Our five (5) year inspection cycle for Distribution Lines and Equipment is based on accepted utility practice and the company's experience in our ability to effectively use Infrared Technology to identify problems and perform repairs or replacements before they adversely affect the reliability and safety of our distribution system. Our experience has shown that the effectiveness of our Infrared Technology in conjunction with a visual inspection of the Overhead Transformers for the identification of potential problems is much more effective on a five (5) year cycle by circuit than doing visual inspections on a more frequent basis. Increasing the cycle from (5) years by circuit to a 1-2 year cycle by circuit for Overhead transformer inspections would cost Duquesne Light approximately \$2 million per year with no real contribution to reliability or safety. [This cost does not justify the benefit that would be gained in our reliability indices as ALL (pad-mounted, below-grade and overhead) transformers only contribute approximately 3% to our SAIFI index on an average yearly basis. See Figure DLC- 2. Most customers would not experience or realize this very small effect on our SAIFI index.

Duquesne Light is requesting a waiver for the five (5) year cycle by circuit for the above ground transformer visual inspections to an eight (8) year cycle by circuit, which will coincide with the below-grade transformer inspections. The eight (8) year cycle by circuit is a requirement for below-grade transformers under the Pennsylvania Utility Commissions new Inspection and Maintenance Standards, Section 57.198(n)(6). It is more cost effective to combine the inspection cycles of our 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 our underground transformer assets. Duquesne Light estimates that the approximate cost to increase the inspection cycle from 8 years to 5 years for our above-grade transformers at \$2 million per year. This cost does not justify the benefit that would be gained in our reliability indices as ALL (pad-mounted, below-grade and overhead) transformers only contribute approximately 3% to our SAIFI index on an average yearly basis. The increase in inspection cycle from 8 years to 5 years would yield no real improvement in the SAIFI index. Most customers would not experience or realize this very small effect

on our SAIFI index. It is also more effective to combine the inspection cycles because we have more pad-mounted transformers than most other Pennsylvania utilities because of the urban area we serve.

Section 121(A) of the National Electrical Safety Code (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 our current PUC Reliability Indices, an 8 year cycle by circuit will support the very high reliability of our Above-grade and Below-grade Transformer Assets on our distribution system required by law.

*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 will complete the replacement of approximately 520 reclosers and sectionalizers on its distribution system by March of 2011. These reclosers and sectionalizers were legacy type devices, which required a considerable amount of maintenance and were not supported with spare parts from vendors. During the replacement program all new devices were equipped with communication devices that report on the status and the condition of the device to our Distribution Operating Center. Our fleet of three-phase 23 kV reclosers communicates with our Distribution Operating Center; therefore, we plan to use the automated self reporting provided by each device instead of operating on an 8 year inspection cycle for our 23 kV recloser equipment.

Duquesne Light plans to visually inspect 4 kV Three-Phase and Single-Phase Reclosers by circuit during our distribution line inspection program on a five (5) year cycle. These units are self-contained hydraulic oil units without counters and are not suitable for repair. Duquesne Light practice is to replace these units rather than repair any unit showing signs of oil leakage or other visual damage, such as excessive rust. Duquesne meets the standard of 8 years or less.

**Reference Documents**

For more information, please see Duquesne Light's Procedure Number ESI-001 – Infrared Testing Procedure – a copy of which is located in the Company's Engineering Office.

**Inspection Plan**

	Area	Recloser Inspections Planned <i>(Number of Circuits)</i>	
		2012	2013
<b>Duquesne Light Company</b> <i>Total Circuits (663)</i>	Service Territory	133	133

**Justification**

Based on the historical operating experience of the Company, our devices are automated and provide status and condition, which has proven to identify and correct equipment issues before they adversely affect the reliability and safety of our distribution system and assets. The 23kV reclosers are providing an “inspection” to Duquesne at all times by communicating with the Distribution Operating Center. Therefore we believe it meets the inspection requirements. If the Commission feels that the constant communication does not meet the inspection standards, then we request a waiver for these 23 kV reclosers. Using employees to visually inspect 23 kV reclosers is not cost effective or prudent as the units will automatically report a problem to our Distribution Operating Center.

Duquesne Light proposes to visually inspect our 4 kV three-phase and single-phase reclosers on a five (5) year cycle by circuit during our Overhead Lines Inspection exceeds the requirement under the Pennsylvania Utility Commissions new Inspection and Maintenance Standards, Section 57.198(n)(7).

*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 Company 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 our work planning group and they enter follow-up items into our maintenance database Maximo and specific groups are assigned to investigate and resolve each issue based on condition as 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

### **Reference Documents**

For more information, please see Duquesne Light's Training Reference CS009609 – Monthly Inspections (Company Substations) – a copy of which is located in the Company's Engineering Office.

**Inspection Plan**

	Area	Substation Inspections Planned <i>(Number of Substations)</i>	
		2012	2013
<b>Duquesne Light Company</b> <i>Total Substations (172)</i>	Service Territory	172	172

*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.*

**Justification**

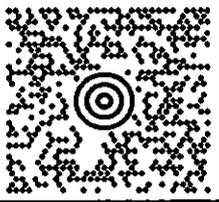
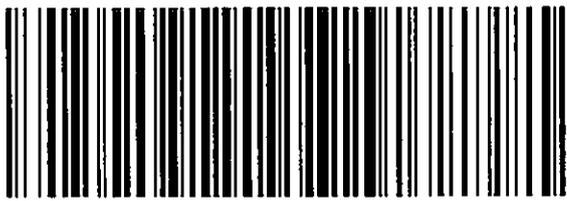
Duquesne Light's inspection of its distribution substations on a monthly basis is based on accepted utility standards and on our experience with performing these inspections. Given the remote location of some of our distribution substation assets, having a trained field person walk through and review a specific check list of items has proven over the years to identify problems that are not found through remote monitoring or security devices. Duquesne Light has been able to find and resolve issues before they degraded our reliability or the integrity of our assets. Duquesne Light meets the inspection requirements for substations and will abide by its monthly standard.

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