STATE OF ILLINOIS
ILLINOIS COMMERCE COMMISSION

Illinois Commerce Commission	)	
On Its Own Motion	)	
	)	
Adoption of report concerning the	)	Dkt. No. 15-0185
2012 reliability performance of	)	
Commonwealth Edison Company	)	
pursuant to 83 Ill. Adm. Code 411.140	)	

RESPONSE OF COMMONWEALTH EDISON COMPANY TO "ILLINOIS COMMERCE COMMISSION ASSESSMENT OF COMMONWEALTH EDISON COMPANY RELIABILITY REPORT AND RELIABILITY PERFORMANCE FOR CALENDAR YEAR 2012"

Commonwealth Edison Company ("ComEd") submits this response to the report of the Commission Staff dated December 23, 2014, and entitled "Illinois Commerce Commission Assessment of Commonwealth Edison Company Reliability Report and Reliability Performance for Calendar Year 2012" ("Assessment").

ComEd would like to thank Staff for providing an assessment of its 2012 Annual Reliability Report. ComEd takes Staff's assessment seriously and would like to take this opportunity to respond to comments by Staff in the Executive Summary and recommendations by Staff in the Summary of Recommendations. ComEd would also like to take this opportunity to expand on a few other points raised by Staff.

Following is ComEd's response to Staff's concerns and recommendations, which are restated below in bold text.

I. Points Raised in the Executive Summary:

ICC Staff commented on several areas on page i of the Executive Summary of the Assessment.

The number of customers who exceeded Service Reliability Targets three years consecutively increased from 5,918 in 2011 to 18,379 in 2012. That was a 211% increase in customers who exceeded Service Reliability Targets each year in 2010, 2011, & 2012 versus customers who exceeded Service Reliability Targets each year in 2009, 2010, & 2011.

ComEd would like to clarify that the interruptions included in the number of customers who exceeded Service Reliability Targets three years consecutively includes both controllable and uncontrollable interruptions.

During the three year period being reported, January 1, 2010 to December 31, 2012, ComEd's service territory experienced 33 reportable storms resulting in 5.8 million customer interruptions. This includes four storms impacting 10% or more of the system's customers. Indeed, the July 11, 2011, storm affected approximately 900,000 customers and was the single largest storm to hit the ComEd service territory in more than a decade. In 2012, these storms drove the unfavorable performance and in nearly every case provide the reason for the customers exceeding the reliability targets. In addition, 2009, which is no longer part of the reporting period, had favorable weather with no 10% system-wide storms.

2012 saw a 38% increase in animal-related interruptions and 34% decreases in weather- and tree-related interruptions over 2011.

As noted in the 2012 Annual Reliability Report dated June 1, 2013, the decrease in Weather Related, Tree Related, and Overhead Equipment Related interruptions in 2012 when compared to 2011, were driven by less storm activity. Although the number of Animal Related interruptions increased in 2012, the System Average Frequency Interruption Index ("SAIFI") impact remained relatively flat.

The 2012 four-year rolling average for ComEd system SAIFI continues its downward trend since 2008 while ComEd system CAIDI rolling average continues its upward trend since 2005.

SAIFI has been improving due to effective planning, prioritization and utilizing innovative solutions and technologies. CAIDI is significantly impacted by large storms. ComEd's Emergency Preparedness organization continues to refine its processes through "lessons learned", storm drills and input from the public. As noted in the Introduction of the 2012 Annual Reliability Report dated June 1, 2013, following the unprecedented 2011 storm season, and in response to over 100 public hearings and meetings, ComEd launched a task force that developed and implemented more than 60 enhancements in the storm restoration process, customer and municipal communications, and improved reliability. The efforts of the task force resulted in a restoration process with enhanced crew productivity,

prioritization model, contractor mobilization, dispatching, wire watching and damage assessment; the development and implementation of solutions to address pocket reliability concerns; and improvements in external and internal communications that deliver accurate and consistent information across all communications channels. Since 2012, ComEd continues to review, develop and improve on our storm processes, implementing an additional 140 enhancements.

The substantial drop in projected future spending for Substation Total Corrective Maintenance Expenditures in Figure 39 may adversely impact future reliability if it also contributes to a reverse in the current decline in Substation Corrective Maintenance Backlogs.

ComEd continues with its Substation Corrective Maintenance (CM) programs to specifically reduce the number of open CMs, increase the number of CMs getting complete, and the spending level (CMs completed: 2010 – 17,574; 2011 – 20,071, 2012 – 24,589, 2013 – 20,568 and 2014 – 21,578; Spending: 2010 – $46M; 2011 – $53M; 2012 – $65M, 2013 - $47M and 2014 $61M).

In addition, year to year inventory of CM tasks may increase or decrease. It is ComEd's general practice to establish policies and schedules by which to timely accomplish its objectives and provide safe and reliable service. Accordingly, ComEd establishes management practices such as hiring and maintaining a qualified workforce; providing training, tools, and resources necessary for its employees to complete Company objectives; supervising, monitoring, and controlling performance; working to improve future performance based on past experience, and implementing quality controls. *(Source: ComEd's Response to Staff Data Request ENG 3.01: subparts (b - e).*

Undoubtedly, intense storm activity will stress the electric distribution infrastructure and expose any weaknesses or shortfalls in material conditions, maintenance, and the quality of vegetation management (see Section 9). In the field, Staff observed vegetation making contact with and threatening ComEd's overhead electric distribution lines and equipment.

ComEd's Transmission and Distribution Vegetation Management Preventive Maintenance Programs schedule cyclic maintenance for circuits requiring vegetation management each year and complete each circuit in accordance with program guidelines. In addition, third-party quality assurance inspectors inspect all work to ensure that program standards are met as established within the programs, processes, and procedures that have been provided to the Commission, and a portion of payment for completed work is withheld from the contractor until all rework is complete. ComEd continues to monitor reliability performance and make adjustments to programs accordingly.

Additionally, Staff observed in the field where trees formed an overhead canopy above ComEd's overhead electric distribution lines and equipment. In many cases, though the overhead canopy was trimmed well away from the primaries, overhead canopies still present a significant reliability concern during adverse weather conditions (such as high winds, early wet snows, and heavy ice storms). Studies have shown that by removing overhead canopies above primaries, restoration times can be cut nearly in half[1] after an adverse weather event.

ComEd's Transmission and Distribution Vegetation Management maintenance programs are consistent with Best Management Practices, where removal of overhanging limbs is dependent on the type of facility, tree species, and other site conditions. In 2007, ComEd enhanced the cyclic maintenance clearance guidelines for the 34kV system to allow no overhanging limbs.

Further, ComEd's enhanced vegetation management programs under Storm Hardening and Grid Resiliency address overhanging branches and risk trees in targeted areas. ComEd uses tree risk assessment methodology to evaluate the condition of each tree in the targeted areas and prescribe the solutions to mitigate the risk. This process results in removal of overhanging branches and a significant number of tree removals. ComEd uses interruption investigations, our knowledge of how trees fail and impact to electric lines, to develop the criteria for Enhanced Vegetation Management.

ComEd also reviewed the studies referenced by Staff. The publication by S. Guggenmoos published in 2010, "Storm Hardening the Electric System Against Tree-Caused Service Interruptions," discusses storm impact to transmission ROW in the forested western U.S., and is not applicable to the urban/suburban ComEd distribution system. The publication from 2007, "Increased Risk of Electric Service Interruption Associated with Tree Branches Overhanging Conductors" is an evaluation of a single tree with different pruning applications and the impact to the distribution system when that tree fails. It does not take into account the likelihood of the tree failure. ComEd does not disagree that pruning overhanging branches back to the bole, as described by the author, would reduce service interruptions should that tree be subjected to storm stress loadings that cause the tree to fail. However, a utility must also take into account, as the author writes, the resulting significant alteration of tree appearance, impact on tree health, the public resistance to pruning, and negative public reactions. The author writes, "Electric distribution conductors and associated hardware must co-exist with the public's valued shady, tree-lined closed-canopy streets." (Guggenmoos 2007). As a result, utilities also consider the likelihood of the tree to fail, along with the consequences of tree failure (based on prioritized circuits or circuit sections).

ComEd has been working closely with customers as well as municipalities where performing enhanced vegetation management because the public highly values shady, tree-lined streets.

II. Recommended Actions:

Staff recommends ComEd should aggressively seek out any problematic maintenance or fundamental design issues that are contributing to customers exceeding the 3 year service reliability targets.

ComEd would, again, like to clarify that the interruptions included in the number of customers who exceed the three consecutive year service reliability targets include both controllable and uncontrollable interruptions. As previously noted there were 33 reportable storms during the three year period, these storms driving the unfavorable performance and in nearly every case provide the reason for the customers exceeding the service reliability targets.

ComEd is focused on identifying distribution system improvement opportunities directed toward customers exceeding the three year service reliability targets. Each interruption affecting these customers is reviewed to determine what can be done to improve the customer's reliability, experience and satisfaction. The system improvement opportunities identified to improve customer reliability encompass many programs such as Storm Hardening, Grid Resiliency, Distribution Automation, Underground Residential Distribution Cable Refurbishment, and Mainline Cable Replacement.

Since 2012 under the Storm Hardening program, engineering solutions have increased the resiliency in target areas. Improvements include overhead-to-underground conversions, spacer cable installation, system automation, enhanced vegetation management, and conductor relocation. Spacer cable on the system has tripled in the last three years; Distribution Automation is now on 90% of all circuits that serve 2,000 or more customers helping to reduce customer interruptions; and for all newly designed work, Grade B construction for poles is now the standard, which is an industry factor and is the highest strength standard for individual structures as specified by the National Electric Safety Code ("NESC").

Staff recommends ComEd continue to investigate problem areas and modify programs to advance *and maintain* a four-year (minimum) tree trimming cycle in compliance with NESC Rule 218 throughout its service territory.

ComEd continues to evaluate the effectiveness of the vegetation management programs and improve programs and contracting strategies. The Distribution Preventive Maintenance Program ensures trimming of circuits on a four-year cycle. The Storm Hardening, Grid Resiliency, Mid-Cycle Trim and 34kV Programs continue to reduce interruptions by concentrating on circuits prior to the next trim cycle. ComEd has quality assurance protection by retaining a percentage of contractor payment until a third-party quality inspection and any rework is completed. As a result of focus on tree removals, over 100,000 trees were removed during distribution cycle maintenance in 2013 and 123,000 trees were removed in 2014, 17% and 20% of the total trees worked, respectively, as compared to approximately 2% historically.

Staff continues to recommend that, as ComEd makes additional progress in re-establishing the trim zones and removing dead wood above conductors of its distribution circuits, ComEd investigate additional ways to address danger and hazard trees (defined in ANSI A300 72.5[1] and 72.8[2]).

ComEd utilizes tree risk assessment methodology, as described in ANSI A300 (Part 9) – 2011, and the International Society of Arboriculture's companion publication Best Management Practices, to evaluate trees and determine which trees require mitigation. This methodology takes into account the likelihood of trees to fail, the likelihood that the tree or tree part will strike ComEd facilities, and the consequences of such failure. Mitigation is prescribed based on programs and processes that have been established.

Staff recommends ComEd pursue more opportunities to educate customers on the reliability consequences of planting some types of vegetation beneath or near ComEd's distribution equipment.

ComEd continues to work with customers and municipalities to promote planting "the right tree in the right place" to avoid future tree/utility conflicts. In 2013, ComEd partnered with The Morton Arboretum to develop and publish an educational booklet entitled, "The Power of Smart Planting: A guide to planting near power lines." The Morton Arboretum provided a list of compatible trees and ComEd explained why this type of planting is necessary to prevent future power interruptions. ComEd utilizes this booklet during discussions with municipalities and customers, and it is available in print and also on ComEd's web site.

ComEd has also attended community meetings and engaged in other outreach activities to educate communities on the importance of line clearance tree trimming and choosing appropriate, compatible trees to plant near power lines. ComEd also continues to work with municipalities to remove incompatible trees that have been repeatedly pruned for line clearance and replace them with low-growing compatible trees.

ComEd's customer notification and education materials were updated in 2014. The *Importance of Vegetation Management* brochure is used for general education to the public and includes Right Tree Right Place information. ComEd was recognized with the Tree Line USA award from the Arbor Day Foundation in recognition of our efforts in tree planting, public education, and quality tree care. In 2015, ComEd initiated a partnership with the Arbor Day Foundation to offer free utility-compatible trees to customers that have been impacted by tree removals on their property. ComEd also participates in and supports numerous Arbor Day events throughout the service territory, which are used to educate the public on compatible tree, shrub, and plant species near electric facilities.

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[1] ANSI A300 72.5 **danger tree:** A tree on or off the right-of-way that could contact electric supply lines.

[2] ANSI A300 72.8 **hazard tree:** A structurally unsound tree that could strike a target when it fails. As used in this clause the target of concern is electrical supply lines.

III. Other Points:

Staff observed in the field on circuit B7507 where dead branches were overhanging the circuit Primary (Picture 1 of Assessment document). On circuit B552, Staff observed a rotted pole top where the J-hook primary mount was about to fall out of the pole (Picture 2 of assessment document) in addition to a number of poles that appeared in need of maintenance:

Based on inspection in September 2014, no dead branches are over the primary at the location noted on Circuit B7507.

During vegetation management preventive maintenance, dead branches overhanging primary conductors are removed unless the tree is inaccessible by a lift truck and is unsafe for an arborist to climb manually. This is in alignment with our distribution vegetation management clearance guidelines. However, the condition of trees change between inspections, and ComEd cannot be aware of the condition of every tree with exposure to 35,000 overhead circuit miles.

Through the Energy Infrastructure Modernization Act (EIMA), ComEd will be inspecting and treating 733,000 distribution wood poles of which 438,000 are already complete. As part of this process, ComEd is identifying poles that need to be replaced or refurbished. Since 2012, ComEd has already replaced or refurbished 11,000 of these poles on the system.

In addition, ComEd has a robust Preventative and Corrective Maintenance program designed to identify and correct equipment in need of repair. In fact, an item identified by staff in 2012 was also captured by ComEd on 12/29/2012. This item was scheduled in August 2013 based on ComEd's prioritization model and was repaired opportunistically on 6/27/2013.

As noted by ICC Staff, rust was visible on transmission towers and substation equipment and vegetation growing into perimeter fencing:

ComEd performs periodic transmission and substation inspections which include identification and monitoring of items such as visible rust and its impact on equipment. If rust exists on a structure or substation equipment beyond surface rust, engineering performs an assessment to determine the extent of rust and its impact to the equipment's integrity and the appropriate corrective maintenance will be scheduled. The rust at TDC375 West DeKalb, TDC207 Tonne, TDC465 South Holland, DCG125 Oak Lawn, DCG39 Oak Lawn and DCG42 Worth Twp. was evaluated and poses no risk to the equipment. The two transmission structures immediately outside TDC 375 West DeKalb are part of a tower painting program, and are planned for 2016. As with all locations, periodic inspections will continue to be performed to monitor conditions. There are presently no existing corrective maintenance items due to issues with structural integrity on equipment noted in Appendix A.

In addition, at substations, vegetation growth is identified and assessed through the same periodic inspections referenced above and is controlled on a regular basis. In cases where extensive vegetation growth is identified between scheduled visits, it is cleared. Vegetation issues at DCG125, DCG42, and DCG78 have been cleared since Staff's inspection.

As noted by ICC Staff, Direct-Stroke Lightning Protection was not installed at substations inspected:

New substations continue to be built with established ComEd standards for lightning protection per Engineering Procedure (*Exhibit A, EP-4020-C "Substation Lightning Protection Requirements"* - 7/2/2014). Existing substations were built per the standards that were in effect at that time. It is not practical or prudent to upgrade the system each time a standard is updated, unless there is a safety item that needs to be addressed.

As noted by ICC Staff, animal guards were not on overhead circuits going into substation yards at locations identified in Appendix A:

Construction Specification C7510 "Wildlife Protection of Electrical Equipment – 34.5kV and Below Systems," dated 4/15/2013, comprises various wildlife protection measures to divert wildlife away from outside substation bus structures and conductors. Particularly in reference to Squirrel Guards (referred to as Line Guards in ComEd specification C7510), C7510 provides basic information for installation of Line Guards. The Line Guards need to be strategically placed based on the substation's physical layout to offer the best protection. This applies only to distribution lines and the associated statics.

ComEd continues to add wildlife protection opportunistically when other substation work is being performed and as situations warrant. In 2014, four wildlife protection fences and related Line Guards were installed at locations with historical wildlife events. At DCG42, the line guards that have slid down inside the fence have a corrective maintenance item that is planned for Fall 2015.

ComEd's periodic substation inspections also include the identification of leaking equipment. A work request is created for any required work and prioritized per the Work Screening And Prioritization Process (*Exhibit B, WM-EU-P014 "Work Screening and Prioritization" - 8/29/2014*). Work requests were issued for the oil leaks at TDC465 South Holland and DCG39 Oak Lawn noted in Appendix A.

New gates are built with grounding per construction specification (*Exhibit C, Revised Construction Specification for C0745 "Substation Gate Grounding ComEd" - Revised 8/1/2006)*. Grounding issues identified such as fence grounding go through screening and are prioritized per WM-EU-P014 Work Screening and Prioritization dated 8/29/2014. Bonding of the fence to the gate post has been completed at four of the five substations identified, with the fifth planned September 2015.

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Respectfully Submitted,

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