

**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Advance Notice of Proposed Rulemaking for : Docket No. L-00040167  
Revision of 52 PA Code Chapter 57 pertaining :  
To Adding Inspection and Maintenance Standards :  
For the Electric Distribution Companies :

**COMMENTS OF DUQUESNE LIGHT COMPANY**

I. INTRODUCTION

Duquesne Light Company (“Duquesne”) hereby submits its comments in the above-captioned docket in response to the Pennsylvania Public Utility Commission’s (“Commission”) Advance Notice of proposed Rulemaking Order and request for Comments pertaining to adopting inspection and maintenance (“I&M”) standards for electric distribution companies (“EDC”). The Proposed Rulemaking Order was issued by the Commission on April 20, 2006, and published in the Pennsylvania Bulletin on October 7, 2006 at 36 Pa.B. 6097.

Duquesne’s comments concern proposed inspection and maintenance standards at Section 57.198(e), (1) – (4) regarding minimum inspection and maintenance intervals for vegetation management, pole inspections, overhead line inspections and substation inspections. Duquesne supports the need for a plan for periodic inspection and maintenance of electric utility facilities. This is critical to maintaining or improving service and reliability to customers. Submittal of a plan to the PUC for review, comment and approval every two years is acceptable.

## II. GENERAL COMMENTS

Duquesne does not believe that prescriptive inspection and maintenance interval cycles need to be mandated by the Commission in order to ensure reliable electric service in Pennsylvania. The reliability standards presently required by the PUC and Duquesne's statistics reported to the PUC are proof that additional standards are not necessary. The Commission currently has sufficient legal authority and power to address unreliable service provided by any utility today without adopting further regulations that could add unneeded costs to utilities and their customers.

The approach proposed in the draft rules requiring additional visual inspections, walking of all distribution lines, and mandating rigid time intervals is directionally wrong. More advanced diagnostics with more technical, condition-based, maintenance and life cycle analysis along with proven strategies and best practices should be utilized to improve reliability. The PUC should be acknowledging and encouraging more intelligent automated distribution components that have self-diagnostics and can be monitored in real-time through SCADA, rather than mandated foot patrols over thousands of miles of land. Not only is such an approach more productive, but it is also much more effective.

However, if the PUC adopts these standards, changes need to be addressed by the Commission. Transformer and recloser inspections and foot patrols are not pertinent or effective in today's world of electric utility maintenance, as detailed in the following comments. They do not address realistic concerns such as overall condition, age, or manner of usage and limitations of equipment, which support more strategic measures of reliability improvement. Many of the other proposed standards are more relevant and

thus acceptable, (substation and pole inspections) or acceptable with modifications (aerial inspections). Finally, matters such as vegetation maintenance cycles should not be imposed with strict standards due to variability of tree growth and right-of-way widths, location, and methods controlling vegetation and its growth. If the PUC proceeds with vegetation maintenance cycles, important modifications should be made, such as utilizing an average cycle length for maintenance rather than mandated minimum cycles, consideration of new construction in the cycle, and the extent of PUC jurisdiction over transmission facilities.

### III. SPECIFIC COMMENTS

#### 57.192. Definitions

##### 1. Rural vs. Urban Area

The only comment Duquesne has with regard to the formatting of the bi-annual plan is the bifurcation of the plan between rural and urban areas. Duquesne's concerns are twofold: Duquesne sees no legitimate reason to distinguish between urban vs. rural circuits. The standards proposed for maintenance intervals under Section (e), (1) – (4) are not dependent on whether the circuits are rural vs. urban. Nowhere is that concept introduced as part of the rulemaking other than requiring that the plans are divided into rural and urban areas (Section 57.198(a)(1)). Duquesne does not distinguish its plans between communities with a population of less than 5,000 people and those having a population of 5,000 or more, and we are aware of no other utilities that do so.

Accordingly, it would require needless and unproductive work to try to distinguish circuits running through or within towns, cities, villages or communities greater than

5,000. Additionally, once the distinction was made, it would serve no useful purpose in reporting or maintenance.

57.198. Inspection and maintenance standards

1. Vegetation Management

Duquesne does not believe that there should be rigid minimum intervals between vegetation maintenance periods. Pennsylvania has four distinct plant hardiness zones defined by the US Department of Agriculture (USDA). Because of these distinct hardiness zones, different areas of the state have different native trees, which grow at different rates. Plant diversity varies greatly across the state. These diverse species grow at different rates with those in colder sections and higher elevations growing much slower than lower elevations. This geographical difference requires utilities whose territory spans different growing zones to have varying maintenance requirements.

Also some utilities have different right-of-way maintenance widths, thereby influencing the necessary maintenance intervals. For example, utility territories that have wider right-of-way widths do not need to maintain the vegetation on the edges through pruning as frequently as those with narrower widths. Urban rights-of-way, usually within municipal rights-of-way, are generally narrower than those in rural areas where private property owners have granted rights. The rules do not take into account what design each individual utility has for rights-of-way. Based on all of these factors, Duquesne does not believe it is productive to set rigid standards for vegetation maintenance.

Duquesne Light Vegetation Management is taking proactive measures to address preventable interruptions through its PIT (Potential Interruption Tree) Remediation Program. While tree growth is predominantly addressed through periodic prunings,

falling trees from outside of the maintained rights-of-way continue to be a monumental challenge. Unfortunately, the detection of tree defects and extent of decay is not an exact science and there is an element of risk taking in everyday decisions of which trees to address. While some potentially hazardous trees are readily identifiable, human error in identifying these trees plays a role during line clearance work and inspections. Also, trees are injured and die during the time between maintenance efforts. Duquesne respectfully suggests the following modifications:

The Commission should adopt an average, rather than minimum cycle, so that those lines needing more attention can be trimmed on cycles that are shorter than the mandated requirement and those not requiring management for various reasons, such as slower growth, low stem densities, establishment of compatible vegetation, etc., will be subject to a longer than average cycle. Duquesne suggests that the cycle is set at six years for distribution, and seven years for transmission. In this case, all lines, as a group, of a utility would need to average treatment every six years or seven years respectively.

Duquesne currently averages a vegetation maintenance cycle of 5.6 years on distribution and 7.1 years for transmission. Duquesne has very high reliability, as our indices such as CAIDI, SAIFI and SAIDI have repeatedly shown. In Duquesne's opinion, to shorten the cycle period, thereby increasing the cost of vegetation maintenance significantly, would have a very small and insignificant impact on reliability. A shortened cycle would address pruning more frequently, however, trees growing into the lines is not the major cause of interruptions. Most outages involve off right-of-way trees falling into the lines. A shorter vegetation maintenance cycle will not accomplish the interruption reduction the Commission desires.

## 2. Transmission

One legal issue the Commission should consider as part of this rulemaking is whether the Commission has full authority to regulate reliability standards for transmission. Currently, both the North American Electric Reliability Council (NERC) and the Federal Energy Regulatory Commission (FERC) have been very active with transmission reliability, through the provisions in the Energy Policy Act of 2005. It would appear that Pennsylvania reliability standards for transmission could result in varying, and perhaps inconsistent, standards for transmission reliability. The Commission must determine if it has the legal authority to regulate transmission, and if it does, whether it wishes to proceed with regulating transmission reliability when the national reliability organization, is regulating that service through implementation of the Vegetation Management Standard FAC-003-1<sup>1</sup>.

Life expectancy of transmission components (poles, insulators, hardware) can be estimated by an "Iowa Probability Curve"<sup>2</sup> which plots Survival Rate versus Age. A newer transmission line would be less likely to have problems than a similar older transmission line, with the expectation of problems defined by the Iowa Probability Curve. To maximize use of resources and increase reliability, utilities could utilize this Probability Curve and inspect the older line more frequently than a newer line. A uniform frequency of inspections does not achieve this.

## 3. Pole Inspections

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<sup>1</sup> February 7, 2006 approved by NERC Board of Trustees with an effective date of February 7, 2007.

<sup>2</sup> "Distribution Reliability Centered Maintenance: Quantifying Common Sense", by Michael Cole, see [www.electricity-today.com/et/apr99/dist.html](http://www.electricity-today.com/et/apr99/dist.html)

Duquesne can agree to visually inspect poles every ten years.

#### 4. Overhead Line Inspections

##### Aerial Inspection

Duquesne believes that aerial inspection of transmission lines on an annual basis is sufficient. Certainly if significant events or major storms occur, aerial inspections may be performed more frequently than annual. In fact, Duquesne performs biannual aerial inspections on transmission lines greater than 200 kV and critical circuits, while transmission lines below 200 kV are aerially inspected once a year, and is sufficient to locate and repair problems.

##### Foot Patrols

Annual foot patrols are extremely time consuming, expensive and labor intensive. Duquesne has over 7,000 miles of lines traversing varying terrain, and that amount is very small in comparison with other utilities in the state. Annual foot patrols do not make much sense to Duquesne.

The PUC should encourage the use of intelligent automated distribution components that have self-diagnostic capabilities and can be monitored remotely. For example, Duquesne does not schedule maintenance on distribution capacitors, but collects real-time data and diagnostics that automatically report on the condition and setting of the device. The ability to remotely troubleshoot and change settings on these devices in real time is much better than visual inspections. Additionally, Duquesne's line current and fault current distribution SCADA system provides important data regarding sectionalizers, reclosers, capacitors, and station breakers on a real-time basis.

The proposed approach in the draft rules to perform visual inspections by walking lines is ineffective and costly. Duquesne is working to develop advanced diagnostics and technical, condition-based life cycle analysis. Additional visual inspections of system components will not result in improved reliability. For example, infrared inspections<sup>3</sup> produce a greater benefit to reliability than visual observation of a line. Duquesne has a proven record where hot spots found during routine infrared inspections have prevented outage situations. The problems, which are quickly and thoroughly identified with the infrared camera, would never be resolved as effectively from a foot patrol program.

Based on all the above descriptions of how Duquesne more progressively maintains its lines today, we conclude that foot patrols are not productive.

5. Repairs

Duquesne can agree with the Commission's proposal that any problems found during inspections that affect the integrity of the circuits shall be repaired or replaced no later than 30 days from discovery subject to several important additions:

- (a) Duquesne prioritizes repairs based on the severity of the defects as found.

Duquesne Light believes the intent of the rule is to address repairs that are high priority work because they immediately threaten continued service or safety. Duquesne currently gives high priority and addresses those issues within the proposed the 30-day requirement.

- (b) Scheduling line outages for repair work may affect the 30-day limit.

Transmission line work must be coordinated with PJM, as transmission lines may not be de-energized for work without the permission of PJM. Other work

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<sup>3</sup> Duquesne Light utilizes Infrared cameras for inspecting wires, connections, lightening arrestors, equipment on poles, and substation equipment.

in progress at substations or on lines may preclude an outage necessary for the required work, as would weather related or impacted repairs.

6. Transformer Inspection

Nothing can be determined by visually inspecting a transformer, other than an occasional oil leak. Almost all of Duquesne's transformer failures are the result of thermal overload, which cannot be detected by visual inspection. It is better to analyze transformer capacity when there is a change in service to customers, such as the addition of new load or during periods of high heat when there is more stress on the system.

Below-ground transformers are a different matter, however. These are not normally inspected because of their belowground installation and the difficulty identifying problems via an inspection. By their very nature, it is nearly impossible to inspect below-ground transformers. They are typically submersible or in vaults and the problems associated with inspections are many, including Occupational Safety & Health Administration (OSHA) confined space rules and availability of trained personnel. These facilities would surely have to be removed from service in order to test and inspect them. Accordingly, Duquesne recommends that transformers not be visually inspected, since it is not effective and would result in unnecessary customer outages.

7. Reclosers

The 4 kV hydraulic reclosers operated by Duquesne cannot be inspected and tested without their complete removal from the distribution system and their transportation to the utility shop for inspection and testing. There is no portable test available to confirm function with the recloser in place. This proposed requirement of

annual testing would be very expensive. If the proposed recloser inspection and testing standard were to be adopted, it is suspected that many utilities would use fuses instead of reclosers due to the cost of removal for inspection and testing. Fusing would decrease reliability and would be an unintended outcome of adopting the proposed rule.

Accordingly, it is Duquesne's firm recommendation that this requirement be deleted.

Duquesne's 23 kV sectionalizer and recloser maintenance program is very effective and highlights the fact that preventive maintenance is only needed on certain models of devices once every two years. Newer equipment with self-diagnostics and real-time reporting provides superior performance without field inspections. Asset Management experience and analysis have proven that this is the right strategy.

#### 8. Substation Inspections

Duquesne supports the requirement that substation equipment, structures and hardware, because of its potential impact on reliability and safety, should be inspected monthly.

#### IV. CONCLUSION

Duquesne does not believe that prescriptive inspection and maintenance interval cycles are necessary in order to ensure reliable electric service in Pennsylvania. The Commission currently has sufficient authority and power to address unreliable service provided by any utility today without adoption of further regulations.

Should the Commission decide, however, that it is intent on proceeding with promulgating mandated standards for all utilities, then Duquesne would respectfully request that the Commission strongly consider those comments provided herein. Some of

the proposed standards are acceptable (substation and pole inspections) or acceptable with modifications (aerial inspections). Others, (transformer and recloser inspections and foot patrols) should be reconsidered for practicality and value.

Duquesne appreciates the opportunity to comment on this proposed rulemaking. In accordance with Ordering paragraph 8 of the Proposed Rulemaking, where EDCs are directed to provide the Commission with their current inspection and maintenance intervals for vegetation management and other intervals mentioned in subsection 57.198(e), Duquesne Light submits Attachment A to these comments.

Dated this 6th day of November, 2006.

Respectfully submitted,  
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## Duquesne Light

	<b>Current Practice</b>
Vegetation Management - Distribution Cycle	<ul style="list-style-type: none"> <li>▪ Vegetation Management Actual Average distribution cycle = 5.63 years (Based on time period from years 2001 - 2005)</li> </ul>
Vegetation Management - Transmission Cycle	<ul style="list-style-type: none"> <li>▪ Vegetation Management Actual Average transmission cycle = 7.04 years (Based on time period from years 2001 - 2005).</li> <li>▪ Field conditions are evaluated during annual aerial patrols and specific work is adjusted as necessary to ensure reliability.</li> <li>▪ Danger trees identified during aerial patrols are remediated after the patrol is completed.</li> </ul>
Pole Inspection	<ul style="list-style-type: none"> <li>▪ Poles are visually inspected as part of the 5 year infrared cycle</li> </ul>
Underground transformers inspection	<ul style="list-style-type: none"> <li>▪ Downtown Pittsburgh, underground transformers are inspected annually.</li> <li>▪ Inspection of pad mounted transformers and of all other submersible transformers is not scheduled.</li> </ul>
Reclosers / Sectionalizers inspected and tested	<ul style="list-style-type: none"> <li>▪ Station circuit breakers (i.e. station reclosers, station OCR's) are visually inspected monthly as substation equipment.</li> <li>▪ Substation recloser trip readings taken once a year; reclosers tested based on number of operations (estimated cycle time for this approach is 6-9 years). Substation reclosers also maintained based on fault duty. 23 kV sectionalizer / recloser maintenance program is only needed on certain models of devices once every two years. Newer equipment with self-diagnostics and real-time reporting provides superior performance with no field inspections.</li> <li>▪ Continuously monitor &amp; prioritize repair or replacement of devices that are out of service.</li> <li>▪ The 4 kV reclosers that are operated by Duquesne cannot be inspected and tested without their complete removal from the distribution system and their transportation back to the utility shop for inspection and testing.</li> </ul>
Transmission Lines inspected aerially	<ul style="list-style-type: none"> <li>▪ Transmission lines &gt;200kV and DLCo critical circuits aerially inspected 2x's per year during early spring and late summer (NERC);</li> <li>▪ 200kV and below aerially inspected 1x per year during late summer.</li> </ul>
Transmission Lines inspected on foot	<ul style="list-style-type: none"> <li>▪ Lines inspected by foot if aerial patrol determines that closer inspection is needed or in areas that are difficult to inspect aerially.</li> </ul>
Distribution Lines inspected on foot	<ul style="list-style-type: none"> <li>▪ Distribution lines inspected via infrared every 5 years</li> </ul>
Repairs - Distribution	<ul style="list-style-type: none"> <li>▪ Repairs are prioritized and schedule based on severity of problem.</li> </ul>
Repairs - Transmission	<ul style="list-style-type: none"> <li>▪ Repairs are prioritized and schedule based on severity of problem;</li> <li>▪ All Transmission Outages must be scheduled with PJM.</li> </ul>
Overhead transformers visual inspection	<ul style="list-style-type: none"> <li>▪ Inspected along with current 5- year circuit infrared inspection cycle.</li> </ul>
Substation equipment, structures, hardware	<ul style="list-style-type: none"> <li>▪ Monthly Inspections</li> </ul>