

**ICC INQUIRY RE: JULY 11, 2011 STORM**

**Commonwealth Edison Company's Response to  
Illinois Commerce Commission ("Staff") Data Requests**

**OUT 1.01 – 1.07**

**Date Received: July 19, 2011**

**Date Served: December 21, 2011**

**REQUEST NO. OUT 1.01:**

System Condition, Maintenance, and Inspection before the storm

- a) Describe ComEd's inspection programs for distribution, transmission, and substation facilities. Explain whether the inspection programs conform to NESC rules, and good utility practices. Indicate whether the inspection programs provide ComEd with a good awareness of system condition.
- b) Explain whether ComEd's corrective and preventive maintenance, including vegetation management, and proactive replacement and refurbishment programs and practices on its transmission and distribution systems and substations are consistent with good utility practices to adequately maintain ComEd's systems and to minimize customer service interruptions.
- c) Provide a monthly record of **corrective maintenance backlogs** for the last five years ending June 30, 2011. Provide a separate record for the distribution, transmission, and substation facilities.
- d) Provide a monthly record of **preventive maintenance backlogs** for the last five years ending June 30, 2011. Provide a separate record for the distribution, transmission, and substation facilities.
- e) Describe and explain ComEd's vegetation management programs for its distribution and transmission facilities.
- f) Explain to what extent ComEd allows portions of trees and tree limbs to overhang its distribution lines and why ComEd employs this practice.
- g) Provide ComEd's analysis of the effectiveness of a vegetation management program that would eliminate all vegetation overhanging its distribution facilities.

**SUPPLEMENTAL RESPONSE TO SUBPART (e) ONLY:**

- e) ComEd has multiple documents to describe and explain the distribution and transmission vegetation management programs. Per request ComEd is providing the documents which were listed in ComEd's initial Response to Staff Data Request OUT 1.01. The documents are attached as OUT 1.01 SUPP\_Attach 01 through OUT 1.01 SUPP\_Attach 16. Please note that the affiliate information has been redacted from these documents. See the table below for the document numbers, titles and corresponding attachment number.

<b>Document No.</b>	<b>Title</b>	<b>Attachment</b>
VM-ED-P024	Vegetation Management QA/QC for Tree Pruning	OUT 1.01 SUPP_Attach 01
VM-ED-P025	Vegetation Management Distribution Clearance Guidelines	OUT 1.01 SUPP_Attach 02, OUT 1.01 SUPP_Attach 03, & OUT 1.01 SUPP_Attach 04
VM-ED-P010	Vegetation Management Distribution Preventive Maintenance Program	OUT 1.01 SUPP_Attach 05
VM-ED-P035	Distribution Corrective Maintenance Program	OUT 1.01 SUPP_Attach 06
VM-CE-P038	48 Month ICC Compliance Process	OUT 1.01 SUPP_Attach 07
VM-ED-P026	Vegetation Management Refusal Process	OUT 1.01 SUPP_Attach 08
VM-ED-P011	Transmission Vegetation Management Program	OUT 1.01 SUPP_Attach 09
VM-ED-P041	Transmission Vegetation Management Preventative Maintenance Process	OUT 1.01 SUPP_Attach 10
VM-ED-P044:	Transmission Vegetation Management Mitigation	OUT 1.01 SUPP_Attach 11
VM-ED-P045	Transmission Vegetation Management Corrective Maintenance Process	OUT 1.01 SUPP_Attach 12
VM-ED-P046	Vegetation Management Transmission QA/QC Process	OUT 1.01 SUPP_Attach 13
VM-ED-1007	Transmission Vegetation Management Scope of Work Verification Procedure Procedure	OUT 1.01 SUPP_Attach 14
VM-ED-1006	Transmission Vegetation Management Clearance Guidelines Procedure	OUT 1.01 SUPP_Attach 15
VM-CE-1004	Transmission Vegetation Management Annual Inspection Procedure	OUT 1.01 SUPP_Attach 16

# ***Exelon Delivery Process***

## **Transmission Vegetation Management**

## **Preventative Maintenance Process**

VM-ED-P041

Rev. 3

Effective: 05-27-2011

Review Type: Level 3

Page 1 of 12

### 1. **PURPOSE**

- 1.1. The purpose of this document is to ensure compliance with NERC Standard FAC-003-1. The Vegetation Management Transmission Preventative Maintenance Program is designed to prevent vegetation from encroaching onto the right-of-way to such an extent that it causes an interruption or impedes access to Exelon facilities. An integrated vegetation management approach is used and is based on a five-year cycle plan.

### 2. **TERMS AND DEFINITIONS**

- 2.1. Aerial Inspection – An aerial inspection of vegetation adjacent to aerial transmission facilities. The inspection may be of any part of the system, and may occur at any time of the year at management's discretion. The aerial inspection, when performed is solely a supplement to the ground inspection.
- 2.2. Annual Inspection – A yearly ground inspection of all vegetation adjacent to all aerial transmission facilities within ROW and granted easements.
- 2.3. Annual Inspection Point (AIP) – A specific location identified during the annual inspection that denotes an observation of vegetation adjacent to aerial transmission facilities.
- 2.4. Annual Inspection Process - Inspections are performed each year to identify any vegetation that poses an immediate threat to transmission facilities. This includes an annual inspection of the entire system and mitigation of vegetation concerns based on inspection results.
- 2.5. Annual Work Plan - An inspection and maintenance plan created each year by Senior Project Manager (SPM).
- 2.6. ANSI Standard A300 - The American National Standard for Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices. This is the American national arboricultural consensus standard.
- 2.7. Border Zone – A section of a transmission right-of-way that extends from the edge of the right-of-way to roughly 10 feet from the outside transmission conductors.
- 2.8. Category 0 AIP (Clear Span) - Vegetation clearances meet or exceed designated distances, as defined in Transmission Clearance Guidelines (VM-ED-1006)

- 2.9. Category 1 AIP (Immediate) - Vegetation that is likely to cause an immediate interruption to the transmission system. This is a location where vegetation appears to be closer to the conductor than the minimum air insulation distance (MAID), at time of inspection. A Category 1 AIP triggers a Response to the Vegetation Management Reports Procedure (OP-ED-4002)
- 2.10. Category 2 AIP (Significant) - Vegetation that is likely to encroach into the Category 1 AIP clearance zone of the transmission system within the current growing season.
- 2.11. Category 3 AIP (Future) - Vegetation is likely to impact the transmission system and become a Category 2 in the following growing season. This is a location where vegetation needs to be monitored on an annual basis.
- 2.12. Category 4 AIP (Access Issue) - Inspector cannot access a span or multiple spans at time of inspection. This location shall require an additional visit to complete the inspection prior to peak summer load season.
- 2.13. Compatible Vegetation - Vegetation that is desirable, or consistent with the intended use of the site. For example, plant species that will never grow sufficiently close to violate minimum clearances with electric conductors. Compatible vegetation will not impede right-of-way access.
- 2.14. Contractor - Performs work on behalf of Exelon
- 2.15. Customer Refusal - A third party preventing Exelon from maintaining right-of-way vegetation in accordance with Transmission Vegetation Management Clearances Guidelines (VM-ED-1006).
- 2.16. Early Succession Plant Communities - The first plant communities to develop following site disturbance. Succession is the replacement of one kind of plant community by another. Vegetation management, in a utility context, often inhibits succession progress past an early successional stage.
- 2.17. Encroachment - A man-made structure or activity that intrudes upon the right-of-way without authorization.
- 2.18. Focus Area - A location where restrictions prevent the attainment of post trimming clearances.
- 2.19. General Foreman (GF) - Contracted level of supervision directly responsible for the execution of Vegetation management work processes and policies.
- 2.20. Herbicide: A pesticide used to control plant growth.
- 2.21. Herbicide methods: Means of managing undesirable vegetation by the use herbicides.

- 2.22. Incompatible Vegetation - Vegetation that is undesirable, unsafe, or interferes with the intended use of the site.
- 2.23. Inspector - Individual that performs vegetation inspections along transmission rights-of-way.
- 2.24. Integrated Vegetation Management (IVM) - A system of managing plant communities in which managers identify compatible and incompatible vegetation, evaluate control methods, and evaluate, select, and implement the most appropriate control method, or methods to achieve specific objectives. The choice of control methods is based on the anticipated effectiveness, environmental impact, site characteristics, safety, security, economics, and other factors.
- 2.25. Maintenance Crews - Contractor crews that perform maintenance along transmission rights-of-way.
- 2.26. Minimum Air Insulation Distance (MAID) - Maximum flash distances for various transmission voltages, as determined by the Institute of Electrical and Electronics Engineers (IEEE Std.516)
- 2.27. Planner - Plans right-of-way maintenance activities for the maintenance crews, which may include pruning requirements, herbicide application, customer interface, etc.
- 2.28. Preventative Maintenance Program - Planned activities performed on a cyclic basis to prevent vegetation from encroaching onto the right-of-way to such an extent that it causes an interruption or impedes access to Exelon facilities. Activities include but are not limited to tree removals, tree pruning, herbicide applications, and mechanical tree and brush clearing.
- 2.29. QA/QC Inspector - Individual that performs Quality Assurance or Quality Control checks on all work performed by contracted work force.
- 2.30. Real Estate & Facilities (REF) - EED Real Estate & Facilities Department

- 2.31. REASONABLE OBSERVATION POINT - The location that an inspector can accurately measure the distance between vegetation or encroachment and conductor or verify that there is no vegetation or encroachment concerns within the span being observed. As a minimum, one observation point shall exist for each span. Additional points may be required based on terrain, field conditions and inspection results. Observation points shall not exceed a distance of three quarters of the length of the span being inspected
- 2.32. Redo - Work identified by the QA inspection that does not meet the Transmission Clearance Guidelines (VM-ED-1006).
- 2.33. Right-of-Way (ROW) - A corridor of land used for a specific purpose, such as an electric transmission line.
- 2.34. ROW Keeper - GIS-based Work Planning Software. This software is housed on a tablet-pc platform collection of geographically referenced data.
- 2.35. Senior Project Manager (SPM) - A subject matter expert who manages the vegetation management process and enforces all applicable policies and procedures.
- 2.36. Supervisor – Contract representative that directly supervises the contracted management team and the work force directly responsible for executing the work.
- 2.37. Third Party - Any non-Exelon employee, contractor, agent or representative.
- 2.38. Transmission Lines - Lines used for the transmission of extra high voltage throughout the Exelon transmission grid. At Exelon, for Vegetation Management purposes, these are lines energized at voltages between 66kV and 765kV.
- 2.39. Transmission System Operations - TSO
- 2.40. Transmission and Substations Engineering - T&S Engineering
- 2.41. Wire Zone – Section of a utility transmission right-of-way directly under the wires and extending to about 10 feet on each side.
- 2.42. Work Manager/Software Support Personnel - Contractor who performs software updates for Exelon

### 3. ROLES AND RESPONSIBILITIES

#### 3.1. SENIOR PROJECT MANAGER

- 3.1.1. Budget setting and tracking

- 3.1.2. Work scheduling and tracking
- 3.1.3. QA and QC tracking
- 3.1.4. Writing and publishing the Transmission Clearance Guidelines (VM-ED-1006)
- 3.1.5. External and internal stakeholder communications
- 3.1.6. Exelon's environmental and safety program compliance
- 3.1.7. Develop and publishes the annual work plan with enough lead time to allow for review, approval, permitting, permission, or necessary regulatory obligations be obtained prior to implementation of the plan
- 3.2. SUPERVISOR
  - 3.2.1. Contractor's performance of awarded work on the Exelon system.
  - 3.2.2. Supplies verified work estimates to the SPM, based upon the annual work plan
  - 3.2.3. Serves as the interface between Exelon and the Contractor.
- 3.3. GENERAL FOREMAN
  - 3.3.1. Field implementation of contractor activities, as defined by the Exelon SPM.
  - 3.3.2. Serves as point of contact with SPM.
  - 3.3.3. Maintains required records in accordance with Exelon procedures
  - 3.3.4. Resolve issues where external constraints prevent maintenance work from being completed according to Transmission Vegetation Management Clearance Guidelines (VM-ED-1006)
- 3.4. INSPECTOR
  - 3.4.1. Performs vegetation inspection of work performed on the Exelon transmission system.
- 3.5. PLANNER
  - 3.5.1. Planning right-of-way maintenance activities.
  - 3.5.2. Notifies adjacent landowners and municipalities of upcoming maintenance activities, and obtaining any necessary access consent.
  - 3.5.3. Plans and delivers work packets to maintenance crews

3.5.4. Maintain required records in accordance with Exelon procedures

3.6. **MAINTENANCE CREWS**

3.6.1. Completes the planned maintenance activities in accordance with the Transmission Vegetation Management Clearance Guidelines (VM-ED-1006)

3.7. **QA/QC INSPECTOR**

3.7.1. Performs QA/QC inspections on all work performed by the maintenance crews

3.7.2. Ensures completed work is in accordance with Exelon Transmission Clearances Guidelines (VM-ED-1006).

3.7.3. Maintains required records in accordance with Exelon procedures

4. **PRECAUTIONS AND LIMITATIONS**

4.1. **PRECAUTIONS**

4.1.1. This document contains specific content that has been or will be used as “Evidence of Compliance” for regulatory audits, or in support of regulatory Readiness Evaluations. Any person(s) making revisions to this document shall contact the Transmission Strategy and Compliance (TSC) group within the Transmission Operations and Planning organization to inform them of proposed revisions (Outlook address of TOP TSC Transmission Compliance). A representative of the TSC shall be included as a “reviewer” of any proposed revisions to this document. Documentation generated during performance of the Program shall be retained in accordance with the Exelon records management program

4.2. **LIMITATIONS**

4.2.1. Access to restricted sites will require advanced notification

5. **PROCESS**

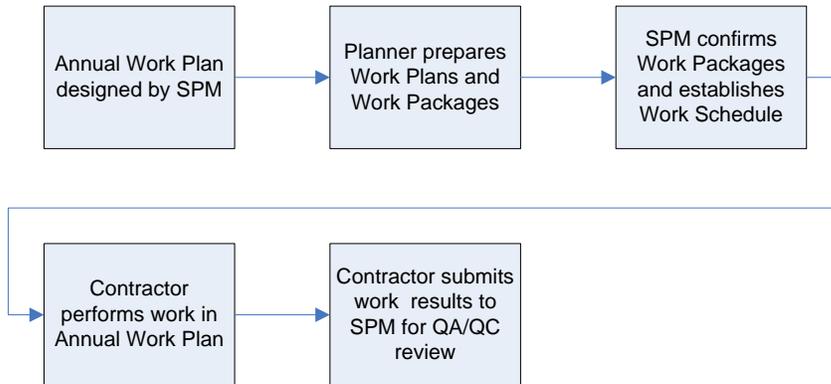
5.1. **ANNUAL WORK PLAN**

5.1.1. SPM designs and publishes annual work plan, in accordance with the Scope of Work Verification Procedure (VM-ED-1007)

5.2. PREVENTATIVE MAINTENANCE WORK PROCESS

- 5.2.1. Planner applies principles described in ANSI A300, part 7, IVM - Best Management Practices handbook to plan work and develops maintenance activity plan prior to the year of execution.
- 5.2.2. Planner prepares work plan documents for maintenance crews to execute.
- 5.2.3. Contract Supervisor verifies work estimates.
- 5.2.4. SPM approves work packages/work estimates including costs before work commences.
- 5.2.5. SPM and Contractor establish work schedule based upon the cycle maintenance requirements and known restrictions/limitations/permitting issues. Any changes to the plan shall be documented.
- 5.2.6. Contract Supervisor manages contractor crew resource levels to meet the agreed maintenance schedule.
- 5.2.7. SPM monitors adherence to the schedule. Any exceptions or variations to plan require SPM approval. The Mitigation Process (VM-ED-P044) provides guidance for locations where scheduled maintenance work is interrupted.
- 5.2.8. Planner notifies customer and adjacent landowners of planned maintenance work
- 5.2.9. Maintenance crews begin work and report progress daily to GF.
- 5.2.10. GF reviews and updates work progress weekly in work planning software.
- 5.2.11. Planner reports to GF all locations where a barrier prevents work completion, according to Transmission Clearance Guidelines Procedure (VM-ED-1006).
- 5.2.12. GF documents and reports all work not completed to Transmission Clearance Guidelines Procedure (VM-ED-1006) to SPM.
- 5.2.13. SPM initiates Mitigation Process to facilitate completion of maintenance work not completed to Transmission Vegetation Guidelines Procedure (VM-ED-1006).
- 5.2.14. GF assembles work closure packets with all applicable supporting documentation and submits to SPM.
- 5.2.15. SPM initiates QA/QC Process (VM-ED-P046) upon completion of work scope.

5.3. PREVENTATIVE MAINTENANCE PROCESS FLOW DIAGRAM



5.4. PREVENTATIVE MAINTENANCE PROCESS LISTING

#	Process Element	Description	Performed By
1	Annual Work Plan	List of Lines that will be worked	SPM
2	Planner prepares work packages	Work to be performed for each line	Planner
3	Establish work schedule	SPM confirms work and establishes work schedule	SPM
4	Work performed	Contractor performs work	Contractor
5	Work completed	Contractor submits results of work to SPM for QA/QC checks	Contractor

5.5. ASSUMPTIONS

5.5.1. None

6. DOCUMENTATION

6.1. Each step the transmission maintenance program is documented to ensure that each stage of the design, survey, planning, work execution, and quality assurance process is documented.

6.2. Documentation generated during performance of the Program shall be retained in accordance with the Exelon records management program.

7. **REFERENCES**

- 7.1. VM-ED-P041 Transmission Vegetation Management Preventative Maintenance Process
- 7.2. VM-ED-P045 Transmission Vegetation Management Annual Inspection Process
- 7.3. VM-ED-P046 Transmission Vegetation Management QA/QC Process
- 7.4. VM-ED-P044 Transmission Vegetation Management Mitigation Process
- 7.5. VM-ED-1006 Transmission Vegetation Management Clearance Guidelines Procedure
- 7.6. VM-ED-1007 Transmission Vegetation Management Scope of Work Verification Procedure
- 7.7. VM-CE-1004 Transmission Vegetation Management Annual Inspection Procedure  
VM-PE-1003 Transmission Vegetation Management Crew Location Notification Procedure
- 7.8. OP-ED-4002 Response to Vegetation Management Reports
- 7.9. NERC Standard FAC-003-1
- 7.10. ANSI A300 standards for Tree Care Operations (Part 7).
- 7.11. Integrated Vegetation Management (Best Management Practices) companion publication to the ANSI A300 Part 7.
- 7.12. I.E.E.E Standard 516-2003. I.E.E.E. Guide for Maintenance Methods on Energized Power Lines

8. **ATTACHMENTS**

8.1. VM-ED-P041-1, ComEd closure checklist.

**ComEd Circuit Closure Check-list**

Circuit \_\_\_\_\_

Review Completed By: \_\_\_\_\_

**TRANSMISSION**

Date Reviewed \_\_\_\_\_

\_\_\_\_\_  
VM Project Manager

<b>Tree Trimming Contractor Forms</b>	<b># Documented in packet *</b>	<b>Documented in ROWKeeper</b> (initial by QA Inspector)	<b>Form is complete as expected *</b>	<b>Open issues upon review Y/N</b>
VM Transmission Line Closure Form				
ComEd Transmission Line Map				
VM Transmission Customer Refusal Form				
VM Transmission Additional Work Required Form				
Davey Work Plan				
VM Transmission Customer Concerns Log				
All Permits acquired (State, tollway, F.P., etc.)				
Herbicide records for line				
Copy of Schedule to est. and act hrs				

\*Indicate "N/R" if not required.

<b>QA Inspector Forms</b>	<b># Documented in packet *</b>	<b>Documented in ROWKeeper</b> (initial by VM PM)	<b>Form is complete as expected *</b>	<b>Open issues upon review Y/N</b>
VM Transmission QA Summary Form				
VM Transmission QA Deficiency Form				

**Notes:**

This form is to be used to ensure proper documentation of circuit closures.

The completion of QA reworks by the tree trimming contractor must be documented with a date and description of work performed, both in the packet on the form and in ROWKeeper

Rev 0: 7/21/2010

9. **DEVELOPMENT HISTORY**

<b>Revision 0</b>		<b>Date 10-31-2008</b>
Writer	Charles Sheppard Manager Vegetation Management	
Review(s)	Merle Turner Vegetation Management ComEd, Alex Brown Vegetation Management PECO	
Approver(s)	Ken Bowman, Vegetation Management Manager ComEd VM	
Reason Written	Support the Corrective action from RCI 96038	

<b>Revision 1</b>		<b>Date 05-29-2009</b>
Writer	Alex Brown, Senior Project Manager, Vegetation Management, Merle Turner Vegetation Management ComEd	
Review(s)	Frank Moffa- Manager of Vegetation Management, PECO, John Blazekovich- Manager of Compliance Exelon Business Services Transmission Strategy and compliance, Shari Gribbon- Assistant council Exelon Business Services Legal	
Approver(s)	Doreen Masalta – Director of Project and Contract and Vegetation Management PECO , Harry Laski-Manager of Business Support and Vegetation management ComEd	
Reason Revised	Update transmission operating procedures and processes to comply with NERC Standard FAC-003-1	

<b>Revision 2</b>		<b>Date 10-29-2009</b>
Writer	Frank Moffa, Manager Vegetation Management	
Review(s)	Alex Brown – Senior Vegetation Project Manager, John Blazekovich – Manager of Compliance Exelon Business Services, Craig Chesley – Manager Vegetation Management Com Ed, Merle Turner – Manager Com Ed Transmission Vegetation Management	
Approver(s)	Doreen Masalta – Director Project, Contract and Vegetation Management	
Reason Revised	Added supersedes line to header of procedure.	

<b>Revision 3</b>		<b>Date 05-25-2011</b>
Writer	Alex Brown, Vegetation Management, Senior Project Manager; Merle Turner, Vegetation Management, Transmission Manager ComEd	
Review(s)	Frank Moffa, PECO Vegetation Management Manager; Myron McCullough, ComEd Vegetation Management; Tim Zidek ComEd Vegetation Management	

<b>Revision 3</b>		<b>Date 05-25-2011</b>
Approver(s)	Bruce Fluehr, Project and Contract & Vegetation Management, Director of Projects, Contracts and Vegetation Management; Craig Chesley, Vegetation Management, ComEd Vegetation Management Manager	
Reason Revised	More closely align with FAC-003-1. Add OP-ED-4002 to References. Change VM-ED-P043 to VM-ED-1006. Add ComEd closure check list to Attachments. Add Process Flow Diagram and Process Listing. Change VM-ED-1007 to VM-ED-1007. Change VM-ED-1007 to VM-ED-1007.	

<b>Revision 4</b>		<b>Date XX-XX-XXXX</b>
Writer		
Review(s)		
Approver(s)		
Reason Revised		