Thermography Assessment of 15kV Joints in Substation Cable Space

ComEd Technical Procedure
AM-CE-121-8001
Rev. 1

Effective:	11/8/2018
Supersedes:	CM-ED-020027
Level:	3
Review Type:	3 Year
Core Function:	Preventative Maintenance

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1. Purpose

1.1. To provide guidelines for consistent thermographic data collection and assessment of elevated temperatures on 15kV joints located in substation cable spaces.

2. Precautions and limitations

2.1. Precautions

2.1.1 None

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2.2. Limitations

Note: This procedure is not all-inclusive.

2.2.1.1 RECORD steps found to be unclear, missing, inaccurate or incomplete in Attachment CM-ED-020027-1 Lessons Learned

3. Safety Measures and Environmental Concerns

3.1. Safety Measures

3.1.1 Per the Safety for Life Rules

3.1.2 Refer to SA-ED-P406 “Enclosed Space / Permit Required Confined Space (ES/PRCS) Classification and Entry Process”

3.2. Environmental Concerns

3.2.1 Insure that the cable space is not flooded to result in engulfment, and that any ladders used for entrance are in tact.

4. Material and Special Equipment

4.1. Material

4.1.1 None

4.2. Special Equipment

4.2.1 Thermography unit capable of identifying and displaying temperature differentials between cable and joints

Note: Equipment must be capable of saving scanned images.

5. Prerequisites

5.1. Thermographer **MUST**

5.1.1 EITHER **MAINTAIN** Level 1, or higher thermography skill set

5.1.2 OR **BE UNDER** direct supervision of a Thermographer who has completed Level 1 thermography course.

5.2. Thermographer **MUST UNDERSTAND** the operation / limitations of the thermography camera to be used.

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CAUTION

BE AWARE that thermography scanning requires the cable to be live.

6. Procedure

6.1. Thermography Inspection

6.1.1 Thermographer scans cables and joints

6.2. ACTIONS REQUIRED FOR ELEVATED TEMPERATURE FINDINGS

6.2.1 Thermographer

6.2.1.1 FOR any identified joints operating at elevated temperatures as specified herein, ,

6.2.1.1.1 delineate Record on IR log

6.2.1.1.1.1 The specific feeder(s) involved

6.2.1.1.1.2 The differential temperature

6.2.1.1.1.3 The physical location of joint

6.2.1.2 Physical Identification

6.2.1.2.1 Tag joint by using tape or other highly visible material

6.2.1.2.2 Place Abnormal Condition tags in highly visible location

6.2.2 **NOTIFY** the Designated Authority

6.2.3 OCC

6.2.3.1 UNTIL permanent repairs are completed, **REDUCES** the circuit's emergency ratings as follows:

6.2.3.1.1 Summer Emergency = Summer Normal

6.2.3.1.2 Winter Emergency = Winter Normal

6.2.3.2 **TEMPORARILY REVISES** the corresponding SCADA (West) screen to indicate the condition UNTIL permanent repairs are completed.

6.2.3.3 **ISSUES** Administrative Tags so as to alert OCC personnel of the resulting field conditions

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6.2.3.4 CHANGES the circuit loading criteria UNTIL permanent repairs are completed.

6.3. CORRECTIVE ACTION WORK REQUEST & PRIORITY ASSIGNMENT

6.3.1 The thermographer **INITIATES** a Passport work request for each joint with a temperature differential between the joint and cable, including the following information:

6.3.1.1 Date of thermographic inspection

6.3.1.2 Circuit

6.3.1.3 Temperature differential between the joint and cable

6.3.2 FOR those feeder joints which have a temperature rise of greater than 14º Celsius (25º Fahrenheit) between the outer surface of the joint and the outer surface of the same phase cable, **INITIATE** a priority 10 work request calling for the removal of the cable joint from the cable space and the installation of new continuous cable from the switchgear to the first available manhole outside the substation building.

6.3.3 FOR those feeder joints which have a temperature rise between 1º and 14º Celsius (2º and 25º Fahrenheit) between the outer surface of the joint and the outer surface of the same phase cable, **INITIATE** a priority 20 work request calling for the removal of the cable joint from the cable space and the installation of new continuous cable from the switchgear to the first available manhole outside the substation building.

6.3.4 IF the circuit is required for contingency support of other circuits in the area, the Designated Authority or System Engineer **ELEVATES** the priority as required.

6.3.5 IF the concentric neutral connections are found to have hot spots,

6.3.5.1 REPLACE the connector

6.3.5.2 INSPECT the circuit bonding

6.3.5.2.1 At the substation switchgear cubicle

6.3.5.2.2 At the first manhole

6.3.5.2.3 At the first up feed pole locations

6.3.5.3 REPLACE suspect connectors.

6.3.5.4 ALLOW approximately one-hour thermal stabilization for components just placed in service.

6.3.5.5 RETEST the connector.

6.4. Regional PDM Thermographer to provide thermographic services

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7. Return to Normal

7.1. UPON removal of joints with elevated temperature, the OCC

7.1.1 **REVISES** the circuit's emergency rating.

7.1.2 **REVISES** the corresponding SCADA (West) screen to indicate the condition.

7.1.3 **ISSUES** instructions for the removal of any associated Administrative Tags.

7.1.4 **CHANGES** the circuit loading criteria

8. Roles and Responsibilities

8.1. MANAGERS

8.1.1 Ensure compliance to this procedure.

8.2. SUPERVISION

8.2.1 EED Group owns this procedure.

8.2.2 EED Subject Matter Expert and Supervisors are accountable for the content and process of the procedure.

8.3. EMPLOYEES/WORKERS

8.3.1 All EED, contractor or vendor personnel performing work within the EED service area shall comply with

8.3.1.1 This procedure

8.3.1.2 EED Fundamentals

8.3.1.3 EED Safety Rule Book

8.3.1.4 Employee Code of Conduct

8.3.1.5 All other Corporate and EED policies, programs, procedures, and expectations appropriate to the work being performed.

9. Documentation

Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

9.1. Documentation generated during performance of this procedure **SHALL BE**

9.1.1 **FILED** by the Thermographer.

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9.1.2 **MAINTAINED** on the thermography program "R:" drive and/or in AS8

10. Terms and Definitions

Refer to CM-ED-000010, EED Technical Glossary for terms and definitions.

10.1. Cable Space

10.1.1 Crawl spaces or basements located beneath a substation facility where primary distribution cables are routed.

10.2. Thermographer

10.2.1 Personnel performing the thermographic field assessment and analysis of test results.

11. References

11.1. LE-AC-401 – Records and Information Management Retention and Disposition.

11.2. AM-ED-P033 Transmission And Substations Thermography Program Guide

11.3. WM-ED-P014 Work Screening and Prioritization

11.4. RCI 18564, TDC 580 Downers Grove Substation Fire

12. Attachments

12.1. CM-ED-020027-1 Lessons Learned

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13. Development history

Revision 0	**Date: 4/13/2015**
Writer	Brian Keys (Distribution Standards)
Reviewer(s)	Thomas Finchum, Mgr Preventive Maintenance
Technical Approver(s)	N/A;
Safety Approver(s)	N/A;
UFAM Approver(s)	Gus Ponce, UFAM Preventative Maintenance, Director Trans & Subst
Reason written	Procedure no longer applies to PECO

Revision 1	**Date: 11/8/2018**
Writer	Margaret Esposito (T&S Predictive Maintenance - Chicago)
Reviewer(s)	Vic Collazo, (Mgr Predictive Maintenance - Chicago); Brotson McThay, (Mgr Predictive Maintenance – Chicago); Thomas Freise (T&S Predictive Maintenance – South); Robert Brock (T&S Predictive Maintenance – North)
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Dan Brea, UFAM Preventative Maintenance, Director Trans & Subst
Reason written	Periodic Updates

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
Technical Approver(s)	Approver's name and work group;
Safety Approver(s)	Approver's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Lessons Learned - Suggested Procedure Improvement
Page _____ of _____

Proc Line #	Equipment Type / Part	Revision / insertion / deletion

Attachment CM-ED-020027-1

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Underfrequency Load Shed & Undervoltage Load Shed ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R0003
Rev. 3

Effective:	5/15/2020
Supersedes:	n/a
Review Type:	NERC
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R0003 Rev03.xlsx

2. Development history

Revision 0	**Date: 3/20/2015**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Dan Wasilewski (ComEd), Davd Carlson (EU TS&C);
UFAM Approver(s)	Mike Moy (ComEd UFAM)
Reason written	To document Exelon Utilities North Star for UVLS/UFLS System Maintenance and align to PRC-005-2 - Protection System Maintenance standard.

Revision 1	**Date: 12/31/2016**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Dan Wasilewski (ComEd); Ruth Miller (EU TS&C)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Updated all references of PRC-005-2 to PRC-005-6. NERC Review Complete.

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Underfrequency Load Shed & Undervoltage Load Shed ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R0003
Rev. 3

Revision 2	**Date: 5/15/2018**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Martin Copello (ComEd); Becky Webb (EU NERC CMT)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Added page numbers to all tabs. Corrected titles to “Maintenance Basis” and “Template Development History” tabs by placing the tab title on the second line of the header. NERC Review Complete.

Revision 3	**Date: 5/15/2020**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Martin Copello (ComEd); Dan Gacek (EU NERC CMT)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Completed periodic review. No significant updates made. NERC Review Complete.

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Circuit Breaker, Vacuum 4-34kV ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1001
Rev. 1

Effective:	3/5/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1001

2. Development history

Revision 0	**Date: 3/2/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (ComEd Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 3/7/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Mgr Material Condition), Doug Mason (T&S Equipment Stds)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	3 year review. Modified the Spare maintenance to align with the EU standard.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Circuit Breaker, Air Magnetic 4-13kV ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1002
Rev. 1

Effective:	3/5/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1002

2. Development history

Revision 0	**Date: 3/2/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (ComEd Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 3/7/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Mgr Material Condition), Doug Mason (T&S Equipment Stds)
UFAM Approver(s)	Mike Moy (UFAM ComEd)
Reason written	3 year review. Updated industry standards in Maintenance Basis and updated document title to 4-13kV. No other content change.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Circuit Breaker, Oil, 4 - 13 kV ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1003
Rev. 1

Effective:	2/12/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1003

2. Development history

Revision 0	**Date: 2/18/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (ComEd Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 2/12/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Mgr Material Condition), Doug Mason (T&S Equipment Stds)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	3 year review with minor format changes and IEEE reference update. No content change.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Substation Capacitor Bank ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1004
Rev. 1

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Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1004

2. Development history

Revision 0	**Date: 2/18/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (ComEd Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 2/12/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Mgr Material Condition), Doug Mason (T&S Equipment Stds)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	3 year review with minor format changes and IEEE reference update. No content change.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Substation Recloser ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1005
Rev. 5

Effective:	1/26/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1005

2. Development history

Revision 0	**Date: 1/12/2007**
Writer	Chris Stefanski (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis

Revision 1	**Date: 11/30/2010**
Writer	Chris Stefanski (Strategic Programs)
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Bill Fluhler, Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups

Revision 2	**Date: 4/29/2011**
Writer	Chris Stefanski, Material Condition
Reviewer(s)	Ken Wendt (Mgr. Material Condition), Drew Reindel, Jim Crane
UFAM Approver(s)	Bill Fluhler(UFAM)
Reason written	Modified criticality definitions and incorporated 10-week, 3-month and 6-month inspection task frequencies. Created separate tabs for Vacuum and Oil.

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Substation Recloser ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1005
Rev. 5

Revision 3	**Date: 3/19/2014**
Writer	Suneetha Parupalli, Material Condition
Reviewer(s)	Nitin Patel (Mgr. T&S Equipment Standards), Ken Wendt (Mgr. Material Condition), William Bradley (Sr. Engineer, T&S Equipment Standards)
UFAM Approver(s)	Mike Moy(UFAM)
Reason written	3 year review, reformat document, add 3 phase note to vacuum reclosers

Revision 4	**Date: 2/6/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (Mgr. Material Condition), Suneetha Parupalli (Sr. Eng. Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Revised criticality definitions and modified document to serve as the ComEd maintenance standard. Corrected thermography frequency at ESS locations ≤ 34 kV from 1 year to 4 years.

Revision 5	**Date: 1/26/2018**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Dale Player (Mgr. Material Condition), Doug Mason (T&S Equipment Stds)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	3 year review. Added reference to IEEE and ASTM standards in task definition and maintenance basis for Oil Dielectric Test.

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Circuit Breaker, Oil 34kV and Above ComEd

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AM-CE-P034-R1006
Rev. 3

Effective:	8/20/2019
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Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1006.xlsx

2. Development history

Revision 0	**Date: 7/28/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (ComEd Material Condition); Greg Hitzke (T&S Eng)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 11/4/2016**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player, Greg Hitzke, Tu Liang, Nitin Patel, Doug Mason
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	Updated document to reflect recommended changes from the EU Substation Breaker Process Assessment/Productivity Review. In addition, based on ComEd OE, added a time directed task to replace the Bushing Tap Assy, model specific, on Nuclear Switchyard Oil Circuit Breakers.

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Circuit Breaker, Oil 34kV and Above ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1006
Rev. 3

Revision 2	**Date: 10/27/2017**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (ComEd), Greg Hitzke (ComEd), Tu Liang (ComEd), Nitin Patel (ComEd), Ismael Rivera Jr (Dresden Nuclear Station Systems Engineer), Travis Greene (Byron Nuclear Station Systems Engineer), Sachin Shukla (Braidwood Nuclear Station Systems Engineer), Aaron Kulow (Quad Cities Nuclear Station Systems Engineer), Kent Nelson (LaSalle Nuclear Station Systems Engineer)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	Revised to include new criticalities as defined in AM-CE-P034-R0001. In addition, the Oil Quality task detail and basis were updated to reflect manufacturer recommendation.

Revision 3	**Date: 8/20/2019**
Writer	Kevin Chamberlain (ComEd Material Condition)
Reviewer(s)	Greg Hitzke, Tu Liang, Nitin Patel, Doug Mason, Richard Bellino, and Elizabeth Spolarich
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	Revised to align with the updated revsion of AM-EU-P034-R1006. Added Internal Inspection requirements for 34kV oil breakers. Updated Pilot and Coontrol Valve refurbishment Task Definitions and title.

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Distribution Bifurcating Cabinets ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1007
Rev. 6

Effective:	1/26/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1007

2. Development history

Revision 0	**Date: 6/17/2005**
Writer	Chris Stefanski (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis

Revision 1	**Date: 11/17/2006**
Writer	Chris Stefanski (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning
Reason written	General scrub, task and periodicity review/update

Revision 2	**Date: 11/30/2010**
Writer	Chris Stefanski, Material Condition
Reviewer(s)	Ken Wendt (Mgr. Material Condition), Drew Reindel, Jim Crane
UFAM Approver(s)	Bill Fluhler , Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups.

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Distribution Bifurcating Cabinets ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1007
Rev. 6

Revision 3	**Date: 4/29/2011**
Writer	Chris Stefanski (Material Condition)
Reviewer(s)	Ken Wendt, Drew Reindel, Jim Crane
UFAM Approver(s)	Bill Fluhler (ComEd)
Reason written	Modified criticality definitions and incorporated 10-week and 3-month inspection task frequencies

Revision 4	**Date: 3/19/2014**
Writer	Suneetha Parupalli(Material Condition)
Reviewer(s)	Ken Wendt (Mgr. Material Condition), William Bradley (Sr. Engineer, T&S Equipment Standards)
UFAM Approver(s)	Mike Moy (ComEd)
Reason written	3 year review, reformat document, No content change

Revision 5	**Date: 2/6/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Mike Moy (ComEd UFAM)
Reason written	Minor administrative corrections; no change to PM program.

Revision 6	**Date: 1/26/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Mgr. Material Condition), Doug Mason (T&S Equipment Standards)
UFAM Approver(s)	Mike Moy (ComEd UFAM)
Reason written	3 year review, No content change

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Circuit Breaker, Single Pressure Puffer ≥34 kV ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1009
Rev. 2

Effective:	5/30/2019
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Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1009

2. Development history

Revision 0	**Date: 6/23/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (ComEd Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 11/30/2016**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Nitin Patel, Dale Player, Tu Liang, Greg Hitzke
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Revisions resulting from EU Substation Breaker Process Assessment/Productivity initiative. Revised Power Factor Test maintenance basis to limit scope of test to only capacitors for breakers with external capacitors. Revised SF6 Moisture Test task definition to clarify.

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Circuit Breaker, Single Pressure Puffer ≥34 kV ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1009
Rev. 2

Revision 2	**Date: 5/30/2019**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Suneetha Parupalli, Manager Material Condition (ComEd); Tu Liang, Senior Engineer (ComEd); Greg Hitzke, Principal Engineer (ComEd); Tony O'Connor (Sr Engineer, T&S Engineering Standards & Applications); Betsy Spolarich (Prin Work Plan Coordinator, ComEd T&S Equipment Stds), Terrence Myelle (Byron Strategic Elec Eng Branch Manager), Joe Haluska (Quad Cities Eng Manager), Adam Kambic (Braidwood Strategic Engineering Branch Manager), Joseph Welch (Dresden Engineering Manager), Ismael Rivera Jr (Dresden Sr Staff Engineer), Aaron Kulow (Exelon Corporate Switchyard Engineer)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Revised maintenance tasks to reflect recent NEIL Standard requirements (2018): Modified NEIL comments for SF6 moisture test and pressure Gauges / Pressure Switches tasks. Modified Lubrication / Maintenance task definition to replace heat sink compound on 345kV Siemens 3AT2 breakers.

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Fire Protection Building and Yard ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1011
Rev. 1

Effective:	10/27/2017
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1011

2. Development history

Revision 0	**Date: 10/30/2015**
Writer	Hugo Castaneda (ComEd Material Condition)
Reviewer(s)	Kenneth Wendt, Ron Diotallevi, Vincen Smith
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 10/27/2017**
Writer	Hugo Castaneda (ComEd Material Condition)
Reviewer(s)	Dale Player (ComEd), Nitin Patel (ComEd), Vincen Smith (ComEd), Ron Diotallevi (ComEd), John Lithio (ComEd), Ismael Rivera Jr (Dresden Nuclear Station Systems Engineer), Travis Greene (Byron Nuclear Station Systems Engineer), Sachin Shukla (Braidwood Nuclear Station Systems Engineer), Aaron Kulow (Quad Cities Nuclear Station Systems Engineer), Kent Nelson (LaSalle Nuclear Station Systems Engineer)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	Revised to reflect additional of Clean Agent suppression at ≥220kV Nuclear Switchyards. In addition, Sprinkler system quarterly inspection, Fire Pump inspection/churn, water based discharge tests and water storage tank drain tasks were added to reflect ComEd best practices.

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Fire Protection Building and Yard ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1011
Rev. 1

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Substation Building ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1012
Rev. 1

Effective:	12/13/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1012

2. Development history

Revision 0	**Date: 12/4/2015**
Writer	Hugo Castaneda (ComEd Material Condition)
Reviewer(s)	Kenneth Wendt, Eric Jensen, David Williams, Nitin Patel
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Revised criticality definitions and modified former PECO/ComEd document to serve as the ComEd maintenance standard.

Revision 1	**Date: 12/13/2018**
Writer	Hugo Castaneda (ComEd Material Condition)
Reviewer(s)	Dale Player (Mgr Material Condition), Tony O'Connor (Sr Engineer, T&S Engineering Standards & Applications) Betsy Spolarich (Prin Work Plan Coordinator, ComEd T&S Equipment Stds), Terrence Myelle (Byron Strategic Elec Eng Branch Manager), Jeff Snyder (LaSalle BOP Eng Manager), Joe Haluska (Quad Cities Eng Manager), Adam Kambic (Braidwood Strategic Engineering Branch Manager), Ismael Rivera Jr (Dresden Sr Staff Engineer), Rizwan Ahmed (Exelon Corporate Switchyard Engineer), Aaron Kulow (Exelon Corporate Switchyard Engineer)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	Revised document as part of the 3yr cycle review. Incorporated Transmission Terminals criticality with associated maintenance basis updated. Updated standard Nuclear Criticality verbiage and added a note to referene NPIRs and Interface Procedure for division of labor.

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Substation Building ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1012
Rev. 1

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Substation Yards ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1013
Rev. 1

Effective:	7/17/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1013.xlsx

2. Development history

Revision 0	**Date: 7/17/2015**
Writer	Hugo Castaneda (ComEd Material Condition)
Reviewer(s)	Kenneth Wendt (ComEd Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 7/17/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Mgr Material Condition), Elizabeth Spolarich (T&S Equip Stds and Fire Protection), Angelo DeAngelis (Material Condition), Rocky Koehler (Transmission Engineering)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	3yr review cycle. Incorporated Transmission Terminals criticality with a 10W visual inspection cycle with associated task definition and maintenance basis updated.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Sump Systems ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1014
Rev. 2

Effective:	9/3/2019
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1014.xlsx

2. Development history

Revision 0	**Date: 4/10/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (ComEd Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 4/25/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Mgr Material Condition)
UFAM Approver(s)	Mike Moy (UFAM ComEd)
Reason written	3yr review, no content changes.

Revision 2	**Date: 9/3/2019**
Writer	Kevin Chamberlain (Material Condition)
Reviewer(s)	Eric Jenson (Substation)
UFAM Approver(s)	Mike Moy (UFAM ComEd)
Reason written	Modified Task Definition to require the verification that the alarm is received by the proper desiginated authority.

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Structures & Lightning Masts ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1015
Rev. 1

Effective:	4/25/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1015

2. Development history

Revision 0	**Date: 4/22/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (ComEd Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 4/25/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Mgr Material Condition)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	3 yr review, no content changes.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Substation Foundations ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1016
Rev. 1

Effective:	3/26/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1016

2. Development history

Revision 0	**Date: 3/31/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (ComEd Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 3/28/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Mgr Material Condition)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	3yr review, with minor format changes. No content changes.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Substation Bus – Open Air

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1017
Rev. 6

Effective:	9/20/2017
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1017

2. Development history

Revision 0	**Date: 1/29/2006**
Writer	George Leinhauser
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis

Revision 1	**Date: 11/30/2010**
Writer	Chris Stefanski (Material Condition)
Reviewer(s)	Kenneth Wendt (Mgr Material Condition)
UFAM Approver(s)	Bill Fluhler , Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups.

Revision 2	**Date: 11/30/2010**
Writer	Chris Stefanski (Material Condition)
Reviewer(s)	Kenneth Wendt (Mgr Material Condition), Drew Reindel, Jim Crane
UFAM Approver(s)	Bill Fluhler (ComEd)
Reason written	Modified criticality definitions and incorporated 10-week, 3-month and 6-month inspection task frequencies

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Substation Bus – Open Air

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1017
Rev. 6

Revision 3	**Date: 12/18/2012**
Writer	Chris Stefanski (Material Condition)
Reviewer(s)	Kenneth Wendt (Mgr Material Condition), Greg Hitzke, Jim Crane
UFAM Approver(s)	Bill Fluhler (UFAM ComEd)
Reason written	Added insulator check and corona survey (Reference Byron RCI on S-Bus Failure) for ≥ 69kV; added separate tab for ≤34 kV.

Revision 4	**Date: 1/8/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Kenneth Wendt (Mgr Material Condition), Greg Hitzke (Engineering), Steve Scalcucci (Material Condition)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	Added Detailed Visual Inspection task. Changed 6 year frequency of maintenance to 8 years on ≥ 69kV bus.

Revision 5	**Date: 3/31/2016**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Ken Wendt, Greg Hitzke, Doug Mason, Nitin Patel, Elizabeth Jakosz
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	Added Metal Clad / Duct configurations with associated maintenance tasks, task detail and maintenance basis. Modified Open Air Bus maintenance to align with Switch maintenance program at locations outside of Nuclear.

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Substation Bus – Open Air

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1017
Rev. 6

Revision 6	**Date: 9/22/2017**
Writer	Hugo Castaneda (ComEd Material Condition)
Reviewer(s)	Dale Player (ComEd Material Condition Manager), Nitin Patel (ComEd T&S Equipment Stds Manager), Greg Hitzke (ComEd T&S Equipment Stds), Elizabeth Spolarich (ComEd T&S Equipment Stds), Richard Bellino (ComEd T&S Equipment Stds), Doug Mason (ComEd T&S Equipment Stds), Ismael Rivera Jr (Dresden Nuclear Station Systems Engineer), Travis Greene (Byron Nuclear Station Systems Engineer), Sachin Shukla (Braidwood Nuclear Station Systems Engineer), Aaron Kulow (Quad Cities Nuclear Station Systems Engineer), Kent Nelson (LaSalle Nuclear Station Systems Engineer)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	Revised Criticalities to reflect AM-CE-P034-R0001 categories.

Revision 7	**Date: XX/XX/XXXX**
Writer	
Reviewer(s)	
UFAM Approver(s)	
Reason written	

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Power Transformer ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1019
Rev. 7

-Effective:	10/30/2017
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1019

2. Development history

Revision 0	**Date: 12/22/2006**
Writer	George Leinhauser (Strategic Programs)
Reviewer(s)	Component Experts
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis

Revision 1	**Date: 1/27/2007**
Writer	George Leinhauser (Strategice Programs)
Reviewer(s)	Component Experts
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	Visual Inspection and Maintenance Inspection Tasks Definitions updated to add additional clarity associated with secondary cable bond connections.

Revision 2	**Date: 11/30/2010**
Writer	Chris Stefanski (Material Condition)
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Bill Fluhler , Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups.

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Power Transformer ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1019
Rev. 7

Revision 3	**Date: 4/29/2011**
Writer	Chris Stefanski (Material Condition)
Reviewer(s)	Ken Wendt (Mgr. Material Condition), Drew Reindel, Jim Crane
UFAM Approver(s)	Bill Fluhler (ComEd) , Bill Sullivan (PECO)
Reason written	Modified criticality definitions and incorporated 10-week and 3-month inspection task frequencies. Created separate tabs by transformer size.

Revision 4	**Date: 4/28/2014**
Writer	Suneetha Parupalli (Material Condition)
Reviewer(s)	Ken Wendt (Mgr. Material Condition) , Kushal Singh (Sr. Engineer, T&S Equipment Standards), Ty Lutes (Sr. Engineer, T&S Equipment Standards), Charles McDonald (Sr. Engineer, T&S Equipment Standards)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	3 year review, reformat document, frequency changes to align with 4 year FEG cycles. Remove sudden pressure relay test will be incorporated in relay template.

Revision 5	**Date: 1/9/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (Mgr. Material Condition) , Kushal Singh (Sr. Engineer, T&S Equipment Standards), Ty Lutes (Sr. Engineer, T&S Equipment Standards), Charles McDonald (Sr. Engineer, T&S Equipment Standards)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	In support of maintenance alignment effort at the Nuclear Switchyards, adjusted criticality definitions and added TTR, low voltage excitation and winding resistance tests for transformers at Nuclear Switchyards. Added check of Geomagnetically Induced Current Monitor.

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Power Transformer ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1019
Rev. 7

Revision 6	**Date: 3/2/2016**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Ken Wendt (Mgr. Material Condition) , Kushal Singh (Sr. Engineer, T&S Equipment Standards), Ty Lutes (Sr. Engineer, T&S Equipment Standards), Charles McDonald (Sr. Engineer, T&S Equipment Standards)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Updated template tasks to align with new EU standard. Included new tab for 34kV Small Power Transformers with LTC.

Revision 7	**Date: 10/27/2017**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Ty Lutes (ComEd), Kushal Singh (ComEd), Brian Chapman (ComEd), Dale Player (ComEd), Nitin Patel (ComEd), Ismael Rivera Jr (Dresden Nuclear Station Systems Engineer), Kent Nelson (LaSalle Nuclear Station Systems Engineer)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Revised to reflect recommended changes from the EU Transformer PM Template Effectiveness Review that includes updates to Oil Quality tests, LTC internal inspection and other clarifications. In addition, added new criticalities to align with AM-CE-P034-R0001.

Revision 8	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Inductors ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1020
Rev. 1

Effective:	6/26/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1020

2. Development history

Revision 0	**Date: 6/23/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Kenneth Wendt (ComEd Material Condition); Charles McDonald (T&S Equipment Standards)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 6/26/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player Mgr Material Condition
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	3 yr review. Minor format and maintenance basis reference updates.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Light & Power Transformer, Panel, ATO ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1021
Rev. 1

Effective:	2/12/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1021

2. Development history

Revision 0	**Date: 2/18/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (ComEd Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 2/12/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Mgr Material Condition), Doug Mason (T&S Equipment Stds)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	3 year review with minor format changes, IEEE reference update and boundary clarification. No content change.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Voltage Regulator ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1022
Rev. 1

Effective:	1/26/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1022

2. Development history

Revision 0	**Date: 2/6/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Kenneth Wendt (Manager Material Condition); Charles McDonald (T&S Eng)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 1/26/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Manager Material Condition); Charles McDonald (T&S Equipment Stds)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	3 Year Review. Updated Oil DGA and Quality task details to clarfy the required lab tests. Updated IEEE references in Maintenance Basis.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Switch (Substation) ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1023
Rev. 2

Effective:	9/25/2017
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1023

2. Development history

Revision 0	**Date: 7/17/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (ComEd Material Condition); Sal Salazar (T&S Eng)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 3/31/2016**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Ken Wendt, Nitin Patel, Doug Mason, Greg Hitzke, Elizabeth Jakosz
UFAM Approver(s)	Mike Moy (UFAM ComEd)
Reason written	Introduced 69kV to 138kV Switch Disconnect maintenance at sites determined by Engineering. In addition, added 16Y mainetnance for ≤ 34 kV Switch Disconnects at Critical and target sites.

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Switch (Substation) ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1023
Rev. 2

Revision 2	**Date: 9/22/2017**
Writer	Hugo Castaneda (ComEd Material Condition)
Reviewer(s)	Dale Player (ComEd Material Condition Manager), Nitin Patel (ComEd T&S Equipment Stds Manager), Greg Hitzke (ComEd T&S Equipment Stds), Elizabeth Spolarich (ComEd T&S Equipment Stds), Richard Bellino (ComEd T&S Equipment Stds), Lonnie Grote (ComEd T&S Equipment Stds), Ismael Rivera Jr (Dresden Nuclear Station Systems Engineer), Travis Greene (Byron Nuclear Station Systems Engineer), Sachin Shukla (Braidwood Nuclear Station Systems Engineer), Aaron Kulow (Quad Cities Nuclear Station Systems Engineer), Kent Nelson (LaSalle Nuclear Station Systems Engineer)
UFAM Approver(s)	Mike Moy (UFAM ComEd)
Reason written	Revised Criticalities to reflect AM-CE-P034-R0001 categories and revised Blade and Hinge Assembley task detail to replace live parts.

Revision 3	**Date: XX/XX/XXXX**
Writer	
Reviewer(s)	
UFAM Approver(s)	
Reason written	

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Circuit Switcher ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1024
Rev. 1

Effective:	6/26/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1024

2. Development history

Revision 0	**Date: 6/29/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Kenneth Wendt (ComEd Material Condition); Sal Salazar (ComEd Equipment Standards)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 6/26/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player Mgr Material Condition
UFAM Approver(s)	UFAM Name, core function and title
Reason written	3 yr review. Added Circuit Switcher maintenance at DC locations for furture coverage. No other major changes.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Substation Grounding Systems ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1025
Rev. 1

Effective:	4/25/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1025

2. Development history

Revision 0	**Date: 4/10/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (ComEd Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 4/25/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Mgr Material Condition)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	3 yr review, no content changes.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Control Cable Junction Boxes ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1027
Rev. 1

Effective:	1/18/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1027

2. Development history

Revision 0	**Date: 1/16/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Kenneth Wendt (Manager Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 1/18/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Manager Material Condition), Greg Hitzke (T&S Equipment Stds)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	3 Year Review. Minor formatting update, no other changes.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Meter, Panel (Volt-Amp-Watt-Var) ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1028
Rev. 1

Effective:	4/25/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1028.xls

2. Development history

Revision 0	**Date: 8/6/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (ComEd Material Condition); Hugo Castaneda (ComEd Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 4/25/2018**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Martin Copello (ComEd)
UFAM Approver(s)	Michael Moy (ComEd)
Reason written	Added headers to all tabs; Revised criticalities to align with AM-CE-P034-R0001, Completed 3 year review.

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Alarm Annunciator Systems ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1030
Rev. 1

Effective:	6/22/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1030.xls

2. Development history

Revision 0	**Date: 8/6/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt (ComEd Material Condition); Hugo Castaneda (ComEd Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 6/29/2018**
Writer	Kevin Swiat (Material Condition)
Reviewer(s)	Martin Copello (Relay & Protection Engineering)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Revised criticalities to align with AM-CE-P034-R0001; Removed statement from Boundary Definition on PECO T&S ownership of substation automation computers; Completed 3 Year Review.

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Protection System Equipment Transmission ComEd
ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1031
Rev. 2

Effective:	12/31/2018
Supersedes:	n/a
Review Type:	NERC
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1031 Rev02.xlsx

2. Development history

Revision 0	**Date: 3/27/2015**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Dan Wasilewski (ComEd), Kenneth Wendt (Material Condition), Davd Carlson (EU TS&C);
UFAM Approver(s)	Mike Moy (ComEd UFAM)
Reason written	New template created to document PRC-005-2 Protection System Maintenance Program.

Revision 1	**Date: 12/31/2016**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Dan Wasilewski (ComEd); Ruth Miller (EU TS&C)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Revision to incorporate changes from PRC-005-6. Revised wording for Sudden Pressure Relay testing and specified tasks and frequencies for Automatic Reclosing Components (Reclosing and Supervisory Relays). NERC Review Complete.

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Protection System Equipment Transmission ComEd
ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1031
Rev. 2

Revision 2	**Date: 12/6/2018**
Writer	Kevin Swiat (ComEd - Material Condition)
Reviewer(s)	Martin Copello - (ComEd - Relay & Protection Engineering), Daniel Gacek (EU - NERC CMT)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Reformatted maintenance template tab from standard format to custom format to simplify documentation of maintenance applied to Transmission Protection Systems; Added comments where applicable to align maintenance template with required component attributes to extend or eliminate maintenance per PRC-005-6; Completed 2-year review. NERC Review Complete.

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Protection System Equipment Distribution ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1032
Rev. 1

Effective:	7/30/2018
Supersedes:	n/a
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1032.xlsx

2. Development history

Revision 0	**Date: 8/31/2015**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Dan Wasilewski (ComEd); Ken Wendt (ComEd)
UFAM Approver(s)	Michael Moy (ComEd), Preventive Maintenance UFAM
Reason written	Addresses AR#000553459-23 to align Co-Gen feeders and lines on a 6Y maintenance interval. This document supercedes and combines previous ComEd Distribution Protection System Maintenance documents AM-ED-P034-R1034 Communications, Distribution Lines below 69 kV; AM-CE-P034-R1071 Distribution Transformer Relaying; and AM-CE-P034-R1072 Relaying, Distribution Breaker.

Revision 1	**Date: 7/30/2018**
Writer	Kevin Swiat (Material Condition)
Reviewer(s)	Martin Copello (Protection & Control Engineering)
UFAM Approver(s)	Michael Moy (ComEd)
Reason written	Updated reference from previous reliability standard to PRC-005-6 on Maintenance Basis tab; added page numbers and document number to all tabs; Revised task for Sudden Pressure Relay testing to align with accepted industry standard wording (reference PRC-005-6 Table 5); Added comment for control circuitry testing to clarify that task also includes control circuitry associated with Sudden Pressure Relaying; Completed 3-year review

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Fault Recorders ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1038
Rev. 5

Effective:	1/24/2018
Supersedes:	n/a
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1038.xlsx

2. Development history

Revision 0	**Date: 8/13/2009**
Writer	Kevin Swiat (Real Time Analysis)
Reviewer(s)	John Juna – Real Time Analysis; John Kruse – Real Time Analysis; Mark Lukas – Real Time Analysis; Linda Lynch - Real Time Analysis; Pat Mintus – Testing Group North; Mark Simon – Real Time Analysis
UFAM Approver(s)	Jean Holderried (PECO FAM), Ron Donovan (ComEd FAM), Bill Forst (ComEd FAM)
Reason written	Procedure Review for NERC PRC-005-2 Compliance

Revision 1	**Date: 11/30/2010**
Writer	Chris Stefanski, Sr. Eng., Material Condition
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Bill Fluhler , Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups.

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Fault Recorders ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1038
Rev. 5

Revision 2	**Date: 4/29/2011**
Writer	Chris Stefanski, Sr. Eng., Material Condition
Reviewer(s)	Ken Wendt, Drew Reindel, Jim Crane
UFAM Approver(s)	Bill Fluhler (ComEd)
Reason written	Modified criticality definitions and incorporated 5X per year inspection task frequency.

Revision 3	**Date: 4/28/2013**
Writer	Chris Stefanski, Sr. Eng., Material Condition
Reviewer(s)	Ken Wendt, Bart Enright, Mike Moy, Bill Miller, Dave Carlson (TS&C)
UFAM Approver(s)	Bill Fluhler (UFAM-ComEd)
Reason written	2 Year NERC Review; Clarify that Test analog and event inputs task is performed As Required. No change to current maintenance program.

Revision 4	**Date: 2/27/2015**
Writer	Kevin Swiat, Engineer, Material Condition (ComEd)
Reviewer(s)	Bill Miller, Ken Wendt, David Carlson (EU TS&C)
UFAM Approver(s)	Mike Moy (UFAM-ComEd)
Reason written	Modified maintenance task and intervals to align Nuclear DFR maintenance across EU, revised criticality definitions to align with EU standard. Revived the NERC Review Type, since it is no longer used as NERC evidence of compliance.

Revision 5	**Date: 2/2/2018**
Writer	Kevin Swiat, Engineer, Material Condition (ComEd)
Reviewer(s)	Bill Miller
UFAM Approver(s)	Mike Moy (UFAM-ComEd)
Reason written	3 year review: Minor formatting changes so that content appears when printed.

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Standalone Substation Automation Schemes ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1042
Rev. 5

Effective:	3/13/2018
Supersedes:	n/a
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1042.xlsx

2. Development history

Revision 0	**Date: 1/26/2007**
Writer	John Juna (Real Time Analysis)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis

Revision 1	**Date: 11/30/2010**
Writer	Chris Stefanski (Strategic Programs)
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Bill Fluhler, Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups

Revision 2	**Date: 4/29/2011**
Writer	Chris Stefanski, Material Condition
Reviewer(s)	Ken Wendt (Mgr. Material Condition), Drew Reindel, Jim Crane
UFAM Approver(s)	Bill Fluhler(UFAM)
Reason written	Modified criticality definitions and incorporated 10-week, 3-month and 6-month inspection task frequencies. Created separate tabs for Vacuum and Oil.

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Standalone Substation Automation Schemes ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1042
Rev. 5

Revision 3	**Date: 3/19/2014**
Writer	Suneetha Parupalli, Material Condition
Reviewer(s)	Ken Wendt (Mgr. Material Condition), Jay Anderson (Sr. Engineer, Relay and Protection)
UFAM Approver(s)	Mike Moy(UFAM)
Reason written	3 year review, reformat document, No content change

Revision 4	**Date: 6/12/2015**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Dan Wasilewski (ComEd), Ken Wendt (ComEd)
UFAM Approver(s)	Michael Moy (ComEd)
Reason written	Consolidated tasks to align with other protective system maintenance templates, updated task definitions, updated failure modes.

Revision 5	**Date: 3/13/2018**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Martin Copello (ComEd), Amjad Farooqi (ComEd)
UFAM Approver(s)	Michael Moy (ComEd)
Reason written	Updated all references from PRC-005-2 to PRC-005-6; Added headers to all tabs; Completed 3 year review.

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Surge Arrester – Free Standing ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1043
Rev. 1

Effective:	10/27/2017
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1043

2. Development history

Revision 0	**Date: 2/6/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Kenneth Wendt (Manager Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 10/27/2017**
Writer	Hugo Castaneda (ComEd Material Condition)
Reviewer(s)	Greg Hitzke (ComEd), Tu Liang (ComEd), Dale Player (ComEd), Nitin Patel (ComEd), Rich Bellino (ComEd), Betsy Spolarich (ComEd), Ismael Rivera Jr (Dresden Nuclear Station Systems Engineer), Travis Greene (Byron Nuclear Station Systems Engineer), Sachin Shukla (Braidwood Nuclear Station Systems Engineer), Aaron Kulow (Quad Cities Nuclear Station Systems Engineer), Kent Nelson (LaSalle Nuclear Station Systems Engineer)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	Revised to include new criticalities as defined in AM-CE-P034-R0001 and adjust Transformer ratings accordingly to reflect testing range for Power Transformers.

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Surge Arrester – Free Standing ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1043
Rev. 1

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

Instrument Transformers – Free Standing Potential Transformers ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1044
Rev. 1

Effective:	10/25/2017
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1044

2. Development history

Revision 0	**Date: 2/20/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt, Greg Hitzke, Tu Liang
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 10/27/2017**
Writer	Hugo Castaneda (ComEd Material Condition)
Reviewer(s)	Greg Hitzke (ComEd), Tu Liang (ComEd), Dale Player (ComEd), Nitin Patel (ComEd), Rich Bellino (ComEd), Betsy Spolarich (ComEd), Ismael Rivera Jr (Dresden Nuclear Station Systems Engineer), Travis Greene (Byron Nuclear Station Systems Engineer), Sachin Shukla (Braidwood Nuclear Station Systems Engineer), Aaron Kulow (Quad Cities Nuclear Station Systems Engineer), Kent Nelson (LaSalle Nuclear Station Systems Engineer)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	Revised to include new criticalities as defined in AM-CE-P034-R0001.

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Instrument Transformers –
Free Standing Potential Transformers ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1044
Rev. 1

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Instrument Transformers – Coupling Capacitor Voltage Transformers (CCVT) ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1045
Rev. 1

Effective:	10/25/2017
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1045

2. Development history

Revision 0	**Date: 2/20/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt, Greg Hitzke, Tu Liang
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 10/25/2017**
Writer	Hugo Castaneda (ComEd Material Condition)
Reviewer(s)	Greg Hitzke (ComEd), Tu Liang (ComEd), Dale Player (ComEd), Nitin Patel (ComEd), Rich Bellino (ComEd), Betsy Spolarich (ComEd), Ismael Rivera Jr (Dresden Nuclear Station Systems Engineer), Travis Greene (Byron Nuclear Station Systems Engineer), Sachin Shukla (Braidwood Nuclear Station Systems Engineer), Aaron Kulow (Quad Cities Nuclear Station Systems Engineer), Kent Nelson (LaSalle Nuclear Station Systems Engineer)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	Revised to include new criticalities as defined in AM-CE-P034-R0001.

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Instrument Transformers –
Coupling Capacitor Voltage Transformers (CCVT) ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1045
Rev. 1

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

Instrument Transformers – Free Standing Current Transformers ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1046
Rev. 1

Effective:	10/27/2017
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1046

2. Development history

Revision 0	**Date: 2/20/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt, Greg Hitzke, Tu Liang
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 10/27/2017**
Writer	Hugo Castaneda (ComEd Material Condition)
Reviewer(s)	Greg Hitzke (ComEd), Tu Liang (ComEd), Dale Player (ComEd), Nitin Patel (ComEd), Rich Bellino (ComEd), Betsy Spolarich (ComEd), Ismael Rivera Jr (Dresden Nuclear Station Systems Engineer), Travis Greene (Byron Nuclear Station Systems Engineer), Sachin Shukla (Braidwood Nuclear Station Systems Engineer), Aaron Kulow (Quad Cities Nuclear Station Systems Engineer), Kent Nelson (LaSalle Nuclear Station Systems Engineer)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	Revised to include new criticalities as defined in AM-CE-P034-R0001.

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Instrument Transformers –
Free Standing Current Transformers ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1046
Rev. 1

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Meters, Revenue Class ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1047
Rev. 1

Effective:	6/26/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1047

2. Development history

Revision 0	**Date: 6/29/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Kenneth Wendt (ComEd Material Condition); Markeis Salyes (ComEd Equipment Standards)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Removed Burden Test, Passing Load Test and Test for Creep. Revised criticality definitions and modified former ComEd/PECO document to serve as the ComEd maintenance standard.

Revision 1	**Date: 6/26/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Plater Mgr Material Condition
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	3yr review. No content change.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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On Line Monitoring System - Transformers ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1048
Rev. 1

Effective:	6/22/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1048.xls

2. Development history

Revision 0	**Date: 8/6/2015**
Writer	Hugo Castaneda (ComEd Material Condition)
Reviewer(s)	Ken Wendt (ComEd Material Condition); Jenn Khong (ComEd Engineering)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 6/29/2018**
Writer	Kevin Swiat (Material Condition)
Reviewer(s)	Greg Voice (T&S Equipment Standards)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Revised criticalities to align with AM-CE-P034-R0001; Clarified Time Directed Tasks for Calisto C501 monitors; Completed 3 Year Review.

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Voltage Control Relay ComEd

ComEd Training and Reference Material (T&RM)
AM-CE-P034-R1049
Rev. 2

Effective:	11/1/2018
Supersedes:	n/a
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1049.xlsx

2. Development history

Revision 0	**Date: 10/31/2015**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Ken Wendt (ComEd)
UFAM Approver(s)	Michael Moy (ComEd), Preventive Maintenance UFAM
Reason written	Modified document to serve as the ComEd maintenance standard.

Revision 1	**Date: 8/27/2018**
Writer	Kevin Swiat (Material Condition)
Reviewer(s)	Joe Qiu (Relay & Protection Engineering)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	Revised criticalities to align with AM-CE-P034-R0001; Removed detail from “Monitor Operations Counter” definition since not all equipment is inspected every 5W; Completed 3 Year Review.

Revision 2	**Date: 11/1/2018**
Writer	Kevin Swiat (Material Condition)
Reviewer(s)	Joe Qiu (Relay & Protection Engineering)
UFAM Approver(s)	Michael Moy (UFAM ComEd)
Reason written	Corrected copy/paste error in wording for criticality II in "Voltage Control Relay" tab.

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Portable Transformer ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1050
Rev. 1

Effective:	9/19/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1050

2. Development history

Revision 0	**Date: 9/23/2015**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Ken Wendt (ComEd Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 9/19/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Mgr Material Condition), Ty Lutes (T&S Equipment Stds), Kushal Singh (T&S Equipment Stds), Dagogo Obomanu III (T&S Services), Jason Baumbach (T&S Services), Greg Hitzke (T&S Equipment Stds), Elizabeth Spolarich (T&S Equipment Stds)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Revised miantenace template as part of its 3yr review cycle. Maintenace tasks & basis were revised to include maintenance for the LTC, Circuit Switchers and Circuit Breakers that may be attached or part of the trailer. Oil Quality and DGA task definition was updated to reflect current practices.

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Portable Transformer ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1050
Rev. 1

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Instrument Transformer – Combination Current / Potential ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1051
Rev. 6

Effective:	9/5/2019
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1051.xlsx

2. Development history

Revision 0	**Date: 11/17/2006**
Writer	Chris Stefanski (Strategic Programs)
Reviewer(s)	Component Experts
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis

Revision 1	**Date: 11/30/2010**
Writer	Chris Stefanski (Material Condition)
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Bill Fluhler , Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups.

Revision 2	**Date: 4/29/2011**
Writer	Chris Stefanski (Material Condition)
Reviewer(s)	Ken Wendt (Mgr. Material Condition), Drew Reindel, Jim Crane
UFAM Approver(s)	Bill Fluhler (ComEd)
Reason written	Modified criticality definitions and incorporated 10-week inspection task frequency

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Instrument Transformer – Combination Current / Potential ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1051
Rev. 6

Revision 3	**Date: 4/28/2014**
Writer	Steve Scalcucci (Material Condition)
Reviewer(s)	Ken Wendt (Mgr. Material Condition) , Greg Hitzke (Sr. Engineer, T&S Equipment Standards)
UFAM Approver(s)	Mike Moy (ComEd UFAM)
Reason written	3 year review, reformat document, Frequency change of the Power Testing task from 6 years to 8 Years to align with the FEG cycles.

Revision 4	**Date: 2/20/2015**
Writer	Christopher Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt, Greg Hitzke, Tu Liang
UFAM Approver(s)	Mike Moy (ComEd UFAM)
Reason written	Administrative changes to align with common format for OpCo template documents. No changes to maintenance program.

Revision 5	**Date: 2/12/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Mgr Material Condition), Greg Hitzke (T&S Equipment Stds)
UFAM Approver(s)	Mike Moy (ComEd UFAM)
Reason written	3 year review with minor format changes. No content change.

Revision 6	**Date: 9/5/2019**
Writer	Kevin Chamberlain (Material Condition)
Reviewer(s)	Greg Hitzke (T&S Equipment Stds)
UFAM Approver(s)	Mike Moy (ComEd UFAM)
Reason written	Added new category for next terminal out of nuclear facility, and other Critical locations. Adjusted Power Factor test of “all other locations” to AR.

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Generators – Substation Auxiliary Power ComEd

ComEd Training and Reference Material (T&RM)
AM-CE-P034-R1056
Rev. 1

Effective:	9/4/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1056

2. Development history

Revision 0	**Date: 9/11/2015**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Ken Wendt (ComEd Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 9/4/2018**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Mgr Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	3yr cycle review. No significant changes.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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STATION DC SUPPLY, includes station batteries and battery chargers ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1074
Rev. 4

Effective:	11/15/2019
Supersedes:	NA
Review Type:	NERC
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1074 Rev04.xlsx

2. Development history

Revision 0	**Date: 3/31/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Ken Wendt, Ron Diotallevi, Greg Voice, Dave Carlson (BSC - TOP TS&C), Dan Wasilewski, Kevin Swiat
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Transferred program documentation from AM-CE-P137-R0001 and created document to serve as the ComEd maintenance standard. Included requirements set forth in Reliability Standard PRC-005-2.

Revision 1	**Date: 5/27/2016**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Dan Wasilewski (ComEd), Ruth Miller (BSC - TOP TS&C)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Updated document number on *Battery MW* tab to reflect actual document number (AM-CE-P034-R1074).

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STATION DC SUPPLY, includes station batteries and battery chargers ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1074
Rev. 4

Revision 2	**Date: 12/31/2016**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Dan Wasilewski (ComEd), Hugo Castaneda, Philip Derr, Ruth Miller (EU TS&C)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Updated all references of PRC-005-2 to PRC-005-6. NERC Review Complete.

Revision 3	**Date: 12/1/2017**
Writer	Kevin Swiat
Reviewer(s)	Dan Wasilewski, Hugo Castaneda, Philip Derr, Aisha Jolly (EU TS&C)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Added comment to clarify that select tasks shall be executed in conjunction with the Quarterly Battery Inspection - Station PM and can be additionally executed in conjunction with the Station/Switchyard Inspection PM. Added comment to clarify that *Verify Float Voltage of Battery Charger* task shall be executed in conjunction with the Battery Annual Maintenance PM. Aligned task definitions for *Annual Battery Inspection - Station* and *Quarterly Battery Inspection - Station* with AM-CE-P181-R0004.

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STATION DC SUPPLY, includes station batteries and battery chargers ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1074
Rev. 4

Revision 4	**Date: 11/15/2019**
Writer	Kevin Swiat (ComEd Material Condition)
Reviewer(s)	Philip Derr (T&S Equipment Standards); Dan Wasilewski (Principal Compliance Specialist); Doug Adams (Principal Compliance Specialist); Martin Copello (T&S Engineering Standards and Applications); Daniel Gacek (NERC CMT)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Specify that maintenance on Sta DC Supply tab is for VLA and NiCAD battery systems; revised criticalities to align with AM-CE-P034-R0001; Updated disclaimer statement to reference the Exelon NERC Compliance and Security NERC Compliance Management Team (NERC CMT); added comment that visual inspection includes Specific Gravity measurements; corrected failure codes for Microwave Battery internal impedance test; aligned task title for Visual Inspection - Station (Battery and Charger) on Failure Modes tab with other tabs; corrected task definitions for Visual Inspection - Station, Quarterly Battery Inspection - Station, and Annual Battery Inspection - Station to avoid capturing the same task within multiple definitions; removed comments to "adjust float voltage if necessary" from Verify Float Voltage of Battery Charger and Verify Station DC Supply Voltage; added task definition for Microwave Internal Impedance Test; added the battery cell impedance check (BITE test) into the Verify Battery Continuity task; added the NEIL Loss Control Manual - 2019 Edition as a reference document; added statement in Maintenance Basis tab for Capacity Tests to align replacement expectations with requirements of NEIL's Loss Control Manual.

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Cyber Systems ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1075
Rev. 2

Effective:	3/12/2019
Supersedes:	n/a
Review Type:	NERC
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1075.xlsx

2. Development history

Revision 0	**Date: 10/31/2016**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Bill Pakosz (ComEd), Pooja Rajoria (ComEd), Mike Scannell (ComEd), Jeff Nagel (ComEd), John Hansen (TSC)
UFAM Approver(s)	Michael Moy (ComEd) Preventive Maintenance UFAM
Reason written	Initial maintenance template development.

Revision 1	**Date: 3/17/2017**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Jeff Nagel (ComEd)
UFAM Approver(s)	Michael Moy (ComEd) Preventive Maintenance UFAM
Reason written	Revise note to specify that tasks contained within the document are assessment activities and not to be considered as operational preventive or predictive maintenance tasks.

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Cyber Systems ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1075
Rev. 2

Revision 2	**Date: 3/12/2019**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Jeff Nagel (ComEd Testing Group); Kyle Spesard (ComEd Testing Group); Kash Dave (ComEd Testing Group); Olive Millan (ComEd Testing Group); Irfan Khan (ComEd R&PE); John Hansen (NERC CMT)
UFAM Approver(s)	Michael Moy (ComEd) Preventive Maintenance UFAM
Reason written	Updated “Cyber Systems” and “Development History” tab header to be “Assessment Template”; Added document number and page numbers to all tab footers; Updated documents to reference Exelon's NERC Compliance Management Team (NERC CMT); Updated Task Definitions to reference the NERC CIP Vulnerability Assessment Process and Procedure for details; Modified “Maintenance Basis” tab label to be “Basis”; Revised basis statement at top of “Basis” tab to reference the NERC CIP Vulnerability Assessment Process and Procedure; Added reference to RC-AC-PCS3-011 NERC CIP Vulnerability Assessment Process; Completed 2-year periodic review.

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34kV & below Battery Energy Storage Systems (BESS)

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R1076
Rev. 0

Effective:	1/31/2020
Supersedes:	n/a
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R1076_Rev00.xlsx

2. Development history

Revision 0	**Date: 1/31/2020**
Writer	Kevin Swiat (Material Condition)
Reviewer(s)	Philip Derr (T&S Equipment Standards); Kyle Scheffel (Relay & Protection Engineering); Andreas Brandt (Relay & Protection Engineering); Steve Urbanczyk (Relay & Protection Engineering); Martin Copello (T&S Engineering Standards and Applications); Jeffrey Bockover; (T&S Engineering Standards and Applications); Martin Rave (Distribution Standards); Miguel Ferrell (Distribution Standards)
UFAM Approver(s)	Michael Moy (ComEd Asset Performance)
Reason written	Maintenance template creation.

Revision 1	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Overhead Transmission, Structures

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R2001
Rev. 1

Effective:	2/5/2018
Supersedes:	None
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R2001

2. Development history

Revision 0	**Date: 2/6/2015**
Writer	Robert Munley, Stephen Dasovich, Howard Murray
Reviewer(s)	George Leinhauser, Ken Wendt, Ken Braerman
UFAM Approver(s)	J. Coffman, Cory Sommerson, Mike Moy
Reason written	Created during alignment across BGE, ComEd, and PECO with incorporation of best practices.

Revision 1	**Date: 2/5/2018**
Writer	Howard Murray, Sr. Engr., Transm. Engineering
Reviewer(s)	Angelo DeAngelis, Sr. Engr. Material Condition
UFAM Approver(s)	Mike Moy, Director (ComEd UFAM)
Reason written	3 year review, no content change.

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Overhead Transmission, Foundations

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R2002
Rev. 1

Effective:	2/5/2018
Supersedes:	None
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R2002.xlsx

2. Development history

Revision 0	**Date: 2/6/2015**
Writer	Robert Munley, Stephen Dasovich, Howard Murray
Reviewer(s)	George Leinhauser, Ken Wendt, Ken Braerman
UFAM Approver(s)	J. Coffman, Cory Sommerson, Mike Moy
Reason written	Created during alignment across BGE, ComEd, and PECO with incorporation of best practices.

Revision 1	**Date: 2/5/2018**
Writer	Howard Murray, Sr.Engr., Transm. Engineering
Reviewer(s)	Angelo DeAngelis, Sr. Engr., Material Condition
UFAM Approver(s)	Michael Moy, Director, (ComEd UFAM)
Reason written	3 year review, no content change.

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Switches

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R2003
Rev. 1

Effective:	2/2/2018
Supersedes:	None
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R2003.xlsx

2. Development history

Revision 0	**Date: 2/6/2015**
Writer	Robert Munley, Stephen Dasovich, Howard Murray
Reviewer(s)	George Leinhauser, Ken Wendt, Ken Braerman
UFAM Approver(s)	J. Coffman, Cory Sommerson, Mike Moy
Reason written	Created during alignment across BGE, ComEd, and PECO with incorporation of best practices.

Revision 1	**Date: 2/2/2018**
Writer	Angelo DeAngelis, Sr. Engr. Material Condition
Reviewer(s)	Howard Murray, Sr. Engr. Transmission Engineering
UFAM Approver(s)	Michael Moy, Director (ComEd UFAM)
Reason written	3 year review, no content change.

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Overhead Transmission, Conductors

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R2004
Rev. 1

Effective:	2/5/2018
Supersedes:	None
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R2004.xlsx

2. Development history

Revision 0	**Date: 2/6/2015**
Writer	Robert Munley, Stephen Dasovich, Howard Murray
Reviewer(s)	George Leinhauser, Ken Wendt, Ken Braerman
UFAM Approver(s)	J. Coffman, Cory Sommerson, Mike Moy
Reason written	Created during alignment across BGE, ComEd, and PECO with incorporation of best practices.

Revision 1	**Date: 2/2/2018**
Writer	Howard Murray, Sr. Engr., Transmission Engineering
Reviewer(s)	Angelo DeAngelis, Sr. Engr., Material Condition
UFAM Approver(s)	Michael Moy, Director (ComEd UFAM)
Reason written	3 year review, no content change.

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Overhead Transmission, Insulators

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R2005
Rev. 4

Effective:	2/5/2018
Supersedes:	None
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R2005.xlsx

2. Development history

Revision 0	**Date: 6/3/2008**
Writer	Howard Murray (Transmission Line Engineering)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis

Revision 1	**Date: 11/30/2010**
Writer	Chuck Priebe
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Bill Fluhler , Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups.

Revision 2	**Date: 1/27/2014**
Writer	Suneetha Parupalli, Sr Engineer, Material Condition
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Mike Moy (UFAM)
Reason written	3 year review, reformat document, No content change

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Overhead Transmission, Insulators

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R2005
Rev. 4

Revision 3	**Date: 2/6/2015**
Writer	Robert Munley, Stephen Dasovich, Howard Murray
Reviewer(s)	George Leinhauser, Ken Wendt, Ken Braerman
UFAM Approver(s)	J. Coffman, Cory Sommerson, Mike Moy
Reason written	Updated to align across BGE, ComEd, and PECO with incorporation of best practices.

Revision 4	**Date: 2/2/2018**
Writer	Howard Murray, Sr. Engr., Transm. Engineering
Reviewer(s)	Angelo DeAngelis, Sr. Engr., Material Condtion
UFAM Approver(s)	Mike Moy, Director (ComEd UFAM)
Reason written	3 year review, no content change.

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Line Low Pressure Fluid Filled (LPFF) Cable System ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R2006
Rev. 5

Effective:	1/26/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R2006

2. Development history

Revision 0	**Date: 11/6/2006**
Writer	George Leinhauser (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 11/30/2010**
Writer	Chuck Priebe
Reviewer(s)	Ken Wendt(Mgr. Material Condition)
UFAM Approver(s)	Bill Fluhler , Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups.

Revision 2	**Date: 6/15/2011**
Writer	Chuck Priebe (Material Condition)
Reviewer(s)	Ken Wendt (Mgr. Mat'l. Condition), Frank Frentzas (Trans. Eng.), Rob Fournie (Mgr. Trans. Eng.)
UFAM Approver(s)	Bill Fluhler
Reason written	Revised Tasks and Frequencies to align with material condition improvement and operating experience.

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Line Low Pressure Fluid Filled (LPFF) Cable System ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R2006
Rev. 5

Revision 3	**Date: 6/18/2014**
Writer	Angelo DeAngelis (Material Condition)
Reviewer(s)	Frank Frentzas(Trans. Eng.), Ken Wendt (Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	a) Align Task Frequencies from 1YR to 3YR for manholes/components previously falling under the Central Business District Criticality Category; includes inspection Tasks for manholes, joint casings, bonding transformers/inductors, insulating fluid pressure, fluid reservoir levels. b.) Revised Condition Monitoring Task "DGA Sampling" to "DGA (Dissolved Gas Analysis) Sampling".

Revision 4	**Date: 2/6/2015**
Writer	Frank Frentzas (Trans. Eng.)
Reviewer(s)	James Flisk (Trans. Eng.); Angelo DeAngelis (Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Aligned Task Frequencies to EU North Star Template as part of the PM Alignment initiative.

Revision 5	**Date: 1/26/2018**
Writer	Angelo DeAngelis (Material Condition)
Reviewer(s)	Frank Frentzas (Trans. Eng.)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	3 year review, no content change.

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Line High Pressure Fluid Filled (HPFF) Cable System ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R2007
Rev. 6

Effective:	1/26/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R2007

2. Development history

Revision 0	**Date: 11/6/2006**
Writer	George Leinhauser (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 11/30/2010**
Writer	Chuck Priebe
Reviewer(s)	Ken Wendt(Mgr. Material Condition)
UFAM Approver(s)	Bill Fluhler , Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups.

Revision 2	**Date: 6/15/2011**
Writer	Chuck Priebe (Material Condition)
Reviewer(s)	Ken Wendt (Mgr. Mat'l. Condition), Frank Frentzas (Trans. Eng.), Rob Fournie (Mgr. Trans. Eng.)
UFAM Approver(s)	Bill Fluhler
Reason written	Revised Tasks and Frequencies to align with material condition improvement and operating experience.

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Line High Pressure Fluid Filled (HPFF) Cable System ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R2007
Rev. 6

Revision 3	**Date: 6/18/2014**
Writer	Angelo DeAngelis (Material Condition)
Reviewer(s)	Frank Frentzas(Trans. Eng.), Ken Wendt (Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	a) Align Task Frequencies from 1YR to 3YR for manholes/components previously falling under the Central Business District Criticality Category; includes inspection Tasks for manholes, joint casings, bonding transformers/inductors, insulating fluid pressure, fluid reservoir levels. b.) Revised Condition Monitoring Task "DGA Sampling" to "DGA (Dissolved Gas Analysis) Sampling".

Revision 4	**Date: 3/4/2015**
Writer	Frank Frentzas(Trans. Eng.)
Reviewer(s)	James Flisk (Trans. Eng.); Angelo DeAngelis (Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Aligned Task Frequencies to EU North Star Template as part of the PM Alignment initiative.

Revision 5	**Date: 12/8/2015**
Writer	Angelo DeAngelis (Mat'l Condtion ComEd)
Reviewer(s)	Frank Frentzas (Transm. Eng.)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Align Tasks to EU North Star Template. Template has been revised addressing the inspection of pipe type cable facilities crossing public waterways or public roadways. Added were two time directed inspection tasks; one task for inspecting suspended facilities such as those attached to a bridge structure and a second task for inspecting buried facilities crossing waterways such as harbors, rivers or streams.

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Line High Pressure Fluid Filled (HPFF) Cable System ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R2007
Rev. 6

Revision 6	**Date: 1/26/2018**
Writer	Angelo DeAngelis (Material Condition)
Reviewer(s)	Frank Frentzas(Trans. Eng.)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	3 year review, no content change.

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Line Solid Type Cable System (XLPE) ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R2008
Rev. 5

Effective:	1/26/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R2008

2. Development history

Revision 0	**Date: 11/6/2006**
Writer	George Leinhauser (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 11/30/2010**
Writer	Chuck Priebe
Reviewer(s)	Ken Wendt(Mgr. Material Condition)
UFAM Approver(s)	Bill Fluhler , Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups.

Revision 2	**Date: 6/15/2011**
Writer	Chuck Priebe (Material Condition)
Reviewer(s)	Ken Wendt (Mgr. Mat'l. Condition), Frank Frentzas (Trans. Eng.), Rob Fournie (Mgr. Trans. Eng.)
UFAM Approver(s)	Bill Fluhler
Reason written	Revised Tasks and Frequencies to align with material condition improvement and operating experience.

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Line Solid Type Cable System (XLPE) ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R2008
Rev. 5

Revision 3	**Date: 6/18/2014**
Writer	Angelo DeAngelis (Material Condition)
Reviewer(s)	Frank Frentzas(Trans. Eng.), Ken Wendt (Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Complete 3 Year Review. Reformat document to new EU template.

Revision 4	**Date: 1/30/2015**
Writer	Frank Frentzas(Trans. Eng.)
Reviewer(s)	James Flisk (Trans. Eng.); Angelo DeAngelis (Material Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Aligned Task Frequencies to EU North Star Template as part of the PM Alignment initiative.

Revision 5	**Date: 1/26/2018**
Writer	Angelo DeAngelis (Material Condition)
Reviewer(s)	Frank Frentzas(Trans. Eng.)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	3 Year Review, no content change.

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Cathodic Protection Equipment Underground Transmission ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R2009
Rev. 1

Effective:	2/2/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R2009

2. Development history

Revision 0	**Date: 2/3/2015**
Writer	Frank Frentzas (ComEd Trans. Eng.)
Reviewer(s)	Youssef Tabib (ComEd Corrosion Control Eng.), Angelo DeAngelis (Mat'l Condition)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Revised Tasks and Frequencies to align with EU PM Alignment initiative.

Revision 1	**Date: 2/1/2018**
Writer	Youssef Tabib (ComEd Corrosion Control Eng.),
Reviewer(s)	Angelo DeAngelis (Mat'l Condition)
UFAM Approver(s)	Michael Moy, Director (UFAM ComEd)
Reason written	3 year review. Revised NACE reference documents to latest issue, no other content change.

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Automatic Throw Over

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3001
Rev. 4

Effective:	1/31/2020
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3001.xlsx

2. Development history

Revision 0	**Date: XX/XX/XXXX**
Writer	Larry Griess (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and basis

Revision 1	**Date: 11/30/2010**
Writer	Chuck Priebe
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Bill Fluhler, Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups

Revision 2	**Date: 1/27/2014**
Writer	Suneetha Parupalli, Sr Engineer, Material Condition
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Mike Moy (UFAM)
Reason written	3 year review, reformat document, No content change

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Automatic Throw Over

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3001
Rev. 4

Revision 3	**Date: 1/24/2017**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Dale Player (Mgr. Material Condition), Henry Sabuda (Distribution Testing), Ed Smykowski (Distribution Standards), Peter Yan (Reliability Programs)
UFAM Approver(s)	Mike Moy (UFAM)
Reason written	3 year review: Minor clarification to the Calibration task detail and Maintenance Basis sections.

Revision 4	**Date: 1/31/2020**
Writer	Jimi Conway (Material Condition)
Reviewer(s)	Suneetha Parupalli (Mgr. Material Condition), Keith Frost (Mgr, Reliability Programs), Lucy Ballesteros (Reliability Programs)
UFAM Approver(s)	Mike Moy (UFAM)
Reason written	3 year review. Updated criticallities to align with Key Venue Requirements and added associated notation in Maintenance Basis.

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Cathodic Protection Equipment, Underground Distribution

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3012
Rev. 5

Effective:	6/25/2020
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3012.xlsx

2. Development history

Revision 0	**Date: 11/17/2006**
Writer	Larry Griess (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis

Revision 1	**Date: 11/30/2010**
Writer	Chris Stefanski (Strategic Programs)
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Bill Fluhler, Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups

Revision 2	**Date: 4/29/2011**
Writer	Rodolofo Patriarca, Material Condition
Reviewer(s)	Ken Wendt (Mgr. Material Condition), Peter Yan, Keith Frost
UFAM Approver(s)	Bill Fluhler(UFAM)
Reason written	To document the maintenance program frequencies.

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Cathodic Protection Equipment, Underground Distribution

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3012
Rev. 5

Revision 3	**Date: 6/18/2014**
Writer	Suneetha Parupalli, Material Condition
Reviewer(s)	Ken Wendt (Mgr. Material Condition), Youssef Tabib (Sr. Engineer, Transmission Line Engineering)
UFAM Approver(s)	Michael Moy(UFAM)
Reason written	3 year review, reformat document, No content change

Revision 4	**Date: 6/23/2017**
Writer	Rodolfo Patriarca, Material Condition
Reviewer(s)	Youssef Tabib (Sr. Engineer, Transmission Line Engineering)
UFAM Approver(s)	Michael Moy(UFAM)
Reason written	UFAM Periodic Peer Review, no content changes made.

Revision 5	**Date: 6/25/2020**
Writer	Jimi Conway, Material Condition
Reviewer(s)	Youssef Tabib (Sr. Engineer, Transmission Line Engineering), Anthony Grazioso (Material Condition)
UFAM Approver(s)	Michael Moy (UFAM)
Reason written	3-year periodic review. Revised to add Criticality II for remote-monitoring enabled rectifiers. The remote monitoring allows for automated reporting of recitifier functionality and only requires a 1 yr minimum frequency for inspection. Re-ordered criticality for formatting clarity (Normal Application is now Criticality I). Revised wording for Criticality III to remove "Nearby Corrosion Interference Equipment" and updated criticality for "bond tie locations in gas/petroluem applications" for 1Y frequency.

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Padmount Transformers ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3016
Rev. 5

Effective:	3/29/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3016.xlsx

2. Development history

Revision 0	**Date: 12/29/2006**
Writer	Larry Griess (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis

Revision 1	**Date: 11/30/2010**
Writer	Chris Stefanski
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Bill Fluhler , Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups.

Revision 2	**Date: 6/10/2011**
Writer	Rodolfo Patriarca
Reviewer(s)	Pete Yan, Keith Frost, Ken Wendt
UFAM Approver(s)	Bill Fluhler
Reason written	To document the maintenance program frequencies.

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Padmount Transformers ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3016
Rev. 5

Revision 3	**Date: 6/25/2014**
Writer	Suneetha Parupalli, Material Condition
Reviewer(s)	Ken Wendt (Mgr. Material Condition), John Basten (Sr. Engineer, Reliability Inspection, Peter Yan (Sr. Engineer, Reliability Programs)
UFAM Approver(s)	Mike Moy(UFAM)
Reason written	3 year review, reformat document, no content change

Revision 4	**Date: 3/2/2015**
Writer	Daniel Kurtz
Reviewer(s)	Tom Rafferty (BGE), Marty Rave (ComEd), Giuseppe Termini (PECO)
UFAM Approver(s)	Cory Summerson (UFAM BGE), Mike Moy (UFAM ComEd) , J. Coffman (UFAM PECO)
Reason written	EU PM Template Alignment (BGE, ComEd, PECO); Separate templates created for Padmount, Submersible, and Pole Top transformers

Revision 5	**Date: 3/27/2018**
Writer	Jim Conway (ComEd)
Reviewer(s)	Keith Frost (ComEd), Ed Smykowski (ComEd)
UFAM Approver(s)	Mike Moy (UFAM ComEd)
Reason written	Three-year cycle review. No changes.

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Distribution Vaults ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3018
Rev. 1

Effective:	3/29/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3018.xlsx

2. Development history

Revision 0	**Date: 3/2/2015**
Writer	Daniel Kurtz (BGE)
Reviewer(s)	Wasif Qazi (PECO), Pete Yan (ComEd), Ed Lake (BGE), Beth Pittaway (BGE)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.

Revision 1	**Date: 3/27/2018**
Writer	Jim Conway (ComEd)
Reviewer(s)	Keith Frost (ComEd), Ed Smykowski (ComEd)
UFAM Approver(s)	Mike Moy (UFAM ComEd)
Reason written	Three- year cycle review. Added in the text for failure mode 5a. Text was missing, but was already present in the failure modes on the cover page.

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Padmounted Operating Devices

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3019
Rev. 1

Effective:	1/31/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3019.xlsm

2. Development history

Revision 0 (ED)	**Date 07/22/2005**
Writer	Larry Griess (Strategic Programs)
Reviewer(s)	07/21/05 Template Challenge Session Attendees
Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason Written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis

Revision 1 (ED)	**Date 01/26/2007**
Writer	Larry Griess (Strategic Programs)
Reviewer(s)	
Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason Written	General scrub, task and periodity review / update

Revision 2 (ED)	**Date 11/30/2010**
Writer	Chris Stefanski
Reviewer(s)	Ken Wendt (Mgr. Material Condition), Drew Reindel (Mgr. T&S Enginering)
Approver(s)	Bill Fluhler , Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason Written	Added note to ensure template changes are communicated to affected work groups.

Revision 0 (CE)	**Date 01/12/2015**
Writer	Daniel Kurtz

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Padmounted Operating Devices

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3019
Rev. 1

Reviewer(s)	Larry Burley (BGE), John Basten (ComEd), Dan Zoladz (PECO)
Approver(s)	Cory Summerson (UFAM BGE), Mike Moy (UFAM ComEd) , J. Coffman (UFAM PECO)
Reason Written	Created ComEd Template as part of EU alignment

Revision 1 (CE)	**Date 01/30/2018**
Writer	Jimi Conway
Reviewer(s)	Keith Frost
Approver(s)	Mike Moy
Reason Written	Updated for alignment with EU template: Added 34kV gas-insulated load centers. Combined 15- and 34- kV switchgear into the 15kv & 34kV pad-mounted modules.

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Transformers – Pole Top ComEd

ComEd Training and Reference Material (T&RM)
AM-CE-P034-R3020
Rev. 1

Effective:	8/30/2018
Supersedes:	AM-CE-P034-R3020-R0
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3020.xlsx

2. Development history

Revision 0	**Date: 8/21/2015**
Writer	Dave Darji, Engineer/Intern, Distribution Standards
Reviewer(s)	Dan Brotzman; Janine Keating, John Basten; Ken Wendt
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Alignment with EU 2Y Mainstem and 6Y Fused Tap Requirements

Revision 1	**Date: 8/30/2018**
Writer	Jimi Conway, Material Condition
Reviewer(s)	Keith Frost, ComEd; Marty Rave, ComEd;
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Three year review cycle – no changes proposed.

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Network Protector

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3023
Rev. 5

Effective:	12/29/2017
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3023.xlsm

2. Development history

Revision 0	**Date: 12/29/2006**
Writer	Nick Aludo (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis

Revision 1	**Date: 12/29/2006**
Writer	Chris Stefanski (Material Condition)
Reviewer(s)	Bill Fluhler. Keith Frost, Pete Tyschenko, John Basten
UFAM Approver(s)	Ron Donovan, Brian Graham, Michelle Blaise
Reason written	Revised frequency and defined application and scope of enclosure leak test.

Revision 2	**Date: 11/30/2010**
Writer	Chris Stefanski
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Bill Fluhler, Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups

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Network Protector

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3023
Rev. 5

Revision 3	**Date: 1/27/2014**
Writer	Suneetha Parupalli, Sr Engineer, Material Condition
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Mike Moy (UFAM)
Reason written	3 year review, reformat document, No content change

Revision 4	**Date: 12/29/2014**
Writer	Dan Kurtz, Engineer, Distribution Engineering (BGE)
Reviewer(s)	Ken Wendt (ComEd); Ed Smykowski (ComEd)
UFAM Approver(s)	Mike Moy (ComEd UFAM)
Reason written	EU PM Template Alignment (BGE, ComEd, PECO)

Revision 5	**Date: 12/29/2017**
Writer	Jimi Conway, Sr Engineer, Material Condition (ComEd)
Reviewer(s)	Keith Frost (ComEd); Ed Smykowski (ComEd)
UFAM Approver(s)	Mike Moy (ComEd UFAM)
Reason written	3 year review. 2-yr cycles corrected to 2.5-yr cycle to align with current process.

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Aerial Conductor ComEd

ComEd Training and Reference Material (T&RM)
AM-CE-P034-R3026
Rev. 1

Effective:	8/29/2018
Supersedes:	AM-CE-P034-R3026-R0
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3026.xlsx

2. Development history

Revision 0	**Date: 8/21/2015**
Writer	Dave Darji, Engineer/Intern, Distribution Standards
Reviewer(s)	Dan Brotzman; Janine Keating, John Basten; Ken Wendt
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Alignment with EU 2Y Mainstem and 6Y Fused Tap Requirements

Revision 1	**Date: 8/29/2018**
Writer	Jimi Conway, Material Condition
Reviewer(s)	Keith Frost, ComEd; Andrew Morris, ComEd;
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Three year review cycle – no changes proposed.

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Cutouts and Disconnects ComEd

ComEd Training and Reference Material (T&RM)
AM-CE-P034-R3027
Rev. 1

Effective:	8/29/2018
Supersedes:	AM-CE-P034-R3027-R0
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3027.xlsx

2. Development history

Revision 0	**Date: 8/21/2015**
Writer	Dave Darji, Engineer/Intern, Distribution Standards
Reviewer(s)	Dan Brotzman; Janine Keating, John Basten; Ken Wendt
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Alignment with EU 2Y Mainstem and 6Y Fused Tap Requirements

Revision 1	**Date: 8/29/2018**
Writer	Jimi Conway, Material Condition
Reviewer(s)	Keith Frost, ComEd; Andrew Morris, ComEd;
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Three year review cycle – no changes proposed.

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Aerial Gang Operated Switch ComEd

ComEd Training and Reference Material (T&RM)
AM-CE-P034-R3028
Rev. 1

Effective:	8/29/2018
Supersedes:	AM-CE-P034-R3028-R0
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3028.xlsx

2. Development history

Revision 0	**Date: 8/21/2015**
Writer	Dave Darji, Engineer/Intern, Distribution Standards
Reviewer(s)	Dan Brotzman, Janine Keating, John Basten, Ken Wendt
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Alignment with EU 2Y Mainstem and 6Y Fused Tap Requirements

Revision 1	**Date: 8/29/2018**
Writer	Jimi Conway, Material Condition
Reviewer(s)	Keith Frost, ComEd; Andrew Morris, ComEd;;
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Three year review cycle – no changes proposed.

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Distribution Wood Poles ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3029
Rev. 1

Effective:	7/30/2018
Supersedes:	AM-CE-P034-R3029-R0
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3029.xlsx

2. Development history

Revision 0	**Date: 7/14/2015**
Writer	Dave Darji, Engineer/Intern, Distribution Standards
Reviewer(s)	Michael Keller, Mgr Distribution Standards(PECO); Wasif Qazi, Distribution Standards(PECO); Daniel Brotzman, Mgr Reliability Programs (ComEd); Gerri Paramore, Reliability Programs(ComEd), David Barnard, Prin Engineer Electric Distribution Engineering & Standards, Suzanne Maxa-Albers, Workload Planning and Inspection(BGE)
UFAM Approver(s)	Michael Moy (ComEd), Preventative Maintenance, Director Asset Performance;
Reason written	EU Alignment on Minimum inspection cycle

Revision 1	**Date: 7/30/2018**
Writer	Jimi Conway (ComEd)
Reviewer(s)	Tom Kuksuk (ComEd); Lucy Ballesteros (ComEd); Bolanle Sosina (ComEd);
UFAM Approver(s)	Mike Moy (ComEd)
Reason written	Three-year cycle review. No changes made to document.

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Pole Top Capacitors ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3031
Rev. 2

Effective:	9/3/2019
Supersedes:	AM-CE-P034-R3031
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3031.xlsx

2. Development history

Revision 0	**Date: 11/20/2015**
Writer	Suneetha Parupalli, Material Condition
Reviewer(s)	Ken Wendt (Mgr. Material Condition), Peter Yan (Sr. Engineer, Reliability Programs), John Basten (Sr. Engineer, Reliability Inspection)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Align with current practice of same maintenance frequency for fixed and switched banks.

Revision 1	**Date: 8/17/2016**
Writer	Suneetha Parupalli, Material Condition
Reviewer(s)	Dale Player (Mgr. Material Condition), Peter Yan (Sr. Engineer, Reliability Programs), Anil Dhawan (Sr. Engineer, Distribution Standards)
UFAM Approver(s)	Mike Moy(UFAM)
Reason written	Modified criticality section to align with EU template

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Pole Top Capacitors ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3031
Rev. 2

Revision 2	**Date: 9/3/2019**
Writer	Jimi Conway (Sr. Engineer, Material Condition)
Reviewer(s)	Suneetha Parupalli (Mgr. Material Condition), Lucy Ballesteros (Sr. Engineer, Reliability Programs), Rudy Patriarca (Sr. Engineer, Material Condition), Jimi Conway (Sr. Engineer, Material Condition), Manisha Bandyopadhyay (Mgr. AESCnT), Krystof Sudol (Mgr. Voltage Optimization), Keith Frost (Mgr. Reliability Programs), Merle Turner (Mgr. Maintenance Inspections)
UFAM Approver(s)	Mike Moy (UFAM)
Reason written	3-yr review. Updated to reflect Voltage Optimization remote monitoring and testing capabilities. Adjusted visual inspection frequencies to align with circuit inspection frequencies and EU requirement. Updated Criticality I to invlude wording for VO equipment. Updated Amp Balance Test to include provisions for confirming corresponding values to be confirmed by standards based on the reading being taken by the specific make/model of the equipment.

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Pole Top Regulators ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3032
Rev. 2

Effective:	7/29/2019
Supersedes:	AM-CE-P034-R3032, Rev 1
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3032.xlsx

2. Development history

Revision 0	**Date: 11/20/2015**
Writer	Suneetha Parupalli, Material Condition
Reviewer(s)	Ken Wendt (Mgr. Material Condition), Peter Yan (Sr. Engineer, Reliability Programs), John Basten (Sr. Engineer, Reliability Inspection)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Align with EU recommendation for mainline and fused tap regulators..

Revision 1	**Date: 7/1/2016**
Writer	Suneetha Parupalli, Material Condition
Reviewer(s)	Dale Player (Mgr. Material Condition), Peter Yan (Sr. Engineer, Reliability Programs)
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Change wording in criticality section to Non Distribution Automation Circuit Mainstem and Fused Regulators to align with EU documentation.

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AM-CE-P034-R3032
Rev. 2

Revision 2	**Date: 7/29/2019**
Writer	Jimi Conway, Material Condition
Reviewer(s)	Lucy Ballesteros, Sr Engineer, Reliability Programs; Merle Turner, Mgr Maintenance Inspections; Manisha Bandyopadhyay, Mgr Distribution Automation; Suneetha Parupalli, Mgr Material Condition
UFAM Approver(s)	Mike Moy, ComEd UFAM
Reason written	Three-year review. No changes made to the document.

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Distribution Manholes

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3033
Rev. 5

Effective:	1/30/2018
Supersedes:	AM-CE-P034-R3013
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3033.xlsx

2. Development history

Revision 0 (AM-CE-P034-R3013)	**Date 12/29/2006**
Writer	Larry Griess (Strategic Programs)
Reviewer(s)	
Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason Written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis

Revision 1	**Date 11/30/2010**
Writer	Chris Stefanski
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
Approver(s)	Bill Fluhler , Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason Written	Added note to ensure template changes are communicated to affected work groups.

Revision 2	**Date 06/29/2012**
Writer	Rudy Patriarca
Reviewer(s)	Dan Brotzman, Pete Yan, Chris Stefanski, Ken Wendt, Bill Gannon
Approver(s)	Bill Fluhler
Reason Written	To document the change in frequency of distribution manhole inspections outside the City of Chicago.

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Distribution Manholes

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AM-CE-P034-R3033
Rev. 5

Revision 3	**Date 09/27/2012**
Writer	Rudy Patriarca
Reviewer(s)	Dan Brotzman, Pete Yan, Chris Stefanski, Ken Wendt, Bill Gannon
Approver(s)	Bill Fluhler
Reason Written	To document the change in frequency of distribution manhole inspections inside the City of Chicago.

Revision 4 (AM-CE-P034-R3033)	**Date 01/12/2015**
Writer	Daniel Kurtz (BGE)
Reviewer(s)	Wasif Qazi (PECO), Pete Yan (ComEd), Tom Rafferty (BGE), Beth Pittaway (BGE)
Approver(s)	Cory Summerson (UFAM BGE), Mike Moy (UFAM ComEd) , J. Coffman (UFAM PECO)
Reason Written	EU PM Template Alignment (BGE, ComEd, PECO); Renamed template from R3013 to R3033 to be consistent with numbering of PECO template

Revision 5	**Date 01/30/2018**
Writer	Jimi Conway
Reviewer(s)	Keith Frost
Approver(s)	Mike Moy
Reason Written	EU PM Template Alignment based on the review conducted in April for AM-EU-P034-R3033; Updated Criticallity/Frequency for Critical MH's and added description wording from the EU template for Critical MH's as defined by OpCo.

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Submersible Transformers ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3034
Rev. 1

Effective:	3/29/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3034.xlsm

2. Development history

Revision 0	**Date: 3/2/2015**
Writer	Daniel Kurtz
Reviewer(s)	Tom Rafferty (BGE), Marty Rave (ComEd), Giuseppe Termini (PECO)
UFAM Approver(s)	Cory Summerson (UFAM BGE), Mike Moy (UFAM ComEd) , J. Coffman (UFAM PECO)
Reason written	EU PM Template Alignment (BGE, ComEd, PECO); Separate templates created for Padmount, Submersible, and Pole Top transformers

Revision 1	**Date: 3/27/2018**
Writer	Jim Conway (ComEd)
Reviewer(s)	Keith Frost (ComEd), Ed Smykowski (ComEd)
UFAM Approver(s)	Mike Moy (UFAM ComEd)
Reason written	Three-year cycle review. No changes made.

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Reclosers and Sectionalizers ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3035
Rev. 1

Effective:	7/30/2018
Supersedes:	AM-CE-P034-R3035-R0
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3035.xlsx

2. Development history

Revision 0	**Date: 7/14/2015**
Writer	Dave Darji, Engineer/Intern, Distribution Standards
Reviewer(s)	Michael Keller, Mgr Distribution Standards(PECO); Ratanak Heng, General Engineer (BGE); Ken Wendt, Mgr Material Condition (ComEd); Wasif Qazi, Engineer(PECO)
UFAM Approver(s)	Michael Moy (ComEd UFAM), Preventative Maintenance, Director Asset Performance;
Reason written	EU Alignment on Minimum inspection cycle

Revision 1	**Date: 7/30/2018**
Writer	Jimi Conway (ComEd)
Reviewer(s)	Pat Arns (ComEd); Keith Frost (ComEd); Jeff Gates (ComEd);
UFAM Approver(s)	Michael Moy (ComEd UFAM)
Reason written	Three-yr cycle review. Revised text for task descriptions for Functional Operations Check and Record Operations counter. FOC text revised to include remote operation & checking to be satisfactory for satisfying task requirements. ROC text revised to remove trending requirement in the task description and to include remote collection of data as satisfactory for satisfying task requirements.

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Submersible Switches ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3036
Rev. 5

Effective:	3/29/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3036.xlsm

2. Development history

Revision 0 (ED)	**Date: 7/22/2005**
Writer	Larry Griess (Strategic Programs)
Reviewer(s)	07/21/05 Template Challenge Session Attendees
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis

Revision 1 (ED)	**Date: 1/26/2007**
Writer	Larry Griess (Strategic Programs)
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	Kathy McHugh (FAM Maintenance Planning)
Reason written	General scrub, task and periodicity review/update

Revision 2 (CE)	**Date: 11/30/2010**
Writer	Chris Stefanski
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Bill Fluhler , Bill Gannon, Nitin Patel, Jim Crane, Bill Sullivan
Reason written	Added note to ensure template changes are communicated to affected work groups.

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Rev. 5

Revision 3 (CE)	**Date: 1/27/2014**
Writer	Suneetha Parupalli, Sr Engineer, Material Condition
Reviewer(s)	Ken Wendt (Mgr. Material Condition)
UFAM Approver(s)	Mike Moy (UFAM)
Reason written	3 year review, reformat document, No content change

Revision 0 (CE)	**Date: 3/2/2015**
Writer	Daniel Kurtz
Reviewer(s)	Larry Burley (BGE), Pete Yan (ComEd), Jim Bezila (PECO);
UFAM Approver(s)	Cory Summerson (UFAM BGE), Mike Moy (UFAM ComEd) , J. Coffman (UFAM PECO)
Reason written	EU PM Template Alignment (BGE, ComEd, PECO); Alignment of Template Number – R3036 replaces R3020

Revision 5	**Date: 3/27/2018**
Writer	Jim Conway (ComEd)
Reviewer(s)	Keith Frost (ComEd), Ed Smykowski (ComEd)
UFAM Approver(s)	Mike Moy (UFAM ComEd)
Reason written	Reviewed as part of 3-year cycle review. Updated Criticality I and Criticality II to 'N/A'. These are N/A for ComEd. Updated 'Modular' to 'Molded' to correct typo.

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DC In A Box ComEd

ComEd Training and Reference Material (T&RM)

AM-CE-P034-R3037
Rev. 1

Effective:	4/5/2019
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P034-R3037.xlsx

2. Development history

Revision 0	**Date: 3/31/2016**
Writer	Hugo Castaneda (Material Condition)
Reviewer(s)	Ken Wendt, Doug Mason, Martin Rave, Anil Dhawam, Nitin Patel, Suneetha Parupalli, Elizabeth Jakosz, Peter Yan
UFAM Approver(s)	Mike Moy (UFAM ComEd)
Reason written	To document the maintenance program tasks, frequencies, failure modes, and maintenance basis for a DC In A Box.

Revision 1	**Date: 4/5/2019**
Writer	Jimi Conway (Material Condition)
Reviewer(s)	Kevin Swiat, Martin Rave
UFAM Approver(s)	Mike Moy (UFAM ComEd)
Reason written	Three-year review. No changes made.

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One Percent (1%) Worst Performing Circuit Program

ComEd Process
AM-CE-P110
Rev. 3

Effective:	10/23/2019
Supersedes:	AM-CE-P110 Rev.1
Review Type:	3 Year
Core Function:	System Performance

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1. Purpose

1.1. To provide guidelines for the worst performing circuit program as set forth by the ICC Section 411.120.

2. Precautions and limitations

2.1. Precautions

2.1.1 Regulatory requirement ICC Section 411.120

2.2. Limitations

2.2.1 None

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One Percent (1%) Worst Performing Circuit Program

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3. Process

3.1. SUMMARY

3.1.1 The one percent (1%) worst performing circuits from the previous year are reported to the Illinois Commerce Commission (ICC) annually. The circuits for the 1% program are selected from each Operating Region based on the reliability indices the previous calendar year (January 1st through December 31st). For example, the circuits in the 2011 program are selected based on their performance January 1, 2010 through December 31, 2010.

3.1.2 Required CM and PD work shall be completed in the program year as reported in the planned improvements included in the ICC Annual Report (section J), which issues on June 1st of each year. See AM-CE-P110-R0001 for the ideal one percent (1%) program schedule to ensure meeting the end of year date.

3.2. CIRCUIT SELECTION

3.2.1 Selection of the "worst-performing circuits" is those distribution circuits that, for each reliability index (SAIFI, CAIFI, and CAIDI), are among the one percent of all circuits in an operating area with the highest achieved values (lowest performance levels) for the reliability index. For the purpose of identifying worst-performing circuits, only distribution circuit interruptions and customers affected by such interruptions shall be considered in calculating the reliability indices.

3.2.2 The operating areas defined to the ICC are Chicago, Northeast (includes Maywood area), Northwest, and Southern regions.

3.2.3 Leading up to each program year, each month from July to November, a preliminary list of SAIFI circuits will be issued out by Reliability Analysis & Reporting at the end of each month beginning in July based on year-to-date performance. The list will be issued for review by Reliability Engineering and for inspection by Reliability Inspections. There are six cycles, with the last cycle being in January when the final official 1% circuits are identified.

3.2.4 Year-to-date performance will also be reviewed by Reliability Analysis & Reporting monthly to see if there are any changes to the preliminary list.

3.2.5 The final list of 1% circuits will be identified before the end of the second week in January based on year-end performance. [Note: some preliminary SAIFI circuits may not make the final official 1% list.]

3.2.6 Reliability Analysis & Reporting will identify fused taps on SAIFI circuits that had three or more overhead equipment related outages in the 12 month reporting period; these fused taps are to have a visual and thermography inspection performed. See AM-CE-P110-R0002 for one percent (1%) worst performing circuit program scope overview.

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One Percent (1%) Worst Performing Circuit Program

ComEd Process
AM-CE-P110
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3.3. ENGINEERING ANALYSIS

3.3.1 Reliability Engineering analyzes outages and makes recommendations on design improvements based on the main SAIFI/CAIFI/CAIDI drivers of each circuit.

3.3.1.1 Potential design improvements may include the following: Refer to AM-CE-P110-R0003 One Percent (1%) Worst Performing Circuit Reliability Toolbox.

3.3.1.2 Examples such as: Sectionalizing/Fusing, Lightning arrester protection, Conductors (overhead and underground), Other pole or equipment adequacy.

3.3.2 The engineering analysis may also include corrective maintenance (CM) items beyond the scope of section 5.4 if they are found related to the cause for the outages being reviewed. Work requests may be issued to C&M for the completion of the (CM) items. Proper 1% coding is to be applied on the WR. See AM-CE-P110-R0004 & AM-CE-P110-R0005.

3.3.3 Reliability Engineering shall generate a Project Diagram number within the PDLog for each worst performing circuit (even when no construction work is required). The PD entry shall describe the analysis performed along with any enhancements identified during the engineering analysis. See AM-CE-P110-R0006.

3.3.4 Reliability Engineering shall develop a description of any action taken or planned to improve the performance of any worst performing circuit based on the causes of the outages that caused the circuit to make the 1% list (which shall include information concerning the cost of such action and a schedule for completion of any such action). In general, the Reliability Engineer has three weeks for cycles 1 – 6 from the time the list of preliminary/final 1% circuits come out for SAIFI circuits, to formulate the plan for improvement for the circuit. In general, the Reliability Engineer has eight weeks from the time the list of final 1% circuits come out for CAIDI circuits, to formulate the plan for improvement for the circuit. If no action is required to improve the performance of a circuit designated as a worst-performing circuit, then Reliability Engineering shall explain the reasons for no action.

3.3.5 Reliability Engineering shall prepare a presentation, along with the proposed PD, exhibiting the enhancements recommended, to be reviewed through a challenge process for all SAIFI and CAIFI circuits. See section 3.7.

3.3.6 Reliability Engineering shall create the appropriate SRs with the final PD attached for circuits requiring work, and route the SR to the appropriate work group (Distribution Engineering & Design, or Transmission & Substation, etc.). Proper 1% coding is to be applied to the SRs. See AM-CE-P110-R0004 & AM-CE-P110-R0005.

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One Percent (1%) Worst Performing Circuit Program

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Rev. 3

3.3.7 Reliability Engineering shall provide the final scope information to Regulatory Performance & Reporting to be included in the ICC Annual Report (section J) which issued on June 1st of each year.

3.4. VISUAL INSPECTION

3.4.1 Inspectors shall perform a visual inspection of overhead primary conductors in order to identify broken or damaged equipment consistent with process document CM-CE-P321 (Overhead Distribution Circuit Inspection and Maintenance).

3.4.2 A non-credit preventive maintenance (PM) work order will be generated, as necessary, by Reliability Inspections, so that the current inspection cycle is not disrupted. Proper 1% coding is to be applied on the WO. See AM-CE-P110-R0007.

3.4.3 For SAIFI circuits, the visual inspection includes the overhead main-stem (also includes main-stem switchgear) and fused taps. In general, Reliability Inspections has six weeks from the time the list of final 1% circuits come out for CAIDI circuits, to inspect and ensure the appropriate CMs are entered into the Asset Management System.

3.4.4 For CAIFI/CAIDI circuits, the visual inspection shall target the overhead portions of either the primary main-stem (if main-stem is an identified scope by Reliability Programs, then the main-stem switchgear is also to be inspected) and/or fused taps that experienced outages which resulted in the 1% circuit status.

3.4.5 Reliability Inspections shall ensure the proper completion of the 1% visual inspection PM WOs; this includes taking the PM WOs to complete in the Asset Management System.

3.4.6 Reliability Inspections shall ensure the CM work orders tasks to repair identified items are generated in the Asset Management System, ensuring the proper 1% coding is on the WOs. See AM-CE-P110-R0004.

3.5. INFRARED (IR) INSPECTION

3.5.1 Reliability Inspections shall perform an infrared (IR) inspection of overhead primary conductors in order to identify “hot spots” on equipment consistent with process document CM-CE-P322 (Overhead Distribution Circuit Thermography Inspection). The scope of the portion of the overhead primary conductors is the same as that which is identified for overhead visual inspection, the timeline for accomplishing the IR inspections is to mimic the overhead visual inspection timeline.

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One Percent (1%) Worst Performing Circuit Program

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3.5.2 Reliability Inspections shall ensure the proper completion of the 1% thermography visual inspection PM WOs; this includes taking the PM WOs to complete in the Asset Management System. And also ensures proper 1% coding on the PM WOs.

3.5.3 Reliability Inspections shall ensure the CM work orders tasks to repair identified items are generated in the Asset Management System, ensuring the proper 1% coding is on the WOs. See AM-CE-P110-R0004.

3.6. RED TAG POLE REINFORCEMENT AND/OR REPLACEMENT

3.6.1 Reliability Programs assembles red tag pole data from visual inspections and determines which poles can be reinforced and which poles require replacement based on historical data from the pole inspection program; this review is to take after each cycle inspection.

3.6.2 During review, if Reliability Programs finds a pole to be a priority pole replacement with an existing WO under the Pole Program, said pole will be forwarded to the Project & Contract Management department to ensure adherence to the 1% Program execution timeline.

3.6.3 Reliability Programs will forward all 3 Phase non-priority restorable poles to Regional Reliablity ahead of the Technical Challenge. Poles are to be included in the SR documentation and replaced under the 1% Worst Performing Circuit Program.

3.6.4 Reliability Programs will forward 1 Phase and 2 Phase restorable poles (poles to be c-trussed) after cycles 1 through 3 has been reviewed (by the beginning of November) to c-truss contractor to determine if all the identified restorable poles can be c-trussed; the evaluation is to be done again after cycles 4 through 6 have been reviewed (by the beginning of March) to ensure information gets to the executing work force in a timely manner.

3.6.5 Projects & Contracts ensures schedule of c-trussing conforms to any and all overtime (Valtin) windows, and notifies Reliability Programs department if there are any issues.

3.6.6 Reliability Programs receives initial information from c-truss contractor concerning those poles that can be c-trussed versus those that cannot; those that cannot be c-trussed are to have a CM task created for pole replacement with the proper 1% coding in a timely fashion so that the work can be planned, scheduled, and executed in a timely manner.

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One Percent (1%) Worst Performing Circuit Program

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3.6.6.1 Reliability Programs ensures either an existing WO task on a 1% CM WO is updated for poles that are to be replaced or creates a new WO task for pole replacement with the proper Primary Equipment Group (PEG) code (i.e. the circuit the pole is on) and the proper 1% coding on the WO. See AM-CE-P110-R0008.

3.6.7 Reliability Programs checks in bi-weekly with Project & Contract Management / Contractor as the c-trussing is being performed to check on any emergent pole replacements identified during the c-trussing program, and creates the required 1% CM WO tasks for these emergent pole replacements, and communicates these new pole replacement tasks in a timely manner to the 1% Program Manager, which the 1% Program Manager then communicates to the Work Management department in a timely manner.

3.7. CHALLENGE PROCESS

3.7.1 The objective of the challenge is to ensure the intended project functionality is achieved at the optimal cost, without sacrificing safety, system integrity, operability, reliability, regulatory requirements or the necessary quality of the end product.

3.7.2 Reliability Programs sets up and facilitates challenge meetings to follow as close to the due dates for reliability analyses.

3.7.3 The project approval:

3.7.3.1 Projects < $100K can be approved at the regional level.

3.7.3.2 Projects > $100K require a unique ITN and Project ID with funds offset via the 1% System Performance ITN 11161.

3.7.3.3 Projects > $500K require approval by the Project Review Committee (PRC)

3.7.4 Process for Work Approval:

3.7.4.1 The Reliability Engineer will obtain detailed multi-year outage information for the circuit that describes the outages and causes.

3.7.4.2 The Reliability Engineer will perform an outage analysis to identify common causes.

3.7.4.3 The Reliability Engineer will perform field investigation to assess the material condition of the circuit.

3.7.4.4 The Reliability Engineer will prepare information for the challenge meeting: Preliminary scope of work, Compare basis of work to the reasons for outages; for each work element identify the outages that would have been avoided, Preliminary cost estimates.

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One Percent (1%) Worst Performing Circuit Program

ComEd Process
AM-CE-P110
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3.7.4.5 The Reliability Engineer will prepare challenge documents and respond to any follow-up action items.

3.7.4.6 The Reliability Engineers shall generate final Project Diagrams (PD's) incorporating recommendations from the challenge meeting.

3.7.5 Challenge Meeting Rules and Flow:

3.7.5.1 Circuit to be challenged is named.

3.7.5.2 Statistics of the feeder are discussed: SAIFI/CAIFI and can include CAIDI, Number of Customers served, Number of outages, Number of lockouts, Any Identifiable outage trend.

3.7.5.3 Engineering analysis of the circuit is reviewed and discussed: Design enhancement, Corrective maintenance.

3.7.5.4 Challenges and recommendations are made.

3.7.5.5 Action Items are summarized.

3.7.5.6 Decision on PD status is made: PD's that do not require a follow-up may be forwarded to Design Engineering via an SR along with any WRs, PD's that require follow-up are to be resolved as soon as possible.

3.8. ENGINEERING DESIGNS (DISTRIBUTION AND T&S)

3.8.1 In general, the Design Engineer has three weeks for cycles 1 – 4, and four weeks for cycles 5 & 6, from the time the final PD's (SRs) are submitted from the Reliability Engineers for SAIFI circuits to create a final design. In general, the Design Engineer has four weeks from the time the final PD's (SRs) are submitted from the Reliability Engineers for CAIDI circuits to create the final design.

3.8.2 The Design Engineer and/or Project Engineer are to ensure the proper WOs are created along with the proper 1% coding. This includes any placeholder WOs that are required to meet scope locks for the 1st (should include cycles 1 -3 Frequency based circuits) and 2nd (should include cycles 4 – 6 Frequency based circuits) quarterly work plans.

3.8.3 Distribution Design Engineering reviews SRs related to clearance issues identified during the visual inspections on current year's 1% program and creates appropriate designs and WO tasks. Design engineer to review marked-up inspection map to determine if other CM clearance issues may have been identified at those same locations to enable bundling of designs/work. If bundling opportunities exist, Design Engineering contacts Work Management Planning to coordinate efforts.

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3.8.4 The Design Engineer and/or Project Engineer progresses and closes out the engineering related tasks in a timely manner. This includes updating design estimates as appropriate as the work tasks are progressed.

3.9. PLANNING AND SCHEDULING OF 1% WORK

3.9.1 Program manager for 1% program assembles all WOs, including any placeholder WOs or trending of hours for CM WOs and submits them to Distribution Work Strategy (DWS) before the quarterly scope lock meetings.

3.9.2 Program manager for 1% program ensures the timing of resources matches delivery of work scope.

3.9.3 Distribution Work Strategy finalizes work plan and ensures all submitted 1% WO & WO tasks are captured in the work plan and forwarded to the regional work planning organization. Any changes to the work plan requested by the 1% program manager are discussed with DWS and any agreed changes to the work plan are then communicated to the regional work planning organization.

3.9.4 Work Management receives list of WO tasks from DWS that make up the 1% scope and plans and schedules the work for execution. Frequency based circuits have a target construction complete date of June 30th of the program year, while Duration based circuits have a target construction complete date of September 30th of the program year. See AM-CE-P110-R0001.

3.9.5 When CM WO tasks require engineering, Work Planning creates SR requesting the appropriate work and codes the SR with the proper 1% coding, noting the WO-task the SR has been generated from. See AM-CE-P110-R0004 & AM-CE-P110-R0005. Work Management shall keep the original WO tasks open until the new WO is established from the SR; once the new WO number is obtained, Work Management cancels the original WO task with a cancellation note referencing the new WO number and ensures the new WO carries the appropriate 1% coding.

3.9.6 Work Planning maintains the integrity of the scope during the life-cycle of the program by not processing WRs that did not originate from the 1% inspections or challenge process onto an existing 1% WO, not creating new WO tasks that are out of scope onto an existing 1% WO, and not canceling the 1% WO task when a duplicate task exists. (The non-1% designated duplicate task shall be the one that is canceled.)

3.10. CONSTRUCTION OF 1% WORK

3.10.1 C&M and T&S SSC performs 1% construction tasks (corrective maintenance and system performance enhancements) per the schedule.

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3.10.2 C&M and T&S SSC works with Engineering to resolve issues where work cannot be constructed as designed/planned; notifies 1% Program Manager of such issues.

3.10.3 C&M and T&S SSC notifies originating department, Work Management, and 1% Program Manager before work is canceled. Cancels tasks as necessary and provides proper cancellation notes.

3.10.4 C&M and T&S SSC completes their WO tasks within the asset management system with proper completion notes.

3.10.5 Testing Group performs relay settings work and closes out WO tasks accordingly.

3.11. VEGETATION MANAGEMENT

3.11.1 Vegetation Management receives final list of one percent circuits in January from Reliability Programs of the program year and creates a WO for the frequency based circuits and a WO for the Duration based circuits. Each circuit to be trimmed is a WO task on each WO with the circuit number in the task title.

3.11.2 Vegetation Management trims Frequency circuits per Vegetation Management processes by June 30th of the program year, and trims Duration circuits per Vegetation Management processes by September 30th of the program year. See AM-CE-P110-R0010.

3.11.3 Vegetation Management receives any special requests for particular trimming requirements and performs trimming as necessary.

3.11.4 Vegetation Management completes their WO tasks within the asset management system with proper notes.

3.12. PROGRAM TRACKING

3.12.1 Reliability Programs 1% Program Manager assembles and maintains WO task list (scope) of 1% program. (Visual inspection results, thermography inspection results, and reliability improvements identified after challenge process.)

3.12.2 Reliability Programs 1% Program Manager ensures Engineering Design meets design delivery dates to facilitate Work Management meeting the 1% process milestone dates.

3.12.3 Reliability Programs 1% Program Manager ensures 1% system performance (SP) reports are run and posted to Distribution Engineering & Design website to facilitate tracking of the progression of work from design to planning to construction.

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3.12.4 Reliability Programs 1% Program Manager ensures Work Management Systems creates and posts tracking report for all 1% work that is to be planned, scheduled, and executed; includes SP, CM and Vegetation Management WO tasks.

3.12.5 Reliability Programs 1% Program Manager reviews the scope, schedule, and budget of the 1% program throughout the execution of the program, includes review of cancelled tasks monthly.

3.12.6 Reliability Programs 1% Program Manager reports periodically on scope, schedule, and budget to upper management during the progress of the program.

3.12.7 Work Management Systems creates and posts tracking report for all 1% work that is to be planned, scheduled, and executed for the specific year's program by the first week in October of the year prior to the program year; includes SP, CM and Vegetation Management WO tasks. (SP & CM work identified through 1% coding on WOs while Vegetation Management work identified by specific WOs with the circuit number listed in the task title.)

3.12.8 Work Management Systems updates tracking report for weekly Programs review call and resolves any discrepancies with the 1% Program Manager. Tracking report shall also have a tab for canceled tasks which includes cancellation notes and cancellation date.

3.13. PROCESS LISTING

#	Process Element	Description	Performed By
NA	NA	NA	NA

3.13.1 NA

3.14. ASSUMPTIONS

3.14.1 None

4. Roles and Responsibilities

4.1. CONSTRUCTION & MAINTENANCE (C&M)

4.1.1 Completes CM and PD work.

4.1.2 Notifies originating department, Work Management, and 1% Program Manager when a work order task is to be canceled or deviated from.

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4.1.3 Updates and completes work order tasks in asset management system, ensuring that close out comments on work order task reflect work completed. If work is not required, or was found completed upon arrival, the work order task shall be canceled and include cancellation comments describing conditions found.

4.1.4 Closes AR assignment. See AM-CE-P110-R0009

4.2. DISTRIBUTION ENGINEERING & DESIGN

4.2.1 Reliability Engineering

4.2.1.1 Analyzes outages and makes recommendations on design improvements based on the main SAIFI/CAIFI/CAIDI drivers of each circuit.

4.2.1.2 Creates PD# and logs information in the PDLog.

4.2.1.3 Submits SR (Reliability Engineer) to Design Engineering.

4.2.1.4 Submits SR (Reliability Engineer) to Transmission and Substation (T&S) where applicable.

4.2.1.5 Submits WR for corrective maintenance items not captured via the Reliability Inspections visual inspections.

4.2.1.6 Ensures SRs & WRs carry the proper 1% coding.

4.2.1.7 Brings proposals for improvements through technical challenge for 1% circuit program, as required.

4.2.1.8 Conducts CAIDI review with OCC as required.

4.2.1.9 Reserves VLF testing slots in the VLF schedule to accommodate any VLF testing approved through the challenge process for the 1% scope.

4.2.1.10 Provides information to Regulatory Performance & Reporting regarding each 1% circuit.

4.2.1.11 Closes AR assignment. See AM-CE-P110-R0009

4.2.2 Design Engineering

4.2.2.1 Creates designs to implement Reliability Engineers recommended enhancements.

4.2.2.2 Creates WOs based on PD's (may include placeholder WOs for submittal for quarterly work plans based on timing for scope lock of quarterly plan).

4.2.2.3 Reviews SRs generated from 1% circuit inspections and creates appropriate WOs.

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4.2.2.4 Ensures WOs carry the proper 1% coding. (Includes removing 1% coding from preliminary SAIFI circuits that do not make the final list and placeholder WOs that are ultimately not required.

4.2.2.5 Closes AR assignment. See AM-CE-P110-R0009.

4.3. DISTRIBUTION WORK STRATEGY

4.3.1 Assembles 1% WO & WO tasks for quarterly work scope and distributes to the appropriate work management regions (may include work assigned to other departments other than C&M, such as Operating or T&S).

4.3.2 Communicates changes to work scope in a timely fashion to the regions.

4.4. OPERATIONS

4.4.1 Performs switching as required.

4.4.2 Completes operating WO tasks after work is performed.

4.4.3 Provides input to Distribution Engineering & Design on CAIDI improvements.

4.5. PROJECT & CONTRACT MANAGEMENT

4.5.1 Serves as main point of contact between ComEd and the contractors.

4.5.2 Initiates and approves contract release for the work to be performed in the current year.

4.5.3 Ensures c-truss contractor does initial walk-down of identified restorable poles to validate poles can be c-trussed after each cycle's information is received.

4.5.4 Ensures c-truss contractor performs c-trussing of restorable poles.

4.5.5 Notifies Reliability Programs immediately when a c-truss pole is found to be non-restorable.

4.6. REGULATORY & GOVERNMENTAL AFFAIRS

4.6.1 Serves as main point of contact between ComEd and ICC field auditors for 1% circuit program.

4.7. REGULATORY AND RELIABILITY ANALYSIS & REPORTING

4.7.1 Reviews ComEd distribution circuit reliability indices and generates official 1% circuit program list.

4.7.2 Creates Action Request (AR) for program year. See AM-CE-P110-R0009.

4.7.3 Identifies any other circuit segments, such as fused taps, that experienced outages which contribute to the 1% circuit status; includes preliminary lists.

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4.7.4 Issues preliminary and final 1% circuit lists to Reliability Programs, Reliability Engineering, Work Management, Vegetation Management, & Reliability Inspections.

4.7.5 Closes out the AR task assigned (Issue official & final 1% circuit list). See AM-CE-P110-R0009.

4.7.6 Incorporates 1% circuit program information from Distribution Engineering & Design into the annual reliability report.

4.8. RELIABILITY INSPECTIONS

4.8.1 Maintains checklist of conditions on Circuit Inspection Form and ensures checklist conditions are prioritized in accordance with current work management prioritization procedures.

4.8.2 Creates PM work orders for visual and IR 1% circuit inspections.

4.8.3 Applies proper 1% coding onto PM WOs and ensures CM WOs generated from PM inspections also carry the 1% coding.

4.8.4 Visually inspects 1% circuits.

4.8.5 Performs IR inspections for the 1% circuits.

4.8.6 Updates and completes PM work orders for visual and IR inspections.

4.8.7 Creates CM work order tasks for items found during PM visual inspection.

4.8.8 Creates CM work order tasks for items found during IR inspection.

4.8.9 Creates SRs, as appropriate, for items found during PM visual inspections.

4.8.10 Provides 1% circuit inspection information to Regulatory Performance & Reporting to be included in the ICC Annual Report which is issued on June 1st of each year.

4.8.11 Performs review to ensure all required PM visual & IR inspections are completed and ensures all required CM WO tasks have generated appropriately.

4.9. RELIABILITY PROGRAMS

4.9.1 Wood Pole Program Manager

4.9.1.1 Reviews identified red tagged poles for possible C-trussing or replacement, creates appropriate WO tasks with proper coding for pole replacements and forwards the information concerning C-trussing to Projects & Contractors and the construction contractor.

4.9.1.2 Ensures proper 1% coding is on tasks that are created, and ensures PEG code (to identify what circuit the work is on) is filled in on WO task.

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4.9.2 One Percent (1%) Program Manager

4.9.2.1 Facilitates 1% challenge meetings and determines final scope of the program.

4.9.2.2 Ensures proper 1% coding is on final scope WOs to be executed by construction (may include WOs funded by other reliability programs that have passed through the challenge process).

4.9.2.3 Monitors completion of inspections (PM WOs), corrective maintenance repairs (CM WO tasks), and design improvements (SP aka PD WOs).

4.9.2.4 Assembles and submits 1% SP and CM Work Orders for quarterly work plans.

4.9.2.5 Contracts out any required engineering as indicated by T&S via their work screening committee.

4.9.2.6 Collaborates with regional work management to ensure T&S resources (TG & SSC) are scheduled for substation work including, but not limited to relay upgrades and auto-reclosing schemes.

4.9.2.7 Takes note that projects requiring relay upgrades at the substation have a 6-8 week construction drawing delivery lead time. This includes a 2 week ComEd review period and a station site walkdown. Construction drawings must be issued at T-10 for projects under $100k and T-12 for projects over $100k per WM-ED-5001. This allows adequate time for Testing Group and Substation Construction to evaluate the construction package, put in the required outages, and align their resources. 1% Program Manager ensures T&S has required info to begin the work in a timely manner.

4.9.2.8 Reviews canceled tasks periodically to ensure scope of work is being accomplished.

4.9.2.9 Reviews exceptions/excluded tasks identified by Work Management tracking report and facilitates resolutions.

4.9.2.10 Establishes and monitors program budget.

4.9.2.11 Communicates status and any program changes to stakeholders.

4.9.2.12 Closes AR assignment. See AM-CE-P110-R0009.

4.10. TRANSMISSION & SUBSTATION (T&S)

4.10.1 3.10.1. T&S Engineering

4.10.1.1 Processes SRs received from Distribution Engineering & Design (usually related to relay work associated with Distribution Automation (DA), and station auto-reclosing).

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4.10.1.2 Assigns technical disciplines as necessary through the T&S Work Screening Committee and creates placeholder tasks for T&S Engineering, SSC and TG with the proper 1% coding. The Reliability PM must coordinate with regional work management to align field resources.

4.10.1.3 Develop and issue scoping documents (Relay, SCADA, and Communication) by the need date indicated on the SR.

4.10.1.4 Review schematic drawings issued by EOC to ensure proper functionality of design (2 week review period).

4.10.1.5 Issues any required settings.

4.10.1.6 Ensures engineering is performed as requested when not contracted.

4.10.1.7 Closes T&S related WO tasks as work is completed.

4.10.2 Testing Group

4.10.2.1 Reviews issued drawings for resource and outage requirements.

4.10.2.2 Submits appropriate outage requests through the Switching Request System (SRS)

4.10.2.3 Submits a MANTIS request for any required SCADA testing.

4.10.2.4 Performs any required testing and relay settings per issued Relay Setting Orders (RSO's) and construction drawings.

4.10.2.5 Returns any marked up drawings to the engineering firm.

4.10.2.6 Updates and completes work order tasks in asset management system, ensuring that close out comments on work order task reflect work completed.

4.10.3 T&S Construction

4.10.3.1 Reviews issued construction drawings for resource and outage requirements.

4.10.3.2 Completes work according to construction drawings.

4.10.3.3 Notifies originating department and program manager when a work order task is to be canceled.

4.10.3.4 Updates and completes work order tasks in asset management system, ensuring that close out comments on work order task reflect work completed. If work is not required, or was found completed upon arrival, the work order task shall be canceled and include cancellation comments describing conditions found.

4.11. VEGETATION MANAGEMENT

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4.11.1 Creates WOs for Frequency and Duration circuits to track trimming done against the circuits.

4.11.2 Visually inspects 1% circuits for vegetation management requirements.

4.11.3 Completes required vegetation corrective actions.

4.11.4 Documents all vegetation work as required and completes the vegetation management WO tasks.

4.11.5 Provides 1% circuit trimming information to Regulatory Performance & Reporting to be included in the ICC Annual Report which issued on June 1st of each year.

4.11.6 Closes AR assignment. See AM-CE-P110-R0009

4.12. WORK MANAGEMENT

4.12.1 Regional Work Management

4.12.1.1 Evaluates resource requirements for 1% circuit program.

4.12.1.2 Develops resource strategy to ensure execution of the plan by prescribed milestone dates.

4.12.1.3 Prepares necessary work packages in support of 1% circuit program requirements.

4.12.1.4 Discusses CM and PD conditions with Reliability Programs when clarification is needed for the scope of work.

4.12.1.5 Ensures that CM and PD tasks are scheduled and tracks execution.

4.12.1.6 Creates CM work orders from work requests to track repairs

4.12.1.7 Maintains line of sight for 1% work for work tasks that are canceled and then referred to SRs and/or WOs by applying the appropriate 1% coding to the referenced SRs and/or WOs.

4.12.1.8 Maintains integrity of 1% scope: Does not process (roll) WRs that are not within the 1% scope onto an existing 1% WO, Does not create a new, out of scope WO task, onto an existing 1% WO, When there are duplicate tasks, does not cancel the 1% task to refer it to the non-1% WO, rather, the non-1% WO-task is to be canceled and then referred to the 1% WO-task.

4.12.1.9 Bundles work as needed to ensure completion of program tasks.

4.12.1.10 Closes AR assignment. See AM-CE-P110-R0009.

4.12.2 Work Management Systems

4.12.2.1 Provides tracking spreadsheet to tracks progress of work order tasks to ensure completion of 1% scope; includes a tab for canceled tasks.

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5. Documentation

Documentation generated during performance of this program shall be stored electronically in the computerized asset management system .

6. Terms and Definitions

6.1. Ambient Temperature

6.1.1 Air temperature in the vicinity of the target.

6.2. Anomaly

6.2.1 A deviation from the expected norm.

6.3. Action Request (AR)

6.3.1 A means to track (Action Tracking) progress and completion of a project or program via particular assignments; the AR to track the progress and completion of the 1% program is captured in the Asset Management System. See AM-CE-P110-R0009 for an example of a 1% program AR.

6.4. Asset Management System

6.4.1 A computerized database for the creation and tracking of information to facilitate the completion of construction and other activities, mainly through the use of work orders.

6.5. CAIDI

6.5.1 Abbreviation for Customer Average Interruption Duration Index. This is the average interruption duration for those customers on the circuit that experience interruptions.

6.6. CAIFI

6.6.1 Abbreviation for Customer Average Interruption Frequency Index. This is the average number of interruptions for those customers on the circuit that experience interruptions.

6.7. ComEd Distribution Circuit

6.7.1 A circuit owned and/or operated by ComEd and designed to operate at a nominal voltage of 15,000 volts or less and supplies one or more distribution transformers.

6.8. Corrective Maintenance (CM)

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6.8.1 Maintenance performed to correct system equipment or component conditions that render them incapable of performing their designed function. As a rule, if the specific equipment or component requiring maintenance has degraded or failed, the action required to repair it is classified as corrective maintenance. Examples would include:

6.8.1.1 Equipment removed from service due to actual or incipient failure.

6.8.1.2 Equipment that has the potential for rapidly increasing component degradation leading to an inability to perform its function.

6.9. Hot Spot

6.9.1 Any area of the equipment that is surveyed within a specified range of temperature above an equipment reference.

6.10. Infrared (IR) Inspection

6.10.1 The detection of infrared radiation and conversion to a temperature dependent image by use of an infrared imager. Temperature variations are made visible and these thermal images may then be recorded and analyzed. This non-intrusive technique is used to monitor the operating condition of equipment and components. IR inspection is a Preventive Maintenance (PM) tool that allows for the identification of anomalies prior to failure, and allows for the scheduling of corrective maintenance. It is a diagnostic inspection technology that is used to help determine maintenance requirements of the Distribution system.

6.11. Inspector

6.11.1 Person performing the inspection. May be a ComEd employee or contractor.

6.12. Main-stem

6.12.1 Portion of circuit where an outage could result in the circuit locking out. Does not include fused taps.

6.13. Outage Cause

6.13.1 The specific cause of an outage.

6.14. Preventive Maintenance (PM)

6.14.1 For purposes of this process document, PM means inspection of circuit components.

6.15. Project Diagram (PD)

6.15.1 Request issued by Engineering to create work order(s) for a defined scope of work.

6.16. Reference Temperature

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6.16.1 The temperature of an adjacent or similarly situated piece of equipment, operating under normal operating conditions, such as another phase or disconnect blade.

6.17. SAIFI

6.17.1 Abbreviation for System Average Interruption Frequency Index. This is the average number of interruptions per customer served on the circuit.

6.18. Service Request (SR)

6.18.1 A request made to Distribution Engineering & Design for engineering review and/or design.

6.19. Temperature Rise

6.19.1 Temperature difference of a component compared to another component of the same or similar design, operating conditions, and environmental surroundings.

6.20. Thermagram

6.20.1 A thermal image of a target that provides a qualitative image of the distribution of radiant energy of the target, which when correctly processed and corrected provides a representation of surface temperature distribution.

6.21. Work Order (WO)

6.21.1 An entry into the asset management system, which is a collection of tasks required to complete the desired work. It provides instructions for construction or maintenance work.

6.22. Work Order Task:

6.22.1 One of a series of steps required to complete a work order.

6.23. Work Request (WR)

6.23.1 An entry into the asset management system, requesting work to be performed; work requests are converted into WO tasks.Term

7. References

7.1. AM-CE-P110-R0001 – General One Percent (1%) Program Schedule

7.2. AM-CE-P110-R0002 – One Percent(1%) Worst Performing Circuit Program Scope Overview

7.3. AM-CE-P110-R0003 – One Percent (1%) Worst Performing Circuit Reliability Toolbox

7.4. AM-CE-P110-R0004 – Guide for Coding 1% Work

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7.5. AM-CE-P110-R0005 – Guide for Applying PD/WC Codes to a Work Request or Service Request

7.6. AM-CE-P110-R0006 – Guide for Entering One Percent (1%) Circuits into PDLog

7.7. AM-CE-P110-R0007 – Approach for 1% PM WOs in Asset Management System

7.8. AM-CE-P110-R0008 – One Percent (1%) Circuit Red Tag Pole Review Process Flow

7.9. AM-CE-P110-R0009 – 1% Worst Performing AR Example

7.10. AM-CE-P110-R0010 – One Percent Circuit Program Vegetation Trimming Criteria

7.11. Overhead Distribution Circuit Inspection and Maintenance CM-CE-P321.

7.12. Overhead Distribution Circuit Thermography and Maintenance CM-CE-P322.

7.13. EED Work Screening and Prioritization WM-ED-P014.

7.14. Testing, Switching And Operating Overview OP-CE-210004.

7.15. Engineering Work Control Procedure AM-ED-9001.

7.16. Asset Investment Committee (AIC) AM-ED-201.

7.17. Distribution Line Clearance Work Process CM-CE-P317.

7.18. Work Management Process Procedure WM-ED-5001.

7.19. Investigating Reported Clearance Violations ESP 5.3.7.2.

8. Attachments

8.1. None

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9. Development history

9.1.

Revision 0	Date: 5/17/2013
Writer	Brian Beissert, Sr. Engineer (Reliability Programs)
Reviewer(s)	Dan Brotzman (Reliability Programs Manager); Jaime Ortega (Reliability Analysis & Reporting Manager); Janine Keating (Reliability Inspections); Emily Kramer (Vegetation Management Manager);
UFAM Approver(s)	William Gannon, System Performance, Director
Reason written	Enhanced document to be more comprehensive to capture current scope and schedule of the program, and to better define the accountabilities of each group affecting the program.

Revision 1	Date: 10/18/2013
Writer	Brian Beissert, Sr. Engineer (Reliability Programs)
Reviewer(s)	Dan Brotzman (Reliability Programs Manager); Janine Keating (Reliability Inspections
UFAM Approver(s)	William Gannon, System Performance, Director
Reason written	Updated CAIDI timeline for Visual Inspection and Engineering Designs, Included Reliability Inspections under section 4.7.4, and fixed misc typos.

Revision 2	Date: 10/17/2016
Writer	Keith Frost (Reliability Programs)
Reviewer(s)	Laura Randle-Smith (Reliability Programs Manager)
UFAM Approver(s)	John Prueitt, System Performance, Director, Engineering.
Reason written	Reviewed per process at 3 year interval. Minor edits.

Revision 3	Date: 10/23/2019
Writer	Adam Gasiorek (Reliability Programs)
Reviewer(s)	Keith Frost (Reliability Programs Manager)
UFAM Approver(s)	Jim Ortega (Reliability Analysis)
Reason written	Reviewed per process at 3 year interval. Minor edits to Red Tag Procedure.

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One Percent (1%) Worst Performing Circuit Program

ComEd Process
AM-CE-P110
Rev. 3

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General One Percent Program Schedule

ComEd Training and Reference Material (T&RM)

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Rev. 2

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1. PDF Document

AM-CE-P110-R0001
General One Percent

2. Development history

Revision 0	**Date: 5/17/2013**
Writer	Brian Beissert, Sr. Engineer (Reliability Programs)
Reviewer(s)	Dan Brotzman (Reliability Programs Manager); Jaime Ortega (Reliability Analysis & Reporting Manager) ; Janine Keating (Reliability Inspections); Emily Kramer (Vegetation Management Manager);
UFAM Approver(s)	William Gannon, System Performance, Director
Reason written	Enhanced document to be more comprehensive to capture current scope and schedule of the program, and to better define the accountabilities of each group affecting the program.

Revision 1	**Date: 5/17/2016**
Writer	Marina Mondello, Sr. Engineer (Reliability Programs)
Reviewer(s)	Marina Mondello, Sr. Engineer (Reliability Programs)
UFAM Approver(s)	John Prueitt, System Performance, Director
Reason written	Periodic Review, No Changes

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General One Percent Program Schedule

ComEd Training and Reference Material (T&RM)

AM-CE-P110-R0001
Rev. 2

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Writer	Adam Gasiorek, Sr. Engineer (Reliability Programs)
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UFAM Approver(s)	Jaime Ortega, Reliability Analysis
Reason written	Periodic Review, No Changes

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One Percent Worst Performing Circuit Program Scope Overview

ComEd Training and Reference Material (T&RM)

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1. PDF Document

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One Percent Worst P

2. Development history

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UFAM Approver(s)	William Gannon, System Performance, Director
Reason written	Enhanced document to be more comprehensive to capture current scope and schedule of the program, and to better define the accountabilities of each group affecting the program.

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Reviewer(s)	Marina Mondello, Sr. Engineer (Reliability Programs)
UFAM Approver(s)	John Prueitt, System Performance, Director
Reason written	Periodic Review, No Changes

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One Percent Worst Performing Circuit Program Scope Overview

ComEd Training and Reference Material (T&RM)

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One Percent Worst Performing Circuit Reliability Toolbox

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One Percent Worst Performing Circuit Reliability Toolbox

ComEd Training and Reference Material (T&RM)

AM-CE-P110-R0003
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Guide for Coding One Percent Work

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Guide for Coding One

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Guide for Coding One Percent Work

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Revision 2	**Date: 3/5/2019**
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Reason written	Periodic Review, No Changes

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Guide for Applying PD WC Codes to a WR or SR

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1. PDF Document

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Guide for Applying PD

2. Development history

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Reason written	Brief description explaining why the process was written

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Guide for Entering One Percent Circuits into PDLog

ComEd Training and Reference Material (T&RM)

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Guide for Entering On

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UFAM Approver(s)	John Prueitt, System Performance, Director
Reason written	Periodic Review, Updated picture of PD Log

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Guide for Entering One Percent Circuits into PDLog

ComEd Training and Reference Material (T&RM)

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Reviewer(s)	Adam Gasiorek, Sr. Engineer (Reliability Programs)
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Approach for One Percent PM WOs in PassPort

ComEd Training and Reference Material (T&RM)

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Rev. 2

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Review Type:	3 Year
Core Function:	System Performance

1. PDF Document

AM-CE-P110-R0007
Approach for One Pe

2. Development history

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Writer	Brian Beissert, Sr. Engineer (Reliability Programs)
Reviewer(s)	Dan Brotzman (Reliability Programs Manager); Jaime Ortega (Reliability Analysis & Reporting Manager) ; Janine Keating (Reliability Inspections); Emily Kramer (Vegetation Management Manager);
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Reason written	Enhanced document to be more comprehensive to capture current scope and schedule of the program, and to better define the accountabilities of each group affecting the program.

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Reviewer(s)	Marina Mondello, Sr. Engineer (Reliability Programs)
UFAM Approver(s)	John Prueitt, System Performance, Director
Reason written	Periodic Review, No Changes

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Approach for One Percent PM WOs in PassPort

ComEd Training and Reference Material (T&RM)

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Revision 2	**Date: 5/30/2019**
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Reason written	Brief description explaining why the process was written

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One Percent Circuit Red Tag Pole Review Process Flow

ComEd Training and Reference Material (T&RM)

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Core Function:	System Performance

1. PDF Document

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One Percent Circuit R

2. Development history

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Reviewer(s)	Dan Brotzman (Reliability Programs Manager); Jaime Ortega (Reliability Analysis & Reporting Manager) ; Janine Keating (Reliability Inspections); Emily Kramer (Vegetation Management Manager);
UFAM Approver(s)	William Gannon, System Performance, Director
Reason written	Enhanced document to be more comprehensive to capture current scope and schedule of the program, and to better define the accountabilities of each group affecting the program.

Revision 1	**Date: 5/17/2016**
Writer	Marina Mondello, Sr. Engineer (Reliability Programs)
Reviewer(s)	Marina Mondello, Sr. Engineer (Reliability Programs)
UFAM Approver(s)	John Prueitt, System Performance, Director
Reason written	Periodic Review, No Changes

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One Percent Circuit Red Tag Pole Review Process Flow

ComEd Training and Reference Material (T&RM)

AM-CE-P110-R0008
Rev. 2

Revision 2	**Date: 5/30/2019**
Writer	Adam Gasiorek, Sr. Engineer (Reliability Programs)
Reviewer(s)	Adam Gasiorek, Sr. Engineer (Reliability Programs)
UFAM Approver(s)	Jaime Ortega, Reliability Analysis
Reason written	Periodic Review, No Changes

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One Percent Worst Performing AR Example

ComEd Training and Reference Material (T&RM)

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1. PDF Document

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One Percent Worst P

2. Development history

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Writer	Brian Beissert, Sr. Engineer (Reliability Programs)
Reviewer(s)	Dan Brotzman (Reliability Programs Manager); Jaime Ortega (Reliability Analysis & Reporting Manager) ; Janine Keating (Reliability Inspections); Emily Kramer (Vegetation Management Manager);
UFAM Approver(s)	William Gannon, System Performance, Director
Reason written	Enhanced document to be more comprehensive to capture current scope and schedule of the program, and to better define the accountabilities of each group affecting the program.

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Writer	Marina Mondello, Sr. Engineer (Reliability Programs)
Reviewer(s)	Marina Mondello, Sr. Engineer (Reliability Programs)
UFAM Approver(s)	John Prueitt, System Performance, Director
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One Percent Worst Performing AR Example

ComEd Training and Reference Material (T&RM)

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Reviewer(s)	Adam Gasiorek, Sr. Engineer (Reliability Programs)
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Reason written	Brief description explaining why the process was written

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One Percent Circuit Program Trimming Criteria

ComEd Training and Reference Material (T&RM)

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Core Function:	System Performance

1. PDF Document

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One Percent Circuit P

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UFAM Approver(s)	William Gannon, System Performance, Director
Reason written	Enhanced document to be more comprehensive to capture current scope and schedule of the program, and to better define the accountabilities of each group affecting the program.

Revision 1	**Date: 5/17/2016**
Writer	Marina Mondello, Sr. Engineer (Reliability Programs)
Reviewer(s)	Marina Mondello, Sr. Engineer (Reliability Programs)
UFAM Approver(s)	John Prueitt, System Performance, Director
Reason written	Periodic Review, No Changes

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One Percent Circuit Program Trimming Criteria

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Revision 2	**Date: 6/20/2019**
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UFAM Approver(s)	Jaime Ortega, Reliability Analysis
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Reason written	Brief description explaining why the process was written

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Distribution Padmount Equipment Inspection Program

ComEd Program
AM-CE-P166
Rev. 1

Effective:	11/27/2017
Supersedes:	OP-ED-142025 and
Review Type:	3 Year
Core Function:	Preventive Maintenance

Table of Contents

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1. Purpose

1.1. To outline the inspection and preventive maintenance process for Distribution Padmount Equipment. This document applies to Distribution Padmount Transformers, Padmount Switchgear and associated components such as cable terminations, elbows and an assortment of hardware.

1.2. Security Inspection of Padmount equipment on schools, parks and playgrounds will be performed on an annual basis. Periodic inspection of Padmount Transformers will be performed on a 10 year basis and Padmount Switchgear on a 5 year basis in accordance with PCM Templates AM EU-P034-R3019 and AM-EU-P034-R3016

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Distribution Padmount Equipment Inspection Program

ComEd Program
AM-CE-P166
Rev. 1

2. Precautions and Limitations

2.1. PRECAUTIONS

2.1.1 IF safety, reliability, or operation of equipment could otherwise be affected before the next inspection cycle, THEN defective conditions **SHALL** be **RECORDED.**

2.1.2 WHEN inspecting energized equipment, Field Inspectors **SHALL** comply with the Minimum Approach Distance (MAD) as prescribed in the ComEd Safety Rule Book

2.1.3 WHEN opening energized equipment, Field Inspectors **SHALL** comply with all PPE requirements per the ComEd Safety Rule Book.

2.2. LIMITATIONS

2.2.1 Component inspection **MAY BE PERFORMED** in any sequence preferred by the Field Inspector.

3. Prerequisites

3.1. **VERIFY** that all ComEd, and Contractor personnel involved are trained and qualified in the equipment and procedures to be used.

ENSURE that all requirements of EA-CE-P022 Flagging and Robust Operational Barriers to Prevent Errors are followed.

4. Program

4.1. PADMOUNT TRANSFORMER INSPECTION

4.1.1 **INSPECT** padmount transformer and the surrounding area per AM-CE-P166-R0001 Distribution Padmount Transformer Inspection Checklist and **RECORD** findings.

4.2. SWITCHGEAR INSPECTION

4.2.1 **INSPECT** switchgear and the surrounding area per AM-CE-P166-R0002 Distribution Padmount Switchgear Inspection Checklist and **RECORD** findings.

4.3. FIX ON FIND

4.3.1 As directed by management, Field Inspector to **PERFORM** minor repairs when identified during the inspection, including but not limited to; Labeling Repair, “Don’t Fence Me In” stickers, Equipment Patch Installation, Removing Obstructions, Padlock Replacement, and Installation of missing Pedestal Locks.

4.4. STRAY VOLTAGE

4.4.1 **DETERMINE** if stray voltage greater than 5 volts exists on any transformers, switchgear, or pedestals encountered using the prescribed stray voltage detector

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4.4.2 IF stray voltage greater than 5 volts is identified THEN **CALL** your Supervisor and the OCC to initiate a priority 10 work request to investigate and address the issue.

4.4.3 SPECIAL EQUIPMENT - Stray Voltage Detector - HD Electric model LV-5

4.5. MAPPING ISSUES

4.5.1 **DOCUMENT** any mapping discrepancies and submit to Mapping Department

4.5.1.1 Erroneous Equipment Numbers for Transformers and Switchgear identified by the Field Inspector **SHALL** be submitted. Erroneous equipment numbers include – duplicate numbers, equipment number mis-match between Passort and the Field and equipment that does not exist in the field.

4.6. ELECTRONIC INSPECTION FORMS

4.6.1 ALL padmount equipment to be inspected for a particular year **SHALL** have a PM WO Task associated with it in AS8.

4.6.2 All inspections SHALL be entered and documented utilizing the electronic inspection forms including:

4.6.2.1 CM Defects

4.6.2.2 Attaching Photos

4.6.2.3 Updating Equipment Data

4.6.2.4 Providing instruction for Work Planning and C&M

4.6.3 CM WO Tasks and History Briefs are generated automatically in AS8

4.7. INSPECTION CORRECTIVE MAINTENANCE PRIORITIES

4.7.1 Emergency Maintenance Items - Items of immediate concern to the Field Inspector are to be identified and reported immediately. The following are some examples of such items: severely leaking transformers, lids that will not close, and large holes.

4.7.2 Except for those items identified as Emergency Maintenance, generally, identified CMs from the inspections are pre-prioritized on the transformer and switchgear inspection checklists. Where choices exist between priorities for the same type of deficiency, a higher priority is to be selected for those deficiencies that pose an imminent reliability issue.

4.8. ENVIRONMENTAL CONCERNS

4.8.1 Waste Materials:

4.8.1.1 **PUT** in approved waste containers.

4.8.1.2 **DISPOSE** of properly.

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4.8.2 IF Fluid spill is observed:

4.8.2.1 **FILL OUT** appropriate Fluid-spill documentation.

4.8.2.2 **UTILIZE** spill kit as practicable.

4.8.2.3 **REPORT** spills as required to the OCC and the Environmental Coordinator (EC).

NOTE: for additional guidance see EN-CE-2004 Oil Spill Response and Contingency

4.9. EQUIPMENT PATCH CONDITION MONITORING

4.9.1 Field Inspectors **SHALL** Identify Corrosion Holes and evaluate the extent of condition

4.9.1.1 IF corrosion holes are significant, THEN the equipment REQUIRES replacement and a Priority 20 CM WO **SHALL** be generated in Passport.

4.9.1.2 IF corrosion hole are moderate, THEN the Field Inspector **SHALL** install Equipment Patches and document on the electronic inspection form.

4.9.2 WHERE Equipment Patches have been installed, the equipment **SHALL** be re-inspected on a more frequent cycle NOT to exceed the recommended manufacture's life of the equipment patch.

4.10. LEGACY CM WORK TASKS

4.10.1 Existing OPEN CM WO Tasks SHALL be validated in the field.

5. Roles and Responsibilities

5.1. CONSTRUCTION & MAINTENANCE

5.1.1 **COMPLETES** the CM repairs and updates PassPort indicating the repairs performed.

5.1.2 **ENSURES** that close out comments in PassPort reflect work completed.

5.1.3 IF work is **NOT** required, OR was found completed upon arrival, **ENSURES** that:

5.1.3.1 The CM is properly dispositioned.

5.1.3.2 Include comments describing conditions found.

5.1.4 **ENSURES** that documentation relative to maintenance tasks is stored centrally and is available for future reference.

5.1.5 For slipped lead sleeves and damaged lead terminations, **INSPECTS/CONFIRMS** "wet" cable conditions, and **TAGS** equipment accordingly.

5.1.5.1 **ENSURES** that a permanent repair work request/work order is generated after tagging is completed for those locations requiring repairs.

5.2. CONTRACT AND PROJECT MANAGEMENT

5.2.1 **IS** the main point of contact with the contractors for all contractual issues.

5.3. DISTRIBUTION RELIABILITY INSPECTIONS

5.3.1 **TRACKS** progress of programmatic and opportunistic inspections.

5.3.2 **MAINTAINS** master file of all inspected equipment.

5.3.3 **IDENTIFIES** annual budgetary requirements necessary:

5.3.3.1 To support program execution per maintenance template.

5.3.3.2 To meet any regulatory commitments.

5.3.4 **COMMUNICATES** program changes to stakeholders as needed.

5.3.5 **MAINTAINS** list of conditions on the padmount transformer and padmount switchgear inspection checklists.

5.3.6 **MAINTAINS** inspection cycles and completion dates within the Passport Equipment Records.

5.3.7 **ENSURES** that:

5.3.7.1 The identified padmount equipment inspected are those due in the current year, other than those inspected opportunistically.

5.3.7.2 PMRQs are maintained in AS8.

5.4. FIELD INSPECTOR

5.4.1 **PERFORMS** inspection utilizing AM-CE-P166-R0001 Distribution Padmount Transformer Inspection Checklist and AM-CE-P166-R0002 Distribution Padmount Switchgear Inspection Checklist.

5.4.2 **ENTERS** deficiencies found into the electronic inspection form.

5.4.3 **COMPLETES AND SUBMITS** mapping discrepancies.

5.4.4 **CAPTURES** digital photo of CM conditions as necessary to enhance ability to plan for repair of the condition..

5.4.5 **CALLS** OCC directly for emergency items.

5.4.5.1 **NOTE:** OCC personnel ENTERS information into PassPort, CIMS, or OMS as required per OCC process.

5.4.6 COMPLETES and SUBMITS the electronic inspection form.

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5.4.6.1 **NOTE**: CM WO Tasks and History Briefs are automatically generated in AS8.

5.5. DISTRIBUTION STANDARDS EQUIPMENT SPECIALISTS

5.5.1 **PROVIDES** input to Reliability and Material Condition groups regarding failure modes and manufacturer's recommendations.

5.5.2 **INVESTIGATES** new technology.

5.5.3 **DETERMINES** specific maintenance trigger levels as applicable to the equipment.

5.5.3.1 **Examples:** Inappropriate equipment installations, etc.

5.5.4 **IS** the primary interface with Original Equipment Manufacturer (OEM).

5.5.5 **PROVIDES** support to the field relative to equipment expertise.

5.6. MAPPING & DOCUMENT SERVICES (M&DS)

5.6.1 **RECEIVES** mapping discrepancies.

5.6.2 **INCORPORATES** changes into the CEGIS Mapping System.

5.7. MATERIAL CONDITION GROUP

5.7.1 **MONITORS** program performance.

5.7.2 **EVALUATES** need to modify program requirements due to failure trends and/or emergent failure modes.

5.7.3 **GATHERS** input from Distribution Equipment Specialists in Distribution Standards group(s) and from Operations groups as required.

5.7.4 **DEVELOPS AND UPDATES** maintenance templates for underground equipment and associated components.

5.8. WORK MANAGEMENT

5.8.1 **EVALUATES** resource requirements for corrective maintenance identified from the padmount inspection program.

5.8.2 **DEVELOPS** long-range work plan.

5.8.3 **DEVELOPS** resource strategy to ensure execution of the plan.

5.8.4 **PREPARES** necessary work packages in support of corrective maintenance.

5.8.5 **DISCUSSES** CM conditions with Reliability Inspections when clarification is needed for the scope of work.

5.8.6 **ENSURES** that maintenance tasks are scheduled and tracks execution.

5.8.7 **BUNDLES** work as needed to ensure completion of program tasks.

5.9. EMPLOYEES/WORKERS:

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5.9.1 All ComEd, contractor or vendor personnel performing work within the ComEd service area **SHALL COMPLY** with:

5.9.1.1 ComEd Safety Rule Book.

5.9.1.2 Employee Code of Conduct.

5.9.1.3 All other corporate and ComEd policies, programs, procedures, and expectations appropriate to the work being performed.

6. Documentation

6.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

7. Terms and Definitions

7.1. Corrective Maintenance (CM): sometimes used to refer to the CM work or CM work order.

7.2. Preventive Maintenance (PM): sometimes used to refer to the PM work or PM work order.

7.3. Programmatic Inspection: An inspection performed based upon a defined preventative maintenance cycle.

7.4. Opportunistic Inspection: An inspection performed while executing other scheduled field work at the same location.

8. References

8.1. LE-AC-401 Corporate Procedure Records Retention and Disposition

8.2. EA-CE-P022 Flagging and Robust Operational Barriers

8.3. WM-ED-P014 Work Screening and Prioritization

8.4. AM-CE-P166-R0001 Distribution Padmount Transformer Inspection Checklist

8.5. AM-CE-P166-R0002 Distribution Padmount Switchgear Inspection Checklist

8.6. OP-EU-050003 Lockout Tag Out

8.7. EN-CE-2004 Oil Spill Response and Contingency

8.8. AM-EU-P034 Preventive and Predictive Maintenance Program

8.9. AM-EU-P034-R3019 PCM Template -Padmounted Operating Devices

8.10. AM-EU-P034-R3016 Padmount Transformers

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8.11. SA-CE-4032 ComEd Safety Rule Book

9. Attachments

9.1. None

Distribution Padmount Equipment Inspection Program

ComEd Program
AM-CE-P166
Rev. 1

10. Development history

Revision 0	**Date: 11/10/2014**
Writer	John Basten – Reliability Inspections
Reviewer(s)	Janine Keating – Manager Reliability Inspections
UFAM Approver(s)	Gus Ponce – UFAM Preventive Maintenance (ComEd)
Reason written	Supersedes OP-ED-142025 URD Padmount Equipment Periodic Testing and Inspection

Revision 1	**Date: 11/27/2017**
Writer	John Basten, Sr. Engineer, Reliability Inspections
Reviewer(s)	Merle Turner, Manager, Reliability Inspections
UFAM Approver(s)	Mike Moy, UFAM Preventative Maintenance
Reason written	3 year periodic review. Removed references to MFIS system.

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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Distribution Padmount Transformer Inspection Checklist

ComEd Training and Reference Material (T&RM)

AM-CE-P166-R0001
Rev. 1

Effective:	2/1/2018
Supersedes:	OP-ED-142025-R0001
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P166-R0001
ComEd Transformer 1

2. Development history

Revision 0	**Date: 12/12/2014**
Writer	John Basten – Reliability Inspections
Reviewer(s)	Janine Keating – Manager Reliability Inspections
UFAM Approver(s)	Gus Ponce – UFAM Preventive Maintenance
Reason written	Supersedes OP-ED-142025-R0001 Distribution Padmount Transformer Inspection Checklist

Revision 1	**Date: 1/26/2018**
Writer	Writer John Basten – Reliability Inspections
Reviewer(s)	Merle Turner – Manager Reliability Inspections
UFAM Approver(s)	Dan Brea, UFAM Preventative Maintenance
Reason written	3 year periodic review

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Distribution Padmount Switchgear Inspection Checklist

ComEd Training and Reference Material (T&RM)

AM-CE-P166-R0002
Rev. 1

Effective:	2/1/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

AM-CE-P166-R0002
ComEd Switchgear 12

2. Development history

Revision 0	**Date: 12/12/2014**
Writer	John Basten – Reliability Inspections
Reviewer(s)	Janine Keating – Manager Reliability Inspections
UFAM Approver(s)	Gus Ponce – UFAM Preventive Maintenance
Reason written	To provide a dedicated Inspection checklist for Distribution Switchgear.

Revision 1	**Date: 1/26/2018**
Writer	John Basten - Reliability Inspections
Reviewer(s)	Merle Turner – Manager Relaibility Inspections
UFAM Approver(s)	Dan Brea– UFAM Preventative Maintenance
Reason written	3 year periodic review

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Transmission Wood Pole Inspection Process

ComEd Process
AM-CE-P197
Rev. 1

Effective:	6/7/2018
Supersedes:	none
Review Type:	3 Year
Core Function:	Preventive Maintenance

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1. Purpose

To provide guidelines for the conduct of work regarding inspection, treatment, and reinforcement of Transmission Wood Poles.

2. Precautions and Limitations

2.1. Precautions

2.1.1 **VERIFY** that all ComEd and contractor personnel involved in this process are trained and qualified in the equipment and procedures to be used.

2.1.2 **Protection of Wetlands and Environmentally Sensitive Areas:**

2.1.2.1 Wetland areas and Environmentally sensitive areas are commonly found within the ComEd transmission right of ways. The contractors inspectors are requested to read the document, ComEd Wetland Plant Identification Guide and complete signoff to acknowledge review .

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Transmission Wood Pole Inspection Process

2.1.2.2 Wetland Areas :

Wetland is a generic term for various types of wet habitats in which the land is wet for some period each year but not necessarily permanently wet.
Wetlands can be identified by the presence of:

- Hydrophytic Vegetation (water lilies and cattails)
- Wetland Hydrology (water saturated land)
- Hydric Soils (soils/landscape formed by saturation/flooding)

2.1.2.2.1 Wetlands can be identified by the presence of the following species of vegetation:

Cattails, Reed Canary Grass, Common Reed Grass, Sedge Purple Loosestrife, Phragmites, Box Elders, Dogwoods, Willows, Cottonwood Trees. Wetland areas may also include swales, non-vegetated ditches and channels and saturated fields.

2.1.2.2.2 Inspectors shall assume there will be a buffer zone (50-150 feet) around wetland area. This buffer zone shall also be treated the same as the wetland area. The size of the buffer zones are determined by the quality and type of vegetation in the wetland and its potential as a habitat.

2.1.2.2.3 For purpose of pole inspection, wetland areas and buffer zones may be entered by foot only, no vehicles permitted. No fumigants or treatments shall be used in wetland or buffer zones.

2.1.2.2.4 Inspectors are requested to record poles within wetland areas utilizing code “WET” under Remarks field when reporting data.

2.1.2.3 Environmentally Sensitive Areas:

2.1.2.3.1 Environmentally Sensitive Areas may be entered ONLY AFTER proper authorization by the "Owners Representative."

2.1.2.3.2 Environmentally sensitive areas include the Hines Emerald Dragonfly Area located immediately west of Will County Station in Joliet, IL.

In addition to the Hine’s Emerald Dragonfly area, other threatened / endangered species to be aware of in the ComEd territory include:

Blanding’s Turtle, Spotted Turtle, Leafy Prairie Clover and Eastern Prairie Fringed Orchid. See photos provided by ComEd Envoronmental Department for guidance.

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Transmission Wood Pole Inspection Process

ComEd Process
AM-CE-P197
Rev. 1

For purpose of pole inspection, Environmentally Sensitive Areas may be entered by foot only, no vehicles permitted. No fumigants or treatments shall be used in Environmentally sensitive areas. Inspectors are requested to record poles within Environmentally Sensitive Areas utilizing code “ENV” under Remarks field when reporting data.

2.2. Limitations

2.2.1 All ComEd and contractor personnel performing wood pole Inspection and remediation work shall comply with all Federal and State Regulation regarding pesticide applicator and operator licensing and pesticide use, transportation and storage. At the beginning of each year, Contractor shall supply Owner with proof of compliance per applicable state licensing regulations prior to beginning work.

3. Wood Pole Inspection Process

3.1. General

3.1.1 All poles will receive a visual inspection of pole structure appurtenances and ground wires. Problem conditions shall be reported.

3.1.2 All Poles will have the applicable inspection tag(s) installed.

3.1.3 All poles will receive treatment unless identified as a non-restorable reject.

3.1.4 Notify Owner immediately of Priority Pole locations.

3.1.5 The pole condition information captured in the field will be transferred to the utility. The required information to be captured is listed in Appendix A.

3.1.6 No pole inspection may take place when outdoor temperatures are below 32 degree F or when frost exists in the top 3 inches of topsoil surrounding the pole.

3.1.7 Poles previously reinforced by Steel Truss or other means shall be inspected for compliance with minimum standards stated within the specification.

3.2. Approved Materials List

3.2.1 Materials needed for inspection and remediation may include, but are not limited to:

3.2.1.1 Internal treatment; OSMOSE - Hollow Heart

3.2.1.2 Internal treatment; OSMOSE HollowHeart Plus

3.2.1.3 Groundline Treatment Preservatives; OSMOSE MP 400

3.2.1.4 Groundline Treatment Preservatives;OSMOSE Shield Kraft backed Polyethylene Paper

3.2.1.5 Fumigant TreatmentOSMOSE MITCI-FUME

The Contractor shall store, transport and apply all preservative materials in accordance with the manufacturer’s instructions and product label and applicable Federal and State of Illinois regulations.

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3.2.2 Substitution of Products

Mention of material products or components by name as products of certain manufacturers within this specification is made to insure that proper quality and/or type is provided. Products of other manufacturers will be acceptable ONLY if the Contractor furnishes proof to the Owner that the proposed substitute products are equal to or better than the specified products in quality, performance, design, environmental qualification, suitability for intended use and price.

3.3. Wood Pole Inspection Process

3.3.1 Sounding Wood Poles . All poles shall be sounded with a hammer around the entire circumference of the pole from the ground-line to as high as the inspector can reach in order to locate interior decay except visual reject poles.

3.3.2 Visual Inspection of Wood Pole

The Contractor shall visually inspect the upper portion of each pole and shall verify and/or record the following applicable information or conditions:

- Pole Number (supplied)
- Installed year Pole height (if legible on brand or estimate)
- Pole class (if legible on brand or estimate)
- Species of wood
- Original type of treatment
- Supplier of pole (if legible on brand)
- Original treatment type (if legible on brand or estimate)
- Type of previous treatment
- Year last inspected / previous treatment was completed
- Original ground-line circumference
- Effective ground-line circumference
- Remarks -Defective condition of pole above ground-line
- Remarks - Woodpecker holes, number of holes, size (sm, med, Lrg)
- Remarks - Defective top – badly split, decayed, or split by lightning, loose top attachment
- Remarks- Cracks or breaks across the grain
- Remarks- Mechanical or fire damage (location, dimensions and extent)

3.3.3 Photographs (As needed)

3.3.3.1 Photographs are not normally required for Transmission designated poles. However, unique conditions may be captured by the contract inspector with photograph and forwarded to Comed Transmission Engineering in electronic format.

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3.3.4 Partial Excavation of Wood Poles at Ground line ;

3.3.4.1 All poles that are 12 years and older shall be partially excavated and bored to identify decay pockets.

3.3.4.2 All poles shall partially excavated and bored in two locations on the pole. A shovelful of earth shall be removed before each boring to a depth of 6 to 8 inches. The first location shall be at the largest check, where sounding indicates a defect, or an area of visual defect. If there are no checks or defects, the first boring shall be on the strain side. The second partial excavation and boring shall be made 90 degrees to the first. The pole must be carefully inspected for external decay at least 6 to 8 inches below ground-line at partial excavation location. If external decay is found, a full excavation and treatment will be performed.

3.3.5 Full Excavation of Wood Pole (As Needed);

3.3.5.1 Poles found to have outer decay, mechanical damage extending below ground-line, or incised poles on which the incising does not extend above the ground-line, shall be fully excavated to a depth of 18 inches and inspected.

3.3.5.2 All Southern Pine species poles shall have full excavation and treatment.

3.3.5.3 If a pole has a cable riser on it, care must be taken to not damage the cable. If any cables or wires should be damaged, the owner must be notified and the hole left open until the damage has been repaired.

3.3.5.4 After excavating, the pole butt shall be scraped and/or wire brushed to remove all foreign material. All external decay shall be removed with a proper tool. Care must be taken so that no sound wood is removed or penetrated by the tool. An ax or hatchet shall not be used for this purpose. In all cases a tarp will be used to collect all excavated material.

3.3.6 Additional Boring Holes if Decay is Suspected;

3.3.6.1 If internal decay is suspected at a specific point or area, the pole shall be bored first in the questionable area starting about two inches below ground-line (the second boring will be at ground-line) and angling downward at a 45 degree angle past the center of the pole. If any internal void is found, the pole shall be bored at least five times to determine its extent.

3.3.6.2 Poles set in pavement or which have concrete collars within six inches of the ground-line, or which cannot be excavated for some other reason shall be bored as low as possible at a 45 degree angle so that the bit penetrates past the center of the pole.

3.3.6.3 Poles with risers fed by underground wires shall be inspected carefully so neither the pole wires or buried wires below the surface of the ground are damaged. Be careful to avoid contacting the wires. Borings shall be made with a 3/8 inch diameter bit or increment borer and plugged with tightly fitting preservative treated wood dowels.

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3.3.7 Groundline Treatment of Wood Poles

3.3.7.1 Poles shall be ground-line treated which meet any of the following criteria:

3.3.7.2 All poles with below ground external decay except non-reinforceable rejects.

3.3.7.3 All Southern Pine poles.

3.3.7.4 All gas treated cellon poles. Types (SPG, SPX, DFG, DFX, LPG)

3.3.7.5 All Douglas Fir, Larch, Western Red Cedar or Lodgepole Pine inwhich the top of the incising does not appear above the ground-line and was not previously ground-line treated.

3.3.7.6 After the pole butt has been scraped and/or wire brushed to remove all foreign material and all debris removed from the hole, supplemental wood preservative approved by the utility shall be applied at least one-sixteenth inch thick from 18 inches below ground-line to at least three inches above ground-line. The preservative shall be covered with an approved paper held firmly in place.

3.3.7.7 The worker must attempt to treat the entire surface of the pole. Poles set on slopes shall have their eighteen inch depth measured on the downhill side. If there is a permanent obstruction in the excavation such as a cable riser, concrete collar, wooden plank, or a rock too large to dislodge, as much dirt as possible must be removed and the exposed wood treated. If there is a ground wire or ground rod, roots, small rocks or other debris, they must be removed or moved aside so that as much of the pole surface as possible will be exposed. Fences and curbs or paving should be undercut to expose the surface below them.

3.3.7.8 If a minimum of three fourths of the outer surface of the pole with shell rot cannot be dug out, the pole must be given an internal fumigant treatment also. Surfaces from which external decay was removed must be liberally covered with preservative, as must the edges next to permanent obstructions. The paper covering the preservative must be shaped to conform to the exposed wood underneath.

3.3.7.9 The area around the pole must be left in a neat condition. If the pole is set in a lawn, all loose dirt must be raked onto the backfill. All debris from the work must be collected by the treating crew and taken with them.

3.3.8 Internal Treatment of Exposed Pockets or Heart Rot

3.3.8.1 All poles, except Non-Restorable reject poles, which contain enclosed pockets or hollow hearts, shall be treated with a liquid preservative approved by the ComEd.

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3.3.8.2 After the extent of void has been determined through boring, the preservative shall be pumped into the bottom hole until it begins to run out of the next higher hole; this procedure is followed until the cavity is filled or a maximum of one gallon is used. If preservative has not flowed out the top hole, a maximum of one gallon shall be pumped into this hole. All holes that have not been previously plugged shall be plugged at this time with tight-fitting treated dowels. When necessary, similar methods shall be used in treating enclosed decay pockets.

3.3.9 Fumigant Treatment of Wood Poles

3.3.9.1 All Poles except Southern Pine, including those with heart rots or internal decay pockets that have sufficient good wood remaining shall be fumigant treated.

3.3.9.2 Using a 7/8" drill bit, drill at a 45 degree angle or greater into the pole. First hole shall be drilled below ground-line where possible. Use following chart to determine number of holes to drill and position of each hole. Holes shall be drilled deep enough to accommodate one tube of fumigant and wooden dowel to seal hole. Vertical spacing should be 6 to 8 inches between holes.

Pole Circumference	Number of Holes and Pattern
less than 36"	3 holes spaced 120 degrees apart.
36"-49"	4 holes spaced 90 degrees apart.
50"-59"	5 holes spaced 72 degrees apart
Over 59"	6 holes spaced 60 degrees apart.

3.3.9.3 When retreating poles previously fumigated, an attempt shall be made to reuse previously drilled holes.

3.3.9.4 In the event internal decay pocket is detected during drilling of the holes, the new hole shall be plugged and an additional hole shall be located immediately above the decay zone.

3.3.10 Tagging

3.3.10.1 Reject poles shall be marked in accordance with Appendix E.

3.3.10.2 All inspection and condition tags shall be attached at a height above (6.5) feet on that side of the pole from which a person would normally approach.

3.3.10.3 Inspection tags shall be placed on each pole sound and bored that pass inspection. The tags shall be oval aluminum tags attached with an aluminum nail on that side of the pole from which a person would normally approach. The Contractor's name and the year inspected shall appear on the tag.

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3.3.10.4 Ground-line externally treated poles shall be marked with a round aluminum tag showing the year treated and the Contractor's name or the preservative used.

3.3.10.5 Internally treated poles shall be marked with an aluminum rectangular tag in combination with the inspection tag or ground-line treatment tag. The letters INT shall appear on the tag.

3.3.10.6 Fumigated poles shall be marked with a teardrop shaped aluminum tag in combination with an inspection or ground-line treatment tag. The name of the fumigant shall appear on the tag.

3.3.11 Difficult Access Wood Poles

3.3.11.1 Every effort will be made to gain access to all poles within the inspection zone. The Contract Inspector is requested to notify the designated ComEd Inspector when poles cannot be inspected due to access limitations. Assistance in gaining access to poles may be provided by ComEd at the discretion of ComEd.

3.3.12 Remaining Strength Evaluation;

3.3.12.1 The circumference of the pole shall be measured. Deductions shall be made for identified external decay, hollow heart condition and internal decay pockets to determine if sufficient good wood remains to meet minimum requirements for that species of pole.

3.3.12.2 Tables of deductions for external decay pockets, hollow hearts and internal decay pockets, and tables showing the minimum circumference requirements for poles of each species shall be approved by the OWNER and conform to the National Electrical Safety Code Standards for a 2.67 safety factor.

3.3.13 Guidelines for Determining Wood Pole Rejection

3.3.13.1 If there is any reason to believe that a pole presents an immanent hazard to the public the inspector shall immediately report this condition to the designated utility contact.

3.3.13.2 Visual inspection of the upper portion of the pole may result in rejection of the pole due to any one of the following causes:

3.3.13.3 Cracks or breaks across the grain of the wood – such as those caused by heavy impacts or severe whipping of the top.

3.3.13.4 Mechanical or fire damage – sufficient to reduce the effective circumference of good wood below that allowable according to tables of minimum effective circumferences approved by ComEd.

3.3.13.5 Poles decayed by heart rot with less than a 3.0 inch shell of good wood at any point around the circumference shall be rejected. This does not apply to poles having enclosed decay pocket.

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3.3.13.6 Poles found with decay or insect damage shall be evaluated for strength. A rejected pole is found to have deteriorated below required strength as defined by NESC code requirements for Grade B construction.

3.3.13.7 Poles with external decay or other damage which result in a reduction of the pole circumference shall be evaluated for strength. A rejected pole is found to have deteriorated below required strength as defined by NESC code requirements for Grade B construction.

3.3.14 Criteria for Reinforceable Poles

3.3.14.1 Reinforceable Reject Poles with steel trusses shall meet the following criteria.

3.3.14.1.1 Above the band area, from (5.5) feet above ground to the top of the pole, the pole shall be free of decay, large splits, crack or breaks across the grain or other damage sufficient to reduce the effective circumference below allowable limits in the approved tables.

3.3.14.1.2 In the lower band area, for purpose of load transfer, an average of (2.5) inches or greater of sound shell exist 15 inches above ground-line or (2.5) inches of sound shell exist 26 inches above ground-line.

3.3.14.1.3 In the upper band area, for purpose of load transfer, an average of four (4) inches of sound shell exist at four and one half (4.5) feet above ground-line.

3.3.14.1.4 Fumigants can be applied above the point where the decay column stops and decay can be contained.

3.3.14.1.5 Shall have no more than twenty-four (24) boring holes over the length of the pole and no more than five (5) boring holes within an 18 inch section.

3.3.14.1.6 All metal truss reinforcement must follow utility standards for material and banding specifications. Any reinforcement of a pole/class combination encountered in the field that is not shown must have approval from the utility prior to installation of the truss. In addition, all metal truss reinforcement bands that are placed behind a U-Guard must be grounded when a pole ground is available.

3.3.14.2 Reinforceable Reject Poles with fiberglass wrap shall meet the following criteria.

3.3.14.2.1 At ground-line there must be a minimum of 1” of sound shell.

3.3.14.2.2 Above ground-line poles must have an average 2.0” sound shell to meet requirements for fiberglass wrap reinforcement.

3.3.14.2.3 Poles shall be free of voids or decay pockets above the designated fiberglass wrap zone.

3.3.14.2.4 At 18” below ground-line there must be an average 2” of sound shell.

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3.3.14.2.5 All Poles to be reinforced with fiberglass wrap shall be approved by the ComEd Transmission Engineering Dept. Inject Hollow Heart Solution as part of this process.

3.3.15 Ground Wire OHMS Testing;

3.3.15.1 All poles shall have OHMS resitance testing completed using the AEMC model 3711 or 3731 hand held device and measurements recorded.

3.3.15.2 Poles with security wire molding shall be excavated to approximately 12 inches below grade at base of molding and have the reading taken below grade.

3.3.15.3 Poles with no grounds shall be recorded as NA.

3.3.15.4 Poles with inaccessible grounds shall be recorded as NA with POLE NOTES added.

3.3.16 Inspection Frequency

3.3.16.1 Wood Pole Inspections shall be completed at the frequency recommended in accordance with the latest update of PCM template AM-ED-P034-R2001.

3.4. Process Flow Diagram

3.4.1 None

3.5. Process listing (list key process elements)

#	Process Element	Description	Performed By

4. Roles and Responsibilities

4.1. MANAGER TRANSMISSION ENGINEERING

4.1.1 **BE AWARE** that Transmission Engineering owns this process.

4.1.1.1 Transmission Engineering are Subject Matter Experts for this work

4.1.1.2 Are **ACCOUNTABLE** for the content of this process.

4.1.1.3 Must **REVIEW** and approve any revisions to this process and applicable reference documents

4.1.1.4 **COORDINATES** with other departments to follow up on the inspection data collected

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4.2. MANAGER TRANSMISSION SERVICES DEPARTMENT

4.2.1 **ENSURES** compliance with this process

4.2.2 **IMPLEMENTS** this process

4.3. EMPLOYEES / WORKERS

4.3.1 All ComEd and contractor personnel performing work within the ComEd service area

4.3.2 **SHALL COMPLY** with This process

4.3.2.1 ComEd Safety Rule Book

4.3.3 All contractor personnel performing wood pole Inspection and remediation work shall comply with all Federal and State of Illinois Regulation regarding pesticide applicator and operator licensing and pesticide use, transportation and storage. At the beginning of each year, Contractor shall supply Owner with proof of compliance with state of Illinois licensing regulations prior to beginning work.

5. Documentation

5.1. The Contractor shall provide bi-weekly Summary Reports of completed work.

The reports shall include:

- Details of the current week(s) findings including number of poles inspected and costs
- Details of the Year-To-Date findings including costs

5.2. The data report will be complete in all respects and has been thoroughly checked by the Contractor before submission.

5.3. All inspection data shall be forwarded to the ComEd Transmission Engineering.

- All reports shall be forwarded electronically
- All inspection data shall be Windows ACCESS 2007 compatible

5.4. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

6. Terms and Definitions

6.1. Bore

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6.1.1 Poles shall be bored at a 45 degree angle past the center of the pole to identify and quantify if internal decay exists.

6.2. External Treatment

6.2.1 A wood preservative that is applied to the external surface of the pole from 18" below ground-line to 3" above the ground-line.

6.3. Full Sound and Bore

6.3.1 A pole which cannot be partially excavated,due to concrete sidewalk, etc, shall be sounded with a hammer from either ground-line or above ground-line as applicable, to as high as the inspector can reach in order to locate exterior decay or interior pockets of decay and bored to accurately locate internal decay.

6.4. Fumigant Treatment

6.4.1 Treatment of poles with an internally applied, approved fumigant

6.5. Fully Excavated

6.5.1 A pole excavated around its full circumference to 18 inches below ground-line for treatment or rejection without treatment

6.6. Internal Treatment

6.6.1 Poles with internal voids or insect infestations shall be treated with an approved liquid. OSMOSE Hollow Heart shall be used on voids without carpenter ants, OSMOSE Hollow Heart PLUS used for voids with carpenter ants.

6.7. Non-Restorable Reject

6.7.1 A reject pole that does not meet the criteria for reinforcement by the C-truss or fiberwrap method

6.8. Partial Excavation

6.8.1 A shovelful of earth is removed from two sides of the pole to a depth of 6 to 8 inches for the purpose of identifying external decay and to bore below ground-line

6.9. Partial Sound and Bore

6.9.1 A pole which has been partially excavated, sounded with a hammer from either ground-line or above ground-line as applicable, to as high as the inspector can reach in order to locate exterior decay or interior pockets of decay and bored to accurately locate internal decay

6.10. Priority Pole

6.10.1 A rejected pole with hollow center and less than 1.0" of shell at any point around the circumference or with a completely decayed butt or loss of 50% or greater effective circumference

6.11. Private Property

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6.11.1 Due to location of the wood pole, the Inspector must walk more than 50 feet from the truck to complete the pole inspection. Examples are rear lots of residence, active Railroad Right of Ways, planted fields. If the terrain is such that a truck access is not possible but all terrain vehicle is required, Private Property may be charged

6.12. Reinforceable Reject

6.12.1 A reinforceable reject pole is any rejected pole which meets the criteria necessary for reinforcement with steel trusses or fiberwrap. Poles with heart rot must have 2 ½ inches shell at lower bands (1.0 ft. AGL) and 4" shell at upper bands (4.5 ft. AGL) . No heart rot is located above 5.5 ft AGL

6.13. Rejected

6.13.1 A rejected pole is any pole which upon inspection is found to have deteriorated below required strength as defined by NESC code requirements for Grade B construction.

6.14. Reported

6.14.1 A reported pole is any pole for which information is gathered and recorded by the Contractor but which is not designated for inspection by virtue of age of other established qualifier

6.15. Visual

6.15.1 A pole that has either been rejected (Visual Reject - VX) based on visually observable reject criteria, or by virtue of age, does not require further inspection

7. References

7.1. LE-AC-401 – Records and Information Management Retention and Disposition.

7.2. SA-CE-0004 Hazard Identification

7.3. ComEd Exelon Delivery Safety Rule Book

7.4. ComEd Wetland Plant Identification Guide , December 2010

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8. Attachments

8.1. Attachment "A"- *FIELD NAMES of Data categories to be collected*.

8.2. Attachment "B"- *MANUF_CODE abbreviations to be collected*

8.3. Attachment "C"- *POLE_TYPE abbreviations to be collected*

8.4. Attachment "D"- *INSP_CODE abbreviations to be collected*

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9. Development History

Revision 0	**Date: 4/24/2015**
Writer	Howard D Murray,(Transmission Engr),
Reviewer(s)	Robert Fournie,(Manager, Transmission Line Engineering); Mark Baranek,(Director, Transmission); Carl Fowler (Operations Coordinator), Bruce Davis (Operations Coordinator)
UFAM Approver(s)	Gus Ponce (Director Transmission & Substation)
Reason written	New Specification.

Revision 1	**Date: 6/7/2018**
Writer	Howard Murray
Reviewer(s)	Mark Baranek (Director Transmission), Dan Brotzman (Manager Transmission Engineering)
UFAM Approver(s)	Dan Brea, UFAM Preventive Maintenance
Reason written	3 year review , corrected title from AM-ED-P197 to AM-CE-P197 .

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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APPENDIX "A" *FIELD NAMES of data to be collected:*

Field Name	Data Type	Description
Contractor	Text	Company Name Contractor performing Wood Pole Inspection
DISTRICT	Text	Not Used
Unique ID	Text	Optional use by Contractor - unique identification number per record
Foremen	Text	Name of Foreman completing the inspection
Work Date	Date / Time	Date of Inspection
JOB NUM	Text	Contractors Job Number
SUB JOB NUM	Text	Contractors Sub Job Number (if needed)
PO NUM	Text	ComEd assigned Purchase Order Number
STR_ID	Number	Provided by ComEd- Unique Id number assigned to structure
WP_ID	Text	Provided by ComEd- Unique Id number assigned to Wood Pole
Header Notes	Text	Optional Use- Notes assigned by Contractor.
LINE NUMBER	Text	Transmission Line Number
POLE NUM	Text	Pole Number (minimum 4 digit required for number, add characters after number)
POLE LOC	Text	Optional Use - Pole Location. 22 characters or less for notes
MANUF CODE	Text	Pole manufacturer- see APPENDIX B for abbreviations
POLE TYPE	Text	Wood Species – see APPENDIX C for abbraviations
ORIG TREAT	Text	Type of Original Pole treatment "C"Creosote, "P" Penta, "SPG" or "SPX" Celon process, "S" CCA (salt treated) type.
E?	Text	List "E" if Year installed is estimated. Leave blank if actual date is readable on pole.
HT	Number	Pole height (feet)
/	Text	Filler for hyphen
CL	Text	Pole Class

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APPENDIX "A" (Continued) *FIELD NAMES of data to be collected:*

Field Name	Data Type	Description
ORIG CIRC	Number	Ground line circumference measured during inspection
EFF CIRC	Number	Equivalent Ground line circumference accounting for decay found in the pole
PERCENT POLE STRENGTH	Text	Calculated Pole Strength based on level of decay identified by Inspector
MITCI COUNT	Text	Number of MITCI Tubes installed per pole.
PREV TREAT	Text	Contractor who previously inspected/ treated the pole
YEAR LAST TR	Number	Year of last inspect/ treatment
INCH LOSS	Number	Shell Rot Condition Only, number of inches loss to circumference since last inspection
DECAY ZONE	Text	Shell Rot Condition Only, the location of decay relative to the treatment zone. "A" above, "B" below, "I" In the zone of treatment
INSP CODE	Text	Inspection code, See APPENDIX E for abbreviations, ALL reject poles contain an "X"
PRIORITY POL	Text	Is the pole a "PRIORITY" pole? If yes, state "YES", If no, Leave blank
RESTORABLE?	Text	Is the reject pole a "Restorable" pole? If yes, state "YES", If no, State "NO". Leave Blank if not a renot a reject pole.
Repair Notes	Text	ComEd USE ONLY - "ISSRES" Issued to Restore, "ISSREP" Issued to Replace,"STRREM" Structure removed/Deleted from line, up to 22 characters
Trans ID Num	Text	ComEd USE ONLY - no data needed
Engineer	Text	ComEd USE ONLY - no data needed
Issue Date	Date / Time	ComEd USE ONLY - no data needed
Completion date	Date / Time	ComEd USE ONLY - no data needed
GPS X COORD	Text	GPS X COORDINATE of inspected wood pole
GPS Y COORD	Text	GPS Y COORDINATE of inspected wood pole

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APPENDIX "A" (Continued) *FIELD NAMES of data to be collected:*

Field Name	Data Type	Description
HHCF	Text	State Yes or No, Was Pole was treated with OSMOSE Hollow Heart?
HHCF PLUS	Text	State Yes or No, was Pole was treated with OSMOSE Hollow Heart PLUS?
INT DECAY?	Text	Internal Decay Present? If yes, state "YES", If no, Leave blank
PRIV PROP	Text	Private Property? Inspector must travel more than 50 ft from truck If yes, state "YES", If no, Leave blank
Stencil	Text	Stencil Installed? If yes, state "YES", If no, Leave blank
POLE NOTES	Text	OPTIONAL - inspectors notes concerning poles or access conditions
REMARK 1	Text	Remarks using Published Contractor codes
REM 1 Q1	Number	Quantity as applies to previous remark
REM 1 Q2	Number	Quantity as applies to previous remark
REMARK 2	Text	Remarks using Published Contractor codes
REM 2 Q1	Number	Quantity as applies to previous remark
REM 2 Q2	Number	Quantity as applies to previous remark
REMARK 3	Text	Ditto
REM 3 Q1	Number	Ditto
REM 3 Q2	Number	Ditto
REMARK 4	Text	Ditto
REM 4 Q1	Number	Ditto
REM 4 Q2	Number	Ditto
REMARK5	Text	Ditto
REM 5 Q1	Number	Ditto
REM 5 Q2	Number	Ditto
REMARK 6	Text	Ditto
REM 6 Q1	Number	Ditto
REM 6 Q2	Number	Ditto
GRND READING	Text	Ground Reading value in ohms using AEMC model 3711 or 3731 hand held device.
MISC_INF1	Text	Miscellaneous Use
MISC_INF2	Text	Miscellaneous Use
MISC_INF3	Text	Miscellaneous Use

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APPENDIX "B" MANUF_CODE abbreviations to be collected:

CODE	DESCRIPTION		CODE	DESCRIPTION
ACE	Applalachee		LAN	LANco
ATC	ATlantic Creo.		LDF	L.D. McFarland
AWT	Atln. Wood Treat		LIN	Lincoln
BAL	BALdw in		MAR	Marion
BAX	BAXco		MCC	McFarland Cascad
BCP	Bell Co. Pole		MCM	McMillan
BEL	Bell Lbr & Pole		MER	MERduc
BJC	B.J. Carney		MGG	MacGillis & Gibb
BRN	BRow N		MKB	McKormic & Baxter
BRO	Broderick Wood		MON	MT Pole & Treat
CAR	Carney		NMM	Neddlemeyer Mtn.
CAS	CAScade		O	Other manufacturer
CCC	Central Creo. Co.		OES	OESer cedar Co.
CEN	Central Forest		OLM	Olin Mathieson
COL	COLfax Creosote		PAC	PACific Wood Tr.
CON	CONroe Creosote		PAH	Page and Hill
CRZ	Crow n Zellerbach		POL	Poles Inc.
CW	Am. Creo. Works		PWP	Penta Wood Prod.
DRK	Dierks		REP	REPublic
ELR	Elrod		SAL	SALvage Pole
EPR	Epping. & Russel		SPL	So. Pine Lumber
ESC	ESCambia		STC	Seaman Timber
FER	Ferw ood		STP	Standard Wood Pr.
GFC	GulF Creosoting		STW	STalWorth
GFP	GulFPort		SWP	South Wood Pied
GSC	Gulf States Creo		SWW	SW Wood preserve
HAL	Haley		TRM	T.R. Miller
HAR	Hart		TEM	TEMple Industry
HPT	Huxford P & T		TXC	TX Creosote Co.
IDA	IDAho		TXE	TX Electric Coop.
INC	Int. Creosote		U	Unknow n Manufacturer
INP	Intl. Paper		UNT	Union Timber
JCT	J.C. Taylor		URN	UraNia Lumber co.
JHB	J.H. Baxter		US	US Pole
JOS	JOSlyn		WEY	Weyerhauser
KAL	KALispell		WLB	Wheeler LB
KMC	Kerr Mcgee		WYC	Wycoff
KOP	KOPpers			

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APPENDIX "C" POLE_TYPE abbreviations to be collected:

CODE	POLE SPECIES		CODE	POLE SPECIES
CH	Chestnut		WC	Western Cedar
DF	Douglas Fir		WF	Western Fir
EC	Eastern Cedar		WH	Western Hemlock
LP	Lodge Pole Pine		WL	Western Larch
NP	Northern Pine		WP	Western Pine
SP	Southern Pine			

APPENDIX "D" INSP_CODE abbreviations to be collected:

CODE	DESCRIPTION		CODE	DESCRIPTION
T	External Treat		V	Visual (REPORT)
TD	External Treat w/Decay		VX	Visual reject
TX	Reject w/Ext. Treat		TNC	Treat no charge
X	Excavated Reject		S	Sound
B	Sound & Bore w/no decay		SX	Sound reject
BD	S & B with decay		DUP	Duplicate record
BX	S & B reject		INFO	Informational
P	Partial excavate w/no decay		RES	Restored
PD	Partial excavate with decay		NORES	Not restored
PX	Partial excavate reject		NI	Not Inspected

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Required Upgrades Of Existing Overhead Distribution Facilities

Exelon Utilities Administrative Procedure

AM-EU-9114

Revision No.: 1

Effective:	11/7/2018
Supersedes:	AM-ED-404-R0002
Level:	3
Review Type:	3 Year
Core Function:	Design Configuration Control

Table of Contents

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1. Purpose

To provide specific upgrade requirements for existing overhead distribution facilities as part of designed work.

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Required Upgrades Of Existing Overhead Distribution Facilities

Exelon Utilities Administrative Procedure

AM-EU-9114

Revision No.: 1

2. Precautions and limitations

2.1. Precautions

2.1.1 Refer to current construction standards and additionally,Technical Bulletins when applicable.

2.2. Limitations

2.2.1 Addition or revision of the following items shall be exempt from upgrade requirements:

- Overhead/aerial service
- Underground service (riser)
- Repeater radio
- Street light

Note: All clearance requirements **SHALL** be met.

2.2.2 Certain limited scope programs of work defined by Technical Services may be exempt from these upgrade requirements.

- Consult Engineering leadership in Technical Services.

3. Prerequisites

3.1. Due to variances among utilities, primary voltages are referenced as: 5kV class, 15kV class, 25kV class, and 35kV class.

4. Procedure

4.1. Upgrade Philosophy

The Exelon Utilities (EU) periodically create and revise construction standards. As work is performed, the Exelon Utilities (EU) strive to upgrade existing facilities to meet current construction standards. However, it may be impractical to completely “rebuild” an existing pole to meet current construction standards, depending on the scope of work.

In certain situations attempting to do so may involve great expense and effort, yet have no real impact to improve safety or reliability. It may also be difficult to determine where to begin or end a specific upgrade project. This procedure provides a list of specific upgrade requirements which shall be performed at all existing overhead locations being modified as part of designed work. Any questions as to the intent or application of this procedure should be directed to Distribution Standards.

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Required Upgrades Of Existing Overhead Distribution Facilities

Exelon Utilities Administrative Procedure

AM-EU-9114

Revision No.: 1

4.2. Required Upgrades Of Existing Overhead Distribution Facilities

Distribution design engineering departments (including New Business) are responsible for incorporating the upgrade requirements for existing overhead distribution facilities detailed below into design packages. If corrective work is required, follow current applicable standards. Any special circumstances or special reasons for not correcting these conditions must be shown in the work order to inform construction.

4.2.1 Pole

CHECK to see that the pole is in good condition:

RESTORE or **REPLACE** any pole that is broken, damaged, or rejected (by an authorized pole inspection contractor).

STRAIGHTEN a pole that is excessively leaning.

RESTORE or **REPLACE** any pole with a non-standard support or misapplied C-Truss.

REPLACE any pole with existing truss (restoration) if installing a capacitor, recloser, voltage regulator, transformer, terminal poles, gang-operated switches or other major equipment.

REPLACE if there is less than 10 years of life left in a pole (based on 50 year useful life) AND a capacitor, recloser, voltage regulator, transformer, terminal poles, gang-operated switches or other major equipment will be added to the pole.

REPLACE damaged or missing reflector (if required).

4.2.2 Pole Top Extension

CHECK to see that the pole top extension is in good condition and secured to a sound, solid pole top:

REPAIR or **REPLACE** broken, loose, or non-standard installations.

REPLACE pole when repairs are impractical.

4.2.3 Conductors

CHECK to see that the conductors are in good condition:

REPORT floating conductors and open neutrals to the OCC and note that action on the work order.

RECONDUCTOR spans (primary, neutral, or secondary) that show signs of electrical or mechanical damage or bird-caging (unraveling).

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RECONDUCTOR any individual primary conductor in a span with more than two splices (automatic or compression). Any combination of splices can be reduced to two splices by installing more wire between the two outermost splices.

RECONDUCTOR any individual neutral conductor in a span with more than two splices. Automatic splices in neutral conductors must be replaced with compression splices. (Does not apply to BGE)

REPAIR any primary conductor that is not properly skinned at the pole attachment or install the appropriate polyethylene pin insulator and PVC tie (see tie wire, section 4.2.9).

INSTALL or **REPLACE** missing or damaged Arc Protection Device (APD) on primary aluminum conductors (AAAC, AAC and ACSR) at any transition from covered to bare (skinned) conductors.

REPAIR any loose or damaged lashing wire on aerial and secondary cable.

4.2.4 Slack Spans (in excess of Reduced Tension Spans requirements)

CHECK to see if there are any slack spans:

RE-TENSION slack spans or **INCREASE** phase separation.

If re-tensioning or phase separation are not a viable options, install phase separating insulators (for BGE, consult Distribution Standards).

REPLACE any automatic line splices or dead-ends in slack or reduced tension spans with compression splices or dead-end clamps.Automatic splices are designed for full tension spans.

4.2.5 Arms

CHECK to see that the arms are in good condition:

REPLACE arms that are broken, rotten, split, twisted, missing nail endplate (PECO), contains wooden pins, or tracking (burn marks).

TIGHTEN loose hardware on arms.

CHECK for grid gains on all wood arms (BGE).

4.2.6 Arm Brace

CHECK to see that the arm braces are in good condition:

REPLACE arm braces that are broken, rotten, split, tracking, or missing.

REPLACE metal braces on circuits greater than 5kV (ComEd/PECO/PHI) or greater than 15kV (BGE).

TIGHTEN loose hardware on arm braces.

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4.2.7 Insulators or Primary Dead-End (suspension insulator)

CHECK to see that the insulators and the primary dead-ends are in good condition and meet current standards:

REPLACE insulators that are damaged, chipped, broken, melted, or tracking.

REPLACE “aluminum” dead-end bells with non-porcelain suspension insulators.

REPLACE AB Chance “Epoxilator”, General Electric “GEPOL”, or Dexmar deadend insulators.

4.2.8 Pins

CHECK to see that the pins are in good condition:

REPLACE pins that are broken, or bent.

REPLACE all wood pins supporting primary conductors.

REPLACE pins that are slipped out of position to where the insulator is resting on the arm.

TIGHTEN loose hardware on pins.

4.2.9 Tie Wire

CHECK to see that the insulator/tie-wire combinations are proper and that the tie wires are in good condition:

REPLACE broken tie wires.

RECONFIGURE improper insulator/tie-wire combinations.

RECONFIGURE connections or splices that are too close to the tie wire or armor rod per utility practice.

4.2.10 Connectors

CHECK to see that the connectors are in good condition:

REPLACE Bridges Connect-O-Switches (ComEd).

REPLACE eyebolt stirrups on 35kV class circuits.

REPLACE primary H-Taps with bolted wedge connectors (PECO).

REPLACE eyebolt stirrups on 5kV class & 15kV class circuits where the eyebolt stirrup is subject to primary mainline load current.

REPLACE live line clamps (“duck-bills”) directly connected to primary wire without a stirrup with appropriate connector per standard (ComEd).

RECONFIGURE conditions with dissimilar metals where “copper is present over aluminum” (correct configuration is aluminum above/over copper).

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4.2.11 Armor Rod

CHECK to see that the armor rods are in good condition:

INSTALL armor rods if missing and required by current standards.

4.2.12 Surge Arresters

CHECK to see that the surge arresters are in good condition and connected:

REPLACE blown, non-MOV, or improper class surge arresters.

INSTALL missing surge arresters on equipment.

RECONFIGURE improper surge arrester leads (i.e. excessive lead lengths, improper connection or training).

MOUNT surge arresters on transformer tanks. If tank mounting is not possible, the reason shall be noted on the work order notes.

4.2.13 Fuse or Cutout

CHECK to see that the fuses and cutouts are in good condition:

REPLACE blown fuses at equipment (i.e. capacitor banks, street light, etc) **OR REFER** it for repair.

REPLACE broken or damaged fuse tubes.

INSTALL tap fusing on un-fused taps per utility practice (check fuse coordination).

REMOVE fuse tubes from normally-open cutouts. Hang at the fuse location per construction standard or install a storage container as appropriate for the location.

VERIFY existing fuse coordination with the next upstream and downstream protective devices per utility practice. If required, replace fuses for proper coordination. Contact Distribution Capacity Planning to review coordination as appropriate.

REPLACE 35kV class Westinghouse DBU power type fuses.

REPLACE 15kV class GE DuraBute polymer cutouts.

REPLACE 15kV class AB Chance porcelain cutouts.

REPLACE 5kV class cutouts or disconnects that lack loadbreak capability or loadbreak tool compatibility (i.e. NOT equipped with loadbreak hooks).

4.2.14 Switch or Disconnect

CHECK to see if switches and disconnects are in good condition and construction is per current standards:

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REPLACE 300 amp solid breakdowns with 600 amp breakdowns (PECO only).

REPLACE 35kV class D7AB Chance, Van Amp and 900 Amps Siemens switches (PECO).

REPLACE any broken or damaged interrupters.

REPAIR or **REPLACE** any broken or damaged switch or disconnect.

REPLACE 5kV class disconnects that lack loadbreak capability or loadbreak tool compatibility (i.e. NOT equipped with loadbreak hooks).

4.2.15 Equipment

CHECK to see that the equipment is in good condition and per current standards:

REPLACE equipment that shows signs of leaking or has damaged bushings or cases.

INSTALL or correct any equipment grounds that are damaged or missing.

INVESTIGATE transformer loading to determine if the correct size transformer is present. If the transformer is over its thermal loading capability, call to upgrade the transformer or shift loading to another transformer without overloading the other transformer.

VERIFY the downstream loading of a recloser with Distribution Capacity Planning, and call for upgrade if required.

4.2.16 Cable Termination

CHECK to see that the cable terminations are in good condition:

REPLACE cable terminations that are damaged, melted, tracking, or burned.

REPLACE “slipped” lead cable (EXL/EXLJ cable) terminations and install cable grips with cable weight supported by the grips. If the EXL/EXLJ cable is connected to a trifurcating joint with paper insulated lead cable (PL/PLJ) in manhole, call for the trifurcating joint to be checked for moisture and **also** **REPLACE** the PL/PLJ cable if moisture is found.

REPLACE metal device arms and termination brackets, unless is part of a current standard

4.2.17 Wildlife Protection

CHECK to see that the wildlife protection is in good condition:

INSTALL wildlife protection if missing and required by current standards.

REPLACE broken, damaged, deteriorated or improperly installed wildlife protection.

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UPGRADE wildlife protection on transformer primary bushings to current standards.

4.2.18 Fault Indicators

CHECK to see that the fault indicators are installed per current standards:

REPOSITION improperly positioned fault indicators.

INSTALL fault indicators if missing but required by current standards.

REPLACE fault indicators of the improper type or size based on current standards.

4.2.19 Grounds

CHECK to see that the grounds are in good condition:

INSTALL ground molding if the ground wire is exposed on the pole at a height less than 8 ft. from grade.

BURY the ground wire and/or ground rod if exposed at the base of the pole. Note: The upper end shall be flush with or below the ground level unless suitably protected.

REPAIR or **REPLACE** neutral and/or ground connections that are inadequate.

4.2.20 U-Guard/Riser Shield

CHECK to see the U-guards are in good condition:

REPLACE broken or missing U-guards.

REPAIR or **REPLACE** broken or missing ground/bond connection on metal U—guard.

4.2.21 Guys

CHECK to see the guying is in good condition:

INSTALL guy markers when missing or damaged.

REPAIR or **REPLACE** guy markers not properly attached.

SHORTEN guy tails that are more than three inches beyond the inside of the dead-end bail or other connector at the anchor end of the guy wire.

REPLACE damaged or broken guy wires.

REPLACE all wooden guy insulators with fiberglass insulators.

TIGHTEN slack guy wires.

INSTALL insulators in guy wires when required by current standards.

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4.2.22 Limited Access Highway, Railroad, or Navigable Waterway Crossing

CHECK to see that the NESC Grade "B" construction is applied at limited access highway, railroad, or navigable waterway crossing:

CORRECT any NESC Grade "B" construction issues. Dead-end arms are typically applied on both sides of the crossing.

RECONDUCTOR spans with automatic or other non-standard splices in the crossing.

4.2.23 Labeling

CHECK to see that the labeling is in good condition:

INSTALL labeling if missing, incomplete, or incorrect and required by current standards.

4.2.24 Clearance Violations

CHECK if there are clearance violations:

RECONFIGURE or **REPLACE** the pole if there is inadequate clearance from the ground, adjacent buildings, fire escapes, billboards, signs and other obstructions. Provide notation to construction personnel on the work order for any special circumstances or special reasons for not correcting the violation.

NOTE: Concerning existing facilities - per the 2017 NESC Section 013B3:

Where conductors or equipment are added, altered, or replaced on an existing structure, the structure or the facilities on the structure need not be modified or replaced if the resulting installation will be in compliance with either:

(a) the rules that were in effect at the time of the original installation, or

(b) the rules in effect in a subsequent edition to which the installation has been previously brought into compliance, or

(c) the rules of this edition in accordance with Rule 013B1.

The National Electrical Safety Code defines a supporting structure as "The main supporting unit (usually a pole or tower) used to support supply and/or communication conductors, cables, and equipment.

4.2.25 Street Lights

CHECK to see if company-owned street lights are in good condition:

REPAIR or **REPLACE** streetlight fixtures that are damaged or malfunctioning.

REPAIR streetlights that are on during the day.

REPAIR or **REPLACE** streetlight bracket grounding per applicable standards.

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4.2.26 Vegetation

CHECK if vegetation management is required:

REQUEST vegetation management if required to properly build facilities attached to that pole. Provide notation on both work order notes and sketch to communicate circumstances to construction personnel.

4.2.27 Pole Steps

CHECK if pole steps need removal:

REMOVE pole steps above the communication (Telephone, CATV etc.) attachments. (ComEd Only)

REMOVE pole steps within 8 ft. of the ground or other accessible surface.

INSTALL wooden hole plug(s) if applicable.

4.2.28 Spacer Cable

CHECK condition of spacers and protective guards:

REPLACE missing or damaged spacers or protective guards.

CHECK condition of spacer cable conductors for any damage

4.2.29 Transformer (3:1 and 5:1 interposing/step-down)

VERIFY construction is up to current standards.

CHECK transformer low side fusing:

REPLACE solid blade disconnect on the low side with a properly sized fuse and fuse tube.

4.2.30 Distribution Automation Device (Recloser or Automatic Sectionalizer)

CHECK for separate equipment and surge arrester grounding:

REPLACE dual ground with single ground.

VERIFY construction is up to standards.

CHECK for surface tracking along the bottom o 35kV class Scada-Mate switch voltage sensors:

REPLACE damaged voltage sensors.

REPLACE 35kV Class ABB Reclosers. (PECO Only)

REPLACE all oil-filled Reclosers. (PECO Only)

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4.2.31 Unused Facilities

REMOVE unused equipment/facilities

REMOVE rubber goods attached or left at the base of the pole.

NOTE: Seasonal facilities or facilities awaiting completion of another Work Order that are intended to be left in place must be indicated in the Work Order notes.

4.2.32 Mapping Discrepancies:

CHECK if facilities do not match the corresponding maps:

INITIATE corrections to resolve mapping discrepancies. Include the exact information to correct the maps.

INITIATE corrections to resolve customer to transformer discrepancies.

5. Roles and responsibilities

5.1. Designer

5.1.1 **INCORPORATE** upgrade requirements for existing overhead distribution facilities into designed work.

5.1.2 **NOTIFY** the Engineering Manager/Supervisor if any doubt exists concerning qualifications to incorporate upgrade requirements for existing overhead distribution facilities into designed work.

5.2. Engineering Manager/Supervisor

5.2.1 **ENSURE** designers under their direction possess the proper skills, experience, and qualifications to incorporate upgrade requirements for existing overhead distribution facilities into designed work.

5.2.2 **ENSURE** that all personnel under their direction are aware of the upgrade requirements for existing overhead distribution facilities as part of designed work.

5.2.3 **REINFORCE** this process.

5.3. Distribution Standards

5.3.1 Responsible for managing distribution standards for construction

6. Documentation

Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

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Required Upgrades Of Existing Overhead Distribution Facilities

Exelon Utilities Administrative Procedure

AM-EU-9114

Revision No.: 1

7. Terms and definitions

7.1. Construction Standard

7.1.1 A document that defines the materials and manner in which a component of the power delivery system shall be constructed. Construction Standards furnish information on how to construct facilities in a standardized manner. These documents provide pre-engineered, modular designs for designing and building construction work packages. They include bills of material, assembly drawings and illustrations, critical dimensions, standards labor estimates and notes to provide direction to field designers and construction personnel.

7.2. Design Package

7.2.1 Drawings, material lists and other documents that facilitate installation of or modification to the T&D system.

7.3. Overhead “Rebuild” Pole Location

7.3.1 A single distribution pole location that is being modified as part of designed work. It is an existing distribution pole including the adjacent span upon which physical construction work will be called for by an engineering design on a work order.

7.4. Work Order (WO)

7.4.1 An Asset Suite (Enterprise Asset Management) document, which is a collection of tasks required to complete the desired work. It provides instructions for construction or maintenance work.

8. References

8.1. LE-AC-401 – Records and Information Management Retention Disposition

8.2. CM-CE-P339 - Minimum Field Expectations

8.3. National Electrical Safety Code (NESC)

9. Attachments

9.1. AM-ED-9114-1, Upgrade Items

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Revision No.: 1

10. Development history

Revision 0		**Date: 6/30/2015**
Writer	Tyschenko, Peter	Mgr, Distribution Standards (ComEd)
Reviewer(s)	Tyschenko, Peter Stamatopoulos, Jim D'Hooge, David Beissert, Brian Martin, G. Michael Guenette, Samantha Brotzman, Daniel Barnard, David L Stryjewski, Matt Keller, Mike Keegan, Kim Viglietta, Joseph M	Mgr, Distribution Standards (ComEd) Mgr, Distribution Standards (ComEd) Prin Engr, Distribution Standards (ComEd) Sr Engr, Distribution Standards (ComEd) Mgr, Training (ComEd) Mgr, Reliability Programs(ComEd) Mgr, Reliability Programs (ComEd) Prin Engineer, Distribution Standards (BGE) Mgr, Distribution Standards (BGE) Mgr, Distribution Standards (PECO) Mgr, Training Methods (PECO) Sr Engineer (PECO)
UFAM Approver(s)	Summerson, Cory Tyschenko, Peter Coffman, J.	Design Configuration Control (BGE) Design Configuration Control (ComEd) Design Configuration Control (PECO)
Reason written	Periodic review a Management Model template update. Replaces AM-ED-404-R0002	

Revision 1		**Date: 11/7/2018**
Writer	Olmo, Felix L. Engr Sup, Distribution Standards (PHI)	
Review(ers)	Shukla, Kunal V. Engr, Distribution Standards (PECO) Keller, Michael P Mgr, Distribution Standards (PECO) Edwards, Jack J. Sr. Engr Tech, Distribution Standards (BGE) Barnard, David L Prin Engr, Distribution Standards (BGE) Cardona, Ferdinand Mgr, Distribution Standards (BGE) Morris, Andrew R Sr. Engr, Distribution Standards (ComEd) Randerson, Dara M Mgr, Distribution Standards (ComEd) Blackburn, Bryndon A Gen Engr, Distribution Standards (PHI) Soliman, Boushra Mgr, Distribution Standards (PHI)	
UFAM Approver(s)	Summerson, Cory Wesby, Shemeka Cornforth, Richard Ruggeri, William	Design Configuration Control (BGE) Design Configuration Control (ComEd) Design Configuration Control (PECO) Design Configuration Control (PHI)
Reason written	Periodic review of Management Model document. PHI implementation.	

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Revision No.: 1

Upgrade Items

EQUIPMENT	UPGRADE, REPAIR, OR REPLACE
POLE	BROKEN/DAMAGED REJECT POLE (BY AN AUTHORIZED POLE INSPECTION CONTRACTOR) IMPROPERLY BRACED OR C-TRUSS MISAPPLIED STRAIGHTEN IF LEANING EXCESSIVELY DAMAGED OR MISSING REFLECTOR (IF REQUIRED).
POLE TOP EXTENSION	BROKEN/NON-STANDARD/LOOSE
CONDUCTORS	FLOATING CONDUCTORS (NOTIFY OCC) OPEN NEUTRAL (NOTIFY OCC) DAMAGED/BIRDCAGING >2 SPLICES PROPER SKINNING
SLACK SPANS	RE-TENSION EXCESSIVE SLACK AUTOMATIC SPLICES
ARMS	BROKEN/ROTTEN/SPLIT/TWISTED/TRACKING LOOSE HARDWARE
ARM BRACES	BROKEN/ROTTEN/SPLIT/TRACKING/MISSING METAL ON CIRC ABOVE 5KV (COMED/PECO) LOOSE HARDWARE
INSULATORS PRI DEAD-ENDS	DAMAGED/CHIPPED/BROKEN/MELTED/TRACKING ALUMINUM DEAD-END BELLS 35KV CLASS POLYETHYLENE (NOT PART OF SPACER CABLE) AB CHANCE “EPOXILATOR”, GENERAL ELECTRIC “GEPOL”, OR DEXMAR
PINS	BROKEN/BENT/TRACKING/SLIPPED WOOD PINS ON 15KV CLASS LOOSE HARDWARE
TIE WIRES	BROKEN TIES INSULATOR/TIE/WIRE COMBINATION CONNECTOR/SPLICE TOO CLOSE TO END OF TIE/ARMOR ROD
CONNECTORS	BRIDGES CONNECT-O-SWITCH EYEBOLTS ON 35KV CLASS EYEBOLTS ON 5KV CLASS & 15KV CLASS SUBJECT TO MAINLINE LOAD LIVE LINE CLAMPS WITHOUT STIRRUP(COMED/PECO) DISSIMILAR METALS
ARMOR RODS	MISSING
ARRESTERS	BLOWN NON-MOV IMPROPER CLASS IMPROPER LEADS TANK MOUNTING
CUT-OUT/FUSE	BLOWN FUSE BROKEN/DAMAGED FUSE TUBES UNFUSED TAPS FUSE COORDINATION 5KV CLASS NON-LOADBREAK AB CHANCE PORCELAIN OR GENERAL ELECTRIC POLMER DURABUTE

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EQUIPMENT	UPGRADE, REPAIR, OR REPLACE
SWITCH/DISCONNECT	300 AMP DISCONNECT (PECO) BROKEN OR DAMAGED INTERRUPTER 5KV CLASS NON-LOADBREAK
EQUIPMENT	DAMAGED BUSHINGS DAMAGED/LEAKING CASES CORRECT TRANSFORMER SIZE DOWNSTREAM RECLOSER LOADING
CABLE TERMINATION	MELTED/DAMAGED/BURNED METAL DEVICE ARM OR CABLE TERMINATION BRACKET SLIPPED LEAD TERMINATIONS
WILDLIFE PROTECTION	MISSING BROKEN/DAMAGED/DETERIORATED IMPROPERLY INSTALLED “BIRD GUARD” ON TRANSFORMER
FAULT INDICATORS	MISSING IMPROPER TYPE OR SIZE IMPROPERLY POSITIONED ON BARE WIRE
GROUNDS	EXPOSED WIRE/ROD MISSING MOLDING NEUTRAL/GROUND CONNECTIONS
U-GUARD/RISER SHIELD	BROKEN/MISSING METAL NOT GROUNDED/BONDED
GUYING	MISSING OR DAMAGED GUY MARKER MARKER NOT PROPERLY ATTACHED IMPROPER PLACEMENT OF STRAIN INSULATORS PROPERLY GROUNDED (IF APPLICABLE) TAIL >3" BROKEN SLACK
HIGHWAY, RAILROAD, OR WATERWAY X-ING	GRADE B CONSTRUCTION SPLICES (AUTOMATIC OR NON-STANDARD)
LABELING	MISSING/INCOMPLETE/INCORRECT
UNSAFE CONDITIONS CLEARANCE VIOLATIONS	DANGEROUS CONDITIONS HORIZONTAL/VERTICAL CLEARANCE
STREETLIGHTS	FIXTURES DAMAGED/MALFUNCTIONING ON DURING DAY UNGROUNDED BRACKETS
VEG MANAGEMENT	REQUIRED TO BUILD FACILITIES
POLE STEPS	REMOVE POLE STEPS WITHIN 8 FT. OF THE GROUND OR OTHER ACCESSIBLE SURFACE.
SPACER CABLE	MISSING OR DAMAGED SPACER OR PROTECTIVE GUARD
TRANSFORMER (3:1/5:1) STEP-DOWN	LOW SIDE FUSING
DA DEVICE	DUAL GROUND TRACKING VOLTAGE SENSOR
UNUSED FACILITIES/EQUIP	REMOVAL
MAPPING DISCREPANCY	CORRECTION

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Preventive and Predictive Maintenance Program

Exelon Utilities Program
AM-EU-P034
Rev. 2

Effective:	3/19/2018
Supersedes:	AM-ED-P034
Review Type:	NERC
Core Function:	Preventive Maintenance

This document applies to BGE, ComEd and PECO only. PHI integration is in progress and this disclaimer will be removed when PHI has been incorporated.

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1. Purpose

To provide guidelines for development, documentation, implementation, and oversight of an effective preventive (PM) and predictive (PdM) maintenance program for the electric transmission, substation, and distribution assets.

2. Precautions and limitations

2.1. Precautions

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2.1.1 This document contains specific content that has been or will be used as "Evidence of Compliance" for regulatory audits. Any person(s) making revisions to this document shall contact the Exelon NERC Compliance and Security NERC Compliance Management Team (NERC CMT) to inform them of proposed revisions (Outlook address: Exelon NERC CMT O&P Compliance).

2.1.2 A representative of the NERC CMT shall be included as a "reviewer" of any proposed revisions to this document.

2.1.3 This document relates to North American Electric Reliability Corporation (NERC) Standards listed below:

2.1.3.1 PRC-005 - Protection System, Automatic Reclosing, and Sudden Pressure Relaying Maintenance

2.1.3.2 PRC-008 - Implementation & Documentation of Under Frequency Load Shedding (UFLS) Equipment Maintenance Program

2.1.3.3 PRC-011 - Under Voltage Load Shedding (UVLS) System Maintenance & Testing

2.1.3.4 PRC-017 - Remedial Action Scheme Maintenance and Testing

2.1.4 ComEd Only: Determination of the NERC status of NERC Protection System Equipment (NPSE) shall follow the process as prescribed in AM-CE-P134 (*Protection System Equipment*).

2.1.5 Responsibilities prescribed by this process may be performed by designees; however, responsibility for the task remains under the purview of the identified role(s). See Section 5 for roles and responsibilities.

2.1.6 If ReliabilityFirst (RF) requests documentation associated with this preventative and predictive maintenance program and its implementation, the information will be provided to RF and NERC within 30 calendar days.

2.1.7 Individual(s) conducting Preventive Maintenance at an Exelon facility impacted by NERC CIP standards shall adhere to Exelon's NERC CIP Cyber Security Policy.

2.2. Limitations

2.2.1 Protection System Maintenance programs are documented as required to meet NERC standards. This documentation will supersede the Maintenance Template Method once a maintenance program is declared implemented for each Protection System Component Type.

2.2.2 NERC CIP Vulnerability Assessments shall adhere to the NERC CIP Vulnerability Assessment Process.

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3. Prerequisites

3.1. There are no prerequisites.

4. Program

4.1. Maintenance Templates will be used to document the required tasks and frequencies for the Preventive and Predictive Maintenance program.

4.2. Budgetary estimates shall be developed to align with the template requirements. Budgetary estimates shall include details relative to resource requirements.

4.3. The long-range work plan will reflect the budgetary estimates. Following finalization of the budget, the long-range work plan will be updated to reflect any necessary changes. The work plan will be levelized as required to support available resources. FEG requirements will be taken into consideration as the plan is developed.

4.4. Procedures will be developed as required to support execution of the program tasks as identified in the Maintenance Templates. Document requirements will be identified by the appropriate field organization. Document development is the responsibility of the appropriate field organization.

NOTE: Procedure requirements should be determined based on the skill of the craft, complexity of the task being performed, and repeatability of the task. Determination of the Level procedure required is also necessary.

4.5. Training of field forces needs to be performed as required to address skill gaps within the craft relative to program requirements. A well-defined and executed training program is necessary to ensure that the craft is proficient in executing tasks as required.

NOTE: As program requirements change there is a need to evaluate the potential for added craft training. Determination of the training requirements requires alignment with the field organizations.

4.6. Model work orders will be used to define the requirements for tasks within the program. PMRQ's will be created for each component relative to the model work orders. Work orders will be generated in Asset Suite or equivalent electronic database to define the program requirements.

NOTE: For tasks initiated out of Cascade, the Cascade procedure type will be used to define the requirements. This information will be passed to Asset Suite.

4.7. Work packages are to be prepared as required to execute the Cascade/Asset Suite work orders. The work planning process is addressed in the Work Planning Procedure.

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4.8. Work tasks are to be scheduled per the Work Week Preparation of the Work Control Schedule procedure, where applicable.

4.9. Work execution is per the Work Execution and Close Out process.

4.9.1 For all equipment within the scope of NERC CIP standards:

4.9.1.1 Changes made to the NERC CIP-010 baseline configuration as part of Preventive Maintenance shall adhere to the NERC CIP Configuration Control and Change Management Process.

4.9.1.1.1 If Corrective Maintenance to applicable NERC CIP equipment emerges during performance of Preventive Maintenance, the individual identifying a need for Corrective Maintenance must contact the Operational Compliance Owner (OCO).

4.9.1.2 An individual identifying a change to a security control that is inconsistent with Exelon practice or an unauthorized change to NERC CIP-010 baseline configuration as part of Preventive Maintenance activity shall contact appropriate business unit Operational Compliance Owner (OCO) to initiate, as required, the Cyber Security Incident Response Program and the NERC CIP Recovery Program.

4.10. Upon completion of a PM and/or PdM work order, the work order is to be completed in Cascade/Asset Suite or equivalent electronic database. Close out comments relative to the scope of work performed, conditions found, and Corrective Maintenance work orders generated are to be included in the work order completion comments.

4.11. Corrective Maintenance work orders are to be generated as required to address as found conditions identified during execution of the PM and PdM program tasks.

4.12. All inspection and test results (paper and/or electronic in format) shall be returned to a repository. This data will be used to fully understand a components maintenance history and current health. This information can be used for future trending.

5. Roles and Responsibilities

5.1. Key Managers

5.1.1 Directors, Managers and their direct report supervisors shall be responsible for the day-to-day implementation of the Maintenance Program.

5.1.2 Provide sponsorship and clear expectations for the consistent adherence to maintenance policies and procedures.

5.1.3 Ensure that all personnel are trained to perform their assigned responsibilities.

5.2. Area Maintenance or Field Engineer

5.2.1 Provides input into the maintenance program relative to equipment health and effectiveness of tasks.

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5.2.2 Evaluates component equipment health.

5.2.3 Reviews PdM test results as required.

5.2.4 Serves as primary interface to field forces for support during maintenance.

5.3. Engineering and/or Material Condition

5.3.1 Prescribes the preventive and predictive maintenance program task requirements for transmission, substation, and distribution system components and/or systems.

NOTE: Vegetation control programs are developed under Vegetation Management.

5.3.2 Documents maintenance program requirements (tasks, frequencies) via Maintenance Templates.

5.3.3 Ensures that Original Equipment Manufacturer (OEM) recommendations are considered when developing program requirements.

5.3.4 Ensures that appropriate experts review proposed template modifications.

5.3.5 Obtains Nuclear Station Engineering agreement on any changes prior to implementation in the preventive/predictive maintenance for all switchyard components included in the Nuclear Station NRC Maintenance Rule including changes such as: PM creation, PM cancellation, PM deferral and justification, and PM frequency change. This is per interface procedures WC-AA-8000 and WC-AA-8003, NERC Standard NUC-001, Requirement R9.3.2, and Nuclear Station NPIRs, Section 5.

5.3.6 Monitors program performance and evaluates need to modify program requirements due to increased failure trends and/or emergent failure modes.

5.3.7 Ensures that regulatory commitments are met relative to completion of program.

5.3.8 Ensures that affected working departments review proposed Maintenance Template modifications for impact on work procedures.

5.3.9 Generates Cascade/Asset Suite work orders as required to ensure program tasks are identified for inclusion in the work plan.

5.3.10 Identifies annual budgetary requirements necessary to support program execution per template.

5.3.11 Communicates program changes to stakeholders as needed.

5.3.12 Provides input to maintenance programs regarding failure modes and necessary tasks to prevent failures. Investigates new technology.

5.3.13 Determines specific maintenance trigger levels as applicable to the equipment. Examples: acceptable oil quality and DGA limits; acceptable power-factor test results; thermography temperature limits.

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5.3.14 Serves as the primary interface with Original Equipment Manufacturer (OEM).

5.3.15 Provides support to the field relative to equipment expertise and may supplement skill of the craft.

5.4. Training Department

5.4.1 Evaluates the need to develop training when preventive and predictive maintenance tasks change.

5.4.2 Develops appropriate training program.

5.4.3 Conducts training programs as required.

5.5. Transmission and Substation / Construction and Maintenance / Distribution System Operations

5.5.1 Executes the preventive maintenance program.

5.5.2 Documents completion of program via work orders in the system of record.

5.5.3 Ensures that close out comments in the system of record reflect work completed and meet the criteria set forth in the Work Execution and Close Out process.

5.5.4 Ensures that questionable or unacceptable PdM or PM test results are reviewed and/or acted upon.

5.5.5 Ensures that either Corrective Maintenance work requests or work orders are generated as required based on results of PdM and PM programs.

5.5.6 Interfaces with Training to ensure that necessary training is approved and that skill of the craft is sufficient to perform program tasks.

5.5.7 Ensures that procedure needs are identified and developed to support field execution of maintenance tasks.

5.5.8 Ensures that changes to work procedures are reviewed by Engineering for alignment with Maintenance Templates and Asset Suite model work orders.

5.5.9 Ensures that documentation relative to predictive and preventive maintenance tasks test results is stored and is available for future reference. Also ensures that physical maintenance logs and checklists are retained per the current record retention policy as described in Exhibit A of Corporate Procedure LE-AC-401, “Records Management, Retention and Disposition”.

5.5.10 Reports mapping discrepancies using the Document Discrepancy Process.

5.6. Vegetation Management

5.6.1 Responsible for the development, documentation, budgetary development, etc. for maintenance programs relative to Vegetation Management.

5.7. Work Management

5.7.1 Evaluates resource requirements for maintenance program.

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5.7.2 Develops long-range work plan.

5.7.3 Develops resource strategy to ensure execution of the plan.

5.8. Work Planner

5.8.1 Development and maintenance of model work orders for preventive and predictive maintenance tasks.

5.8.2 Prepares necessary work packages in support of preventive and predictive maintenance.

5.9. Work Scheduler / Responsible Manager

5.9.1 Ensures that maintenance tasks are scheduled such that the grace period is not exceeded.

5.9.2 Schedules work to align with FEG when required.

5.9.3 Bundles work as needed to ensure completion of the program tasks.

5.10. Operation Compliance Officer (OCO)

5.10.1 Ensures compliance at the Business Unit or Shared Services level for NERC CIP standards.

5.10.2 Single Point of Contact (SPOC) for field personnel if suspected deviations from the NERC CIP baseline configuration are identified during Preventive Maintenance.

6. Documentation

6.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

6.2. Completion of the PM program is documented in the system of record.

6.3. Predictive maintenance test results are to be captured and stored in Cascade to the extent that Cascade has been implemented.

6.4. Hardcopy test results are to be stored.

7. Terms and Definitions

7.1. Document Discrepancy Process - The process for notifying the responsible mapping department of discrepancies that exist between the established as-built field condition and the current maps and drawings depicting that condition.

7.2. Functional Equipment Group (FEG) - Operationally integrated equipment that can be removed from service as a system to allow for efficient bundling of work activities. Typically, a family of components common to a clearance order boundary.

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7.3. Grace Period - The grace period is an authorized amount of time allowed beyond a prescribed due date. The grace timeframe is typically the lesser of 25% of the task performance interval or 4 years. This timeframe is provided to allow for scheduling efficiency in support of an equipment outage schedule or cycle plan/ FEG bundling opportunities.

7.4. Inspection - Failure finding task visually performed on a scheduled periodicity. Also used to review the operating condition of components and gather required data to assess the condition of equipment.

7.5. Inventory - Population of preventive and predictive program tasks tracked via Cascade/Asset Suite. Inventory size is one of the indicators of the potential health of the preventative and predictive maintenance systems.

7.6. Maintenance Template – Identifies the preventive and predictive maintenance tasks recommended for a component or system. Maintenance tasks and frequencies are based on the criticality of the component, its duty cycle, and the environment in which it operates.

7.7. Model Work Order - Pre-planned templates used to create work orders for repetitive work or to generate Preventive Maintenance Work Orders.

7.8. NRC Maintenance Rule - "NRC Maintenance Rule" shall mean the NRC rules and regulations set forth in 10CFR50.65, as they may be amended from time to time. 10CFR50.65 provides the NRC requirements for monitoring the effectiveness of maintenance at Nuclear Power Plants. The Maintenance Rule requires the licensee to monitor the performance or condition of structures, systems, or components (SSCs) against licensee established goals in a manner sufficient to provide reasonable assurance that such SSCs are capable of fulfilling their intended function.

7.9. Overdue - Preventive or predictive maintenance tasks that exceed their grace period.

7.10. Past Due - Preventative or predictive maintenance tasks that have gone beyond the prescribed due date.

7.11. Predictive Maintenance (PdM) – Predictive Maintenance tasks are inspections and diagnostics activities. Examples of such tasks include, but are not limited to, infrared thermography, insulating oil sampling, acoustic monitoring, travel timing tests, system or equipment performance tests, visual inspections, and operational data reviews. PdM collected data is integrated and evaluated to make timely maintenance decisions in the form of corrective or preventive maintenance task execution, or preventative and predictive maintenance frequency performance adjustments.

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7.12. Preventive Maintenance (PM) - Physical maintenance performed at set intervals with the intent of improving equipment material condition and thus preventing a component or sub-component performance failure. PM activities are preplanned and directed at preventing in-service failures. Normally, these activities are scheduled for performance at set frequencies (i.e. time directed), but may also be initiated based upon a specific event or system equipment condition. Examples: calibration of transformer gauges, circuit breaker temperature gauges and lubrication of mechanisms are Preventive Maintenance.

7.13. Work Order (WO) – A *Asset Suite* document, which is a collection of tasks required to complete the desired work. It provides instructions for construction or maintenance work.

7.14. Work Order Task – One of a series of steps required to complete a Work Order.

7.15. Work Request (WR) – *Asset Suite* document of an Originator's request to have work performed.

8. References

8.1. AM-CE-P134 Data Management for Protection & Control Equipment

8.2. LE-AC-401 – Records and Information Management Retention and Disposition

8.3. LE-AC-401 Exhibit A Exelon Records Retention Schedule

8.4. NERC Reliability Standard NUC-001, Nuclear Plant Interface Coordination

8.5. NERC Reliability Standard PRC-005, Protection System, Automatic Reclosing, and Sudden Pressure Relaying Maintenance

8.6. NERC Reliability Standard PRC-008, Implementation and Documentation of Underfrequency Load Shedding Equipment Maintenance Program

8.7. NERC Standard CIP-010, Cyber Security - Configuration Change Management and Vulnerability Assessments

8.8. NERC Reliability Standard PRC-011, Undervoltage Load Shedding System Maintenance and Testing

8.9. NERC Reliability Standard PRC-017, Remedial Action Scheme Maintenance and Testing

8.10. Memorandum of Understanding Between Exelon Nuclear And BGE/ComEd/PECO

8.11. WC-AA-8000, Interface Procedure between BGE/ComEd/PECO and Exelon Generation (Nuclear/Power) for Construction and Maintenance Activities

8.12. WC-AA-8003, Interface Procedure between BGE/ComEd/PECO and Exelon Generation (Nuclear/Power) for Design Engineering and Transmission Planning Activities

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8.13. OP-AA-108-107-1002, Interface Procedure between BGE/ComEd/PECO and Exelon Generation (Nuclear/Power) for Transmission Operations

8.14. WC-BR-8003-1000 Braidwood Station Units 1 and 2 Nuclear Plant Interface Requirements (NPIRs)

8.15. WC-BY-8003-1001 Byron Station Units 1 and 2 Nuclear Plant Interface Requirements (NPIRs)

8.16. WC-DR-8003-1003 Dresden Station Units 2 and 3 Nuclear Plant Interface Requirements (NPIRs)

8.17. WC-LA-8003-1004 LaSalle County Station Units 1 and 2 Nuclear Plant Interface Requirements (NPIRs)

8.18. WC-LG-8003-1005 Limerick Generating Station Units 1 and 2 Nuclear Plant Interface Requirements (NPIRs)

8.19. WC-PB-8003-1007 Peach Bottom Station Units 2 and 3 Nuclear Plant Interface Requirements (NPIRs)

8.20. WC-QC-8003-1008 Quad Cities Station Units 1 and 2 Nuclear Plant Interface Requirements (NPIRs)

8.21. WC-CA-8003-1010 Calvert Cliffs Nuclear Power Plant Units 1 And 2 Nuclear Plant Interface Requirements (NPIRs)

8.22. WM-EU-4001, Work Planning Procedure

8.23. WM-EU-5001, Workweek Preparation of the Work Control Schedule

8.24. WM-EU-P020, Work Execution and Close Out

8.25. WM-EU-P029, EED Predefined Deferral Process

8.26. RC-AC-POL3-001, NERC CIP Cyber Security Policy

8.27. RC-AC-PCS3-007, NERC CIP Configuration Control and Change Management Process

8.28. RC-AC-PGM3-003, NERC CIP Cyber Security Training Program

8.29. RC-AC-PGM3-005, NERC CIP Access Management Program

8.30. RC-AC-PGM3-006, NERC CIP Recovery Program

8.31. RC-AC-PGM3-009, Cyber Security Incident Response Program

8.32. RC-AC-PCS3-011, NERC CIP Vulnerability Assessment Process

9. Attachments

9.1. N/A

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Preventive and Predictive Maintenance Program

Exelon Utilities Program
AM-EU-P034
Rev. 2

10. Development history

Revision 0	**Date: 8/1/2014**
Writer	Kenneth Wendt, Material Condition – ComEd
Reviewer(s)	John Hartenstein, EU CFAM; Dan Brotzman, ComEd ; Jim Crane, EU; Ben Kao, EU; George Leinhauser, PECO Eng.; Chris Lotz, BGE Eng.; Nitin Patel, ComEd Eng.; Drew Reindel, PECO Eng.; Pete Tyschenko, ComEd Eng.; Michael Keller, PECO Eng.; Kevin Swiat, ComEd Material Condition; Suneetha Parupalli, ComEd Material Condition; Angelo DeAngelis, ComEd Material Condition; Steve Scalcucci, ComEd Material Condition; Nicole Love, ComEd Eng.; Dan Wasilewski, ComEd RTA; Pat Indenbaum, BGE Eng; Robert Munley BGE Eng, Wasif Qazi, PECO Eng; David J. Carlson, Transmission Strategy and Compliance
UFAM Approver(s)	Mike Moy (UFAM ComEd), (J. Coffman UFAM PECO), Cory Summerson (UFAM BGE)
Reason written	Document rewritten for applicability to Exelon Utilities

Revision 1	**Date: 4/1/2016**
Writer	Kevin Swiat, Material Condition – ComEd
Reviewer(s)	Ken Wendt, ComEd Material Condition; Tony O'Connor, ComEd Eng; Dan Gacek, ComEd Eng; Mike Scannell, ComEd Eng; Andrew Kang, PECO Eng; Drew Reindel, PECO Eng; Bert Chee, BGE Eng; Kirk Rae, BGE Eng; Larry Laws, BGE Eng; John Hansen, EU TS&C
UFAM Approver(s)	Mike Moy (UFAM ComEd), J. Coffman (UFAM PECO), Cory Summerson (UFAM BGE)
Reason written	Revised for to ensure compliance with NERC CIP V5, Updated document references to most recent document number and title; Updated to reference Asset Suite.

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Preventive and Predictive Maintenance Program

Exelon Utilities Program
AM-EU-P034
Rev. 2

Revision 2	**Date: 3/19/2018**
Writer	Don Elmore, T&S Engineering - PECO
Reviewer(s)	Jen Nowoswiat, T&S - PECO; Nevin Schlabach, T&S Reliability - PHI; Carl Kapes - T&S Reliability - PHI; Dale Player - Material Condition - ComEd; George Bentz, System Analysis - BGE; Roy Pappan, SCADA/CIP - PECO; Rajesh Geevarghese, T&S NERC Compliance – PECO; Becky A. Webb, Prin. NERC Compliance Specialist, Exelon; John Hansen, Mgr. NERC Compliance Program, Exelon
UFAM Approver(s)	Richard M. Cornforth, Dir. Engineering (PECO); Michael C. Moy, Dir. Asset Performance (ComEd); Rick Knotts, Mgr. Engineering & Design (BGE); Carl S. Kapes, Mgr. Reliability Programs NERC (PHI)
Reason written	Revised to ensure compliance with NERC two year review process and per AR 00474778-36. Updated document references to most recent document number and title; Removed references to Passport. NERC review complete.

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Maintenance Template Index

Exelon Utilities Training and Reference Material (T&RM)

AM-EU-P034-R0001
Rev. 5

Effective:	3/10/2020
Supersedes:	n/a
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Maintenance Template Matrix

Distribution Related Maintenance Templates		Applicability					
		ED	EU	BE	CE	PE	PH
AM-XX-P034-R3001	Automatic Throw Over				X		
AM-XX-P034-R3012	Cathodic Protection Equipment, Distribution		X		X		
AM-XX-P034-R3014	Submersible Vacuum Circuit Breakers		X			X	
AM-XX-P034-R3015	Network Sectionalizing Boxes		X			X	
AM-XX-P034-R3016	Padmount Transformers		X	X	X	X	
AM-XX-P034-R3018	Distribution Vaults		X	X	X	X	
AM-XX-P034-R3019	Padmounted Operating Devices		X	X	X	X	
AM-XX-P034-R3020	Pole Top Transformers		X	X	X	X	
AM-XX-P034-R3022	Network Pilot Wire Scheme		X			X	
AM-XX-P034-R3023	Network Protector		X	X	X		
AM-XX-P034-R3026	Aerial Conductor		X	X	X	X	
AM-XX-P034-R3027	Cutouts & Disconnects		X	X	X	X	
AM-XX-P034-R3028	Aerial Gang Operated Switch		X	X	X	X	
AM-XX-P034-R3029	Wood Poles		X	X	X	X	
AM-XX-P034-R3030	Cable Equipment		X	X		X	
AM-XX-P034-R3031	Capacitors		X	X	X	X	
AM-XX-P034-R3032	Distribution Regulators		X	X	X	X	
AM-XX-P034-R3033	Distribution Manholes		X	X	X	X	
AM-XX-P034-R3034	Submersible Transformers		X	X	X	X	
AM-XX-P034-R3035	Reclosers and Sectionalizers		X	X	X	X	
AM-XX-P034-R3036	Submersible Switches		X	X	X	X	
AM-XX-P034-R3037	DC In A Box		X		X		

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Exelon Utilities Training and Reference Material (T&RM)

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Protection System Related Maintenance Templates		Applicability					
		ED	EU	BE	CE	PE	PH
AM-XX-P034-R0003	Underfrequency Load Shed & Undervoltage Load Shed		X	X	X	X	
AM-XX-P034-R1028	Meters, Panel (Volt-Amp-Watt-Var)		X	X	X	X	
AM-XX-P034-R1030	Alarm Annunciator Systems		X	X	X	X	
AM-XX-P034-R1031	Protection System Equipment Transmission		X	X	X	X	
AM-XX-P034-R1032	Protection System Equipment Distribution		X	X	X	X	
AM-XX-P034-R1038	Fault Recorders		X	X	X	X	
AM-XX-P034-R1042	Standalone Substation Automation Schemes		X		X		
AM-XX-P034-R1048	On Line Monitoring System - Transformers		X	X	X	X	
AM-XX-P034-R1049	Voltage Control Relay		X	X	X	X	
AM-XX-P034-R1074	STATION DC SUPPLY, includes station batteries and battery chargers		X	X	X	X	
AM-XX-P034-R1075	Cyber Systems		X	X	X	X	
AM-XX-P034-R1075	34kV and below Battery Energy Storage Systems (BESS)				X		

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Maintenance Template Index

Exelon Utilities Training and Reference Material (T&RM)

AM-EU-P034-R0001
Rev. 5

Substation Related Maintenance Templates		Applicability					
		ED	EU	BE	CE	PE	PH
AM-XX-P034-R1001	Circuit Breaker, Vacuum 4-34 kV		X	X	X	X	
AM-XX-P034-R1002	Circuit Breaker, Air Magnetic, 4-12 kV		X	X	X	X	
AM-XX-P034-R1003	Circuit Breaker, Oil, 4-13 kV		X	X	X	X	
AM-XX-P034-R1004	Substation Capacitor Bank		X	X	X	X	
AM-XX-P034-R1005	Substation Recloser		X		X		
AM-XX-P034-R1006	Circuit Breaker, Oil, 34 kV and Above		X	X	X	X	
AM-XX-P034-R1007	Distribution Bifurcating Cabinets		X		X		
AM-XX-P034-R1008	Circuit Breakers, Air Blast 66 kV and Above		X	X			
AM-XX-P034-R1009	Circuit Breaker Single Pressure Puffer ≥34 kV		X	X	X	X	
AM-XX-P034-R1010	Fixed Water Spray System		X	X		X	
AM-XX-P034-R1011	Fire Protection Buildings and Yards		X	X	X	X	
AM-XX-P034-R1012	Substation Building		X	X	X	X	
AM-XX-P034-R1013	Substation Yards		X	X	X	X	
AM-XX-P034-R1014	Sump Systems		X	X	X	X	
AM-XX-P034-R1015	Structures and Lightning Masts		X	X	X	X	
AM-XX-P034-R1016	Substation Foundations		X	X	X	X	
AM-XX-P034-R1017	Substation Bus - Open Air		X	X	X	X	
AM-XX-P034-R1018	Circuit Breaker 2 Pressure SF6		X	X		X	
AM-XX-P034-R1019	Power Transformer		X	X	X	X	
AM-XX-P034-R1020	Inductors		X	X	X	X	
AM-XX-P034-R1021	Light and Power Transformers, Panel, ATO		X	X	X	X	
AM-XX-P034-R1022	Voltage Regulator		X		X	X	
AM-XX-P034-R1023	Switch (Substation)		X	X	X	X	
AM-XX-P034-R1024	Circuit Switcher		X	X	X	X	
AM-XX-P034-R1025	Substation Grounding Systems		X	X	X	X	
AM-XX-P034-R1027	Control Cable Junction Boxes		X	X	X	X	
AM-XX-P034-R1043	Surge Arrester - Free Standing		X	X	X	X	
AM-XX-P034-R1044	Instrument Transformers – Free Standing Potential Transformers		X	X	X	X	
AM-XX-P034-R1045	Instrument Transformers – Coupling Capacitor Voltage Transformers (CCVT)		X	X	X	X	
AM-XX-P034-R1046	Instrument Transformers – Free Standing Current Transformers		X	X	X	X	
AM-XX-P034-R1047	Meters, Revenue Class		X	X	X	X	
AM-XX-P034-R1050	Portable Transformer		X	X	X	X	
AM-XX-P034-R1051	Instrument Transformers - Combination Current / Potential		X		X		
AM-XX-P034-R1052	Circuit Breaker, H-type Oil – H2O 13 kV		X			X	

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		ED	EU	BE	CE	PE	PH
AM-XX-P034-R1055	Circuit Breaker, Air Blast 13 kV		X			X	
AM-XX-P034-R1056	Generators - Substation Auxiliary Power		X	X	X	X	
AM-XX-P034-R1061	Switch, Unit Cage Load-Break And Cage Assembly		X			X	
AM-XX-P034-R1062	Gas Insulated Switchgear (GIS)		X				

Transmission Related Maintenance Templates		Applicability					
		ED	EU	BE	CE	PE	PH
AM-XX-P034-R2001	Overhead Transmission, Structures		X	X	X	X	X
AM-XX-P034-R2002	Overhead Transmission, Foundations		X	X	X	X	X
AM-XX-P034-R2003	Overhead Transmission, Line Switches		X	X	X	X	X
AM-XX-P034-R2004	Overhead Transmission, Conductors		X	X	X	X	X
AM-XX-P034-R2005	Overhead Transmission, Insulators		X	X	X	X	X
AM-XX-P034-R2006	Line Low Pressure Fluid Filled (LPFF) Cable System		X	X	X	X	X
AM-XX-P034-R2007	Line High Pressure Fluid Filled (HPFF) Cable System		X	X	X	X	X
AM-XX-P034-R2008	Line Solid Type Cable System (XLPE)		X	X	X	X	X
AM-XX-P034-R2009	Cathodic Protection Equipment Underground Transmission		X	X	X	X	X

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Exelon Utilities Training and Reference Material (T&RM)

AM-EU-P034-R0001
Rev. 5

2. Development history

Revision 0	**Date: 6/17/2005**
Writer	Kathy McHugh (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh, FAM Maintenance Planning
Reason written	To provide a consolidated index of issued PCM Templates

Revision 1	**Date: 6/30/2005**
Writer	Kathy McHugh (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh, FAM Maintenance Planning
Reason written	Revised to add documents posted to the Management Model on 6/30/05

Revision 2	**Date: 7/22/2005**
Writer	Kathy McHugh (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh, FAM Maintenance Planning
Reason written	Revised to add documents posted to the Management Model in July, 2005

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Revision 3	**Date: 4/28/2006**
Writer	Kathy McHugh (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh, FAM Maintenance Planning
Reason written	Revised to add AM-ED-P1056 to the list of Substation Related Templates

Revision 4	**Date: 11/6/2006**
Writer	Kathy McHugh (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh, FAM Maintenance Planning
Reason written	Revised to add reference for applicability to EED, ComEd, PECO

Revision 5	**Date: 11/13/2006**
Writer	Kathy McHugh (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh, FAM Maintenance Planning
Reason written	Revised to add additional references for applicability to EED, ComEd, PECO

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Exelon Utilities Training and Reference Material (T&RM)

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Rev. 5

Revision 6	**Date: 11/17/2006**
Writer	Kathy McHugh (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh, FAM Maintenance Planning
Reason written	Revised to add additional references for applicability to EED, ComEd, PECO

Revision 7	**Date: 12/22/2006**
Writer	Kathy McHugh (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh, FAM Maintenance Planning
Reason written	Revised to add additional references for applicability to EED, ComEd, PECO

Revision 8	**Date: 12/29/2006**
Writer	Kathy McHugh (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh, FAM Maintenance Planning
Reason written	Revised to add additional references for applicability to EED, ComEd, PECO

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Maintenance Template Index

Exelon Utilities Training and Reference Material (T&RM)

AM-EU-P034-R0001
Rev. 5

Revision 9	**Date: 1/12/2007**
Writer	Kathy McHugh (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh, FAM Maintenance Planning
Reason written	Revised to add additional references for applicability to EED, ComEd, PECO

Revision 10	**Date: 1/26/2007**
Writer	Kathy McHugh (Strategic Programs)
Reviewer(s)	
UFAM Approver(s)	Kathy McHugh, FAM Maintenance Planning
Reason written	Revised to add additional references for applicability to EED, ComEd, PECO

Revision 11	**Date: 7/31/2009**
Writer	Frank Gabrieli (T&S Maintenance)
Reviewer(s)	
UFAM Approver(s)	Jean Holderried, FAM
Reason written	PRC-005 - Transmission and Generation Protection System Maintenance and Testing- PCM Template Index version issue should be corrected (procedure has page 1 has Rev 10 page 2 has Rev. 7.same issue found during 2007 RFC audit of PECO). AR 106670 – 15. Additionally added templates that are on the management model but not in the index.

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Maintenance Template Index

Exelon Utilities Training and Reference Material (T&RM)

AM-EU-P034-R0001
Rev. 5

Revision 12	**Date: 8/1/2009**
Writer	Drew Davis (T&S Engineering)
Reviewer(s)	Drew Reindel (T&S Engineering)
UFAM Approver(s)	Jean Holderried (PECO FAM), Ron Donovan (ComEd FAM), Bill Forst (ComEd FAM)
Reason written	Modified the following templates to demonstrate “Evidence of Regulatory Compliance” as applicable to PECO: Deleted AM-ED-P034-R0003 and created AM-CE-P034-R0003 and AM-PE-P034-R0003. Deleted AM-ED-P034-R0004 and created AM-CE-P034-R0004 (Com Ed only). Deleted AM-ED-P034-R1031, R1035 and R1040, combined these three (3) templates into one for each company AM-CE-P034-R1031 and AM-PE-P034-R1031. Deleted AM-ED-P034-R1037 (SPS) and created AM-CE-P034-R1037, SPS was included in PECO AM-PE-P034-R1031. Deleted AM-ED-P034-R1038 and created AM-CE-P034-R1038 and AM-PE-P034-R1038.

Revision 13	**Date: 12/23/2009**
Writer	Drew Davis (T&S Engineering)
Reviewer(s)	Rich Webster (T&S Engineering), Vince Catania (T&S), Rob Crognale(T&S Engineering), John Blazekovich (TSC)
UFAM Approver(s)	Bill Sullivan (PECO FAM)
Reason written	Deleted AM-PE-P034-R1033 and modified the title of AM-PE-P034-R1031.

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Maintenance Template Index

Exelon Utilities Training and Reference Material (T&RM)

AM-EU-P034-R0001
Rev. 5

Revision 14	**Date: 4/26/2010**
Writer	Drew Reindel (T&S Engineering)
Reviewer(s)	Drew Davis (T&S Engineering), Bernie Dwyer (T&S Engineering
UFAM Approver(s)	Bill Sullivan (PECO FAM)
Reason written	Added AM-PE-P034-R1061 for Unit Cage Switch Maintenance.

Revision 15	**Date: 11/30/2010**
Writer	Chris Stefanski (Material Condition)
Reviewer(s)	Ken Wendt (Material Condition), John Blazekovich (TSC), Drew Davis, Drew Reindel (PECO)
UFAM Approver(s)	Bill Fluhler, Nitin Patel, Bill Gannon, Jim Crane (ComEd FAMs), Bill Sullivan (PECO FAM)
Reason written	Deleted AM-ED-P034-R1039, AM-CE-P034-R0003, AM-CE-P034-R0004, AM-CE-P034-R1031, AM-CE-P034-R1033, AM-CE-P034-R1037, AM-CE-P034-R1033. Added AM-CE-P137-R0001.

Revision 16	**Date: 5/6/2011**
Writer	Drew Reindel (T&S Engineering)
Reviewer(s)	Drew Davis (T&S Engineering), George Leinhauser (T&S Engineering)
UFAM Approver(s)	Bill Sullivan (PECO FAM)
Reason written	Deleted AM-PE-P034-R1026 – “34 kV Medium Voltage Static Transfer Switch” due to the retirement of the template following the sale of Zach Substation. Change affects PECO only.

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Revision 17	**Date: 5/14/2011**
Writer	Jason Connell (T&S Engineering)
Reviewer(s)	Drew Reindel (T&S Engineering), Tim Shannon (T&S Engineering)
UFAM Approver(s)	Drew Davis (PECO FAM)
Reason written	Changed title of AM-PE-P034-R1038 from “Fault Recorders” to “Disturbance Monitoring Equipment.” Change affects PECO only.

Revision 18	**Date: 5/23/2011**
Writer	Jason Connell (T&S Engineering)
Reviewer(s)	Drew Reindel (T&S Engineering), Tim Shannon (T&S Engineering)
UFAM Approver(s)	Drew Davis (PECO FAM)
Reason written	Removed AM-ED-P034-R1029 – “Fuses, Relay Protection Secondary and Control.

Revision 19	**Date: 5/22/2013**
Writer	Chris Stefanski (Material Condition)
Reviewer(s)	Drew Reindel (PECO), George Leinhauser (PECO), Ken Wendt (ComEd), Terry Whalen (ComEd), Nicole Love (ComEd)
UFAM Approver(s)	Bill Fluhler (UFAM ComEd) , J. Coffman (UFAM PECO
Reason written	Removed documents (AM-ED-P034-R1036, -R1041, AM-PE-P034-R1026, AM-CE-P034-R2003); added documents (AM-CE-P034-R1071, -R1072, AM-PE-P034-R1070, -R1073); revised titles as appropriate to match posted documents

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Exelon Utilities Training and Reference Material (T&RM)

AM-EU-P034-R0001
Rev. 5

Revision EU 0	**Date: 5/22/2015**
Writer	Chris Stefanski (Exelon Utilities)
Reviewer(s)	Rick Clarke (BGE), George Leinhauser (PECO), Ken Wendt (ComEd), Mike Keller (PECO)
UFAM Approver(s)	Cory Summerson (UFAM BGE), Mike Moy (UFAM ComEd) , J. Coffman (UFAM PECO)
Reason written	Reconfigured document list into matrix format to support creation of EU and OpCo specific templates. Changed document number from ED to EU applicability and changed review type from NERC to 3-year.

Revision EU 1	**Date: 6/10/2016**
Writer	Kevin Swiat (Exelon Utilities)
Reviewer(s)	Hugo Castaneda (ComEd), Frank Frantzas (ComEd), Jacob Burlin (BGE), Bob Munley (BGE), Mike Keller (PECO)
UFAM Approver(s)	Cory Summerson (UFAM BGE), Mike Moy (UFAM ComEd) , J. Coffman (UFAM PECO)
Reason written	General updates to reflect changes from Maintenance Template Alignment initiative.

Revision EU 2	**Date: 7/1/2016**
Writer	Suneetha Parupalli (ComEd)
Reviewer(s)	Kevin Swiat (ComEd), Pete Yan (ComEd)
UFAM Approver(s)	Cory Summerson (UFAM BGE), Mike Moy (UFAM ComEd) , J. Coffman (UFAM PECO)
Reason written	Removed document AM-XX-P034-R3008 as ComEd no longer has this equipment on the system.

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Exelon Utilities Training and Reference Material (T&RM)

AM-EU-P034-R0001
Rev. 5

Revision EU 3	**Date: 10/31/2016**
Writer	Kevin Swiat (ComEd)
Reviewer(s)	Dale Player (ComEd)
UFAM Approver(s)	Rick Knotts (UFAM BGE), Michael Moy (UFAM ComEd) , Rich Cornforth (UFAM PECO), Carl Kapes (UFAM PHI)
Reason written	Added AM-XX-P034-R1075 in Protection System Related Maintenance Templates section for Cyber Systems.

Revision EU 4	**Date: 9/24/2019**
Writer	Nevin Schlabach, T&S Equipment Engineering (PHI)
Reviewer(s)	Dale Player (ComEd)
UFAM Approver(s)	Mike Moy (UFAM ComEd), Carl Kapes (UFAM PHI), Rick Knotts (UFAM, BGE), Richard Cornforth (UFAM PECO)
Reason written	Added AM-BE-P034-R0001 BGE Substation Criticality Definitions, removed AM-CE-P034-R1008.

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Exelon Utilities Training and Reference Material (T&RM)

AM-EU-P034-R0001
Rev. 5

Revision EU 5	**Date: 3/10/2020**
Writer	Kevin Swiat, Material Condition (ComEd)
Reviewer(s)	Suneetha Parupalli (ComEd)
UFAM Approver(s)	Michael Moy (UFAM ComEd), Carl Kapes (UFAM PHI), Rick Knotts (UFAM BGE), Richard Cornforth (UFAM PECO)
Reason written	Added AM-CE-P034-R1076 for 34kV and below Battery Energy Storage Systems (BESS); Added AM-EU-P034-R1062 for Gas Insulated Switchgear.

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Inspection of Aerial Facilities

ComEd Technical Procedure
CM-CE-021005
Rev. 2

Effective:	12/18/2019
Supersedes:	XX-XX-XXXX
Level:	3
Review Type:	3 Year
Core Function:	Corrective Maintenance

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1. Purpose

1.1. To provide guidelines for inspection of aerial facilities prior to performing work on the facilities.

1.2. Field Procedure CM-CE-021005-R0001, “Inspection of Aerial Facilities,” covers section 8 of this procedure.

2. Precautions and limitations

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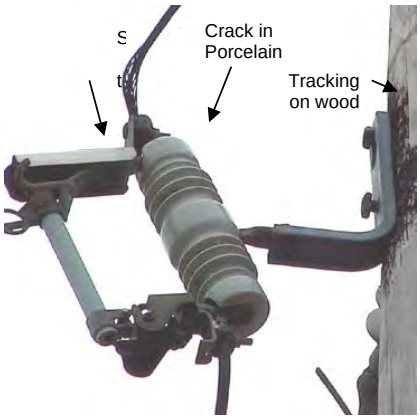
2.1. Precautions

NOTE: REFER to Field Procedure CM-CE-021005-R0001, "Inspection of Aerial Facilities."

2.2. A large percentage of failed or damaged cutouts submitted for analysis are from A.B. Chance. A.B. Chance cutouts can be easily recognized by the stainless steel rain/sleet cover that is distinct from the copper or galvanized top pieces of other manufacturers.



2.3. Limitations

2.3.1 This procedure is not to be confused with the Preventive Maintenance Overhead (Aerial) Inspections that are performed on the whole circuit under the PM Program. That procedure number is CM-ED-021001, "Overhead Distribution Circuit Inspection and Maintenance Procedure."

3. Safety Measures and Environmental Concerns

3.1. Safety Measures

3.1.1 The existing conditions related to the safety of the work to be performed **SHALL BE** determined before work is started.

3.1.2 INSPECT the pole, equipment, adjacent facilities, line clearances to structures, vegetation and the area prior to starting work on the facilities.

3.1.3 Lines and equipment that could endanger life or property **SHALL BE** promptly repaired, disconnected, or isolated.

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3.2. Environmental Concerns

3.2.1 Upon inspection, if oil is noted to be leaking from a transformer, the following steps are to be taken:

3.2.1.1 If the leak is active (i.e. wet), the oil leak **SHALL BE** contained using spill control equipment such as oil absorbent pads, booms and/or oil-dry.

3.2.1.2 The equipment **SHALL BE** inspected for the presence of a yellow PCB sticker or a blue non-PCB sticker. If a yellow PCB sticker is observed on the leaking equipment, the Environmental Services Department **SHALL BE** immediately notified.

3.2.1.3 Per EN-CE-2004, the OCC **SHALL BE** notified of all active oil leaks/spills.

3.2.1.4 A written spill report **SHALL BE** submitted (per EN-CE-2004, attachment EN-CE-2004-3) to the Environmental Services Department for tracking.

4. Material and Special Equipment

4.1. Material

4.1.1 None

4.2. Special Equipment

4.2.1 Optional – Binoculars.

4.2.2 ComEd Cat ID 0001118060, Center focus binoculars.

5. Prerequisites

5.1. Prior to working on any of the equipment in this procedure, employees SHALL perform the inspections in the manner described in this procedure including storm recovery situations.

5.2. **NOTE**: IF necessary, binoculars can be used to provide a more detailed inspection of the conductors and equipment.

6. Procedure

6.1. **NOTE:** **REFER** to Field Procedure CM-CE-021005-R0001, “Inspection of Aerial Facilities.”

7. Return to Normal

7.1. None

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8. Roles and Responsibilities

8.1. MANAGERS

8.1.1 Ensure compliance to this procedure.

8.2. SUPERVISION

8.2.1 ComEd owns this procedure.

8.2.2 ComEd Subject Matter Experts and Supervisors are accountable for the content and process of the procedure.

8.3. EMPLOYEES/WORKERS:

8.3.1 All ComEd, contractor, or vendor personnel performing work within the ComEd service area shall comply with:

a) This procedure.

b) ED Fundamentals.

c) ComEd Safety Rule Book.

d) Employee Code of Conduct.

8.4. All other Corporate, ED, ComEd policies, programs, procedures, and expectations appropriate to the work being performed/Group

9. Documentation

Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

10. Terms and Definitions

10.1. Refer to OP-ED-000010, EU Glossary for terms and definitions.

11. References

11.1. LE-AC-401 – Records and Information Management Retention and Disposition.

11.2. EN-CE-2004, Oil Spill Response and Contingency.

11.3. CM-CE-000017, Line of Fire Overarching.

11.4. AM-ED-129-8001, Electric Equipment and Component Failure Process.

11.5. 29 CFR 1910.269 (Appendix D)

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11.6. Field Procedure CM-CE-021005-R0001, "Inspection of Aerial Facilities"

12. Attachments

12.1. None

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Inspection of Aerial Facilities

ComEd Technical Procedure
CM-CE-021005
Rev. 2

13. Development history

Revision 0	**Date: 9/24/2009**
Writer	Kevin Kinnerk (Methods), Renee Jourdin (PAG)
Reviewer(s)	Kevin Kinnerk (Methods), Ed Bengson (Methods), Tom Lambert (Methods), Tom Trychta (CM); John Lasky (CM), John Martinez (CM), Phil Russel (CM), Rick Hansen (CM), Steve Jankovich (CM), Steve Klasinski (CM), Bill Schuaff (TS), Tim Ayers (CM COC), Bob Gaynor (CM COC), John Riley (CM COC), Charlie Rudd (TQ COC), Steve Trexler (MI)
Technical Approver(s)	Gus Ponce/Dan Galovich (CM FAM Owner); Lori Cimaglia (TS FAM Owner)
Safety Approver(s)	Split CM-ED-021002 procedure into ComEd and PECO specific procedures & update references due to procedure splits. Remove Section 8 language and replace with visual field procedure document as an associated reference document (CM-CE-021005-R0001). Add reference to 29 CFR 1910.269 (Appendix D).
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

Revision 1	**Date: 12/15/2016**
Writer	Susan Gasper (Dist Ops)
Reviewer(s)	Tom Trychta (C&M); Phil Russell (C&M); Steve Jankovich (C&M)
Technical Approver(s)	Ed Bengson (Methods)
Safety Approver(s)	Mark Primm (Safety)
UFAM Approver(s)	Adam St Pierre (CM UFAM)
Reason written	Periodic review performed; updated EN-ED-2001 to EN-CE-2004

Revision 2	**Date: 12/18/2019**
Writer	Susan Gasper (Dist Ops)
Reviewer(s)	Tom Trychta (C&M); Phil Russell (Work Planning); Steve Jankovich (C&M)
Technical Approver(s)	Ed Bengson (Elec Ops)
Safety Approver(s)	Jack Craighead (Safety)
UFAM Approver(s)	Eric Henderson (UFAM)
Reason written	Periodic review was performed; no content revisions made

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Inspection of Aerial Facilities

ComEd Training and Reference Material (T&RM)
CM-CE-021005-R0001
Rev. 4

Effective:	11/12/2019
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Corrective Maintenance

1. Insert Documentation

Adobe Acrobat Document

2. Development history

Revision 0	**Date: 9/24/2009**
Writer	Kevin Kinnerk (Methods), Renee Jourdin (PAG)
Reviewer(s)	Kevin Kinnerk (Methods), Ed Bengson (Methods), Tom Lambert (Methods), Tom Trychta (CM); John Lasky (CM), John Martinez (CM), Phil Russel (CM), Rick Hansen (CM), Steve Jankovich (CM), Steve Klasinski (CM), Bill Schuaff (TS), Tim Ayers (CM COC), Bob Gaynor (CM COC), John Riley (CM COC), Charlie Rudd (TQ COC), Steve Trexler (MI)
UFAM Approver(s)	Gus Ponce/Dan Galovich (CM FAM Owner); Lori Cimaglia (TS FAM Owner)
Reason written	Place previous Section 8 language from CM-ED-021002 into a visual field procedure document

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Inspection of Aerial Facilities

ComEd Training and Reference Material (T&RM)
CM-CE-021005-R0001
Rev. 4

Revision 1	**Date: 8/22/2014**
Writer	Ed Bengson (Methods)
Reviewer(s)	John Haluzak (C&M), Tim Geraty (C&M), Steve Jankovich (C&M), Todd Weaver (Weaver), Mike Kennedy (C&M), Mike Meathe (C&M), Keith Halsall (C&M), Kent Keiser (C&M), Jeff Smith (C&M) , Robert Smith (C&M), Tom Forbes (C&M), Kevin Kinnerk (PAG), Pete Tyschenko (Engineering), Ed Suarez (Safety), Jack Craighead (Safety), Milan Krpan (Methods), Tom Distasio (Methods), Tom Butts (Methods), Steve Castellari (C&M), Bob Odegard (C&M), Pat Calabrese (C&M), Vic Pignatari (C&M), Paul Lense (C&M), Mark Schleehauf (C&M), Carl Christensen (C&M), Tony Mejia (C&M), Dave Hocking (C&M), Kurt Aehlert (C&M), Mike Lojdl (C&M), Ron Burda (C&M), Darren Mack (C&M), Larry Morgan (C&M), Wally O'Conner (C&M), Dexter Moore (C&M), Frank Moran (C&M), Randy Wolf (C&M), Rusty Kiser (C&M), Bob White (Training), John Williams (Training), Tim Jobes (Training), Jeff Cadotte (Training), Ken Alexander (Training), Ryan Kenealy (Training), Wess Ness (Training), Scott Edmonson (Training), Warren Handy (Training), Kathy Thigpen (Training), Mike Martin (Training/Methods), Bill Sullivan (Training)
UFAM Approver(s)	Mark Primm (ComEd UFAM)
Reason written	Pole tagging added, graphics corrected, OSHA reference updated

Revision 2	**Date: 9/4/2015**
Writer	Ed Bengson (Methods)
Reviewer(s)	Tony Fornelli (Methods), Lou Rivera (Methods), Bob White (Training), Wess Ness (Training), Ryan Knealy(Training), Mike Martin (Training & Methods Manager), Tim Jobbes (Training Manager), Jeff Cadotte (Training), Tom Filkowski (Training), Jack Craighead (Safety)
UFAM Approver(s)	Mike Meathe (ComEd UFAM)
Reason written	Correct typographical errors

Revision 3	**Date: 8/31/2018**
Writer	Susan Gasper (Distribution Ops)
Reviewer(s)	Warren Handy (Methods); Chris Johnson (Methods); Tony Fornelli (Methods); Bob White (Training); Mike Martin (Training & Methods Manager); Tim Jobes (Training Manager); Jeff Cadotte (Training); Tom Filkowski (Training); Jack Craighead (Safety)

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Inspection of Aerial Facilities

ComEd Training and Reference Material (T&RM)
CM-CE-021005-R0001
Rev. 4

Revision 3	**Date: 8/31/2018**
UFAM Approver(s)	Adam St Pierre CM UFAM; Benjamin Henry PECO CM UFAM
Reason written	Periodic review, removed pole rocking step

Revision 4	**Date: 11/12/2019**
Writer	Ed Bengson (Taining & Methods Manager)
Reviewer(s)	Warren Handy (Methods); Chris Johnson (Methods); Tony Fornelli (Training); Jeff Cadotte (Training); Tim Griffin (Methods)
UFAM Approver(s)	Eric Henderson CM UFAM
Reason written	Removed pole rocking step and direction that was not removed Rev 3

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Ready-for-Start Inspection

ComEd Technical Procedure
CM-CE-303002
Rev. 7

Effective:	3/27/2019
Supersedes:	N/A
Level:	2
Review Type:	3 Year
Core Function:	Corrective Maintenance

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1. Purpose

1.1. To provide guidelines for qualified personnel to perform and document *Ready-for-Start Inspections,* which ensure that mechanical, electrical, and control systems are ready to be *placed in-service* (i.e. commissioned) before energizing or reenergizing ComEd equipment.

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2. Precautions and limitations

2.1. Precautions

2.1.1 ComEd prohibits energization of equipment without first confirming the existence of a Preventive Maintenance (PM) Work Order in PassPort according to AM-CE-9095 (NERC PM Lifecycle Management).

2.1.2 ComEd personnel must be trained to recognize hazardous energy sources, including the type and magnitude applicable to the job, and the means and methods to isolate and control that energy according to OP-EU-050003 (Lockout Tag Out).

2.1.2.1 Three-Part Communication must be used when energizing equipment.

2.1.2.2 Appropriate PPE must be used when energizing equipment.

2.1.3 The Designated Authority must be notified before testing lines or equipment on the ComEd System.

2.1.4 Personnel, including contractors and vendors who perform work on behalf of ComEd, must perform a final walk-down inspection before energizing transformers rated >2000 kVA.

2.1.5 Personnel, including contractors and vendors who perform work on behalf of ComEd, must adhere to:

2.1.5.1 ComEd Safety Rule Book

2.1.5.2 Exelon Utilities' (EU) policies, programs, processes, procedures, engineering practices and standards, which are applicable to the work being performed.

2.1.6 PM Work Orders are distinct from Project Work Orders, which are not tied to the PMID-RQ.

2.1.7 ComEd Construction and Maintenance owns this procedure, is accountable for its content, and must be included as a reviewer of proposed revisions.

2.1.8 Individual(s) placing equipment in-service at an Exelon facility impacted by NERC CIP standards shall adhere to Exelon's NERC CIP Cyber Security Policy (RC-AC-POL3-001).

2.2. Limitations

2.2.1 CM-CE-303002 (*Ready-for-Start Inspections*) does NOT supersede the following procedures:

2.2.1.1 CM-ED-020017 (*T&S Testing Group (TG) Completing Modification Projects*), which describes TG expectations for modification projects;

2.2.1.2 CM-ED-P311-R0002 (*Testing Group Livening Procedure Template*), which is the template TG uses during the equipment livening process;

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2.2.1.3 OP-EU-050003 (*Lockout Tag Out*), which describes the process to safely isolate Transmission and Distribution equipment from all forms of hazardous energy for the protection of personnel who perform work on isolated equipment;

2.2.1.4 OP-ED-050003-R0001 (*Workers Alteration Log and Instructions*), which accounts for documenting changes when performing maintenance.

2.2.2 NERC CIP Vulnerability Assessments shall adhere to the NERC CIP Vulnerability Assessment Process (RC-AC-PSC3-011).

2.3 The installation of high side taps of a cutout or switch is the final step prior to closing, energizing that device (e.g., VO 3-Phase cap bank, transformers, DA devices, regulators).

3. Safety Measures and Environmental Concerns

3.1. Safety Measures

3.1.1 None

3.2. Environmental Concerns

3.2.1 None

4. Material and Special Equipment

4.1. Material

4.1.1 None

4.2. Special Equipment

4.2.1 None

5. Prerequisites

5.1. None

6. Procedure

6.1. Process

6.1.1 Perform the *Ready-for-Start Inspection* when equipment is:

6.1.1.1 Installed new or reconfigured on the ComEd system;

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6.1.1.2 Decommissioned (i.e. taken *out-of-service*) to perform scheduled or emergent work: corrective/preventive maintenance, reconfigurations, repairs, replacements, upgrades, or testing;

6.1.1.3 *Ready-for-Start* equipment types include, but may not be limited to:

6.1.1.3.1 Transformers

6.1.1.3.1.1 Large Power Transformers

6.1.1.3.1.2 Small, Large Power Transformers

6.1.1.3.1.3 Power Transformers (PT)

6.1.1.3.1.4 Current Transformers (CT)

6.1.1.3.1.5 CCVT (Capacitance-coupled Voltage Transformer)

6.1.1.3.1.6 Examples of transformer reconfigurations include changing links or internal components in the field

6.1.1.3.2 Automatic Throw Over (ATO)

6.1.1.3.3 Switchgear

6.1.1.3.4 Capacitors

6.1.1.3.5 Circuit Breakers

6.1.1.3.6 Reclosers

6.1.1.3.7 Other equipment controlled by the Distributions Systems Operator (DSO) or the Transmission Systems Operator (TSO).

6.1.2 The Ready-for-Start Inspection is comprised of the following requirements:

6.1.2.1 Identify applicable checklist(s) according to CM-CE-303002-R0001:Ready-for-Start Inspection Documentation.

6.1.2.1.1 CM-CE-303002-R0003: Field Equipment, Transformers <2000 kVA, Substation Equipment, and Relay Inspection.

6.1.2.1.2 CM-CE-303002-R0004: City of Chicago Equipment Inspection.

6.1.2.1.3 CM-CE-303002-R0005: Substation Transformers Inspection.

6.1.2.1.4 CM-CE-303002-R0006: Network High-rise Equipment and Transformers Inspection.

6.1.2.1.5 CM-CE-303002-R0007: Battery and Battery Chargers.

6.1.2.1.6 CM-CE-303002-R0008: Substation Circuit Breakers.

6.1.2.2 For all equipment within the scope of NERC CIP standards:

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6.1.2.2.1 Changes made to the NERC CIP-010 baseline configuration as part of Preventive Maintenance shall adhere to the NERC CIP Configuration Control and Change Management Process (RC-AC-PSC3-007).

6.1.2.3 Pre-livening Verification

6.1.2.3.1 Perform inspection using the appropriate checklist.

6.1.2.3.2 Sign and date the checklist for prelivening attributes.

6.1.2.3.3 Notify the Designated Authority to energize (reference appropriate checklist).

6.1.2.3.3.1 Always use Three-Part Communication.

6.1.2.3.3.2 Confirm checklist is completed, signed, and dated.

6.1.2.3.3.3 Confirm post-livening checks will be performed.

6.1.2.3.4 Perform post-livening checks.

6.1.2.4 Account for and address Abnormal Conditions before livening

6.1.2.4.1 Individually document the list of abnormal conditions not returning to normal, including the Work Request and or Work Order number(s);

6.1.2.4.2 Notify the designated authority for, document the details of, and properly tag abnormal control switch positions, pulled alarm cutouts, or similar conditions not returning to normal;

6.1.2.4.3 Mitigate abnormal conditions by repairing all abnormal conditions, or consult with the responsible T&S engineer and obtain concurrence to energize with existing (abnormal) conditions;

6.1.2.4.4 Complete the checklist;

6.1.2.4.5 Sign and date the prelivening checklist;

6.1.2.4.6 Contact the First Line Supervisor (FLS) and verbally verify completion of each checklist step;

6.1.2.4.7 Notify the designated authority to energize (reference the checklist).

6.1.2.4.7.1 Always use Three-Part Communication;

6.1.2.4.7.2 Confirm checklist is completed, signed, and dated;

6.1.2.4.7.3 Confirm post-livening checks will be performed.

6.1.2.5 Closeout Work

6.1.2.5.1 Person-in-Charge returns the completed checklist(s) with the Work Package to the planner or designee;

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6.1.2.5.2 Supervisor reviews applicable checklist(s):

6.1.2.5.2.1 Ensures completeness of notes, explanations and comments;

6.1.2.5.2.2 Verifies completion of checklist(s), signature(s), and date.

6.1.2.5.2.3 Signs and dates the checklist(s).

6.1.2.5.2.4 Files the checklist(s) and report(s) for closeout.

6.1.3 Equipment that requires Preventive Maintenance according to AM-EU-P034 (Preventive and Predictive Maintenance Program) must have an active Preventive Maintenance Identifier and Requirement (PMID-RQ) in PassPort according to AM-CE-9095 (NERC PM Lifecycle Management) and CM-CE-P012 (Guidelines for Adding/Updating Substation Equipment Records in Cascade/PassPort).

6.1.3.1 ComEd requires an active PM Work Order for all applicable equipment according to AM-CE-9095 before being energized.

6.1.4 Process Elements

#	Process Element	Description	Performed By
1	CM-CE-303002-R0003	Used for field and substation equipment, and transformers rated <2000 kVA.	Working Department Representative
2	CM-CE-303002-R0004	Used for equipment within the City of Chicago	Working Department Representative
3	CM-CE-303002-R0005	Used for substation transformers	Working Department Representative
4	CM-CE-303002-R0006	Used for Network high-rises equipment and transformers	Working Department Representative
5	CM-CE-303002-R0007	Checklist for New Battery Installation	Working Department Representative
6	CM-CE-303002-R0008	Substation Circuit Breaker	Working Department Representative

6.1.5 Assumptions

6.1.5.1 Equipment being energized/livened has been entered in Cascade/PassPort.

6.1.5.2 The PassPort record for the equipment type being energized/livened was assigned the appropriate PMID-RQ, and Preventive Maintenance (PM) schedule.

6.1.5.3 Equipment being energized/livened has an active PM Work Order in PassPort.

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6.1.5.4 The PM Coordinator communicated, as reference, the PM Work Order number(s) in the Project Work Order.

6.1.5.5 The PM Work Order has been verified prior to energizing/livening equipment.

7. Return to Normal

7.1. None

8. Roles and Responsibilities

8.1. First Line Supervisor (FLS)

8.1.1 Ensures crews use appropriate Cascade/PassPort equipment add/update forms, and accurately record nameplate data for the following scenarios:

8.1.1.1 Adding new equipment

8.1.1.2 Replacing old equipment

8.1.1.3 Renaming/reconfiguring equipment

8.1.1.4 Retiring equipment

8.1.1.5 Removing equipment

8.1.2 Must review Cascade/PassPort add/update forms for accuracy/completeness

8.1.3 Prior to commissioning equipment, transmits completed form(s) to the Cascade System Administrator for new equipment record(s) and or applicable updates to be entered into the Cascade system according to CM-CE-P012.

8.2. Person in Charge

8.2.1 Crew Leader or designee in charge of the job/job site.

8.3. Supervisor

8.3.1 Foreman responsible for assigning jobs to the Crew Leaders/Person-in-Charge.

8.4. T&S FLS / Work Planner

8.4.1 Ensure that the appropriate Ready-to-Start checklist is included in the group's work package.

8.5. Managers

8.5.1 ENSURE compliance with this procedure.

8.5.2 Provide sponsorship and clear expectations for the consistent adherence to this procedure.

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8.5.3 Ensure that all personnel are trained to perform their assigned responsibilities in accordance with this procedure.

8.6. Testing Group Managers / Field Engineers

8.6.1 ENSURE that the appropriate Ready-to-Start checklist is strictly adhered to and that appropriate maintenance PMs are established for the equipment.

8.6.2 ENSURE that for an Exelon facility impacted by NERC CIP standards work in performed in adherence to Exelon NERC CIP Cyber Security Policy (RC-AC-POL3-001)

8.7. Operation Compliance Officer (OCO)

8.7.1 Ensures compliance at the Business Unit or Shared Services level for NERC CIP standards.

9. Documentation

9.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

10. Terms and Definitions

10.1. Automatic Throw Over (ATO)

10.1.1 Or transfer switch, is a switch that automatically switches a load between two power sources; an ATO is often installed to allow for auxiliary power to be switched to automatically in the event of a loss of power.

10.2. Capacitance-coupled Voltage Transformer (CCVT) or Capacitor Voltage Transformer

10.2.1 A transformer used in power system to step-down extra high voltage (>1500 V DC) signals and provide a low voltage (>=120 V) signal for measurement, or to operate a protective relay.

10.3. Capacitors

10.3.1 A passive two-terminal electrical component used to store energy electrostatically in an electric field.

10.4. Circuit Breakers

10.4.1 An automatically operated electrical switch designed to protect an electrical circuit from damage caused by overload or short circuit.

10.5. Current Transformers (CT)

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10.5.1 Also referred to as an instrument transformer is an electrical device used to measure alternating electric currents by producing a reduced current proportional to the current in the circuit, which can be connected to measuring and recording instruments.

10.6. Preventive Maintenance Identifier and Requirement (PMID-RQ)

10.6.1 This numeric code defines the schedule/template for a specific package according to AM-EU-P034 (Preventive & Predictive Maintenance Program).

10.6.2 Originates in PassPort, copied into PowerBase, and replicated in RTS.

10.6.3 PM ID is eight digits, and RQ is two digits (e.g. 12345678-01).

10.7. Preventive Maintenance (PM) Work Order (PM Work Order)

10.7.1 An entry in PassPort generated from a PMID-RQ, used to track maintenance, and anchor the PM schedule for a specific Package.

10.7.2 This is distinct from the project Work Order, which is generated from a different funding center and not tied to the PMID-RQ.

10.8. Power Transformer (PT)

10.8.1 An electrical device that transfers energy between two or more circuits through electromagnetic induction, and converts inbound voltage to a higher or lower value to accommodate the current-flow required for a specific purpose.

10.9. Reclosers

10.9.1 Also known as an autorecloser, is a circuit breaker with a mechanism that can automatically close the breaker after is has been opened due to a fault, which are used to detect and interrupt momentary faults, which helps to improve service continuity by automatically restoring power to the line after a momentary fault.

10.10. Switchgear

10.10.1 The combinations of electrical disconnect switches, fuses, or circuit breakers used to control, protect and isolate electrical equipment.

11. References

11.1. LE-AC-401 – Records and Information Management Retention and Disposition.

11.2. AM-CE-9095 (NERC Preventive Maintenance Lifecycle Management)

11.3. AM-EU-P034 (Preventive and Predictive Maintenance Program)

11.4. CM-ED-000010 (EED Technical Glossary)

11.5. CM-ED-020017 (T&S Testing Group (TG) Completing Modification Projects)

11.6. CM-ED-P311-R0002 (Testing Group Livening Procedure Template)

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11.7. LE-AC-401 (Records and Information Management, Retention and Disposition)

11.8. OP-EU-050003 (Lockout Tag Out)

11.9. OP-ED-050003-R0001 (Workers Alteration Log and Instructions)

11.10. OP-ED-142009 (Transformer Three-Phase Radial and Feed-Thru Compartmental Energizing)

11.11. CM-CE-303002-R0001, *Documenting Ready-for-Start Inspection*

11.12. CM-CE-303002-R0002, *Test Department New Equipment Ready-for-Start Inspection Report*

11.13. CM-CE-303002-R0003, *Field Equipment and Transformers <2000 kVA and Substation Equipment Ready-for-Start Inspection*

11.14. CM-CE-303002-R0004, City of Chicago Equipment Ready-for-Start Inspection

11.15. CM-CE-303002-R0005, Substation Transformers Ready-for-Start Inspection

11.16. CM-CE-303002-R0006, *Network High-rise Ready-for-Start Inspection for Field Equipment and Transformers <2000kVA*

11.17. CM-CE-303002-R0007 ComEd Transmission and Substation – Ready-to-Start Checklist for New Battery Installations

11.18. CM-CE-303002-R0008 Substation Circuit Breakers

11.19. RC-AC-POL3-001, NERC CIP Cyber Security Policy

11.20. RC-AC-PSC3-007, NERC CIP Configuration Control and Change Management Process

11.21. RC-AC-PSC3-011, NERC CIP Vulnerability Assessment Process

12. Attachments

12.1. None

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13. Development history

Revision 0	Date: 12/15/2009
Writer	Kevin Kinnerk (Methods), Renee Jourdin (PAG)
Reviewer(s)	Kevin Kinnerk (Methods); Tim Jobes (CM); Eric Henderson (CM); Jeff Wagner (CM); Steve Bocherts (CM); John Riley (COC); Tom Hogue (COC); Mike Buelow (Safety).;
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Dan Galovich (CM FAM Owner); Lori Cimaglia (TS FAM Owner)
Reason written	Split CM-ED-9123 procedure into ComEd and PECO specific procedures and update references due to procedure splits. Remove Section 6 language and replace with visual field procedure document as an associated reference document (CM-CE-303002-R0001) and create new documents for the Ready to Start Checklists (CM-CE-303002-R0002, R0003, R0004, R0005, and R0006).

Revision 1	Date: 12/16/2011
Writer	William Sullivan
Reviewer(s)	Kevin Kinnerk, Jeff Sword, Ed Suarez, Doug DeTienne, Paul Chillemi, Chip Carter
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Dan Galovich (CM FAM Owner); Lori Cimaglia (TS FAM Owner)
Reason written	Current expectation was placed into the Purpose Statement for greater clarity. In Purpose Statement, changed the word “transformer” to “equipment.”

Revision 2	Date: 8/15/2014
Writer	Ben Demus, C&M
Reviewer(s)	Chris Gibbs (CM), Shane Cole (CM), Steven Jankovich (CM), Brian Lopresti Jr (WM), Tim Shales (COC), Bill Sullivan III (TRNG), Michael Meathe (OPS), James Williams (CM), Don Kelly (CM), Tim Johnson (CM), Nichole Owens (OPS), Frank Gonzalez (CM), Kevin Kinnerk (PAG), Ken Buck (SSC), Robert Pinto (CM)
Technical Approver(s)	N/A
Safety Approver(s)	Stephen Franker (Safety)
UFAM Approver(s)	Mike Primm, Manager of C&M

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Ready-for-Start Inspection

ComEd Technical Procedure
CM-CE-303002
Rev. 7

Revision 2	**Date: 8/15/2014**
Reason written	Miscellaneous grammar updates. Updated References and added OP-ED-142009.

Revision 3	**Date: 11/4/2014**
Writer	Tony O'Connor, Sr. Engineering Tech. Specialist
Reviewer(s)	Ken Wendt, Manager, Material Condition; Steve Scalcucci, Engineer, Asset Performance; Terry Whalen, Operations Coordinator, Testing Group; Tony Locatelli, Sr. Engineer, Relay & Protection; Dan Long, Intern, Relay & Protection Engineering; Mark Primm, Manager, Construction & Maintenance;
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Mark Primm – UFAM Corrective Maintenance
Reason written	Incorporated CM-CE-303002 Rev.2 into the new Management Model Template; aligned this process to AM-CE-9095 and CM-CE-P012; added terms/definitions, roles and responsibilities.

Revision 4	**Date: 11/4/2014**
Writer	N/A
Reviewer(s)	N/A
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	N/A
Reason written	Moved to new template; no content revisions included.

Revision 5	**Date: 3/18/2016**
Writer	Daniel Gacek
Reviewer(s)	Tony O'Connor; Jim McNulty
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Mike Meathe
Reason written	Added NERC CIP V5 standard language to the procedure

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Ready-for-Start Inspection

ComEd Technical Procedure
CM-CE-303002
Rev. 7

Revision 6	**Date: 12/15/2017**
Writer	Charles Stanford, Dist Fld Engineering
Reviewer(s)	Gregory Mayer, Mgr Dist Fld Eng; Philip Wroblewski, Dist Fld Eng
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Adam St Pierre, Mgr Regional Elec Operations
Reason written	Removed references to now defunct department Distribution Testing (CM-CE-303002-R0002 has been archived).

Revision 7	**Date: 3/27/2019**
Writer	Charles Stanford, Dist Fld Engineering
Reviewer(s)	RCI Tea Lead Dale Player
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Shane Cole, Mgr Regional Elec Operations
Reason written	Corrective Action from RCI Event. Added 2.3 The installation of high side taps of a cutout or switch is the final step prior to closing, energizing that device (e.g., VO 3-Phase cap bank, transformers, DA devices, regulators)

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Documenting Ready-to-Start Inspection

ComEd Training and Reference Material (T&RM)

CM-CE-303002-R0001
Rev. 2

Effective:	12/5/2019
Supersedes:	XX-XX-XXXX
Review Type:	3 Year
Core Function:	Corrective Maintenance

1. Insert Documentation

CM-CE-303002-R0001.pdf

2. Development history

Revision 0	**Date: 12/15/2009**
Writer	Kevin Kinnerk (Methods), Renee Jourdin (PAG)
Reviewer(s)	Kevin Kinnerk (Methods); Tim Jobes (CM); Eric Henderson (CM); Jeff Wagner (CM); Steve Bocherts (CM); John Riley (COC); Tom Hogue (COC); Mike Buelow (Safety); Chip Carter (TS).
UFAM Approver(s)	Dan Galovich (CM FAM Owner); Lori Cimaglia (TS FAM Owner)
Reason written	Place previous Section 8 language from CM-ED-9123 into a visual field procedure document

Revision 1	**Date: 12/7/2016**
Writer	Susan Gasper (Dist Ops)
Reviewer(s)	Ed Bengson (Methods); Mark Primm (Safety); Tim Jobes (Training); Eric Henderson (C&M); Chip Carter (T&S)
UFAM Approver(s)	Adam St Pierre (CM UFAM)
Reason written	Periodic review was performed; no content revisions made

Revision 2	**Date: 12/9/2019**
Writer	Susan Gasper (Dist Ops)
Reviewer(s)	Warren Handy (Methods); Jack Craighead (Safety); Tim Jobes (Elec Ops); Eric Henderson (C&M); Chip Carter (T&S)
UFAM Approver(s)	Eric Henderson (UFAM)

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Documenting Ready-to-Start Inspection

ComEd Training and Reference Material (T&RM)

CM-CE-303002-R0001
Rev. 2

Revision 2	**Date: 12/9/2019**
Reason written	Periodic review was performed; no content revisions made

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Field Equipment and Transformers <2000kVA, Substation Equipment, and Relays Inspection (Ready-for-Start)

ComEd Training and Reference Material (T&RM)
CM-CE-303002-R0003
Rev. 8

Effective:	3/17/2020
Supersedes:	n/a
Review Type:	3 Year
Core Function:	Corrective Maintenance

1. Insert Documentation

Equipment less than 2000kVA RTS.d

2. Development history

Revision 0	Date: 12/15/2009
Writer	Kevin Kinnerk (Methods), Renee Jourdin (PAG)
Reviewer(s)	Kevin Kinnerk (Methods); Tim Jobes (CM); Eric Henderson (CM); Jeff Wagner (CM); Steve Bocherts (CM); Paul Selzer (CM); John Riley (COC); Tom Hogue (COC); Mike Buelow (Safety); Chip Carter (TS), Bill Krueger (OP), Rich Urban (OP), Russ Dahl (OP), Dave Froning (OP)
UFAM Approver(s)	Dan Galovich (CM FAM Owner); Lori Cimaglia (TS FAM Owner)
Reason written	Place previous checklist CM-ED-9123-3 from CM-ED-9123 into a separate ComEd specific document.

Revision 1	Date: 9/16/2010
Writer	Keith Sunahara (Reliability Engineering)
Reviewer(s)	Kevin Kinnerk (Methods)
UFAM Approver(s)	Dan Galovich (CM FAM Owner); Lori Cimaglia (TS FAM Owner)
Reason written	Corrective action CA 3-A from AR# 00112771 ACE

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Field Equipment and Transformers <2000kVA, Substation Equipment, and Relays Inspection (Ready-for-Start)

ComEd Training and Reference Material (T&RM)
CM-CE-303002-R0003
Rev. 8

Revision 2	Date: 9/16/2011
Writer	Keith Sunahara (Reliability Engineering)
Reviewer(s)	Scott Yielding DSO; Steve Notto T&S;Kevin Torres T&S; Mark Primm C&M
UFAM Approver(s)	Dan Galovich (CM FAM Owner); Gus Ponce (T&S)
Reason written	Following the required cyclical review, inserted a place to identify the dispatcher name and a requirement to ensure that the station operator's instructions reflect the current configuration, revised the document to meet current document formatting standards and updating references to other controlled documents

Revision 3	Date: 7/29/2014
Writer	N/A
Reviewer(s)	N/A
UFAM Approver(s)	N/A
Reason written	Moved to new template; no content revisions included.

Revision 4	Date: 8/15/2014
Writer	Ben Demus, C&M
Reviewer(s)	Chris Gibbs (CM), Shane Cole (CM), Steven Jankovich (CM), Brian Lopresti Jr (WM), Tim Shales (COC), Bill Sullivan III (TRNG), Michael Meathe (OPS), James Williams (CM), Stephen Franker (SAFETY), Don Kelly (CM), Tim Johnson (CM), Nichole Owens (OPS), Frank Gonzalez (CM), Kevin Kinnerk (PAG), Ken Buck (SSC), Robert Pinto (CM)
UFAM Approver(s)	Mark Primm, Manager C&M
Reason written	To provide clarity and differentiate job responsibilities and hand-offs between the construction crews and operating crews. Also include reference to OP-ED-142009 for clarity around the proper way to take voltage readings and test for proper phase rotation before Return To Normal. Reference ACE #351981.

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Field Equipment and Transformers <2000kVA, Substation Equipment, and Relays Inspection (Ready-for-Start)

ComEd Training and Reference Material (T&RM)
CM-CE-303002-R0003
Rev. 8

Revision 5	**Date: 11/4/2014**
Writer	Tony O'Connor, Sr. Engineering Tech. Specialist, Relay & Protection
Reviewer(s)	Ken Wendt, Manager, Material Condition; Steve Scalcucci, Contractor, Asset Performance; Terry Whalen, Operations Coordinator, Testing Group; Tony Locatelli, Sr. Engineer, Relay & Protection;
UFAM Approver(s)	Mark Primm – UFAM Corrective Maintenance
Reason written	Incorporated CM-CE-303002 Rev.4 into the new Management Model Template; aligned this process to AM-CE-9095 and CM-CE-P012; added terms/definitions, roles and responsibilities, and applicable Preventive Maintenance requirement, and applicable Preventive Maintenance requirements.

Revision 6	**Date: 12/28/2015**
Writer	Steven Scalcucci, Contractor, Transmission and Substations Work Manangement
Reviewer(s)	Tony O'Connor, Sr. Engineering Tech. Specialist, Relay & Protection Kevin Swiat, Principal Engineer, Material Condition
UFAM Approver(s)	Michael Meathe – UFAM Corrective Maintenance
Reason written	Include verbage to support NERC CIP v5 activities.

Revision 7	**Date: 9/5/2017**
Writer	Frank "Chip" Carter, Principal Transmission Project Manager
Reviewer(s)	Baranek, Mark, ComEd Transmission Overhead Director, Brea, Daniel J, ComEd Outside T&S Director and T&S FAM, Buck, Kenneth D, ComEd South T&S Substation Manager, Edgren, David R, ComEd Level 4 Transformer Services Manager, Flores, Peter, ComEd North T&S Manager, Fluhler, William, ComEd Testing Group Director, Torres, Kevin, ComEd Testing Group Manager, Gannon, William J, ComEd T&S Engineering Director, Hornicak, Thomas ComEd, Chicago T&S Manager, Johnson, Bradley D, ComEd Relay & Protection Manager, Landeros, Marvin ComEd West T&S Manager, Martino, Vito, ComEd Chicago T&S Director, Weygandt, Timothy, ComEd Level 4 Transmission Overhead Director.
UFAM Approver(s)	Dan Brea – (TS FAM Owner)

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Field Equipment and Transformers <2000kVA, Substation Equipment, and Relays Inspection (Ready-for-Start)

ComEd Training and Reference Material (T&RM)
CM-CE-303002-R0003
Rev. 8

Revision 7	**Date: 9/5/2017**
Reason written	Corrective action 1A from ACE Report 01091518. The following wording was added to the start of the affected RTS Procedures: "For any items on this Ready To Start (RTS) Checklist that cannot be completed OR have conditions that are questionable, the Person In Charge (PIC) is required to contact the appropriate ComEd Subject Matter Expert (SME) to determine the condition that must be achieved prior to Livening. Any items that cannot be resolved prior to Livening must be approved by the appropriate SME. That discussion shall be documented in the Comments section at the end of the RTS Checklist. Those Comments shall contain the date discussed, resolution, RTS Lead name and the name and position of the ComEd SME contacted".

Revision 7	**Date: 4/24/2018**
Writer	N/A
Reviewer(s)	N/A
UFAM Approver(s)	N/A
Reason written	Administrative Update: Inserted document is Revision 7. Correct Revison number was not displayed throughout document due to a Header Section break. Updated all pages to reflect Revision 7. **NO changes to content or Effective Date**.

Revision 8	**Date: 3/17/2020**
Writer	Patrick Mintus, PdM Manager
Reviewer(s)	Mark Rossi, PdM Manager Jeff Ancel, PdM Manager Jared Cartee, Ops Coordinator Robert Griffis, Area Maintenance Engineer
UFAM Approver(s)	Eric Henderson, UFAM
Reason written	Included area operating for checklist and signoff, as well as operating inspection checklist from the retired DT ready for start CM-CE-303002-R0002.

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City of Chicago Equipment Ready for Start

ComEd Training and Reference Material (T&RM)

CM-CE-303002-R0004
Rev. 4

Effective:	10/20/2017
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Corrective Maintenance

1. Insert Documentation

CM-CE-303002-R000
4_City of Chicago Equ

2. Development history

Revision 0	**Date: 12/15/2009**
Writer	Kevin Kinnerk (Methods), Renee Jourdin (PAG)
Reviewer(s)	Kevin Kinnerk (Methods); Tim Jobes (CM); Eric Henderson (CM); Jeff Wagner (CM); Steve Bocherts (CM); Paul Selzer (CM); John Riley (COC); Tom Hogue (COC); Mike Buelow (Safety); Chip Carter (TS)
UFAM Approver(s)	Dan Galovich (CM FAM Owner); Lori Cimaglia (TS FAM Owner)
Reason written	Place previous checklist CM-ED-9123-4 from CM-ED-9123 into a separate ComEd specific document. No changes made from previous document except formatting.

Revision 1	**Date: 9/16/2011**
Writer	Kevin Kinnerk (Methods), Renee Jourdin (PAG)
Reviewer(s)	Mark Primm (C&M) Steve Notto (T&S) Joe Moser (DSO) Juan Rosales (T&S
UFAM Approver(s)	Dan Galovich (CM FAM Owner); Gus Ponce (TS FAM Owner)
Reason written	Following the scheduled, periodic review, one minor correction was made and the document was reformatted to meet current standards

Revision 2	**Date: 10/27/2014**
Writer	N/A
Reviewer(s)	N/A
UFAM Approver(s)	N/A
Reason written	Moved to new template; no content revisions included.

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City of Chicago Equipment Ready for Start

ComEd Training and Reference Material (T&RM)

CM-CE-303002-R0004
Rev. 4

Revision 3	**Date: 10/31/2014**
Writer	Kevin Kinnerk (Methods), Renee Jourdin (PAG)
Reviewer(s)	Mark Primm (C&M) Steve Notto (T&S) Joe Moser (DSO) Juan Rosales (T&S
UFAM Approver(s)	Mark Primm
Reason written	Periodic review and moved to new template; no content revisions included.

Revision 4	**Date: 10/12/2017**
Writer	Susan Gasper (Dist Ops)
Reviewer(s)	Mark Primm (C&M) Steve Notto (T&S) Joe Moser (DSO) Juan Rosales (T&S), Kevin Kinnerk (Methods), Renee Jourdin (PAG)
UFAM Approver(s)	Adam St Pierre CM UFAM
Reason written	Periodic review with minor content revisions.

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Substation Transformer Inspection (Ready-for-Start)

ComEd Training and Reference Material (T&RM)
CM-CE-303002-R0005
Rev. 9

Effective:	3/17/2020
Supersedes:	n/a
Review Type:	3 Year
Core Function:	Corrective Maintenance

1. Insert Documentation

CM-CE-303002-R0005 rev9.docx

2. Development history

Revision 0	**Date: 12/15/2009**
Writer	Kevin Kinnerk (Methods), Renee Jourdin (PAG)
Reviewer(s)	Kevin Kinnerk (Methods); Tim Jobes (CM); Eric Henderson (CM); Jeff Wagner (CM); Steve Bocherts (CM); Paul Selzer (CM); John Riley (COC); Tom Hogue (COC); Mike Buelow (Safety); Chip Carter (TS), Bill Krueger (OP), Rich Urban (OP), Russ Dahl (OP), Dave Froning (OP)
UFAM Approver(s)	Dan Galovich (CM FAM Owner); Lori Cimaglia (TS FAM Owner)
Reason written	Place previous checklist CM-ED-9123-3 from CM-ED-9123 into a separate ComEd specific document.

Revision 1	**Date: 9/16/2010**
Writer	Keith Sunahara (Reliability Engineering)
Reviewer(s)	Kevin Kinnerk (Methods)
UFAM Approver(s)	Dan Galovich (CM FAM Owner); Lori Cimaglia (TS FAM Owner)
Reason written	Corrective action CA 3-A from AR# 00112771 ACE

Revision 2	**Date: 9/16/2011**
Writer	Keith Sunahara (Reliability Engineering)
Reviewer(s)	Mark Primm (C&M) Kevin Kinnerk (SS) Joe Moser (DSO) Juan Rosales (T&S)
UFAM Approver(s)	Dan Galovich (CM FAM Owner); Gus Ponce (TS FAM Owner)

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Substation Transformer Inspection (Ready-for-Start)

ComEd Training and Reference Material (T&RM)
CM-CE-303002-R0005
Rev. 9

Revision 2	**Date: 9/16/2011**
Reason written	Following the scheduled, periodic, revised to include the acceptance of Operator's Instructions for any new or remodeled equipment of configuration and reformatted to meet current standards

Revision 3	**Date: 7/29/2014**
Writer	N/A
Reviewer(s)	N/A
UFAM Approver(s)	N/A
Reason written	Moved to new template; no content revisions included.

Revision 4	**Date 11/04/2014**
Writer	Steven Scalcucci, Engineer
Review(s)	David Wurzburger, Sr. Engineer, Testing Group Tony O'Connor Sr. Engineering Tech Specialist, Relay and Protection Engineering Ken Wendt, Manager, Material Condition
FAM Approver(s)	Mark Primm – UFAM Corrective Maintenance
Reason Revised	Removal of Power Testing column, removal of unnecessary rows in table that had information previously deleted. Align *Ready-for-Start* with AM-CE-9095 and CM-CE-P012.

Revision 5	**Date 12/28/2015**
Writer	Steven Scalcucci, Contractor, T&S Work Management
Review(s)	Tony O'Connor Sr. Engineering Tech Specialist, Relay and Protection Engineering Kevin Swiat – Principal Engineer, Material Condition
FAM Approver(s)	Michael Meathe – UFAM Corrective Maintenance
Reason Revised	Include verbage to support NERC CIP v5 activities.

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Substation Transformer Inspection (Ready-for-Start)

ComEd Training and Reference Material (T&RM)
CM-CE-303002-R0005
Rev. 9

Revision 6	**Date 09/29/2017**
Writer	William Lones, Operations Coordinator, Substation Construction
Review(s)	Tony O'Connor Sr. Engineering Tech Specialist, Relay and Protection Engineering Kevin Swiat – Principal Engineer, Material Condition
FAM Approver(s)	Michael Meathe – UFAM Corrective Maintenance
Reason Revised	Changed verbiage instructions from Passport to correctly reference new Asset Suite 8 system in the following: * NERC CIP v5 activity instructions * Steps 57 and 58 Added Step 7 to checklist requiring verification Transformer Secondary cables installed are appropriate KV size and ratings per specifications of Unit Total Steps of checklist updated from 60 to 61 Actions are result of Corrective Action associated with ACE 1081755- Station 18 Unit livened with incorrect secondary cables installed

Revision 7	**Date 2/6/2019**
Writer	Jason Baumbach, Operations Coordinator, TS Services
Review(s)	Kevins Torres – Operations Coordinator – Testing Group;
FAM Approver(s)	Adam St. Pierre – UFAM Corrective Maintenance
Reason Revised	Add language to Ready to Start Line #14 ; Anytime Transformer is Vacuum Filled SPR/PRD must be tested. Add Column – to TS Services Sign off.

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Substation Transformer Inspection (Ready-for-Start)

ComEd Training and Reference Material (T&RM)
CM-CE-303002-R0005
Rev. 9

Revision 8	**Date 8/16/2019**
Writer	Jason Baumbach, Operations Coordinator, TS Services
Review(s)	Jeff Ancel – Operations Coordinator SSC – South Region Sam Ferguson – FLS – TS Services
FAM Approver(s)	Adam St. Pierre – UFAM Corrective Maintenance
Reason Revised	Multiple Line Item Revisions – Line 21, 40, 35, 43, 44, 46

Revision 9	**Date: 3/17/2020**
Writer	Patrick Mintus, PdM Manager
Reviewer(s)	Mark Rossi, PdM Manager Jeff Ancel, PdM Manager Jared Cartee, Ops Coordinator Robert Griffis, Area Maintenance Engineer
UFAM Approver(s)	Eric Henderson, UFAM
Reason written	Included area operating for checklist and signoff.

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Network High-rise Equipment and Transformers Inspection (Ready-for-Start)

ComEd Training and Reference Material (T&RM)
CM-CE-303002-R0006
Rev. 6

Effective:	3/17/2020
Supersedes:	n/a
Review Type:	3 Year
Core Function:	Corrective Maintenance

1. Insert Documentation

Network High Rise
RTS, CM-CE-303002-

2. Development history

Revision 0	Date 12/15/2009
Writer	Chip Carter, (TS) Kevin Kinnerk (Methods), Renee Jourdin (PAG)
Review(s)	All T&S - Chip Carter Joseph Binetti, Daniel Brea, Thomas Finchum, Thomas Hornicak, Neldo Izquierdo, Richard Jump, Ty Lutes, William McBride, Patrick Mintus, Steven Notto, Miguel Ortega, Ronald Regner, Carl Schuetz, William Siwiec, Mark Slezak, Kenneth Wendt.
FAM Approver(s)	Dan Galovich (CM FAM Owner); Lori Cimaglia (TS FAM Owner)
Reason Written	Create new Network Hi-Rise Ready to Start Checklist
Revision 1	**Date 09/16/2010**
Writer	Keith Sunahara (Reliability Engineering)
Review(s)	Kevin Kinnerk (Methods)
FAM Approver(s)	Dan Galovich (CM FAM Owner); Lori Cimaglia (TS FAM Owner)
Reason Revised	Corrective action CA 3-A from AR# 00112771 ACE

Revision 2	Date 1/08/2015
Writer	Steven Scalcucci, Engineer
Review(s)	Ken Wendt, Manager, Material Condition. Tony O'Connor, Sr. Engineering Tech. Specialist, Relay & Protection
FAM Approver(s)	Micahel Meathe – UFAM Corrective Maintenance
Reason Revised	Align *Ready-for-Start* with the Preventive Maintenance requiremetns of AM-CE-9095: NERC PM Lifecycle Management.

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Network High-rise Equipment and Transformers Inspection (Ready-for-Start)

ComEd Training and Reference Material (T&RM)
CM-CE-303002-R0006
Rev. 6

Revision 3	Date 3/30/2016
Writer	Glenn Gilliam T&S Manager Network High-rise
Review(s)	Glenn Gilliam, Joseph A Glowacki, Jeremy Smith, Gus Ponce
FAM Approver(s)	Michael Meathe – UFAM Corrective Maintenance
Reason Revised	Align *Ready-for-Start* Requiremetns – Part of corrective action.

Revision 4	Date 8/30/2016
Writer	Glenn Gilliam T&S Manager Network High-rise
Review(s)	Glenn Gilliam, Joseph A Glowacki, Jeremy Smith, Vito Martino
FAM Approver(s)	Michael Meathe – UFAM Corrective Maintenance
Reason Revised	Align *Ready-for-Start* Requiremetns – Part of corrective action.

Revision 5	Date 9/05/2017
Writer	Frank “Chip” Carter, Principal Transmission Project Manager
Review(s)	Baranek, Mark, ComEd Transmission Overhead Director, Brea, Daniel J, ComEd Outside T&S Director and T&S FAM, Buck, Kenneth D, ComEd South T&S Substation Manager, Edgren, David R, ComEd Level 4 Transformer Services Manager, Flores, Peter, ComEd North T&S Manager, Fluhler, William, ComEd Testing Group Director, Torres, Kevin, ComEd Testing Group Manager, Gannon, William J, ComEd T&S Engineering Director, Hornicak, Thomas ComEd, Chicago T&S Manager, Johnson, Bradley D, ComEd Relay & Protection Manager, Landeros, Marvin ComEd West T&S Manager, Martino, Vito, ComEd Chicago T&S Director, Weygandt, Timothy, ComEd Level 4 Transmission Overhead Director.
FAM Approver(s)	Dan Brea, (TS FAM Owner)
Reason Revised	Corrective action 1A from ACE Report 01091518. The following wording was added to the start of the affected RTS Procedures: “For any items on this Ready To Start (RTS) Checklist that cannot be completed OR have conditions that are questionable, the Person In Charge (PIC) is required to contact the appropriate ComEd Subject Matter Expert (SME) to determine the condition that must be achieved prior to Livening. Any items that cannot be resolved prior to Livening must be approved by the appropriate SME. That discussion shall be documented in the Comments section at the end of the RTS Checklist. Those Comments shall contain the date discussed, resolution, RTS Lead name and the name and position of the ComEd SME contacted”.

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Network High-rise Equipment and Transformers Inspection (Ready-for-Start)

ComEd Training and Reference Material (T&RM)
CM-CE-303002-R0006
Rev. 6

Revision 6	**Date: 3/17/2020**
Writer	Patrick Mintus, PdM Manager
Reviewer(s)	Mark Rossi, PdM Manager Jeff Ancel, PdM Manager Jared Cartee, Ops Coordinator Robert Griffis, Area Maintenance Engineer
UFAM Approver(s)	Eric Henderson, UFAM
Reason written	Included area operating for checklist and signoff.

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New Battery & Battery Charger Installations (Ready-for-Start)

ComEd Training and Reference Material (T&RM)
CM-CE-303002-R0007
Rev. 1

Effective:	10/27/2017
Supersedes:	n/a
Review Type:	3 Year
Core Function:	Corrective Maintenance

1. Insert Documentation

Acrobat Document.pdf

2. Development history

Revision 0	**Date: 12/11/2014**
Writer	Tony O'Connor, Relay & Protection
Reviewer(s)	Hugo Castaneda, Equipment Standards; Ron Diotallevi, Equiment Standards; Mike Kregg, Predictive Maintenance; Steve Scalcucci, Material Condition; Ken Wendt, Material Condition
UFAM Approver(s)	Mike Meathe – UFAM Corrective Maintenance
Reason written	Formalize the Ready-for-Start process for Batteries and Battery Chargers to ensure compliance with the ComEd PM Program.

Revision 1	**Date: 10/20/2017**
Writer	Susan Gasper (Dist Ops)
Reviewer(s)	Tony O'Connor, Relay & Protection; Ron Diotallevi, Equiment Standards; Mike Kregg, Predictive Maintenance; Ken Wendt, Material Condition; Philip Derr, Equipment Standards
UFAM Approver(s)	Adam St Pierre CM UFAM
Reason written	Periodic review with no content revisions

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Substation Circuit Breaker Inspection (Ready-for-Start)

ComEd Training and Reference Material (T&RM)
CM-CE-303002-R0008
Rev. 3

Effective:	3/17/2020
Supersedes:	n/a
Review Type:	3 Year
Core Function:	Corrective Maintenance

1. Insert Documentation

Substation Breaker
RTS CM-CE-303002-F

2. Development history

Revision 0	**Date: 1/8/2015**
Writer	Tony O'Connor, Relay & Protection
Reviewer(s)	Steve Notto, Mike Hanson, Thomas Hornicak, William Lones, Robert Heisner, Thomas Finchum, Francisco Figueroa, Peter Flores, Russ Dahl, Steve Scalcucci, Ken Wendt
UFAM Approver(s)	Michael Meathe – UFAM Corrective Maintenance
Reason written	New Procedure

Revision 1	**Date: 12/28/2015**
Writer	Steven Scalcucci, Contractor, T&S Work Management
Reviewer(s)	Tony O'Connor, Relay & Protection Devin Swiat, Principal Engineer, Material Condition;
UFAM Approver(s)	Michael Meathe – UFAM Corrective Maintenance
Reason written	Include verbage to support NERC CIP v5 activities.

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Substation Circuit Breaker Inspection (Ready-for-Start)

ComEd Training and Reference Material (T&RM)
CM-CE-303002-R0008
Rev. 3

Revision 2	**Date: 9/5/2017**
Writer	Frank "Chip" Carter, Principal Transmission Project Manager
Reviewer(s)	Baranek, Mark, ComEd Transmission Overhead Director, Brea, Daniel J, ComEd Outside T&S Director and T&S FAM, Buck, Kenneth D, ComEd South T&S Substation Manager, Edgren, David R, ComEd Level 4 Transformer Services Manager, Flores, Peter, ComEd North T&S Manager, Fluhler, William, ComEd Testing Group Director, Torres, Kevin, ComEd Testing Group Manager, Gannon, William J, ComEd T&S Engineering Director, Hornicak, Thomas ComEd, Chicago T&S Manager, Johnson, Bradley D, ComEd Relay & Protection Manager, Landeros, Marvin ComEd West T&S Manager, Martino, Vito, ComEd Chicago T&S Director, Weygandt, Timothy, ComEd Level 4 Transmission Overhead Director.
UFAM Approver(s)	Dan Brea, (TS FAM Owner)
Reason written	Corrective action 1A from ACE Report 01091518. The following wording was added to the start of the affected RTS Procedures: "For any items on this Ready To Start (RTS) Checklist that cannot be completed OR have conditions that are questionable, the Person In Charge (PIC) is required to contact the appropriate ComEd Subject Matter Expert (SME) to determine the condition that must be achieved prior to Livening. Any items that cannot be resolved prior to Livening must be approved by the appropriate SME. That discussion shall be documented in the Comments section at the end of the RTS Checklist. Those Comments shall contain the date discussed, resolution, RTS Lead name and the name and position of the ComEd SME contacted".

Revision 3	**Date: 3/17/2020**
Writer	Patrick Mintus, PdM Manager
Reviewer(s)	Mark Rossi, PdM Manager Jeff Ancel, PdM Manager Jared Cartee, Ops Coordinator Robert Griffis, Area Maintenance Engineer
UFAM Approver(s)	Eric Henderson, UFAM
Reason written	Included area operating for checklist and signoff.

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Routine Substation Inspection Procedure

ComEd Technical Procedure
CM-CE-402001

Rev. 1

Effective:	7/23/2020
Supersedes:	CM-ED-402001
Level:	2
Review Type:	3 Year
Core Function:	Preventive Maintenance

Table of Contents

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1. Purpose

1.1. To purpose of this procedure is to be used in conjunction with the Monthly Substation Inspection Checklist document CM-CE-402001-R0001**.**

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Routine Substation Inspection Procedure

ComEd Technical Procedure
CM-CE-402001

Rev. 1

1.2. It is intended to establish a standard to follow and ensure that all aspects of a station inspection be checked and verified to be in proper working condition. If equipment is found defective and cannot be repaired during the inspection a work ticket must be created by the inspectior. The work ticket must specifically state what is defective, the location of the defect on the piece of equipment, and if it requires a repair or replacement.

It is the responsibility of the inspector to clearly communicate the findings and ensure measures are in place to repair/replace defective equipment. [ACE 01779772]

1.3. Section 6 of this procedure has been divided into the following subsections:

Subsection	Title	Page
6.1	Buildings & Interiors	4
6.2	Batteries/Chargers	9
6.3	Switchyard/Outdoors – Security/Safety	13
6.4	Miscellaneous	21
6.5	Environmental Issues	22
6.6	Sabotage Recognition and Reporting	23

2. Precautions and limitations

2.1. Precautions

2.1.1 Individual(s) placing equipment in-service at an Exelon facility impacted by NERC CIP standards shall adhere to Exelon's NERC CIP Cyber Security Policy (RC-AC-POL3-001).

2.1.2 This document contains specific content resulting from an ACE Investigation, RCI Report, Regulatory Requirement, or authorized document. This document shall identify such content by bracketing [Specific Source and Reference Number] to identify the specific referenced restriction. Any item identified as ACE Investigation, RCI Report, or Regulatory Requirement shall not be deleted without authorization from the Core Function UFAM(s)."

2.2. Limitations

NOTE: This procedure is no all-inclusive.

2.2.1 **RECORD** steps found to be unclear, missing, inaccurate or incomplete in Attachment CM-ED-402001-1, Lessons Learned.

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3. Safety Measures and Environmental Concerns

3.1. Safety Measures

3.1.1 Adhere to all safety rules as identified in the ComEd Safety Rulebook.

3.2. Environmental Concerns

3.2.1 Use caution around PCB equipment and any leaking equipment. If equipment is leaking, contain the leak (if safe to do so) and report on a work request and to OCC and/or Environmental Coordinator.

3.2.2 Inspection of all oil filled equipment is required by 40CFR112, which is identified in the Substation Spill Prevention Control and Countermeasures Plan.

4. Material and Special Equipment

4.1. Material

4.1.1 N/A

4.2. Special Equipment

4.2.1 N/A

5. Prerequisites

5.1. All ComEd, contractor or vendor personnel performing work within the ComEd service area **MUST BE** trained and qualified in all equipment and procedures to be used.

5.1.1 Personnel performing inspections at Exelon facility impacted by NERC CIP standards shall be trained to inspect facilities and report security related concerns as required by Exelon's NERC CIP Cyber Security Policy (RC-AC-POL3-001).

5.2. **MAKE SURE** that all proper outage tags are in place per OP-EU-050003, Lockout Tag Out Procedure.

5.3. Where applicable, **ENSURE** that any changes in equipment status are recorded on the Workers Alteration Log Sheet, OP-EU-050003-R0001.

6. Procedure

6.1. Buildings and Interiors

NOTE: Refer to OP-EU-P019, Security of Substations for additional information.

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6.1.1 Doors

6.1.1.1 VERIFY that the door is in good working condition

6.1.1.2 ENSURE the frame is in good condition

6.1.1.3 CONFIRM the handle is operable

6.1.1.4 VERIFY the lock works smoothly

6.1.1.5 VERIFY the door re-closures are connected and in good working condition.

6.1.1.6 VERIFY that alarm trigger on outer doors of station are set and functioning properly:

6.1.1.6.1 **VERIFY** that door actuator is not tied back or disabled in any way.

6.1.1.6.2 **EXAMINE** door recloser to ensure there are no oil leaks. If leaking, create a Work Request to replace.

6.1.1.6.3 **OPEN** and **CLOSE** the door and verify that the arm of the actuator is functioning properly.

6.1.1.6.4 **OPEN** and **CLOSE** the door and call the Designated Authority.

6.1.1.6.5 IF the inspection occurs during the hours from 0600 to 1800 hrs., the operator must open the door and keep it open. Then call the Designated Authority to verify the status via the Off Normal Summary.

6.1.1.6.6 After the door is closed, the Designated Authority must verify that the alarm was cleared from the Off Normal Summary.

6.1.1.6.7 Mark findings on the Monthly Substation Inspection Checklist.

6.1.1.7 VERIFY that signage on doors is as required.

6.1.2 Windows

6.1.2.1 VERIFY that no windows are broken.

6.1.2.2 VERIFY window frames are in good condition.

6.1.2.3 VERIFY windows are in good operating condition.

6.1.2.4 VERIFY windows can be securely closed.

6.1.3 Roof

6.1.3.1 VERIFY that the roof is not leaking (signs of wetness in the ceiling and/or floor, and/or equipment, active leak inside the bulding). [ACE: 01779772]

6.1.3.2 VERIFY the drain pipes from roof are not leaking.

6.1.3.3 IF any deficiencies are found, [ACE: 01779772]

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6.1.3.3.1 **CREATE** a work tickets as required

6.1.3.3.2 **REPORT** condition to supervisor

6.1.4 Station Lighting

6.1.4.1 **VERIFY** that station lighting panels are clearly marked.

6.1.4.2 **VERIFY** that panel has all electrical connections covered.

6.1.4.3 **VERIFY** that all breakers/fuses are clearly marked as to what they operate.

6.1.4.4 **VERIFY** that switches for station lighting are painted white.

6.1.4.5 **VERIFY** the switches are painted red for circuits that are to be left on at all times.

6.1.4.6 **VERIFY** that emergency lighting is in working order.

6.1.5 Exit Signs

6.1.5.1 **VERIFY** that there are exit signs by all outer doors.

6.1.5.2 **VERIFY** that all are lit.

6.1.6 Fire Suppression System

6.1.6.1 **VERIFY** that the system is in working order.

6.1.6.2 **VERIFY** Cardox signage/labeling in place; **OPERATOR SHALL** perform an audit of all CARDOX labeling and signage at the substations and will repair/replace those in need of maintenance and generate work request for all other deficiencies that cannot be immediately repaired/replaced.

6.1.6.3 **VERIFY** that tags are in place and signed off.

6.1.6.4 **VERIFY** that fire extinguishers are mounted on brackets.

6.1.6.5 **VERIFY** that CO2/Cardox system charged.

6.1.6.6 **RECORD** minimum CO2 tank level.

6.1.6.7 **RECORD** actual CO2 tank level.

6.1.6.7.1 **NOTIFY** TSO/OCC if actual CO2 tank level is below the designated minimum CO2 tank level.

6.1.7 Fire Detection System

6.1.7.1 **VERIFY** that ADT panel is clear of alarms

6.1.7.2 **VERIFY** that CO2/Cardox system clear of alarms

6.1.7.3 **VERIFY** that fire detection system is in working order

6.1.7.4 **VERIFY** that fire detection system is connected to monitoring system

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6.1.8 Fire Stops in Place

6.1.8.1 VERIFY that ceiling is sealed between floors

6.1.8.2 VERIFY that inside fire doors in station are closed

6.1.8.3 VERIFY that floor manholes closed

6.1.9 Housekeeping/Garbage

6.1.9.1 VERIFY that station desk clean of all unnecessary papers/supplies

6.1.9.2 VERIFY that no food left out

6.1.9.3 VERIFY that trash properly disposed of, trash can lids covered

6.1.9.4 VERIFY that station checked for rodent/animal infestation

6.1.9.5 VERIFY that aisles clear of equipment

6.1.9.6 VERIFY that spare breakers not left in operating aisle

6.1.9.7 VERIFY that spare breakers wiped down and covered

6.1.9.8 VERIFY that floors clean and swept (no dust build up)

6.1.10 Bathroom

6.1.10.1 **VERIFY** that bathroom is clean

6.1.10.2 **VERIFY** that bathroom is properly supplied

6.1.10.3 **VERIFY** that hot/cold water system working

6.1.11 Switching Tools

6.1.11.1 **VERIFY** that all are stored neatly and not left lying on a breaker

6.1.11.2 **VERIFY** hot sticks are all in serviceable condition

6.1.11.3 **VERIFY** all hot sticks are clean

6.1.11.4 **VERIFY** all hot sticks are waxed

6.1.11.5 **VERIFY** proper yearly tag is filled out and in place

6.1.11.6 **VERIFY** that control cords are stored properly and in place

6.1.11.7 **VERIFY** that ground leads are hung/stored in designated area

6.1.11.8 **VERIFY** that excess tools are stored in cabinet

6.1.12 Heating/Cooling System

6.1.12.1 **VERIFY** that station heaters in working order

6.1.12.2 **VERIFY** that station fans in working order

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6.1.12.3 **VERIFY** that station vents in working order

6.1.13 Cable Room/Basement Access

6.1.13.1 **VERIFY** that access covers are clearly marked

6.1.13.2 **VERIFY** that area is clear of equipment

6.1.13.3 **VERIFY** the monitor/blower requirements

6.1.13.4 **VERIFY** that basement is clean and dry

6.1.14 Drains/Sumps/Cable Troughs

6.1.14.1 **VERIFY** that drains are clean of debris

6.1.14.2 **VERIFY** that drain covers are in place

6.1.14.3 **VERIFY** that sump pumps are operational

6.1.14.4 **VERIFY** that cable troughs are debris free

6.1.15 Phones/Clocks/Furniture

6.1.15.1 **VERIFY** that station phone (if supplied) is in working order

6.1.15.2 **VERIFY** that station clock (if supplied) is set for correct time

6.1.15.3 **VERIFY** that station furniture (if supplied) is in good working condition

6.1.15.4 **VERIFY** that desk, tables cabinets, chairs, trash cans, are in good working order

6.1.16 Supplies

6.1.16.1 **VERIFY** that desk supplies include:

6.1.16.1.1 Station log book

6.1.16.1.2 Extra LOTO tags

6.1.16.1.3 Station documentation

6.1.16.1.4 One line diagram

6.1.16.1.5 Extra indicating bulbs for relays

6.1.16.2 **VERIFY** that materials to clean station are in sufficient supply:

6.1.16.2.1 Broom

6.1.16.2.2 Dustpan

6.1.16.2.3 Rags

6.1.16.2.4 Light bulbs

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6.1.16.2.5 Environmental spill kits and/or environmental containment materials

6.1.16.2.6 Etc.

6.1.16.3 **VERIFY** that bathroom (if station has one) is sufficiently supplied with:

6.1.16.3.1 Soap

6.1.16.3.2 Towels

6.1.16.3.3 Toilet paper

6.1.16.3.4 Etc.

6.1.17 Spare Fuses and Fuse Information

6.1.17.1 **VERIFY** that station aux power fuses are stored in supply cabinet

6.1.18 Oil Pump House Annunciator Panel, Oil Levels and Metering

6.1.18.1 **VERIFY** that annunciator panel is clear of targets

6.1.18.2 **VERIFY** metering to be normal

6.1.18.3 IF target is found:

6.1.18.3.1 **RECORD** in station log book

6.1.18.3.2 **NOTIFY** OCC

6.1.18.3.3 **REPAIR** OR **REPLACE** if possible

6.1.18.3.4 **MAKE OUT** a work tickets as required

6.1.18.3.5 **REPORT** condition to supervisor

6.1.18.4 **VERIFY** that oil level is normal

6.1.18.5 IF oil level is found to be abnormal:

6.1.18.5.1 **RECORD** in station log book

6.1.18.5.2 **REPAIR** OR **REPLACE** if possible

6.1.18.5.3 **MAKE OUT** a work ticket as required

6.1.18.5.4 **NOTIFY** OCC (report oil leaks as required in EN-EU-P012, Spill/Release Contingency Program and EN-CE-2004, Oil Spill Response and Contingency)

6.1.18.5.5 **REPORT** condition to supervisor

6.2. Batteries/Chargers

6.2.1 Pilot Cell

6.2.1.1 **RECORD** temperature

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6.2.1.2 RECORD specific gravity

6.2.1.3 RECORD liquid level

6.2.1.4 RECORD terminal voltage for entire battery

6.2.1.5 VERIFY the battery for positive or negative grounds

6.2.1.6 RECORD findings

6.2.1.7 VERIFY that battery on float charge

6.2.1.8 VERIFY proper voltage setting

6.2.1.9 VERIFY that electrolyte levels for all cells to be within limits

6.2.1.10 VERIFY that signage around batter area is visible and proper for:

6.2.1.10.1 No smoking

6.2.1.10.2 Eye wash station

6.2.1.11 VERIFY that battery room has proper ventilation

6.2.1.12 VERIFY that the battery cells are in good condition and are not leaking.

6.2.1.13 VERIFY that terminals on battery are:

6.2.1.13.1 Greased

6.2.1.13.2 Without corrosion

6.2.1.13.3 All connections made up

6.2.1.14 VERIFY that the battery charger is in working order

6.2.1.14.1 VERIFY that charger is putting out proper voltage

6.2.1.14.2 VERFY that charger is at proper amperage

6.2.2 Relaying, Controls Panels and Metering

6.2.2.1 VERIFY that the annunciator panel is clear of targets

6.2.2.2 TEST annunciator panel for burnt out bulbs

6.2.2.3 IF bulb is burnt out, **REPLACE** it

6.2.2.4 VERIFY that the SCADA switch is in the proper position (local/remote)

6.2.2.5 CHECK relays for targets

6.2.2.6 IF target is found

6.2.2.6.1 RECORD in station log book

6.2.2.6.2 NOTIFY OCC

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6.2.2.6.3 **REPAIR** OR **REPLACE** if possible

6.2.2.6.4 **MAKE OUT** a work ticket as required

6.2.2.6.5 **REPORT** condition to supervisor

6.2.2.7 **VERIFY** that relay covers,

6.2.2.7.1 Are properly mounted

6.2.2.7.2 Have glass in windows

6.2.2.7.3 Are clean, without dust build up

6.2.3 Indicating Lamps, Voltmeters and Ammeters

6.2.3.1 **VERIFY** all are properly indicating

6.2.3.2 IF bulb is burnt out, **REPLACE** it

6.2.3.3 **TEST** switches/alarm cut-outs (proper position/labeled)

6.2.4 Guard level Readings/DFR

6.2.4.1 **RECORD** guard level readings

6.2.4.1.1 Verify proper guard level

6.2.4.1.2 Indicating lamps are lit

6.2.4.1.3 Clear of targets

6.2.4.2 **VERIFY** that DFR has sufficient paper supply

6.2.5 Aux Power ATO

6.2.5.1 **PERFORM** functional test

6.2.5.2 **VERIFY** auxiliary power for normal position

6.2.5.2.1 **CHECK** auxiliary power sources for proper feed

6.2.5.2.2 **FOLLOW** station write up

6.2.5.2.3 **EXERCISE** auxiliary power throw over

6.2.5.2.4 **RETURN** auxiliary power to normal position

6.2.6 Nomenclature and Labeling

6.2.6.1 **VERIFY** (entire station) has proper and complete labeling, including:

6.2.6.1.1 Relays

6.2.6.1.2 Breakers

6.2.6.1.3 Equipment

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6.2.6.1.4 Etc.

6.2.7 Circuit Breakers and Reclosers

6.2.7.1 Counters and Mechanical Position Indicators

6.2.7.1.1 **VERIFY** the breaker number

6.2.7.1.2 **RECORD** the counter reading in station log book

6.2.7.1.3 **VERIFY** the circuit breaker control handle mechanical indicator (flag) matches the circuit breaker position and the indicating lights status. **NOTIFY** the Designated Authority if a mismatch is found.

6.2.7.1.4 **VERIFY** that manual breaker position indicator is displaying the current operating condition of the breaker.

6.2.7.1.5 IF applicable, IF the breaker is in service, **VERIFY** that the breaker is charged for next operation.

6.2.8 Circuit Breaker and Bushing Oil Levels

6.2.8.1 **VERIFY** that oil circuit breakers are at proper liquid level AND that no leaks or spills are present.

6.2.8.2 **VERIFY** that bushings are at proper liquid level.

6.2.8.3 **DRAIN** water from air compressor on circuit breakers if so equipped.

6.2.9 Alarm Cutouts and AC/DC Circuit Breakers/Fuses/Knife Blades/Fuses (labeled)

6.2.9.1 **VERIFY** that all are in correct position

6.2.9.2 **VERIFY** that all are properly labeled

6.2.10 Ground Test Device, Rosettes and Spare Circuit Breakers

6.2.10.1 **VERIFY** that all are properly stored and ready for service

6.2.10.2 **VERIFY** ground test device for spare rosettes for different amperage

6.2.10.3 **VERIFY** that circuit breakers are in their assigned cubicles

6.2.10.4 **VERIFY** that breaker recloser selector switch (79) is in proper operating position.

6.2.10.5 **CHECK** AND **RECORD** recloser Ni-Cad battery reading

6.2.11 Three Phase Station Reclosers (only)

6.2.11.1 Battery Check

NOTE: Shorting bar connects battery charger to battery terminal

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NOTE: Inside the control cabinet are terminals marked BATTERY (+) and BATTERY (-) on the front of the UPS (upper unit in control)

6.2.11.2 **SET** multi-meter to DC

6.2.11.3 **CONNECT** the **RED** lead to the positive (+) battery test terminal

6.2.11.4 **CONNECT** the **BLACK** lead to the negative (-) battery test terminal

6.2.11.5 **CHECK** the battery voltage

NOTE: Acceptable battery voltage is 24 to 29 volts DC

NOTE: Perform load test on battery and ensure voltage drop does not exceed 3 volts DC

6.2.11.6 If battery voltage does not meet either of the criteria above, then check for proper AC voltage (120 VAC) to both sides of the charger board fuse

NOTE: If fuse is blown replace it

NOTE: If AC voltage is not present contact OCC immediately

6.2.11.7 **REPLACE** battery if voltage deviates form acceptable battery voltage

NOTE: Check the battery voltage on newly installed batteries. If the battery voltage is below 24 volts **REPLACE**, the battery

6.2.11.8 **RECORD** battery voltage after test in Cascade during PM's

6.2.12 Power Transformers/Aux Transformers

6.2.12.1 **VERIFY** that the sudden pressure selector switch (63) is in proper operating position

6.2.12.2 **VERIFY** that the sudden pressure relief indicator is in proper operating position

6.2.12.3 **VERIFY** that fans are clear of debris

6.2.12.4 **VERIFY** unit has equalized or positive Nitrogen pressure if applicable. If unacceptable, add Nitrogen to proper pressure per standard work practices and have Work Request created.

6.2.13 Inspect Dehydrating Breather (Conservator Tank/LTC)

6.2.13.1 **CHECK** the desiccant color

NOTE: Normal color is blue (or orange) depending on type used.

6.2.13.2 IF desiccant is changing from blue to pink/white (or orange to white), **REPLACE DESICCANT** and have work request created.

6.2.14 Bushing and Lighting Arrestor Porcelain

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6.2.14.1 **CHECK** for:

6.2.14.1.1 Dirt or contamination build up

6.2.14.1.2 Cracks

6.2.14.1.3 Broken skirts

6.2.14.1.4 Other damage

6.2.15 LTC Tap Position

6.2.15.1 **RECORD** LTC position along with HI/LOW position

6.2.15.2 **RECORD** LTC operations

6.2.15.3 IF LTC is at the full OR full raise position **NOTIFY** the OCC

6.2.16 Instrument Transformers (PT/CT's) Oil Levels

6.2.16.1 **VERIFY** that all instrument transformers are operating properly

6.2.16.2 FOR all instrument transformers, **VERIFY** that,

6.2.16.2.1 The PT's & CT's are not leaking

6.2.16.2.2 The liquid level is within proper range

6.2.17 Aux Power Transformer Oil Levels and Fuses

6.2.17.1 **VERIFY** that all aux power transformers are,

6.2.17.1.1 Operating properly

6.2.17.1.2 Not leaking

6.2.17.2 **VERIFY** that liquid level is within proper range

6.2.17.3 **VERIFY** that aux power fuses are,

6.2.17.3.1 The proper size

6.2.17.3.2 Functioning properly

6.3. Switchyard/Outdoors – Security Safety

NOTE: for additional information refer to OP-EU-P019 Substation Security procedure

6.3.1 Gates

6.3.1.1 **VERIFY** the gate is in good working condition

6.3.1.2 **VERIFY** the gates has a PCB label on the outside of the gate, if the equipment within is PCB, or PCB contaminated

6.3.1.3 **REPORT** any recent signs of forced entry or damage to the OCC

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6.3.1.4 VERIFY that the gate,

6.3.1.4.1 Has the proper lock

6.3.1.4.2 The lock is latched before, during and after entry/exit of property

6.3.1.5 REPORT any lock on gate that does not belong to ComEd to the OCC and supervisor.

CAUTION

DO NOT LOCK ComEd lock to another lock UNLESS authorized to do so.

6.3.2 Fences

6.3.2.1 CHECK for any sign of damage or forced entry

6.3.2.2 REPORT any recent signs of forced entry or damage to the OCC and Supervisor.

6.3.2.3 CHECK fences for proper grounding

6.3.3 Signage

6.3.3.1 VERIFY that gate and fences for proper signage posting per Engineering Practice, EP-4023-E, Signage in Substations.

6.3.4 Station Yard Lighting and AC/Lighting Panels Labeling

6.3.4.1 VERIFY that station yard lighting is in working condition

6.3.4.2 REPLACE burnt out bulbs

6.3.4.3 VERIFY that timers/night light sensors are operating properly

6.3.4.4 VERIFY that AC/Lighting panels are properly labeled

6.3.4.5 IF any deficiencies are found,

6.3.4.5.1 REPAIR OR **REPLACE** if possible

6.3.4.5.2 CREATE a work ticket as required

6.3.4.5.3 REPORT condition to supervisor

6.3.5 Animal Intrusion, Wildlife Protection, Vegetation and Debris

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NOTE: Refer to CM-ED-401002, Substation Wildlife Mitigation for further information.

6.3.5.1 CHECK for any signs of wildlife intrusion

6.3.5.2 CHECK to see if any nests have been built

6.3.5.3 VERIFY that wildlife protection is in place and in good working condition

6.3.5.4 CHECK wildlife fence for,

6.3.5.4.1 Gaps at base, seams, or gate

6.3.5.4.2 Signs of leaning

6.3.5.4.3 Secureness of latch

6.3.5.4.4 Line guards on all aerial conductors

6.3.5.4.5 Proper voltage if electric

6.3.5.5 CHECK for vegetation growing in yard and along fence line

6.3.5.6 CHECK for debris left over from past work

6.3.5.7 RECORD all findings in station log book

6.3.5.8 IF any deficiencies are found,

6.3.5.8.1 REPAIR OR **REPLACE** if possible

6.3.5.8.2 CREATE a work tickets as required

6.3.5.8.3 REPORT condition to supervisor

6.3.6 Insulators, Bus-Work, Expansion Joints, Potheads and Cables

6.3.6.1 Insulators

6.3.6.1.1 VERIFY that insulators are in serviceable condition

6.3.6.1.2 CHECK insulators for,

6.3.6.1.2.1 Signs of corrosion

6.3.6.1.2.2 Signs of tracking or dirt/contamination buildup

6.3.6.1.2.3 Missing or broken parts

6.3.6.1.2.4 Signs of cracking

6.3.6.1.2.5 Out of vertical alignment

6.3.6.1.3 RECORD all findings in station log book

6.3.6.1.4 IF any deficiencies are found,

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6.3.6.1.4.1 **REPAIR** OR **REPLACE** if possible

6.3.6.1.4.2 **CREATE** a work ticket as required

6.3.6.1.4.3 **REPORT** condition to supervisor

6.3.6.1.5 IF insulators are visually out of vertical alignment (leaning), **CREATE A WORK REQUEST** to investigate the cause. Request for Substation Maintenance crews to investigate the following:

6.3.6.1.5.1 Steel supporting columns for vertical alignment (true vertical).

6.3.6.1.5.2 For columns directly on concrete without leveling nuts, check top of foundation for horizontal levelness.

6.3.6.1.5.3 Bus support fitting for proper installation (slip or rigid).

6.3.6.1.5.4 Look for any other obvious cause of rigid bus and bus fitting binding.

6.3.6.2 Bus Work

6.3.6.2.1 **VERIFY** that bus work is in serviceable condition

6.3.6.2.2 **CHECK** bus work for,

6.3.6.2.2.1 Signs of corrosion

6.3.6.2.2.2 Signs of cracking

6.3.6.2.2.3 Signs of wildlife nesting material

6.3.6.2.3 **RECORD** all findings in station log book

6.3.6.2.4 IF any deficiencies are found:

6.3.6.2.4.1 **REPAIR** OR **REPLACE** if possible

6.3.6.2.4.2 **CREATE** a work ticket as required

6.3.6.2.4.3 **REPORT** condition to supervisor

6.3.6.3 Expansion Joints

6.3.6.3.1 **VERIFY** that expansion joints are in serviceable condition

6.3.6.3.2 **CHECK** expansion joints for any signs of

6.3.6.3.2.1 Discoloration

6.3.6.3.2.2 Heating up

6.3.6.3.3 **RECORD** all findings in the station log book

6.3.6.3.4 IF any deficiencies are found:

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6.3.6.3.4.1 **REPAIR** OR **REPLACE** if possible

6.3.6.3.4.2 **CREATE** a work ticket as required

6.3.6.3.4.3 **REPORT** condition to supervisor

6.3.6.4 Pot Heads and Cables

6.3.6.4.1 **VERIFY** that pot heads and cables are:

6.3.6.4.1.1 Properly labeled

6.3.6.4.1.2 In good working condition

6.3.6.4.2 **CHECK** pot heads and cable for:

6.3.6.4.2.1 Signs of leaks

6.3.6.4.2.2 Signs of hot spots

6.3.6.4.3 **RECORD** all findings in the station log book

6.3.6.4.4 IF any deficiencies are found,

6.3.6.4.4.1 **REPAIR** OR **REPLACE** is possible

6.3.6.4.4.2 **CREATE** a work tickets as required

6.3.6.4.4.3 **REPORT** condition to supervisor

6.3.6.5 Disconnects, Fuses, Whips

6.3.6.5.1 **VERIFY** all are aligned and seated properly

6.3.6.5.2 **VERIFY** that disconnects are

6.3.6.5.2.1 Properly labeled

6.3.6.5.2.2 In good working condition

6.3.6.5.3 **VERIFY** that fuses are,

6.3.6.5.3.1 In good working condition

6.3.6.5.3.2 The right size

6.3.6.5.4 **VERIFY** that whips are,

6.3.6.5.4.1 Aligned

6.3.6.5.4.2 The proper length

6.3.6.5.4.3 Seated properly for next operation

6.3.6.5.5 **RECORD** all findings in the station log book

6.3.6.5.6 IF any deficiencies are found:

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6.3.6.5.6.1 **REPAIR** OR **REPLACE** if possible

6.3.6.5.6.2 **CREATE** a work ticket as required

6.3.6.5.6.3 **REPORT** condition to supervisor

6.3.7 Circuit Switcher's and Motor Operating Disconnects, Gas/Indicator, Heaters, Targets, and Coupling Device

6.3.7.1 Circuit Switcher and Motor Operated Disconnect

6.3.7.1.1 **VERIFY** that Circuit Switcher targets have the correct indication

6.3.7.1.2 **VERIFY** that all are fully seated

6.3.7.1.3 IF in service, **VERIFY** they are coupled

6.3.7.1.4 IF out of service, **VERIFY** that,

6.3.7.1.4.1 All are uncoupled

6.3.7.1.4.2 Operating feeds are isolated with proper LOTO tags

6.3.7.1.5 **RECORD** all findings in the station log book

6.3.7.1.6 IF any deficiencies are found:

6.3.7.1.6.1 **REPAIR** OR **REPLACE** if possible

6.3.7.1.6.2 **CREATE** a work ticket as required

6.3.7.1.6.3 **REPORT** condition to supervisor

6.3.7.2 Gas Indicators and Heaters

6.3.7.2.1 **VERIFY** that gas indicators pressure is within proper range for operation

6.3.7.2.2 **VERIFY** that heaters inside cabinet are,

6.3.7.2.2.1 Functional

6.3.7.2.2.2 In the ON position

6.3.7.2.3 **RECORD** all findings in the station log book

6.3.7.2.4 IF any deficiencies are found:

6.3.7.2.4.1 **REPAIR** OR **REPLACE** if possible

6.3.7.2.4.2 **CREATE** a work ticket as required

6.3.7.2.4.3 **REPORT** condition to supervisor

6.3.7.3 Ground System – Grid/Straps/Connections and Static Wire

6.3.7.3.1 **VERIFY** that the ground system is in serviceable condition

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6.3.7.3.2 IF the lead sheathing of the ground cable to the structure has been cut into for grounding of vehicles, **VERIFY** that the cable has been properly sealed.

6.3.7.3.3 **VERIFY** that all ground connections are tight.

6.3.7.3.4 **VERIFY** that ground straps are not twisted or frayed.

6.3.7.3.5 **VERIFY** the condition of the static wire connected to the fence line.

6.3.7.3.6 **RECORD** all findings in the station log book

6.3.7.3.7 IF any deficiencies are found:

6.3.7.3.7.1 **REPAIR** OR **REPLACE** if possible

6.3.7.3.7.2 **CREATE** a work ticket as required

6.3.7.3.7.3 **REPORT** condition to supervisor

6.3.7.4 Foundations, Pads, Trough Covers, Grading and Wash-Out

6.3.7.4.1 **VERIFY** that all foundations and pads,

6.3.7.4.1.1 Are in good condition

6.3.7.4.1.2 Are free from cracking

6.3.7.4.2 **VERIFY** that all cable trough covers are in serviceable condition

6.3.7.4.3 WHERE vehicles cross cable troughs **VERIFY** that the covers are made of metal sufficient to support he weight.

6.3.7.4.4 **VERIFY** that grading in yard and around switches to be operated is level.

6.3.7.4.5 **RECORD** all findings in the station log book

6.3.7.4.6 IF any deficiencies are found:

6.3.7.4.6.1 **REPAIR** OR **REPLACE** if possible

6.3.7.4.6.2 **CREATE** a work ticket as required

6.3.7.4.6.3 **REPORT** condition to supervisor

6.3.7.5 Fire Extinguishers

6.3.7.5.1 **VERIFY** that all fire extinguishers are,

6.3.7.5.1.1 Charged and in serviceable condition

6.3.7.5.1.2 Pressure is proper

6.3.7.5.1.3 Mounted properly

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6.3.7.5.1.4 Has current inspection tag date

6.3.7.5.2 IF extinguisher is serviceable, **SIGN** inspection tag

6.3.7.6 Material Stored in Substation Yards

6.3.7.6.1 Material stored in substation yards within wood packing crates or pallets **SHALL** be inspected at the regularly scheduled PM frequency.

6.3.7.6.2 **INSPECT** the condition of the crating and packaging material and **RECORD** on the applicable substation inspection form.

6.3.7.6.3 IF crating or packaging material (for example, pallets and wood crating) is identified as Hazardously Degraded (see attachment FBC 10-40 for illustrations), the following steps **SHALL** be taken:

6.3.7.6.4 **DO NOT** enter within the Line of Fire.

6.3.7.6.4.1 The **LINE OF FIRE** shall be considered as the area that the object can cover if it fails.

6.3.7.6.5 **BARRICADE** the area to a distance outside the Line of Fire.

6.3.7.6.5.1 Outside of substations, use caution tape, traffic cones and the single applicable Warning tag (Cat ID 1613886).

6.3.7.6.5.2 Inside of substations, use caution ropes, traffic cones and the single applicable Warning tag.

6.3.7.6.5.3 WHERE strength and durability are needed for wind and weather conditions, USE products made of woven polypropylene such as the yellow and black Safety Ribbon (Cat ID 853191) or the yellow and black safety rope (Cat ID 714078).

6.3.7.6.6 Affix the WARNING tag with a cable tie (Cat ID 392201).

6.3.7.6.7 After barricading, note the degraded condition on the inspection sheet for future disposition.

6.3.7.6.7.1 **ONLY USE** caution ropes when in a substation yard (Cat ID 714078)

6.3.7.6.7.2 **DO NOT USE** caution tape when in a substation yard. Use of caution tape is prohibited.

6.3.7.6.7.3 **USE** caution ropes and traffic cones as a barricade and AFFIX a Warning tag with a cable tie (Cat ID 392201).

6.3.7.6.8 **CREATE** a Work Request with the appropriate priority as defined by WM-EU-P014, Work Screening and Prioritization procedure. Priority should be determined by the extent of the hazardously degraded condition.

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6.3.7.6.9 **OBTAIN** a digital photograph of the condition and forward to FLS.

6.3.7.6.10 **NOTIFY** the FLS if a hazardously degraded condition exists.

6.3.7.6.11 IF notified of a hazardously degraded condition, the FLS **SHALL**:

6.3.7.6.11.1 **OBTAIN** a digital photograph of the condition.

6.3.7.6.11.2 **CONFIRM** a Work Request was created with the appropriate priority as defined by WM-EU-P014. Priority should be determined by the extent of the hazardously degraded condition.

6.3.7.6.11.3 **FORWARD** the Work Request and digital photograph of the field condition to the Work Screen Committee for action.

6.4. Miscellaneous

6.4.1 SCADA Battery Reading Pilot Cell

6.4.1.1 **RECORD** temperature

6.4.1.2 **RECORD** specific gravity

6.4.1.3 **RECORD** liquid level

6.4.2 **RECORD** terminal voltage for entire battery

6.4.3 **CHECK** battery for positive or negative grounds AND **RECORD**

6.4.4 **VERIFY** that the battery is:

6.4.4.1 On float charge

6.4.4.2 At proper voltage setting

6.4.5 **VERIFY** that electrolyte levels for all cells are within the limits

6.4.6 **VERIFY** that the flame arrestors are in good working condition

6.4.7 **VERIFY** that the signage around the battery area is proper and visible

6.4.7.1 No smoking

6.4.7.2 Eye wash station

6.4.7.3 Proper ventilation

6.4.8 **CHECK** battery terminals for

6.4.8.1 Grease

6.4.8.2 Corrosion free

6.4.8.3 All connections made up

6.4.9 **VERIFY** the battery charger is in working order

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6.4.9.1 **VERIFY** that the charger is putting out proper voltage

6.4.9.2 **VERIFY** the charger at proper amperage

6.4.9.3 **RECORD** all findings in the station log book

6.4.9.4 IF any deficiencies are found

6.4.9.4.1 **REPAIR** OR **REPLACE** if possible

6.4.9.4.2 **CREAT** a work ticket as required

6.4.9.4.3 **REPORT** condition to supervisor

6.4.10 Thermography

6.4.10.1 **SCAN** heaters AND **VERIFY** any suspected hot spots with thermograph device.

6.4.10.2 **RECORD** all findings in the station log book

6.4.10.3 IF any hot spots are found

6.4.10.3.1 **REPAIR** OR **REPLACE** if possible

6.4.10.3.2 **CREAT** a work ticket as required

6.4.10.3.3 **REPORT** condition to supervisor

6.4.11 Ambient Temperature

6.4.11.1 **RECORD** in Fahrenheit

6.5. Environmental Issues

6.5.1 **CHECK** transformers/circuit breakers/capacitors for leaks

6.5.2 **REPORT** PCB, oil or SF6 leaks

6.5.3 IF any leaks are found,

6.5.3.1 **REPAIR** OR **REPLACE** if possible

6.5.3.2 **CREAT** a work ticket as required

6.5.3.3 **REPORT** condition to supervisor

6.5.4 **VERIFY** pressurized cylinders, drums, and flammables are properly stored

6.5.5 **RECORD** condition in station log book

6.5.6 IF any deficiencies are found

6.5.6.1 **REPAIR** OR **REPLACE** if possible

6.5.6.2 **CREAT** a work ticket as required

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6.5.6.3 **REPORT** condition to supervisor

6.5.6.4 **VERIFY** that PCB/ Environmental labels are in place

6.5.6.5 IF labeling is not correct,

6.5.6.5.1 **VERIFY** the correct label required

6.5.6.5.2 **PLACE** the correct label on the equipment (for more information see EN-EU-P006, PCB Management Program and EN-EU-8015, PCB Management Procedure).

6.5.6.5.3 IF label is not legible, **PLACE** new label on equipment

6.5.7 **RECORD** all findings in station log book.

6.5.8 IF any deficiencies are found

6.5.8.1 **REPAIR** OR **REPLACE** if possible

6.5.8.2 **CREAT** a work ticket as required

6.5.8.3 **REPORT** condition to supervisor

6.6. Sabotage Recognition and Reporting

6.6.1 **SABOTAGE** is an act, with malicious intent, the purpose of which is to significantly damage or attempt to damage a company facility, property or cyber resource. Another way of defining sabotage is violence against property.

6.6.2 **REPORT** any sabotage or potential sabotage events to:

6.6.2.1 Local police (911) provide details

6.6.2.2 Corporate Security 1-800-550-6154

6.6.2.3 The OCC (or BPO)

6.6.2.4 The Supervisor

6.6.2.5 Enter details into Cascade or on the SSO PM Checklist

6.6.3 Examples of sabotage or potential sabotage could include:

6.6.3.1 Suspicious persons

6.6.3.2 Surveillance activities

6.6.3.3 Unidentified individuals conducting surveillance (camera / video)

6.6.3.4 Suspicious packages

6.6.3.5 Tampering with transmission towers and poles (loosening bolts, cutting guy wires)

6.6.3.6 Gunshots to equipment, conductors or insulators

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6.6.3.7 Causing intentional failure of a component or system

6.6.3.8 Damage to microwave towers including toppling

6.6.3.9 Damage to microwave antenna

6.6.3.10 Cut telephone lines

6.6.3.11 Cut fiber optic lines

7. Return to Normal

7.1. Deliver used desiccant to SSC for recycling.

8. Roles and Responsibilities

8.1. Managers

8.1.1 Ensure compliance to this procedure.

8.2. Supervision

8.2.1 ComEd Transmission & Substations (T&S) Group owns this procedure.

8.2.2 ComEd T&S Subject Matter Experts (SMEs) and Supervisors are accountable for the content and process of the procedure.

8.3. Employees/Workers

8.3.1 All ComEd, contractor or vendor personnel performing work within the ComEd service area shall comply with this procedure.

8.3.2 All ComEd, contractor or vendor personnel performing work within the ComEd service area shall demonstrate management expectations as identified in EA-CE-P022-R0001, Flagging and Robust Operational Barriers.

8.3.3 All ComEd, contractor or vendor personnel performing work within the ComEd service area shall demonstrate management expectations as identified in CM-ED-800001, Tools and Equipment Overview Procedure.

8.3.4 All ComEd, contractor or vendor personnel performing work within the ComEd service area shall demonstrate management expectations as identified in CM-ED-800002, Power Tool Use Overview Procedure.

8.3.5 All ComEd, contractor or vendor personnel performing work within the ComEd service area shall demonstrate management expectations as identified in EN-EU-P012, Spill/Release Contingency Program and EN-CE-2004, Oil Spill Response and Contingency.

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9. Documentation

9.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

10. Terms and Definitions

10.1. Refer to CM-EU-010006, EU Technical Glossary

11. References

11.1. CM-CE-402001-R0001, Substation Inspection Checklist

11.2. CM-ED-401002, Substation Wildlife Mitigation Procedure

11.3. CM-ED-801001, Tools and Equipment Overview Procedure

11.4. CM-ED-801002, Power Tool Use Overview Procedure

11.5. CM-EU-010006, EU Technical Glossary

11.6. EN-CE-2004, Oil Spill Response and Contingency

11.7. EA-CE-P022-R0002, Flagging and Robust Operational Barriers

11.8. EN-EU-8015, PCB Management Procedure

11.9. EN-EU-P006, PCB Management Program

11.10. EN-EU-P012, Spill/Release Contingency Program

11.11. LE-AC-401 – Records and Information Management Retention and Disposition.

11.12. OP-EU-050003-R0001, Workers Alteration Log sheet

11.13. OP-EU-P019, Security of Substations

11.14. RC-AC-POL3-001, Exelon's NERC CIP Cyber Security Policy.

11.15. WM-EU-P014, Work Screening and Prioritization Procedure

11.16. ACE 01779772, SS459 Vollmer 34kV Bus 1/2/3 Lockout

12. Attachments

12.1. CM-CE-402001-1, Lesson Learned – Suggested Procedure Improvement

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12.2. CM-CE-402001-2, FBC 10-40 – Material Inspection

12.3. CM-CE-402001-3, Substation Inspection Checklist

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13. Development history

Revision 0 CM-ED-402001	**Date: 5/27/2005**
Writer	James J. Hehir (Methods); Larry Scarpaci (Operations)
Reviewer(s)	Lorinda Alms (Environmental); Joe Glowacki (Operations); Alex Prichisky (AME)
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Michelle M. Blaise
Reason written	To provide a standard for conducting a station inspection.

Revision 1 CM-ED-402001	**Date: 4/15/2007**
Writer	Craig Creamean
Reviewer(s)	Joe Glowacki; Frank Gabrieli
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Mark Quinlan
Reason written	Revise CM-ED-402001 to fully delineate the PM template for building door alarm testing and verification per ACE AR 53204.

Revision 2 CM-ED-402001	**Date: 6/27/2007**
Writer	Larry Kostbade
Reviewer(s)	Larry Scarpaci; Ray Tomac; Judy Freitag; Donal Quaid
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Don Pellegrini
Reason written	Incorporated DGA HIT Team recommendations for Nitrogen adds, Desiccant change out and referenced the Substation Inspection Checklist.

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Revision 3 CM-ED-402001	**Date: 11/30/2007**
Writer	George P. Papadopoulos
Reviewer(s)	Scarpaci, Lawrence V; Jensen, Eric J.; Siwiec, William J; Landeros, Marvin; Lambert, Thomas W., Walker, Rodney C.; Leonard, Jack F.
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Bill Forst
Reason written	Revise CM-ED-402001 to provide inspection criteria for leaning insulators.

Revision 4 CM-ED-402001	**Date: 3/30/2009**
Writer	John Bee
Reviewer(s)	Scarpaci, Lawrence V.; Walker, Rodney C.; Perman, Karl; Gabrieli, Frank; McNally, James R., Blazekovich, J.
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Bill Forst; Frank Gabrieli; Gus Ponce; Peter Singh
Reason written	Added section 6.1.1, added section 8.5 to address sabotage recognition and reporting.

Revision 5 CM-ED-402001	**Date: 6/1/2010**
Writer	Lori Cimaglia
Reviewer(s)	Scarpaci, Lawrence V.; Smith, Vincen; Graham, Brian
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Dan Galovich, Lori Cimaglia, Frank Gabrieli, Peter Singh
Reason written	Addition to section 8.1.1, added section to record minimum and actual CO2 tank levels.

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Revision 6 CM-ED-402001	**Date: 9/22/2010**
Writer	Kimberly A. Smith
Reviewer(s)	DSO West Managers; Bob Johnson, Director P&CM
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Dan Galovich, Lori Cimaglia, Frank Gabrieli, Peter Singh
Reason written	Addition to section 8.2.11, providing additional guidance when inspecting material stored at substation yards.

Revision 7 CM-ED-402001	**Date: 11/16/2010**
Writer	Richard Martucci
Reviewer(s)	SSO Managers, Ken Buck, Tim McGuire
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Gus Ponce, Frank Gabrieli, Dan Galovich,
Reason written	Added details to SSO inspection checklist, added additional inspection checklists.

Revision 8 CM-ED-402001	**Date: 1/2/2014**
Writer	Susan Gasper (Dist Ops)
Reviewer(s)	Tom Distasio (Methods); Eduardo Suarez (Methods); Ken Buck (T&S); Rich Martucci (T&S); Tim McGuire (T&S); Frank Gabrieli (PECO OCC)
Technical Approver(s)	Larry Scarpaci (Training);
Safety Approver(s)	Len Tully
UFAM Approver(s)	Mark Primm (ComEd CM FAM Owner); Frank Moffa (PECO CM FAM)
Reason written	NERC procedure review and format update

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Revision 9 CM-ED-402001	**Date: 3/4/2014**
Writer	Susan Gasper (Dist Ops)
Reviewer(s)	Tom Distasio (Methods); Eduardo Suarez (Methods); Ken Buck (T&S); Rich Martucci (T&S); Tim McGuire (T&S); Frank Gabrieli (PECO OCC)
Technical Approver(s)	Larry Scarpaci (Training);
Safety Approver(s)	Len Tully
UFAM Approver(s)	Mark Primm (ComEd CM FAM Owner); Frank Moffa (PECO CM FAM)
Reason written	Web site link on page 1 changed

Revision 10 CM-ED-402001	**Date: 9/10/2015**
Writer	N/A
Reviewer(s)	N/A
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	N/A
Reason written	Moved to new template; no content revisions included.

Revision 11 CM-ED-402001	**Date: 11/19/2015**
Writer	Francisco Figueroa
Reviewer(s)	Andrew Pocklington, AME; Doug Mason, Equipment Specialist; Sammy Zayed, Substation Engineer; Jeff Bergmann, Testing Group; Lawrence Scarpaci, Training; David Carlson, EU TS&C
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Michael Meathe, ComEd; William Mokoid, PECO
Reason written	Added section Three Phase Station Reclosures (only) 6.1.4.1.16 – Battery Check. Removed the “NERC Review” designation. NERC Review Complete.

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Revision 12 CM-ED-402001	**Date: 3/18/2016**
Writer	Daniel Gacek
Reviewer(s)	Tony O'Connor; Jim McNulty
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Mike Meathe
Reason written	Added NERC CIP V5 standard language to the procedure

Revision 13 CM-ED-402001	**Date: 8/23/2016**
Writer	Patrick Mintus
Reviewer(s)	Tom Finchum, Victor Collazo, Pete Figueroa, Robert Griffis, Russ Dahl
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Mike Meathe
Reason written	Enhanced procedure and wildlife inspection checklist for wildlife fences and nesting. Added reference to contamination buildup section 6.2.4.1.1.

Revision 0 CM-CE-402001	**Date: 3/18/2019**
Writer	N/A
Reviewer(s)	N/A
UFAM Approver(s)	Daniel J. Brea, Dir. Trans & Substations
Reason written	This procedure has been updated to reflect ComEd only and has been renumbered to CM-CE-402001. This procedure supersedes CM-ED-402001. CM-ED-402001 is no longer a shared procedure as PECO created a stand-alone procedure in 2014 and assigned it number CM-PE-402001 (per J. Lonabaugh, Mgr. PECO). Minor content changes were made to fix formatting and to correct typos. This procedure is now ComEd only and CM-ED-402001 will be archived.

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Revision 1 CM-CE-402001	**Date: 7/23/2020**
Writer	Heriberto Gonzalez
Reviewer(s)	Jeffrey D Ancel, Mark A Rossi, Patrick E Mintus, Jason BaumbachNwabueze Phil-Ebosie
UFAM Approver(s)	Daniel J. Brea, Dir. Trans & Substations
Reason written	Revised as part of [ACE: 01779772] Corrective Action #10.

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Lessons Learned - Suggested Procedure Improvement
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Proc Line #	Equipment Type / Part	Revision / insertion / deletion

Attachment CM-CE-402001-1

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Field Bulletin

Effective Date: May 3rd, 2010 **FBC 10-40**

LL/OE

GREEN

Organization / Level: Communicate immediately to all Field employees in the following departments:
Department: All
Functional Area: All

Summary: On April 14, 2010, a fatal accident occurred which involved the collapse of a wooden shipping crate that stored disconnect switches. A focused effort to identify degraded storage of large equipment will be conducted. Degraded crating and packaging material (e.g. pallets, wood crating) can be a Line of Fire hazard with the potential for significant injury. All material stored outside within wood packing crates or pallets will be identified and inspected through assignments by the regional coordinators. The objective of this initiative is to (1) identify material stored at all outside storage locations, including storeroom sites; (2) conduct a visual inspection of the crating and packaging material; and, (3) for degraded conditions, properly barricade the material to avoid a line of fire incident.

Caution: There should be no physical contact of degraded storage conditions. The intent of this initiative is to barricade the materials and properly designate the area with the appropriate Warning tag. No attempt to correct the hazard should be made. If the equipment cannot be properly barricaded, contact your supervisor immediately.

Details: All materials on pallets or within wooden crates stored outdoors, including storeroom yards, shall be inspected with the attached form completed for each.

Crating and packaging materials shall be considered a hazard if the degradation or wear jeopardizes the stability of the crate and its contents. Examples of conditions to identify are rot, decay, insect infestation, leaning material, and missing or rusted bolts. There are pictures attached that depict both good and bad storage examples.

Inspectors of these crates shall not place themselves, or others in the Line of Fire until it is established that hazardous degradation is not evident.

Positive steps shall be taken to assure that degraded packaging and crating materials that present Line of Fire hazards are barricaded for the protection of personnel.

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Employees shall not enter the Line of Fire to install these barricades. Specific instruction is as follows:

If crating or packaging material (for example, pallets and wood crating) are identified as hazardously degraded

1. Do not enter within the Line of Fire.
   a. The Line of Fire shall be considered as the area that the object can cover if it falls.
2. Barricade the area to a distance outside of the Line of Fire
   a. Outside of substations, use caution *tapes*, traffic cones and the single applicable Warning tag.
   b. Inside of substations, use caution *ropes*, traffic cones, and the single applicable Warning tag.
   c. WHERE strength and durability is needed for wind and weather conditions, USE products made of woven polypropylene such as the yellow and black Safety Ribbon, (Cat ID 853191) or the yellow and black safety rope, (Cat ID 714078).
   d. Affix the Warning tag with a cable tie (Cat ID 392201).
3. After barricading, note the degraded condition on the inspection sheet for future disposition.

The hazardous condition will be reviewed by the respective line organization First Line Supervisor (FLS). A safe work plan will be developed prior to removing the equipment.

Inspection sheets shall be returned to the assigned regional coordinators. Any questions regarding this bulletin should be directed to Dan Galovich (C&M), Ken Buck (DSO), Bill McBride (T&S), Mark Falcone (F&MS) or Yves Lassere (Supply).

Personnel should also be cognizant and avoid any Line of Fire situations involving Customer locations.

Required Actions: None

Communication Expectations: Verbally review this Field Bulletin with field employees. It should take approximately 10 minutes. Post this bulletin until May 28th, 2010 and remove.

Supporting Documents: None

Barrier Tapes and Rope

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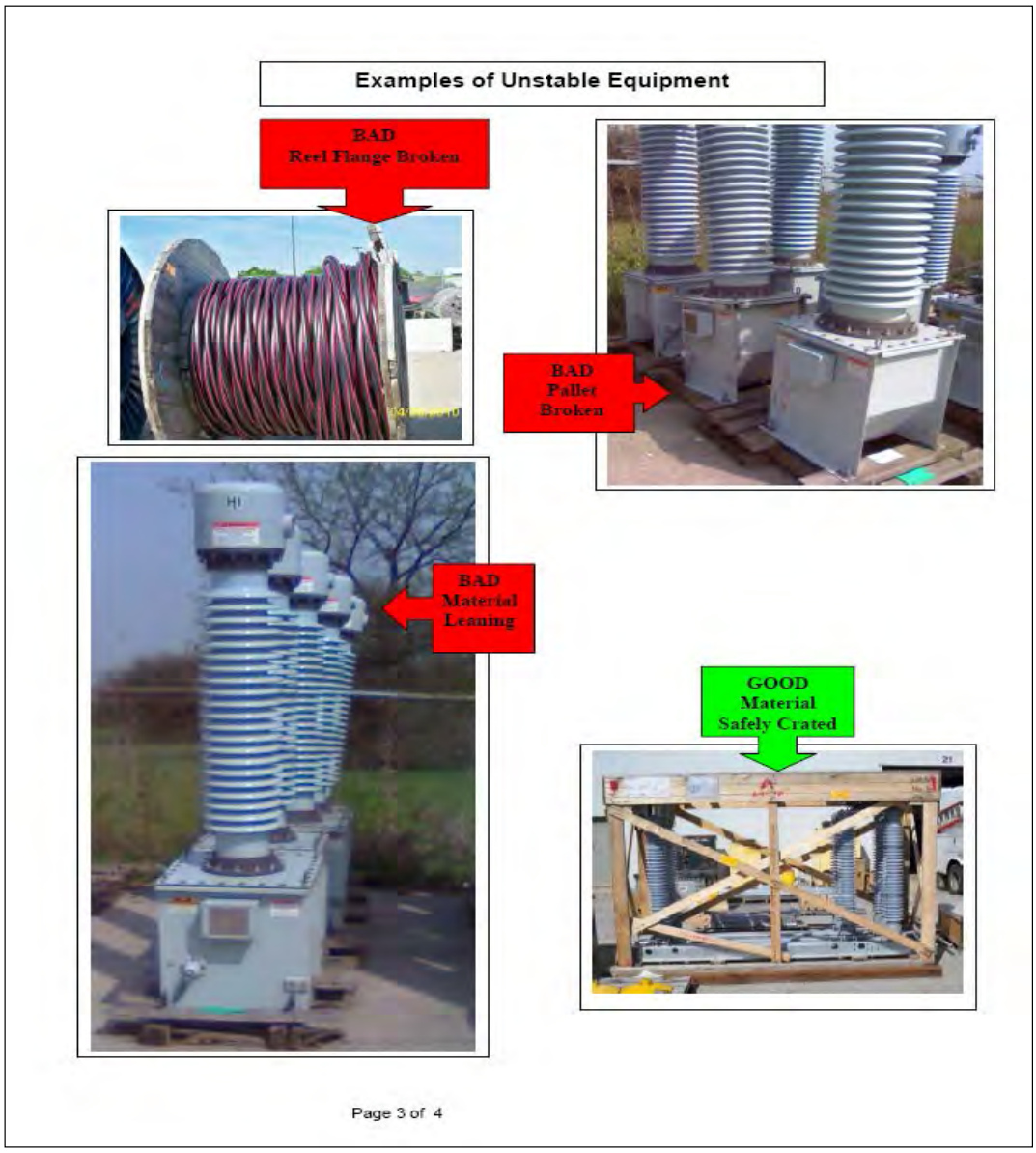

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Material Inspection Checklist

TO BE COMPLETED FOR ALL MATERIAL STORED AT ALL OUTSIDE STORAGE LOCATIONS (INCLUDING STOREROOM SITES)

LOCATION

Material Location_____ Date_____
(Name of Storeroom yard, Substation, or other)

Material Type_____
(Identify the actual piece of material)

Will the material be installed within 60 days of above date? : YES_____ NO_____

INSPECTION

Inspected By (print)_____ Initial_____

Degraded: YES_____ NO_____
(Examples: rot, decay, leaning, insect infestation, missing or rusted bolts)

Describe:_____

_____ No Qualifying Material Onsite. MATERIAL STORED ON PALLETS OR WITHIN WOODEN CRATES AT OUTSIDE STORAGE LOCATIONS (INCLUDING STOREROOM SITES)

BARRICADE

_____Barricaded with Cones, Caution Tape/Safety Rope Tag#_____
(Substation sites shall use Cones and Safety Rope and designated warning tape)

WARNING

INSPECTED EQUIPMENT IDENTIFIED AS DEGRADED SHALL NOT BE APPROACHED.
DEGRADED EQUIPMENT SHALL BE BARRICADED AS DESCRIBED ABOVE

Barricaded By: (print)_____ Initial_____

RECORD

_____Received by Regional Operations Coordinator

_____Entered by locally controlled spreadsheet for tracking

Regional Operations Coordinator (print) _____

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SUBSTATION INSPECTION CHECKLIST (CM-CE-402001-R0001)

Check each box in this checklist to confirm completion of the task or place N/A if not applicable

Originator: SSO PM TWAM: L. Scarpaci, M Koelper, K. Buck, J. Leech	Revised: 12/18/2018
Supersedes: SSO PM CHECKLIST 1.0	Page 1 of 1

Purpose: This checklist is intended to document expectations and tasks to be performed as part of the Preventative Maintenance on this equipment per Routine Substation Inspection procedure CM-CE-402001

Building/Indoors	
☐ Security/Safety Doors, Locks, Windows & Signage **Checklist #7**	☐ Switching Tools & Control cords stored properly
☐ Simulate Door Alarms with D.A.	☐ Heaters, Fans, Vents and Roof leaks
☐ Lighting, Emergency Lighting & Exit	☐ Drains, sumps and cable troughs
☐ Fire Extinguishers	☐ Water System and Bathroom
☐ Fire Suppression System **Checklist #8**	☐ Phones, Clock, Furniture & Supplies
☐ Minimum CO2 Tank Level _____	☐ Log book, One-line diagrams & Station Procedures
☐ Actual CO2 Tank Level _____	☐ LOTO Tags in place per procedure
☐ Fire Detection System, Smoke Detectors & fire stops in place	☐ Rodent Animal Infestation **Checklist #9**
☐ Flammables stored properly	☐ Spare Fuses & fuse information
☐ Housekeeping Debris, Dust/Webs/Floors clear & swept	☐ Oil Pump House annunciator oil levels & metering
☐ Cable Room Basement Safely Accessible	
Batteries/Chargers	***Relaying/Control Panes/Meetering***
☐ PILOT CELL: Volts, S.G. Temperature & Term Volts	☐ Annunciator Panel Test -SCADA (local / remote)
☐ Positive or Negative Ground Voltage	☐ Relay targets, covers on and clean
☐ Float Voltage/Equalized	☐ Indicating lamps, voltmeters & ammeters
☐ Electrolyte Levels & Flame Arrestors	☐ Test Switches Alarm Cut-outs (proper position labeled)
☐ Static & No Smoking Signage/Eyewash Station/Ventilation	☐ Guard Level readings DFR
☐ Corrosion Connections (battery area clean / clear)	☐ Aux Power ATO- Perform functional test
☐ CHARGER: DC Amps & DC Volts	☐ Review Nomenclature & Labeling Entire Station
Circuit Breakers/Reclosers	***Power Transformers/Aux Transformers***
☐ Counters & Mechanical Position Indicators-Confirm CB indicator flag vs. Indicator light status	☐ Sudden Pressure selector switch (63) & relief indicator
☐ Circuit Breakers & Bushing Oil Levels	☐ Nitro-add if necessary ☐ Desiccant-replacement if necessary
☐ Alarm cutouts & AC-DC circuit breaker fuses (labeled)	☐ Alarm cutouts & AC-DC circuit breakers fuses (labeled)
☐ Grd Test, Rosettes and Spare C.B.s properly stored/ready	☐ Bushing & Lighting Arrestor porcelain
☐ Circuit Breakers in assigned cubicles	☐ LTC Tap Position (full lower full raise) notify OCC
☐ Recloser selector switch (79)	☐ Instrument Transformer (PTs / CTs) oil levels
☐ Recloser NI-Cad battery ready	☐ Auxiliary Power Transformer oil levels and fuses
Per Sec, 6.2.11.1 Three Phase	

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Switchyard/Outdoors	*Miscellaneous*
☐ Security/Safety: Gates, Locks, Fences, Signage & Fire Extinguishers (Checklist #7)	☐ SCADA Battery Reading
☐ Material stored in Substation Yards (Checklist #6)	☐ AMBIENT TEMPERATURE (F) = _____
☐ Yard Lighting & AC/ Lighting panels labeled	☐ Thermography
☐ Animal Intrusion, Wildlife Protection, Vegetation & Debris (Checklist #9)	☐ Generator Fuel Level & Hour Meter
☐ Insulators, Bus-work, Expansion joints and Cables	
☐ Disconnects, Fuses & Whips aligned & seated properly	
☐ C/Ss & MODs - Gas/Ind. Targets, Heaters & Coupling device - Verify interrupter target (open/close - white/yellow)	***Environmental Issues***
Per Sec, 6.2.11.1 Three Phase	☐ Transformer/C.B./Caps-Report PCB or Oil Leaks
☐ Ground System: Grid/Straps/Connections & Static Wire	☐ Verify PCB/Environmental labels in place
☐ Foundations, Pads, Trough Covers, Grading & Wash-Out	☐ Proper storage-pressurized cylinders, drums, flammables
☐ Check Potheads for oil or compound leaks/contamination	☐ Verify SF6 Levels Normal
☐ Verify calibration dates on all station tools & testing equipment (sticks, ext. cords, etc.)	

TIME STARTED JOB: _____	**TIME COMPLETED JOB:** _____
WORK ORDER # _____	**STATION:** _____ **AO NAME:** _____
DATE: _____	

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Station Number_____ Date_____ Inspector_____ Work Task#_____

Transformer Number									
LTC Counter Reading Current / Previous / Difference									
LTC Tap Indicator Positions Reset if possible	Max. _____ Min. _____ Present____		Max. _____ Min. _____ Present____		Max. _____ Min. _____ Present____		Max. _____ Min. _____ Present____		
LTC Automatically Passes Through Neutral (Circle Entry)	Yes No Forced		Yes No Forced		Yes No Forced		Yes No Forced		
LTC Sel./Trans. Compt. -Oil Level (1 or 2 Compts.) (Circle Entry)	Normal High Low		Normal High Low		Normal High Low		Normal High Low		
LTC Temp Diff. Monitor 1 Reading	Peak	Valley	Peak	Valley	Peak	Valley	Peak	Valley	
LTC Temp Diff. Monitor 2 Reading	Peak	Valley	Peak	Valley	Peak	Valley	Peak	Valley	
Main Tank / Conservator Tank -Oil Level (Circle Entry)	Normal High Low		Normal High Low		Normal High Low		Normal High Low		
Transformer Bushings Oil Level (Circle Entry)	All (See Comments) Normal High Low		All (See Comments) Normal High Low		All (See Comments) Normal High Low		All (See Comments) Normal High Low		
Transformer Main Tank Oil Temperature Reset if possible	High _____ Low _____ Present_____		High _____ Low _____ Present_____		High _____ Low _____ Present_____		High _____ Low _____ Present_____		
Transformer Nitrogen Pressure	As FND_____ AS LEFT_____		As FND_____ AS LEFT_____		As FND_____ AS LEFT_____		As FND_____ AS LEFT_____		
Nitrogen Cylinder Pressure	Reading_____		Reading_____		Reading_____		Reading_____		
Fan/Pumps Positions (Circle Entry)	Auto / Manual 1 2		Auto / Manual 1 2		Auto / Manual 1 2		Auto / Manual 1 2		
Cap Bank Irregularities Cap Bank # and kV		kV		kV		kV		kV	
# of Tanks/Cans Damaged and # of Fuse Failures									
Circuit Breaker Bushings Oil Level (Circle Entry)	All (See Comments) Normal High Low		All (See Comments) Normal High Low		All (See Comments) Normal High Low		All (See Comments) Normal High Low		
CB Number (69kV and above)	Automatic Operations		Counter Reading		CB Number (69kV and above)		Automatic Operations		Counter Reading
CB Number (69kV and above)	Automatic Operations		Counter Reading		CB Number (69kV and above)		Automatic Operations		Counter Reading

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Transformer Inspection Form

Station Number	Date	Inspector	Work Task #

Initial	Inspection Description	Remarks			
		TR._____	TR._____	TR._____	TR._____
	1. External Visual Inspection				
	Check for oil leaks, paying particular attention to flanges, gaskets and instrument penetrations.				
	Check for damaged connections or badly corroded cables.				
	Check areas needing paint or developing corrosion problems.				
	Check for loose or missing terminal box covers and missing fasteners, replace and tighten as necessary.				
	Check for signs of hot spots or metal discoloration on the surface of the tank.				
	Check for loose objects in the area to prevent faults or shorts.				
	Check for signs of metal cracks weld leaks on the main tank, bushing tank, and-or LTC tank.				
	Check for gas in the gas detector relay, if installed.				
	Report any unusual noises in the transformer.				
	Check the transformer temperature and oil level gauges for proper levels and record the following: (Include min tank, tap changer compartment, oil expansion tanks, and bushings). Reset all maximum indicator hands on the thermometers.				
	Transformer Winding Temp. (If equipped).				
	2. Nitrogen Blanket and Regulator Cabinet				
	NOTE: Some transformer designs use a nitrogen blanket to pressurize the void space above the oil volume to a pressure slightly greater than atmospheric, while others use a conservator tank. NOTE: Check pressure gauge for positive nitrogen pressure. If indicator is near zero or negative, add N2 to proper pressure per standard work and have work request created.				
	If the transformer has a nitrogen blanket, then inspect the nitrogen blanket regular cabinet (if equipped) for the following:				
	Check for enclosure preservation and cleanliness.				
	Check for proper sealing of all valves, regulators, and tubing.				
	Check cylinder pressure. Replace cylinder if necessary.				
	NOTE: Check with Load Dispatcher prior to performing the next task.				
	Replace nitrogen bottle if the pressure is below 200 psi.				
	Review log sheet or tracking sheet for periodicity of cylinder change and nitrogen consumption. Report any increased usage of nitrogen.				
	Check door weather strip for damage. Repair if necessary.				
	Clean inside of cabinet. Monitor Gas Accumulator (if applicable)				
	3. LTC				
	Check for unusual LTC noises during RAISE and LOWER operation. Verify that LTC drive mechanism stops On Position.				
	Check LTC breathers (if equipped) for indications of oil leakage or blowing of oil.				
	Check LTC Pressure Relief Device (if equipped) for indications of operation (flag up).				
	Check lever or BETA Switch (if equipped) for correct operating position.				
	Check LTC filtration system for proper operation (if applicable).				

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Transformer Inspection Form

Station Number	Date	Inspector	Work Task #

Initial	Inspection Description	Remarks			
		TR.____	TR.____	TR.____	TR.____
	4. Control Cabinet				
	Check that door hinges open and close easily and that latches operate, lubricate as needed.				
	Check the door weather-strip gasket for damage. Repair or replace as needed.				
	Check for moisture intrusion, corrosion, stains, or water accumulation on the bottom of the cabinet.				
	Check for burned or broken components, blown fuses, damaged wiring, and loose connections.				
	Check for overheating and discoloration at wire terminal blocks.				
	Check for proper routing and grouping of wiring.				
	Check molded case circuit breakers, contactors, relays and terminals for loose connections or discoloration. Report any unusual conditions.				
	Check that the cabinet light functions properly, repair if necessary.				
	Check that the heaters are working properly, repair or replace if necessary.				
	Check for proper sealing of all incoming cables and conduits.				
	Clean the inside of the control cabinet.				
	5. Cooling Equipment-Radiators-Cooling Fans-Pumps				
	NOTE: The appropriate number of coolers must remain in service when the transformer is in service.				
	Verify proper cooling system configuration.				
	If the cooling equipment is in operation, note whether all fans and pumps are operating. Record any equipment not in operation.				
	Check fans and pumps for vibration and unusual noise. Place the fans and pumps on for the cooler being inspected.				
	Check fan blades for cracking, chipping, looseness and missing bolts. Create work request to replace if necessary.				
	Check for bearing wear and lubricate fan bearings if possible.				
	Clean up debris around transformer, and from radiators and fans.				
	Check for extensive dirt build-up on radiators or coolers. Record in notes if pressure washing is needed.				
	Check pumps for oil leakage from pump flanges or pump valve seals.				
	Check radiators for air passage and that they are free from dirt and blockage.				
	Check radiators for oil film that indicates oil leakage.				
	Check radiator valves to transformer open.				
	Check that all fans operate and in the correct rotation. Identify wiring problems remove and replace defective fan blades, motors, cords and connectors.				
	Check oil pump flow indicators for Pump On indication; also check for noise or flutter of the flow gauge. This could be evidence of a problem.				
	Check that all pumps operate and in the correct rotation. Identify wiring problems remove and replace defective pumps, motors, cords and connectors.				

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Transformer Inspection Form

Station Number	Date	Inspector	Work Task #

Initial	Inspection Description	Remarks			
		TR_____	TR_____	TR_____	TR_____
	6. Desiccant Replacement				
	Inspect dehydrating breather(s). (Conservator Tank and/or LTC) Replace desiccant as needed.				
	7. Bushings-Insulators-Surge Arresters				
	Check for porcelain chipping, cracking and signs of arcing.				
	Check for proper oil level.				
	Check for oil leakage.				
	Check for corrosion or discoloration due to heating.				
	Check surge arrester counter, if applicable.				
	8. Sudden Pressure Relay-Pressure Relief Device				
	Check for oil leaks and gasket deterioration.				
	Check the pressure relief device to ensure that the device has not operated (The indicator flag should be down.).				
	Check Sudden Pressure Cutout (63 device) NORMAL				

ADDITIONAL REMARKS

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Routine Substation Inspection Procedure

ComEd Technical Procedure
CM-CE-402001

Rev. 1

Material Inspection Checklist #6

TO BE COMPLETED FOR ALL MATERIAL STORED AT ALL OUTSIDE STORAGE LOCATIONS (INCLUDING STOREROOM SITES)

LOCATION

Material Location_____ Date_____
(Name of Storeroom yard, Substation, or other)

Material Type_____
(Identify the actual piece of material)

Will the material be installed within 60 days of above date? : YES_____ NO_____

INSPECTION

Inspected By (print)_____ Initial_____

Degraded: YES_____ NO_____
(Examples: rot, decay, leaning, insect infestation, missing or rusted bolts)

Describe:_____

_____ No Qualifying Material Onsite. MATERIAL STORED ON PALLETS OR WITHIN WOODEN CRATES AT OUTSIDE STORAGE LOCATIONS (INCLUDING STOREROOM SITES)

BARRICADE

_____Barricaded with Cones, Caution Tape/Safety Rope Tag#_____
(Substation sites shall use Cones and Safety Rope and designated warning tape)

WARNING

INSPECTED EQUIPMENT IDENTIFIED AS DEGRADED SHALL NOT BE APPROACHED.
DEGRADED EQUIPMENT SHALL BE BARRICADED AS DESCRIBED ABOVE

Barricaded By: (print):_____ Initial_____

RECORD

_____Received by Regional Operations Coordinator

_____Entered by locally controlled spreadsheet for tracking

Regional Operations Coordinator (print) _____

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ComEd
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Routine Substation Inspection Procedure

ComEd Technical Procedure
CM-CE-402001

Rev. 1

SUBSTATION SECURITY CHECKLIST #7

DATE _____ LOCATION: _____ AO NAME _____

☐ **Gates / Fences**

- Verify that the gate is in good working condition with no signs of forced entry. Check the hinges to see if they have been removed or damaged. Look for a tampered lock, chain or hasp.
- Check that the gate closes with no gaps large enough to allow entry.
- Check for the address sign on the gate to assist emergency responder, if called. Observe if the Danger High Voltage and Private Property/No Trespassing signs are in place.
- Verify that there are no holes or cuts in the fence (or gates). Observe the fence ties to make sure they have not been cut or removed. Check for any openings underneath the fence. Check posts and fence to be secure.
- Razor wire/Barbed wire- Check for the barbed and razor wire on top of fences and gates for any gaps. Check for wire to be intact and secure.

☐ Vegetation

- Look for vegetation growing close to the inside or outside of the fence, which would allow for someone to remain concealed when tampering with the fence

☐ Material / storage

- Limit or store as much of the equipment inside the buildings, conex boxes or sheds, if possible, to minimize risk

☐ Building

- Inside the substation building, one of the first things you should observe when approaching the building is the door and the door lock to make sure there has not been any tampering.
- If there are windows on the building please notice if any windows have been broken for possible access.
- When entering a substation building, call the DA to notify him that you are in the station and verify that the OCC received a door alarm via SCADA
- ANYONE entering a substation is required to enter their information of who they are and what they are doing into the station log book.

☐ **Doors / Door Alarms / Windows/Vents/Hatches**

- You should observe when approaching the building is the door and the door lock to make sure there has not been any tampering. Check the pick plate to be intact.
- Check with the OCC that the door alarm is in working order by opening and closing the door along with getting alarm at the same time.
- If there are windows on the building please notice if any windows have been broken for possible access. Check vents and hatches to be secure and intact.

☐ Lighting

- Verify that control room and station lighting is working along with checking switchyard lights to be working properly. NOTE: Usually in the lighting panel of the station the switches for lighting are painted white.

☐ Locks / Key card access

- Look for tampered lock, chain or hasp. If the station has key card entry, possible damage to the card reader.

☐ Vehicles / trailer

- If company vehicles are parked inside the substation, (or even employee owned vehicles parked there while on shift), park them away from the fence.
- Lock up any material in the truck that might be attractive to thieves and vandals.
- Back up truck to one of the buildings on the property to minimize view and access.

For more information refer to the following procedure(s):

OP-ED-P019 "Security of Substations Procedure" http://mgmtmodel.exeloncorp.com/AllDocs/2010-07-22T05-34-57Z/OP-ED-P019_M7SZRA.doc

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Routine Substation Inspection Procedure

ComEd Technical Procedure
CM-CE-402001

Rev. 1

Fire Suppression System Checklist #8

LOCATION: (# - Name) _____ DATE: _____

AO Name: _____

☐ **VERIFY** that the system is in working order

☐ **VERIFY** Cardox signage/labeling in place;

OPERATOR SHALL perform an audit of all CARDOX labeling and **SIGNAGE** at the substations and will repair/replace those in need of maintenance and generate work request for all other deficiencies that cannot be immediately repaired/replaced.

☐ **VERIFY** that tags in place and signed off

☐ **VERIFY** that fire extinguishers are mounted on brackets

☐ **VERIFY** that CO2/Cardox system charged

☐ **RECORD MINUMUM CO2 TANK LEVEL (COMED ONLY)** _____

☐ **RECORD ACTUAL CO2 TANK LEVEL (COMED ONLY)** _____

- NOTIFY TSO/OCC IF ACTUAL CO2 TANK LEVEL IS BELOW THE DESIGNATED MINIMUM CO2 TANK LEVEL (COMED ONLY)

☐ VERIFY *FIRE STOPS* in place, the ceiling is sealed between floors, inside fire doors in station are closed and that floor manholes are closed.

For more information refer to the following procedures:

AM-ED-P008 "EED Fire Protection Program"

http://mgmtmodel.exeloncorp.com/AllDocs/2010-09-17T02-03-05Z/AM-ED-P088_C5FP1R.doc

CM-ED-402001:"Routine Substation Inspection Procedure"

http://mgmtmodel.exeloncorp.com/AllDocs/2010-09-17T02-03-05Z/CM-ED-402001_LYUF6I.doc

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WILDLIFE INSPECTION CHECKLIST #9 Pg 1 of 2

DATE:_____ LOCATION: _____ AO NAME: _____

☐ PERIMETER AND INTERNAL FENCING
Inspect any perimeter and internal fencing for holes, loose sections, and excessive gaps at the end of the sections, at corner poles, gate poles, and gate openings. Ensure gates are in good working order and properly aligned.
DEFICIENCIES:

☐ WILDLIFE FENCE AND ACCESSORIES ☐ NO WILDLIFE FENCE
Inspect base and connection points of wildlife fence for any gaps. Verify fence footings are not exposed. Verify fence does not lean excessively. Inspect all gates (man gates and vehicle gates, both hinge and latch areas) for any gap larger than 1/2". Verify latch is secure. Verify sweep for gate, if existing, is secure. Verify all overhead conductors have appropriate line guards and/or pole has metal wrap for climbing deterrent. If electric fence, verify gauges read proper voltage. Verify troughs with access from outside of fence are sealed.
DEFICIENCIES:

☐ GRADING OF YARD
Inspect grading of yard for smoothness and proper back filling. Grading should be above the bottom of the fence line, except at gates where a 2" or less gap should be maintained (excluding wildlife fence). There should be no visible drainage ruts or potholes. Back filling along buildings and equipment pads should be smooth and at a height that will prevent animals from burrowing underneath.
DEFICIENCIES:

☐ VEGETATION CONTROL
Inspect the substation for any vegetation (excluding landscaping) within the perimeter fence line, and if possible, 4' – 6' outside the perimeter fence line. (This includes tree branches that overhang the area above the top of the fence.)
DEFICIENCIES:

☐ CLEANLINESS OF YARD AND BUILDINGS
Inspect the substation for cleanliness. (Special note should be made of any excessive bird droppings.)
All unnecessary materials in the yard and buildings (equipment, materials, parts and spools) should be removed from the premises, and all food and material garbage properly contained and disposed of (outside of building if possible).
DEFICIENCIES:

☐ ANIMAL HOMES AND NESTS
Inspect the substation yard, equipment, structures, buildings, and control cabinets for any animal burrows, hives, homes or nests. (Special attention should be paid to areas where birds nest, as material can cause flash/damage).
DEFICIENCIES:

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WILDLIFE INSPECTION CHECKLIST #9 Pg 2 of 2

☐ CABLE TROUGHS, UNDERGROUND AND RISER CONDUITS, AND DRAINPIPES
Inspect cable troughs to verify that all covers are properly placed, and that all trough ends and intersections are blocked and sealed. Inspect underground and riser conduits to verify that the conduit is not oversized for the conductors, and that both ends of the conduit are sealed and in good condition. Inspect drainpipes and similar piping that exit the substation to verify that both ends (where applicable and possible) are covered and protected with metal screening.
DEFICIENCIES:

☐ BUILDING AND EQUIPMENT VENTILATION AND PORTALS
Inspect all building and equipment ventilation portals to verify that appropriate exclusionary type protection is securely and properly placed to prevent animal entry
DEFICIENCIES:

☐ OUTDOOR WILDLIFE COVERS AND BARRIER
Inspect all 34 kV and below outdoor equipment for proper wildlife protection applications. Wildlife protection shall be secure, with no gaps for burrowing or nesting, and no flagging tape. Do not seal the bottom of cover, as moisture may be retained. Tape live parts under cover if it is possible that wildlife may push up cover. Tape live parts not covered by a protector. Install bus support covers on the middle phase of the bus, squirrel guards on outer phase. Cover center phase 3 feet from either side of the bus cover. For phase spacing 20" or less, cover entire center phase. Install line guards on overhead phase, neutral and guy wires that provide an overhead path for wildlife fence entry and, where equipment is not protected by wildlife fence, substation fence entry. Bushing covers shall be installed on all exposed equipment (bushings and arrestors). All leads (transformer, aux power, circuit breaker, and recloser) shall be covered. For 12 kV and below, 600 V insulated cable is acceptable. Fused disconnect covers shall be installed on Aux Power TR fused disconnects. In general, any bare conductor with phase to phase spacing of 20" or less should be covered. Any bare conductor with phase to ground clearance of 20" or less shall be covered, if squirrel guards cannot be applied.
DEFICIENCIES:

NUMBER OF DEFICIENCIES IDENTIFIED: ☐

ComEd Only:			Date
ACTION TAKEN:	AME notified	☐	_____
	FLS notified	☐	_____
	AS8 Work Request created	☐	_____
Other: _____		☐	_____

For more information refer to the following procedures
CM-ED-401002 "Substation Wildlife Mitigation Procedure"
CM-ED-402001 "Routine Substation Inspection Procedure"

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Substation Inductor Maintenance

ComEd Technical Procedure
CM-CE-033953056

Rev. 0

Effective:	9/25/2018
Supersedes:	CM-ED-142003; OP-ED-142003
Level:	3
Review Type:	3 Year
Core Function:	Preventive Maintenance

Table of Contents

1. Purpose 1
2. Precautions and Limitations 1
3. Safety Measures and Environmental Concerns 2
4. Material and Special Equipment 2
5. Prerequisites 2
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1. Purpose

1.1. To provide guidelines for ComEd and contract individuals involved in the maintenance of substation neutral inductors.

2. Precautions and limitations

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2.1. Precautions

2.1.1 PRIOR to energizing or de-energizing equipment, **ENSURE** that

2.1.1.1 All Lockout Tag Out Procedure (OP-EU-050003) information is correct.

2.1.1.2 Proper approvals have been received.

2.1.2 PRIOR to beginning any testing procedures, **CONFIRM** that:

2.1.2.1 All required switching activities have occurred.

2.1.2.2 All required Lockout Tag Out Procedure (OP-EU-050003) requirements have been met.

2.1.3 **DO NOT GROUND** any circuit that has not been tested for voltage.

2.2. Limitations

2.2.1 N/A

3. Safety Measures and Environmental Concerns

3.1. Safety Measures

3.1.1 Class 2 gloves MUST be worn while performing work on or inside the inductor bay.

3.2. Environmental Concerns

3.2.1 N/A

4. Material and Special Equipment

4.1. Material

4.1.1 N/A

4.2. Special Equipment

4.2.1 Class 2 Gloves.

5. Prerequisites

5.1. All ComEd, contractor or vendor personnel performing work within the ComEd service area **MUST BE** trained and qualified in all equipment and procedures to be used.

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Substation Inductor Maintenance

ComEd Technical Procedure
CM-CE-033953056

Rev. 0

5.2. As applicable, **OBTAIN** the work package, including items such as, procedures or special work instructions.

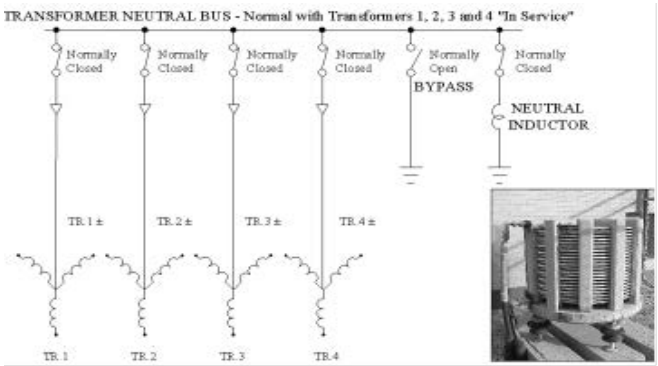
5.3. **INSPECT** all required tools, voltage test devices and grounding devices.

5.4. **ENSURE** all required tools, voltage test devices and grounding devices are in good working condition.

5.5. **ENSURE** Lockout Tagout Procedure (OP-EU-050003) tagging has been applied.

6. Procedure

NOTE: The illustration of the NORMAL configuration before Neutral Inductor is for illustration purposes. Maintenance while Transformers 1, 2, 3 and 4 are "in service."

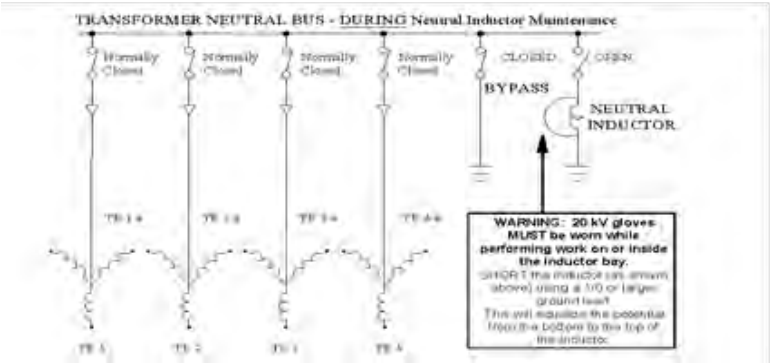


6.1. **WEAR** the proper approved apparel and Personal Protective Equipment (PPE).

6.2. **ENSURE** the inductor bypass is **CLOSED**.

6.3. **ENSURE** the inductor disconnect is **OPEN**.

SHORT the inductor (as shown below) using a 1/0 or larger shorting lead.



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NOTE: This will equalize the potential from the bottom to the top of the inductor.

NOTE: The SHORTING LEAD (Ground Lead) is **not** being used for personal protective grounding. The grounding requirement of a cylindrical stud is **not** required in this procedure.

6.4. **DOCUMENT** the shorting lead on the Maintenance Alteration Log.

6.5. **VERIFY** all terminal connections as per Maintenance Work Order.

6.6. **INSPECT** and **CLEAN** base insulators.

6.7. **REMOVE** shorting jumper.

6.8. **DOCUMENT** the removal of the shorting lead on the Maintenance Alteration Log.

6.9. **ENSURE** area is secure and inductor bay gate is,

6.9.1 Closed.

6.9.2 Locked.

NOTE: Steps 6.11 and 6.12 may be part of the operating switching order.

6.10. **CLOSE** the inductor disconnect.

6.11. **OPEN** the inductor bypass.

7. Return to Normal

7.1. IF appropriate, **ENSURE** that,

7.1.1 Lockout Tag Out Procedure (OP-EU-050003) tagging is removed.

7.1.2 The system is **RETURNED** to service in accordance with applicable ComEd procedures.

8. Roles and Responsibilities

8.1. Managers

8.1.1 Ensure compliance with this procedure.

8.2. Supervision

8.2.1 **BE AWARE** that Methods owns this procedure.

8.2.2 **BE AWARE** that Method Subject Matter Experts (SMEs) and Supervisors are accountable for the content and process of the procedure.

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8.3. Employees/Workers

8.3.1 All ComEd, contractor or vendor personnel performing work within the ComEd service area **SHALL COMPLY** with:

8.3.1.1 This procedure.

8.3.1.2 ComEd Fundamentals.

8.3.1.3 ComEd Safety Rule Book.

8.3.1.4 Employee Code of Conduct.

8.4. All other Corporate and ComEd policies, programs, procedures, and expectations appropriate to the work being performed.

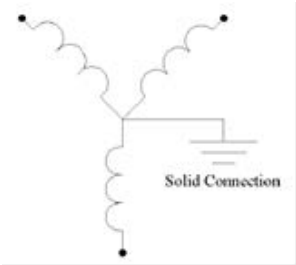
9. Documentation

Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

10. Terms and Definitions

10.1. Ground Bus

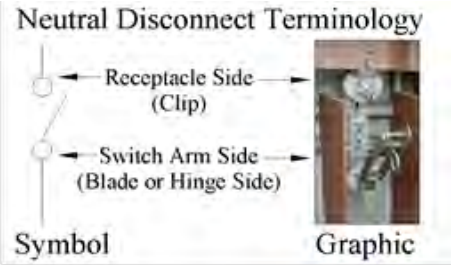
10.1.1 A solid connection made4 to earth ground potential. For example, the Wye-wound secondary show in the illustration (right) is solidly connected to ground.



10.2. Inductors

10.2.1 Low resistance, large, copper cable coils called inductors are used to limit fault current flow between phases as well as reduce disturbance and damage.

10.3. Neutral Bus



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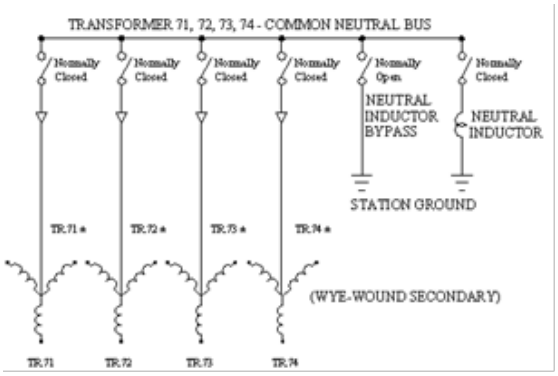
10.3.1 A common connection point that is used to handle imbalance of phase currents from transformers. This point is electrically at a higher potential than the Ground Bus.

NOTE: The illustration is for reference only and contains a Neutral Disconnect Switch for each Wye-Wound, Transformer Secondary Neutral (Transformers 71, 72, 73 and 74).



10.3.2 The Neutral Inductor also has a Disconnect Switch used to isolate the Neutral Indicator from the Neutral Bus.

10.3.3 An Inductor Bypass Switch is used to connect the Ground Bus to the Neutral Bus thereby "bypassing" or shorting the inductor.

10.4. Neutral Disconnects and Bypass Disconnects

10.4.1 Disconnects are switches used to either isolate or bypass equipment.

10.5. **REFER** to CM-EU-010006, EU Technical Glossary for additional terms and conditions.

11. References

11.1. CM-EU-010006, EU Technical Glossary.

11.2. ComEd Engineering Construction Standards (C) and Material Specifications (EM).

11.3. ComEd Safety Rulebook.

11.4. LE-AC-401 – Records and Information Management Retention and Disposition.

11.5. OP-EU-050003, Lockout Tagout Procedure.

12. Attachments

12.1. CM-CE-033953056 -1, Inductor Theory Job Aid.

12.2. CM-CE-033953056 -2, Inductor Types Job Aid.

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12.3. CM-CE-033953056 -3, Application of Inductors Job Aid.

13. Development history

Revision 0 OP-ED-142003	**Date: 12/10/2004**
Writer	Tom Lambert (Methods); Rodney Walker (Methods)
Reviewer(s)	Rodney Walker (Methods); Kevin Kinnerk (Methods); Frank Hess (Methods); Matt Morson (Methods); Clyde Behrens (Methods); Steve Pinciotti (Methods); Ed Bengson (Methods)
UFAM Approver(s)	Don Pellegrini, Jeff Wolfrom
Reason written	EED Procedure Upgrade Project

Revision 0 CM-ED-142003	**Date: 6/27/2005**
Writer	Tom Lambert (Methods); Rodney Walker (Methods)
Reviewer(s)	Rodney Walker (Methods); Kevin Kinnerk (Methods); Frank Hess (Methods); Matt Morson (Methods); Clyde Behrens (Methods); Steve Pinciotti (Methods); Ed Bengson (Methods)
UFAM Approver(s)	Kelvin Owen (CM)
Reason written	EED Procedure Reformat and Renumber Project

Revision 0 CM-CE-033953056	**Date: 9/25/2018**
Writer	Thomas Distasio, Sr. Methods Specialist
Reviewer(s)	Thomas Distasio, Sr. Methods Specialist
UFAM Approver(s)	Daniel J. Brea, Dir. Trans & Substations
Reason written	This revision satisfies the required 3-year review in accordance with the guidelines for this procedure. Updated to the new template. This procedure is ComEd only after EU Peer Review Group determined BGE & PECO do not use Transformer Neutral Inductors. After review it was determined there were no changes required to this procedure at this time. This procedure was renumbered per the requirements of the Management Model to CM-CE-033953056. CM-ED-142003 will be archived.

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Substation Inductor Maintenance

ComEd Technical Procedure
CM-CE-033953056

Rev. 0

INDUCTOR THEORY JOB AID

Inductors are low resistance, large, copper cable coils called inductors are used to limit fault current flow between phases as well as reduce disturbance and damage. These coils will not noticeably affect the flow of current as long as it is constant or changes very slowly. When a fault occurs, the current normally flowing tends to increase very rapidly to very high values.

- ❑ This rate of change of current flow as well as the rate of change of the magnetic flux of the coil is very great.
- ❑ As a result, a high counter voltage is generated in the coil to oppose the supply voltage, thereby, limiting the flow of current in the circuit.

Protective relays acting on this disturbance respond by triggering the opening of certain circuit breakers or switches to help prevent serious damage to any major equipment.

Current limiting inductors in circuits are subject to high short circuit currents for several reasons.

- ❑ By limiting the amount of short circuit current, inductors are intended to protect equipment from excessive heating and destructive mechanical forces due to strong magnetic fields.
- ❑ Trouble can be localized at the point of origin to help prevent the fault from disturbing other portions of the system. A short circuit that is not limited may cause a voltage drop, which could result in severe system trouble.
- ❑ Lower interrupting capacity circuit breakers may be used where inductors are included as part of the circuit.

When a fault occurs between phase conductors, generally much larger current flows occur than when a single phase to ground fault occurs. Because the tremendous flow of current between phases does not flow through the neutral path, it can best be limited by inductors in the phase leads rather than by a neutral inductor.

INDUCTOR NAMEPLATE RATINGS

All inductor should feature a nameplate rating, which includes, or indicates, one or more of the following:

- ❑ Continuous current carrying capacity
- ❑ Voltage
- ❑ Frequency
- ❑ Ohms or percentage drop

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Substation Inductor Maintenance

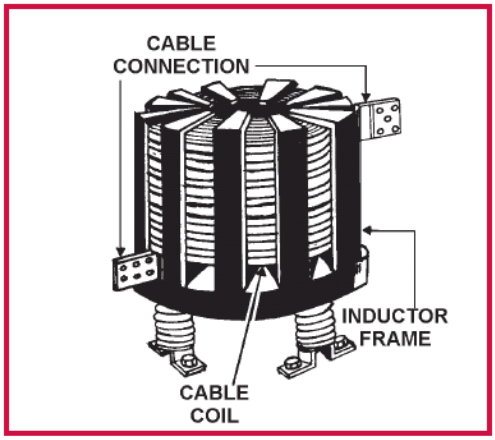
ComEd Technical Procedure
CM-CE-033953056

Rev. 0

Inductor Types Job Aid

INDUCTOR (DRY TYPE)

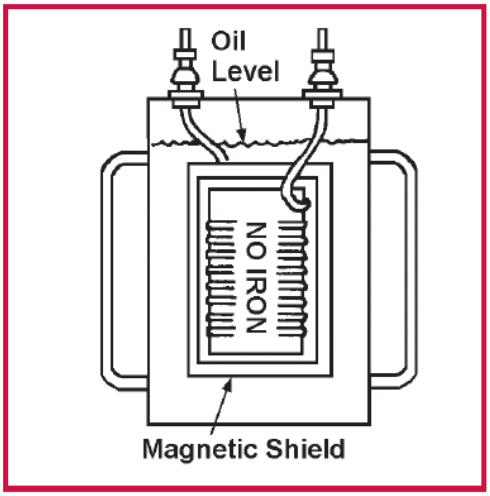
The majority of inductors on our system are the dry type. They consist of a large number of turns of cable wound in flat or conical layers, clamped or cast in an open framework, and mounted on insulator bases. Very little maintenance is required on the dry type inductor. They should be blown out occasionally and the insulators cleaned.



DRY INDUCTOR

INDUCTOR (OIL IMMERSED TYPE)

Oil immersed inductors are used for higher voltages, particularly on outdoor installations. They feature a magnetic shield that prevents heating of the outer tank from magnetic field effects. The oil provides better insulation between turns and also assists in cooling. Oil-filled inductors should be handled the same as a power transformer with regard to installation and maintenance.



OIL-FILLED INDUCTOR

Attachment CM-CE-033953056 -2
Page 1 of 1

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Substation Inductor Maintenance

ComEd Technical Procedure
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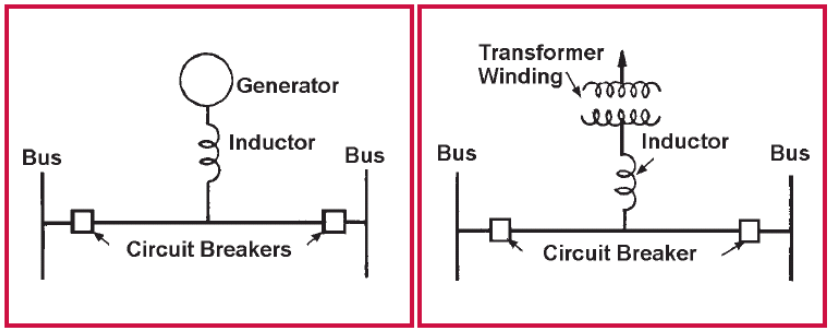
Rev. 0

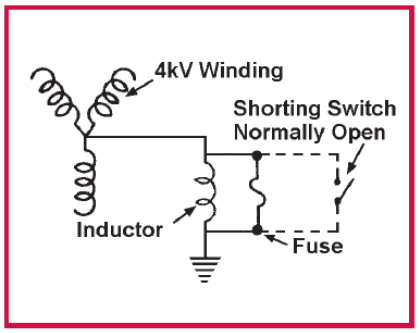
Application of Inductors Job Aid

Inductors are installed and connected to some generators, between a generator and the circuit breaker, and may also be connected to certain transformers throughout the system.



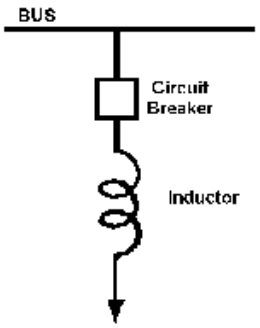
INDUCTOR CONNECTED TO GENERATOR (LEFT) AND TO TRANSFORMER (RIGHT)

A fuse may be installed in parallel with the inductor. Therefore, when a heavy fault occurs, the fuse will blow, leaving the inductor on the circuit to do its' job of limiting the fault current. While replacing a blown fuse, close the shorting switch.



4kV neutral connection for 12kV to 4kv transformers Inductors are also used on the load side of some generating station lines and in the lines from substations.

Inductors are used on the load side of some generating station lines and in the lines from substations circuit breakers.



Attachment CM-CE-033953056 -3
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Circuit Breaker Maintenance Overview

ComEd Technical Procedure
CM-CE-332953062
Rev. 0

Effective:	3/6/2020
Supersedes:	CM-ED-332001; OP-ED-332001
Level:	3
Review Type:	3 Year
Core Function:	Preventive Maintenance

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2. Precautions and limitations 2
3. Safety Measures and Environmental Concerns 2
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1. Purpose

1.1. To provide guidelines for ComEd and contract individuals involved in the performance of circuit breaker maintenance.

1.2. Section 6 has been divided into the following subsections:

Subsection	Title	Page
6.1	Circuit Breaker Types	3

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Circuit Breaker Maintenance Overview

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Subsection	Title	Page
6.1.1	Air Circuit Breakers (ACB)	4
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6.3.2	Maintenance functions to be performed:	6
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6.3.4	Restoration	7
6.4	Circuit Switchers	7

2. Precautions and limitations

2.1. Precautions

2.1.1 WHEN performing circuit breaker maintenance **BE AWARE** of inclement weather conditions and nearby conductors.

2.1.2 **REFER** to specific maintenance for each circuit breaker type in the particular manufacturers' documentation.

2.1.3 **NOTIFY** the Designated Authority that low pressure alarms associated with maintenance to be performed upon the affected circuit breaker will be activated.

2.2. Limitations

2.2.1 N/A

3. Safety Measures and Environmental Concerns

3.1. Safety Measures

3.1.1 Comply with all ComEd Safety expectations and procedures.

3.2. Environmental Concerns

3.2.1 Comply with all ComEd environmental expectations and procedures.

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Circuit Breaker Maintenance Overview

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4. Material and Special Equipment

4.1. Material

4.1.1 Lubricating oil.

4.1.2 Pressure test gauge for low pressure cutout switch calibration check.

4.1.3 Leak detection fluid.

4.1.4 De-greasing solvent.

4.1.5 Compressor intake filters.

4.1.6 Stainless steel cotter pins.

4.2. Special Equipment

4.2.1 N/A

5. Prerequisites

5.1. **INSPECT** all required equipment to ensure it is in good working condition.

5.2. BEFORE you work on a circuit breaker

5.2.1 **VERIFY** that a circuit breaker cannot be opened or closed automatically or remotely.

5.2.2 IF the circuit breaker has a pneumatic or hydraulic mechanism,

5.2.2.1 **REDUCE** the pressure in the supply tank to zero.

5.2.2.2 TO be sure the circuit breaker is not working **TRY TO OPERATE** the breaker.

5.2.3 IF the circuit breaker has individual operating bus switches or disconnecting devices,

5.2.3.1 **OPEN** the switch or device that.

5.2.3.2 IF you cannot open the switch or device, **DISCONNECT** the control wires AND/OR **BLOCK** the operating relays.

5.3. **NEVER ENTER** a circuit breaker tank WHILE it is being operated, UNLESS it is being worked by hand for an adjustment check.

5.4. BEFORE you trip a circuit breaker, UNLESS the devices are permanently fixed, **REMOVE** manual closing devices.

6. Procedure

6.1. Circuit Breaker Types

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Circuit Breaker Maintenance Overview

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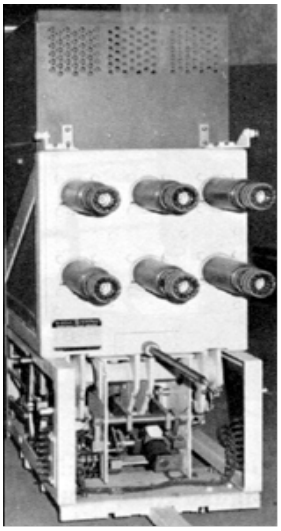


6.1.1 Air Circuit Breakers (ACB)

6.1.1.1 Used extensively in low voltage applications, such as switchboards, switchgear groups, and distribution panels.

6.1.1.2 Safer than an oil circuit breaker because the device does not use flammable oil.

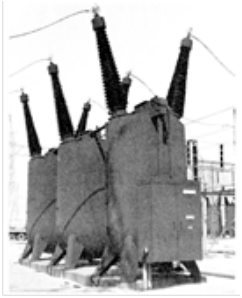
6.1.1.3 Affected by dampness, changing temperatures and dirt so they are contained in clean switch-rooms or adequate metal enclosures to ensure proper operation.

6.1.1.4 Arc extinguishing types:

6.1.1.4.1 Air blast

6.1.1.4.2 Magnetic blowout

6.1.1.4.3 De-ionizing method



6.1.2 Oil Circuit Breaker (OCB)

6.1.2.1 Used extensively in high current or voltage applications.

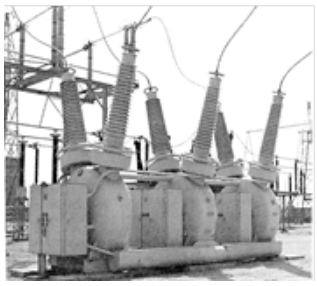
6.1.2.2 Oil provides a safer cooler and insulator than air.

6.1.2.3 Unaffected by varying weather conditions.

6.1.2.4 Oil extinguishes arc by stretching and cooling it at the same time while immersed in insulating oil.

6.1.3 Gas Circuit Breaker (GCB)

6.1.3.1 Used extensively in high voltage applications.



6.1.3.2 Uses Sulphur Hexafluoride (SF_6) Gas

6.1.3.2.1 Non-Flammable

6.1.3.2.2 Odorless.

6.1.3.2.3 Non-Toxic.

6.1.3.2.4 Excellent cooling properties.

6.1.3.2.5 Excellent dielectric characteristics.

6.1.3.3 Unaffected by varying weather conditions.

6.1.3.4 Commonly used dual pressure breaker is an alternate design.

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6.2. Circuit Breaker Operation

6.2.1 Specifications

6.2.1.1 Rated by the interrupting duty, usually expressed in kva, and by the time in cycles (usually eight (8) or less) it takes to completely interrupt the circuit.

NOTE: For example, circuit breakers may be required to interrupt 15,000 amperes at 138,000 volts in about three (3) cycles.

6.2.1.2 The rated current (also called continuous or load current) and the interrupting rating are shown on the data plate of a circuit breaker.

6.2.2 Construction

6.2.2.1 Load contacts carry the normal (or load) current.

6.2.2.2 Arc contacts carry the interrupting duty current.

6.2.2.3 **NOTE**: The arc contacts normally get replaced during any circuit breaker maintenance function.

6.2.3 Reclosure

NOTE: Once a circuit breaker has opened to interrupt current flow to a fault or line problem, it must be ready to reclose that circuit as soon as the problem has been cleared. Therefore, it is necessary to provide a stored source of reclosing power.

6.2.3.1 Reclosure Components

6.2.3.1.1 Spring assemblies.

6.2.3.1.2 Motor to compress closing springs

6.2.3.1.3 Trigger assemblies to discharge coiled springs

6.2.3.2 Reclosure Types

6.2.3.2.1 Large, pneumatically-operated circuit breakers are designed with sufficient reserve air pressure to open and close the breaker three (3) or more times, even if the electrically-operated compressor fails.

6.2.3.2.2 Other types of breakers charge a spring-return mechanism that recloses the breaker when the proper signal is received.

6.2.3.2.3 Some purely mechanical breakers provide both interrupting and reclosing energy from spring compression. Recharging motors or solenoids must operate electrically to charge these springs before the cycle can be repeated.

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6.2.3.2.4 **NOTE**: Most breakers will not reclose a circuit until the opening mechanism is properly charged, thus ensuring the breakers ability to open rapidly in the event of a main line problem. Breakers that cannot close until they are charged to trip are referred to as trip free breakers. Circuit breakers are operated electrically by energizing their closing and tripping solenoid coils. The control switches for closing or tripping usually are remote from the breaker itself.

6.2.3.3 Breaker Trip Position

6.2.3.3.1 Green signal lamp indicates the open position.

6.2.3.3.2 Red light indicates closed.

6.3. Circuit Breaker Maintenance

6.3.1 Preparing Equipment for Maintenance

6.3.1.1 **COMPLETE** required procedures to take equipment out-of-service.

6.3.1.2 **PERFORM** all required tests to **CONFIRM** that equipment is de-energized.

6.3.2 Maintenance Functions to be Performed

6.3.2.1 **DRAIN** the air compressor oil reservoir

6.3.2.2 **REPLACE** air compressor oil reservoir with appropriate oil.

6.3.2.3 **REPLACE** air compressor intake filters.

6.3.2.4 **CHECK** for signs of oil leaks, as applicable.

6.3.2.5 IF necessary, **REPLENISH** oil, as needed.

6.3.2.6 **INSPECT** all cotter pins

6.3.2.7 IF necessary, **REPLACE** any worn or damaged cotter pins with stainless steel pins.

6.3.2.8 **INSPECT** all rollers for flat spots.

6.3.2.9 IF necessary, **REPLACE** rollers.

6.3.2.10 **CHECK** all moveable surfaces

6.3.2.10.1 Excessive oil

6.3.2.10.2 Grease buildup

6.3.2.11 IF necessary, **CLEAN** excessive oil or grease buildup with solvent

6.3.2.12 IF necessary, **RE-OIL** with 3-in-1 oil or 30W oil.

6.3.2.13 **CHECK** low-pressure cutouts for proper pressure setting.

6.3.2.14 **LIFT** wires at pressure switch.

6.3.2.15 **CHECK** alarm circuit for proper pressure setting.

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6.3.2.16 **LIFT** wires at pressure switch.

6.3.2.17 **CHECK** latch switches for visible cracks.

6.3.2.18 **CHECK** all heaters to ensure proper operation.

6.3.2.19 IF necessary, **BYPASS** thermostat.

6.3.3 Miscellaneous Functions

6.3.3.1 **CHECK** all air lines and connections for air leaks.

6.3.3.2 **CHECK** oil level gauge at top of bushings for proper oil level.

6.3.3.3 Visually **CHECK** each bushing for oil leaks/damage.

6.3.3.4 **CHECK** each tank oil level gauge for proper oil level.

6.3.3.5 **CHECK** that counter is working properly.

6.3.3.6 **CHECK** that all mechanism bolts/nuts to cabinet and breaker are tight.

6.3.3.7 **CHECK** breaker hold-down bolts to foundation for tightness.

6.3.4 Restoration

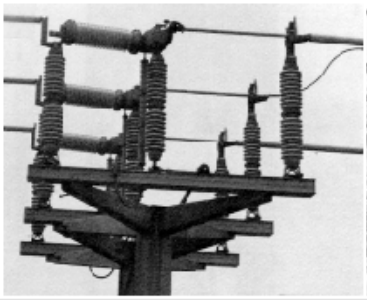
6.3.4.1 **RETURN** all wires, valves, pins, etc., to normal in-service positions.

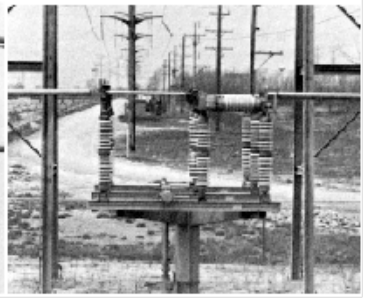
6.3.4.2 **COMPLETE** Protective Card Procedures to **CLEAR** outage cards.

6.3.4.3 **FOLLOW** all required procedures to return the circuit breaker to service.

6.4. Circuit Switchers

NOTE: Load-break protective device for outdoor use resemble high voltage disconnects with certain additions.





Most are motor operated, and trip open automatically in the event of a circuit overload.

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NOTE: If a fault occurs on the secondary or in the transformer itself, the circuit switcher opens the circuit in less than one (1) second.

NOTE: A power circuit breaker can do the job in a much shorter time (often in less than three cycles), but in the majority of overload situations, the slower circuit switcher provides adequate protection for the equipment at a cost far less than that of a power circuit breaker.

7. Return to Normal

7.1. **REMOVE** all debris.

7.2. **DISPOSE** of all debris properly.

8. Roles and Responsibilities

8.1. Managers

8.1.1 Ensure compliance to this procedure.

8.2. Supervision

8.2.1 ComEd Methods Group owns this procedure.

8.2.2 ComEd Methods Group Subject Matter Experts (SMEs) and Supervisors are accountable for the content and process of the procedure.

8.3. Employees/Workers

8.3.1 All ComEd, contractor or vendor personnel performing work within the ComEd service area shall comply with:

8.3.1.1 This procedure.

8.3.1.2 ComEd Fundamentals.

8.3.1.3 ComEd Safety Rule Book.

8.3.1.4 Employee Code of Conduct.

8.4. All other Corporate and ComEd policies, programs, procedures, and expectations appropriate to the work being performed

9. Documentation

9.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

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Circuit Breaker Maintenance Overview

ComEd Technical Procedure
CM-CE-332953062
Rev. 0

10. Terms and Definitions

10.1. Refer to CM-EU-010006, EU Technical Glossary for terms and definitions.

11. References

11.1. CM-EU-010006, EU Technical Glossary

11.2. LE-AC-401 – Records and Information Management Retention and Disposition.

12. Attachments

12.1. N/A

13. Development history

Revision 0	**Date: 10/29/2004**
Writer	Steve Pinciotti (Methods), Ed Bengson (Methods)
Reviewer(s)	Kevin Kinnerk (Methods), Tom Lambert (Methods), Frank Hess (Methods), Matt Morson (Methods), Rodney Walker (Methods), Clyde Behrens (Methods)
UFAM Approver(s)	Don Pellegrini, Jeff Wolfrom
Reason written	EED Procedure Upgrade Project

Revision 1	**Date: 5/31/2005**
Writer	Steve Pinciotti (Methods), Ed Bengson (Methods)
Reviewer(s)	Kevin Kinnerk (Methods), Tom Lambert (Methods), Frank Hess (Methods), Matt Morson (Methods), Rodney Walker (Methods), Clyde Behrens (Methods)
UFAM Approver(s)	Kelvin Owens
Reason written	Procedure Renumbering

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Circuit Breaker Maintenance Overview

ComEd Technical Procedure
CM-CE-332953062
Rev. 0

Revision 0 CM-CE-332953062	**Date: 3/6/2020**
Writer	Ed Bengson (Methods)
Reviewer(s)	Omar Maldonado, Sr. Methods Specialist
UFAM Approver(s)	Danilo J. Brea, Dir. Trans & Substations
Reason written	This revision satisfies the required 3 year review in accordance with the guidelines for this procedure. This procedure was updated to the new template. This procedure supersedes CM-ED-332001 which was archived due to the fact it was no longer used by PECO. This is a ComEd only procedure and was renumbered using the current Management Model numbering scheme. There were no updates to this procedure.

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Scheduled Cathodic Protection Calibration Survey

ComEd Process
CM-CE-P025
Rev. 3

Effective:	4/3/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

Table of Contents

1. Purpose 1
2. Precautions and limitations 2
3. Process 2
4. Roles and Responsibilities 5
5. Documentation 6
6. Terms and Definitions 7
7. References 9
8. Attachments 10
9. Development history 10

1. Purpose

1.1. To provide guidelines for performing the scheduled survey for cathodically protected underground structures. The structures vary from:

1.1.1 Directly buried or inducted lead sheathed cables.

1.1.2 Bare copper concentric cables.

1.1.3 Pipe type cables.

1.1.4 Microwave tower anchors and tower base.

1.2. The survey is performed at a particular site to assess.

1.2.1 The performance of the different hardware components of the cathodic protection system.

1.2.2 The corrosion control effectiveness for that particular buried underground structure.

1.3. These surveys are performed at the frequency set per PCM templates.

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1.3.1 AM-CE-P034-R3012 Cathodic Protection Equipment, Distribution PCM Template

1.3.2 AM-ED-P034-R2009 Cathodic Protection Equipment, UGT PCM Template

2. Precautions and limitations

2.1. Precautions

2.1.1 N/A

2.2. Limitations

2.2.1 N/A

3. Process

3.1. Summary

3.1.1 For each cathodic protection component (regardless of the structure to be surveyed), the following steps are performed.

3.1.1.1 Verify parameter data as recorded in Asset Suite 8 (AS8).

3.1.1.2 Set the path to perform the survey.

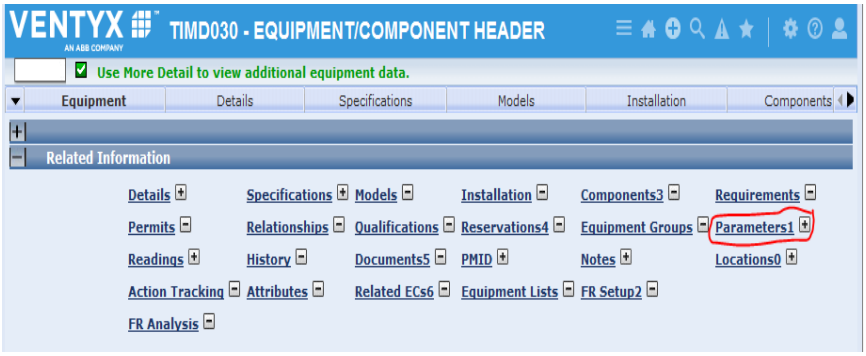
3.1.1.3 Assess the condition of the cathodic protection main components.

3.1.1.4 Perform, test and record applicable readings.

3.1.1.5 Complete the “Parameters”/”Reading” records in AS8.

3.2. AS8 Entry Review

3.2.1 Before the survey, the AS8 “Parameter” record for each of the cathodic protection system (EM) component is accessed and the information is either completed, to be verified or will be corrected as a result of the survey.



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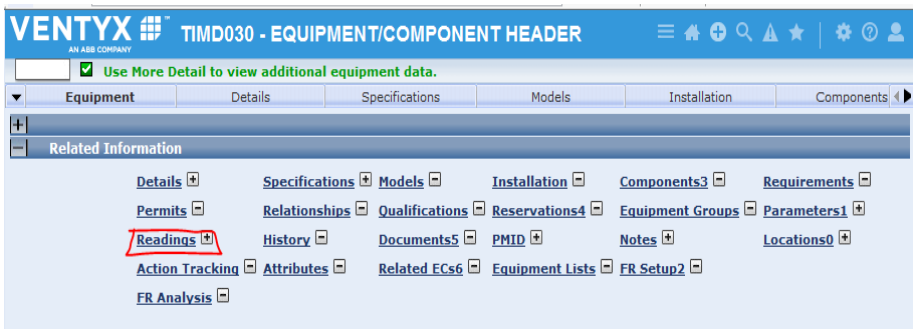
3.2.2 The “AS8 “Readings” record for each of the cathodic protection (EM) component is to be prepared for the survey.



3.3. Field Survey

3.3.1 The actual activities during the survey will be dependent on the current status of the cathodic protection main equipment rectifier for the impressed current system or the galvanic anode for the galvanic cathodic protection system.

3.3.2 If there is measurable rectifier or galvanic anode output, the surveyor,

3.3.2.1 Verifies the entry for the component “Parameter” panel.

3.3.2.2 Measures and records the required measurement for each component “Reading” panel such as but not limited to:

3.3.2.2.1 Measures and records the anode output.

3.3.2.2.2 Verifies the structure-to-electrolyte potential.

3.3.2.2.3 Measures and records for “ON”/I “OFF” current.

3.3.2.3 If there is **no** measurable rectifier or galvanic anode output, the surveyor,

3.3.2.3.1 Measures and records the structure-to-electrolyte as “Static” reading.

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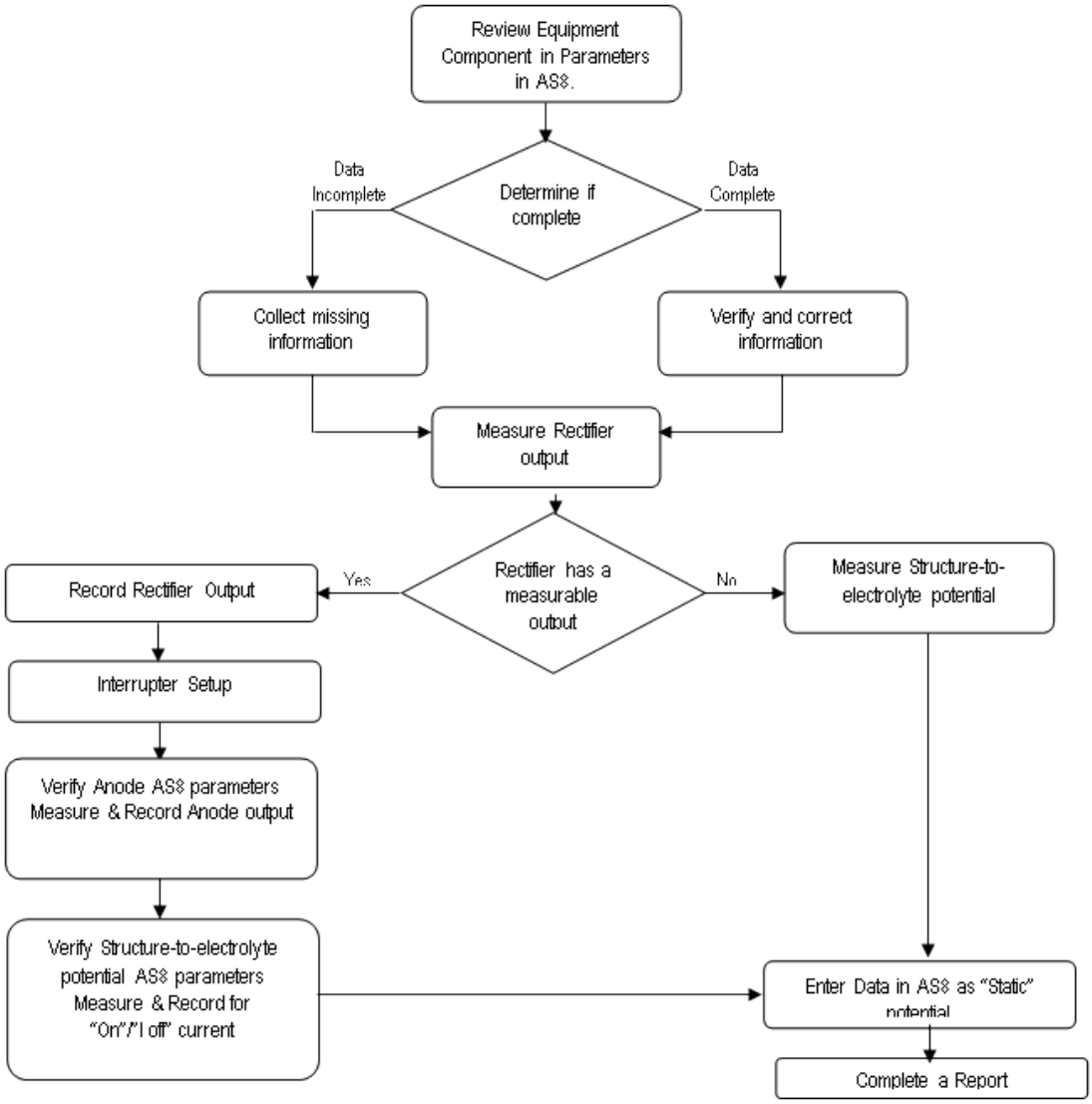
3.4. Process Flow Diagram



3.4.1 Process Flow Chart

3.4.1.1 N/A

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3.5. Process listing (list key process elements)

#	Process Element	Description	Performed By
N/A			

3.6. Assumptions

3.6.1 N/A

4. Roles and Responsibilities

4.1. Corrosion Engineer

4.1.1 **SETS** the survey requirements.

4.1.2 **MAINTAINS** the procedure.

4.1.3 **ASSESSES** the condition of the systems based on the feedback from the field.

4.1.4 **DEVELOP** procedures for each type/class of equipment which needs this type of survey, ensuring that the instructions are compliant with this process.

4.2. Field Corrosion Technicians

4.2.1 **PERFORM** the survey AND **COLLECT** data.

4.2.2 **ENTER** in AS8.

4.2.3 **INITIATE** work request to repair malfunction equipment/CP system.

4.2.4 **GENERATE** work request to initiate repairs to equipment and/or systems.

4.2.5 **GENERATE** report containing field observation and recommendations for Corrosion Engineer for analysis.

4.3. Compliance and Success Measures

4.3.1 For each job,

4.3.1.1 **ENSURE** that a job brief is conducted to verify the qualifications of the personnel and compliance with,

4.3.1.1.1 CM-ED-050001 Flagging and Robust Operational Barriers to Prevent Errors

4.3.1.1.2 OP-EU-050003 Lockout Tag Out Procedure

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4.3.2 **VERIFY** that all ComEd, contractor or vendor personnel involved are trained and qualified in the equipment and procedures to be used.

4.3.3 For each job, **ENSURE**, inspect, and prepare all needed testing tools such as:

4.3.3.1 Meters.

4.3.3.2 Test leads.

4.3.3.3 Reference Electrode/cells.

4.3.3.4 Submersible connectors.

4.3.3.5 Interrupter units.

4.3.4 **PREPARE** documentation such as:

4.3.4.1 AS8 screen print of the “Parameter” panel for each component.

4.3.4.2 AS8 screen print of the “Reading” panel for each component.

4.3.4.3 A useful copy of the EM map of the system to be surveyed.

4.4. Document Writers and Reviewers

4.4.1 **BE AWARE** that Corrosion Control Engineers own this process.

4.4.2 **BE AWARE** that Corrosion Control Engineer.

4.4.2.1 Is accountable for the content of this process.

4.4.2.2 Must review any revisions to this process and applicable reference documents.

5. Documentation

5.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

5.2. Test results are recorded in AS8 and maintained indefinitely.

5.3. As required, the surveyor creates a Work Request for any repair/replacement work deemed necessary.

5.4. The Surveyor

5.4.1 Prepares a report using attachment CM-CE-P025-2 Transmission Services Corrosion Report CP Calibration.

5.4.2 Inserts/attaches the report in the equipment main panel and/or Work Request under “Document”.

5.4.3 Submits it to the Corrosion Engineer for review and analysis.

5.5. The Corrosion Engineer

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5.5.1 Reviews the report.

5.5.2 Determines if the proposed repair/replacement work is appropriate.

5.5.3 Updates/Prepares a PDF file of the EM map.

5.5.4 Ensures that a most recent PDF file of the EM map is left in the equipment panel.

6. Terms and Definitions

NOTE: The following definitions were edited from NACE glossary.

6.1. Anode

6.1.1 The electrode of an electrochemical cell from which electrons flow away in the external circuit.

6.2. Cables

6.2.1 Bare Concentric Cables

6.2.1.1 Power cables constructed such as copper bare wires constituting the shield/ground are wound circumficially on the outside of the cable.

6.2.2 Bare Lead Sheathed Cables

6.2.2.1 Power cables constructed such as the outer sheath is bare and non-jacketed.

6.2.3 Jacketed Cable

6.2.3.1 Power cable constructed with an outer non-conductive coating.

6.2.4 Pipe Type Cable

6.2.4.1 A high voltage cable placed in a coated steel pipe. In most cases the three phases are intertwined inside the pipe. The coated steel pipe acts as sturdy barrier to protect the transmission cables.

6.3. Cathode

6.3.1 The electrode of an electrochemical cell toward which the electrons flow in the external circuit.

6.4. Cathodic Protection

6.4.1 A technique to reduce the corrosion of a metal surface by making that surface the cathode of an electrochemical.

6.5. Coating

6.5.1 A liquid, liquefiable, or mastic composition that, after application to a surface, is converted into a solid protective, or functional adherent film. Coating is also a solid wrap with adhesion property that is applied to a structure to isolate it from its surrounding.

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6.6. Corrosion

6.6.1 The deterioration of a material, usually a metal that results from its reaction with its environment.

6.7. Criterion

6.7.1 A standard for assessment of the effectiveness of a cathodic protection system.

6.8. Electrode

6.8.1 A conductor used to establish a good contact with an electrolyte and through which current may/may not be transferred to or from the electrolyte.

6.9. Electrolysis Map (EM)

6.9.1 A sketch or drawing depicting the cathodic protection system component and their location.

6.10. Electrolyte

6.10.1 Moist soil or liquid containing dissolved chemical ions free to migrate in an electric field. The soil or the liquid must be in contact with a buried or submerged metallic structure.

6.11. Galvanic Anode

6.11.1 A metal that reacts with the electrolyte giving up electrons when electrically coupled with a more noble metal.

6.12. Holiday

6.12.1 A discontinuity in a protective coating that exposes the underlying metal to the environment.

6.13. Impressed Current

6.13.1 A DC current supplied by a rectifier forcing the discharge of electrons from the anode.

6.14. Instant Off Potential

6.14.1 A measurement of a structure-to-electrolyte potential taken following the interruption of cathodic protection system.

6.15. Interference

6.15.1 Any electrical disturbance on a metallic structure as a result of stray current.

6.16. NACE

6.16.1 National Association of Cathodic Engineers.

6.17. Polarization

6.17.1 The change from the open-circuit potential as a result of current across the structure/electrolyte interface.

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6.18. Polarized Potential

6.18.1 The potential across the structure/electrolyte interface at which the reaction is at "equilibrium".

6.19. Reference Electrode

6.19.1 An electrode whose open-circuit potential is constant under similar conditions of measurement, which is used for measuring the relative potentials of other electrodes.

6.20. Stray Current

6.20.1 Current through paths other than the intended circuit.

6.21. Structure-to-Electrolyte Potential

6.21.1 The potential difference between the pipe metallic surface and electrolyte that is measured with reference to an electrode in contact with the electrolyte.

6.22. Test Lead

6.22.1 A wire or cable attached to a structure for connection of a test instrument to make a measurement.

6.23. Voltage

6.23.1 An electromotive force or a difference in electrode potentials expressed in volts.

7. References

7.1. CM-CE-027009 Scheduled Cathodic Protection Survey-Directly Buried Cable or Inducted Lead Sheathed Cables

7.2. CM-CE-027010 Scheduled Cathodic Protection Survey: Bare Copper Concentric Cables

7.3. CM-CE-027011 Scheduled Cathodic Protection Survey: Pipe Type Cables

7.4. CM-CE-027012 Scheduled Cathodic Protection Survey: Microwave Tower Anchors and Tower Base

7.5. ComEd Fundamentals

7.6. ComEd Safety Rule Book

7.7. Employee Code of Conduct

7.8. LE-AC-401 – Records and Information Management Retention and Disposition.

7.9. OP-EU-010006, EU Technical Glossary

7.10. OP-EU-050003, Lockout Tag Out Procedure

7.11. OP-EU-050003-R0001, Workers Alteration Log Sheet

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Scheduled Cathodic Protection Calibration Survey

ComEd Process
CM-CE-P025
Rev. 3

8. Attachments

8.1. CM-CE-P025-1, Lessons Learned – Suggested Process Improvement

8.2. CM-CE-P025-2, Transmission Services Corrosion Report CP Calibration

9. Development history

Revision 0	**Date: 7/15/2008**
Writer	Youssef Tabib (Corrosion Engineering)
Reviewer(s)	Robert Barczak (Corrosion Engineering)
UFAM Approver(s)	William Forst (T&S) and Gus Ponce
Reason written	To provide guidelines for performing the annual survey for cathodically protected underground structures. The structures vary from directly buried or inducted lead sheathed cables, pipe type cables and microwave tower anchors and tower base.

Revision 1	**Date: 11/10/2008**
Writer	Youssef Tabib (Corrosion Engineering)
Reviewer(s)	N/A (no history for Reviewer)
UFAM Approver(s)	William Forst (T&S) and Gus Ponce
Reason written	To rename the process from Annual to Scheduled.

Revision 2	**Date: 2/9/2012**
Writer	Youssef Tabib (Corrosion Engineering)
Reviewer(s)	Samantha Guenette (Corrosion Field Supervisor), Youssef Tabib (Corrosion Control Engineer)
UFAM Approver(s)	Gus Ponce (T&S), Isaac Akridge (Distribution Ops)
Reason written	Following scheduled periodic review, no significant content revisions were deemed necessary, the format was revised to meet current standards

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Scheduled Cathodic Protection Calibration Survey

ComEd Process
CM-CE-P025
Rev. 3

Revision 3	**Date: 4/3/2018**
Writer	Youssef Tabib (TLE)
Reviewer(s)	Youssef Tabib (TLE)
UFAM Approver(s)	Mark R. Baranek, Dir. Transmission (on behalf of Daniel J. Brea who is on special assignment until 3/14/18)
Reason written	This revision satisfies the required 3-year review in accordance with the guidelines for this procedure. References to PassPort were replaced with Asset Suite 8 (AS8). This procedure was updated to the new template.

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Scheduled Cathodic Protection Calibration Survey

ComEd Process
CM-CE-P025
Rev. 3

Lessons Learned - Suggested Process Improvement
Page _____ of _____

Proc Line #	Equipment Type / Part	Revision / insertion / deletion

Attachment CM-CE-P025-1

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Scheduled Cathodic Protection Calibration Survey

ComEd Process
CM-CE-P025
Rev. 3

BY: _____ **DATE:** _____ **WO#:** _____

REGION: _____ **LINE:** _____ **EM MAP:** _____

CORROSION CONTROL

SUMMARY OF JOB: **PERFORM CP CALIBRATION:**

SET INTERRUPTER: ☐YES ☐NO ☐NA

RESULTS: **RECTIFIER OPERATING:** ☐YES ☐NO ☐NA

READINGS: ☐ENTERED IN PASSPORT UNDER ITS RESPECTIVE COMPONENT.

CONCLUSIONS: **SYSTEM FUNCTIONALITY AS WHOLE IS:**

☐SATISFACTORY ☐NOT SATISFACTORY

RECTIFIER OPERATING: ☐YES ☐NO

ANODES FUNCTIONING: ☐YES ALL ☐NO ☐NA

ANODE BED FUNCTIONING: ☐YES ALL ☐NO ☐NA

RECOMMENDATION: **RECTIFIER:** ☐FIX **WR#** _____ ☐NA

☐REPLACE **WR#**_____

ANODE REPLACE: ☐NONE

REPLACED _____ * **WR#** _____

*SPECIFY REPLACED ANODE(S) LOCATION

_____
_____
_____

Attachment CM-CE-P025-2

Page 1 of 1

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On-Board/Orientation Process For C&M First Line Supervisors

ComEd Process
CM-CE-P055
Rev. 3

Effective:	12/17/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Corrective Maintenance

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2. Precautions and limitations 1
3. Process 2
4. Roles and Responsibilities 5
5. Documentation 6
6. Terms and Definitions 7
7. References 8
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9. Development history 10

1. Purpose

1.1. To provide guidelines to Line Management on required orientation, training, evaluation and oversight for Field C&M First Line Supervisors (FLS), effectively developing and implementing a process that can be used for new First Line Supervisors as they are assigned to their specific work group.

1.2. Within 3 months of assignment, all subject areas required in this process

1.2.1 Are to be scheduled for starting First Line Supervisors

1.2.2 Are to be successfully completed within twelve months of assignment.

1.3. The First Line Supervisor is expected to be in full compliance prior to and during the performance of assigned work in the field

2. Precautions and limitations

2.1. Precautions

2.1.1 None

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On-Board/Orientation Process For C&M First Line Supervisors

ComEd Process
CM-CE-P055
Rev. 3

2.2. Limitations

2.2.1 This process will **not** take the place of, or interfere with the established Supervisor Development Program.

3. Process

3.1. Summary

3.1.1 This process it is strictly for the On Boarding of new hires during a specified time as they become acclimated to their new position as an FLS.

Section	Topic	Page
3.2.	Key Development Training	4
3.3.	Labor Relations:	4
3.4.	Field / Emergent Work Supervisor Key Elements	4
3.4.1.	Safety	4
3.4.2.	Human Resources	5
3.4.3.	Timekeeping	5
3.4.4.	Daily FLS Tasks	5
3.4.5.	CDL Guidelines	6
3.4.6.	FERC (Applicable to Specific Departments Ex Operations)	6
3.4.7.	Training Needs	6
3.4.8.	Technical	6
3.5.	JULIE/ DIGGER Training	7

3.2. KEY DEVELOPMENT TRAINING:

3.2.1 Key development areas for new FLS's

3.2.1.1 Safety

3.2.1.2 Human Resources, Employee & Labor Issues

3.2.1.3 Technical Overview

3.2.1.4 Administrative Overview (Daily FLS Tasks)

3.2.1.5 Systems Information Overview

3.2.1.6 Individual Development

3.3. LABOR RELATIONS:

3.3.1 Labor Issues (Collective_Bargaining Agreement, ARCOS, Valtin)

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3.3.1.1 ComEd labor Issues (CBA)

3.3.1.2 Employee Standards of Conduct

3.3.1.3 Consensus Call Process

3.3.1.4 Overtime Scheduling

3.3.1.5 Valtin (Arbitration Award)

3.3.1.6 MARC Training

3.4. FIELD / EMERGENT WORK SUPERVISOR KEY ELEMENTS

3.4.1 Safety

3.4.1.1 Exelon Safety Philosophy

3.4.1.2 Safety Rulebook

3.4.1.3 Proper Personal Equipment (PPE)

3.4.1.4 Injury Reporting (OHS)

3.4.1.5 BAPP Training / Required Observations

3.4.2 Human Resources

3.4.2.1 Human Resources Philosophy

3.4.2.2 Occupational Health Services (OHS)

3.4.2.3 Fitness for Duty

3.4.2.4 FMLA

3.4.2.5 Attendance Policy

3.4.2.6 EAP

3.4.2.7 Corporate Security/Violence in the Workplace Awareness

3.4.3 Timekeeping

3.4.3.1 Roles and Responsibilities

3.4.3.2 Understanding of Project Codes (Capital and O&M splits)

3.4.3.3 Passport / Work Orders

3.4.3.4 Opex Resource Codes

3.4.4 Daily FLS Tasks

3.4.4.1 Event Free Tool Book / Human Performance

3.4.4.2 Crew Make-Ups

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3.4.4.3 Work Management Process

3.4.4.4 Morning Huddle

3.4.4.5 Audits (Critical Task, Safety, Yard Dog)

3.4.4.6 Job Walk Downs

3.4.4.7 Customer Relations

3.4.4.8 Structured Report Outs (ACE, Condition reports)

3.4.4.9 SRS / Switching Routines

3.4.4.10 Duty Responsibilities (OCC / Designated Authority-LD OD)

3.4.5 CDL Guidelines

3.4.5.1 Federal Motor Carrier Act

3.4.5.2 Fatigue Issues / Fitness for Duty

3.4.5.3 RVA Responsibilities

3.4.5.4 Choice Point

3.4.6 FERC (Applicable to Specific Departments Ex Operations)

3.4.6.1 Roles and Responsibilities

3.4.7 Training Needs

3.4.7.1 Outlook (Passwords & User ID's)

3.4.7.2 Passport

3.4.7.3 ARCOS

3.4.7.4 SRS System

3.4.7.5 CAIDI All Call

3.4.7.6 OMS (Net Cad Ops)

3.4.7.7 Drive Cam

3.4.7.8 PECS

3.4.7.9 FLS Peer Group Website

3.4.7.10 SRP Website

3.4.7.11 Mobile Dispatch

3.4.8 Technical

3.4.8.1 Work Practices & Procedures

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3.4.8.2 Critical Tasks (Overhead, Underground, Transmission OH, Transmission UG, Operations, etc)

3.4.8.3 SPEC / Standards Book

3.4.8.4 Map Reading

3.4.8.5 LOTO (Lock Out Tag Out)

3.4.8.6 Job Set Up

3.4.8.6.1 Job Briefing

3.4.8.6.2 ZOP (Zone of Protection)

3.4.8.6.3 Work Area Protection

3.4.8.6.4 Working on Energized Equipment

3.5. JULIE/ DIGGER Training

3.5.1 Completes all evaluation forms

3.5.2 Ensures an adequate work area protection zone of protection is established if required.

3.6. Process Flow Diagram

3.6.1 None

3.7. Process listing (list key process elements)

#	Process Element	Description	Performed By
N/A	N/A	N/A	N/A

3.8. Assumptions

3.8.1 None

4. Roles and Responsibilities

4.1. MANAGER:

4.1.1 **UNDERSTAND** the requirement that all criteria, expectations and topics in this document are assigned to starting construction Front First Line Supervisors.

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4.1.2 **ENSURES** that this process' scheduling and completion time requirements are enforced..

4.1.3 REVIEW Front First Line Supervisor existing personnel/working file, experience and training records to assist with determination of appropriate development.

Note: Prioritization of training needs from a Personal Individual Development Perspective

i. Exelon New Hire Orientation
ii. Introduction to the Industry (ex Regulatory, Transmission and Distribution knowledge)
iii. Leadership / Chain – of – Command
iv. Organizational Savvy (protocol)
v. Business Acumen (Organizational Chart and Protocol)
vi. E-Talent
vii. IDP (Individual Development Plan)
viii. Career Management Tool (To include Performance and Development Plan)
ix. SDP (Supervisor Development Program)

4.2. DOCUMENT WRITERS AND REVIEWERS

4.2.1 **BE AWARE** that Construction And Maintenance owns this process.

4.2.2 **BE AWARE** that Construction And Maintenance Subject Matter Expert and Supervisors

4.2.2.1 Are accountable for the content of this process.

4.2.2.2 Must review any revisions to this process and applicable reference documents.

4.2.3 **BE AWARE** that Human Relation SMEs must review any revisions to this process and applicable reference documents.

4.3. FIRST LINE SUPERVISOR:

4.3.1 **UNDERSTAND** AND **FOLLOW** this process to better implement the systems, processes and practices necessary to perform their new roles so as to safely and successfully execute their responsibilities and meet expectations.

5. Documentation

5.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

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5.2. Use CM-CE-P055-R0001 On-Board/Orientation Process For First Line Supervisors Task List to track the dates of completion on significant processes/events.

6. Terms and Definitions

6.1. Coaching

6.1.1 Providing task-related information, direction, answers, responses, or signals to a trainee, or intervening in any other way, which could affect the independent nature of a trainee's task performance.

6.2. Discuss (D)

6.2.1 A performance level designation performed through discussion of a task and required performance standards using procedures, manuals, drawings, photos, prints, or similar equipment. This option will only be used if system equipment or realistic simulation is not readily available.

6.3. Independent Task Performance

6.3.1 Designation of a qualified individual to effectively and safely perform job tasks without direct and continued supervision.

6.4. Job Performance Measure (JPM)

6.4.1 Detailed, objective criteria against which the ability of a trainee to perform a particular task is measured and documented.

6.5. OJT/TPE Observation

6.5.1 A formal evaluation of an OJT or TPE session to determine if OJT/TPE was conducted in an effective manner and if the OJT Trainer/TPE Evaluator performance standards were met.

6.6. On-The-Job Evaluation (OJE)

6.6.1 Structured assessment activities conducted in the job environment, through which trainees demonstrate abilities learned during OJT for the purpose of qualification, prior to independent job/task assignment.

6.7. On-The-Job Evaluation (OJE) Evaluator

6.7.1 A designated individual who conducts OJE under the direction of line supervision. (Also applies to TPE Evaluator).

6.8. On-The-Job Trainer

6.8.1 A qualified job incumbent (or designated subject matter expert) who conducts OJT under the direction of line supervision.

6.9. On-The-Job Training (OJT)

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6.9.1 Structured training activities conducted in the job environment, through which trainees achieve defined learning objectives.

6.10. Perform (P)

6.10.1 A performance level designation using system equipment, simulator, classroom, or laboratory to demonstrate performance of a task in accordance with the performance standards. When performing a task in the simulator classroom or laboratory setting, equipment similar to system equipment shall be used.

6.11. Qualification Task Log

6.11.1 Received in training, the booklet identifies training experiences and job tasks that are part of the development for each skill-area including Performance Tasks that each trainee's Mentor crew leader, First Line Supervisor (FLS), and reporting center manager must approve of via sign-off, as the trainee demonstrates the given task(s)

6.12. Simulate (S)

6.12.1 A performance level designation that creates a realistic representation of task performance by simulating performance while explaining the task, expected responses, and required performance standards. When simulating a task in the simulator classroom, or laboratory setting, equipment similar to system equipment shall be used.

6.13. Task

6.13.1 A particular work assignment. In the terminology of training programs, the term "task" typically denotes a specific, narrowly defined activity that falls within the scope of a job category. However, since related tasks are often grouped for work assignment qualification, the term "task" may refer to one task, or a grouping of several related tasks.

6.14. Task Performance Evaluation (TPE)

6.14.1 A formal evaluation based on performance standards (conducted at the job site, in the simulator, classroom, in a mock-up, or in the laboratory) to determine a trainee's ability to independently perform a task.

Note: OJE, TPE, and JPM are functionally equivalent terms with the main difference in them being setting and task scope. For the purpose of this document, will be used TPE to avoid confusion.

7. References

7.1. LE-AC-401 – Records and Information Management Retention and Disposition.

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On-Board/Orientation Process For C&M First Line Supervisors

ComEd Process
CM-CE-P055
Rev. 3

7.2. CM-CE-P055-R0001 On-Board/Orientation Process For First Line Supervisors Task List

8. Attachments

8.1. None

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On-Board/Orientation Process For C&M First Line Supervisors

ComEd Process
CM-CE-P055
Rev. 3

9. Development history

Revision 0	**Date: 11/24/2008**
Writer	Dwayne K Barlow Training)
Reviewer(s)	All appropriate UFAMS for ComEd and PECO
UFAM Approver(s)	Gus Ponce, William Forst, Peter Singh and Frank Gabrieli
Reason written	To provide guidelines to Line Management on required orientation, training, evaluation and oversight for C&M First Line Supervisors, effectively developing and implementing a process that can be used for new First Line Supervisors as they are assigned to their specific work group

Revision 1	**Date: 5/25/2015**
Writer	N/A
Reviewer(s)	N/A
UFAM Approver(s)	N/A
Reason written	Moved to new template; no content revisions included.

Revision 2	**Date: 12/15/2015**
Writer	Susan Gasper
Reviewer(s)	Craig Chesley; Michael Martin; Gus Ponce
UFAM Approver(s)	Mike Meathe
Reason written	Periodic review performed; no content revisions included.

Revision 3	**Date: 12/17/2018**
Writer	Susan Gasper (Distribution Ops)
Reviewer(s)	Craig Chesley (Utility Perf Assessment); Gus Ponce (Utility Integration)
Safety Approver(s)	Jack Craighead (Safety)
UFAM Approver(s)	Adam St Pierre – CM UFAM
Reason written	Periodic review performed; no content revisions included.

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Inspection Process for Distribution Manholes And Components

ComEd Process CM-CE-P319 Rev. 5

Effective:	7/31/2017
Supersedes:	CM-CE-221002
Review Type:	3 Year
Core Function:	Preventive Maintenance

Table of Contents

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2. Precautions and limitations 2
3. Process 2
4. Roles and Responsibilities 5
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1. Purpose

To provide guidelines and requirements for

- The visual inspection (required whenever work is to be performed or as required by existing inspection program(s)) of manholes and the equipment (components) contained within manholes

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- The prioritization of the work required to correct abnormalities found
- Identifying and communicating work required to departments other than C&M

2. Precautions and limitations

2.1. Precautions

2.1.1 **VERIFY** that all EED, contractor or vendor personnel involved are trained and qualified in the equipment and procedures to be used.

2.1.2 **FOLLOW** SA-ED-P406 Confined Space and Hazardous Entry Process procedure throughout the inspection process.

2.1.3 WHEN entering a manhole where the floor is **not** completely visible, **USE CAUTION** in determining the condition of those manhole floors you cannot see.

2.1.4 600V CABLES

- **BE AWARE** that insulation from 600V cables can breakdown and form combustible gas to accumulate at the floor or ceiling level as well as in the ambient air.
- **PAY** special attention to locations were 600V cables are present.

2.2. Limitations

2.2.1 None

3. Process

3.1. Summary

3.1.1 The inspections are performed by CM field personnel, following CM-CE-P319-R0001. Form and submitting the data gathered either in hard copy reports or via electronic methods.

3.2. Manhole Inspections are required anytime a crew enters the manhole, the crew is or a shift change occurs.

3.2.1 The data collected shall include information on

- Air quality
- Condition of the Structure
- Condition on the Cables
- Condition of Equipment

3.2.2 Defective conditions identified by the visual manhole inspection shall be recorded, when safety, reliability, or operation of equipment could otherwise be affected (under normal and abnormal circumstances) before the next inspection cycle.

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3.2.3 The inspections shall include mapping of the structure and its contents as well as any discrepancies found.

3.2.4 The inspections shall include mapping of the structure and its contents as well as any discrepancies found.

3.2.5 The Computerized Maintenance Management System (PassPort) shall be used to schedule inspections and to provide and receive information.

3.2.6 Once defective conditions and/or discrepancies have been identified, the priority of the corrective work shall be assigned per WM-ED-P014 Work Screening and Prioritization.

3.2.7 Inter-Department notification of work needed to be done by non-C&M groups and the necessary follow-ups are considered by the Work Screening Committee.

3.3. COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM (PASSPORT)
Manholes to be inspected shall have Preventive Maintenance (PM) Work Orders (WOs) generated in PassPort.

3.4. INSPECTION CHECKLIST
The Inspector shall use CM-CE-P319-R0001 Distribution Manhole Field Inspection Form or its electronic counterpart in a handheld device.

Information on the manholes to be inspected can be uploaded onto a handheld device through the use of a Mobile Field Inspection System (MFIS). Each manhole has an electronic checklist that can be brought up for recording the identified defects.

3.5. SAFETY CONCERNS

3.5.1 AIR QUALITY

-

Entry into the manhole shall be performed per SA-ED-P406 Confined Space and Hazardous Entry Process procedure.

The inspector shall check the air quality and record the air quality level on checklist.

- IF air quality is acceptable, the highest detected LEL reading shall be recorded.

The inspector shall monitor for burning odors and smoking equipment, following CM-CE-211032 Response to Burning Odors or Smoke in a Manhole or Vault as necessary.

3.6. VISUAL MANHOLE INSPECTION ELEMENTS

3.6.1 Record Manhole Identification data

3.6.2 Determine the AS FOUND environmental conditions

3.6.3 Inspect for presence and condition of the following and correct as indicated:

- Check for the presence of oil per EN-CE-6003 Discharge of Water from Manholes and Cable Space Whenever conditions are unacceptable
- EITHER submit a Work Request

- OR create a CM work order.
-

NOTE: Defective conditions shall be recorded when safety, reliability, or operation of equipment could otherwise be affected (under normal and abnormal circumstances) before the next inspection cycle.

IF Oil is found,

- Call The Environmental Coordinator
- Follow EN-CE-6003 for further instructions
- Remove any debris if practical.
- Check for the presence of Asbestos around cables.

IF Asbestos is found,

- Refer to SA-ED-904 Asbestos Classification and Management Program

NOTE: If asbestos is present and intact, the inspection may proceed, however, contaminated cables should not be disturbed.

- Record the presence of asbestos
- Inspect condition of structure and cable support components.
- Inspect cables (ALL VOLTAGES) and splices.
-

NOTE: SA-ED-P427-R1002 Electrical Safety Expanded Joint Tables can be referenced to determine maximum allowable circumference.

- If jacketed cable is present, check for lose or missing corrosion protection tape.
- DETERMINE if manhole has a perimeter ground by looking for a ground bus near the top of the manhole that is connected to ground rods (inside or outside manhole).
- If Perimeter Ground is present, check condition
- If Perimeter Ground is not present, identify on checklist.
- If Secondary Bus present, check condition.
- If Switches are Present, check condition.
- IF Transformers are Present, CHECK condition.

3.7. MAPPING AND DATA ISSUES

3.7.1 Record

- Secondary cables present
- Unmapped Secondary cable present
- Unmapped primary cable present

3.7.2 Follow procedure AM-CE-1033 Mapping Data Discrepancy Identification Process for mapping discrepancies.

3.7.3 Enter any mapping discrepancies into the Asset Management Map Discrepancies webpage.

NOTE: Enter direction (North, South, East, or West) of unmapped primary or secondary cable.

3.8. MANHOLE INSPECTION CORRECTIVE MAINTENANCE PRIORITIES

3.8.1 Refer to WM-ED-P014 Work Screening and Prioritization for CM Priorities

3.8.2 For Emergency Maintenance Items - Items of immediate concern to the inspector

- Identify immediately
- Discuss with C&M.

3.8.3 For Non-emergency CM's for work to be completed by work groups other than C&M, Work Management Shall:

- Prioritize as 20
- Ensure that a Work Request is generated

3.8.4 For Non-emergency CM's from the manhole inspections to be completed by C&M, categorize as routine maintenance.

3.9. INTER-DEPARTMENT NOTIFICATION AND FOLLOW-UP

3.9.1 Ensure that the work requests to be completed by non-C&M groups are considered and scheduled by the Work Screening Committee

#	Process Element	Description	Performed By
	N/A		

3.10. Assumptions

3.10.1 Click to enter assumptions

3.10.2 Click to enter assumptions

4. Roles and Responsibilities

4.1. DOCUMENT WRITERS AND REVIEWERS:

4.1.1 BE AWARE that Construction and Maintenance owns this process.

4.1.2 BE AWARE that Construction and Maintenance Subject Matter Expert and Supervisors

4.1.3 Are accountable for the content of this process.

4.1.4 Must review and approve any revisions to this process and applicable reference documents.

4.2. CM DEPARTMENT MANAGERS:

4.2.1 ENSURE compliance with this process

4.2.2 IMPLEMENT this process

4.2.3 COORDINATE with other departments to follow up on the inspection data collected

4.3. EMPLOYEES/WORKERS:

4.3.1 All EED, contractor or vendor personnel performing work within the EED service area SHALL COMPLY with

4.3.2 This process

4.3.3 Com Ed ED Fundamentals

4.3.4 Com Ed ED Safety Rule Book

4.3.5 Employee Code of Conduct

4.3.6 All other Corporate and ED policies, programs, procedures, and expectations appropriate to the work being performed.

-

5. Documentation

Documentation generated during performance of this process shall be maintained in accordance with LE-AC-401 (Records and Information Management, Retention and Disposition).

Completion of the PM Program shall be documented via PassPort.

6. Terms and Definitions

NOTE: REFER to CM-ED-000010 Technical Glossary for additional technical terms and definitions.

6.1. Work Screening Committee (WSC): This group meets daily (Monday thru Friday) to review, prioritize and ensure proper PassPort coding for all Work Requests and Work Orders originated since the previous meeting.

A cross-discipline group consisting of, but not limited to:

- Work Control Coordinator
- Work Week Manager

- FIN Team FLS or Planner
- Maintenance Engineering
- New Business representative
- Field Operations representative
- Work Planning representative
- Supply Work Management Analyst.
- Operations representative (OCC and TSO)

Participants must have the required knowledge base to make appropriate decisions. The Work Control Coordinator has the authority to require attendees as appropriate.

7. References

1. EN-ED-P201 Spill Response and Contingency
2. EN-ED-2002 EED Spill On-Site Response and Reporting
3. CM-ED-050001 Flagging And Robust Operational Barriers
4. ComEd Exelon Delivery Safety Rule Book
5. SA-ED-P427-R1002 Electrical Safety: Expanded Joint Tables
6. AM-CE-P034-R3013 Manhole PCM Template
7. AM-CE-4006 Commitment Implementing Procedure City of Chicago Distribution Manhole Inspections
8. AM-CE-1033 Mapping Data Discrepancy Process
9. EN-CE-6003 Discharge of Water From Manholes and Cable Space
10. SA-ED-P904 Asbestos Classification and Management Program
11. CM-ED-P043 C&M Response To A Fire Alarm Or Fire In A Manhole Or Vault
12. SA-ED-P406 Confined Space and Hazardous Entry Process
13. WM-ED-P014 Work Screening and Prioritization
14. CM-CE-P319-R0001 Distribution Manholes And Components Inspection Forms

8. Attachments

8.1. None

Inspection Process for Distribution Manholes And Components

ComEd Process
CM-CE-P319
Rev. 5

9. Development history

Revision 0	**Date 1/28/2009**
Writer	Ken Wendt, Kevin Touhy
Reviewer (s)	Vito Martino, Chris Gibbs, Frank Batjes, Brett Leftwich, Bill Gannon; Chris Gibbs; Miguel Medina
Approver(s)	Gus Ponce and William Forst
Reason Written	To convert CM-CE-221002 to a process template and to provide guidelines and requirements for the visual inspection of manholes and the equipment (components) contained within manholes, the prioritization of the work required to correct abnormalities found and identifying and communicating work required to departments other than C&M, inserting revisions recommended as a result of the West Loop RCI. To revise the paper inspection report

Revision 1	**Date 06/20/2011**
Writer	Chris Gibbs, Frank Batjes
Reviewer (s)	Dan Galovich
FAM Approver(s)	
Reason Revised	To establish criteria as to when opportunistic manhole inspections are required regarding short term duration and manhole re-entry. To correct procedure number in the References section under 7.12 to reference the correct number of SA-ED-P406—“Confined Space Entry Procedure”. To eliminate step 4.1.1(DT Contact) as more prescriptive language exists in SA-ED-P406.

Revision 2	**Date 09/27/2011**
Writer	Ken Wendt,
Reviewer (s)	Vito Martino, Chris Gibbs, Frank Batjes, Brett Leftwich
FAM Approver(s)	Dan Galovich, Gus Ponce
Reason Revised	Review for accuracy

Inspection Process for Distribution Manholes And Components

ComEd Process
CM-CE-P319
Rev. 5

Revision 3	**Date 04/27/2012**
Writer	Pete Yan
Reviewer (s)	Bill Gannon; Dan Brotzman; Chris Gibbs;
FAM Approver(s)	Bill Gannon
Reason Revised	Inspection checklist (CM-CE-P319-R0001 Rev1.0) revised to upgrade the priority codes for five (5) critical cable related CMs from P40 to P30. Also changed cable support and other cable related type CMs to INFO ONLY on checklist in anticipation that repair work will be performed by EIMA manhole assessments.

Revision 4	**Date 07/30/2014**
Writer	Ben Demus (CM)
Reviewer (s)	Chris Gibbs (C&M), Shane Cole (C&M), Steven Jankovich (C&M), Brian Lopresti Jr (WM), Timothy Shales (Contractor), Robert Shuttleworth Jr (C&M Training), William Sullivan III (C&M Training), Michael Meathe (C&M), James Williams (C&M), Stephen Franker (Dist Safety), Donald Kelly (C&M), Timothy Johnson (C&M), Adela Vargas (C&M)
FAM Approver(s)	Mike Primm (CM UFAM)
Reason Revised	Inspection checklist, CM-CE-P319-R0001, revised to include checklist requirement for identifying corrosion protection tape and signature line. Also, updated CM-CE-P319 procedure references, miscellaneous punctuation and grammar changes.

Revision 5	**Date 07/26/2017**
Writer	Jimi Conway
Reviewer (s)	Pete Yan
FAM Approver(s)	Dan Brea (UFAM)
Reason Revised	Reviewed as part of the three-year document review cycle. No changes.

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Distribution Manhole Field Inspection Form

ComEd Training and Reference Material (T&RM)

CE-CM-P319-R0001
Rev. 3

Effective:	3/8/2018
Supersedes:	NA
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

Manhole Insp Form - CM-CE-P319-R0001

2. Development history

Revision 1	**Date: 9/27/2011**
Writer	Ken Wendt,
Reviewer(s)	Vito Martino, Chris Gibbs, Frank Batjes, Brett Leftwich
UFAM Approver(s)	Dan Galovich, Gus Ponce
Reason written	Review for accuracy

Revision 2	**Date: 7/30/2014**
Writer	Ben Demus (CM)
Reviewer(s)	Chris Gibbs (C&M), Shane Cole (C&M), Steven Jankovich (C&M), Brian Lopresti Jr (WM), Timothy Shales (Contractor), Robert Shuttleworth Jr (C&M Training), William Sullivan III (C&M Training), Michael Meathe (C&M), James Williams (C&M), Stephen Franker (Dist Safety), Donald Kelly (C&M), Timothy Johnson (C&M), Adela Vargas (C&M)
UFAM Approver(s)	Mike Primm (CM UFAM)
Reason written	Inspection checklist, CM-CE-P319-R0001, revised to include checklist requirement for identifying corrosion protection tape and signature line. Also, updated CM-CE-P319 procedure references, miscellaneous punctuation and grammar changes.

Revision 3	**Date: 2/8/2018**
Writer	Keith Frost
Reviewer(s)	Dan Barabas, Pete Yan, John Hans, Andrew Morris, Chris Gibbs, Frank Batjes, Mike Meathe, Vince Ransom, John Jamicich III, Craig Creamean
UFAM Approver(s)	Mark Baranek
Reason written	Form and Checklist were updated to include items from EIMA Manhole Assessment.

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Overhead Distribution Circuit Inspection and Maintenance

ComEd Training and Reference Material (T&RM)

CM-CE-P321
Rev. 1

1. **PURPOSE**

To outline the programmatic inspection and maintenance for 4kV, 12kV, and 34kV overhead circuits.

NOTE: This document applies to routine inspection and preventive maintenance (PM) of overhead 4k, 12kV, and 34kV circuits.

To outline the basic tasks for performing inspections and issuing the associated corrective maintenance (CM).

NOTE: This includes reliability driven inspections such as, but not limited to, 1% circuit inspections.

Section 3, Responsibilities has been divided into the following subsections:

Subsection	Title	Page
3.1	Document Writers And Reviewers	2
3.2	Construction & Maintenance	3
3.3	Contract and Project Management	3
3.4	Distribution Reliability Inspections	3
3.5	Distribution Standards Equipment Specialists	5
3.6	DSO	5
3.6.1	Information Desk Technician (IDT)	5
3.6.2	OES	6
3.7	Distribution Engineering & Design and New Business	6
3.8	Mapping & Document Services (M&DS)	6
3.9	Material Condition Group	6
3.10	Training Department	6
3.11	Work Management	7
3.11.1	Long-Range Planner	7
3.11.2	Planner	7
3.11.3	Scheduler	7
3.12	Employees/Workers	7

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Overhead Distribution Circuit Inspection and Maintenance

ComEd Training and Reference Material (T&RM)

CM-CE-P321
Rev. 1

Section 8, Process has been divided into the following subsections:

Subsection	Title	Page
8.1	Distribution Circuit Inspection Program	9
8.2	Special Inspections –	9
8.3	Visual Circuit Inspection	9
8.3.1	Scope	9
8.3.2	Type Of Inspection	9
8.4	CM Conditions – Overhead Distribution Circuit Inspection Checklist	10
8.5	Fix on Find	10
8.6	Mapping Issues	10
8.7	Potential Clearance Issues	10
8.8	Computerized Maintenance Management System (PassPort)	10
8.9	Circuit Inspection Corrective Maintenance Priorities	11
8.10	Legacy CM Work Tasks	12

2. TERMS AND DEFINITIONS

NOTE: **REFER** to CM-ED-000010 Technical Glossary for additional technical terms and definitions.

1. All-Inclusive (All-In) Inspection – A visual inspection that is primarily performed by walking the circuit. The field of vision is from the top of the pole to the ground line.

2. Corrective Maintenance (CM) sometimes used to refer to the CM work or CM work order.

3. High Impact Primary (HIP) Inspection – A visual inspection of the top of the pole to the bottom of equipment cutouts or bottom of line arresters (a line arrester that is not on the load side of the cutout). The inspection is performed primarily by driving and/or with front lot binocular observations, and includes limited rear-lot and Right of Way (ROW) walking or access.

4. Preventive Maintenance (PM) sometimes used to refer to the PM work or PM work order.

3. ROLES AND RESPONSIBILITIES

3.1. DOCUMENT WRITERS AND REVIEWERS

1. **BE AWARE** that Reliability Inspections owns this program.

2. **BE AWARE** that Reliability Inspections:

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A. Are accountable for the content of this program.
B. Must review any revisions to this program and applicable reference documents.

3.2. CONSTRUCTION & MAINTENANCE

1. **COMPLETES** the CM repairs and updates PassPort indicating the repairs performed.

2. **ENSURES** that close out comments in PassPort reflect work completed.

3. IF work is **not** required, OR was found completed upon arrival, **ENSURES** that:

   A. The CM is properly dispositioned.

   B. Include comments describing conditions found.

4. **ENSURES** that documentation relative to maintenance tasks is stored centrally and is available for future reference.

5. For slipped lead sleeves and damaged lead terminations, **INSPECTS/CONFIRMS** "wet" cable conditions at the adjacent manhole, and **TAGS** equipment accordingly.

   A. **ENSURES** that a permanent repair work request/work order is generated after tagging is completed for those locations requiring repairs.

3.3. CONTRACT AND PROJECT MANAGEMENT

1. **IS** the main point of contact with the contractors for all contractual issues.

3.4. DISTRIBUTION RELIABILITY INSPECTIONS

NOTE: Applies to visual inspection only, unless specified.

1. **TRACKS** progress of inspections.

2. **MAINTAINS** master file of all inspected circuits.

3. **IDENTIFIES** annual budgetary requirements necessary:

   A. to support program execution per maintenance template.

   B. to meet any regulatory commitments.

4. **COMMUNICATES** program changes to stakeholders as needed.

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5. **MAINTAINS** list of conditions on the overhead distribution circuit inspection checklist.

6. **REQUESTS** copies of circuit maps from Mapping & Document Services.

7. **MAINTAINS** circuit inspection cycles within the Computerized Maintenance Management System (CMMS) (PassPort).

8. **ENSURES** that:

   A. The identified circuits inspected are those due in the current year.

   B. Pouches assembled as necessary for identified circuits to be inspected contains the operating map of the circuit and the overhead distribution circuit inspection checklist.

   C. The inspection type is indicated on the inspection pouch.

      NOTE: "All-In" mode for 34kV Circuits and 1% Circuits, "HIP" mode for all others. Modifications are to be approved by Reliability Inspections.

   D. PM Work Orders in Passport reflect appropriate programmatic information identifiers.

   E. Locations requiring corrective maintenance are marked on the inspection map and the marked-up maps are made available for use by other departments.

   F. Vegetation conflict items are noted on the inspection map and vegetation conflict forms are completed and submitted to Vegetation Management.

   G. Mapping discrepancies are noted on the map and mapping discrepancy forms are completed and submitted.

   H. Any emergent work into PassPort not captured by the mobile devices or entered by the OCC as applicable is created manually in the CMMS.

   I. Technical support is provided for the mobile field inspection system (MFIS).

9. INSPECTOR:

   A. **PERFORMS** inspection of the circuit utilizing current overhead distribution circuit inspection checklist.

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B. **DOWNLOADS** circuits from the Mobile Field Inspection System (MFIS) into a mobile device.

C. **MARKS** inspection map with location and anomaly.

D. **ENTERS** location description into mobile device.

E. **ENTERS** deficiencies found into mobile device.

F. **COMPLETES AND SUBMITS** vegetation conflict form.

G. **COMPLETES AND SUBMITS** mapping discrepancy form.

H. **INDICATES** location where ComEd primary lines may have a potential clearance issue.

I. **REQUIRES** the creation of a Corrective Maintenance task for potential clearance issues.

NOTE: Issues are to be reviewed and resolved by Work Management, New Business and/or Engineering and Design.

J. **INDICATES** name(s), company cell phone number, type of inspection, and inspection completion date on the marked-up inspection map.

K. **CAPTURES** digital photo of CM conditions as necessary to enhance ability to plan for repair of the condition and forwards to Reliability Inspections Planner to include in the CM work order tasks.

L. **CAPTURES** GPS coordinates of CM locations, as needed and marks coordinates on inspection map to assist with planning of repairs.

M. **CALLS** OCC directly for emergency items.

NOTE: OCC personnel **ENTERS** information into PassPort, CIMS, or OMS as required per OCC process.

N. **SYNCHRONIZES** the completed inspection in the mobile device to the Computerized Maintenance Management System (CMMS = PassPort system).

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NOTE: The PassPort system automatically generates a Corrective Maintenance (CM) Work Order (WO) and completes the Preventive Maintenance (PM) WO.

3.5. DISTRIBUTION STANDARDS EQUIPMENT SPECIALISTS

1. **PROVIDES** input to Reliability and Material Condition groups regarding failure modes and manufacturer's recommendations.

2. **INVESTIGATES** new technology.

3. **DETERMINES** specific maintenance trigger levels as applicable to the equipment.

   Examples: Inappropriate equipment installations, pole degradation levels, etc.

4. **IS** the primary interface with Original Equipment Manufacturer (OEM).

5. **PROVIDES** support to the field relative to equipment expertise.

3.6. DSO

3.6.1. Information Desk Technician (IDT)

1. **ENSURES** that EITHER Corrective Maintenance work requests, work orders OR Emergency OMS Tickets are generated for Emergency DSO jobs, as required, based on results of the inspection per OCC process.

2. **ENSURES** that close out comments in PassPort and/or OMS, reflect work completed by Operations personnel under the direction of the DSO.

3. **ENSURES** that documentation relative to maintenance tasks is stored and is available for future reference.

4. **ENSURES** use of WO Group code supplied by Inspector on WO generated.

3.6.2. OES

1. **COMPLETES** the CM repairs as required.

2. **RETURNS** the data sheets to the DSO Planner indicating what repairs were performed.

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3.7. DISTRIBUTION ENGINEERING & DESIGN AND NEW BUSINESS

1. **REVIEWS** Potential "Clearance" issues as reported from the circuit inspection, for those items not initially planned and scheduled by Work Management and C&M.

2. **DESIGNS** changes, as needed, to maintain acceptable clearances.

3.8. MAPPING & DOCUMENT SERVICES (M&DS)

1. **CREATES** circuit maps for use by Reliability Inspections to perform the circuit inspections.

2. **RECEIVES** mapping discrepancies.

3. **INCORPORATES** changes into the circuit maps.

3.9. MATERIAL CONDITION GROUP

1. **MONITORS** program performance.

2. **EVALUATES** need to modify program requirements due to failure trends and/or emergent failure modes.

3. **GATHERS** input from Distribution Equipment Specialists in Distribution Standards group(s) and from Operations groups as required.

4. **DEVELOPS** AND **UPDATES** maintenance templates for overhead circuits and associated components.

3.10. TRAINING DEPARTMENT

1. **EVALUATES** the need to develop training in conjunction with the line organizations when preventive maintenance tasks change.

2. **DEVELOPS** the appropriate training program.

3. **CONDUCTS** training as required.

3.11. WORK MANAGEMENT

3.11.1. Long-Range Planner

1. **EVALUATES** resource requirements for corrective maintenance identified from the circuit inspection program.

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2. **DEVELOPS** long-range work plan.

3. **DEVELOPS** resource strategy to ensure execution of the plan.

3.11.2. Planner

1. **PREPARES** necessary work packages in support of corrective maintenance.

2. **DISCUSSES** CM conditions with Reliability Inspections when clarification is needed for the scope of work.

3.11.3. Scheduler

1. **ENSURES** that maintenance tasks are scheduled and tracks execution.

2. **BUNDLES** work as needed to ensure completion of program tasks.

3.12. EMPLOYEES/WORKERS:

1. All ComEd, contractor or vendor personnel performing work within the ComEd service area **SHALL COMPLY** with:

A. This procedure.

B. ComEd Fundamentals.

C. ComEd Safety Rule Book.

D. Employee Code of Conduct.

E. All other corporate and ComEd policies, programs, procedures, and expectations appropriate to the work being performed.

4. MATERIAL AND SPECIAL EQUIPMENT

4.1. MATERIAL

1. Materials needed for Fix on Find purposes include, but are not limited to:

A. Guy Markers.

B. Ground Molding.

C. Temp Patches.

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4.2. SPECIAL EQUIPMENT

1. None.

5. SAFETY MEASURES AND ENVIRONMENTAL CONCERNS

5.1. SAFETY MEASURES

1. None.

5.2. Environmental Concerns

1. Waste Materials:

A. **PUT** in approved waste containers.

B. **DISPOSE** of properly.

2. IF Fluid spill is observed:

A. **FILL OUT** appropriate Fluid-spill documentation.

B. **UTILIZE** spill kit as practicable.

C. **REPORT** spills as required to the OCC.

NOTE: for additional guidance see EN-ED-P201 & EN-ED-2002.

6. PRECAUTIONS AND LIMITATIONS

6.1. PRECAUTIONS

1. WHEN safety, reliability, or operation of equipment could otherwise be affected before the next inspection cycle, **RECORD** defective conditions.

6.2. LIMITATIONS

1. Component inspection **MAY BE PERFORMED** in any sequence preferred by the Inspector.

7. PREREQUISITES

1. **VERIFY** that all ComEd, contractor or vendor personnel involved are trained and qualified in the equipment and procedures to be used.

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2. **MAKE SURE** that all requirements of CM-ED-050001 Hazard Identification, Error Prevention, STAR, Peer Check, Flagging And Robust Operational Barriers have been followed.

8. PROCESS

8.1. DISTRIBUTION CIRCUIT INSPECTION PROGRAM

1. This program involves the inspection of 4kV, 12kV, and 34kV circuits with overhead exposure. The frequency of the inspections is to be in accordance with the Maintenance Templates for distribution overhead circuits and components.

8.2. SPECIAL INSPECTIONS

1. Certain circuits or portions of circuits may be inspected at more frequent intervals resulting from any of the following:

   A. Post storm events.

   B. Conditions found on routine inspections.

   C. Excessive loading.

   D. or Other conditions that make such action advisable.

8.3. VISUAL CIRCUIT INSPECTION

8.3.1. Scope

1. For the programmatic cyclic annual circuit inspections, **VISUALLY INSPECT** the overhead portion of the circuit from the first pole from the substation breaker/recloser to the service drops; this includes the overhead portions of primary mainline as well as all primary lateral taps.

2. For inspections other than the programmatic cyclic annual circuit inspections, scope is based on the specific situation, determined by management.

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8.3.2. Type of Inspection

1. For the 4/12kV programmatic cyclic annual circuit inspections, and for any ComEd management specially directed circuit inspections that do **not** fall within the All-In designation, a "High Impact Primary" inspection is performed. Components outside the "High Impact Primary" zone are **not** specifically excluded from a HIP inspection. If the inspector observes conditions listed on the overhead distribution circuit inspection checklist that are located outside the "High Impact Primary" zone, the condition(s) **SHALL STILL BE RECORDED** as part of the inspection. FIX ON FIND items **SHALL** also be addressed. The HIP inspection mode is intended to focus on conditions impacting the primary, and **not** merely to exclude other components.

2. For the 34kV programmatic cyclic annual circuit inspections, and for any ComEd management specially directed circuit inspections, the inspection is primarily performed as an All-Inclusive (All-In) inspection. This includes inspection of the secondaries and identification of possible clearance violations.

3. For 1% Circuits, the scope of the inspection is determined by Reliability Programs. The inspection is primarily performed as an All-Inclusive (All-In) inspection. This includes inspection of the secondaries and identification of possible clearance violations.

8.4. CM CONDITIONS – OVERHEAD DISTRIBUTION CIRCUIT INSPECTION CHECKLIST

1. Circuit inspections shall record deficiencies for conductors, equipment, and the structures that support them, refer to the overhead distribution circuit inspection checklist CM-CE-P321-R0001 for detail.

8.5. FIX ON FIND

1. As directed by management, Inspector to perform minor repairs when identified during the inspection, including but not limited to replacement of guy markers and replacement of missing or damaged ground molding.

8.6. MAPPING ISSUES

1. **NOTE:** Any mapping discrepancies shall be noted on a mapping data discrepancy form AND **FORWARDED** to a mapping discrepancy administrator to have it entered into the Asset Management Map Discrepancies webpage.

Examples: Of mapping discrepancies include but are not limited to:

- An unmapped fuse. Special attention should be paid to mainline fuses and whether or not by-pass disconnects are installed and mapped correctly.

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- A switch found in a different location in the field than on the map (up or downstream from a tap or feeder tie).

8.7. POTENTIAL CLEARANCE ISSUES

1. ComEd facilities with inadequate clearance from the ground, adjacent buildings, fire escapes, billboards, signs and other obstructions in accordance with ComEd Construction Standards shall require the creation of a Corrective Maintenance Item for a potential clearance issue. Refer to ESP 5.7.3.2 for selection of priority.

2. This issue is to be reviewed and resolved by regional work planner, and/or New Business or Engineering & Design.

8.8. COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM (PASSPORT)

NOTE: The circuits to be inspected for a particular year have Preventive Maintenance (PM) Work Orders (WOs) generated in PassPort.

1. The circuits to be inspected for the year can be uploaded onto a moblie device through the use of a Mobile Field Inspection System (MFIS).

2. Each circuit has an electronic checklist that can be brought up for each pole location that has identified defects.

3. The results of the inspection are to be entered into PassPort written against the equipment record (the circuit). (Done automatically when MFIS is used)

   A. Each task on the WO represents a pole location.

   B. Each pole location may have multiple defects identified at that pole location, however, each wrench turning maintenance item is to have its own WO task. (Done automatically when MFIS is used)

4. The defects for a pole location are entered into a mobile device via the electronic overhead distribution circuit inspection checklist.

5. When the circuit inspection has been completed, the mobile device is synchronized to the CMMS, which automatically generates a CM Work Order (WO) and completes the Preventive Maintenance (PM) WO.

6. For each repair location, the inspector is to include the following descriptive/location information:

   A. Circuit or feeder identifier. (Automatically included when using MFIS)

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B. Location description: physical location relative to a fixed reference point on the circuit itself (e.g. “Disc D12345” or “2 poles s/ of tr 123456A1”); or by address; or other landmark description; or by GPS as last resort. Note: for Clearance issues identified for services or customer work required, the address for the location served by the service drop is required to be captured in the comments box; if an address does not exist, as a last resort measure, the meter number and street name of the location must be recorded in the comments box.

NOTE: GPS coordinates may be used as a supplement when necessary.

8.9. CIRCUIT INSPECTION CORRECTIVE MAINTENANCE PRIORITIES

1. Emergency Maintenance Items - Items of immediate concern to the inspector are to be identified and reported immediately. The following are some examples of such items: severely leaking transformers/reclosers/potheads; broken pole; primary wire on crossarm or making contact with other facilities; wire down.

2. Except for those items identified as Emergency Maintenance, generally, identified CMs from the circuit inspections are pre-categorized on the overhead distribution circuit inspection checklist. Where choices exist between priorities for the same type of deficiency, a higher priority is to be selected for those deficiencies that pose an imminent reliability issue.

8.10. LEGACY CM WORK TASKS

1. Programmatic inspections are done fresh without regard to the legacy CMs; as these circuits are re-inspected, the legacy CMs from the previous programmatic circuit inspections are periodically reviewed and appropriately dispositioned.

9. RETURN TO NORMAL

1. None

10. DOCUMENTATION

1. None

11. REFERENCES

11.1. TECHNICAL REFERENCES

1. None

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11.2. STANDARD REFERENCES

1. CM-ED-050001 Hazard Identification, Error Prevention, STAR, Peer Check, Flagging And Robust Operational Barriers
2. WM-ED-P014 Work Screening And Prioritization
3. AM-ED-P034-R3002 – Template – Distribution Aerial Conductor
4. AM-ED-P034-R3003 – Template – Cutouts and Disconnects
5. AM-ED-P034-R3004 – Template – Gang Operated Switches
6. AM-ED-P034-R3009 – Template – Pole Top Capacitors
7. AM-ED-P034-R3010 – Template – Pole Top Regulators
8. ESP 5.7.3.2 – Investigating Reported Clearance Violations

12. **ATTACHMENTS**

1. CM-CE-P321-R0001 Overhead Distribution Circuit Inspection Checklist

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Overhead Distribution Circuit Inspection and Maintenance

ComEd Training and Reference Material (T&RM)

CM-CE-P321
Rev. 1

DEVELOPMENT HISTORY

Revision 0	**Date 3/16/2009**
Writer	Brian Beissert & Keith Frost (Reliability Inspections)
Reviewer (s)	Michelle Blaise
Approver(s)	Gus Ponce
Reason Written	Revised the document into a ComEd process and revised requirements for visual inspection, including the addition of identifying the need for tagging of slipped lead sleeves and damaged lead terminations as a Priority 20 Work Task. Added clarification to C&M West to generate appropriate Work Requests or Work Orders for permanent repairs after tagging has been performed of possible wet cables. Also revised the checklist (CM-CE-P321-R0001).

Revision 1	**Date 12/31/2017**
Writer	Jimi Conway, Sr Engineer, Material Condition (ComEd)
Reviewer (s)	Keith Frost (ComEd)
UFAM Approver(s)	Dan Brea (ComEd)
Reason Revised	Reviewed as part of the standard three-year cycle for review. No Changes to content. Document updated to current ComEd header format.

Revision 2	**Date XX/XX/XXXX**
Writer	
Reviewer (s)	
FAM Approver(s)	
Reason Revised	

Revision 3	**Date XX/XX/XXXX**
Writer	
Reviewer (s)	
FAM Approver(s)	
Reason Revised	

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Overhead Distribution Circuit Inspection Checklist

ComEd Training and Reference Material (T&RM)

CM-CE-P321-R0001
Rev. 7

Effective:	2/1/2019
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Preventive Maintenance

1. Insert Documentation

CM-CE-P321-R0001

2. Development history

Revision 0	**Date: 4/3/2009**
Writer	Old version, no development history included
Reviewer(s)	Old version, no development history included
UFAM Approver(s)	Old version, no development history included
Reason written	Old version, no development history included

Revision 1	**Date: 7/8/2009**
Writer	Old version, no development history included
Reviewer(s)	Old version, no development history included
UFAM Approver(s)	Old version, no development history included
Reason written	Old version, no development history included

Revision 2	**Date: 11/2/2009**
Writer	Old version, no development history included
Reviewer(s)	Old version, no development history included
UFAM Approver(s)	Old version, no development history included
Reason written	Old version, no development history include

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Overhead Distribution Circuit Inspection Checklist

ComEd Training and Reference Material (T&RM)

CM-CE-P321-R0001
Rev. 7

Revision 3	**Date: 11/9/2009**
Writer	Old version, no development history included
Reviewer(s)	Old version, no development history included
UFAM Approver(s)	Old version, no development history included
Reason written	Old version, no development history included

Revision 4	**Date: 4/16/2010**
Writer	John Basten, Reliability Inspections Engineer
Reviewer(s)	Keith Frost, Reliability Inspections Manager
UFAM Approver(s)	Dan Galovich
Reason written	Minor revision to Overhead Distribution Circuit Inspection Checklist. Revision includes the addition of "non-standard jumper" and "P10 Call-In" on the checklist.

Revision 5	**Date: 2/12/2014**
Writer	John Basten, Reliability Inspections Engineer
Reviewer(s)	Janine Keating, Reliability Inspections Manager
UFAM Approver(s)	Gus Ponce, Preventive Maintenance
Reason written	Engineering review of checklist performed eliminating Material Condition Items and P40 CMs that which are no longer included in the Corrective Maintenance Program and are now being worked as minimum field expectations or being captured as INFO only. Also – Core Function changed from Corrective Maintenance to Preventive Maintenance to align with parent document.

Revision 6	**Date: 1/6/2016**
Writer	John Basten, Reliability Inspections Engineer
Reviewer(s)	Janine Keating, Reliability Inspections Manager
UFAM Approver(s)	Michael Moy, Preventive Maintenance

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Overhead Distribution Circuit Inspection Checklist

ComEd Training and Reference Material (T&RM)

CM-CE-P321-R0001
Rev. 7

Revision 6	**Date: 1/6/2016**
Reason written	Checklist revised due to Exelon Utilities PM alignment recomendations. Significant changes include: • POLES: Excessive Leaning increased from a P40 to P30 • POLE TOP EXTENSION: Broken increased from P30 to P20 • SECONDARY CONDUCTOR: o Damaged increased from P40 to P30 o Floating increased from P40 to P20 • SPACER CABLE: Additional P30 Defects added • TIE WIRE: Broken increased from P30 to P20 • FUSE / CUTOUTS: o Blown at Cap Bank increased from P40 to P30 o Damaged Fuse Tube (P30) removed • EQUIPMENT: o Damaged increased from P40 to P30 o Active Leaking increased from P20 to P10 o Non Active Leaking increased from P40 to P30 • Non-OIL TERM: Damaged Non-Lead Term increased from P40 to P30 • UGUARD: Primary Damaged/Missing increased from P40 to P30 • GUY WIRES / ANCHORS: Damaged/Missing increased from P40 to P30 • HIGHWAY & T.R. CROSSING: o Auto Splice in Crossing (P30) Added o Grade B Construction Needed increased from P40 to P30

Revision 7	**Date: 2/1/2019**
Writer	John Basten, Reliability Inspections Engineer
Reviewer(s)	Merle Turner, Reliability Inspections Manager
UFAM Approver(s)	Dan Brea, Preventive Maintenance
Reason written	Periordic 3 year minor revision: Removed Tie-wire mis-combinations and changed priority of not connected to system ground from P40 to P30.

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Minimum Field Expectations

ComEd Process
CM-CE-P339
Rev. 4

Effective:	6/16/2020
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Corrective Maintenance

Table of Contents

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1. Purpose

1.1. The purpose of this process is to capture and communicate minimum field expectations for value added work to be accomplished when identified during the performance of regular work activities within Distribution Operations.

1.2. This process provides field personnel the flexibility to perform specifically defined work without going through the normal work management processes of planning and scheduling. This work requires no additional outages or additional work groups to support the activity.

1.3. The completion of these activities is not intended to impact the completion of the regular work activities planned for the day.

2. Precautions and limitations

2.1. Precautions

2.1.1 N/A

2.2. Limitations

2.2.1 N/A

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Minimum Field Expectations

ComEd Process
CM-CE-P339
Rev. 4

3. Process

3.1. Performance of Minimum Field Expectations

3.1.1 **SURVEY** the work area for items that may be completed as Minimum Field Expectations. Examples of Minimum Field Expectations are referenced in attachment CM-CE-P339-1.

3.1.2 Engineering **IDENTIFIES items in the** Minimum Field Expectation checklist and adds notes into design sketches.

3.1.3 Work group personnel **COMPLETES** previously identified or newly identified Minimum Field Expectations for all types of work assigned, whether is it a design package, corrective maintenance, trouble call, etc.

3.1.3.1.1 Assigned work in the Minimum Approach Distance: All items on the Minimum Field Expectation Checklist SHALL be completed as applicable

3.1.3.1.2 Assigned work outside the Minimum Approach Distance: All items outside the Minimum Approach Distance on the Minimum Field Expectation Checklist MUST be completed as applicable.

3.1.4 Minimum Field Expectations MUST be **ADDED** to existing active clearance orders as required in accordance with the Exelon Energy Delivery Safety Rule Book, Job Briefings, and the fundamental STAR principle.

3.1.5 When personnel have determined the corrective action is required per Minimum Field Expectations, they SHALL **PROCEED** with the repair or problem resolution.

3.1.6 The persons performing the work MUST **CONTACT** their immediate supervisor if any doubt exists concerning qualifications to perform this work.

3.1.7 The Operations Control Center (OCC) and or TSO shall be **CONTACTED** if:

3.1.8 There are questions regarding the potential operability of structures, systems, or equipment items with an identified deficiency.

3.1.9 The activity could affect equipment operation, equipment availability, indication or alarm, and then **NOTIFY** the appropriate DSO or TSO Designated Authority.

3.1.10 Work group personnel **PERFORMS** Minimum Field Expectations.

3.1.11 Work group **REPORTS** the results of the Minimum Field Expectations completed by adding to the completion comments for the task, indicating that minimum field expectation work was performed and the type and quantity of Minimum Field Expectation(s) performed. (If Operations interface was required, also **NOTIFY** the appropriate DSO or TSO Designated Authority of task completion.)

1. Minimum Field Expectation completion comment MUST begin with: MFE (This will indicate that a Minimum Field Expectation has been performed).

2. Example MFE completion comments:

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A. MFE: wildlife protection 1, guy markers 2

B. MFE: guy tail 1

3.2. Process Flow Diagram - N/A

3.3. Process listing - N/A

#	Process Element	Description	Performed By

3.4. Assumptions

3.4.1 None

4. Roles and Responsibilities

4.1. Qualified Personnel, C&M (Distribution) and DO

4.1.1 Personnel MUST ensure they possess the necessary skills, experience, and qualifications to perform Minimum Field Expectations.

4.1.2 Perform Minimum Field Expectations per process.

4.1.3 Contact their immediate supervisor if any doubt exists concerning qualifications or the work scope in regard to the intended activity.

4.2. First Line Supervisor

4.2.1 Provide oversight and ensure applicable employees under their direction possess the proper skills, experience, and qualifications that are necessary to complete Minimum Field Expectations correctly and safely.

4.2.2 Ensure that all personnel under their direction are aware of the criteria of items that may be performed as Minimum Field Expectations.

4.2.3 Provide their respective work team members with the proper tools and materials that are required to perform the Minimum Field Expectations.

4.2.4 Reinforce this process to ensure the work is being performed.

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4.2.5 Performs quality control check of work locations/ job sites to ensure Minimum Field Expectations were executed before job close out.

4.3. Regional Engineering

4.3.1 Reviews Minimum Field Expectations checklist and incorporates items into designs.

5. Documentation

5.1. WO task completion comments, captured in the Computerized Asset Management Tool (AS8).

6. Terms and Definitions

6.1. Bundled Location

6.1.1 A location that is not part of the current job package/assignment, but its geographical location is close enough to accomplish the value added work without impacting the overall performance of regular work activities.

6.2. Job Location/Assignment

6.2.1 A location that is part of the work package or work assignment.

6.3. Minimum Field Expectations

6.3.1 Work that does not require support from additional work groups during execution and does not require detailed work instructions as part of the work order. This work is not scheduled and is completed the same day it is started. These maintenance activities SHALL be incorporated and completed as part of the planned task at the specific job location/assignment, and these maintenance activities should be incorporated and completed at bundled locations based on impact to the overall performance of regular work activities.

Minimum Field Expectations shall **NOT** be used for:

1. Activities that require detailed planning.
2. Activities which require a separate, planned clearance order to accomplish the Minimum Field expectation. (If a planned clearance order is already in place for other work, and the minimum field expectation work can be accomplished under that order, the Minimum Field Expectation should be executed.)
3. Activities that affect other work groups to such an extent that they should become scheduled activities.
4. Activities that require post maintenance testing.

7. References

7.1. CM-CE-P321 ComEd Overhead Distribution Circuit Inspection and Maintenance

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7.2. Exelon Energy Delivery Safety Rule Book

7.3. National Electrical Safety Code (NESC)

7.4. AM-EU-9114 Required Upgrades Of Existing Overhead Distribution Facilities

8. Attachments

8.1. CM-CE-P339-1, Minimum Field Expectations Checklist

9. Development history

Revision 0	**Date: 8/2/2012**
Writer	Brian Beissert, Reliability Programs; Valerie Stratford, Work Management
Reviewer(s)	Marguerite Anselmo, Mark Baranek, Vic Chesna, Rick Sanner, Work Management, Keith Frost, John Basten, Reliability Inspections; Cristine Vesely, Distribution Operations Support
UFAM Approver(s)	Isaac Akridge and Gus Ponce
Reason written	CM Backlog Reduction Initiative

Revision 1	**Date: 10/20/2014**
Writer	Dan Holloway, Performance Assessment Group
Reviewer(s)	Dan Lyons, Manager PAG
UFAM Approver(s)	Mark Primm
Reason written	Revised checklist to clarify requirement to verify proper and legible labeling of pad- and pole-mounted equipment in accordance with corrective action 294450-24

Revision 2	**Date: 9/26/2017**
Writer	Keith Frost
Reviewer(s)	Maurice Nutall, Kathy Egan, Craig Weber
UFAM Approver(s)	Adam St. Pierre

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Minimum Field Expectations

ComEd Process
CM-CE-P339
Rev. 4

Revision 2	**Date: 9/26/2017**
Reason written	Updated checklist and clarified responsibilities for various groups.

Revision 3	**Date: 10/31/2019**
Writer	Jack Craighead
Reviewer(s)	Jack Craighead
UFAM Approver(s)	Eric Henderson
Reason written	Removed reference to CM-CE-4030. Replaced with SA-EU-09014

Revision 4	**Date: 6/16/2020**
Writer	Patrick Arns
Reviewer(s)	Pete Tyschenko, Keith Frost, Maurice Nutall, Rob Joyce, Shane Cole, Terrika Worthon, Merle Turner, Dave D'Hooge
UFAM Approver(s)	Eric Henderson
Reason written	Updated to include insulating requirements for energized service connections referencing updates to TB-20-051, C7724, C7729, C7511 and C7736. Removed inactive references for Area Cleanup.

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Minimum Field Expectations

ComEd Process
CM-CE-P339
Rev. 4

CM-CE-P339-1 Minimum Field Expectations Checklist	
Value Added Item	**C-STD./PRO./S.R.B./E.S.P.**
Area Cleanup and Proper Restoration	SRB 1.2.19,
Vines - Snipped at base of pole	VM-CE-P006
Obstruction (Vegetation) - Removed	VM-CE-P007
Wildlife Protection - Installed Cat ID 1604228/1612204	C7511
Spill Prevention, Control and Countermeasure (SPCC) Oil Absorbent Pad / Spill Kit – Applied/ Make All Proper Notifications	EN-EU-P002 EN-CE-2004
Arrester Cap - Replaced	C8505
Fault Indicators (Aerial) - Reinstalled Properly	C5170 / ESP 5.7.5.6
Ground Leads (Broken) - Repaired	C8550
Ground Molding - Replaced	C8550
Guy Marker - Installed	C7130
Guy Wire Excessive Tail (> 3 Inches) - Trimmed	C7130
Guy Wire/Anchor Loose, Sagging, Slack - Repaired	C7130
Clear & Accurate Labeling of Pad-mounted and Pole-mounted Equipment	C7493
Improper Tie Wire Combination - Repaired	C7754
APDs (Arc Protection Devices) - Repaired/Installed	C7702
Loose/Missing Hardware - Repaired	AM-EU-9114
Obstruction (General) - Removed	C5323
Pole Step < 8 Feet From Grade or Pedestrian Accessible - Removed	AM-EU-9114
Shipping Brackets – Rotated	C5323/C5325
U-Guard - Repaired/Replaced	C8347
U-Guard (Metal) Bond - Replaced	C8347
Floating Secondary Conductor - Repaired	AM-EU-9114
Protective Cap - Installed	C5327
Junction Box Cover/Screws - Replaced	AM-CE-P166
Pedestal Lock - Installed	C5283
Pentabolt - Replaced	Cat ID 1607278
Rubber Goods - Installed/Removed	C7500
Service Connections Insulated	TB-20-051, C7724, C7729

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Auxiliary Maintenance Order Procedure

ComEd Administrative Procedure

CS-CE-0061

Revision No.: 3

Effective:	1/8/2018
Supersedes:	N/A
Level:	3
Review Type:	N/A
Core Function:	Meter Services

Table of Contents

1. Purpose 1
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5. Roles and responsibilities 3
6. Documentation 4
7. Terms and definitions 4
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10. Development history 7

1. Purpose

1.1. To provide guidelines for issuing and assigning of Auxiliary Maintenance orders

1.2. Section 4 of this procedure has been divided into the following subsections:

Subsection	Title	Page
4.1	TRANSFORMER-RATED METER INSTALLATION	2
4.2	BACK OFFICE ACTIVITY	2
4.3	POST INSTALLATION INSPECTION ACTIVITY	2
4.4	REPORTING ACTIVITY	2

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Auxiliary Maintenance Order Procedure

ComEd Administrative Procedure

CS-CE-0061

Revision No.: 3

2. Precautions and limitations

2.1. Precautions

2.1.1 All established safety procedures must be adhered to (see F&MS Safety Policy CS-ED-43).

2.2. Limitations

2.2.1 None

3. Prerequisites

3.1. Requires the issuance of “transformer-rated meter installation” orders per the appropriate guidelines.

3.2. Assumes that Auxiliary Equipment is entered into CIMS per the appropriate guidelines.

4. Procedure

4.1. TRANSFORMER-RATED METER INSTALLATION

4.1.1 Upon installation of a transformer-rated meter, the field technician must access, complete and transmit an “Auxiliary Maintenance Secondary Completion” form in Mobile Dispatch.

4.1.2 Upon installation of a transformer-rated meter, the field technician must enter CT/PT information in the Mobile Dispatch completion comments of their meter field order per MD-DDD-2010-18.

4.2. BACK OFFICE ACTIVITY

4.2.1 Upon completion of an “Auxiliary Maintenance Secondary Completion WFM” a billing clerk must issue an “Auxiliary Maintenance” order for post-installation inspection per departmental guidelines.

4.3. POST-INSTALLATION INSPECTION ACTIVITY

4.3.1 Work Planner reviews Mobile Dispatch queue and schedules Auxiliary Maintenance orders so they can be completed within 50-Days.

4.3.2 Ensure Auxiliarry maintenance order is not completed by the Technician who completed installation of meter and CT’s

4.4. REPORTING ACTIVITY

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4.4.1 FSS Business Analyst runs weekly "Aged Order" report to flag aging "Auxiliary Maintenance" orders.

4.4.2 FSS Business Analyst issues monthly "Transformer Rated Installation" reports to ensure that the back office has issued the necessary Auxiliary Maintenance orders for post-installation inspections.

5. Roles and responsibilities

5.1. FIELD & METER SERVICES - WORK PLANNER

5.1.1 Responsible for planning and scheduling field orders and responsible for assigning work in the field technician's, mobile-dispatch-queue for execution.

5.1.2 Responsible for reviewing "aged orders" and for scheduling and dispatching auxiliary maintenance orders so that they can be completed within 50-Days of issuance.

5.1.3 Ensures Post Installation Inspection is not completed by the SET who installed Auxiliary Equipment and meter.

5.2. FIELD & METER SERVICES – SENIOR/PRIMARY ENERGY TECHNICIAN

5.2.1 Responsible for completing auxiliary maintenance secondary completion forms for **all** transformer-rated installations.

5.2.2 Responsible for completing auxiliary maintenance primary completion forms for ALL auxiliary maintenance orders.

5.2.3 Responsible for executing auxiliary maintenance field orders for post-installation inspections per CS-ED-185.

5.3. FIELD & METER SEVICES - FIELD SUPERVISORS

5.3.1 Responsible for ensuring that "Auxiliary Maintenance Secondary Completion Forms" are completed for ALL transformer-rated, meter installations.

5.3.2 Responsible for ensuring that "Auxiliary Maintenance Primary Completion Forms" are executed within 90-days per Section 410.155-"Installation Inspections" of Title 83-Public Utilities-Chapter 1.

5.3.3 Responsible for timely resolution of issues that cause auxiliary maintenance orders to be "unable to complete" (UTC).

5.4. FIELD SERVICES SUPPORT - CLERICAL

5.4.1 Responsible for issuing "Auxiliary Maintenance" orders upon completion of an "Auxiliary Maintenance Secondary Completion Form" WFM.

5.4.2 Responsible for issuing "Auxiliary Maintenance" orders upon review of "Transformer Rated Installation" reports when no order exists.

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5.4.3 Responsible for follow up on "Auxiliary Maintenance UTC WFMs" to ensure that "Auxiliary Maintenance" orders are **not** "auto void".

5.5. FIELD SERVICES SUPPORT – REPORTING BUSINESS ANALYST

5.5.1 Responsible for tracking the age of "Auxiliary Maintenance" orders and for issuing weekly "Aged Order" reports notating the age of pending "Auxiliary Maintenance" orders.

5.5.2 Responsible for issuing monthly "Transformer Rated Installation" reports to back office clerical for ensuring that orders have been issued on accounts where required.

6. Documentation

6.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

6.2. Documentation generated during performance of this procedure shall be filed by the CIMS system **and** maintained as viewable for 3 months **and** archived for at least 2 years.

7. Terms and definitions

7.1. AUXILIARY EQUIPMENT

7.1.1 Instrument transformers (Current transformers/"CT's" and Potential transformers/"PT's") used to convert high voltage and/or current to a level that can be measured by standard metering equipment.

7.2. AUXILIARY EQUIPMENT SECONDARY COMPLETION FORM

7.2.1 A form completed in Mobile Dispatch that details the auxiliary equipment installed.

7.3. AUXILIARY EQUIPMENT SECONDARY COMPLETION FORM WFM

7.3.1 A work flow manager "flag" generated in CIMS when a SET fills out the Auxiliary Equipment Secondary Completion form in Mobile Dispatch.

7.4. AUXILIARY MAINTENANCE ORDER

7.4.1 An order generated in CIMS and scheduled in Mobile Dispatch that is used for auxiliary equipment post installation inspections.

7.5. CUSTOMER INFORMATION AND MANAGEMENT SYSTEM (CIMS)

7.5.1 A computer system that contains bill account information and is the user front end for customer and marketing activities.

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7.6. FIELD & METER SERVICES (F&MS)

7.6.1 An organization responsible for “fielding” and “completing” meter orders.

7.7. FIELD SUPERVISOR (FLS)

7.7.1 An employee that supervises field personnel and reviews field work.

7.8. FIELD ORDER

7.8.1 A work item detailing specific meter activity to be completed at the work site.

7.9. FIELD SERVICES SUPPORT (FSS)

7.9.1 The back office department in the F&MS organization that is responsible for long range work planning, field order issuance, service order closure, order tracking and order reporting.

7.10. MOBILE DISPATCH

7.10.1 A wireless mobile information system used to dispatch and complete orders.

7.11. PART 410

7.11.1 A section of the Illinois Administrative Code that requires a post-installation inspection either prior to a meter exchange or within 90 days after a new meter installation.

7.11.2 F&MS has internal SLA of 50 days to complete inspection after initial install.

7.12. PRIMARY ENERGY TECHNICIAN (PET)

7.12.1 The field employee responsible for “fielding” and “completing” primary metered field orders.

7.12.2 Inspection WILL not be completed by PET that completed install.

7.13. SENIOR ENERGY TECHNICIAN (SET)

7.13.1 The field employee responsible for “fielding” and “completing” Three-Phase meter field orders.

7.13.2 Inspection WILL not be completed by SET that completed install

7.14. Unable to Complete (UTC)

7.14.1 A field condition, such as access, that prevents a field order from being completed.

7.15. WORK PLANNER

7.15.1 The F&MS employee responsible for assigning and scheduling field orders to field employees to comply with SLA’s

8. References

8.1. LE-AC-401 – Records and Information Management Retention Disposition

8.2. List Title 83: Public Utilities – Chapter I: Illinois Commerce Commission Subchapter c: Electric Utilities – Part 410 – Section 410.155.

8.3. FMS-FN-06-003 – Post Installation Inspections.

8.4. Instrument Transformers & Service Inspection Tests Training Manual.

9. Attachments

9.1. None

Auxiliary Maintenance Order Procedure

ComEd Administrative Procedure

CS-CE-0061

Revision No.: 3

10. Development history

Revision 0	**Date: 12/17/2010**
Writer	Tami Wilson-F&MS
Reviewer(s)	Michael Schyman-F&MS, Michael Wilson-F&MS, Dawn Owens-F&MS, Cheryll Sawyer-F&MS, Robert Ruerhdanz-F&MS, John Selenica-System Meter, Tim Leahy-System Billing, Susan Hoftiezer-Reg Prog Implementation ComEd
UFAM Approver(s)	Joseph Svachula, Director Customer Strategies & Support, Meter to Cash
Reason written	Tracking and Handling of Auxiliary Maintenance Orders

Revision 1	**Date: 2/25/2015**
Writer	N/A
Reviewer(s)	N/A
UFAM Approver(s)	N/A
Reason written	Moved to new template; no content revisions included.

Revision 2	**Date: 4/10/2015**
Writer	Gerard Kramp F&MS
Review(ers)	Robert Ruehrdanz F&MS Chris Gubala Distribution Standards
UFAM Approver(s)	Kendall Hodge Meter Services UFAM
Reason written	Periodic Review: No Change to Procedure Update Terminology and formatting.

Revision 3	**Date: 1/3/2018**
Writer	Gerard Kramp F&MS
Review(ers)	Robert Ruehrdanz F&MS Chris Gubala Distribution Standards
UFAM Approver(s)	William Walsh Meter Services UFAM
Reason written	Periodic Review: No Change to Procedure

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Periodic Exchange Program

ComEd Administrative Procedure

CS-CE-190

Revision No.: 4

Effective:	2/4/2019
Supersedes:	N/A
Level:	3
Review Type:	3 Year
Core Function:	Meter Services

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1. Purpose

1.1. To provide guidelines for selecting commercial electric meters to be tested on a periodic basis. Under Illinois Commerce Commission (ICC) regulations, in-service electric meters must be exchanged or tested on a periodic (8 year) basis from last test date.

1.2. Section 6 has been divided into the following subsections:

Subsection	Title	Page
6.1	Periodic Exchange Process	3
6.1.1	CEDIT	3
6.2	Meter Shop	3
6.3	SMART METER OPERATIONS Management Team	3
6.4	CEDIT	3

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Periodic Exchange Program

ComEd Administrative Procedure

CS-CE-190

Revision No.: 4

6.5	Meter Shop	3
6.6	Lead Work Planner	4

2. Precautions and limitations

2.1. Precautions

2.1.1 None

2.2. Limitations

2.2.1 None

3. Prerequisites

3.1. None

4. Procedure

4.1. Periodic Exchange Process

4.1.1 CEDIT

4.1.1.1 **QUERY** CIMS for all meters in year of Periodic Exchange Program for Commercial meters with a test date of 8 years to current of exchange year.

4.1.1.2 **CONTACT SMART METER OPERATIONS** to inform them that the query is complete.

4.2. Meter Shop

4.2.1 **REVIEW** list AND **MEET** with Management team to inform them of how many meters in Periodic Exchange Program.
Meter shop **REVIEW** meters in ADM

4.3. SMART METER OPERATIONS Management Team

4.3.1 **REVIEWS** query to determine what meters will be Periodic Field Meter Test OR Periodic Meter Exchanges.

4.3.1.1 The quantity of meters in program will determine how many field tests are needed.

4.4. CEDIT

4.4.1 **CREATES** Periodic Exchanges AND Periodic Field Test in CIMS.

4.5. METER SHOP

4.5.1 **REVIEWS** inventory AND **ORDERS** appropriate meters for the first two months.

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4.5.2 **FILLS** meter orders for regions.

4.6. Lead Work Planner

4.6.1 **MANAGES** all of the work in Mobile data AND **VERIFIES** the planners are following work plan.

4.6.2 **TRACKS** completed orders to **VERIFY** the Periodic are completed.

5. Roles and responsibilities

5.1. Management Team

5.1.1 Sets the parameters for the periodic exchanges for the current year. They will determine which meters are field tested **or** exchanged.

5.1.2 Meet with CEDIT to go over periodic.

5.2. CEDIT

5.2.1 Will query system to find how many meters meet the requirement for the periodic exchange program.

5.2.2 Create orders in CIMS

5.3. Meter Shop

5.3.1 Meter Supervisor will meet with the CEDIT group to go over Periodic Exchanges.

5.3.2 Review inventory levels and order meters for program.

6. Documentation

6.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

6.2. Documentation generated during performance of this procedure shall be filed Meter Shop Supervisor and maintained for 10 years.

7. Terms and definitions

7.1. CEDIT

7.1.1 Maintenance and enhancement in the CMIS database

7.2. CMO

7.2.1 Change Meter Only - Change an installed meter with a newly tested meter in the field

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7.3. Lead Work Planner

7.3.1 Manages work load and maintain orders in Mobile Data

7.4. Management Team

7.4.1 Set workload for SMART METER OPERATIONS and set the parameters on what meters are tested or changed for the Periodic Exchange Program

7.5. Meter Shop

7.5.1 Smart Meter Operations team that test all meters and controls the inventory

7.6. Mobile Data

7.6.1 Mobile computer system used to complete orders in the field by meter techs.

7.7. Periodic Exchange Program

7.7.1 Under Illinois Commerce Commission (ICC) regulations, in-service commercial electric meters must be exchanged or tested on a periodic basis, 8 years from last test date.

7.8. Periodic Meter Exchange

7.8.1 Meter Exchange order issued to do Periodic Meter Exchange program.

7.9. Pragmacad

7.9.1 Dispatching tool used in Mobile Data.

7.10. Work Plan

7.10.1 At the end of each year a work plan is create for the upcoming year. The SMART METER OPERATIONS Management team creates this plan and the Lead Work Planner manages and controls all of the work. He makes sure that all of the work gets completed.

8. References

8.1. LE-AC-401 – Records and Information Management Retention Disposition

9. Attachments

9.1. None

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Periodic Exchange Program

ComEd Administrative Procedure

CS-CE-190

Revision No.: 4

10. Development history

Revision 0	**Date: 12/15/2004**
Writer	Frank Ippolito – SMART METER OPERATIONS Supervisor
Reviewer(s)	Phil Martin – SMART METER OPERATIONS System Engineer
UFAM Approver(s)	Woody Scherer – SMART METER OPERATIONS Manager
Reason written	To provide guidelines for selecting commercial electric meters to be tested on a periodic basis. Under Illinois Commerce Commission (ICC) regulations, in-service electric meters must be exchanged or tested on a periodic basis. 8 years from last test date.

Revision 1	**Date: 5/16/2005**
Writer	Ritesh Patel – Principal Engineer
Reviewer(s)	Carolyn Johnson – SMART METER OPERATIONS Analyst
UFAM Approver(s)	Alyssa McCartney, Woodson Scherer – SMART METER OPERATIONS Manager
Reason written	To update procedure to proper format.

Revision 2	**Date: 2/25/2016**
Writer	Ritesh Patel – Principal Engineer
Reviewer(s)	John Selenica – SMART METER OPERATIONS Supervisor
UFAM Approver(s)	William Walsh– SMART METER OPERATIONS Manager
Reason written	Periodic Review No changes to procedure.

Revision 3	**Date: 2/29/2016**
Writer	N/A
Reviewer(s)	N/A
UFAM Approver(s)	N/A
Reason written	Moved to new template; no content revisions included.

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Periodic Exchange Program

ComEd Administrative Procedure

CS-CE-190

Revision No.: 4

Revision 4	**Date: 2/4/2019**
Writer	Yee Chow– SR Engineer
Reviewer(s)	John Selenica – SMART METER OPERATIONS Supervisor
UFAM Approver(s)	William Walsh– SMART METER OPERATIONS Manager
Reason written	Periodic Review No changes to procedure.

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Annual Random Sample Procedure

ComEd Administrative Procedure

CS-CE-191

Revision No.: 6

Effective:	8/20/2020
Supersedes:	NA
Level:	3
Review Type:	2 Year
Core Function:	Meter Services

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Annual Random Sample Procedure

ComEd Administrative Procedure

CS-CE-191

Revision No.: 6

1. Purpose

To provide guidelines for: for testing and filing reports for the random sample program

Section 4 of this procedure has been divided into the following subsections

Subsection	Title	Page
4.1	Sample Groups	3
4.2	Generating Sample Test Groups	3
4.3	Issue of Meter Exchanges	3
4.4	Testing	3
4.5	Reporting	3 - 4

2. Precautions and limitations

2.1. Precautions

Hub personnel need to be instructed to handle random sample meters with care. Whenever possible, special pickup and delivery methods should be used to eliminate meter being damaged in transit

Random Sample labels must be attached to the meters for identification

2.2. Limitations

None

3. Prerequisites

3.1. An entity that chooses to use sample testing shall use the procedures prescribed in any of the following documents (alone or in combination) to sample test non-demand, self-contained single phase, or three-wire network meters

3.2. ANSI/ASQC Z1.4 -1993 “Sampling Procedures and Tables for Inspection by Attributes”, approved 1993, American Society of Quality Control, 611 East Wisconsin Avenue, Milwaukee, WI 53202. No later amendment or editions are incorporated

3.3. ANSI/ASQC Z1.9 -1993 “Sampling Procedures and Tables for Inspection by Attributes”, approved 1993, American Society of Quality Control, 611 East Wisconsin Avenue, Milwaukee, WI 53202. No later amendment or editions are incorporated

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3.4. Military Standard 414 "Sampling Procedures and Tables for Inspection by Variables", approved May 8, 1968, Defense Automation and Production Service, Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094. No later amendment or editions are incorporated

4. Procedure

4.1. SAMPLE GROUPS

4.1.1 System Meter Engineering shall **DIVIDE** the meter populations into homogeneous groups consisting of meters of the same basic type AND purpose. A sample shall be **TAKEN** each year for each homogenous group

4.2. GENERATING SAMPLE TEST GROUPS

4.2.1 CEDIT **ENTERS** the groups provided by System Meter Engineering into CIMS to **GENERATE** the list of sample meter AND exchange orders

4.2.2 IT **CREATES** a MS Access table in the ADM database for tracking

4.2.3 Exchange comments are **UPDATED** annually AND **ISSUED** with the exchange orders

4.3. ISSUANCE OF METER EXCHANGES

4.3.1 The work planners **PULL** down random sample exchanges from CIMS AND **DISPATCH** according to the work plan

4.3.2 Once the Random Sample population allotment is completed, the lead work planner will **DELETE** all remaining change meter orders (CMOs)

4.4. TESTING

4.4.1 The test limits for Random Sample meters are automatically calculated by the ADM system. Obsolete meters are **JUNKED** after the test is within limits. Tampered meters are **HELD** per System Meter Shop guidelines. Out of limits meters are set aside for evaluation by the System Meter Shop tamper room

4.4.2 ADM **STORES** random sample meter test results AND is used to **GENERATE** reports on testing progress

4.5. PASS/FAIL OF SAMPLE GROUP

4.5.1 ICC 410.180 states that ComEd is to follow ANSI/ASQC Z1.9 -1993 for the random sampling pass/fail process. We are to use the "Normal Inspection for Variability Unknown – Standard Deviation Method"

4.5.1.1 Weighted Average for each meter is calculated by $\frac{4*FL+LL}{5}$ per ICC 410.150(d)

4.5.1.2 μ is the calculated average of the weighted averages

4.5.1.3 σ is the standard deviation of the weighted averages

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4.5.1.4 Quantity(u) is calculated by $\frac{102-\mu}{\sigma}$

4.5.1.5 Quantity(l) is calculational by $\frac{\mu-98}{\sigma}$

4.5.1.6 Acceptability Constants (K) can be found in table B-1 on page 35 of the ANSI/ASQC Z1.9 -1993

4.5.2 A sample group **PASSES** the random sampling process if quantity(u) **OR** quantity(l) ≥ acceptability constant (K)

4.5.3 A sample group **FAILS** the random sampling process if quantity(u) **OR** quantity(l) < acceptability constant (K)

4.5.3.1 System Meter Shop & System Meter Engineers are to analyze and dissect the failed sample group into smaller subgroups to minimize the impact (i.e. subgrouping by serial number, purchase order, meter type, etc.). Use meter vendor as an asset in determining subgroups

4.5.3.2 The impact of a sample group failing is the requirement to exchange the entire meter population with a group that passes the sampling procedure

4.5.3.3 Retest each subgroup as a normal sample group

4.5.3.4 If the subgroup **PASSES,** then no other action is required

4.5.3.5 If the subgroup **FAILS** again, then this subgroup needs to be exchanged

4.6. REPORTING

4.6.1 From the Illinois Administrative Code, Part 410, Section 180, "Each entity using sample testing shall **FILE** a yearly report no later than March 31st of the following year with the Chief of the Commission AND **PROVIDE** a copy to the Manager of the Energy Division OR its successor detailing the sample plan used in the previous year, along with the results of the testing program"

4.6.1.1 System Meter Shop Supervisor **GENERATES** a "master tab" by querying the stored random sample results

4.6.2 System Meter Engineering & System Meter Shop Supervisor run statistical analytics from the "master tab". Steps are as follows

4.6.2.1 SORT by Test Group, then by Test Date

4.6.2.2 CHECK for duplicates; if any found than delete duplicated test record

4.6.2.3 Copy & Paste each group into individual tabs within the spreadsheet

4.6.2.4 LOOK UP Total Population Sizes for each group, see Attachment 9.1. The population size is the only input needed into each spreadsheet tab, see Attachment 9.2

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4.6.2.5 Preset-Logic will determine Sample Size, Acceptability Constant (K), Upper Limit (U), Lower Limit (L), Mean (**μ**), Standard Deviation (**σ**), quantity(u), quantity(l), ∑ meters < 98%, ∑ meters > 102%, and End Test Date. See an example in Attachment 9.2

4.6.2.6 "Totals tab" is linked throughout the spreadsheet and is to be used for the ICC report. See an example in Attachment 9.3

4.6.3 Table from "Totals tab" is copied to report documents and **SENT** to the Illinois Commerce Commission requiring F&MS vice president approval. This effort should be coordinated with the Regulatory Affairs Department

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5. Roles and responsibilities

5.1. SYSTEM METER ENGINEERING

5.1.1 Determine random sample groups for the following calendar year. These groups will be entered in CIMS to determine the number of sample tests that will need to be generated

5.1.2 Evaluate progress of the sample program

5.2. SYSTEM METER SHOP SUPERVISOR

5.2.1 Schedule the testing and report out on the progress of the random sample test schedule

5.3. CEDIT

5.3.1 The CEDIT group will enter each sample group into CIMS to generate the random sample meter population

5.4. SMART METER OPERATIONS WORK PLANNER/LEAD PLANNER

5.4.1 Assigns Random Exchange orders in Mobile Dispatch

5.4.2 Lead Planner voids remainng orders upon completion of the program

6. Documentation

6.1. The annual report generated during the random sample test procedure **SHALL** be filed by March 31st of the following year as stated in 4.6.1

7. Terms and definitions

7.1. ADM

System Meter Shop inventory control & meter shop test control system

7.2. CEDIT

Information Technology group responsible for maintenance and enhancements to the CIMS database.

7.3. CIMS

Customer Information Management System

7.4. CMO

Change Meter Order, the service order in CIMS that meter technicians work the exchanges

7.5. IT

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Information Technology group

7.6. LABELS

Identifier and instructions attached to the front of each meter

7.7. Shop Test

Meter watt-hour accuracy test performed at System Meter Shop

7.8. FL

Full Load test, conducted at 100% of meter's test amps

7.9. LL

Light Load test, conducted at 10% of meter's test amps

8. References

8.1. LE-AC-401 – Records and Information Management Retention Disposition

8.2. Illinois Administrative Code, Part 410, Section 140

9. Attachments

9.1. CS-CE-191-1, How to Find Group Populations:

1. CIMS Production → Select Population Definition

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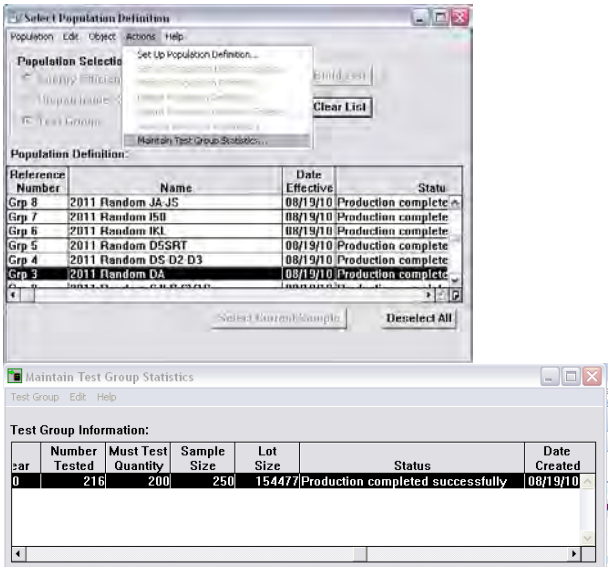
Annual Random Sample Procedure

ComEd Administrative Procedure

CS-CE-191

Revision No.: 6

2. Select Test Groups → Click Build List → Select Group(s) → Under Actions, Maintain Test Group Statistics. Inside the "Lot Size" gives you the population.



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9.2. CS-CE-191-2, View of Preset logic in each tab

Values		Notes
Population Size	3,619	*Only input by engineer*
Sample Size	75	*If Population < 151, logic will not work*
Acceptability Constant, K	1.65	*Table B-1, page 35*
Upper Limit, U	102	
Lower Limit, L	98	
μ	100.17	*Mean = (∑ averages) / (sample size)*
σ	0.09142777	*Standard Deviation of Averages*
Quantity(u) = (U - μ) / σ	20.06859259	*Qty(u) must be > K*
Quantity(l) = (μ - L) / σ	23.68179093	*Qty(l) must be > K*
<98%	0	*Sort by Columm F, count < 98.*
>102%	0	*Sort by Columm F, count >102*
End test date	4-Mar-11	*Sort by Columm G, to check last test date*

9.3. CS-CE-191-3, View of Totals Tab

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GROUP	DESCRIPTION	POPULATION	SAMPLE Z1.9	PASS/FAIL	MEAN	< 98%	> 102%	Test Completed
1	A8LN6J	3,619	75	PASS	100.17	0	0	3/4/2011
2	CJLS-CY1S	649,464	200	PASS	100.11	0	0	5/18/2011
3	DA	3,820	75	PASS	99.78	0	0	9/6/2011
4	DS-D2S	49,640	150	PASS	99.99	1	0	6/20/2011
5	D5SRT	152,137	200	PASS	99.40	15	0	6/15/2011
6	IKL	9,363	75	PASS	100.00	0	0	8/5/2011
7	I50-I55	79,348	150	PASS	99.61	1	0	6/20/2011
8	JA-JS	124,478	150	PASS	99.64	2	0	8/17/2011
9	J3S	171,851	200	PASS	99.46	3	1	8/17/2011
10	LC2S	2,663	50	PASS	100.14	0	0	8/5/2011
11	MF-MK	74,555	150	PASS	99.61	2	1	8/17/2011
12	MQ-MS	263,039	200	PASS	100.07	1	1	5/23/2011
13	P2-S12	89,529	150	PASS	100.13	1	0	6/21/2011
14	V612S	43,588	150	PASS	99.91	1	0	6/20/2011
15	D4S	209,351	200	PASS	99.91	0	0	6/21/2011
16	D5-D6	80,543	150	PASS	100.07	0	0	8/17/2011
17	I60-I70	662,381	200	PASS	99.99	0	0	6/20/2011
18	J4S-J5S	186,694	200	PASS	99.82	0	0	8/1/2011
19	I71	692,932	200	PASS	99.88	0	0	8/1/2011
20	I210-I211	119,434	150	PASS	99.89	0	0	8/2/2011
21	NDS1X	1,170	35	PASS	99.94	0	0	6/22/2011

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Annual Random Sample Procedure

ComEd Administrative Procedure

CS-CE-191

Revision No.: 6

10. Development history

Revision 0	**Date: 12/15/2004**
Writer	Philip G. Martin – Engineer System Meter
Reviewer(s)	Frank Ippolito – Supervisor F&MS;
UFAM Approver(s)	Woody Scherer – Manger F&MS
Reason written	To provide guidelines for testing a filing reports for the random sample program

Revision 1	**Date: 5/24/2005**
Writer	Ritesh Patel – Engineer System Meter
Reviewer(s)	Carolyn Johnson – Analyst F&MS;
UFAM Approver(s)	Alyssa McCartney, Woody Scherer – Manger F&MS
Reason written	To update format

Revision 2	**Date: 4/27/2012**
Writer	Christopher Gubala – Engineer System Meter
Reviewer(s)	Philip Martin – Senior Engineer System Meter; John Selenica – Senior Supervisor Customer Field Ops; Edward AdAMS ADM- Director Field & Meter Services;
UFAM Approver(s)	Miguel Ortega – Director Customer Technology & Support
Reason written	Update process and procedure to reflect newly implemented logic that was put in place and tested to ensure accuracy of statistics.

Revision 3	**Date: 4/17/2014**
Writer	Yee Chow – Senior Engineer System Meter
Reviewer(s)	Philip Martin – Senior Engineer System Meter; John Selenica – Senior Supervisor Customer Field Ops; David Deleon- General Engineer System Meter;
UFAM Approver(s)	Edward AdAMS ADM- Director Field & Meter Services
Reason written	Document has been reviewed for validity and accuracy. New Format.

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Annual Random Sample Procedure

ComEd Administrative Procedure

CS-CE-191

Revision No.: 6

Revision 4	**Date: 3/11/2016**
Writer	Yee Chow – Senior Engineer System Meter
Reviewer(s)	John Selenica – Senior Supervisor Customer Field Ops;
UFAM Approver(s)	William Walsh - Director Field & Meter Services
Reason written	Periodic Review. Minor Change to terminolog

Revision 5	**Date: 8/28/2018**
Writer	Christopher Gubala – Senior Engineer, System Metering Standards
Reviewer(s)	John Selenica – Senior Supervisor, Customer Field Ops Janine Keating – Manager, System Metering Standards
UFAM Approver(s)	William Walsh – Director Field & Meter Services
Reason written	Added language determining pass/fail criteria

Revision 6	**Date: 8/20/2020**
Writer	Chris Gubala – Senior Engineer, System Metering Standards
Reviewer(s)	Chris Ruschke:Senior Supervisor, Customer Field Ops Hector Garcia: Manager System Meter Engineering Tolanda Jones: Planning MGR Smart Meter Operations
UFAM Approver(s)	Anna Vargas – Director Field & Meter Services
Reason written	Scheduled 2 Year Review

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Smart Meter Operations High Temperature Monitoring Emergency Investigation Response

ComEd Administrative Procedure

CS-CE-09022

Revision No.: 3

Effective:	5/2/2019
Supersedes:	NA
Level:	3
Review Type:	3 Year
Core Function:	Meter Services

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1. Purpose

This procedure defines the field emergency investigation response related to AMI high temperature monitoring. The purpose of this procedure is to reduce the risk of degradation of customer owned equipment

2. Precautions and limitations

2.1. Precautions

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2.1.1 All safety regulation rules must be adhered to.

2.1.2 All proper PPE must be worn per departmental policy.

2.2. Limitations

2.2.1 Restricted access to meters could prohibit the completion of AMI high temperature field investigations.

3. Prerequisites

3.1. All safety procedures shall be followed.

3.2. Socket Gap Tester.

3.3. This procedure is used only on incidents that meet AMI Operations AMI high temperature monitoring criteria for field emergency investigations.

4. Procedure - Smart Meter High Temperature Investigation (Non A-Base)

Temperature scans are performed for all communicating AMI meters in the field. An algorithm is used to identify AMI meters with potential concerns. Further investigations are performed if needed to reduce potential false positives. Emergency Investigation service orders are created by AMI Operations.

Smart Meter operations Work planner assigns high temperature investigation to available technician by next business day or as otherwise agreed to by AMI Operations.

4.1.1 Smart Meter Operations field technician verifies the premise address to the address on the route sheet.

4.1.2 Upon arrival, notify the customer that they may be without power due to maintenance and if the customer is not home, leave the ComEd door card at the premise signifying that work was performed.

4.1.2.1 Suggested talking points for Smart Meter Ops with the customer include: “Your smart meter has reported an abnormal condition. I’m here to investigate and verify everything is normal with your meter equipment and identify any potential service issues.”

4.1.3 Verify the smart meter number and address to the order.

4.1.4 Check the meter display to determine if the meter is cycling properly through the various displays. If the display appears blank or is not cycling appropriately, this may indicate a defective meter. Record all findings in the completion comments within MDT and in the AMI Operations High Temperature Investigation SharePoint Form.

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4.1.5 Collect the ambient temperature; point the temperature scanner directly at the wall. Record the ambient temperature in the comments section of the route sheet.

4.1.6 Collect the temperature reading for the meter face and record the temperature in the comments section of the route sheet.

4.1.7 Perform an exterior visual inspection of the meter inside of the fitting to determine if it can be jumpered or if tampering has occurred.

4.1.8 Verify service.

4.1.9 Check for proper jumper placement; install jumpers if the meter has horn jumpers. If jumpers cannot be installed, customer must be notified of a brief interruption of service.

4.1.10 Remove the meter from the fitting by de-energizing the line side of the meter first.

4.1.10.1 If it is ring style fitting, remove the ring before removing the meter.

4.1.11 Collect the temperature readings for all four bayonets and record each reading along with any visual heat damage in the comments section of the route sheet.

4.1.12 Collect the temperature readings for all four jaw terminals and record each reading in the comments section of the route sheet.

4.1.13 Visually inspect the smart meter and fitting for the following conditions: discoloration or damage on the globe, bayonets, jaws, lugs, loose connections, arching signs on the bayonets or jaws, carbon deposits, melting on the meter, its line, load and link wires/insulation, or bus bar if applicable, gap on the jaws by utilizing gap tester.

4.1.14 If any of the above conditions exist or, a single temperature reading registers above 160 degrees Fahrenheit and it is safe to do so, install a jumper plate to keep the customer in power. Complete a CMO and hang the new meter. Ensure the new meter is placed in a waterproof bag per FBC15-51. Clearly label the removed meter with “HT” on the upper left corner away from the barcodes and display. Label the meter using a grease pencil, permananet marker or label. Return the removed meter to Meter Shop.

4.1.15 If the meter is not damaged and it is safe to do so, re-install the original smart meter and locking ring if required.

4.1.16 Verify the meter is cycling properly through the various displays and the load side has proper voltage at the load terminal.

4.1.17 Seal the meter. Log this seal number on the route sheet and remove the Brady sticker if applicable.

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5. Procedure - Smart Meter High Temperature Investigation (A-Base)

5.1.1 Field technician verifies the premise address to the address on the route sheet.

5.1.2 Upon arrival notify the customer that they may be without power due to maintenance and if the customer is not home, leave the ComEd door card at the premise signifying what work was performed.

5.1.3 Verify the smart meter number and address to the order.

5.1.4 Perform an exterior visual inspection. Clip the meter seal then lift the cover off and conduct another visual inspection of the meter fitting. Determine if any tampering or irregular conditions exist.

5.1.5 Verify service.

5.1.6 Check the meter display to determine if the meter is cycling properly through the various displays. If the display appears blank or is not cycling appropriately, this may indicate a defective meter. Record this finding in the completion comments within MDT and in the AMI Operations High Temperature Investigation SharePoint Form.

5.1.7 Collect the ambient temperature; point the temperature scanner directly at the wall. Record the ambient temperature in the comments section of the route sheet.

5.1.8 Collect the temperature reading for the meter face and record the temperature in the comments section of the route sheet.

5.1.9 Collect the temperature readings for terminal 1 on the A-Base block, and record this reading in the comments section of the route sheet. Repeat these steps for terminals 2, 3 & 4.

5.1.10 Pull the meter from the adapter, ensuring the adapter itself doesn't come off the hook in the ohms box .

5.1.11 Collect the temperature reading for bayonet 1 and record the temperature and heat damage identified in the comments section of the route sheet. Repeat these steps for Bayonet 2, 3 and 4.

5.1.12 Collect the temperature readings for jaw terminal 1 and record the temperature in the comments section in the route sheet. Repeat these steps for jaw terminal 2, 3 and 4.

5.1.13 Visually inspect the smart meter and fitting for any of the following conditions: discoloration or damage on the globe, bayonets, jaws, lugs, adaptor or block on an A-Base, loose connections, arching signs on the bayonets or jaws, carbon deposits, melting on the meter, the adapter and its connection points, A-Base block, line, load and link wires/insulation, or bus bar if applicable, gap on the jaws by utilizing gap tester.

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5.1.14 If any of the above conditions exist or, a single temperature reading registers above 160 degrees Fahrenheit and it is safe to do so, install a jumper plate to keep the customer in power. Complete a CMO and hang the new meter. Ensure the new meter is placed in a waterproof bag per FBC15-51. Clearly label the removed meter with “HT” on the upper left corner away from the barcodes and display. Label the meter using a grease pencil, permananet marker or label. Return the removed meter to Meter Shop.

5.1.15 If none of the above conditions exist, and the meter is not damaged, re-install the original smart meter and locking ring if required.

5.1.16 Verify the meter is cycling properly through the various displays and the load side has proper voltage at the load terminal of the block.

5.1.17 Close and seal the ohms box. Log this seal number on the route sheet and remove the brady sticker if applicable.

6. **Procedure –** Completion Process

6.1.1 Upon completion of all High Temperature Emergency Investigations, including UTCs, the AMI Operations High Temperature Investigation form must be completed. Access AMI Operations High Temperature investigation SharePoint form on your MDT.

6.1.2 From the home page, click on “Items” under the List Tools to add a new item.

6.1.3 Fill out the Share Point form and submit it.

6.1.3.1 If the technician could not complete the investigation, include the reason it could not be completed in the UTC Comments sections of the form.

6.1.3.2 If a jumper plate was installed, note this in the comment section of the form.

6.1.3.3 If the customer is out of power or has partial power, note this on the form along with contacting the AMI duty phone at 224-422-9381. Inform your FLS immediately. Follow the established ComEd procedure.

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7. Roles and responsibilities

7.1. BACK OFFICE EMPLOYEES

7.1.1 AMI Operations will issue Emergency Investigation service orders for AMI high temp field investigations.

7.1.2 AMI Operations will attempt to contact customers via phone call to make an appointment if the order is UTC in the field.

7.2. FIELD EMPLOYEES

7.2.1 Smart Meter Operations (SMO) technicians investigates suspected high temperature conditions to determine if they exist and report back the appropriate findings.

7.2.2 Smart Meter Operations techs shall contact the AMI duty phone and report if the customer is out of power or has partial power.

8. Documentation

8.1. None

9. Terms and definitions

9.1. **Advanced Meter Infrastructure (AMI):** An integrated system of smart meters, communications networks, and data management systems that enables two-way communication between utilities and customers.

9.2. **SMART METER OPERATIONS (FMS):** Department responsible for maintaining and installing electric meters and associated equipment.

9.3. **Unable To Complete (UTC):** Technician unable to complete the order in the field.

10. References

10.1. None

11. Attachments

11.1. None

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Smart Meter Operations High Temperature Monitoring Emergency Investigation Response

ComEd Administrative Procedure

CS-CE-09022

Revision No.: 3

12. Development history

Revision 0	**Date: 2/13/2017**
Writer	Kaveh Aflaki, Sr Engineer AMI Operations
Reviewer(s)	Carla Frieh AMI Operations and Bill Walsh Smart Meter Operations
UFAM Approver(s)	Bill Walsh, UFAM Meter Services
Reason written	Document procedure for emergency investigations related to AMI high temperature monitoring.

Revision 1	**Date: 5/10/2017**
Writer	Kaveh Aflaki, Sr Engineer AMI Operations
Reviewer(s)	Dave Doherty; Carla Frieh; and Bill Walsh Smart Meter Operations;
UFAM Approver(s)	Bill Walsh, UFAM Meter Services
Reason written	Document procedure for emergency investigations related to AMI high temperature monitoring.

Revision 5	**Date: 5/2/2019**
Writer	Shivraj Bhosale SR Engineer AMI Operations
Reviewer(s)	Shivraj Bhosale SR Engineer AMI Operations
UFAM Approver(s)	Bill Walsh, UFAM Meter Services
Reason written	Periodic Review No changes to procedure

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AMI High Temperature Event Process

ComEd Administrative Procedure

CS-CE-09024

Revision No.: 1

Effective:	5/5/2020
Supersedes:	N/A
Level:	3
Review Type:	3 Year
Core Function:	Meter Services

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11. Development history 6

1. Purpose

This procedure defines the AMI high temperature event process. The purpose of this procedure is to reduce the risk of degraded customer owned equipment through a defensive strategy

2. Precautions and limitations

2.1. Precautions

2.1.1 All safety regulation rules must be adhered to.

2.1.2 All proper PPE must be worn per departmental policy.

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2.2. Limitations

2.2.1 Restricted access to meters could prohibit the completion of AMI high temperature field investigations.

3. Prerequisites

3.1. All safety procedures are followed.

3.2. This procedure is used for "AMI High Temp" Emergency Trouble Tickets (ETT).

4. Procedure - Smart Meter High Temperature Event Process

Meter temperatures and events are recorded for all communicating AMI meters in the field.

4.1.1 An "AMI High Temp" Emergency Trouble Ticket is automatically created in CIMS and OMS for meters with temperature events or readings over 203ºF.

4.1.2 An automatic email with meter number, meter details, and premise address is sent for each ticket generated to the "ComEd AMI High Temperature" Outlook group (ComEdAMIhightemperature@exeloncorp.com), which includes members from AMI Operations and the OCC.

4.1.2.1 If the email states "AMI High Temp manual ticket creation is required," the OCC follows the manual non-active account ticket creation procedure to generate an "AMI High Temp" trouble ticket.

4.1.2.2 The OCC replies to the AMI High Temp email stating, "Trouble ticket number xxxxxx for meter xxxxxxxx is generated on address xxxxxxxxx / account number xxxxxxxxx."

4.1.3 The OCC then adds meter details to the trouble ticket in OMS before dispatching, including meter type and size, based on the email received.

4.1.4 All "AMI High Temp" emergency trouble tickets are dispatched by the OCC regardless of time of day.

4.1.5 When the OCC needs to involve a Field & Meter Services (FMS) tech instead of an OES, the OCC utilizes the Field and Meter Services call out/escalation process to engage Field and Meter Services immediately. FMS' on duty supervisor creates the appropriate order.

4.1.6 If it is after 0600 and before 2100:

4.1.6.1 The OCC dispatches the ticket within 2 hours.

4.1.7 If it is after 2100 and before 0600:

4.1.7.1 The OCC pings the meter for the real time temperature.

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4.1.7.2 If the meter's real-time temperature is less than 160ºF, the OCC verifies the meter temperature every hour to ensure the temperature remains below 160ºF. The OCC dispatches tickets between 0600 and 0800.

4.1.7.3 If the meter's real-time temperature is greater than or equal to 160ºF, or if the meter is not pinging:

4.1.7.3.1 The OCC calls the customer regarding the potential safety concern.

4.1.7.3.2 If the OCC makes customer contact, the OCC dispatches the ticket within 2 hours.

4.1.7.3.3 If the OCC is unable to contact the customer, the meter is communicating, and the meter is equipped with an RCD switch (remote connect and disconnect capable), the OCC attempts to remote disconnect the meter.

4.1.7.3.4 If the OCC is unable to contact the customer and remote disconnect the meter, the OCC dispatches an OES within 2 hours to pole cut.

4.1.7.3.5 The OCC calls the Call Center to request a Critical Contact note be added in CIMS, noting that, "Power cannot be restored until the meter and fitting is investigated for safety." The OCC adds the same comment in the trouble ticket.

4.1.7.3.6 Once power is disconnected, either remotely or by a pole cut, the OCC dispatches the ticket for the meter and fitting to be field investigated. This happens when either the customer contacts ComEd for an outage, or between 0600-0800, whichever comes first.

4.1.8 Once the OES/FMS tech is dispatched to investigate the meter and fitting, the OES/FMS tech verifies the meter and address.

4.1.8.1 The OES/FMS tech knocks on the door and notifies the customer onsite that they may briefly be without power while they investigate the meter and fitting.

4.1.8.2 If the OES/FMS tech cannot gain access to the meter (UTC), the OES/FMS tech calls the OCC dispatcher to notify them of the situation.

4.1.8.2.1 The OCC calls the customer to gain access. If the OCC is unable to contact the customer, the meter is communicating, and the meter is equipped with an RCD switch (remote connect and disconnect capable), the OCC attempts to remote disconnect the meter. If they are not able to remote disconnect, the OES is to pole cut the meter.

4.1.8.2.1.1 The OCC calls the Call Center to request a Critical Contact note be added in CIMS, noting that, "Power cannot be restored until the meter and fitting is investigated for safety." The OCC adds the same comment in the trouble ticket.

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4.1.8.3 Upon gaining access to the meter, the OES/FMS tech performs a visual inspection of the meter fitting.

4.1.8.3.1 The OES/FMS tech verifies the meter display is cycling through all of the required cycles.

4.1.8.4 The meter seal and cover are removed.

4.1.8.5 A visual inspection of the meter inside of the fitting is performed to determine if the meter can be jumpered to retain customer power or, if tampering has occurred.

4.1.8.6 If tampering has occurred, the service is pole cut and step 4.1.4.9.1 is followed.

4.1.8.7 If the meter has horn jumpers, and it is safe to do so, jumpers are installed to retain customer power. The meter is removed from the fitting and visually inspected for the following:

4.1.8.7.1 Discoloration – On the meter face, bayonets, jaws, lugs, adaptor, or block on an A-base

4.1.8.7.2 Melting – Of the meter, meter base, wires, wire coverings, fitting, adaptor or block on an A-base

4.1.8.7.3 Carbon Deposits

4.1.8.8 If there are no signs of heat damage, the meter is exchanged. The removed meter is clearly labeled with “HT” on the upper left corner away from the barcodes and display. The meter is labeled using a grease pencil, permanent marker, or label. The new AMI meter is installed and the removed meter is returned to the Meter Shop.

4.1.8.9 In situations where heat damage is evident, the service is made safe and if possible, the customer’s power is maintained. A new AMI meter is left onsite to be installed by F&MS or ComEd contracted licensed electrician after repairs are completed. The removed meter is clearly labeled with “HT” on the upper left corner away from the barcodes and display. The meter is labeled using a grease pencil, permanent marker, or label. The removed meter is returned to the Meter Shop.

4.1.8.9.1 Findings are reported to the AMI duty phone at (224) 422-9381, as well as whether damage was visible or not, and if an electrician repair is needed. Before and After pictures of the meter and the fitting should be sent to HighTempInvestigationPictures@exeloncorp.com or can be texted to the AMI duty phone. Service upgrades and damaged caused by customers are potential exceptions to ComEd funded electrician repairs.

4.1.8.9.2 If damage due to tampering is found, the service is pole cut for safety.

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4.1.8.9.2.1 If damage due to tampering was found and it was pole cut for safety, the OCC calls the Call Center to request a Critical Contact note be added in CIMS, noting “Cut for Safety. Power cannot be restored until customer makes repairs, and the meter and fitting are investigated.” The OCC adds the same comment in the trouble ticket.

4.1.8.10 The process is followed to complete the meter exchange in CIMS.

4.1.8.11 The ticket is closed in OMS.

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AMI High Temperature Event Process

ComEd Administrative Procedure

CS-CE-09024

Revision No.: 1

5. Documentation

5.1. None

6. Terms and definitions

6.1. **Advanced Meter Infrastructure (AMI):** An integrated system of smart meters, communications networks, and data management systems that enables two-way communication between utilities and customers.

6.2. **FIELD AND METER SERVICES (FMS):** Department responsible for maintaining and installing electric meters and associated equipment.

6.3. **Overhead Electrician Specialists (OES):** Department responsible for 24/7 emergency overhead work and outages.

6.4. **Unable To Complete (UTC):** Technician unable to complete the order in the field.

7. References

7.1. None

8. Attachments

8.1. None

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AMI High Temperature Event Process

ComEd Administrative Procedure

CS-CE-09024

Revision No.: 1

9. Development history

Revision 0	**Date: 1/1/2017**
Writer	Kaveh Aflaki, Senior Engineer AMI Operations
Reviewer(s)	Dave Doherty Director Customer Strategy AMI, Carla Frieh Manager AMI Operations, Carol Radick Manager Operations, John Biscan Manager OCC Operations, Scott Nicholson Regional Electric Operations, Brian Hock Regional Electric Operations, Missy Loyd Manager Field & Meter Services, Rhonda West Senior Work Planner, John Selenica Senior Supervisor Customer Field Operations
UFAM Approver(s)	Bill Walsh, UFAM Meter Services
Reason written	Document procedure for emergency investigations related to AMI high temperature monitoring.

Revision 1	**Date: 5/5/2020**
Writer	Shivraj Bhosale AMI Operations
Reviewer(s)	Dave Doherty Director Smart Meter Operations; Dan Walrath Mgr AMI Ops Scott Nicholson Regional Electric Operations; Brian Hock Regional Electric Operations; Zach Butkus WR Mgr Smart Meter Ops; Tolanda Jones Planning Mgr Smart Meter Ops; Chris Ruschke FLS Smart Meter Ops
UFAM Approver(s)	Anna Vargas Director Smart Meter Operations
Reason written	Periodic Review no changes to documnet

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Staffing Substations and Visual Inspection of Network Protectors for System Loading Concerns

ComEd Administrative Procedure

EP-CE-2033

Revision No.: 9

Effective:	3/15/2019
Supersedes:	NA
Level:	2
Review Type:	3 Year
Core Function:	Emergency Preparedness

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1. Purpose

1.1. To provide guidelines for staffing or conducting periodic checks at a predetermined list of substations to prevent or minimize concerns relating to system loading. Develop criteria for substations and Network Protectors to be added to or remain on the predetermined list of locations. Staffing substations for security events is the responsibility of Corporate Security per procedure **EP-ED-5001 RESPONSE TO SECURITY EVENTS AND THREAT CONDITIONS.**

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1.2. In the event of system loading concerns, ComEd is committed to visual inspections of network protectors at critical locations per Liberty's Recommendation ID # Nine-4, to which a recommendation response letter was sent, dated 02/14/2001, from D. Helwig, SVP ComEd to the ICC.

1.3. Section 6 of this procedure has been divided into the following subsections:

Subsection	Title	Page
4.1	Determination to Staff Substations and Perform Visual Inspections of Network Protector critical locations	3
4.2	Staffing Substations Activation	3
4.3	Crew List Reports	4
4.4	Inspecting Network Protectors	4
4.5	Staffing Substations Initiated Off Hours	5
4.6	Substation Staffing and Network Protector Visual Inspections Checklists	5
4.7	Stand Down For Staffing Substations	5
4.8	Keeping Station Lists Current	5
4.9	Keeping Network Protector Critical Locations Current	6

2. Precautions and limitations

2.1. Precautions

2.1.1 Due to system loading concerns, ComEd is committed to visual inspections of network protectors at critical locations per Liberty's Recommendation ID # Nine-4, to which a recommendation response letter was sent, dated 02/14/2001, from D. Helwig, SVP ComEd; to the ICC. Any changes to this part of the procedure must be agreed to in conjunction with Regulatory Strategies.

2.2. Limitations

2.2.1 None

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Staffing Substations and Visual Inspection of Network Protectors for System Loading Concerns

ComEd Administrative Procedure

EP-CE-2033

Revision No.: 9

3. Prerequisites

3.1. None

4. Procedure

4.1. DETERMINATION TO STAFF SUBSTATIONS AND PERFORM VISUAL INSPECTIONS OF NETWORK PROTECTOR CRITICAL LOCATIONS

4.1.1 The determination to activate this procedure is based on evaluation of weather and system conditions.

1. Potential criteria for activation:

   A. **Often Staffed Substations**: 2nd day of System Status Red.

   B. **Sometimes Staffed Substations**: 3rd day of System Status Red.

   C. **Seldom Staffed Substations**: Evaluate every day after the 3rd day of System Status Red.

   D. **Network Protectors**: Evaluate every day after the 3rd day of System Status Red.

4.1.2 Staffing Substations may be activated by any one of the following:

1. TSO Shift Manager

2. OCC Shift Manager

3. Deputy Operations Section Chief

4. System Incident Commander

4.1.3 Visual Inspections of Network Protectors may be activated by any one of the following:

1. OCC Shift Manager

2. Deputy Operations Section Chief

3. System Incident Commander

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Staffing Substations and Visual Inspection of Network Protectors for System Loading Concerns

ComEd Administrative Procedure

EP-CE-2033

Revision No.: 9

4.2. STAFFING SUBSTATIONS ACTIVATION

4.2.1 If the TSO Shift Manager requires staffing at designated TSO Substations, the TSO Shift Manager shall:

1. Contact the OCC Shift Manager to initiate the T&S Branch Director for staffing substations.
2. Fax the TSO list of substations EP-CE-2033-1 with the desired stations checked off, to the OCC Shift Manager.

4.2.2 If the OCC Shift Manager requires staffing at designated DSO stations, the OCC Shift Manager shall:

1. Identify substations on the substation list EP-CE-2033-1 kept by the OCC Shift Manager.
2. Contact the TSO Shift Manager to determine whether TSO has any substations to be staffed.

4.2.3 The OCC Shift Manager shall request the System Incident Commander and the Deputy Operations Section Chief to review the OCC and/or the TSO list, if the EOC is open.

4.2.4 The OCC Shift Manager shall contact the T&S Branch Director on-duty to request the staffing of substations.

4.2.5 The OCC Shift Manager shall provide the T&S Branch Director with the list of substations to be staffed.

4.2.6 When notified by the T&S Branch Director or via the T&S Work Week Management hotline to perform station staffing, the T&S Duty Manager or T&S Work Week Manager shall:

1. Coordinate crews as required to staff designated substations.
2. Notify the T&S Branch Director when all crews are in place and provide crew names and locations

4.2.7 The field crews on arrival at the designated substations will:

1. Check in with their appropriate Regional Work Week Manager.
2. Report minor equipment problems to the appropriate Work Week Manager
3. Report specific equipment problems to the appropriate Senior Substation System Operator (SSSO) or Transmission Dispatcher (TD).

4.3. CREW LIST REPORTS

4.3.1 The T&S Branch Director shall:

1. Have ARCOS updated

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2. Notify the OCC Information Desk that the crew list reports were e-mailed.

4.3.2 The OCC Information Desk shall notify SSSOs that ARCOS has been updated.

4.4. INSPECTING NETWORK PROTECTORS

4.4.1 If an inspection of Network Protector critical locations is required/requested, the OCC Shift Manager identifies the Network Protectors to inspect, per the Network Protector critical location list provided by the Regional Operations Managers EP-CE-2033-1 list.

4.4.2 The OCC Shift Manager contacts the Regional Operations Manager to initiate Area Operators to inspect the Network Protectors.

4.5. STAFFING SUBSTATION INITIATED OFF HOURS

4.5.1 In the rare case the T&S Branch Director would be contacted after hours to initiate the Staffing Substations, they would contact the T&S Duty Manager. The T&S Duty Manager may convey the crew staffing information manually or verbally or may contact the Work Week Manager to assist.

4.6. SUBSTATION STAFFING, STATION CHECKS AND NETWORK PROTECTOR VISUAL INSPECTIONS CHECKLISTS

4.6.1 Staff substations, provide station checks, field crews per **EP-CE-1281 Substation Inspections for High Heat.**

4.6.2 The SSO PM checklist for Network Center Inspection shall be used to perform the network protector critical location visual inspections.

4.7. STAND DOWN FOR STAFFING SUBSTATIONS

4.7.1 The determination to stand down will be made by the original requester TSO Shift Manager, DEPUTY OPERATIONS SECTION CHIEF, System Incident Commander or OCC Shift Manager.

4.7.2 The OCC Shift Manager shall contact the T&S Branch Director to communicate the stand down request.

4.7.3 The T&S Branch Director shall contact the T&S Work Week Managers and T&S Duty Manager to inform crews to stand down.

4.8. KEEPING STATION LISTS CURRENT

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4.8.1 Emergency Preparedness shall update the station list annually after being reviewed by DSO System Engineering and TSO Planning. The updated station list will be emailed to the following:

1. T&S ERMs
2. Regional Operations Manager (Chicago, North, South, West)
3. T&S Directors (Chicago, North, South, West)
4. OCC Shift Managers
5. TSO Management

4.8.2 Criteria for substations to be added to or remain on the EP-CE-2033-1 list:

1. TSO Criteria –

A. Criticality of the substation to system configuration/vulnerability

2. DSO Criteria -

A. 90% or higher projected loaded substations

B. Potential voltage collapse issues

C. Priority Customer Substations, i.e. substations that feed Chicago loop load only

D. Deemed necessary by DSO Planning/DSO Management

E. Consider utilizing the Distribution Load at Risk information available on the DSO secure drive per procedure **EP-CE-6002 Substation Recovery Strategy.**

4.9. KEEPING NETWORK PROTECTOR CRITICAL LOCATIONS CURRENT

4.9.1 Regional Operations Managers shall update the network protector critical location list annually and email to the following, no later than 05/15 of the current year.

1. OCC Shift Managers
2. Emergency Preparedness

4.9.2 Criteria for determination of Network protectors for the EP-CE-2033-1 list:

1. No SCADA indication installed for the protector position at critical Network protector locations, i.e. O'hare, Midway, Daley Center.

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4.9.3

5. Roles and responsibilities

5.1. System Incident Commander

5.1.1 Directs staffing of substations as needed when the EOC is open, per **EP-CE-2110 System Incident Commander Abnormal System Condition Checklist.**

5.2. DEPUTY OPERATIONS SECTION CHIEF

5.2.1 Per System Incident Commander direction, may direct the staffing of substations or network protector locations and coordinates with OCC Shift Manager.

5.3. FIELD CREWS

5.3.1 Responsible for staffing stations and/or station checks per **EP-CE-1281 Substation Inspections for High Heat**.

5.3.2 Shall report identified station issues.

5.4. OCC Information group

5.4.1 Will provide field crew names to the OCC SSSO, as provided by the T&S Branch Director via fax or e-mail.

5.5. OCC shift manager

5.5.1 Performs response for abnormal system conditions per EP-ED-2120 OCC Shift Manager Abnormal System Condition Checklist.

5.5.2 In conjunction with Deputy Operations Section Chief/System Engineers, determines DSO stations to be staffed and TSO stations (when notified). Initiates the process by contacting the T&S Branch Director.

5.5.3 Contacts the Regional Operations Manager to initiate Area Operators to inspect the Network Protectors.

5.6. REGIONAL OPERATIONS MANAGER

5.6.1 Owner of the Network Protectors Critical Location List.

5.7. T&S Branch Director

5.7.1 When notified by OCC Shift Manager, shall initiate staffing substations per **EP-CE-1280 T&S Branch Director Checklist** by contacting one of the following:

5.7.2 T&S Work Management hotline (during normal business hours).

5.7.3 T&S Duty Managers (outside of normal business hours).

5.7.4 Provides list of crew names to OCC Information Desk via fax or e-mail.

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5.8. T&S DUTY MANAGER

5.8.1 Performs station staffing when directed to do so by the T&S Branch Director.

5.8.2 Coordinate staffing of substations by field personnel and provides field crew names to the T&S Branch Director.

5.9. T&S WORK WEEK MANAGER

5.9.1 Performs station staffing when directed to do so by the T&S Branch Director.

5.9.2 Coordinate staffing of substations by field personnel and provides field crew names to the T&S Branch Director.

5.10. TSO Shift manager

5.10.1 Shall determine whether TSO requires stations to be staffed and if so will fax the TSO list to the OCC Shift Manager.

5.10.2 Shall notify the OCC Shift Manager for stand down.

6. Documentation

6.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

6.2. When the EOC is open, all documentation generated by the EOC regarding station staffing during performance of this procedure shall be:

6.2.1 Filed by Emergency Preparedness.

6.2.2 Maintained for a period of two years.

7. Terms and definitions

7.1. SIC

7.1.1 System Incident Commander.

7.2. OCC

7.2.1 Operations Control Center.

7.2.2 SSSO

7.2.3 Senior Substation System Operator

7.3. TD

7.3.1 Transmission Dispatcher.

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Staffing Substations and Visual Inspection of Network Protectors for System Loading Concerns

ComEd Administrative Procedure

EP-CE-2033

Revision No.: 9

8. References

8.1. LE-AC-401 – Records and Information Management Retention Disposition

8.2. Checklists

8.2.1 EP-CE-1280 T&S Branch Director Checklist

8.2.2 EP-CE-1281 Substation Inspections for High Heat

8.2.3 EP-CE-2110 System Incident Commander Abnormal System Condition Checklist

8.2.4 EP-CE-2120 OCC Shift Manager Abnormal System Condition Checklist

8.3. Commitments

8.3.1 Liberty's Recommendation ID # Nine-4

1. 2001 ComEd agreed to perform visual inspections of netwrk protectors at critical locations on peak days.

8.3.2 Internal Documents

8.3.3 OCC Shift Manager Station List – EP-CE-2033-1

8.3.4 SSO PM Checklist, Network Center Inspection

8.4. Process & Procedures

8.4.1 EP-CE-P200 Abnormal System Conditions

8.4.2 EP-ED-5001-Response to Security Events and Threat Conditions procedure

8.4.3 EP-CE-6002 Substation Recovery Strategy

9. Attachments

9.1. None

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Staffing Substations and Visual Inspection of Network Protectors for System Loading Concerns

ComEd Administrative Procedure

EP-CE-2033

Revision No.: 9

10. Development history

Revision 0	**Date: 9/7/2005**
Writer	Rick Chism – EP
Reviewer(s)	Glenn Smith – EP Manager
UFAM Approver(s)	Ron Yungk – EP Director
Reason written	Update new procedure numbers, Supercedes EP-CE-233

Revision 1	**Date: 12/15/2005**
Writer	Ken Zroka; Rick Chism – EP
Reviewer(s)	Carol Meyers - EP, Dan Broztman, Tim McGuire, Ron Donovan, Harry Laski, Ron Bradley
UFAM Approver(s)	Ron Yungk – EP Director
Reason written	Added information for performing Network Protector visual Inspections

Revision 2	**Date: 3/1/2006**
Writer	Carol Meyers – EP; Rick Chism – EP
Reviewer(s)	Gene Ransom; John Garavaglia
UFAM Approver(s)	Ron Yungk – EP Director
Reason written	Changed reference to EP-ED- P200 Abnormal System Conditions and T&S Inspection Form EP-ED-1812; Corrected Liberty's Recommendation # to Nine-4; Updated T&S ERMs responsibilities;

Revision 3	**Date: 5/10/2006**
Writer	Rick Chism –EP
Reviewer(s)	Carol Meyers – EP
UFAM Approver(s)	Ron Yungk – EP Director
Reason written	Reworded for clarity section 3.4.1, to align with newly published checklist

Revision 4	**Date: 9/18/2007**
Writer	Melinda Sayers –EP

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Staffing Substations and Visual Inspection of Network Protectors for System Loading Concerns

ComEd Administrative Procedure

EP-CE-2033

Revision No.: 9

Revision 4	**Date: 9/18/2007**
Reviewer(s)	Cheryl Maletich – Manager, Operations Planning; Bob Moyer – EP, Nichole Tillman – EP, Bill McBride – T&S Manager, Ron Donovan – Director Asset Performance, Keith Frost – Regulatory Strategies
UFAM Approver(s)	Bob Moyer - EP
Reason written	Added Potential Criteria for activation and adding/review of substations on the EP-CE-2033-1 list. Criteria for determining which Network Protectors to be added/review for the EP-CE-2033-1 list. Removed verbiage relating to the T&S crews being entered into a database. Restated the purpose for the procedure. Added D. Helwigs title at ComEd. Added the System Engineers to 3.5.2. Added the location of EP-ED-1281 document. Added reference to EP-CE-6002 Substation Recovery Strategy.

Revision 5	**Date: 5/6/2008**
Writer	John Blazekovich (TSC), Melinda Sayers
Reviewer(s)	Melinda Sayers –EP , Cheryl Maletich – Manager, Operations Planning, Dave Carlson (TSO)
UFAM Approver(s)	Dan Gron (EP)
Reason written	Addition of “precaution” statement flagging this document as a “NERC Compliance” document. MKS Section 3.7 Removed contacting the T&S work management and T&S management, left per the checklist for substation staffing. Changed LD to SDSD and provided definitions for SDSD and TD.

Revision 6	**Date: 5/8/2009**
Writer	Melinda Sayers - EP
Reviewer(s)	Cheryl Maletich – DSO, Ron Regner, John Blazekovich –TSO, Bob Charland, Judy Papaleo –EP
UFAM Approver(s)	Bob Charland, Judy Papaleo – EP
Reason written	EP checklist number changes only.

Revision 7	**Date: 1/14/2010**
Writer	Bob Plant - EP
Reviewer(s)	Carol Meyers –EP, Judy Papaleo – EP, John Blazekovich –TSO
UFAM Approver(s)	Jim Conway –Director Distribution OCC
Reason written	Removal of “precaution” statement flagging this document as a “NERC Compliance” document. Removed TSC review requirement for document changes.

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Staffing Substations and Visual Inspection of Network Protectors for System Loading Concerns

ComEd Administrative Procedure

EP-CE-2033

Revision No.: 9

Revision 8	**Date: 12/9/2016**
Writer	Steve Lusted ,Sr. EP Admin, EP ComEd
Reviewer(s)	Marvin Landeros, Mgr Substations, SSC-West Operations
UFAM Approver(s)	Ken Wagner, Emergency Planning & Business Continuity, EP Manager ComEd
Reason written	Updated ERO old titles to NIMS (current) titles. Clarified Liberty's recommendation 8.3.1.

Revision 9	**Date: 3/15/2019**
Writer	S. Kelli McCurdy ,Sr. EP Admin, EP ComEd
Reviewer(s)	Peter Flores, North Substation manager, Marvin Landeros, Mgr Substations, SSC-West Operations, Mark Primm, OCC Shift Manager-Carlos Cornejo, Brian Runowski-TSO Manager; Patrick Cronin-Mgr System Operations; Network Hi-Rise Gabriel Hernandez, David Watts, Shift Manager TSO, James deYoung
UFAM Approver(s)	Ken Wagner, EP Manager ComEd, UFAM
Reason written	Annual Update; removal or fax information, Changed OCC Dispatcher naming convention (SDS's now SSSO (Senior Substation System Operators))

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Documenting Represented Employee Performance in ESup

ComEd Administrative Procedure

HR-CE-1002

Revision No.: 1

Effective:	7/26/2019
Supersedes:	N/A
Level:	3
Review Type:	3 Year
Core Function:	Performance Evaluations

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1. Purpose

To provide ComEd employees guidelines for documenting performance and behaviors of represented employees to achieve company goals.

2. Precautions and limitations

2.1. Precautions

2.1.1 N/A

2.2. Limitations

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2.2.1 ESup is also being used by PECO Customer Care Center and Generation. Any changes to the software will be reviewed through Pilat, the software developer, for adverse impact.

3. Prerequisites

3.1. In order to have access to ESup, a supervisor/manager must have direct reports in PeopleSoft. Access to ESup will automatically be provided based on daily PeopleSoft updates.

3.2. All ESup users are requested to complete a computer-based training module in LMS *ESup 101 The Basics E-ALL-ALL-ESUP-WBT*.

4. Procedure

4.1. ESup Computer Based Training Overview

4.1.1 Introduction to ESup

4.1.2 Overview of ESup and benefits

4.1.3 Access ESup from desk top

4.1.4 Main process for getting to ESup

4.1.4.1 Exelon Main Page, click MyHr, click ETalent

4.1.5 ESup is a part of ETalent. Making entries is simple.

4.1.5.1 Click on Employee List

4.1.5.2 Click on ESup

4.1.5.3 Click New for new entry

4.1.5.4 The main page opens. One-stop-shop for everything

4.1.5.5 Enter required fields

4.1.5.6 Complete = no more updates

4.1.5.7 Incomplete = still editable

4.1.5.8 Save it

4.2. Demos

4.2.1 Entry for single employee

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4.2.2 Entry for a group of employees

4.2.3 Entry for My Team

4.2.4 Running report for non-completed entries, team and individual reports to identify high-risk employees and trends.

4.2.5 Giving permission to an alternate.

4.3. **LMS *ESup 101 The Basics E-ALL-ALL-ESUP-WBT*** for more details

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5. Roles and responsibilities

5.1. Front Line Supervisor (FLS)

5.1.1 Enter performance information for both performance recognition and performance management

5.2. ESup Administrator

5.2.1 Responsible for facilitating reporting relationship changes in PeopleSoft

5.2.2 Responsible for deleting any inaccurate confirmed ESup entries

5.3. Talent Management & Organization Effectiveness

5.3.1 Exelon Center of Expertise is responsible for the relationship between Exelon and Pilat, the ESup software provider

5.4. ComEd Human Resources

5.4.1 Responsible for coordinating ESup changes based on needs of the organization

5.4.2 Approve and assign Full Access Proxy rights when more than one FLS supervises a represented employee

5.4.3 Delete entries if a FLS makes a mistake (for example, makes an entry in the wrong employee file)

5.5. Senior Leadership (Key Managers and VPs)

5.5.1 Run reports at minimum on a quarterly basis and review for high-risk employees and trends.

6. Documentation

6.1. PECS Entries: All historical PECS entries will be downloaded to each indvidiual employee file. The data will not be available for team reporting.

6.2. ESup Entries: All confirmed ESup entries will be maintained permanently in a employee's ESup file. All non-confirmed entries will be maintained for 13 months.

7. Terms and definitions

7.1. ESup

7.1.1 Short for Electronic Supervisor, ESup is a software application designed to track performance management of represented employees.

7.2. Represented Employee

7.2.1 All ComEd employees represented by a bargaining unit

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7.3. Confirmed Entries

7.3.1 When an FLS has completed all items in the ESup entry, the FLS indicates it is a Confirmed Entry which means it is a permanent note in the employee's ESup file

7.4. Non-Confirmed Entries

7.4.1 When an FLS still needs to gather information or may need to make changes to an ESup entry, the FLS can indicate it is a Non-Confirmed entry which allows the entry to be edited. The entry will stay in the employee's ESup file for 13 months.

8. References

8.1. LE-AC-401 – Records and Information Management Retention Disposition

9. Attachments

9.1. ESup Workflow

9.2. ESup FAQ

9.3. ESup Course Summary

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10. Development history

Revision 0	**Date: 6/30/2014**
Writer	Angela Karesh, HR Manager Projects
Reviewer(s)	Jessica Rudolphi, Sr HR Generalist, Terry Holmes, Sr. Customer Service Supervisor
UFAM Approver(s)	UFAM Name, Sandra Hirsh, Director HR Ops
Reason written	To provide guidelines for documenting performance and behaviors of represented employees

Revision 1	**Date: 7/26/2019**
Writer	Jessica Rudolphi, Manager Human Resources
Reviewer(s)	Jessica Rudolphi, Manager Human Resources
UFAM Approver(s)	Trovato, Jaclyn M:(ComEd) Director of Human Resources - ComEd
Reason written	Process will be updated within the next year to reflect changes of system into ePeople Talent from eTalent To provide guidelines for documenting performance and behaviors of represented employees

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Brief description explaining why the process was written

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ESup Workflow Attachment #1 Continued

Entry Type	Recogition / Intervention Area	Subcategory
	Safety Behaviors	
	Availability	Accommodations
		Bereavement
		Fit for Work
		FMLA - Self (FT = Paid; PT = Unpaid)
		FMLA paperwork provided
		FMLA unpaid
		Full day absence
		Jury Duty
		Military Leave
		Miscellaneous
		No call no show
		OT End of Shift
		OT Tardy
		Partial day absence
		Sick
		Tardy
		Total record
		Unpaid 4X
	Communication	
	Policy Violation	Acceptable Use of Electronic Assets
		Dress Code
		Drug & Alcohol
		Electrical Emergency Policy
		Employee Delinquency
		Employee Standards of Conduct
		Gas Emergency Policy
		Quality Guidelines
	Other	
Supervisor	Mid-Year Rating	
	Year End Rating	
	Monthly Rating	

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ESup FAQ Attachment #2

1. **What is *ESup*?**

✓ **The purpose of the Exelon Supervisor Electronic Working File *(ESup)*** is to provide an electronic system that can be used as the primary tool to record and track supervisor working file entries about individual employees.

2. **Why was *ESup* developed?**

✓ ***ESup*** was developed to replace PECS, the current Performance Event & Coaching System. It provides a user friendly electronic tool for supervisors to document and track leadership engagement accountability discussions with individual employees when **performance recognition and management** opportunities occur.

3. **How is the *ESup* different from PECS ?**

✓ Feedback from employee focus groups, questionnaires and key management interviews identified a valuable opportunity for implementing changes to the current PECS software and its ultimate impact on the workforce. By using **E*Sup***, supervisors gain clarity in distinguishing between the roles of engaging the workforce for *performance improvement* trends on the department level and *performance management* on the individual level.

a. The **Exelon Supervisor Electronic Working File (*ESup*)** is a user friendly electronic tool for supervisors to document and track leadership engagement accountability discussions when **performance recognition and management** opportunities occur with individual employees.

b. Two technical improvements were added to make ESup even more user friendly. First, automatic updates of reporting relationships. Second, ability to make an entry for multiple team members at the same time.

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c. To best provide supervisors value in their leadership engagement role around performance, the **E*Sup*** system focuses on **six (6) core performance areas**. Performance based categories are applicable to **all types of employees**, **both craft and management**.

Performance Categories

- **Work Performance –** *Employee Output: Strengths, improvements, expectations*
- **Safety Behaviors -** *Compliance and commitment to safety and environmental rules and expectations*
- **Availability-** *Attendance information about absences and tardiness*
- **Communication-** *Two-way communication between management and craft including supervisor huddles, tailgates, etc.*
- **Policy Violation-** *Call Center Only: Corporate Policy, Employee Standards of Conduct, Call Center Guidelines*
- **Other –** *Not covered by another area*

4. Where is E*Sup* located and how do I get access?

✓ ***ESup*** is located within the **Exelon HR Etalent** system; a system already used by the company for development and yearly performance reviews of non-craft employees.

a. Within the Etalent system structure, **E*Sup*** **now** **provides** the supervisor a with familiar user friendly environment for entry and record keeping of supervisor working file entries on **both** **represented** **and** **non-represented** **employees**.

b. This platform provides an exceptional fit for the design, security, access, reporting and retention requirements required for a supervisor working file.

c. Access is already available through the current Etalent login process, available on the Exelon intranet website and through the myHR portal. Thus, no new login requirements are necessary.

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5. What advantage is ESup for me as a leader in Exelon?

✓ ***ESup*** gives the supervisor many advantages over previous methods for logging and maintaining supervisor working file entries such as:

a. Providing a **uniform tool** for documenting and recording individual performance engagement activities for **all** direct reports. Helping leaders in their **accountability** for **recognizing positive individual performance** as well as engaging employees when **performance management intervention** is warranted.

b. Provide structure and ease for the role in '***Engagement'*** - **more interaction with a defined purpose.**

c. Improves supervisor/employee relationships by facilitating openness (crucial conversations) around individual insights provided by leadership when providing feedback on individual performance.

d. Real time technology solution reducing the administrative burden of supervisors (automatic updates of craft to management reporting relationships).

e. ***ESup*** provides current information on employee performance that can be easily recalled for mid-year and end-of-year performance review discussions (non-craft employees).

6. What employees does *ESup* apply too?

✓ ***ESup*** functionality is **available to all supervisors and leaders** who have direct reports and currently utilize the Etalent system. All direct reports (whether they use Etalent or not) will be viewable to their supervisors for entering ***ESup*** working file entries (represented employees as well as non-represented employees).

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- ✓ ***ESup*** documents leadership engagements around individual employee performance that can be easily recalled by a supervisor for mid-year and end-of-year performance review discussions (non-represented employees).

7. Who can <u>enter</u> and <u>see</u> *ESup* supervisor working file entries?

- ✓ **<u>Supervisors</u> (meaning all levels of management) enter working file entries on their direct reports.** These entries reinforce the supervisor/employee relationship and facilitate direct individual engagement.

- ✓ In addition, permission ***<u>may</u>*** *be* granted by a direct supervisor for **another supervisor(s) to enter *ESup* entries** on their direct reports (direct reporting relationships are defined in Etalent through linkage with the Exelon Position Management system). Entries made by authorized non-direct supervisors will reside in the direct supervisor's working file. ***ESup*** entry permission can be granted or removed by the direct supervisor at any time.

8. What happens if an employee changes supervisors?

- ✓ Reporting relationship will change automatically through PeopleSoft position management change submittals when transitions occur. If a reporting relationship needs to be changed, contact your HR Representative.

- ✓ Note: If an employee changes supervisors, confirmed (see below) ***ESup*** working file entries will transfer to the new supervisor.

9. How long are *ESup* entries maintained?

- ✓ **Draft *ESup* entries (<u>Unconfirmed</u>)** may be made by supervisors as they identify opportunities for individual employee engagement interactions. Unconfirmed ***ESup*** working file entries will be deleted after a period of 13 months if not taken to confirmed status and discussed with the employee. Unconfirmed ***ESup*** working file entries <u>will</u> <u>not</u> <u>transfer</u> to a new supervisor if an employee changes their reporting relationship.

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- ✓ A **'Confirmed'** ***ESup*** working file entry is one that has been **discussed with an employee**. Confirmed supervisor working file entries will be visible within the Etalent system forever, even with reporting relationship changes. Historical entries will be maintained in accordance with established legal records retention requirements associated with the Etalent system. If an employee changes supervisors, confirmed ***ESup*** working file entries will automatically transfer to the new supervisor.

10. Do employees have access to their *ESup* entries?

- ✓ ***ESup*** is the company working file of a supervisor and **employees do not have access** to that file. However, **supervisors are encouraged to share working file entries** with employees and may provide copies of **confirmed** entries to employees during discussions about performance or behaviiors.

11. Does *ESup* have reporting capability?

- ✓ Yes. Supervisors will be able to run established reports highlighting ***ESup*** working entries on all their direct reports. In addition, other reports will be available to leadership within the reporting department and organization (similar to Etalent reports currently available).

12. Is *ESup* open to all of Exelon?

- ✓ Although the Etalent system is utilized throughout the Exelon organization, ***ESup*** functionality will only be open to Exelon Nuclear, PECO, and ComEd. However, oversight of the design and development of ***ESup*** functionality has been maintained to ensure Etalent functionality across the organization is not hindered nor precludes the use of ***ESup*** elsewhere if desired.

13. How does *ESup* relate to the company disciplinary action process or collective bargaining agreements?

- ✓ ***ESup*** is a system to record a supervisor's working file entries documenting their **initial engagement** with employees around recognition or performance intervention.

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- ✓ ***eSup*** **DOES NOT** replace established Exelon procedures and processes governing **rewards and recognition (HR-AC-37), disciplinary actions (HR-AC-13), the Exelon Employee Standards of Conduct (ESOC), or collective bargaining agreements.** These documents and processes are available for supervisors on the ***myHR*** website **if outcomes** of leadership engagement accountability interactions require their reference. The links to these are documents are as follows:

  - ***myHR Home – My Pay & Time – Awards & Recognition***…provides access to the following, among others:

    - HR-AC-37, Reward and Recognition Policy

    - Recognition Request and Approval Process

  - ***myHR Home – My Profile – My Collective Bargaining Agreement***…provides access to the following, among others:

    - Employee and Labor Relations Procedures and the MARC Process

    - Collective Bargaining Agreements

    - Standards of Conduct

  - ***Exelon Intranet – Organizations – Business Services – Legal and Governance – Ethics and Compliance***

    - For the most recent revision of the **Exelon Code of Business Conduct**

Note: For assistance finding policies, please contact myHR at 1-877-7EXELON. For questions concerning applicability and execution of polices, please contact your local HR Representative.

14. Where can I go for help with ESup?

- ✓ ***Computer Based Training:*** *A 20-25 minute computer based training is available on LMS. The code is ESup 101 E-ALL-ALL-ESUP-WBT*

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- ✓ ***For Technology Questions:*** *If the systems is not working properly, you can contact myHR at 1-887- 7EXELON (1-877-739-35666)*

- ✓ ***For information on how to use ESup:*** *Contact your local HR Representative or angela.karesh@comed.com. If you are having technical difficulties, contact MyHR.*

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ESup Course Summary Attachment #3

Introduction

ESupervisor, or ESup, is the performance management system that replaces PECS. A performance management system is used to improve performance and clarify expectations with employees, as well as acknowledge a job well done. ESup streamlines the entry of feedback for managers.

Benefits of ESup

- It's part of ETalent, a one-stop shop, for all employee performance and development entries.
- You can quickly add the same entry for multiple employees.
- Easy to use.
- Automatic updates of reporting relationships. No more manual updates!

Accessing ESup

- ESup is part of eTalent and the links are on the main ETalent menu.
- The ESup links are at the bottom of the links in the left column as shown below.
    - **ESup Permissions** allows you to give access to a colleague to make entries on your direct reports.
    - **ESup for My Team** opens the main ESup entry screen.

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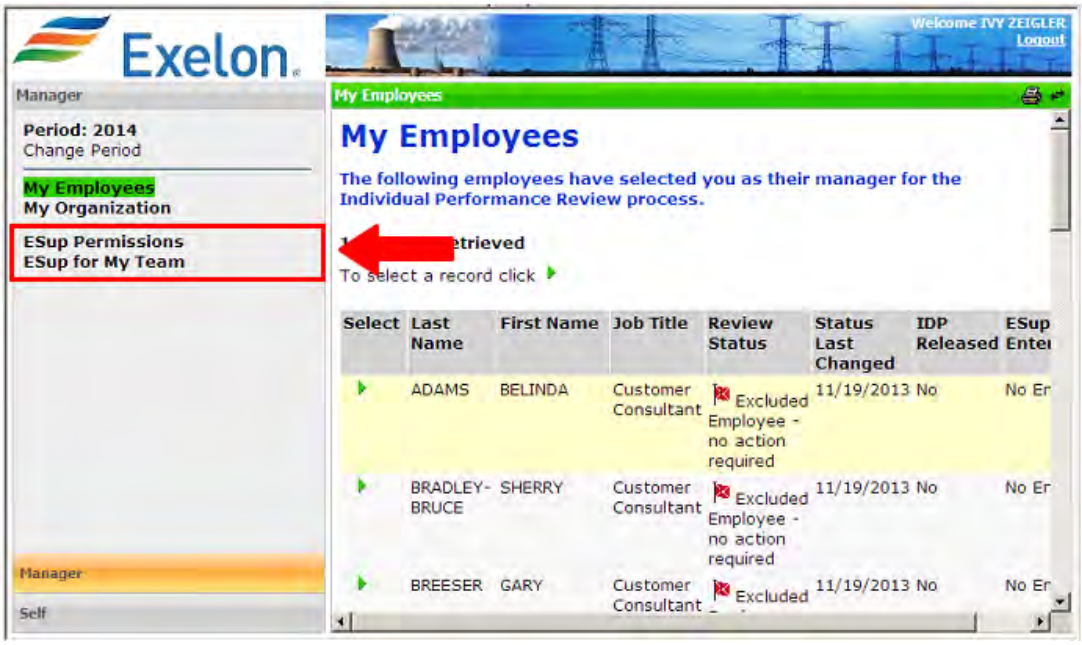

Employee Entries

There are two primary types of Employee entries.

1. **Performance Recognition Entry**

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These entries note and reinforce positive behavior of employees, like when a customer sends a note about a great experience with a CSR or a crew that helps a customer get restored quickly.

2. Performance Management Entry

These notes are where you are informing an employee, like a new policy or attending training, or where something went wrong.

Confirming Entries

The **Confirm** field determines how the entry is treated by ESup.

Confirm Entry?

Yes

When selected, the entry becomes part of the employee's **permanent** record. A confirmed entry is visible in ESup forever. Prior to selecting Yes, you should talk with the employee about the entry. A confirmed entry cannot be changed. If a confirmed entry needs to be clarified, add a new entry.

No

When selected, the entry is designated as **temporary** in your ESup supervisor notebook. A non-confirmed entry is visible for 13 months. These entries are used for recording information prior to talking with an employee, taking notes that need to be updated with other information, or as a place for "note taking" of behaviors that might be a pattern.

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Making ESup Entries

There are two methods to make entries in ESup. One is for an individual and the other is for multiple team members.

Method One

My Employees allows you to select a specific employee and then open ESup for that employee and make an entry.

Method Two

ESup for My Team allows you to view all of your team members on one screen. It also allows you to make identical entries for multiple members of your team at the same time, thus saving you the effort of making the entries individually for each employee.

Here are other actions you can do with ESup for My Team:

- Run a report for your team
- For Customer Care Center, look at rejected work for your team
- Review entries you made in the last 7 days
- View all non-confirmed (temporary) entries for your team
- Make new entries for your team

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Reports

ESup Report - This report includes all ESup entries for an individual employee.

PECS History - This report contains the historical entries made in PECS for that employee. The first time you go into ESup, check the employee's PECS history to verify the PECS history is correct for each employee because PECS will no longer be available to you. You can only run this for one employee at a time. If the PECS information is not correct for any of your direct reports, contact Angela Karesh via Outlook.

Reject Work report - This report provides a listing of all Rejected Work items. (Customer Care only)

There are three reports available on the **ESup for My Team** window.

The **ESup Status Report** is for all of your direct reports collectively. It will display two charts indicating the breakdown by type for all entries for your team, by type of entry and interaction area.

The **Unconfirmed Entries for Your Team Report** displays all the entries made for you team members that have not been confirmed. The report allows you to open an entry and complete and confirm it as required.

Reject Work report - This report provides a listing of all Rejected Work items. (Customer Care only)

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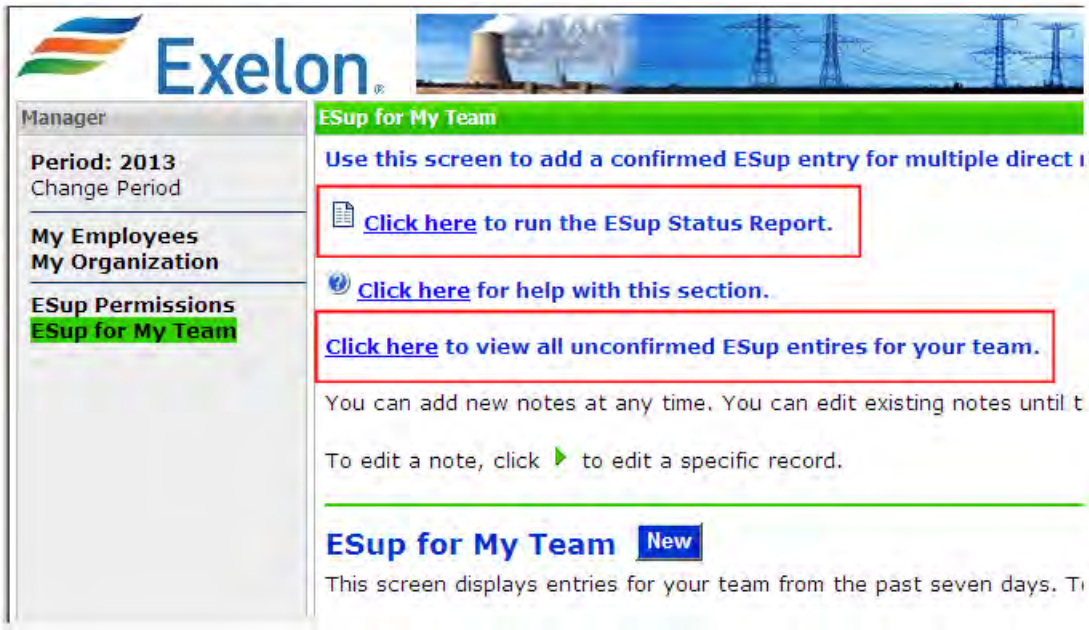

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Giving Proxy Permission

If you will be away from work, you can give one or more colleagues permission to add ESup entries for your direct reports. Entries made as a proxy are automatically Confirmed entries and cannot be edited.

ESup Permissions allows you to search for a colleague by name or title. Once the permission is given, the employee to whom it was given will be listed on the ESup Permission page.

You can give multiple colleagues permission to make entries on your direct reports. The ESup permission can be deleted at any time.

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Flooding Inspection, Mitigation, and Response Plan for Substations and Vaults

ComEd Process
OP-CE-P062
Rev. 5

Effective:	6/3/2019
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Operate & Restore

Table of Contents

1. Purpose 1
2. Precautions and limitations 1
3. Process 2
4. Roles and Responsibilities 5
5. Documentation 6
6. Terms and Definitions 6
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9. Development history 8

1. Purpose

To provide guidelines to initiate inspections of substations and vaults prone to flooding that could suffer adverse impacts to electrical equipment due to floodwaters within the substation or vault.

2. Precautions and limitations

2.1. Precautions

2.1.1 Flooding conditions and accompanying hazards may exist in basements, 1st floors, and other low-lying areas not located in the immediate flood zone.

2.1.2 The same cautious approach shall be used when evaluating and working in flooded areas or in properties remote from the immediate flood zone.

2.2. Limitations

2.2.1 None

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Flooding Inspection, Mitigation, and Response Plan for Substations and Vaults

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3. Process

3.1. Summary

3.1.1 N/A

3.2. Process Flow Diagram

3.2.1 N/A

3.3. Process listing (list key process elements)

#	Process Element	Description	Performed By

3.4. INITIATING INSPECTION PROCESS

3.4.1 The Shift Manager determines that flooding may result by consulting with the ComEd weather service and the National Weather Service website: http://water.weather.gov/ahps2/index.php?wfo=lot. Adverse flooding conditions could include:

- Heavy or prolonged rain showers.
- Rapid melting of snow or ice.
- Rising rivers or streams.

3.4.2 If the Shift Manager determines that flooding could occur, the Shift Manager shall

- Initiate an enhanced periodic inspection of the facilities prone to flooding.
- Inform the Information Supervisor or Information Desk Technician to send a page to the applicable paging group to initiate the inspection process.

CAUTION
Conditions will differ across the ComEd system and judgment will be required to initiate inspections on all or some of the substations & vaults prone to flooding

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3.4.3 If the Shift Manager initiates an enhanced periodic inspection of the substations and vaults prone to flooding, an Information Desk Technician (IDT) or Information Supervisor shall

3.4.3.1 Go the "Remote N" Drive for Flood Inspections" folder on the Dispatch at CCC desktop, "Perm" folder, "Inspections" folder, "Flood Inspections" folder

3.4.3.2 Make a copy of the spreadsheet titled "Flood Inspections Template" and place it in the applicable year folder.

3.4.3.3 Once it is placed in the applicable year folder, rename the spreadsheet by replacing the word "Template" with the current date.

3.4.3.4 Create a shortcut to the dated spreadsheet and E-mail the shortcut to the appropriate work groups' based on the areas prone to flooding.

Each Regional Operations team shall print a copy of their applicable substation and vaults to be inspected and provide the list(s) to their field personnel. Note: The current list of substation and vault to be inspected can be found on the following link:

Flood inspections.lnk

3.4.4 Field Operations shall perform the enhanced periodic inspections and document the level of risk based upon the following condition levels:

A. Level 1:

Observation: Substation or vault dry with no signs of water intrusion.

Action Required: No action required.

B. Level 2:

Observation: Substation or vault damp with signs of water intrusion but electrical equipment is not in imminent danger of contamination.

Action Required: ENSURE substation or vaults sump pumps are in working condition (where applicable). Re-inspect as needed based upon initial evaluation and risk.

C. Level 3:

Observation: Substation or vault is in imminent danger of flooding causing adverse effect to electrical equipment.

Action Required: FLOOD MITIGATION. Contact the Designated Authority to initiate corrective actions which could include:

- Continued observation of imminent flooding area

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Flooding Inspection, Mitigation, and Response Plan for Substations and Vaults

ComEd Process
OP-CE-P062
Rev. 5

- Staging of Flood Mitigation Team(s) or equipment in closer proximity to the at-risk facility.
- Deployment of Flood Mitigation Team and equipment which may include:
  - Equipment (pumps, barriers, sandbags, etc…)
  - Personnel, which may include, but not limited to:
    - First Line Supervisor
    - Substation Construction Crew
    - Area Operator
    - Contractor(s)

- The Flood Mitigation Team is responsible to deploy necessary equipment from the region (either with ComEd and/or contractor staff)
- NOTE: When selecting areas to deploy equipment and personnel, consider CAIDI impact and critical customers.
- As a last resort, consider removing from service any sensitive equipment (e.g. breakers, relays, etc.) proactively to minimize equipment damage AND shorten restoration time.
- In the event of any Flood Mitigation Team mobilization, the T&S ERM shall notify the Operations Section Chief (if the EOC is open) or the On-Duty System Incident Commander (if the EOC is not open) and OCC Shift Manager.
- OCC Shift Manager to notify the T&S ERM
- OCC Shift Manager to notify the External Affairs Manager (EAM) for the appropriate area (or an on-duty EAM) regarding imminent flooding of a substation or residential area.
- External Affairs to contact the appropriate Municipality or County governments to notify them of a potential loss of critical infrastructure
  - County Emergency Management contact information: http://www.state.il.us/iema/contacts/contacts.htm
  - NOTE: EAMs should already have their municipal contact lists
  - NOTE: Municipal, County, and State contacts may be able to assist with flood mitigation and response. EAMs may coordinate between ComEd Operations and external agencies to identify other resources that may be able to assist in flood response.
- T&S ERM to notify the T&S Regional Manager
- T&S ERM to activate the T&S War room (if necessary)

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3.4.5 Each Regional Operations team shall enter the inspection data in the applicable spreadsheet on the "N" drive.

Note: As entries are made, the "summary" tab automatically calculates the percentage of completion and the various flooding levels reported.

3.5. COMMUNICATIONS

3.5.1 Safety Messages

3.5.1.1 See attachment OP-CE-P062-1 for pertinent safety messages during flooding

3.5.2 Customer Messages

3.5.2.1 See attachment OP-CE-P062-2 for pertinent call scripts and customer messages during flooding

3.5.3 Internal Process Communications

3.5.3.1 See attachment OP-CE-P062-3 for pertinent internal process communications during flooding

4. Roles and Responsibilities

4.1. DOCUMENT WRITERS AND REVIEWERS

4.1.1 **BE AWARE** that Operations owns this process.

4.1.2 **BE AWARE** that Operations Subject Matter Expert and Supervisors

4.1.2.1 Are accountable for the content of this process.

4.1.2.2 Must review any revisions to this procedure and applicable reference documents

4.2. OCC SHIFT MANAGER

4.2.1 **MONITORS**: the National Weather Service for any Flood Watches or Warnings within the ComEd Service Territory here: http://www.crh.noaa.gov/lot/

4.2.2 In the event of a **FLOOD WATCH** or **FLOOD WARNING**, **MONITORS** the National Weather Service website for river gauges indicating potential flooding of substations at the following website: http://water.weather.gov/ahps2/index.php?wfo=lot

4.2.3 Ensures **NOTIFICATION** of the **T&S ERM** and the **Substation Engineering Duty Person**, (located here Contact list) regarding the appropriate weather, Advisory, Watch or Warning. (Contact information on T&S Duty Roster)

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4.2.4 **IMPLEMENTS** the inspection process in the event of forecasted weather conditions that could lead to flooded substations and/or vaults.

4.3. INFORMATION DESK TECHNICIAN / INFORMATION SUPERVISOR

4.3.1 **PREPARE** a copy of "Flood Inspections Template" located in the 'Remote N Drive for Flood Inspections' folder on the Dispatch at CCC desktop

4.3.1.1 **FORMAT** with the applicable date

4.3.1.2 **MOVE** the formatted spreadsheet to the applicable folder.

4.3.2 **SEND** a link to the applicable folder to specified address in Outlook.

4.3.3 **SEND** a page to the applicable regional operations group to initiate the inspection process with the expected date/time.of completion

4.4. T&S ERM

4.4.1 In the event of activating the inspection process, consideration to be given to activation of the T&S War Room.

4.4.2 In the event of staging or deploying a Flood Mitigation Team or related equipment, consideration to be given to activation of a T&S War Room.

4.5. FIELD OPERATIONS

4.5.1 **PRINT OUT** the applicable substation and vault inspection list(s).

4.5.2 **ASSIGN** Field Operations to inspect the applicable substations and vaults.

4.5.3 **PERFORM** enhanced periodic inspections of substations and vaults.

4.5.4 WHEN directed by the Designated Authority, **TRANSFER** load from the potentially affected facility to mitigate any interruption of service to ComEd customers.

4.5.5 **DOCUMENT** the applicable inspection data.

5. Documentation

Documentation generated during performance of this process shall be maintained in accordance with LE-AC-401 (Records and Information Management, Retention and Disposition).

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6. Terms and Definitions

6.1. Enhanced Periodic Inspection:

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6.1.1 An inspection outside of the normal routine inspection process, initiated by the Shift Manager.

6.2. Substation:

6.2.1 A facility that contains various high voltage electrical equipment including switching devices, transformers, and wood or steel structures. These facilities could have a cable space and or basement below grade.

6.3. Vault:

6.3.1 A steel and concrete enclosure, usually below ground containing various high/low voltage electrical equipment including switching devices, transformers, and high/low voltage cable

7. References

7.1. None

8. Attachments

8.1. Safety Messages

8.2. Customer Messages

8.3. Internal Process Communications

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Flooding Inspection, Mitigation, and Response Plan for Substations and Vaults

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9. Development history

Revision 0	**Date 02/21/2008**
Writer	Timothy McThenia DSO
Reviewer (s)	Rich Urban OCC Shift Manager; Craig Creamean DSO Chicago Region; Ken Buck DSO Northern Region.
FAM Approver(s)	Mark Quinlan DSO Manager
Reason Revised	To provide guidelines to initiate inspections of substations and vaults prone to flooding that could suffer adverse impacts to electrical equipment due to floodwaters within the substation or vault.

Revision 1	**Date 04/14/2008**
Writer	Timothy McThenia DSO
Reviewer (s)	Mark Sayers; Information Manager Andrew Knoderer, Information Desk Technician
FAM Approver(s)	Mark Quinlan DSO Manager
Reason Revised	To clarify the role of the Information Desk Technician and the Information Supervisor. Change the address in Outlook for the template to be sent to.

Revision 2	**Date 11/15/2011**
Writer	Russell Elberts OCC Ops Coordinator
Reviewer (s)	OCC West Shift Manager, OCC West Info Supervisors
FAM Approver(s)	Bob Pinto, ComEd Mgr OCC Operations
Reason Revised	Procedure review and format update.

Revision 3	**Date 05/19/2014**
Writer	Dave Bunge
Reviewer (s)	Robert Charland, Brian Hock, Mark Sayers, Eric Jensen
FAM Approver(s)	Brian Hock, Mgr OCC Operations
Reason Revised	ACE Corrective Action AR 419567-09

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Revision 4	**Date 10/10/2016**
Writer	Edward Finn OCC Ops Coordinator
Reviewer (s)	OCC West Shift Managers, OCC West Info Supervisors
FAM Approver(s)	John Biscan, Mgr OCC Operations
Reason Revised	Periodic Review

Revision 5	**Date 06/03/2019**
Writer	Edward Finn Ops Mgr
Reviewer (s)	OCC West Shift Managers, OCC West Info Supervisors
FAM Approver(s)	John Biscan, Mgr OCC Operations
Reason Revised	Periodic Review

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Communications Message: Don't drive into flooded areas

Here are some precautions to keep in mind while navigating flooded roadways safely:

- Obey all signs and barriers blocking roadways – do not drive around them
- Adhere to weight limits for roads and bridges – know your weight!
- Do not drive through flooded areas. Even if the water appears shallow enough to cross, don't try it. Water hides dips in the road. Worse yet, there may be no road at all under the water. Flooding can wash away the entire road surface and a significant amount of ground beneath.
- Roads concealed by water may not be intact.
- Be especially cautious at night. It's harder to recognize water danger then.
- Do not park your vehicle along streams and washes as their height may change quickly
- If your car stalls in rapidly rising waters, get out immediately and move to higher ground. Rapidly rising water may engulf the vehicle and sweep it away.
- Be aware of your surroundings as flooding may have caused familiar places to change dramatically.

Attachment OP-CE-P062-1

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Communications Message: Flooded basements

Storms bring a risk of basement flooding. Because so many people have critical systems and other electronic devices in their basements, there is a higher risk of electrocution when entering a flooded basement to assess damage. ComEd offers the following safety tips for customers with flooded basements.

1. Never wade into a flooded basement unless all electricity has been disconnected (such as power that supplies sump pumps, freezers, etc.). Water may be in contact with electrical outlets, appliances or cords.
2. If you are experiencing a power outage, do not wade into a flooded basement. Power may be restored while you are in the flooded basement and the motors on appliances may be submerged.
3. Never attempt to turn off power at the breaker box if you must stand in water to do so.
4. Never operate electrical appliances or devices or touch electrical switches, outlets or cords if you are standing in water or are on a wet surface, of if you are wet.
5. Be aware of any electrical equipment that could be energized and in contact with water

Report your outage online, or sign up for Outage Alerts and text OUT to COMED at (26633) to report your outage and receive updates on your outage status. You can also report your outage on our Mobile App.

Attachment OP-CE-P062-2

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Communications Message: Proactive Call Script for Customers out in Flooded Inaccessible Areas:

What you need to know:

- We are reaching out to customers that are still out of power due to flooding in their area
- The proactive call script for customers who are out in the flooded areas that are inaccessible to our crews is as follows:

- This is ComEd calling. We are reaching out to you as our records show you are still out of power. Your equipment is in an area that is inaccessible due to flooding. We are continuing to monitor the flooding around the equipment and will dispatch a crew to restore your power as soon as we can, in a safe manner. If your power is, in fact, on, please call us at 1-800-334-7661 to cancel the order. We apologize for any inconvenience this has caused. Thank you for your patience.

What do you need to do:

- If a customer calls to advise that their power is on please void the electric trouble ticket.

Attachment OP-CE-P062-2

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Communications Message: If you require ComEd to disconnect power and have flooding in or around your home

If you have flooding in or around your home and require that ComEd disconnect your power temporarily for safety reasons, please be prepared to answer the following questions.

- Is your meter outside?
- Is your meter covered in water outside your home?
- Is your meter surrounded by water that is visible above your landscaping?

After the water has receded and your home has returned to a dry and safe state, please keep in mind that you may be required to pass a safety inspection through your municipality prior to ComEd reconnecting your power.

Attachment OP-CE-P062-2

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Communications Message: Restoration Process for Customers Who Have Experienced a Flood

What you need to know:

As a result of the recent storm activity, some customers may have experienced flooding at their premise. Their electrical service may need to be cut for safety purposes. CSRs must inform the customer during the initial call, that an inspection is needed prior to the customer being restored due to the water intrusion into ComEd's equipment.

What you need to do:

Customer calls in to be restored after being cut for safety due to flooding.

Note: New Business is NOT required to inspect for flood issues.

CSR references the external affairs list of municipalities requiring or not requiring an inspection with the municipality inspector's phone number.

1 - Customer requires a municipal inspection will proceed to step A

2 - Customer does not require a municipal inspection will proceed to step B.

Step A.

CSR informs customer that they need to contact municipality to get service inspected and call back once inspection has been completed. Additionally, the CSR must inform the customer that the municipality will fax ComEd the completed inspection form.

City/Village Inspectors will complete the inspection and then will fax the completed form to ComEd New Business department to update CIMS.

Customer calls back informing municipal inspection completed will proceed to step B.

Step B.

CSR to review CIMS contacts and outage history to deem if:

- meter has been removed
- service has been cut at pole

CSR will inform customer they need to be at the premise and their main circuit breaker will need to be off. Customer must provide a primary and alternate contact number.

Determination will need to be made as to what resources will be needed to restore the customer. If comments in CIMS read "**meter pulled**" issue an **Emergency Meter Investigation**. If CIMS comments state "**cut at the pole**" issue an **ETT**. If there are no comments in CIMS regarding how the service was cut, issue an ETT.

- CSR to issue an Emergency Meter Investigation for "meter pulled" ready for reconnect due to flooding. *(If after hours a notification will need to be made to the OCC)

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- CSR to issue an Electric Trouble Ticket (OTHER POTENTIAL DANGER) for cut at pole. Tickets must be issued with notes stating “customer was cut at pole due to flooding and ready for a reconnect”.

If an ETT is issued, a notification will need to be made to the OCC Information Desk that a reconnect ticket was issued. In turn, an IDT at the OCC will refer this ticket to “CUST RESTORE REQ” for proper restore prioritization. Tickets in this referral group will be processed as elevated outage status.

*OCC will attempt to restore all after hour EMI. If outages exist and a 3-4hr ETR is provided F&MS will need to perform callout.

For questions about this and other alerts, please contact your supervisor.

Attachment OP-CE-P062-3

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Substation, Overhead Transmission And Distribution Insulator Contamination Inspection and Maintenance

ComEd Process
OP-CE-P066
Rev. 6

Effective:	11/5/2019
Supersedes:	CM-ED-P001 CIMP4.8
Review Type:	3 Year
Core Function:	Operate & Restore

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1. Purpose

To provide guidelines for the inspection of Overhead Transmission Lines, Overhead Distribution Lines and Substations for insulators contaminated by airborne particulates.

Section 3 has been divided into the following subsections:

Subsection	Title	Page
3.1.1	Contamination Inspection And Maintenance Program	2
3.1.2	What To Examine For Insulators	3
3.1.3	Contamination report levels:	5
3.1.3.1	Transmission Lines	5
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2. Precautions and limitations

2.1. Precautions

2.1.1 None

2.2. Limitations

2.2.1 All inspections are to be completed by noon of the second day after being scheduled or called for. IE: If called for on Tuesday inspections are to be completed by noon on Thursday

3. Process

3.1. Summary

3.1.1 CONTAMINATION INSPECTION AND MAINTENANCE PROGRAM

1. Attachment OP-CE-020029-1 shows the overhead transmission and distribution locations where Exelon has line crossings that are susceptible to winter contamination problems on the insulators.
2. Attachment OP-CE-020029-1 shows the Substations prone to insulator contamination.
3. These locations shall be inspected for winter contamination problems on the insulators on the following dates, unless a special weather related inspection was completed in the five days prior to:
    - December 1
    - January 2
    - February 1
    - March 1
4. SPECIAL weather related inspections of these locations should occur based on the following conditions related to winter weather. Criterion for inspection:
    a. Locations crossing under the Chicago Skyway (Chicago Region) where debris from snow plowing will always be a factor should be inspected after every occurrence when snow plowing is completed.
    b. All locations should be inspected when conditions are favorable for airborne salt spray to settle on the insulators.

NOTE: This occurs when roads are plowed and salted, and temperatures are such that the road conditions are wet and traffic is moving along at reasonable speeds causing airborne spray. This may also occur during the winter freeze thaw cycle.
Under these conditions, it is recommended that the locations be inspected on the second day and continue on a 5 day cycle until weather conditions change or local knowledge indicates this is not a problem.

Caution

Conditions will differ across ComEd system and judgment will be required.

Determination shall be made for special weather related insulator inspections by either the Manager, Transmission Line Engineering Department, Manager, Transmission Substation Engineering Department or the Regional Engineering Managers.

3.1.2 WHAT TO EXAMINE FOR INSULATORS

Note: CM-ED-551001 Insulator Contamination Sampling

1. Porcelain insulators typically have a shiny surface; if the surface is dull contamination is present.
    a. The only exception to this is when it is cold enough that the insulator is covered with frost, especially in the evening.
    b. Unless the insulator is severely contaminated frost will not cause a flashover.

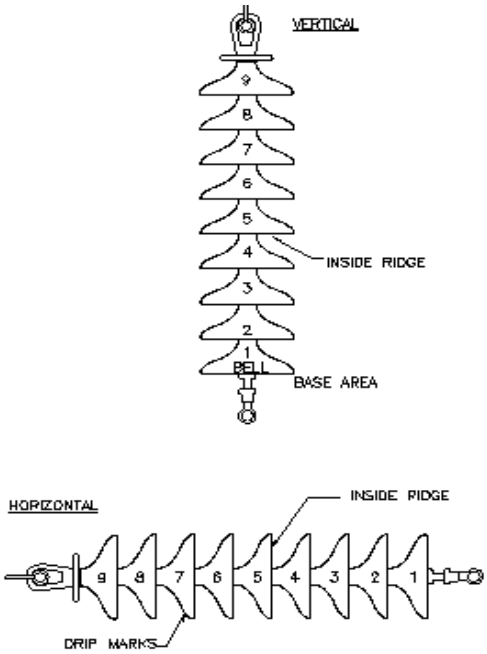


Figure 1

2. Sometimes heavy contamination will be apparent by the build up at the base of the insulator, or when in the dead end horizontal configuration you will see significant drip marks. This is an indication that the location should be monitored. (see Figure 1).
3. Audible noise signifies that an insulator most likely should be washed. The insulator should be inspected during the day and again at dusk to determine if visable acrhing can be observed (See Figure 2).
4. The most important area that signifies an insulator needs cleaning is when you can see the contamination in inside ridges underneath the bells. (see Figure 1). When contamination is present on the inside ridges, the insulator should be washed.
5. If the insulators have visible corona discharge (easier to see at night) the decision to clean is a bit easier. If the corona goes beyond the second bell (see Figure 1) the insulator should be cleaned. This will hold true for either 138kV or 345kV.

3.1.3 CONTAMINATION REPORT LEVELS:

3.1.3.1 Transmission Lines

Each Region can filter on the Inspection Reporting Sheet for the locations in their region (Attachment OP-CE-020029-1) that is to be completed every time the lines are inspected for contaminated insulators.

When examining the insulators for contamination, the contamination report levels are required to be reported which are as listed below:

Level 1:

Observation: Insulators slightly contaminated.

Action Required: No action required.

Level 2:

Observation: Insulators moderately contaminated with salt residue, slight hissing noise and/or minor corona discharge observed at the first bell only.

Action Required: Insulator cleaning not required. Inspect next day and continue on a 5-day cycle until weather conditions change or local knowledge indicates this is not a problem.

Level 3:

Observation: Insulators heavily contaminated with salt residue, visible rings of contamination under bell skirts. Loud hissing noise and/or corona discharge observed beyond bottom two bells.

Action Required: Insulator cleaning required.

3.1.3.2 Distribution Lines

Distribution contamination levels have been written slightly different due to less number of insulator bells in a string and shorter skirts.

Each Region can filter on the Inspection Reporting Sheet for the locations in their region (Attachment OP-CE-020029-1) that is to be completed every time the lines are inspected for contaminated insulators.

When examining the insulators for contamination, the contamination report levels are required to be reported which are as listed below:

Level 1:

Observation: Insulators slightly contaminated.

Action Required: No action required.

Level 2:

Observation: Insulators moderately contaminated with salt residue, slight hissing noise and/or minor intermittent corona discharge observed at the base of insulator string/strut.

Action Required: Insulator cleaning not required. Inspect next day and continue on a 5-day cycle until weather conditions change or local knowledge indicates this is not a problem.

Level 3:

Observation: Insulators heavily contaminated with salt residue, visible rings of contamination under bell skirts/strut sheds. Loud hissing noise and/or corona discharge observed beyond base of insulator string/strut.

Action Required: Insulator cleaning required.

3.1.3.3 Substations

Each Region can filter on the Inspection Reporting Sheet for the locations in their region (Attachment OP-CE-020029-1) that is to be completed every time the lines are inspected for contaminated insulators.

When examining the insulators for contamination, the contamination report levels are required to be reported which are as listed below:

Level 1:

Observation: Insulators slightly contaminated, No hissing noise, No corona discharge, No signs of flashover / tracking and no signs of icing on the insulators.

Action Required: No insulator cleaning is required at the present time.

Level 2:

Observation: Insulators moderately contaminated with salt or other residue, Spark Discharges Bridge more than 25% and less than 50% (non-continuous bridging) of the insulator sheds. (See Figure 2) Ice bridging present less than 25% of insulator length. (See Figure 3) Slight hissing noise, Minor corona discharge with no flashover or tracking observed.

Action Required: Perform insulator cleaning when it can be arranged/scheduled. If only ice is bridging insulator and no other factors are detected, remove ice when it can be arranged/scheduled.

Level 3:

Observation: Insulators heavily contaminated with salt or other residue, Spark discharges bridge 50% (non-continuous bridging) or more of the insulator sheds. (See Figure 2). Ice bridging present on more than 25% of insulator length. (See Figure 4). Loud hissing noise, corona discharge, Flashover and / or tracking present.

Action Required: Insulator cleaning and possible replacement is required as soon as possible. If only ice is bridging insulator and no other factors are detected, remove ice as soon as possible. If signs of flashover or tracking are observed on the insulators, notify the appropriate Regional Work Management Hotline.

Figure 2

Spark Discharges: Level 2 spark discharges bridge 25% to 50% (non-continuous bridging) of the insulator sheds (as shown), clean when it can be arranged/schedule. Level 3 spark discharges bridge 50% (non-continuous bridging) or more of the insulators, clean as soon as possible.

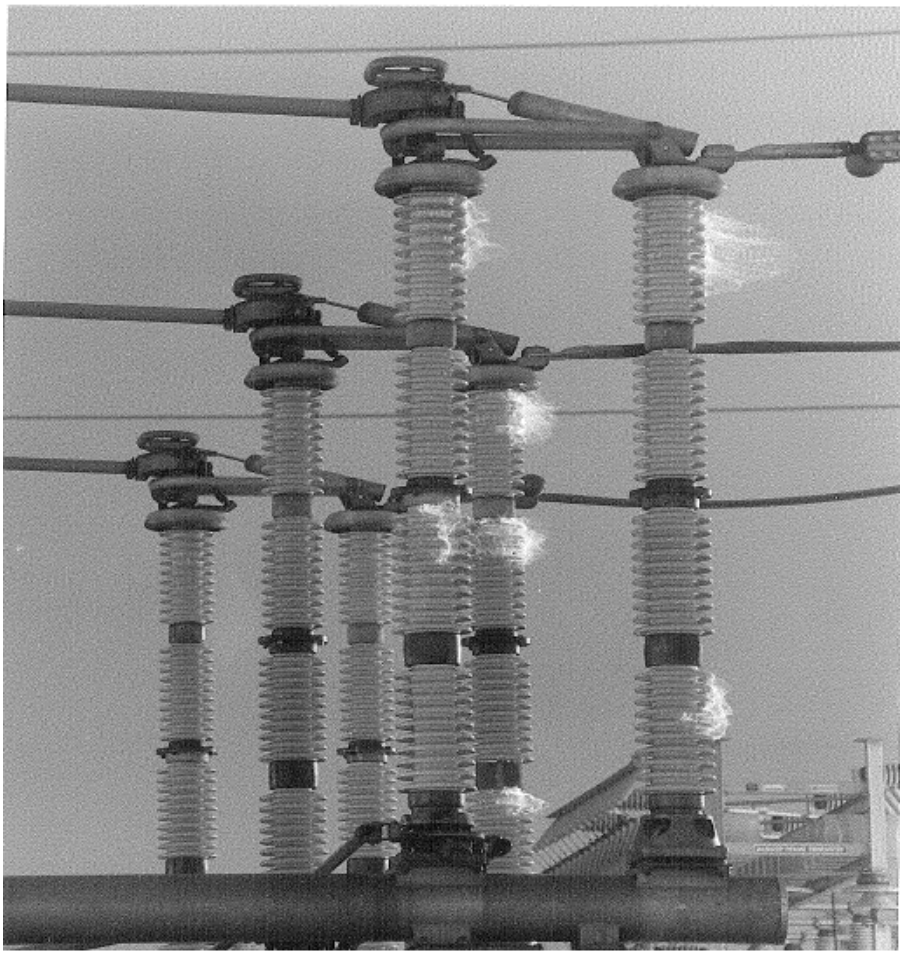
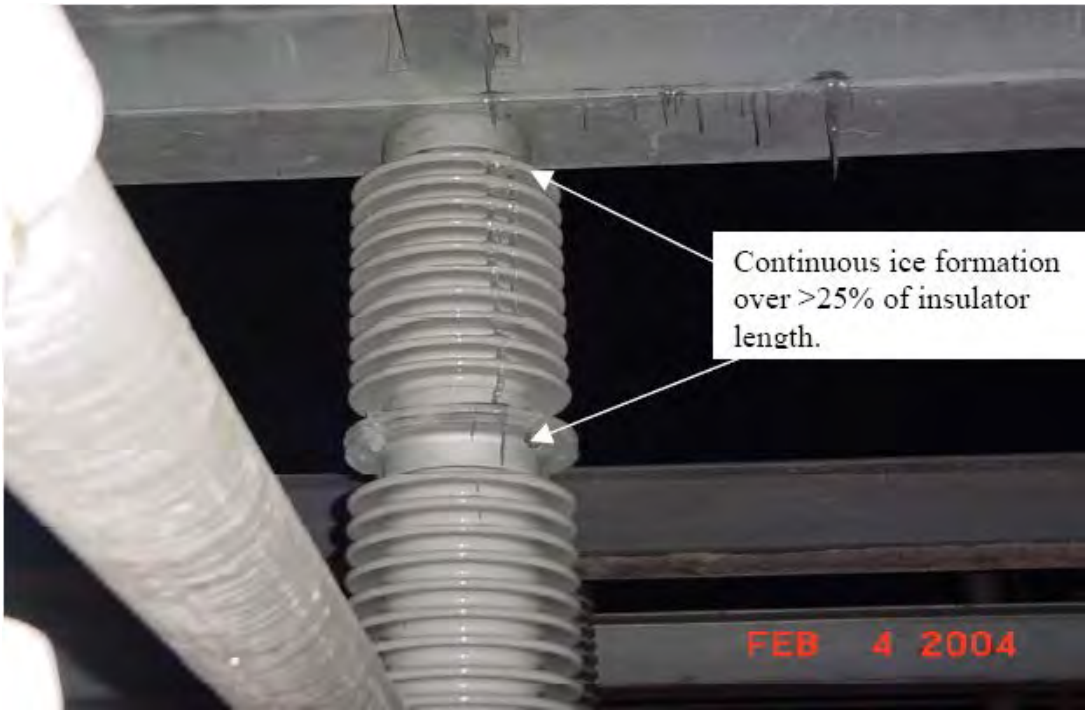


Figure 3

Level 2 Icing: Level 2 icing continuously bridges 25% or less of the insulators sheds (as shown), ice should be removed when it can be arranged/scheduled.

Figure 4

Level 3 Icing: Level 3 icing continuously bridges more than 25% of the insulator length (as shown), ice should be removed as soon as possible.



3.2. INSULATOR CLEANING

1. If insulator cleaning is required as indicated in any of the above, these should be washed per CM-ED-552002 Insulator Bushing And Surge Arrestor Cleaning as soon as it can be arranged.
2. If insulator cleaning is required for Transmission line insulators based on Level 3 report levels, Manager, Transmission Line Engineering Department shall notify the Director, Transmission Department for cleaning the insulators on Transmission lines.
3. If insulator cleaning is required for Distribution line insulators based on Level 3 report levels, Manager, Regional Engineering Department shall notify the Manager, Construction and Maintenance Department for cleaning the insulators on Distribution lines.
4. If insulator cleaning is required for Substation insulators based on Level 3 report levels, Manager, Transmission Substation Engineering Department shall notify the Regional T&S PDM Manager for cleaning the insulators in Substations.
5. Any work done related to the inspection and cleaning of insulators should be charged to the appropriate maintenance activity. (Project ID BCM T000).
6. If insulators show visible signs of flashover or damage, contact the appropriate Engineering Manager.

3.3. Assumptions

3.3.1 N/A

Click here to enter text.

Substation, Overhead Transmission And Distribution Insulator Contamination Inspection and Maintenance

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4. Roles and Responsibilities

4.1. MANAGER, TRANSMISSION LINE ENGINEERING DEPARTMENT

4.1.1 Responsible to annually ensure the list of Transmisison Line inspection locations are reviewed and modified as necessary and posted in (Attachment OP-CE-020029-1).

4.1.2 Responsible to request Manager, Operations Control Center; to initiate SPECIAL weather related insulators inspections of the Overhead Transmission Lines in the vicinity of Tollways/Highways and in industrial areas.

4.1.3 Responsible to review inspection results of Transmission line inspections reports as reported per (Attachment OP-CE-020029-1).

4.1.4 Responsible to determine course of action based on the inspection reports and inform Director, Transmission Department if cleaning the contaminated insulators is required for Transmission line insulators.

4.2. MANAGER, TRANSMISSION SUBSTATION ENGINEERING DEPARTMENT

4.2.1 Responsible, in conjunction with the T&S PDM Managers, to annually ensure the list of Substation inspection locations are reviewed and modified as necessary and posted in (Attachment OP-CE-020029-1).

4.2.2 Responsible to request Manager, Operations Control Center; to initiate SPECIAL weather related insulators inspections of the Substations in the vicinity of Tollways/Highways and in industrial areas.

4.2.3 Responsible to review inspection results of Substation inspections reports as reported per (Attachment OP-CE-020029-1).

4.2.4 Responsible to determine course of action based on the inspection reports and inform PDM Managers if cleaning the contaminated insulators is required for Substation insulators.

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4.3. REGIONAL ENGINEERING MANAGERS

4.3.1 Responsible to annually ensure the list of Distribution Line inspection locations are reviewed and modified as necessary and posted in (Attachment OP-CE-020029-1).

4.3.2 Responsible to request Manager, Operations Control Center; to initiate SPECIAL weather related insulators inspections of the Overhead Distribution Lines in the vicinity of Tollway/Highways and industrial areas.

4.3.3 Responsible to review inspection results of Distribution line inspections reports as reported per (Attachment OP-CE-020029-1).

4.3.4 Responsible to determine course of action based on the inspection reports and inform Manager, Construction and Maintenance Department if cleaning the contaminated insulators is required for Distribution line insulators.

4.4. DIRECTOR, TRANSMISSION DEPARTMENT

4.4.1 Responsible to complete both planned corrective and emergent repairs of the insulators in the vicinity prone to insulator contaminations as per directions by Manager, Transmission Line Engineering Department.

4.4.2 Responsible to arrange for cleaning the Transmission lines with the contaminated insulators based on determination by Manager, Transmission Line Engineering Department.

4.5. T&S PDM MANAGERS

4.5.1 Responsible, in conjunction with the Maanager, Substation EngineeringT&S PDM Managers, to annually ensure the list of Substation inspection locations are reviewed and modified as necessary and posted in (Attachment OP-CE-020029-1).

4.5.2 Responsible to complete both planned corrective and emergent repairs of the insulators in the vicinity prone to insulator contaminations as per directions by Manager, Transmission Line Engineering Department.

4.5.3 Responsible to arrange for cleaning the Transmission lines with the contaminated insulators based on determination by Manager, Transmission Line Engineering Department.

4.6. MANAGER, FIELD OPERATIONS DEPARTMENT

4.6.1 Responsible for weather related contaminated insulator inspections, as informed by Manager, Operations Control Center.

4.6.2 Responsible for inspection of locations for winter contamination problems on the insulators on the following dates, unless a SPECIAL inspection was completed in the five days prior to: December 1st, January 2, February 1, and March 1.

4.6.3 Responsible to record inspection results for the locations within their region as shown per (Attachment OP-CE-020029-1) .

4.7. MANAGER, CONSTRUCTION AND MAINTENANCE DEPARTMENT

4.7.1 Responsible to arrange for cleaning the Distribution lines with the contaminated insulators based on determination by Manager, Regional Engineering.

4.8. SUPERVISOR, TRANSMISSION SYSTEM OPERATIONS DEPARTMENT

4.8.1 Responsible to initiate inspections and inform Manager, Operations Control Center to perform SPECIAL weather related inspections of contaminated insulators.

4.9. MANAGER, OPERATIONS CONTROL CENTER

4.9.1 Responsible to initiate inspections and inform Manager, Field Operations Department to perform monthly and SPECIAL weather related inspections of contaminated insulators.

5. Documentation

5.1. REPORTING REQUIREMENTS

5.1.1 Manager, Field Operations shall ensure that all inspection entries are made into the dated spreadsheet as supplied by the OCC for each required monthly inspection, as well as for any special inspections when called for by the Manager, OCC Operations.

5.2. DOCUMENT RETENTION

5.2.1 Documentation generated during performance of this procedure shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

5.2.2 Retention period for all Inspection data shall be the greater of, 3 years from date of inspection or one inspection cycle.

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6. Terms and Definitions

Note: Refer to CM-EU-010006 EU Technical Glossary for technical terms and definitions.

6.1. Audible Noise

6.1.1 The measure of the noise emanating from equipment in audible frequencies represented in dBA.

6.2. Corona Discharge

6.2.1 An electrical discharge brought on by the ionization of a fluid surrounding a conductor, which occurs when the potential gradient exceeds a certain value, in situations where sparking is not favored.

6.3. Corrective Maintenance

6.3.1 Maintenance required if it is identified that failure OR malfunctioning of the equipment has occurred.

6.4. Emergent Repairs

6.4.1 Repairs with high priority (10 or 20) and should be completed as within duration defined by priority assignment.

6.5. Frost

6.5.1 Frost is the result of deposition of water vapor in saturated air. When solid surfaces come in contact with the air that is chilled below the frost point (32 degree F), the spicules of ice grow out covering the solid surface.

6.6. Insulator Contamination

6.6.1 Insulator covered with airborne particles, road salts or other pollutants, which can result in flashover of the insulator and thereby can cause an outage.

6.7. Preventive Maintenance

6.7.1 Maintenance done to prevent any malfunctioning or failure of equipment.

7. References

LE-AC-401 – Records and Information Management Retention and Disposition.

8. Attachments

OP-CE-020029-1, Overhead Transmission, Distribution lines, and Substations susceptible to contamination. Additionally, a transmission line kmz file exists to map the inspection locations.

Substation, Overhead Transmission And Distribution Insulator Contamination Inspection and Maintenance

ComEd Process
OP-CE-P066
Rev. 6

9. Development history

Revision 0	**Date: 1/1/2009**
Writer	Richard Urban
Reviewer(s)	Ronald Regner manager Transmission Control, John Garavaglia Manager Engineering Standards, Miguel A. Ortega Director Transmission and Substation Engineering, OCC West Shift Managers.
UFAM Approver(s)	Mark Quinlan Manager OCC Operations
Reason written	Consolidate CM-ED-P001 and CIMP 4.8, as well as convert the procedure from CM-ED to OP-CE.

Revision 1	**Date: 2/19/2009**
Writer	Richard Urban
Reviewer(s)	Ronald Regner manager Transmission Control, John Garavaglia Manager Engineering Standards, Miguel A. Ortega Director Transmission and Substation Engineering, OCC West Shift Managers.
UFAM Approver(s)	Mark Quinlan Manager OCC Operations
Reason written	Transmission Engineering requested 1 additional inspection location.

Revision 2	**Date: 12/1/2009**
Writer	Richard Urban, Shift Manager OCC ComEd
Reviewer(s)	John Garavaglia manager Transmission Control, Ronald Regner Manager Engineering Standards, Miguel A. Ortega Director Transmission and Substation Engineering, OCC West Shift Managers.
UFAM Approver(s)	Robert Pinto Manager OCC Operations
Reason written	Elimination of mandatory December 1st inspection. Re-assignment of inspections within responsible area within regions per Regional Ops Managers.

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Substation, Overhead Transmission And Distribution Insulator Contamination Inspection and Maintenance

ComEd Process
OP-CE-P066
Rev. 6

Revision 3	**Date: 11/20/2011**
Writer	Howard Murray Sr Engineer, Joe Landise Sr Engineer, Taral Patel General Engineer
Reviewer(s)	OCC West Shift Managers, William J. Forst West Engineering Manager
UFAM Approver(s)	Robert Pinto Manager OCC Operations
Reason written	3 year procedure review and format updates.

Revision 4	**Date: 11/30/2012**
Writer	Russell Elberts, Ops Coordinator
Reviewer(s)	Abel P. Del Toral Reliability Engineer, Chicago Region; Taral G. Patel Manager Reliability Engineering; Howard D. Murray ComEd Transmission Engineering Department
UFAM Approver(s)	Robert Pinto Manager OCC Operations
Reason written	Separated the procedure from the list of inspection locations.

Revision 5	**Date: 10/5/2016**
Writer	Edward Finn, Ops Coordinator
Reviewer(s)	Abel P. Del Toral,Reliability Engineer; Joseph Landise, OHT; Tyler Petersen, OHT; Howard Murray, OHT Eng.
UFAM Approver(s)	John Biscan, OCC Operations
Reason written	Periodic review and format update

Revision 6	**Date: 11/5/2019**
Writer	Edward Finn, Ops Mgr
Reviewer(s)	Abel P. Del Toral, Reliability Engineer; Tyler Petersen, OHT Eng; Howard Murray, OHT Eng; Dan Snyder, T&S Ops Coordinator; OCC Shift Managers
UFAM Approver(s)	John Biscan, OCC Operations Manager
Reason written	Comprehensive review and revision of procedure and attachments to align with winter readiness approach

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Substation, Overhead Transmission And Distribution Insulator Contamination Inspection and Maintenance

ComEd Process
OP-CE-P066
Rev. 6

Attachment

OP-CE-020029-1

The link below will direct you to the inspection sheets for documentation that are to be used by those completing the inspections. Entry of this data into the shared workbook is to be completed by a designee from the region as the inspections are being completed. Percentage completion should be reported on the 0800 Leadership call during inspection periods.

Note: The link to the list of Lines and Substations can be found at the following location:

\\Cccmsfs12\CCCNW302_VOL3\COMED\PERM\Inspections\InsulatorInspections

Program Management Plan Wood Pole Inspection, Treatment, Reinforcement, and Replacement

ComEd Program
PC-CE-P031
Rev. 2

Effective:	4/15/2020
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Project and Work Management

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1. Purpose

The Wood Pole Program entails assessing the strength and structural integrity of distribution wood poles within the ComEd distribution system and treating, reinforcing, or replacing them as appropriate. The scope is composed of three sub-programs:

- Pole Inspection and Treatment
- Pole Reinforcement (Ctrussing)
- Pole Replacement

Executing the work will reduce the frequency of service disruptions due to pole failure.

This Program Management Plan (PgMP) sets forth the methods, management, organization, schedule, budget and other parameters that ComEd will use in managing and executing this program of work. It is based on the EIMA Wood Pole Program

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Management Plan that is archived on the Wood Poles common drive in Project and Contract Management (PCM).

This document will be revised or re-affirmed every 3 years from issuance of the original version. The owner of this document is PCM who will be responsible for annual update or re-affirmation.

2. Precautions and Limitations

2.1. Precautions

2.1.1 None.

2.2. Limitations

2.2.1 Adequate funding needs to be budgeted for the activities in each year.

3. Prerequisites

3.1. The guidance in this PgMP is aligned with Project Management – Centrally Managed Programs document (PC-EU-P026) and Project Management Process document (PC-EU-P030). These documents should be understood prior to reading this PgMP.

3.2. This document is organized around five Project Management Critical Performance Element (CPE) processes: Initiation, Planning, Execution, Monitoring and Control, and Close-out. The sixth CPE process: Project Manager Skill Development is not covered. Monitoring and Control is included under the Execution CPE process.

4. Program

4.1. Pole Inspection and Treatment - Objective and Requirements

The objective of the Pole Inspection and Treatment Program entails assessing the strength and structural integrity of distribution wood poles within the ComEd distribution system. This data is used to determine if the poles need to be treated, reinforced, or replaced. The number of wood poles to be included in the program is selected in order to reduce the age since last inspection from a cycle of 24 years to 10 years. This will be accomplished through selection of townships with the longest age since the last inspection of the poles within the township. Pole inspection and treatment will be conducted by a Contractor.

4.1.1 Initiation Process

4.1.1.1 Work Selection Criteria

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The number of wood poles in the program will be selected based on the target inspection cycle length and the total number of wood poles within the ComEd distribution system as documented in CEGIS. As stated previously, the current target inspection cycle length is 10 years. Given that there are approximately 1.4 million poles within the ComEd system in total, the current target for pole inspections is approximately 140,000 poles per year.

The Reliability Programs group sets or reaffirms the criteria for inclusion of work in the scope of the Inspection and Treatment Program each year. The criteria for inclusion of work are set by the Reliability Programs Manager (RPM) in consultation with the Subject Matter Experts in the Standards group. Note: all priority reject poles ≤ 30' or having 3 phases will not be reinforced – they will be replaced.

4.1.1.2 Budget Build

The Pole Inspection and Treatment Program budget will be collaboratively developed by the Reliability Programs Manager (RPM), the Principal Project Manager (PPM) and the Project Manager (PM) during the Long Range Planning (LRP) Process. The RPM will facilitate regular status meetings during LRP development. Distribution Work Strategy (DWS) drives the levelization for LRP Process which has two major iterations: LRP 1.0 is developed in the spring and LRP 2.0 is developed in the fall. Pole Inspection/Treatment is considered non-ordinary and customary (non-O&C) work and does not affect Valtin. Pole Inspection/Treatment is considered 100% Expense.

The budget will be based on the number of poles targeted for the inspection per year and previous years' performance (cost per inspection, treatment rate, Chicago vs. Suburbs). The PPM will maintain a 'working copy' of the budget on PCM's common drive.

Jointly owned poles will have the cost of inspections shared between ComEd and Joint Work Agreement (JWA) partners. The PM is responsible for invoicing the JWA partners. This will not affect the budget, since payments received from the JWA partners are credited to Revenue and not to the program.

The PPM is responsible for obtaining authorization (~December for the upcoming program year) in accordance with procedure FI-EU-2001. The RPM is responsible for providing the business case for authorization. The PPM will hold the Cost Engineer accountable for entering the detailed budget information into the accounting system which is used for the approval process.

4.1.1.3 Select Scope Candidates

Annually, the RPM analyzes the Pole Inspection Township Summary to determine which township's poles have the greatest age since last pole inspection. Those townships with the greatest age since last inspection will be recorded in the annual inspection scope file and emailed to the PPM who will work with the Contractor for scheduling. The target number of inspections may be exceeded, if budget allows, to

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ensure the number of candidates for the Reinforcement and Replacement Programs are met.

4.1.1.4 Review Execution Plans

A program kick-off meeting will be held annually. Attendance at this meeting will include but is not limited to, the RPM, PPM, PM, Contractors, JWA partners, and Asset Information and System Policy (AISP). This meeting is intended to set expectations for each party and ensure understanding of responsibilities.

Additionally, data delivery requirements for ComEd and the Contractor will be established and agreed upon at the beginning of each program year. The first data transfer will occur at the beginning of the year. AISP will be responsible to upload all overhead asset information from CEGIS to the Contractor FTP website for the Contractor's reference throughout the Inspection and Treatment Program.

4.1.2 Planning Process

4.1.2.1 Establish Project Schedules

The current year's scope candidates will be generated in Asset Suite 8 (AS8) per automated process in January of each year and an XML file of scope will be sent to Contractor with oversight by the RPM.

The Contractor will schedule inspections by township/office by month to meet targets. Monthly targets will be straight-lined for the months of April through November but may be adjusted to accommodate opportunities for efficiencies. In general, poles with greater age since last inspection, as measured in whole years, will be given higher priority. The PM will send the scheduled work information to the Reliability Analysis Department in the agreed upon Excel template for upload to the external communications website.

4.1.2.2 Develop Designs

Designs are not required for the Pole Inspection and Treatment Program.

4.1.2.3 Plan Work Orders

AS8 will auto create Work Order Tasks (new process in 2016) at the beginning of the year with oversight by the RPM. The Contractor will be responsible for any JWAs, permits, and locates associated with pole inspection work. Detailed planning (work pouches, schedule, crew assignment) is done by the Contractor.

4.1.3 Execution Process

4.1.3.1 Physical Installation

Contractor performs inspections per EXELON 2005 Pole Spec – Distribution System Wood Pole Inspection and Remediation Procedure.

Update electronic records:

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- The Contractor will upload all pole inspection results (Excel and Access formats) to the FTP site on a monthly basis. The Contractor will also upload photographs taken during inspections. The RPM and AISP will review the data for completeness and reasonableness and will respond to the Contractor with any corrections needing to be made. If there are no errors identified, the RPM will approve and it will be uploaded by AISP into AS8. Inspection data results can be viewed in AS8 in the D030 Equipment Panel and searching on the pole number.
- New poles (poles not in CEGIS) identified during inspections will be numbered by the contractor as a “900 series” pole i.e., the last three digits in the pole number will start with a “9”. The first such pole in a township will be numbered 901, the second pole will be 902, and the third 903, etc., AISP will assign a pole number and the necessary equipment records in CEGIS. These asset records will be uploaded to AS8 by AISP.

4.1.3.2 Monitor program progress and performance

The Contractor will report program progress and results via email on a weekly basis using the submittal template provided by the PPM. This submittal includes cost information which the PPM/PM will use to monitor cost in relation to budget.

Daily route sheets will also be submitted to the PPM/PM and Project Support Group. The information within these route sheets will be compiled by the Project Support Group for all programs and will also be saved by the PM to the appropriate project folder.

The PM will host weekly conference calls with the Contractor to monitor inspection progress, address barriers to execution, and confirm the upcoming work schedule.

4.1.3.3 Verify and document program results and performance

Each month, the PPM/PM will generate a monthly report including various productivity and budget related metrics (see Section 4.5.1). The RPM provides the metric for age since last inspection for each township. The rest of these metrics will be provided to the PM by the Contractor via monthly report out. These metrics will be compared against the program schedule and budget to determine the status of the program.

Throughout the month, the PM will monitor actual expenditures compared to budget and adjust program activities as necessary in order to meet budget requirements.

4.1.4 Closeout Process

4.1.4.1 Formalize project termination and acceptance

As discussed in Section 4.1.3.1 all results will be reviewed/approved by the RPM. Once approved, the RPM will notify the Contractor of acceptance, or request any changes as necessary. This is a monthly process.

4.1.4.2 Financial closure

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Once the RPM approves inspection results submitted by the Contractor, the Contractor will submit an associated invoice for inspection work. The PPM will then hold the PM accountable for creating a Contract Payment Authorization for that invoice per PC-ED-P014. The PPM is responsible for approving invoices and forwarding them on for final approval per the Delegation of Authority. This is a monthly process.

The Contractor will itemize charges for jointly owned poles so that ComEd can bill JWA partners. The PM will prepare invoices for JWA partners.

At the end of each program year, the PPM will lead validation efforts to ensure proper financial closure.

4.1.4.3 Conduct Lessons Learned

Annually, an effectiveness review of the previous program year will be conducted with input from each program stakeholder. In attendance will be representatives from PCM, Engineering, the RPM, Contractors, and Regions. Subjects to be covered include, but are not limited to: project performance and results, stakeholder communication, obstacles encountered, etc. The completed lessons learned document will be uploaded to the ComEd PMO Sharepoint under the ComEd-PM Lessons learned tab.

4.1.4.4 Closeout checklist

A closeout checklist will be completed by the PPM per PC-EU-2009-1 upon closure of any project ID. Any actions needing to be taken before project closeout will be included in this checklist.

4.2. Pole Reinforcement – Objective and Requirements

The objective of this program is to preemptively reinforce wood poles before failures occur. Based on historical find rates of reinforceable priority reject poles identified during inspection, this program is projected to reinforce approximately 3,000 poles per year. This number is based on 2.1% of all inspected poles being classified as Priority Reject poles (needing either reinforcement or replacement), and less than 1% meeting the criteria for reinforcement. These values are estimated and will remain flexible throughout program duration. Pole reinforcements will be conducted by a Contractor.

4.2.1 Initiation Process

4.2.1.1 Set work selection criteria

All poles meeting the criteria for priority reinforceable poles as given in Section 4.1.1.1 will be reinforced, also known as “CTrussed”. The criteria for reinforcement are set by the RPM in consultation with the Subject Matter Experts in the Standards Group. These criteria relate to the nature of degradation of the pole and likelihood that reinforcement will adequately address the risk presented by the degradation. These criteria may be adjusted by the RPM in order to meet ~3,000 poles per year in the most prudent possible manner from a cost and reliability perspective. Note: all priority reject poles ≤ 30’ or having 3 phases will not be reinforced – they will be replaced.

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4.2.1.2 Budget build

The Pole Reinforcement budget will be collaboratively developed by the Reliability Programs Manager (RPM), the Principal Project Manager (PPM) and the Project Manager (PM) during the Long Range Planning (LRP) Process. Distribution Work Strategy (DWS) drives the LRP Process which has two major iterations: LRP 1.0 is developed in the spring and LRP 2.0 is developed in the fall. The RPM will facilitate regular status meetings during LRP development. Pole reinforcements are considered ordinary and customary (O&C) work and affects Valtin. Pole reinforcements are considered 100% capital.

The budget will be based on the number of poles targeted for reinforcements per year and previous years' performance (cost per reinforcement, estimated number of jointly owned poles). The PPM will maintain a 'working copy' of the budget on PCM's common drive.

Jointly owned poles will have the cost of reinforcements shared between ComEd and JWA partners. The PM is responsible for invoicing the JWA partners. Contribution in Aid of Construction (CIAC) will be budgeted and based on the percentage of jointly owned poles. CIAC is credited directly to the program.

The PPM is responsible for obtaining authorization (~December for the upcoming program year) in accordance with procedure FI-EU-2001. The RPM is responsible for providing the business case for authorization. The PPM will hold the Cost Engineer accountable for entering the detailed budget information into the accounting system which is used for the approval process.

4.2.1.3 Select Scope Candidates

Candidates are identified by the Contractor in the Inspection and Treatment Program and should be reinforced in the current year. Poles not reinforced in the current year become backlog poles in the following year. Pole inspection targets may be adjusted, to the extent that budget allows, in order to generate additional candidates for reinforcement work, as described in section 4.1.1.3. Candidates not reinforced in the current year will become backlog poles to be reinforced in the next year.

All priority reinforceable reject poles will be reinforced. Additionally, the Contractor will conduct a load calculation utilizing the LoadCalc software on each pole categorized as a non-priority reject after inspection. The load calculation will determine the remaining strength of the pole and the load on the pole. Based on these two factors, non-priority reject poles may be re-categorized as priority reject poles in which case they too will be included in the scope of the reinforcement or replacement programs, depending on whether or not they also meet the criteria for reinforcement.

For poles which cannot be reinforced, the contractor will note that they could not be reinforced and those poles will then be included in the scope of the replacement

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program. The replacement Work Order (WO) will be coded: “NOT-CTRUSD-201X” (where X signifies the year it was found).

4.2.1.4 Review execution plans

A program kick-off meeting held for the Inspection and Treatment Program will also address reinforcement (see section 4.1.1.4).

4.2.2 Planning Process

4.2.2.1 Establish project schedules

Candidates are identified by the Contractor in the Inspection and Treatment Program and should be reinforced in the current year.

The Contractor will schedule reinforcements by township/office by month to meet targets. Backlog poles should be scheduled first. Monthly targets will be straight-lined for the months of April through November but may be adjusted to accommodate opportunities for efficiencies. The PM will send the scheduled work information to the Reliability Analysis Department in the agreed upon Excel template for upload to the external communications website.

The PM will hold the Scheduler accountable for entering the schedule information into P6 weekly. This schedule information feeds into the Internal Resource Review (IRR) system for Valtin management. Each month, the PM will also send the scheduled work information to the Reliability Analysis department in the agreed upon Excel template format for upload to the external communications website.

4.2.2.2 Develop designs

Designs are not required for the Pole Reinforcement Program.

4.2.2.3 Plan work orders

AS8 will auto create WO’s based on inspection data. The Contractor will be responsible for any JWAs, permits, and locates associated with pole reinforcement work. Contractor will be responsible for the detailed planning (work pouches, schedule, crew assignment). All material to be supplied by the Contractor.

4.2.2.4 Review plan

See Section 4.1.1.4 Review Execution Plans.

4.2.3 Execution Process

4.2.3.1 Physical installation

Poles will be reinforced by the Contractor following ComEd construction standard C7029. Any reinforcement of a pole size/class combination encountered in the field that is not shown in C7029 must be approved by ComEd prior to installation of the truss. In addition, all metal truss reinforcement bands that are placed behind a U-Guard

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must be grounded when a pole ground is available. After installation of the C-Truss, an additional load calculation may be required upon notice by ComEd.

Update electronic records:

Results of pole reinforcements will be recorded by the Contractor and transmitted to the RPM and PPM via an FTP file transfer in the MS Excel and MS Access formats specific, upon program initiation. Contractor will notify the RPM and PPM of this data transfer via email. This data will be reviewed and approved by the RPM before Contractor transmits to AS8. RPM verifies transmitted records in AS8.

4.2.3.2 Monitor program progress and performance

The Contractor will report program progress and results via email on a weekly basis using the submittal template provided by the PPM. This is the same submittal as described in section 4.1.3.2. This submittal includes cost information which the PPM/PM will use to monitor cost in relation to budget.

Daily route sheets will also be submitted to the PPM/PM and Project Support Group. The information within these route sheets will be compiled by the Project Support Group for all programs and will also be saved by the PM to the appropriate project folder.

The PM will host weekly conference calls with the Contractor to monitor reinforcement progress, address barriers to execution, and confirm the upcoming work schedule.

4.2.3.3 Verify and document program results and performance

Each month, the PPM/PM will generate a monthly report including various productivity and budget related metrics (see Section 4.5.2). The rest of these metrics will be provided to the PPM/PM by the Contractor via monthly report out. These metrics will be compared against the program schedule and budget to determine the status of the program.

Throughout the month, the PM will monitor actual expenditures compared to budget and adjust program activities as necessary in order to meet budget requirements.

4.2.4 Closeout Process

4.2.4.1 Formalize project termination and acceptance

As discussed in Section 4.2.3, all results will be sent to the RPM for review and approval.

Once approved, the RPM will notify the Contractor of acceptance, or request any changes as necessary.

4.2.4.2 Financial closure:

See pole inspection financial closure section 4.1.4.2.

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4.2.4.3 Conduct lessons learned:

See pole inspection lessons learned section 4.1.4.3.

4.2.4.4 Closeout checklist:

See pole inspection closeout checklist section 4.1.4.4.

4.3. Pole Replacement – Objective and Requirements

The objective of this program is to replace wood poles before failures occur. Based on historical find rates of non-restorable priority reject poles identified during inspection, this program is projected to replace ~3,500 per year. Pole replacements will be conducted by Contractors and ComEd C&M.

4.3.1 Initiation Process

4.3.1.1 Set work selection criteria

All poles meeting the criteria for priority non-restorable poles as given in Section 4.1.1.1 will be replaced. The criteria for replacement are set by the RPM in consultation with the Subject Matter Experts in the Standards Group. Note: all priority reject poles ≤ 30' or having 3 phases will be replaced.

Poles meeting these criteria during inspection in previous inspection program years, which have not yet been replaced, are also included in the scope of the Replacement Program. These poles make up what is referred to as the backlog. Backlog poles are given the highest scheduling priority in the Replacement Program.

These criteria may be adjusted by the RPM in order to meet the budget commitment of $40M per year in the most prudent possible manner from a cost and reliability perspective.

4.3.1.2 Budget build

The Pole Replacement budget will be collaboratively developed by the Reliability Programs Manager (RPM), the Principal Project Manager (PPM) and the Project Manager (PM) during the Long Range Planning (LRP) Process. Distribution Work Strategy (DWS) drives the LRP Process which has two major iterations: LRP 1.0 is developed in the spring and LRP 2.0 is developed in the fall. The RPM will facilitate regular status meetings during LRP development. Pole replacements are considered ordinary and customary (O&C) work and affect Valtin. Pole replacements are considered 93% capital and 7% expense.

The budget will be developed based on the following:

- Quantity of pole replacements assigned to ComEd (determined with DWS/WM).
- Number of poles targeted for replacement per office (supplied by the RPM based on current results and historical find rates).
- Historical hour per pole by office, ComEd (supplied by PPM).

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- Historical cost per pole by office, Contractors (supplied by PPM).
- Historical cost per pole, material (supplied by PPM).
- Historical non-O&C contractor costs (supplied by PPM).
- Engineered pole costs (supplied by PPM).

The PPM will maintain a 'working copy' of the budget on PCM's common drive.

Jointly owned poles will have the cost of replacements charged to the JWA partners based on established rates per the JWA process. This will not affect the budget, since payments received from the JWA partners are credited to Revenue and not to the program.

The PPM is responsible for obtaining authorization (~December for the upcoming program year) in accordance with procedure FI-EU-2001. The RPM is responsible for providing the business case for authorization. The PPM will hold the Cost Engineer accountable for entering the detailed budget information into the accounting system which is used for the approval process.

4.3.1.3 Select scope candidates

Upon completion of the monthly pole data inspection review, AISP uploads data into AS8. WO's may be created via an automated interface, Test Director, or manual entry. AS8 auto creates WO's which will identify the Priority Reject Poles with a PD/WC code designation of RLxx-POL-INSP-W where xx = the year of inspection (for example, RL**20**-POL-INSP-W stands for a priority non-restorable pole identified by inspection in year 2020).

Poles to be included in the Replacement Program will be determined from inspection results in the previous year, given the selection criteria in 4.3.1.1. For example, priority non-restorable poles inspected in 2020 will be replaced in 2021. This will include those poles initially classified as non-priority rejects which, in light of the load calculation, were re-categorized as priority rejects as described in section 4.1.1.1. This will also include backlog poles as defined in 4.3.1.1; backlog poles will be given the highest priority. Non-priority non-restorable poles may be included in the program based on the criteria established by the RPM.

4.3.1.4 Review execution plans

A program kick-off meeting will be held on an annual basis. Attendees will include, but are not limited to, the RPM, PPM, PM, Regional Work Management Single Point of Contacts (SPOCs), Contractors, JWA Partners, and AISP. Data delivery plans for ComEd and the Contractor will be established and agreed upon.

4.3.2 Planning Process

4.3.2.1 Establish project schedules

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The RPM in conjunction with the PPM develops pole replacement targets by month for the coming program year during the budget process and finalized in LRP 2.0. The targets will be broken down by office and by ComEd/Contractor. The PPM is responsible for assigning WO's between ComEd and Contractors; the assignments will be captured in the Assignment Database (MSAccess application developed by AISP which pulls data from AS8). The list of WO's assigned to ComEd will be communicated to the Regional SPOCs and will be posted to DWS's sharepoint site. The Regional SPOCs will communicate the WO's to their respective regional offices; the Work Planners will schedule the WO's in PV. The full list of WO's will be assigned and communicated no later than the middle of January for the upcoming program year.

The PPM will develop a bid package for pole replacements assigned to contractors which will follow Supply's process in Perfect Commerce. Upon awarding of contracts, the PM and the Scheduler will develop a schedule based upon dates supplied by the contractors. The Scheduler will enter the information into P6. This schedule information feeds into the IRR system for Valtin management. The PM will also send the scheduled work information to the Reliability Analysis Department in the agreed upon Excel template format for upload to the external communications website.

Work Planners (Work Management) are responsible for notifying the PM of additional WO's needed or bundling opportunities and should not be self-identifying or creating pole replacement WO's in AS8 for their designated regions. The PM will send the Work Planners new WO's, as needed, with the expectation that the Work Planners schedule them in PV.

During the course of the year, changes in assignments may be necessary. All changes must be vetted/approved by the affected Work Groups which include, but are not limited to: Reliability Programs, Work Management, DWS, C&M, PCM and Contractors.

4.3.2.2 Develop Designs

Poles needing a design will be identified in one of two ways:

- Screening:
  - The RPM will ensure photographs of priority non-restorable poles taken during the inspection process are screened on a regular basis. This screening process proactively identify poles needing a design for replacement in the following year. The PM will verify the need for a design for these poles.
- Field walk downs:
  - Constructing organization identifies poles needing a design for replacement in the current year.

For all poles needing a design, the PM will create a Service Request (SR) and participate in the Engineering Work Screening Call. If Regional Engineering cannot support, the PPM will bid out the design to an Engineering Organization of Choice

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(EOC). PPM will track the number of pole replacements needing a design to completion.

Design development will follow ComEd's existing engineering design processes.

4.3.2.3 Plan work orders

All planning will be completed by the regional Work Planner or Contractor before pole replacement can begin for ComEd assigned poles or contractor assigned poles, respectively. This will include JULIE locates, all necessary permits, JWAs (if applicable), permits, task additions in AS8 for MRs, and any switching requests required by the scope of work.

4.3.2.4 Review plan

See section 4.3.1.4 Review Execution Plan.

4.3.3 Execution Process

4.3.3.1 Physical installation

Both ComEd and Contractors will work on the Pole Replacement Program per WO assignments made by the PPM.

Pole replacements will adhere to ComEd construction standards. ComEd does not have a procedure governing pole replacement work due to variance in case-by-case pole replacements.

Update electronic records:

Pole replacement WO's will be progressed and closed out by the constructing organization. For ComEd assigned poles, the FLS will ensure the associated electronic records are updated in AS8. For contractor assigned poles, the contractor will update the associated electronic records in AS8.

4.3.3.2 Monitor program progress and performance

The Contractor will report program progress and results via email on a weekly basis using the submittal template provided by the PM.

The PM will run the OSMx Hyperion query to confirm that ComEd assigned poles are scheduled by regional work planners as expected where x = the program year (for example, OSM**0** stands for program year 2020).

Daily route sheets will be posted and weekly calls held in the same manner as that for the Reinforcement Program per Section 4.2.3.2.

The PM will host weekly conference calls with the Regional SPOCs and Contractors to monitor reinforcement progress, address barriers to execution, and confirm the upcoming work schedule.

4.3.3.3 Verify and document program results and performance

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Each month, the PPM/PM will generate a monthly report including various productivity and budget related metrics (see Section 4.5.3). Contractors will provide data for the metrics during the weekly status calls; the PM will generate the metrics from the appropriate data sources for ComEd. These metrics will be compared against the program schedule and budget to determine the status of the program.

Throughout the month, the PM will monitor actual expenditures compared to budget and adjust program activities as necessary in order to meet budget requirements.

4.3.4 Closeout Process

4.3.4.1 Formalize project termination and acceptance

The PM will run the OSMx query in Hyperion to verify completion of each pole replacement work order assigned to ComEd. The PM will filter the Assignment Database on contractor poles to validate pole replacements by the Contractors.

4.3.4.2 Financial closure

See Pole Inspection and Treatment Financial Closure section 4.1.4.2.

4.3.4.3 Conduct lessons learned

See Pole Inspection and Treatment Lessons Learned section 4.1.4.3.

4.3.4.4 Closeout checklist

See Pole Inspection and Treatment Closeout Checklist section 4.1.4.4.

4.4. Quality Management

4.4.1 Quality Management System

The ComEd Quality Management System (QMS) is comprised of people, processes, and tools which support ComEd's core business functions in achieving excellence.

The QMS is aligned with International Organization for Standardization (ISO) 9001 standards, ComEd specifications, standards, and practices, as well as nationally recognized quality programs.

4.4.2 Quality Control Approach

Quality Control (QC) activities focus on the identification of quality issues. This is a product driven approach to quality management. At ComEd, much of the QC function is implemented through observation and inspection of completed work to verify construction meets specifications, standards, and practices set forth by ComEd. During these inspections, critical criteria (ComEd standards) are evaluated to determine if construction could affect quality.

The inspection checklists used for QC Inspection of the Wood Pole Program may be obtained from the Quality & Analysis Department (QAD).

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QC Inspector resources for the Wood Pole Program will be provided by the QAD and the Engineering Department.

Quality Control Inspectors

- Conduct Inspections: routine project site visits, inspecting for workmanship, deficiencies, and corrective actions assuring all work is consistent with applicable standards.
- Verify materials are installed consistent with applicable standards and codes.
- Verify equipment is installed consistent with applicable standards and codes.
- Provide QC and QA input for the project status meetings.
- Act as a conduit to the QM team managers to direct the focus of inspections and assessments.
- Verify re-work / corrective actions and evaluate the effectiveness of the actions taken.
- Inform the QC Analyst of satisfactory corrective action completion to authorize the closure of Action Tracking Tickets.

4.4.3 Quality Assurance Approach:

Quality Assurance (QA) is the system by which ComEd fulfills its responsibility to be certain the QC is functioning and the end product is realized as specified. QA is a processes driven approach which monitors and evaluates processes to ensure expectations are being met, to resolve identified problems, and prevent occurrence of potential quality issues.

Routine audits, document and record reviews, and continuous improvement initiatives will be executed to provide quality assurance. Industry standard tools and methods are used to facilitate these activities and drive continuous improvement within ComEd.

The QAD will audit the Wood Pole Program against this PgMP on a three year cycle.

Quality Assurance Auditors

- Conduct Audits and Surveillances to ensure QC Documentation and Signoff, QC Inspections, and Quality work processes are being executed in accordance with procedure and management expectation.
- Verify Corrective and Preventive actions stemming from recurring/systemic issues are completed to standard/expectation.
- Procedural change verification.
- Interviews with staff to confirm understanding of processes and procedures.
- Surveillance of work practices in field and office.
- Desk reviews of documents and records.

4.4.4 QC Inspection Sampling

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Field QC Inspections and QC Documentation and Record Reviews will be utilized on a sampling basis to improve and control construction quality.

- Pole Inspection and Treatment Program – 0%. Field walkdown with contractor, PPM, PM, RPM, JWA and Joint partners once a year. PPM may request inspections as needed.
- Pole Reinforcement Program – 0%. Field walkdown with contractor, PPM, PM, RPM, JWA and Joint partners once a year. PPM may request inspections as needed.
- Pole Replacement Program – minimum 10% of all WO's completed on a monthly basis. PM will provide the WO's to QC.

4.5. Compliance and Success Measures

Tools for the calculation of Performance Metrics will be documented and made accessible to the Manager of Programs and Executive Leadership. Instructions will be written for the use of these tools, including detailed descriptions of the data sources and methods used in the calculations. The month and year end targets will be determined in December for the upcoming program year. Metrics may be added/deleted during the course of the year pending approval by the Director of Projects.

4.5.1 Pole Inspection and Treatment Program

- OSHA Recordable Events
- Human Performance Events (DI, SI, HP)
- Human Performance Near Misses
- Priority C-Truss Identified
- Priority Replacements Identified
- Poles Treated
- Cost per Pole Inspection
- Priority 10 and 20 CM Items Identified
- Average Number of Years Since Last Inspection
- Number of Stray Voltages Found/Number of Stray Voltage Tests Performed

4.5.2 Pole Reinforcement Program

- OSHA Recordable Events
- Human Performance Events (DI, SI, HP)
- Human Performance Near Misses
- C-Truss Success Rate
- Cost per Pole
- Priority Pole Reinforcements In Backlog Prior to Current Year

4.5.3 Pole Replacement Program

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- OSHA Recordable Events
- Human Performance Events (DI, SI, HP)
- Human Performance Near Misses
- Hours per Pole
- Cost per Pole
- Priority Pole Replacements In Backlog Prior to Current Year
- CMs Closed

4.6. Assumptions

4.6.1 None.

5. Roles and Responsibilities

5.1. Responsibility (RACI) Matrices for each program are provided in the following Attachments:

- PC-CE-P031-1 Pole Inspection and Treatment Program Responsibility Matrix
- PC-CE-P031-2 Pole Reinforcement Program Responsibility Matrix
- PC-CE-P031-3 Pole Replacement Program Responsibility Matrix

5.2. Process flow diagram (shows interdependencies between work groups) is provided in Attachment PC-CE-P031-4, Process Flow. Visio File available from PCM.

5.3. Project and Contract Management (PCM) - Principal Project Manager (PPM), Project Manager (PM). Responsibilities and actions identified below are in some instances shared and or joint functions of both the PPM and PM.

5.3.1 PPM is the official point of contact with all organizations regarding the Wood Pole Program. The authority and responsibility to plan, organize, execute and control the program from its initial authorization to its completion and verification of success (or cancellation) is vested in the PPM.

5.3.2 Ensures that the program is safely executed on schedule, within authorized cost limits, and to the quality specified with due consideration to business needs. The PPM has the ultimate responsibility, authority, and accountability for program planning, estimating, scheduling, control and administration.

5.3.3 Works with RPM to collaboratively develop budgets for the program.

5.3.4 Initiation Process (ref. PC-EU-0018 and PC-EU-P030)

- Initiates activities leading to Phase1 Study funding authorization by PRC/PARC as required.

5.3.5 Planning Process (ref. PC-EU-P030)

5.3.5.1 Study Phase

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- Establishes Project Team.
- Initiates the Project Plan.
- Ensures that the financial system is current with appropriate investment tracking number, Project IDs, financial data, and preliminary plant accounting information.
- Interacts with all necessary groups to secure increased detailed information regarding Project scope, schedule and estimate.
- Obtains initial commitments from groups responsible for land issues, environmental issues, regulatory and governmental requirements, work planning, etc.
- Ensures development of cost estimate and schedule at a level commensurate with the available information.

5.3.5.2 Design Phase

- Updates Project Plan to address the Study findings regarding scope, schedule and cost requirements.
- Ensures environmental issues, regulatory notifications, real estate, ROW, and permit issues are resolved.-Ensures labor force, major material, outage schedule and operations are prepared for the Installation Phase.
- Ensures scope, schedule and cost information are current and accurate.

5.3.6 Execution Process (ref. PC-EU-P030)

- Update Project Plan to address any changes to scope, schedule and cost requirements as a result of detailed design or other emergent factors.
- Ensure that work force activities during construction are within the defined scope, schedule and cost of the Project. Any deviations from the plan are to be promptly identified and addressed.
- Initiate and follow the change process for scope, schedule and cost. See PC-EU-0020 Project Management Change Management Process.
- Ensure livening, testing, and equipment turnover to operations.
- Ensure complete documentation turnover to the maintenance and operation groups.
- Change the status of Project in the financial system to “In-Service.”

5.3.7 Closeout (ref. PC-EU-2009)

- Ensure invoices are paid, contracts closed, excess materials returned, work orders closed, mapping complete, as-builts completed, Add/Delete sheets submitted, etc.

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- Ensure lessons learned information is documented and filed.
- Perform Project Final Report or Project Implementation Analysis, if required.
- Update Project Plan with final as-built information regarding scope, schedule and cost.
- Change the status in the financial system to “Closed”.

5.4. Reliability Programs – Reliability Program Manager (RPM)

5.4.1 Provides the scope criteria by identifying oldest poles since last inspection.

5.4.2 Maintains responsibility for the creation of work orders and to challenge costs.

5.4.3 Works with PPM/PM to collaboratively develop budgets for the program.

5.4.4 Develops business cases for annual authorization of the program. Performs a Project Study to define scope, alternatives, strategies, estimates, etc., as appropriate.

5.5. Contractors

5.5.1 Plans and oversees execution of Work Orders; responsible for managing scope, schedule, budget, and safety performance. Manages resources and equipment.

5.5.2 Provides status of assigned WO’s on weekly basis.

5.5.3 Additional responsibilities to include program reporting for budgets, audits, key performance indicators, condition reports and any additional reports needed to support the execution of the Wood Pole Program.

5.6. Design Engineering

5.6.1 When a design is needed, creates WO tasks to support work.

5.6.2 When a design is needed, creates Material Requests (MRs) for long lead material.

5.6.3 When a design is needed, requests needed permits.

5.7. Distribution Work Strategy

5.7.1 Responsible for resource allocation and leveling on an annual and quarterly basis and issuing work scope to Regional Work Management.

5.7.2 Drives the Long Range Planning (LRP) Process (budgeting).

5.8. Operations Control Center (OCC)

5.8.1 Decides if and when a circuit can be removed from service on day of requested outage.

5.9. Cost Engineer

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5.9.1 Enters financial data into the accounting and budgeting systems.

5.9.2 Generates financial reports on a monthly basis.

5.10. C&M

5.10.1 Executes Pole Replacement Work Orders.

5.10.2 Progresses tasks in AS8.

5.11. Quality Control

5.11.1 Conduct Inspections: routine project site visits, inspecting for workmanship, deficiencies & corrective actions assuring all work is consistent with applicable standards.

5.11.2 Verify materials are installed consistent with applicable standards and codes.

5.11.3 Verify equipment is installed consistent with applicable standards and codes.

5.11.4 Verify testing is done by competent authorized testing personnel or certified firms; recording results.

5.11.5 Verify Test Logs for each project reflecting all testing required is completed.

5.11.6 Provide QC and QA input for the project status meetings

5.11.7 Verify re-work / corrective actions and evaluate the effectiveness of the actions taken.

5.11.8 Inform the QC Analyst of satisfactory corrective action completion to authorize the closure of Action Tracking Tickets.

5.12. Work Management

5.12.1 Responsible for scheduling and planning work.

5.12.2 Regional Single Point of Contact (SPOC)

- Participates in weekly status meetings facilitated by PM.
- Reports progress (poles completed) for the region on a weekly basis.
- Communicates Work Plan (list of WO's for replacements) to the regional offices.

5.13. Asset Information and System Policy (AISP)

5.13.1 Assigns ComEd pole numbers to the 900 series generated poles identified by the Contractor.

5.13.2 Updates CEGIS and AS8 Pole Equipment records and associated attributes.

6. Documentation

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6.1. Documentation generated during performance of this program shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 Records and Information Management Retention and Disposition.

7. Terms and Definitions

7.1. Corrective Maintenance (CM)

7.1.1 Work that is performed to repair or replace components identified as being degraded and that may adversely affect performance of the distribution system.

7.2. Joint Ownership

7.2.1 The ownership classification which applies when both ComEd and a telecommunications company are joint owners of a pole, sharing certain rights and obligations with respect to its use and maintenance.

7.3. Joint Work Agreement (JWA)

7.3.1 Agreement between joint owners regarding obligations for work related to jointly owned assets.

7.4. MS Access

7.4.1 Microsoft Corporation database management system software allows users to create custom databases that store information in an organized structure. Custom forms, tables and SQL Queries can all be created with this software.

7.5. MS Excel

7.5.1 Microsoft Corporation spreadsheet software allows users to organize, format and calculate data.

7.6. Non-priority Reject Pole

7.6.1 A reject pole with between 34% and 67% remaining strength.

7.7. Non-restorable Reject

7.7.1 A reject pole that cannot be reinforced with steel trusses.

7.8. Asset Suite 8 (AS8)

7.8.1 The primary application for work and maintenance planning, and Supply support activities (i.e. Purchasing, Accounts Payable, Contracts, and Inventory). The application is utilized as the central database for all equipment information. Modules supported include: Action Tracking, Work Management, Engineering Change, Equipment Tag Out, Controlled Documents, Records Management, Labor Entry and Reporting, Project Management, Design Engineering, and System Administration.

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7.9. Priority Reject Pole

7.9.1 A reject pole having less than 34% remaining strength.

7.10. Project View (PV) and P6

7.10.1 Project View and P6 are Critical Path Method (CPM) scheduling tools that assist with the scheduling of Work Order tasks, SRS activities, and Clearance Orders. They are used to manage maintenance and project activities and assist with managing internal and external resources. PV data assist with collecting data for Milestone Metric, Stability and Adherence reports.

7.11. RACI Matrix

7.11.1 A matrix defining the level of responsibility/role of key program groups or individuals:

- Responsible (R): This Party is responsible for deliverable; set of goals to be achieved, budget to be maintained, Project Milestones to be achieved.
- Accountable (A): This Party has been delegated the creation of the work/deliverable and will deliver to the Responsible Party.
- Consulted (C): This Party's input is needed for decision making by R or A party.
- Informed (I): This Party receives email/copy of document informing them of update/change/plan, no input required.

7.12. Reject Pole

7.12.1 A reject pole is any pole which upon inspection is found to have deteriorated below its required strength as defined by NESC requirements for Grade B or Grade C construction, as appropriate. Reject poles have less than 67% remaining strength.

7.13. Restorable Reject Pole

7.13.1 A reinforceable reject pole is any reject pole which meets the criteria necessary for reinforcement with steel trusses.

7.14. System Performance (SP)

7.14.1 System Performance (SP) programs improve reliability performance through modifications to system design and application of new technology and equipment**.**

7.15. Valtin

7.15.1 Method or process used to reimburse ComEd craft when contractor labor performs ordinary and customary work.

8. References

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8.1. AM-CE-9067 – Work Plan Prioritization Procedure

8.2. AM-CE-P005 – Reliability Improvement Programs

8.3. C7029 – Pole Butt Reinforcing Metal Truss

8.4. EXELON 2005 Pole Spec – Distribution System Wood Pole Inspection and Remediation Procedure

8.5. FI-EU-2001 – Authorization of Projects

8.6. LE-AC-401 – Records and Information Management, Retention and Disposition

8.7. NESC – National Electric Safety Code

8.8. PC-CE-2007 – P&CM (Pre-authorization) Challenge

8.9. PC-EU-09005 – Project Monitoring and Control Procedure

8.10. PC-EU-2009 – Project Closeout – Centrally Managed

8.11. PC-EU-2011 – Document Retention for Centrally Managed Projects

8.12. PC-EU-0018 – Project Initiation

8.13. PC-EU-0020 – Project Management Change Management Process

8.14. PC-EU-P010 – Project Management Program

8.15. PC-EU-P014 – Contract Management Process for Centrally Managed Projects

8.16. PC-EU-P026 – Project Management - Centrally Managed Programs

8.17. PC-EU-P030 – Project Management Process

8.18. WM-EU-4001 – Work Planning Procedure

8.19. WM-ED-P010 – Work Management Process

9. Attachments

9.1. PC-CE-P031-1 Pole Inspection and Treatment Program Responsibility Matrix

9.2. PC-CE-P031-2 Pole Reinforcement Program Responsibility Matrix

9.3. PC-CE-P031-3 Pole Replacement Program Responsibility Matrix

9.4. PC-CE-P031-4 Process Flow

9.5. PC-CE-P031-5 Reject Pole Tags

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Program Management Plan Wood Pole Inspection, Treatment, Reinforcement, and Replacement

ComEd Program
PC-CE-P031
Rev. 2

10. Development history

Revision 0	**Date: 11/14/2016**
Writer	Jude Piotrowski, Principal Project Mgr, P&CM.
Reviewer(s)	Bola Sosina, Reliability Programs; Laura Randle-Smith, Reliability Programs; Tom Tumminaro, P&CM; Roy Brown, P&CM; Denise Munoz, P&CM, Dave Summers, AISP; Steve Peisker, QC.
UFAM Approver(s)	D. Stoppelman, Project Management, Director Transmission Projects.
Reason written	Update/convert EIMA Pole Program Management Plan to a controlled document in the Management Model.

Revision 1	**Date: 11/16/2016**
Writer	Jude Piotrowski, Principal Project Mgr, P&CM.
Reviewer(s)	Bola Sosina, Reliability Programs; Laura Randle-Smith, Reliability Programs; Tom Tumminaro, P&CM; Roy Brown, P&CM; Denise Munoz, P&CM, Dave Summers, AISP; Steve Peisker, QC.
UFAM Approver(s)	D. Stoppelman, Project Management, Director Transmission Projects.
Reason written	Updated QC Inspection Sampling section 4.4.4 and added attachment PC-CE-P031-5 Reject Pole Tags.

Revision 2	**Date: 4/15/2020**
Writer	Morgan Noon, Principal Project Manager, P&CM
Reviewer(s)	Bola Sosina, Reliability Programs; Dunk Buie, Reliability Programs; Morgan Noon, P&CM; Charlene Brown, P&CM
UFAM Approver(s)	Vic Chesna, Project Management
Reason written	Updated Work Selection Criteria section 4.1.1.1, Pole Reinforcement 4.2, Set Work Selection Criteria section 4.2.1.1, Set Work Selection Criteria section 4.3.1.1, Select Scope Candidates 4.3.1.2, Budget Build 4.3.1.3, Non-Priority Reject Pole 7.6.1 and Priority Reject Pole 7.9.1

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Program Management Plan Wood Pole Inspection, Treatment, Reinforcement, and Replacement

ComEd Program
PC-CE-P031
Rev. 2

Attachment PC-CE-P031-1, Pole Inspection and Treatment Program Responsibility Matrix

		Function											
Phase	**Task**	**Reliability Programs**	**Design Engineering**	**C&M/ Contractor**	**WM/ DWS**	**Project Management**	**Project Controls**	**PRC/ PARC**	**AISP**	**Supply**	**OCC**	**QAQC**	**Capacity Planning**
Initiation (PC-EU-0018)	Set work selection criteria	R				I							
	Budget build	R				A	A	A					
	Select scope candidates	R											
	Review execution plans			A		R		C			C		
Planning (PC-EU-P030)	Establish project schedules	C				R					C		
	Develop designs												
	Plan work orders			R									
	Review plan			R		R					C		
Execution (PC-EU-P030)	Physical installation			R		C					I		
	Update electronic records	A		R		R			A				
	Monitor program progress and performance					R					I		
	Verify and document program results and performance	R		A		R			A		A	A	
Closeout (PC-EU-2009)	Formalize project termination and acceptance	R		I		A							
	Financial closure	C		A		R							
	Conduct lessons learned	C		C	C	R	C		C		C		
	Closeout checklist	C				R							

Attachment Notes: R = responsible; A = accountable; C = consulted; I = informed (ref. *RACI Matrix* in Terms & Definitions).

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Program Management Plan Wood Pole Inspection, Treatment, Reinforcement, and Replacement

ComEd Program
PC-CE-P031
Rev. 2

Attachment PC-CE-P031-2, Pole Reinforcement Program Responsibility Matrix

		Function											
Phase	**Task**	**Reliability Programs**	**Design Engineering**	**C&M/ Contractor**	**WM/ DWS**	**Project Management**	**Project Controls**	**PRC/ PARC**	**AISP**	**Supply**	**OCC**	**QAQC**	**Capacity Planning**
Initiation (PC-EU-0018)	Set work selection criteria	R				I							
	Budget build	R				A	A	A					
	Select scope candidates	R											
	Review execution plans			A		R		C					
Planning (PC-EU-P030)	Establish project schedules			R		R	A						
	Develop designs		R										
	Plan work orders			R									
	Review plan			R		R							
Execution (PC-EU-P030)	Physical installation			R		C							
	Update electronic records	A		R		R							
	Monitor program progress and performance					R							
	Verify and document program results and performance	R		A		R			A			A	
Closeout (PC-EU-2009)	Formalize project termination and acceptance	R		I		A							
	Financial closure	C		A		R							
	Conduct lessons learned	C		C	C	R	C		C				
	Closeout checklist	C				R							

Attachment Notes: R = responsible; A = accountable; C = consulted; I = informed (ref. *RACI Matrix* in Terms & Definitions).

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Program Management Plan Wood Pole Inspection, Treatment, Reinforcement, and Replacement

ComEd Program
PC-CE-P031
Rev. 2

Attachment PC-CE-P031-3, Pole Replacement Program Responsibility Matrix

		Function											
Phase	**Task**	**Reliability Programs**	**Design Engineering**	**C&M/ Contractor**	**WM/ DWS**	**Project Management**	**Project Controls**	**PRC/ PARC**	**AISP**	**Supply**	**OCC**	**QAQC**	**Capacity Planning**
Initiation (PC-EU-0018)	Set work selection criteria	R			A	I							
	Budget build	R				A	A	A					
	Select scope candidates	R		C		I							
	Review execution plans			A		R		C					
Planning (PC-EU-P030)	Establish project schedules			R	A	R	A						
	Develop designs												
	Plan work orders			R									
	Review plan			R		R							
Execution (PC-EU-P030)	Physical installation			R		C					C		
	Update electronic records	A		R		R							
	Monitor program progress and performance			R	R	R							
	Verify and document program results and performance	R		R		A			A			A	
Closeout (PC-EU-2009)	Formalize project termination and acceptance	R		I		A							
	Financial closure	C		A		R							
	Conduct lessons learned	C		C	C	R	C		C				
	Closeout checklist	C				R							

Attachment Notes: R = responsible; A = accountable; C = consulted; I = informed (ref. *RACI Matrix* in Terms & Definitions).

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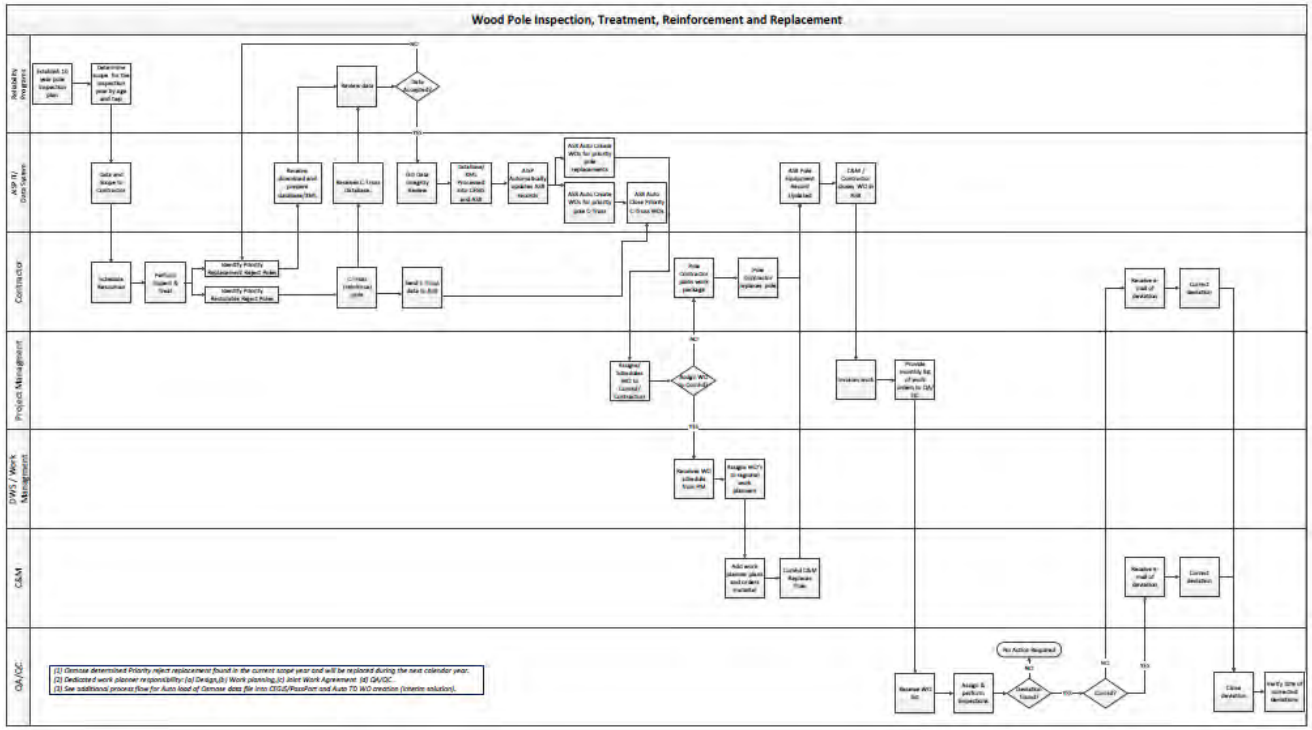
Program Management Plan Wood Pole Inspection, Treatment, Reinforcement, and Replacement

ComEd Program
PC-CE-P031
Rev. 2

Attachment PC-CE-P031-4, Process Flow (Visio File available from PCM)



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Program Management Plan Wood Pole Inspection, Treatment, Reinforcement, and Replacement

ComEd Program
PC-CE-P031
Rev. 2

Attachment PC-CE-P031-5, Reject Pole Tags

Tagging	Application	Instruction
	Non Priority Restorable Poles (C-Truss)	3 sets of Tags visible from separate vantage points at 6.5 ft. height
	Non Priority Non-Restorable Poles (replacement)	3 sets of Tags visible from separate vantage points at 6.5 ft. height
	Priority Restorable Poles (C-Truss)	3 sets of Tags visible from separate vantage points at 6.5 ft. height
	Priority Non-Restorable Poles (replacement)	3 sets of Tags visible from separate vantage points at 6.5 ft. height

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Cost of Quality: Performing Corrective Action for Quality Inspections

ComEd Administrative Procedure
QA-CE-1018

Revision No.: 1

Effective:	4/30/2019
Supersedes:	N/A
Level:	3
Review Type:	2 Year
Core Function:	Quality Assurance

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1. Purpose

To provide detail on the process associated with corrective action work for quality control inspections.

2. Precautions and limitations

2.1. QC Inspectors must hold the appropriate ComEd QC Inspector Qualifications for the type of work to be inspected.

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2.2. ComEd Construction & Maintenance crews and Contractors have five (5) days to complete corrective actions associated with overhead work and thirty (30) days to complete corrective actions associated with underground and transmission/substation work.

2.3. Contractors may not charge remediation/corrective action work to ComEd; corrective action work is provided under warranty.

2.4. ComEd Construction & Management crews may not charge O&M corrective action work to capital.

3. Prerequisites

3.1. None.

4. Procedure

4.1. QC Inspector Performs Inspection on Completed Construction

4.1.1 Using the QC Inspection Checklist on the iPad (paper only when iPad has no connection), the Inspector shall visually inspect the work in question.

4.2. QC Inspector Logs Finding (including Deviations, where applicable) in QC Inspector Database

4.2.1 The QC Inspector must record the result of the inspection into QCI using the iPad at the time of the Inspection or on a computer connected to the Exelon intranet post (within 24 hours) inspection. Please refer to the procedure, QC Inspection: Entering Inspections into QCI for additional detail on entering inspection results.

4.2.2 For all deviations identified, the QC Inspector shall take digital photographs of the work product focusing on the area of the deviation. Several pictures shall be taken as necessary so that the deviating condition can be seen clearly

4.3. 4.3QAD Notifies Constructing Organization via CAR Email

4.3.1 *For C&M AND T&S Work*

4.3.1.2 C&M and T&S will set up a new work order task annotated “Rework” that is searchable by original work order number and by reporting center (e.g. Joliet, Rockford, Dixon, etcetera). The new work orders will be coded to O&M funding since corrective action cannot be coded Capital.

4.3.1.1 QAD will submit a CAR email to the C&M and T&S team that explains the defect and includes notes on the inspection and also requires a new work order task to charge all work against.

4.3.2 *For Contractor Work*

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4.3.2.1 QAD will submit a CAR email to the Contractor that explains the defect and includes notes on the inspection.

4.3.2.2 QAD will also include a “Cost of Correction Form” that contractors will be asked to use to submit details on the costs incurred to the Contractor as part of any remediation work associated with the construction devation.

4.4. Constructing Organization Investigates Defect

4.4.1 *For C&M AND T&S Work*

4.4.1.1 C&M AND T&S will investigate the deviation using all of the information provided by QAD and captured in CAR email.

4.4.2 *For Contractor Work*

4.4.2.1 Contractor will investigate the deviation using all of the information provided by QAD and captured in CAR email.

4.5. Constructing Organization Performs Corrective Action

4.5.1 *For C&M AND T&S Work*

4.5.1.1 C&M AND T&S performs all corrective action required to bring the original construction up to standard and expected quality.

4.5.1.2 C&M AND T&S shall use the new work order tasks to charge time.

4.5.2 *For Contractor Work*

4.5.2.1 Contractor performs all corrective action required to bring the original construction up to standard and expected quality.

4.5.2.2 Contractor also notates all costs associated with this corrective action (personnel and non-personnel) on the Cost of Correction form.

4.6. Constructing Organization Closes out Corrective Action via QCI

4.6.1 *For C&M AND T&S Work*

4.6.1.1 C&M and T&S shall submit via email all materials associated with corrective action back to QAD. These materials include the checklist with description, photographic evidence of correction and rework work order task.

4.6.2 *For Contractor Work*

4.6.2.1 Contractor submits via email all materials associated with corrective action back to QAD. This includes the checklist with description, photographic evidence of correction , as well as the Contractor Cost of Correction Form.

4.7. QAD Records “Date Correction Completed”

4.7.1 Once all materials are received from the constructing organization, QAD will record the date that the correction was completed in the QCT web-based tool.

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4.8. QAD Audits Coding and Contractor Forms

4.8.1 QAD will be responsible, in partnership with the Finance team, for auditing the work order and task coding to ensure that time and cost was charged to the correct O&M codes.

4.8.2 QAD will be responsible to obtain Contractor Cost of Correction Forms and identifying remediation costs

4.9. QAD Aggregates Data and Analyzes Results

4.9.1 QAD will be accountable for using aggregate statistics to analyze and understand the total cost of quality to ComEd.

5. Roles and responsibilities

5.1. Quality & Analysis Department

5.1.1 Manage QC Inspector Database and Corrective Action Reports.

5.1.2 .

5.1.3 Manage Cost of Construction form aggregation.

5.1.4 Perform audits and reporting as required to ensure compliance with policies.

5.1.5 Aggregate data to analyze total cost of quality.

5.2. QC Inspector

5.2.1 Conducting QC Inspection of a WO and entering results into the QC Inspector Database.

5.2.2 Will be responsible for inspecting approximately 10% of corrective action work; adjust sample size based on findings

5.3. Construction & Maintenance

5.3.1 Performs all required corrective action work for deviations found during QC inspections.

5.3.2 Ensures that the proper O&M work orders are created to complete this work.

5.4. Budget and Finance

5.4.1 Sets up project IDs to charge corrective action work.

5.5. Contractor

5.5.1 Performs all required corrective action work for deviations found during QC inspections.

5.5.2 Completes Contractor Cost of Correction forms for all work.

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Cost of Quality: Performing Corrective Action for Quality Inspections

ComEd Administrative Procedure
QA-CE-1018

Revision No.: 1

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Cost of Quality: Performing Corrective Action for Quality Inspections

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6. Documentation

6.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

7. Terms and definitions

7.1. Cost of Quality

7.1.1 The costs associated with running a Total Quality Management program, including personnel and non-personnel costs associated with inspections, as well as the costs that are expended to correct the identified deviations.

7.2. Corrective Action Request

7.2.1 An email that notifies the organization responsible for a job that a deviation from ComEd Construction Standard or job design has been identified, and that correction of the deviation is requested.

7.3. Deviation/Defect

7.3.1 Work product does not conform to job design and a field change has not been approved.

7.3.2 Work product does not conform to Construction Standards and/or minimum field expectations (CM-CE-P339).

7.4. Inspection

7.4.1 Activity such as measuring, examining, testing or gauging one or more characteristics of a product or service, and comparing the results with specified requirements in order to establish whether conformity is achieved for each characteristic

8. References

8.1. XX-XX-XXXX QC Inspection: Entering Inspections into QCI.

8.2. XX-XX-XXXX QC Inspection: Corrective Action Requests

9. Attachments

9.1. Appendix A, Process Flow Diagram

9.2. Appendix B, Process Flowchart Diagram for ComEd C&N Work

9.3. Appendix C, Process Flowchart Diagram for Contractor Work

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9.4. Appendix D, Contractor Cost of Correction Form

10. Development history

Revision 0	**Date: 5/29/2015**
Writer	Michael Harrill, Manager, Quality and Analysis
Reviewer(s)	Michael Harrill, Manager, Quality and Analysis Grace Brigando, Manager, Technical Services
UFAM Approver(s)	Grace Brigando, Manager, Technical Services
Reason written	To provide detail on the process associated with corrective action work for quality control inspections.

Revision 1	**Date: 4/29/2019**
Writer	Maurice Nutall, Manager, Quality and Analysis
Reviewer(s)	Maurice Nutall, Manager, Quality and Analysis Karon Richardson, Manager, Technical Services
UFAM Approver(s)	Karon Richardson, Manager, Technical Services
Reason written	Scheduled Review; Note – Procedure is currently being evaluated by all OPCOs as part of an EU Initiative

Revision 2	**Date: XX/XX/XXXX**
Writer	Writer's name, title and work group
Reviewer(s)	Reviewer's name and work group; Reviewer's name and work group; Reviewer's name and work group;
UFAM Approver(s)	UFAM Name, core function and title

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Revision 2	**Date: XX/XX/XXXX**
Reason written	Brief description explaining why the process was written

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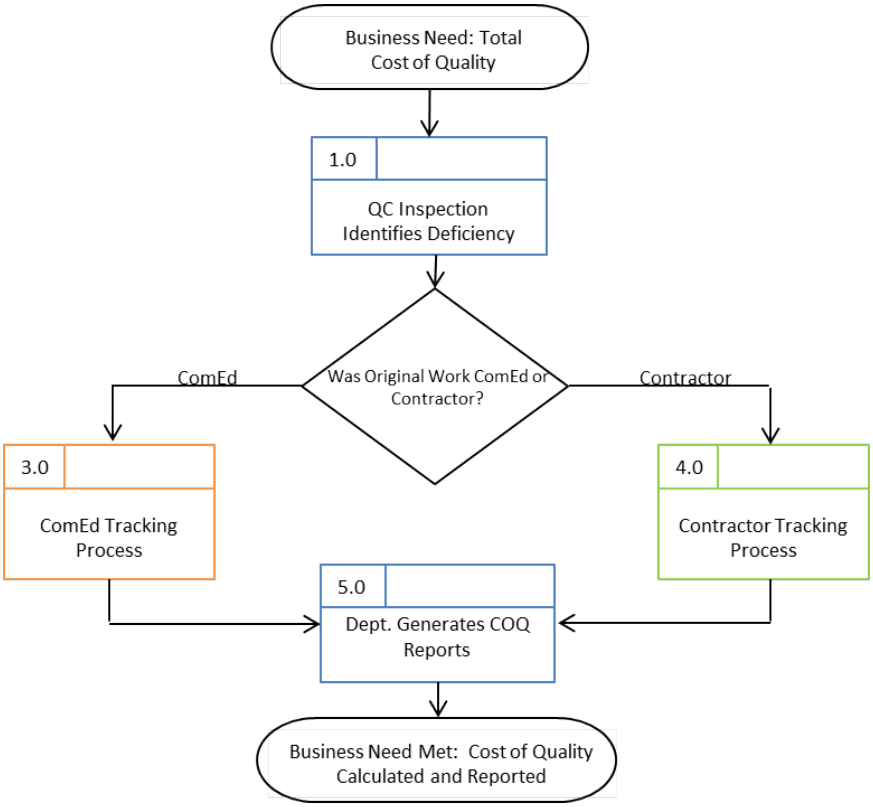
Cost of Quality: Performing Corrective Action for Quality Inspections

ComEd Administrative Procedure
QA-CE-1018

Revision No.: 1

Appendix A, Process Flow Diagram



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Cost of Quality: Performing Corrective Action for Quality Inspections

ComEd Administrative Procedure
QA-CE-1018

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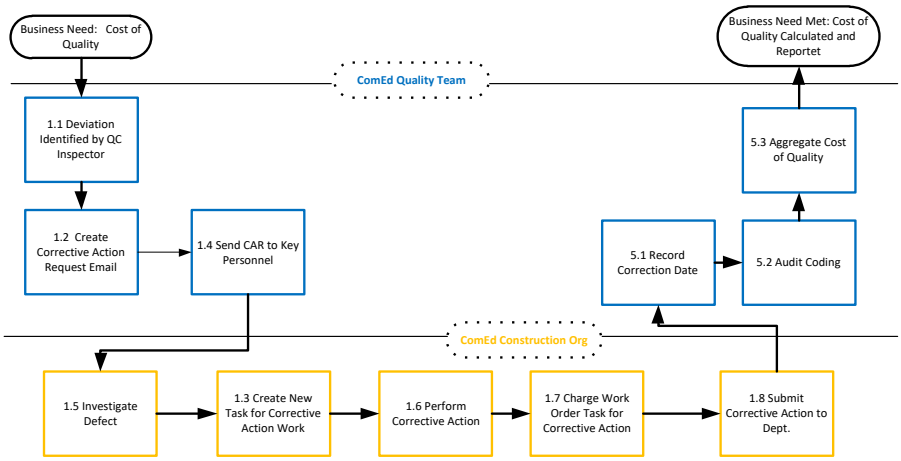
Appendix B, Process Flowchart Diagram for ComEd C&M AND T&S Work



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Cost of Quality: Performing Corrective Action for Quality Inspections

ComEd Administrative Procedure
QA-CE-1018

Revision No.: 1

Process Step	Description
Business Need: Total Cost of Quality	Business Need: Track Cost of Quality (COQ).
1.1 Deviation Identified on ComEd Construction	During routine quality inspections on ComEd-performed construction, a Quality inspector may identify a deviation between the specifications and the work as completed.
1.2 Create Corrective Action Request Email	The QAD will create a Corrective Action Request (CAR) email that explains the deviation and includes notes on the inspection.
1.3 C&M and T&S - Create a new task for corrective action work	C&M AND T&S will set up a new work order task annotated “Rework” that is searchable by original work order number and by reporting center (e.g. Joliet, Rockford, Dixon, etcetera). The new work orders will be coded to O&M funding since corrective action cannot be coded Capital.
1.4 Send CAR to key personnel	The QAD will send the CAR via email to all relevant individuals, including the Regional Director and the Key Manager in the C&M AND T&S Organization.

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Cost of Quality: Performing Corrective Action for Quality Inspections

ComEd Administrative Procedure
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Revision No.: 1

1.5 Investigate Defect	The relevant C&M AND T&S group will investigate the Defect, using all of the information provided by the quality inspection and captured in the CAR email.
1.6 Perform Corrective Action	The ComEd Constructing Organization will perform all corrective action required to bring the original construction up to standard and expected quality. ComEd policy states that constructing organizations have: • five (5) business days to complete corrective action for overhead work • thirty (30) days to complete underground transmission and substation work.
1.7 Charge work order task for Corrective Action.	All ComEd Constructing Organizations must use the new work order task created by C&M or T&S for all time and work associated with re-inspection and additional construction. It is critical that work be coded properly for O&M versus Capital.
1.8 Submit Corrective Action to Dept. email	C&M and T&S shall submit via email all materials associated with corrective action back to QAD. These materials include the checklist with description, photographic evidence of correction and rework work order task..
5.1 Record "Date Correction Completed"	Once all materials are received from C&M AND T&S, the QAD will record the date that the correction was completed in the QCI web-based tool.

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Cost of Quality: Performing Corrective Action for Quality Inspections

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5.2 Audit Coding to Ensure Proper Reporting	The QAD will be responsible, in partnership with the Finance team, for auditing the work order codes to ensure that time and cost was charged to the correct codes.
5.3 Aggregate Cost of Quality	The Quality Department will also be accountable for using aggregate statistics to analyze and understand the total cost of quality for ComEd.
Business Need Met: Cost of Quality Calculated and Reported	The business need is met when all costs associated with both ComEd performed re-work as well as contractor-performed re-work can be aggregated and reported out on so that the Total Cost of Quality can be determined.

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Cost of Quality: Performing Corrective Action for Quality Inspections

ComEd Administrative Procedure
QA-CE-1018

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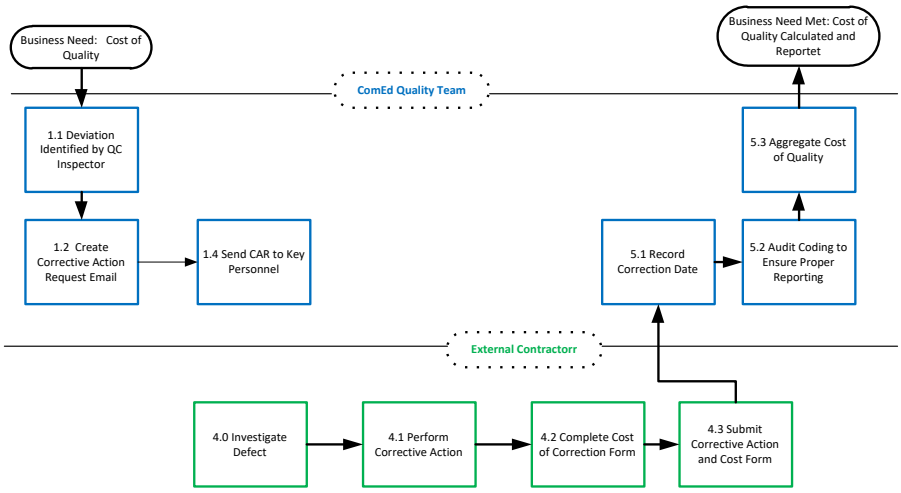
Appendix C, Process Flowchart Diagram for Contractor Work



Process Step	Description
Business Need: Total Cost of Quality	In order to more accurately understand the total Cost of Quality to ComEd, a new process will be instituted to better track the cost associated with remediating construction deviations.
1.1 Deviation Identified on ComEd Construction	During routine quality inspections on Contractor performed construction, a Quality inspector may identify a deviation between the original engineering and construction specifications and the work completed.

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Cost of Quality: Performing Corrective Action for Quality Inspections

ComEd Administrative Procedure
QA-CE-1018

Revision No.: 1

1.2 Create Corrective Action Email	When a deviation is identified during a field inspection, the Quality Department will note that finding in its system. The Quality Department will create a Corrective Action Request (CAR) email that explains the deviation and includes notes on the inspection.
1.3	". Contractors will be asked to submit basic details on the cost incurred to the Contractor as part of any remediation work associated with the construction deviation. The QAD will make forms available;. It is important to note that the Contractor cannot charge any work associated with remediation back to ComEd. As part of ComEd's standard contract terms and agreements, the Contractor cannot re-bill for the effort. However, in order to fully capture the total quality cost, ComEd will catalog these data moving forward.
1.4 Send CAR to Contractor and Key People	The Quality Department will send the CAR via email to all relevant individuals, including the Contractor point of contact, the PM, QML, Inspector and Quality Mailbox.
4.0 Investigate Defect	The Contractor will investigate the defect, using all of the information provided by the quality inspection and captured in the CAR email.

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Cost of Quality: Performing Corrective Action for Quality Inspections

ComEd Administrative Procedure
QA-CE-1018

Revision No.: 1

4.1 Perform Corrective Action	The Contractor will perform all corrective action required to bring the original construction up to the quality/engineering standard. The Contractor may not charge any work associated with remediation back to ComEd. ComEd policy states that Contractors have five (5) business days to complete corrective action for overhead work and thirty (30) days to complete underground and transmission and substation work.
4.2 Complete Cost of Correction Form	The Contractor will complete the Cost of Correction form. This task is meant to capture the total cost of correction. This would include: • Personnel costs (all employee time including time to travel) • Non-Personnel costs (material and travel) Failure to complete this form will result in non-compliance with the overall corrective action process.
4.3 Submit Corrective Action and Cost Spreadsheet to QAD	Contractor submits via email all materials associated with corrective action back to QAD. This includes the checklist with description, photographic evidence of correction , as well as the Contractor Cost of Correction Form
5.1 Record "Date Correction Completed"	Once all materials are received from the Contractor, including the Cost of Correction data, the Quality Department will record the date that the correction was completed in the Quality database.

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Cost of Quality: Performing Corrective Action for Quality Inspections

ComEd Administrative Procedure
QA-CE-1018

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5.2 Audit Cost of Correction Forms	The Quality Department will be responsible for auditing the Cost of Correction forms to ensure that costs are able to be aggregated and analyzed.
5.3 Aggregate Cost of Quality	The Quality Department will also be accountable for using aggregate statistics to analyze and understand the total cost of quality for ComEd.
Business Need Met: Cost of Quality Calculated and Reported	The business need is met when all costs associated with both ComEd performed re-work as well as Contractor-performed re-work can be aggregated and reported out on so that the Total Cost of Quality can be determined.

Appendix D, Contractor Cost of Correction Form

CONTRACTOR COST OF CORRECTION FORM

To be completed by Contractor after the Quality Inspection reveals a Deviation/Deficiency with the original work. This form should be returned to the Quality Team by email (QAQC Mailbox) or fax at….

Original Work Order Number: _____

Deviation Found: _____

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Cost to Remediate

Total Cost of Time (hours worked including travel time): _____

Total Number of Employees Involved (e.g. 3 man crew): _____

Material Costs (e.g. replacement parts): _____

Other Costs: _____ _____

TOTAL REMIDIATION COST **$**_____

Additional Notes:

_____
_____
_____
_____
_____

****

Internal Use

Logged by Quality Department: _____

Notes: _____

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QC Inspection: Entering Inspections into QCI

ComEd Administrative Procedure

QA-CE-1023

Revision No.: 1

Effective:	5/17/2019
Supersedes:	N/A
Level:	3
Review Type:	2 Year
Core Function:	Quality Assurance

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1. Purpose

To provide guidelines for entering inspections into the Quality Control Inspection (QCI) Web Database.

2. Precautions and limitations

2.1. Precautions

2.1.1 User must enter the correct construction organization. If any deviations are identified, a Corrective Action Request (CAR) will automatically be sent to the named constructing organization.

2.2. Limitations

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2.2.1 Work Order location / Hold Point must be 100% completed prior to inspection.

3. Prerequisites

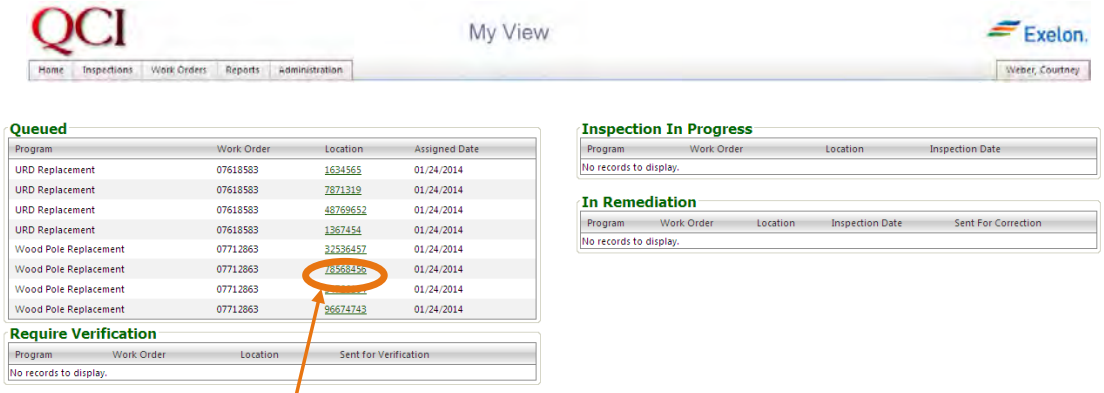
3.1. Individual performing inspection must be qualified as a QC Inspector.

4. Procedure

4.1. Website

4.1.1 Go to the www.qci.exeloncorp.com

4.1.2 Once there, you'll see the following screen:



4.2. Queued

4.2.1 All jobs assigned to you will be in your queued section. This will be listed by Program, Work Order Number, Location and Assignment Date.

4.2.2 To pull up the WO information and to complete the inspection, click on the location that you will be inspecting.

4.2.3 The following screen will show up:

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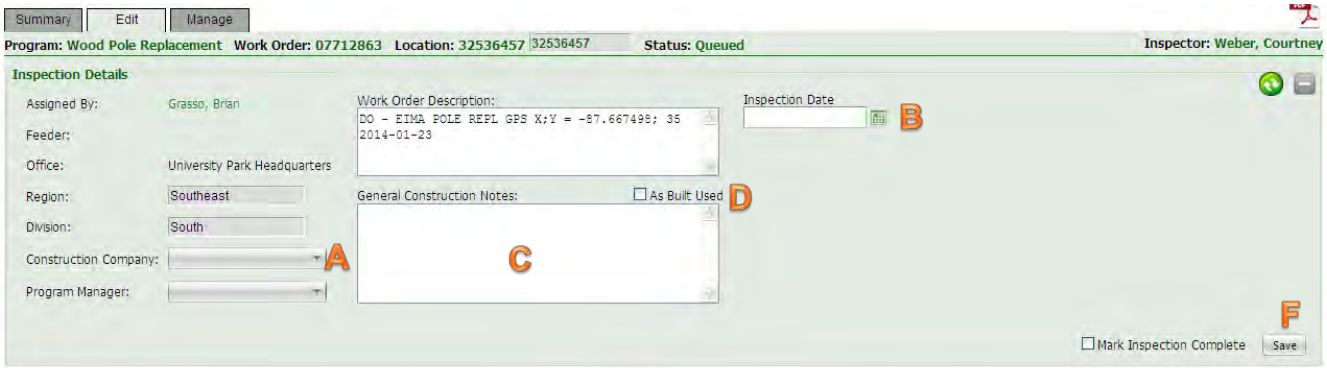
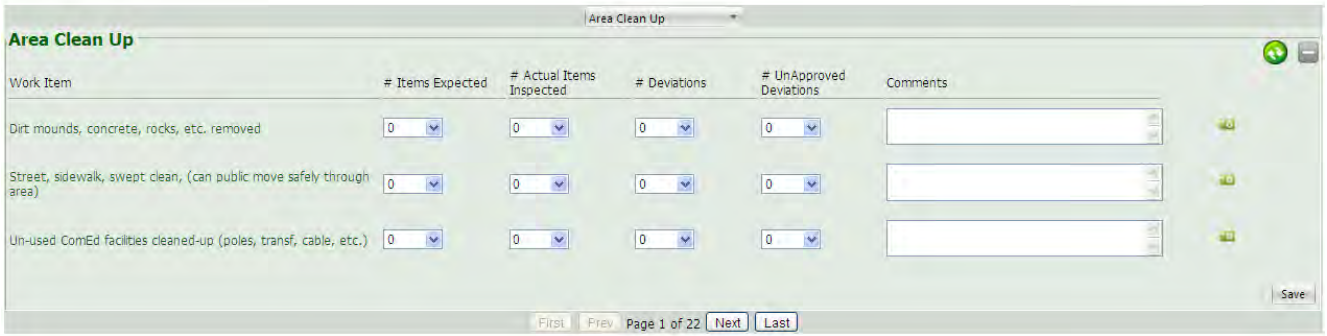
QC Inspection: Entering Inspections into QCI

ComEd Administrative Procedure

QA-CE-1023

Revision No.: 1





4.2.4 For Inspection Details, complete the following fields:

A. Select Construction Company
B. Select Inspection Date
C. Enter any General Construction Notes
D. Mark if As Built was Used
E. (Program Manager does not have to be filled in, this is already designated by Program in the data tables)
F. Press Save

4.2.5 For Inspection Categories (i.e. Area Clean Up, Grounding, etc.), complete the following fields:

G. # Items Expected
H. # Actual Items Inspected
I. # Deviations
J. # Unapproved Deviations (this will equal # Deviations, unless deemed an acceptable deviation by standards)
K. Comments, when necessary
L. Upload photo, when necessary

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M. Press either next, save or select a new Inspection Category from the drop down menu.

4.2.6 If for any reason on the Inspection Details or Inspection categories tab you need to clear all entered information, press the green button in the top right hand corner.

4.2.7 Marking Inspection complete:

4.2.7.1 Once all inspected items have been filled in, press the save button and then check the box “Mark as Complete”. The following screen will be brought up:

4.3. Inspection in Progress

4.3.1 This area houses any inspections that have been started but have yet to be marked as complete.

4.4. In Remediation

4.4.1 This area of the QCI website houses any inspections you had with deviations that are still in the process for correction. Once the corrections have been made, the inspection will no longer be on this screen.

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4.5. Require Verification

4.5.1 Depending on the number of inspections you've completed, or the severity of the deviation, you may be required to re-inspect the work order to ensure all corrections have been made. If this is the case, the inspection will be put into your Require Verification queue.

5. Roles and responsibilities

5.1. QC Inspector

5.1.1 Inspect WO location and enter inspection onto the QCI Database.

5.1.2 Preform any verification inspections.

5.2. QC Analyst

5.2.1 Assign inspections.

5.2.2 Manage the QCI Database.

6. Documentation

6.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

7. Terms and definitions

7.1. Acceptable Deviation

7.1.1 Work product conforms to construction standards but a field change that was made was not approved prior to construction. After being flagged by the QC Inspector as a *deviation*, the engineering/design authority approved the field change.

7.2. Actual Items Inspected

7.2.1 The number of work items inspected at a single location. This may differ from Items Expected due to access issues or lack of proper equipment (e.g. wire sag).

7.3. Deviation

7.3.1 Work product does not conform to job design and a field change has not been approved.

7.3.2 Work product does not conform to Construction Standards.

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7.4. Items Expected

7.4.1 The expected number of work items to be inspected at a single location.

7.5. Remediation

7.5.1 If an inspection resulted in unapproved deviations, the inspection will be considered in remediation. Upon the correction of the deviations, the QC Analyst will mark corrections as complete, removing the inspection from in remediation status to remediated status.

7.6. Unapproved Deviations

7.6.1 Work product does not conform to job design and a field change has not been approved.

7.6.2 Work product does not conform to Construction Standards.

8. References

8.1. XX-XX-XXXX QC Inspection: Conducting Inspections

8.2. XX-XX-XXXX QC Inspection: Training Material

8.3. XX-XX-XXXX QC Inspection: Properly Documenting Deviations

8.4. XX-XX-XXXX QC Inspection: Guidance on Design Deviations

9. Attachments

9.1. None

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QC Inspection: Entering Inspections into QCI

ComEd Administrative Procedure

QA-CE-1023

Revision No.: 1

10. Development history

Revision 0	**Date: 5/29/2015**
Writer	Michael Harrill, Manager, Quality and Analysis Carmela Wallace, Senior Quality Assurance Specialist
Reviewer(s)	Grace Brigando, Manager, Technical Services Michael Harrill, Manager, Quality and Analysis
UFAM Approver(s)	UFAM Name, core function and title
Reason written	To provide guidelines for entering inspections into the Quality Control Inspection (QCI) Web Database.

Revision 1	**Date: 5/12/2017**
Writer	Maurice Nutall, Manager, Quality and Analysis Carmela Wallace, Senior Quality Assurance Specialist
Reviewer(s)	Karon Richardson, Manager, Technical Services Maurice Nutall, Manager, Quality and Analysis
UFAM Approver(s)	Karon Richardson, Manager, Technical Services
Reason written	Scheduled Review

Revision 2	**Date: 5/17/2019**
Writer	Maurice Nutall, Manager, Quality and Analysis
Reviewer(s)	Maurice Nutall, Manager, Quality and Analysis Karon Richardson, Manager, Technical Services
UFAM Approver(s)	Karon Richardson, Manager, Technical Services
Reason written	Scheduled Review; Note – Procedure is currently being evaluated by all OPCOs as part of an EU Initiative

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Thermographic Assessment of Underground Cables and Cable Accessories in Enclosed Spaces

ComEd Technical Procedure
SA-CE-929-2001
Rev. 4

Effective:	8/3/2017
Supersedes:	N/A
Level:	3
Review Type:	3 Year
Core Function:	Safety

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1. Purpose

To establish an evaluation criteria for elevated localized surface temperatures/differentials of energized primary voltage cables or cable accessories identified via Infrared (IR) thermography and to establish response relative to these readings.

IR scans provide information regarding the thermal condition of surrounding energized cables and cable accessories prior to performing work within an enclosed space.

IR scans complement visual inspections to ensure energized cables and cable accessories within the enclosed space are operating within their thermal limits.

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Cables or cable accessories that are found to be operating outside their thermal temperature specifications or an abnormal temperature differential found between the cable and cable accessory may indicate that the cable or cable accessory is deteriorating and could possibly fail.

2. Precautions and limitations

2.1. All personnel shall:

2.1.1 Wear appropriate Personal Protective Equipment (PPE).

2.1.2 Perform a pre-job briefing to discuss the scope of work to be performed and hazards involved.

2.1.3 Follow the proper procedures for confined and enclosed spaces.

2.1.4 Observe all safe work practices.

2.2. Limitations

2.2.1 This procedure is not all-inclusive.

2.2.2 IR scans shall only be performed on energized electrical equipment that is in service carrying load current. De-energized equipment will not emit proper temperatures to detect abnormal conditions.

2.2.3 An IR scan of equipment shall be performed by a trained employee when working within an enclosed space or equipment room containing energized electrical equipment. Meter rooms are excluded from this requirement.

2.2.4 Exceptions - An IR scan is not required if:

2.2.4.1 Work performed in a new construction de-energized enclosed space.

2.2.4.2 Switching with a duration of 15 minutes or less.

2.2.4.3 Inspection or data collection with a duration of 15 minutes or less.

2.2.5 **FOR** content found to be unclear, missing, inaccurate or incomplete:

1. **RECORD** in Attachment SA-CE-929-2001-4 Lessons Learned.
2. **SUBMIT** Attachment SA-CE-929-2001-4 Lessons Learned to the Utility Functional Area Manager (UFAM) for consideration on inclusion in future revisions.

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Thermographic Assessment of Underground Cables and Cable Accessories in Enclosed Spaces

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3. Safety Measures and Environmental Concerns

3.1. Safety Measures

3.1.1 Precautionary IR thermography scans shall be performed by a trained employee when working (for more than a brief period of time) within an enclosed space containing energized cables or cable accessories.

3.1.2 Upon entering an enclosed space, employees shall first perform a visual overview of the equipment and structure to determine if any conditions warrant immediate exit of the space (refer to SA-ED-P406 “Confined Space And Hazardous Entry Process”, CM-CE-P319 “Inspection Process for Distribution Manholes And Components”, and CM-CE-P336 “Assessment of Distribution Manholes And Components”).

3.1.3 Once it is determined that it is safe to continue occupying the space, an IR scan of the various components shall be performed.

3.1.4 Cable and cable accessories that have been submerged in water (a heat sink) may experience a rise in temperatures as the water is removed. Temperatures of cables and cable accessories that have been under water shall be periodically monitored for 2 hours after the removal from the water to allow time for temperatures to stabilize.

3.1.5 To account for daily load cycles and routine switching activities, IR thermography scans shall be performed every 4 hours (typically mid-shift) and recorded on the job brief (SA-ED-4024-R0001 under “Other unusual/special conditions or topics for discussion”). Typically this would occur:

- AM job brief (start of work).
- PM job brief (after lunch period).

3.2. Environmental Concerns

3.2.1 None

4. Material and Special Equipment

4.1. Material

4.1.1 Abnormal Condition Tag

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4.2. Special Equipment

4.2.1 Thermography unit capable of identifying and displaying temperature differentials between cable, joints, and other metallic components.

Fluke IR camera model ti25 or equivalent model.

NOTE: Equipment must be capable of saving scanned images.

NOTE: All IR cameras require appropriate warm-up time in order to obtain the most accurate temperature measurement and best image quality. This time can often vary by model and by environmental conditions. Warm up times for cameras can vary from 30 seconds to 8-plus minutes based on technology used

5. Prerequisites

CAUTION

BE AWARE THAT THERMOGRAPHY SCANNING REQUIRES THE CABLE TO BE ENERGIZED AND CARRYING LOAD CURRENT.

5.1. Thermographer **must** be qualified (hands-on training) and **must** understand the operation / limitations of the thermography camera to be used.

5.2. Prior to performing any thermography, review the Thermography Inspection Form (Attachment 1)

5.3. As required, conduct a pre-assessment review of the following items related to the enclosed space:

5.3.1 Feeder mapping

5.3.2 Prior manhole inspection documentation (PassPort or local file)

5.3.3 Confined space entry requirements

5.4. Keep tools and material clean, dry, and maintained in good condition.

5.5. As required, **ENSURE** IR equipment is calibrated and within its re-calibration dates.

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6. Procedure

6.1. Thermography Inspection Form (Attachment 1)

6.1.1 For each Anomaly:

1. **COMPLETE** a Thermography Inspection Form

   Refer to Attachment 1

2. **RECORD** both digital thermal (IR) and photographic (visible light) images.

   Save the image as a radiometric image that allows further temperature analysis.

3. **PLACE** Abnormal Condition tags at the top of the enclosed space.
   A. A tag shall be at each entrance
   B. The tags shall only be removed when the anomaly has been repaired/replaced
4. **SUBMIT** the completed Thermography Inspection Form and images.

   Forms and Images shall be archived in PassPort for future review.

6.2. THERMOGRAPHIC ASSESSMENT

6.2.1 To ensure accurate IR scanning and imaging, **SETUP** the imager **BEFORE** performing any scan:

1. **ENSURE** memory card is installed
2. **CHECK** that battery is charged
3. **TURN** the camera on
4. **SET** the camera range mode to MANUAL.
5. **SET** the Span range of the imager.
   A. An 11 degree C (20 degree F) span level is appropriate for most situations
   B. A 17 degree C (30 degree F) span level is appropriate for situations with a transformer in the image
6. **SET** emissivity to proper setting, typically (Refer to Attachment 2):
   A. 0.95 - Black electrical tape & cable jackets
   B. 0.93 – Rubber cable accessories
   C. 0.63 - Lead, oxidized (dull, weathered appearance)
   D. 0.08 - Lead, shiny (as or like new)

These settings will provide the best image to help identify any areas of concern that may be present.

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NOTE: For cables that are covered with white arcproofing tape utilize the same emissivity as set for black electrical tape & cable jackets

The camera's algorithm will correct the temperature by using the emissivity to calculate a temperature that more closely matches the actual contact temperature of the object.

NOTE: If an emissivity other than 1.00 is chosen, then an appropriate background temperature must be entered into the camera in order for the algorithm to make an accurate correction.

a. **NOTE:** The camera should be as close as possible to the target without violating the Minimum Approach Distance (MAD) from energized equipment. For joints, the cable on both sides of the joint shall be included in the image for differential temperature identification. For terminations, the cable and the connecting equipment shall be included in the image for differential temperature identification.

6.2.2 **INSPECT** the enclosed space:

SCAN cables and cable accessories to determine the surface temperature.

- Scan cables from the point they enter a structure to the point they exit the structure.
- Excessive surface temperature may indicate that the cable is operating at or above its maximum conductor temperature rating (well above load rating). A localized temperature rise in a ~1-2 square inch area over the prevailing temperature of the rest of the cable may point out signs of possible deterioration that could lead to a future failure. Refer to section 6.4
- Compare cable accessory temperatures with the cable they are connected to (special care must be taken when a comparison is made to adjacent phases of the same feeder due to the potential variations in load among phases).

  Examples of similar cable accessories that should be operating at approximately the same temperatures are:

  - Primary joints on the same circuit – comparison of A, B and C phases.
  - Primary terminations on the same equipment - comparison of A, B and C phases.

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NOTE: Feeder load imbalances can cause variability between phases.
NOTE: Due to daily load cycles, cable accessories displaying an elevated temperature but below an action threshold should be monitored every 2 hours while working in the enclosed space.**NOTE:** The camera can only measure surface temperature for objects within the camera's field of view. For manholes with joints two or more deep on a rack, racks high on a wall, etc. additional provisions may need to be made to perform the thermal scan.

6.2.3 **IDENTIFY** and/or **VERIFY** anomaly by duct placement, where practicable, and/or by using maps, geographic location, and other equipment as reference points.

6.2.4 For each Anomaly

1. **RECORD** a focused thermal (IR) image with a maximum temperature that is well within the range of the camera.
2. **RECORD** a focused visible light (photographic) image.
3. On the Thermography Inspection Form, **RECORD**:

   A. Date
   B. Inspected By
   C. Manhole/Vault/Equipment#
   D. Feeder
   E. Time of day
   F. Ambient temperature of enclosed space
   G. Temperature scale (°F or °C)
   H. Description of thermographic anomaly (cable, joint, termination, bond/ground connection)
   I. Hot Spot temperature
   J. Refernce temperature
   K. Temperature differential or ΔT (Hot Spot temp – Reference temp)
      - To convert $°F_{diff}$ to $°C_{diff}$ multiply F by 0.556
      - To convert $°C_{diff}$ to $°F_{diff}$ multiply C by 1.8
   L. Temperature differential scale (°F or °C)
   M. Duct or equipment positions that the anomaly is located between:
   N. Feeder Load
   O. The location of Abnormal Condition Tags placed – tags are to be place at the top of the enclosed space at each entrance.
   P. Other comments:
      - Image numbers associated with the anomaly
      - Record if Anomaly was under water prior to the inspection.

NOTE: Anomalies found underwater will be at a higher temperature (and possibly higher criticality) when out of water. Refer to section 3.1.4

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6.2.5 On the Abnormal Condition Tag, **RECORD**:

1. Date
2. Crew Leader
3. Manhole/Vault/Equipment#
4. Feeder
5. Description of thermographic anomaly (cable, joint, termination, bond/ground connection)
6. Hot Spot temperature
7. Refernce temperature
8. Temperature differential or ΔT
9. Temperature scale (°F or °C)

Refer to Attachment SA-CE-929-2001-6, Abnormal Condition Tag

6.2.6 **PLACE** an Abnormal Condition Tag at the top of the enclosed space at each entrance for easy identification by subsequent employees entering manhole.

6.3. ACTIONS REQUIRED WHEN ANOMALY IS NOT FOUND

6.3.1 **RE-SCAN** all cables and accessories in enclosed space every 4 hours after initial scan

6.3.2 IF Abnormal Condition Tags are in place for a temperature anomaly that is no longer present, THEN **CONSIDER** the cable as exhibiting the temperature/differential indicated on the tag until such time as the anomaly is repaired/replaced.

6.4. CORRECTIVE ACTIONS FOR RISE IN LOCALIZED TEMPERATURE DIFFERENTIALS

6.4.1 1-3 degrees Celsius (1–5 degrees Fahrenheit) temperature differential (ΔT = Spot temp – Reference Temp)

1. **PLACE** suspension of reclose
2. **PLACE** Abnormal Condition tags at the top of the enclosed space at each entrance.
3. **MONITOR** every 1-2 hours to account for chages in loading
4. Planner / FIN Planner to **CREATE** WR/WO and **ASSIGN** as Pri-40

NOTE: Local leadership with PIC may elevate required action based on factors that include but are not limited to:

- Size of space where anomaly is found.
- Placement of anomaly in relationship to worker.
- Position or condition of anomaly (stress, bending, pitting, corrosion issues)

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- Abnormalities that could lead to or be an indication of an impending fault.
- A rising trend in temperature during monitoring

NOTIFY the Designated Authority if suspension of reclose or de-energization of anomaly is required

6.4.2 4-14 degrees Celsius (6- 25 degrees Fahrenheit) temperature differential (□T = Spot temp – Reference Temp)

1. **Exit** workspace
2. **PLACE** an Abnormal Condition tag at the entrance(s) to the enclosed space.
3. **De-energize** before re-entry
4. Designated Authority to **create** wr/wo and **Assign** as Pri-30

When abnormal conditions are found, requiring the immediate evacuation of an enclosed space, appropriate supervision shall be notified as soon as possible, to determine the necessary corrective action.

NOTIFY the Designated Authority (feeder off-loading may be necessary if it cannot be de-energized)

6.4.3 15 degrees Celsius (26 degrees Fahrenheit) and above temperature differential (ΔT = Spot temp – Reference Temp)

1. **EXIT** workspace
2. **PLACE** an Abnormal Condition tag at the entrance(s) to the enclosed space.
3. **DE-ENERGIZE** before re-entry
4. Designated Authority to **CREATE** WR/WO and **ASSIGN** as Pri-20

When abnormal conditions are found, requiring the immediate evacuation of an enclosed space, appropriate supervision shall be notified as soon as possible, to determine the necessary corrective action.

NOTIFY the Designated Authority (feeder off-loading may be necessary if it cannot be de-energized)

6.4.4 Corrective Actions For high overall cable surface temperature

1. **EXIT** workspace and reduce loading when the overall cable surface temperature exceeds 75 degrees Celsius (167 degrees Fahrenheit)
2. **PLACE** an Abnormal Condition tag at the entrance(s) to the enclosed space.
3. **DE-ENERGIZE** before re-entry
4. Designated Authority to **CREATE** WR/WO and **ASSIGN** as Pri-10

When abnormal conditions are found, requiring the immediate evacuation of an enclosed space, appropriate supervision shall be notified as soon as possible, to determine the necessary corrective action.

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NOTIFY the Designated Authority (feeder off-loading may be necessary if it cannot be de-energized)

7. Return to Normal

7.1. When cable or cable accessories exhibiting anomalies are repaired/replaced then **REMOVE** any associated Abnormal Condition Tags

8. Roles and Responsibilities

8.1. MANAGERS

8.1.1 Ensure compliance to this procedure.

8.2. SUPERVISION

8.2.1 ComEd Safety owns this procedure.

8.2.2 ComEd Subject Matter Experts and Supervisors are accountable for the content and process of the procedure.

8.3. EMPLOYEES/WORKERS

8.3.1 All contractor or vendor personnel performing work within the ComEd service territory shall comply with:

- This procedure
- Safety Rule Book
- Employee Code of Conduct
- All other corporate policies, programs, procedures, and expectations appropriate to the work being performed.

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9. Documentation

9.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

9.2. Person in Charge shall **VERIFY** that the appropriate inspection forms have been completed and signed. The person in charge shall **SUBMIT** the relevant checklists for review by the FLS.

9.3. Thermal images and Digital photos shall be captured and **SUBMITTED** for review by the FLS.

9.4. Scanned inspection forms, digital thermal (IR) images, and photographic (visible light) images shall be and **RETAINED** electronically in Passport

9.5. **GENERATE** a work request for any cable or cable accessory anomalies (refer to WM-ED-P013 Work Initiation)

10. Terms and Definitions

10.1. Anomaly

10.1.1 For the purpose of this document, refers to localized heating / differentials (or hot spot) on cables and cable accessories.

As a general rule, a cable should exhibit consistent temperatures along its length within an enclosed space.

Due to loading, temperature differences between different phases of cables of the same circuit is an expected condition and does not, in itself, indicate any anomalies.

Cable joints should operate at temperatures equal to or less than the temperature of the cables they connect. This means that any time the temperature of a joint is greater than the temperature of its respective conductor a “higher resistance connection” exists and a failure can be expected, but not precisely predicted.

It is probable that degradation will occur faster with increased load.

Contributing factors in overheating of cable accessories:

- Use of a non-specified connector, e.g.
  - Copper connector on an aluminum conductor
  - AL-rated aluminum connector on a copper conductor. Aluminum connectors must have a CU/AL-rating for use on copper conductors.

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- Failure to remove the oxide layer on aluminum conductor by wire brushing.
- Removal of oxide inhibitor (Penetrox) from the connector prior to crimping.
- Failure to fully insert the conductor into the connector.
- Partially severing the outer strand layer of the conductor when performing the cable insulation cutback.
- Inadequate number of compressions on both sides of the connector.
- Inadequate depth of compressions (too shallow).

10.2. Cable Accessories

10.2.1 For the purpose of this document, refers to joints elbows and terminations which can be constructed from tape, pre-mold, heat shrink, or cold shrink technology.

10.3. Designated Authority (DA)

10.3.1 BPO or OCC personnel qualified to issue Clearance Orders and administer the ED Lock Out Tag Out procedure.

10.4. Emissivity

10.4.1 Emissivity is a term representing a material's ability to emit thermal radiation. Emissivity is the ratio of the heat emitted by a surface compared to that reflected and / or transmitted. A material's emissivity can range from a theoretical 0.00 (completely not-emitting) to an equally-theoretical 1.00 (completely emitting). To make a temperature measurement of an object, the thermographer will refer to an emissivity table to choose the emissivity value of the object, which is then entered into the IR camera.

10.5. Enclosed Space

10.5.1 A working space (relative to power generation, transmission and distribution) such as a manhole, vault, cable space, tunnel or shaft that has a limited means of egress or entry that:

- Is designed for periodic employee entry under normal operating conditions.
- Under normal conditions, does not contain a hazardous atmosphere, but may under abnormal conditions, contain a hazardous atmosphere, per SA-ED-P406 “Confined Space and Hazardous Entry Process.”

10.5.2 As specifically related to this procedure, a space where energized distribution cables are routed.

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10.6. Hot spot

10.6.1 A localized portion of a cable circuit that exhibited a higher temperature over a small surface area (less then 1 square foot) compared to the reference temperature.

10.7. “Indirect” Temperature Measurement

10.7.1 Thermography of cables and cable accessories involves an “indirect” temperature measurement because there is considerable thermal insulation between the conductor or connector and the surface seen by the IR camera.

Electrical insulation is a good “thermal” insulation.

The internal temperature can be several times higher than the reading seen by the IR camera on the outer surface.

The thermal gradient depends on the amount of thermal insulation and how hot the internal problem is.

10.8. Infrared (IR) Radiation

10.8.1 Infrared (IR) radiation is a form of electromagnetic radiation with a wavelength longer than visible light. Infrared radiation is produced by all matter, and can be used to identify electrical hot spots

Infrared light can be produced by electrical hot spots which radiate heat.

A current flowing through a high resistance caused by a poor electrical contact between two surfaces results in an electrical I^2R loss (current x current x resistance) appearing in the form of heat.

NOTE: The infrared heating may be present during the last 10% (or less) of component life.

10.8.2 A thermography camera senses the infrared light and thus can detect heat.

10.9. Reference Temperature

10.9.1 The temperature of the cable surface measured one foot from the duct entrance. This temperature should be the same across the joint towards the opposite duct entrance.

10.10. Suspension Of Auto Reclosing

10.10.1 Prevents the re-energizing of equipment by automatic reclosing devices following a tripping due to a fault.

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10.11. Temperature Conversion Factors

10.11.1 Temperature is a physical property of matter that quantitatively expresses the common notions of hot and cold. Most of the world uses the Celsius scale (°C) for most temperature measurements , a scale on which water freezes at 0°C and boils at 100°C (under one atmosphere of pressure). The United States uses the Fahrenheit scale for common purposes, a scale on which water freezes at 32 °F and boils at 212 °F (under one atmosphere of pressure). (NOTE: Fahrenheit is acceptable and may be more familiar to the work force)

- °C = (°F - 32) x 5/9
- °F = (°C x 9/5) + 32

For temperature differentials:

- To convert $°F_{diff}$ to $°C_{diff}$ multiply F by 0.556
- To convert $°C_{diff}$ to $°F_{diff}$ multiply C by 1.8

10.12. Thermographer

10.12.1 Personnel performing the thermographic field assessment and analysis of test results.

10.13. Thermography

10.13.1 Infrared (IR) thermography is a technique used to translate heat radiated by an object in the infrared spectrum into the visible spectrum.

Infrared thermography can be used to measure the heat generated by load current flowing through cables or cable accessories.

10.14. Visible Light

10.14.1 Light that can be viewed with the naked eye. Standard digital photographs exhibit the visible light spectrum.

10.15. Utility Functional Area Manager (UFAM)

10.15.1 A key Manager appointed by each Utility Sponsor with oversight responsibility for a particular Management Model Core Function and all the controlled documents within. The UFAM identifies and approves required documents for that Core Function.

10.16. Refer to CM-ED-000010, Glossary for additional terms and definitions.

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11. References

11.1. Action Tracking 00268081-15 & 16

11.2. ANSI C119.4 “American National Standard For Electric Connectors: Connectors For Use Between Al-Al Or Al-Cu Conductors”

11.3. CM-ED-020027 “Thermography Assessment Of 15kv Joints In Substation Cable Space”

11.4. CM-CE-P319 “Inspection Process For Distribution Manholes And Components”

11.5. CM-CE-P336 “Assessment Of Distribution Manholes And Components”

11.6. CM-CE-P336 “Assessment of Distribution Manholes And Components”

11.7. LE-AC-401 “Records and Information Management Retention and Disposition”

11.8. NETA MTS-2011 “Std For Maintenance Testing Spec For Elect Power Equip And Systems”

11.9. NETA ATS-2009 “Std For Acceptance Testing Spec For Electl Power Equip And Systems”

11.10. OP-CE-600003 “Suspension Of Auto Reclosing For Undg Work”

11.11. OP-EU-050003 “Lockout Tag Out”

11.12. SA-ED-4024-R0001 “ComEd Multi-Person Job Briefing Sheet”

11.13. SA-ED-P406 “Confined Space And Hazardous Entry Process”

11.14. SA-ED-P427 “Electrical Safety Program”

11.15. WM-ED-P013 “Work Initiation”

12. Attachments

12.1. SA-CE-929-2001-1, Thermography Inspection Form

12.2. SA-CE-929-2001-2, Fluke - Emissivity Values Of Common Materials

12.3. SA-CE-929-2001-3, Fluke - Ti9, Ti10, Ti25, TiRx, TiR and TiR1 Thermal Imagers Users Manual

12.4. SA-CE-929-2001-4, Celsius/Fahrenheit temperature conversion chart

12.5. SA-CE-929-2001-5, Connection Measurement Points

12.6. SA-CE-929-2001-6, Abnormal Condition Tag

12.7. SA-CE-929-2001-7, Lessons Learned

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13. Development history

Revision 0		**Date: 3/28/2014**
Writer	Michael Meathe William Sullivan III Peter Tyschenko	Emergent Work Manager Mgr Training Manager - Dist Standards
Reviewer(s)	ComEd: Michael Meathe William Sullivan III Peter Tyschenko John Hans Kevin Kinnerk Stephen Gifford Michael Kregg	 Emergent Work Manager Mgr Training Manager - Dist Standards Prin Engineer – Dist Standards Sr Methods Specialist - Methods Sr Engineering Tech – Reliability Inspection Sr Engineering Tech - T & D Reliability
Technical Approver(s)	ComEd: Michael Meathe William Sullivan III Peter Tyschenko John Hans Kevin Kinnerk Stephen Gifford Michael Kregg	 Emergent Work Manager Mgr Training Manager - Dist Standards Prin Engineer – Dist Standards Sr Methods Specialist - Methods Sr Engineering Tech – Reliability Inspection Sr Engineering Tech - T & D Reliability
Safety Approver(s)	Jack Craighead	
UFAM Approver(s)	Sharon Pluskis, Director Environmental Health and Safety	
Reason written	To establish acceptance criteria necessary to evaluate elevated localized surface temperatures of cables or cable accessories via Infrared (IR) thermography and to prioritize Corrective Maintenance based on IR thermography results. Action Tracking assignments 00268081 15 & 16.	

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Revision 1	**Date: 9/2/2015**
Writer	Jack Craighead
Reviewer(s)	Michael Meathe; John Hans; Steven Doyen; Mike Martin, Bob Shuttleworth
Technical Approver(s)	Pete Tyschenko
Safety Approver(s)	Jack Craighead
UFAM Approver(s)	Sharon Pluskis, Director Environmental Health and Safety
Reason written	Note added to section 6.2.2 due to AR 803811

Revision 2	**Date: 1/30/2017**
Writer	Jack Craighead
Reviewer(s)	Mark Primm
Technical Approver(s)	
Safety Approver(s)	Jack Craighead
UFAM Approver(s)	Mark Primm
Reason written	No changes, procedure reposted after being archived

Revision 3	**Date: 3/6/2017**
Writer	Jack Craighead
Reviewer(s)	Mike Martin, Bob Shuttleworth, Scott Matrisciano, Chris Gibbs
Technical Approver(s)	John Hans, Andrew Morris
Safety Approver(s)	Jack Craighead
UFAM Approver(s)	Mark Primm
Reason written	Section 6.4.4 changed to require Pri-10 for cable with temperature at greater than 75C to align with other EU companies.

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Revision 4	**Date: 8/1/2017**
Writer	Jack Craighead
Reviewer(s)	Mike Martin, Scott Matrisciano, Chris Gibbs
Technical Approver(s)	John Hans, Andrew Morris
Safety Approver(s)	Jack Craighead
UFAM Approver(s)	Mark Primm
Reason written	Section 2.2.4 update to align with EU exceptions, updated attachment SA-CE-929-2001-1.

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SA-CE-929-2001-1, Thermography Inspection Form

SA-CE-929-2001-1 Inspection Form rev 4

SA-CE-929-2001-2, Fluke - Emissivity Values Of Common Materials

Fluke - Emissivity Values Of Common Ma

SA-CE-929-2001-3, Fluke - Ti9, Ti10, Ti25, TiRx, TiR and TiR1 Thermal Imagers Users Manual

Fluke - Ti9, Ti10, Ti25, TiRx, TiR and Ti

SA-CE-929-2001-4, Celsius/Fahrenheit temperature conversion chart

Temperature Conversion Deg F De

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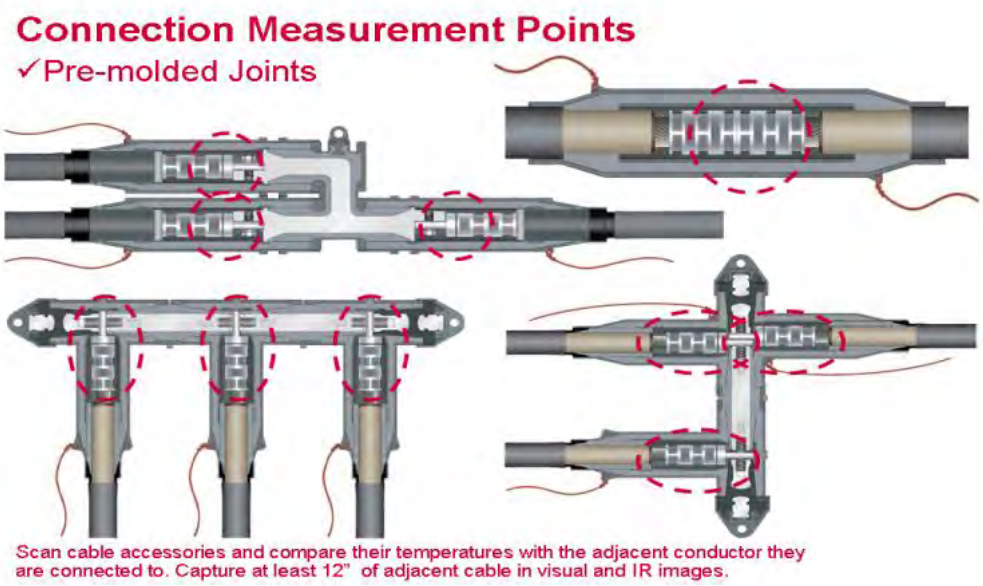
SA-CE-929-2001-5, Connection Measurement Points



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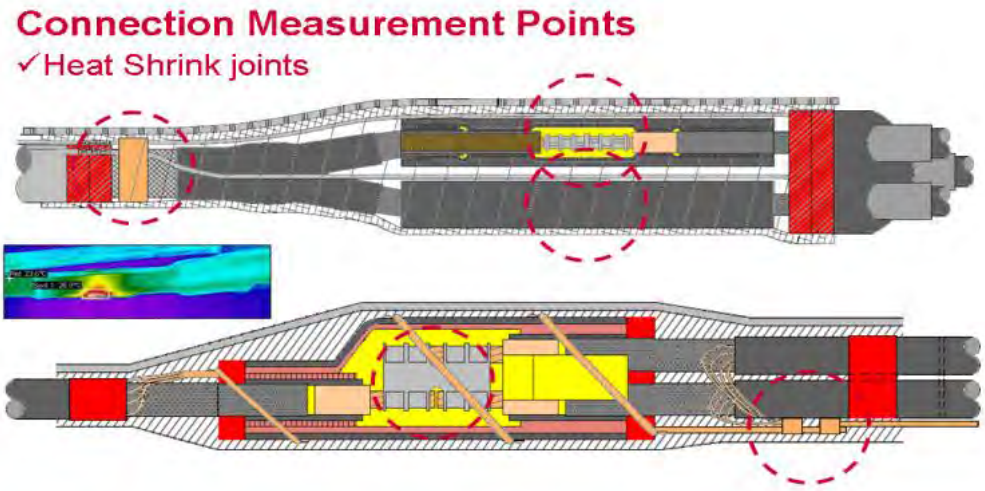

Scan cable accessories and compare their temperatures with the adjacent conductor they are connected to. Capture at least 12" of adjacent cable in visual and IR images.

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Rev. 4

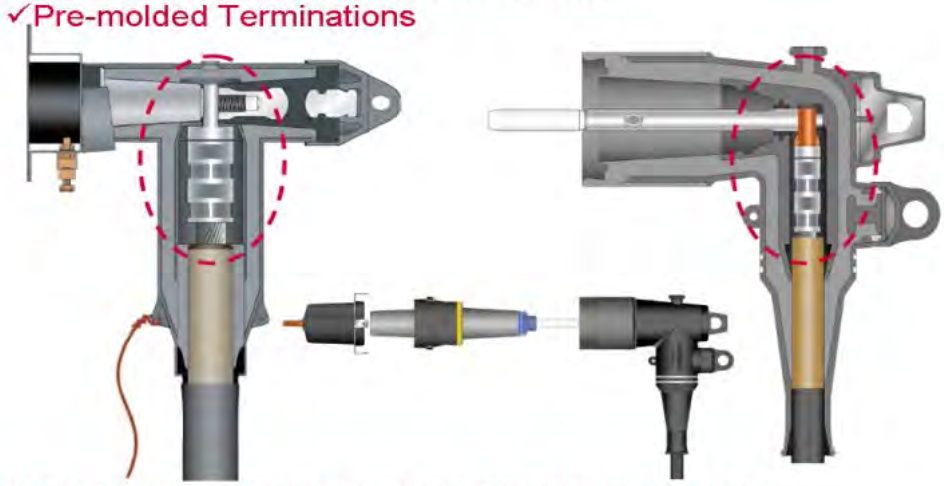
Connection Measurement Points

✓Cold Shrink joint

Scan cable accessories and compare their temperatures with the adjacent conductor they are connected to. Capture at least 12" of adjacent cable in visual and IR images.

Connection Measurement Points

✓Pre-molded Terminations



Scan cable accessories and compare their temperatures with the adjacent conductor they are connected to. Capture at least 12" of adjacent cable in visual and IR images.

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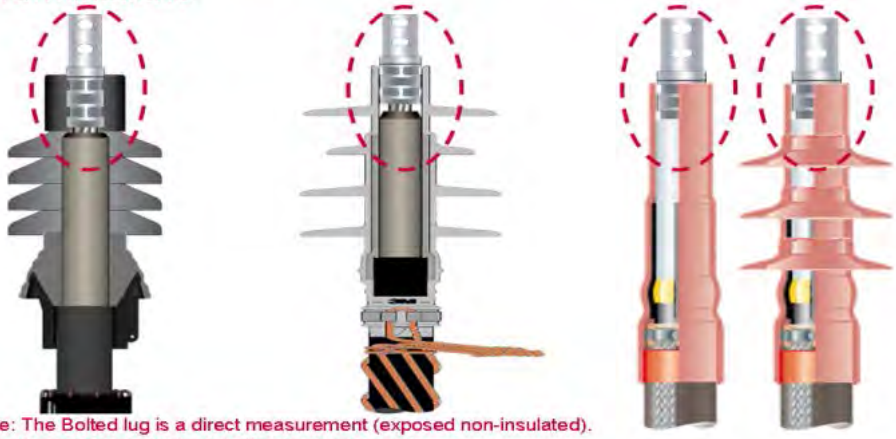
Connection Measurement Points

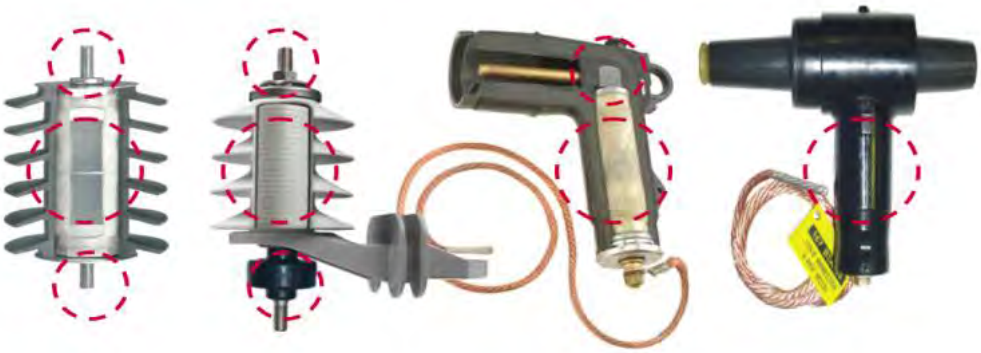
✓Terminations



Note: The Bolted lug is a direct measurement (exposed non-insulated).
The crimped connector is an indirect measurement.
Scan cable accessories and compare their temperatures with the adjacent conductor they are connected to. Capture at least 12" of adjacent cable in visual and IR images.

Connection Measurement Points

✓Surge Arresters



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Connection Measurement Points

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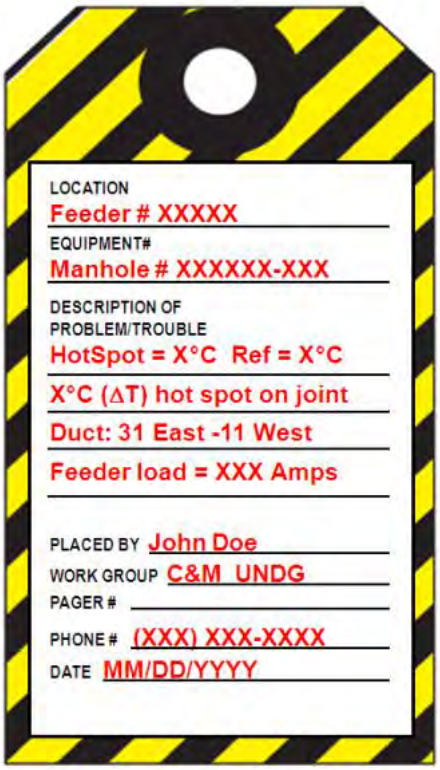
SA-CE-929-2001-6, Abnormal Condition Tag



Attachement SA-CE-929-2001-6

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Lessons Learned - Suggested Procedure Improvement
Page _____ of _____

Proc Line #	Revision / insertion / deletion

Attachement SA-CE-929-2001-7

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Overhead Construction Training Program

Exelon Utilities Administrative Procedure

TQ-EU-111

Revision No: 1

Effective:	11/27/2017
Supersedes:	TQ-ED-111
Level:	3
Review Type:	3 Year
Core Function:	Training and Qualification

This document applies to BGE, ComEd and PECO only. PHI integration is in progress and this disclaimer will be removed when PHI has been incorporated.

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Overhead Construction Training Program

Exelon Utilities Administrative Procedure

TQ-EU-111

Revision No: 1

1. Purpose

1.1. This Training Program description describes the Overhead Construction Training and Qualification Programs. The programs consist of initial training and continuing training. The programs are owned by the respective overhead construction department leadership, and are governed by the respective Training Councils and the Curriculum Review Committees (TC/CRC).

2. Precautions and limitations

2.1. Precautions

2.1.1 N/A

2.2. Limitations

2.2.1 N/A

3. Prerequisites

3.1. OSHA 1910.269

4. Procedure

4.1. Selection and Hiring Process

4.1.1 Candidates must successfully meet all required hiring criteria for this position.

NOTE: For hiring practices governed by a union contract, refer to that document for specifics.

4.2. Overhead Construction Training and Qualification Program

4.2.1 Initial training and evaluation consists of training on entry-level topics and tasks. The training is performance-based, and the evaluation is on knowledge and skills contained in the appropriate task groups. The training ensures that the candidate has demonstrated the skill and knowledge to safely and independently perform entry-level tasks.

4.2.2 EU Training personnel, supported/augmented by line personnel, administer all progression training topics. OJT training shall be administered by line personnel.

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Overhead Construction Training Program

Exelon Utilities Administrative Procedure

TQ-EU-111

Revision No: 1

4.3. Advanced Hire Initial Process (PECO only)

4.3.1 Advanced hire initial training consists of training on entry level topics, self-study and evaluation on basic topics not covered in the Advanced Hire Exam and performance based evaluation on selected topics. This training and evaluation, combined with the results of the Advanced Hire Examinations ensures that fundamental knowledge and skills are present. Line personnel with the help of EU instructors, typically administer the advanced hire program.

4.3.2 Trainees will have 6 months to complete the advanced hire program. Upon successful completion, candidates will receive additional training on specialty topics as appropriate. Candidates who do not successfully complete the advanced hire program training and evaluation within the prescribed 6 months will meet with a Performance Review Committee to determine if they will be retained in the program or released from employment.

4.4. Continuing Training

4.4.1 Continuing training maintains and improves the performance level of personnel who have been qualified to independently perform tasks associated with overhead line activities.

4.4.1.1 Required Topics—Required continuing training topics for the overhead construction disciplines are identified in the Master Task List These topics are selected to meet corporate, industry, and OSHA standards and requirements.

4.4.1.2 Refresher Training—Refresher training topics for overhead construction are extracted from initial and advanced training topics. CRC/Training Councils will review topics on an annual basis for topic selection and inclusion into Continuing Training. CRC reviews will assist in determining the format and methodology of the training to optimize the effectiveness. Diagnostic testing may be used to narrow the scope of or eliminate the need to perform refresher training. Elimination of refresher training during a calendar year will require the respective VP approval. The ongoing periodic training ensures the fundamental knowledge is maintained and enhanced by continuously refreshing core elements of the job in a challenging manner. Training should cover both theoretical as well as technical /hands on knowledge of the subject. Other topics may be added due to assignments of Corrective Actions.

4.4.1.3 CRC Selected Topics—Additional continuing training topics are selected by each CRC in accordance with TQ-EU-P117, Training Administration Process. Topic selection is based on but not limited to the following areas:

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4.4.1.3.1 Worker performance

4.4.1.3.2 New equipment or tools

4.4.1.3.3 New or revised procedures

4.4.1.3.4 Industry Events

4.4.2 Continuing Training Hours

4.4.2.1 The number of hours of continuing training received by each trainee on an annual basis is determined by the line and training organizations and approved by executive leadership.

4.5. Training Exemptions

4.5.1 Training exemptions shall be conducted in accordance with the requirements of TQ-EU-P117, Training Administration Process, and documented usingTQ-EU-1039-2, “OJT Waiver Form.”

4.6. Instructor Qualifications

4.6.1 Instructor and Subject Matter Experts (SME) use shall be in accordance with the requirements of TQ-EU-P117, ”Training Administration Process.”

4.6.2 The conduct of on the job training (OJT) and On The Job Evaluation (OJE) shall be in accordance with the requirements of TQ-EU-1039, ”On The Job Training and On The Job Evaluation Procedure.”

4.7. Trainee Evaluation

4.7.1 Knowledge examinations are designed and constructed in accordance with the requirements of TQ-EU-P107, Training Systems Development (TSD) Process.

4.7.2 Program Pass/Fail standard criteria are as follows across EU line organizations, unless specific labor contracts or agreements specify otherwise.

4.7.2.1 The minimum passing criteria for all knowledge evaluations is 80%.

4.7.2.2 Passing criteria may be increased based on the requirements of the owner/manager/goverming entity, such as Rail Road Entry training programs which requires 100% on their knowledge check.

4.7.2.3 The minimum passing criteria for performance evaluations is detailed in the individual examination guides for each phase of progression examination.

4.7.2.4 Qualifications shall be removed/withheld for that particular task for the time of the initial failure until the remediation plan has been successfully completed.

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4.8. Remediation and Re-Evaluation

4.8.1 Remediation and re-evaluation shall be conducted in accordance with the requirements of TQ-EU-P107, Training Systems Development (TSD) Process.

4.8.2 A Performance Review Committee (PRC) shall be convened to determine qualification status, remediation, and re-evaluation methods/actions when any of the following occur:

4.8.2.1 Failure of a second consecutive knowledge or performance evaluation on the same topic/area

4.8.2.2 Failure to progress in knowledge and skills from one phase of progression to the next

4.9. Program Maintenance

4.9.1 Program maintenance is performed in the TSD process in accordance with TQ-EU-P107, Training Systems Development (TSD) Process.

4.9.2 The master task lists are reviewed at a minimum, on a two-year frequency in accordance with TQ-EU-P107, Training Systems Development (TSD) Process. Results of the reviews are forwarded to the applicable training and line managers for review and disposition. In addition to a formal task list revision, credit for task list revisions and review can be demonstrated through normal training reviews and documentation by the CRCs. This documentation should include follow-up items demonstrating that the appropriate program has been updated.

5. Roles and responsibilities

5.1. EU Training and Line Organization responsibilities are outlined in TQ-EU-P117, “Training Administration Process.”

6. Documentation

6.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

6.2. Training Records

6.2.1 Training records are maintained in accordance with TQ-EU-P105, “Training Records Classification and Retention Process”.

6.3. The current revision of the Training Records Inventory is available from the Business Unit Lead and Records Manager.

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6.4. Program instructors are responsible for maintaining program/training material.

6.5. Course codes are used to identify and track overhead construction training in the applicable training information tracking system or database.

6.6. Examination results are available from the program instructor.

6.7. Exam banks are available from an Instructional Designer (ID)..

6.8. Training Schedule

6.8.1 Training dates for initial and continuing training are scheduled by EU Training and approved by the line organizations.

6.9. EU Training under the direction of EU line management coordinates training and qualification.

7. Terms and definitions

7.1. Climbing School

7.1.1 A school that provides instruction in basic pole climbing techniques.

7.2. Secondary School (i.e. Basic Line School / Initial / Phase 1)

7.2.1 Entry-level overhead construction training that provides the knowledge and skills required for personnel to safely and effectively perform the elementary tasks associated with their job. Focus is on secondary voltage equipment and overhead construction standards.

7.3. Continuing Training (i.e. Refresher / Requalification)

7.3.1 Training that provides personnel with the knowledge and skill necessary to perform assigned duties independently in a safe, reliable, and efficient manner.

7.4. Master Task List

7.4.1 A list of tasks covering activities performed by overhead construction employees.

7.5. Singe-Phase School (i.e. 3rd Class / Phase 1)

7.5.1 Overhead construction training that provides the technical knowledge skills and abilities required for working single phase tasks where it is not necessary to reach over energized conductors to perform a given task.

7.6. Task to Training Matrix

7.6.1 A list of job tasks and the training that is required to perform each task.

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7.7. Three-Phase School (i.e. 2nd Class and 1st Class / Phase 2)

7.7.1 Overhead construction training and associated training that provides the technical knowledge, skills and abilities required for personnel to safely and effectively perform the higher level tasks associated with the job. Completion of these schools qualifies the worker to perform work on all types of overhead construction.

7.8. Training Systems Development (TSD)

7.8.1 The systematic training process by which an identified training need is analyzed, and the appropriate training is designed, developed, implemented, and evaluated (feedback) to support job performance and professional development.

8. References

8.1. LE-AC-401 – Records and Information Management Retention Disposition

8.2. TQ-EU-1039 – On The Job Training and On The Job Evaluation Procedure

8.3. TQ-EU-1039-2 – OJT Waiver Form

8.4. TQ-EU-P105 – Training Records Classification and Retention Process

8.5. TQ-EU-P107 – Training Systems Development (TSD) Process

8.6. TQ-EU-P117 – Training Administration Process

9. Attachments

9.1. None

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Overhead Construction Training Program

Exelon Utilities Administrative Procedure

TQ-EU-111

Revision No: 1

10. Development history

Revision 0	**Date: 1/21/2015**
Writer	Mark Dolle, Manager – Training, Technical Training (BGE) Kimberly Keegan, Manager – Training Methods PA & QA, Methods East (PECO) Michael Martin, Manager - C&M Training (ComEd) Craig Menzel, Manager - Training, Electric Training (BGE) William Sullivan, Manager – Training, C&M Training (ComEd)
Reviewer(s)	Mark Dolle, Manager – Training, Technical Training (BGE) Kimberly Keegan, Manager – Training Methods PA & QA, Methods East (PECO) Michael Martin, Manager - C&M Training (ComEd) Craig Menzel, Manager- Training, Electric Training (BGE) William Sullivan, Manager – Training, C&M Training (ComEd)
UFAM Approver(s)	Larry Burley, Sr., Training & Qualification, Manager – Training (BGE) Michael Martin, Manager - C&M Training (ComEd) Kimberly Keegan, Training & Qualification, Manager – Training (PECO)
Reason written	• This revision creates TQ-EU-111 which supersedes TQ-ED-111 • Convert to and EU document with alignment between BGE, ComEd and PECO. • Align document with design criteria from Overhead Side By Side Initiative • Standardize overhead training language and terms where possible • Remove references to outdated or non-existent management model documents.

Revision 1	**Date: 11/15/2017**
Writer	Tim Jobes, Manager Training- (ComEd); Pat Batchelor, Manager Training-(PECO); Rodney Walker, Sr Training Specialist-(PECO); Gina Wyatt, Manager Training-(BGE); Sharon Sasada, Sr. Training Specialist-(BGE)
Reviewer(s)	Kimberly Keegan, Manager – Training Methods PA & QA, Methods East (PECO); Larry Burley, Manager – Utility Training, (BGE); Tyler White, Manager- Utility Training, (PEPCO); Michael Martin, Manager - C&M Training (ComEd)

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Overhead Construction Training Program

Exelon Utilities Administrative Procedure

TQ-EU-111

Revision No: 1

Revision 1	**Date: 11/15/2017**
UFAM Approver(s)	Kimberly Keegan, Manager – Training Methods PA & QA, Methods East (PECO); Larry Burley, Manager – Utility Training, (BGE); Tyler White, Manager- Utility Training, (PEPCO); Michael Martin, Manager - C&M Training (ComEd)
Reason written	3 year review

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Overhead Transmission (OHT) Training Program

Exelon Utilities Program
TQ-EU-1028
Rev. 1

Effective:	7/17/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Training and Qualification

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1. Purpose

1.1. To provide guidelines for Overhead Transmission Group training and qualification programs within EU. The programs consist of initial training and continuing training. The programs are owned by the respective T & S Department Leadership for T & S, and are governed by the respective Curriculum Review Committees (CRC) and Training Advisory Councils (TAC).

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Overhead Transmission (OHT) Training Program

Exelon Utilities Program
TQ-EU-1028
Rev. 1

2. Precautions and limitations

2.1. Precautions

2.1.1 N/A

2.2 Limitations

2.1.2 Currently PHI uses contractors to perform this work. PHI will utilize this procedure if and when the work practices change.

3. Prerequisites

3.1. 29 CFR OSHA 1910.269 – *Electric power generation, transmission, and distribution*.

4. Program

4.1. Selection and Hiring Process

4.1.1 Candidates successfully meeting hiring criteria are required to have completed all required classes (linemen schools, etc.).and hold the classification of a "Journeyman Lineman," (PECO/ComEd) or "Transmission Line Mechanic" (BGE) and satisfactorily complete a structured interview with a hiring group representative.

***Note**: For hiring practices governed by a union contract, refer to that document for specifics.*

4.2. Overhead Transmission Initial Training and Qualification Program

4.2.1 Initial training and evaluation consists of training on entry level topics and tasks. The training is classroom and performance based, and the evaluation is on knowledge and skills contained in the appropriate task groups. The training will ensure that the candidate has demonstrated the skill and knowledge to safely and independently perform entry level tasks.

4.2.2 EU Training personnel, supported/augmented by line personnel, administer all progression training topics. OJT training will be administered by line personnel.

4.3. Advanced Hire Initial Process (BGE)

4.3.1 Advanced hire initial training consists of training on advanced level topics, self-study and evaluation on basic topics not covered in the Advanced Hire Exam and performance based evaluation on selected topics. This training and evaluation, combined with the results of the Advanced Hire Examinations ensures that advanced knowledge and skills are present. Line personnel with the help of EU instructors, typically administer the advanced hire program.

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4.3.2 Trainees will have a definitive timeline based on the training criteria to complete the advanced hire program. Upon successful completion, candidates will receive additional training on specialty topics as appropriate. Candidates who do not successfully complete the advanced hire program training and evaluation within the prescribed period of time will meet with a Performance Review Committee to determine if they will be retained in the program or released from employment.

4.4. Continuing Training

4.4.1 Continuing training maintains and improves the performance level of personnel who have been trained to independently perform tasks associated with Overhead Transmission /Aerial Line activities.

4.4.1.1 Required Topics—required continuing training topics are selected to meet corporate, industry, and OSHA standards and requirements. Topics are included to meet business needs, new technology, and Lessons Learned.

4.4.1.2 Refresher Training—Refresher training topics for the listed disciplines are extracted from initial and advanced training topics. CRC/TAC will review topics on an annual basis for topic selection and inclusion into Continuing Training. CRC reviews will determine the format and methodology of the training to optimize the effectiveness. Diagnostic testing may be used to narrow the scope of or eliminate the need to perform refresher training. Elimination of refresher training during a calendar year will require the respective VP approval. The ongoing periodic training ensures the fundamental knowledge is maintained and enhanced by continuously refreshing core elements of the job in a challenging manner. The training should cover both theoretical as well as technical /hands on knowledge of the subject.

4.4.1.3 CRC Selected Topics—Additional continuing training topics are selected by each CRC in accordance with TQ-ED-P117, "*Training Administration Process*." Topic selection is based on but not limited to the following areas:

4.4.1.3.1 Worker performance

4.4.1.3.2 New equipment or tools

4.4.1.3.3 New or revised procedures

4.4.1.3.4 Industry Events

4.4.2 Continuing Training Hours

4.4.2.1 The number of hours of continuing training received by each trainee on an annual basis is determined by the continuing training content selection by the CRC.

4.5. Training Exemptions

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4.5.1 Training exemptions shall be conducted in accordance with the requirements of TQ-EU-P107, TSD Activities, and documented usingTQ-EU-1039-2, "*OJT Waiver Form*."

4.6. Instructor Qualifications

4.6.1 Instructor and Subject Matter Experts (SME) use shall be in accordance with the requirements of TQ-EU-P117, "*Training Administration Process*."

4.6.2 The conduct of on the job training and On The Job Evaluation (OJE) shall be in accordance with the requirements of TQ-EU-1039, "*On-the-Job Training (OJT) and On-the-Job Evaluation (OJE) Procedure*."

4.7. Trainee Evaluation

4.7.1 Knowledge examinations are designed and constructed in accordance with the requirements of TQ-EU-P107, "*Training Systems Development (TSD) Process.*"

4.7.2 Program Pass/Fail standard criteria are as follows across EU line organizations, unless specific labor contracts or agreements specify otherwise.

4.7.2.1 The minimum passing criteria for all knowledge evaluations is 80%.

4.7.2.2 The minimum passing criteria for performance evaluations is detailed in the individual examination guides for each phase of progression examination.

4.7.2.3 Qualifications shall be removed/withheld for that particular task for the time of the initial failure until the remediation plan has been successfully completed.

4.8. Remediation and Re-Evaluation

4.8.1 Remediation and re-evaluation shall be conducted in accordance with the requirements of TQ-EU-P107, "*Training Systems Development (TSD) Process*."

4.8.2 A Performance Review Committee (PRC) shall be convened to determining qualification status, remediation, and re-evaluation Methods/actions when any of the following occur:

4.8.2.1 Failure of a second consecutive knowledge or performance evaluation on the same topic/area

4.8.2.2 Failure to progress from one phase of progression to the next.

4.9. Program Maintenance

4.9.1 Program maintenance is performed in the TSD process in accordance with TQ-EU-P107, "*Training Systems Development (TSD) Process*."

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4.9.2 The master task lists are reviewed at a minimum, on a two-year frequency in accordance with TQ-EU-P107, Training Systems Development (TSD) Process. Results of the reviews are forwarded to the applicable training and line managers for review and disposition. In addition to a formal task list revision, credit for task list revisions and review can be demonstrated through normal training reviews and documentation by the CRCs. This documentation should include follow-up items demonstrating that the appropriate program has been updated.

5. Roles and Responsibilities

5.1. EU Training and Line Organization

5.1.1 EU Training and Line Organization responsibilities are outlined in TQ-EU-P117, "*Training Administration Processs*."

5.1.2 Maintain and coordinate training schedule and qualification

5.2. CRC

5.2.1 The CRC is responsible for maintaining the training schedule (initial and continuing) and developing initial and continuing training and qualification

6. Documentation

6.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

6.2. Training Records

6.2.1 Training records are maintained in accordance with TQ-EU-P105, "*Training Records Classification and Retention Process.*"

6.2.2 The current revision of the Training Records Inventory is available from the Business Unit Lead and Records Manager.

6.2.3 Program instructors are responsible for maintaining program/training material.

6.2.4 Course Codes are used to identify and track Transmission Overhead training in the applicable training information tracking system or database.

6.2.5 Examination results and exam banks are available from the program instructor.

7. Terms and Definitions

7.1. Continuing Training

7.1.1 Training that provides personnel with the knowledge and skill necessary to perform assigned duties independently in a safe, reliable, and efficient manner.

7.2. Initial Training

7.2.1 Initial overhead transmission training that provides the knowledge and skills required for personnel to safely and effectively perform the elementary tasks associated with their job utilizing construction standards.

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7.3. Master Task List

7.3.1 A list of tasks covering activities performed by Overhead Transmission Mechanics.

7.4. TSD (Training Systems Design)

7.4.1 The systematic training process by which an identified training need is analyzed, and the appropriate training is designed, developed, implemented, and evaluated (feedback) to support job performance and professional development.

8. References

8.1. LE-AC-401 – Records and Information Management Retention and Disposition.

8.2. 29 CFR OSHA 1910.269, "*Electric Power Generation, Transmision, and Distribution*"

8.3. TQ-EU-1039, "On The Job Training and On The Job Evaluation Procedure"

8.4. TQ-EU-1039-2, "OJT Waiver Form"

8.5. TQ-EU-P105, "Training Records Classification and Retention Process"

8.6. TQ-EU-P107, Training Systems Development (TSD) Process"

8.7. TQ-EU-P117, "Training Administration Process"

9. Attachments

9.1. None

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Overhead Transmission (OHT) Training Program

Exelon Utilities Program
TQ-EU-1028
Rev. 1

10. Development history

Revision 0 (TQ-ED-1028)	**Date: 11/17/2005**
Writer	Deanne Steinmetz
Reviewer(s)	Carl Fowler, Pete Smith, Robert Warren
UFAM Approver(s)	M.J. Roache
Reason written	To define the program to training and maintain qualification as an Overhead Transmission Mechanic within Transmission and Substation.

Revision 0 (TQ-EU-1028)	**Date: 6/10/2016**
Writer	Patricia Batchelor, PECO, Manager, Training
Reviewer(s)	Craig Menzel, BGE, Manager Training; Steve Scheihing, BGE, Supervisor Transmission, ; Timothy Jobes, ComEd, Manager Training
UFAM Approver(s)	Kimberly Keegan, PECO, Manager Training and Methods; Craig Chesley, ComEd, Director Performance Methods
Reason written	Updates impact term and definitions as well as reference documentation. Minor verbiage changes throughout to better align the three utilities.

Revision 1 (TQ-EU-1028)	**Date: 7/17/2018**
Writer	Dawn Owens, ComEd, Manager Training
Reviewer(s)	Patricia Batchelor, PECO, Manager, Training, Gina Wyatt, BGE, Manager Training, Christopher Archibald, BGE, Supervisor Training, Anthony Harmon, PHI, Manager Training, Andrew Vahey, DPL, Manager Training,
UFAM Approver(s)	Kimberly Keegan, PECO, Mike Martin, ComEd, Anthony Harmon, PHI, Larry Burley, BGE
Reason written	6/8/18 Corrected numbering sequence. Removed “PECO” from Section 4.3. Added “PHI Limitations – Contractor performs this work”. 7/19/18 – Admin Update: Writer Dawn Owens requested info in header in red text regarding applicability to be removed, and PHI contractor information to be added to Limitations section. Completed same for content did not change.

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PI Tiers 3 & 4 - Performance Indicator Procedure

Exelon Utilities Administrative Procedure

TQ-EU-1041

Revision No.: 3

Effective:	1/22/2018
Supersedes:	N/A
Level:	3
Review Type:	3 Year
Core Function:	Training and Qualification

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PI Tiers 3 & 4 - Performance Indicator Procedure

Exelon Utilities Administrative Procedure

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Revision No.: 3

1. Purpose

This document provides detailed guidelines pertaining to the Tiers 3 and 4 Performance Indicators for use by Exelon Utilities. The objective of this document is a detailed indication of the content and calculations associated with Tier 3 and 4 metrics, including specified metric data sources. This document also lends clarity to the definition of a metric across the utilities, for the benefit of metrics process participants.

Metrics discussed are divided into two sets – Tier 3 and Tier 4, shown in the table below:

Subsection	Metric	Page
TIER 3		
4.1	Approximate OSHA recordable rate for trainees and apprentices in initial training	4
4.2	RVA Percentage for trainees and apprentices in initial training	6
4.3	Effectiveness of Instruction	7
4.4	Average “modified” LEVEL 3 Evaluation Rating	8
TIER 4		
4.5	Percentage of classes delivered vs. planned for all classes	9
4.6	Percentage of classes delivered vs. planned for Electric classes	10
4.7	Percentage of classes delivered vs. planned for Gas classes*	11
4.8	Percentage of classes delivered vs. planned for Customer Service	12
4.9	Level 1 Evaluation Rating: Course quality and effectiveness	133
4.10	Refresher Training completion percentage	14
4.11	Percentage of Gas employees that are out of compliance*	155
4.12	Percentage of Gas contractors that are out of compliance*	16

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4.13	Instructor observations observed	177

2. Precautions and limitations

2.1. Precautions

2.1.1 The development of Performance Metrics across Exelon Utilities is in its inception phase. As such, definition and components of metrics may be subject to change.

2.2. Limitations

2.2.1 This document is limited to Tiers 3 and 4 Performance Indicators associated with the Training and Qualification core function.

3. Prerequisites

3.1. None

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4. Procedure

14 metrics are discussed - 4 in Tier 3 and 9 in Tier 4. As such, a placeholder for this metric has been made available.

4.1. Approximate OSHA recordable rate for trainees and apprentices in initial training

4.1.1 Metric Type: Monthly/YTD

4.1.2 EU Book/PI Book Definition: Recordable injuries include every occupational death, every non-fatal occupational illness or injury which involves one or more of the following:

i. loss of consciousness,
ii. restriction of work or motion,
iii. transfer to another job, or
iv. medical treatment (not first-aid).

Refer to OSHA 29 CFR 1904. All trainees and apprentices are counted until titles are changed.

4.1.3 Calculation:

Monthly:

$$\frac{\text{No. of trainee or apprentice OSHA incidents in current month} * 200\,000}{\text{No. of trainees or apprentices in current month} * 170 \text{ hrs}}$$

YTD

$$\frac{\text{YTD Sum (No. of trainee or apprentice OSHAs)} * 200\,000}{\text{YTD Sum (No. of trainees or apprentices)} * 170 \text{ hrs}}$$

Whole Number

Total # of Osha Recordable Incidents for Trainees or Apprentices in a current month and YTD

4.1.4 Exceptions/Inclusions: These pertain to all organizations listed in Attachment A. Employees in an initial training program ONLY are included. Apprentices/Trainees in the OJT portion of training are also included until their OJT period has ended. Customer Operations for all utilities will be included.

Exceptions / Inclusions	BGE	ComEd	PECO	PHI
Excludes Engineers and Designers.	•	•	•	•
Excludes Information Technology.	•	•	•	•
Excludes Human Resources.	•	•	•	•

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Excludes Contracted Credit Center trainees.			•	•
Excludes Trainees for the DSO and TSO organizations.	•	•	•	•

4.1.5 Data Sources:

No. of OSHA incidents	Safety & Wellness data, Training database
No. of trainees/apprentices	Human Resources/ePeople

4.1.6 Goal/Target

i. </= the EOY target for OSHA Recordables for the associated utility.

ii. The projection methodology for Training at each utility should be matched with the projection methodology for Safety, with the goal identical to the Safety EOY goal for that facility.

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4.2. RVA percentage for trainees and apprentices in initial training

4.2.1 Metric Type: Monthly/YTD

4.2.2 EU Book/PI Book Definition: An RVA is a motor vehicle accident in which the driver failed to do everything that reasonably could be done to avoid the collision. The determination of preventability is based on criteria similar to that found in the National Safety Council's guide to Determine Motor Vehicle Accident Preventability. All trainees and apprentices will be counted until titles are changed.

4.2.3 Calculation:

Monthly: $$\frac{\text{No. of trainee \& apprentice RVAs in current month}}{\text{No. of trainees \& apprentices in current month}}$$

YTD $$\frac{\text{YTD Sum (No. of trainee \& apprentice RVAs)}}{\text{YTD Sum (No. of trainees \& apprentices)}}$$

4.2.4 Inclusions/Exceptions: These are shown in the table below:

Inclusions	BGE	ComEd	PECO	PHI
Includes trainees/apprentices in initial program that drive company vehicles.	•	•	•	•

Exceptions	BGE	ComEd	PECO	PHI
Excludes trainees/apprentices for the DSO and TSO organizations.	•	•	•	•
Excludes commuting accidents occurring in fleet vehicles.	•	•	•	•

4.2.5 Data Sources:

No. of RVA incidents	Safety & Wellness data
No. of trainees/apprentices	Human Resource /ePeople

4.2.6 Goal/Target

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i. 1%
ii. No projection to be included.

4.3. Effectiveness of Instruction

4.3.1 Metric Type: Monthly & YTD

4.3.2 EU Book/PI Book Definition: Training course effectiveness feedback as valued by the work force depicted as a percent rating based on questions scored 1-5 on the Level 1 evaluation.

4.3.3 Calculation:

Monthly: $$\frac{\text{Sum of scores obtained for questions 1C,2B,2C,and 4 on Level 1 evaluations}}{\text{No.of questions 1C,2B,2C,and 4 for which a numerical response was received}} \times 20$$

YTD $$\frac{\text{YTD Sum of scores obtained for questions 1C,2B,2C,and 4 on Level 1 evaluations}}{\text{YTD Sum (No.of questions 1C,2B,2C,and 4 for which a numerical response was received)}} \times 20$$

4.3.4 Exceptions/Inclusions:

Exceptions / Inclusions	BGE	ComEd	PECO	PHI
Includes ONLY classes greater than 4 hours in length with a “knowledge check”.	•	•	•	•
Contractors are not included	•	•	•	•

4.3.5 Data Sources:

Sum of scores (1C, 2B, 2C, and 4) — Level 1 Evaluations/ LMS030 Report

Total number of questions (1C, 2B, 2C, and 4) — Level 1 Evaluations/ LMS030 Report

4.3.6 Goal/Target: 90%; Threshold: 80%

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4.4. Average "Modified" LEVEL 3 Evaluation Rating "Training Sustainability"

4.4.1 Metric Type: Monthly/YTD

4.4.2 EU Book/PI Book Definition: This metric provides a means of evaluating the effectiveness of training, using trainee evaluations, within a 60-90 day period after training has been completed. It measures the transfer of knowledge, skills, and attitudes as a result of the Exelon Utilities training programs as well as the applicability of training to the work being performed.

4.4.3 Calculation:

Monthly: Count of evaluations done in current month

YTD: YTD Total evaluations

4.4.4 Exceptions/Inclusions:

Exceptions / Inclusions	BGE	ComEd	PECO	PHI
Contractors are not included	•	•	•	•

4.4.5 Data Sources:

Count of Evaluations Level 3 Evaluations

4.4.6 Goal/Target:
BGE/PECO have a goal of 1 evaluation per month.
ComEd has a goal of 2 evaluations per month.
The percentage is based on the percent to target, i.e. if ComEd does 1, their percentage is represented at 50% to target for the current month.

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4.5. Percentage of classes delivered vs. planned for all classes

4.5.1 Metric Type: Monthly & YTD

4.5.2 EU Book/PI Book Definition: This metric indicates the percentage of classes being delivered out of those that were planned. Classes are counted in sessions, which may be across a period (e.g., a week, with breaks in between).

4.5.3 Calculation:

Monthly: $$\frac{\text{No.of classes delivered (all classes)}}{\text{No.of classes planned (all classes)}} \times 100$$

YTD $$\frac{\text{YTD Sum (No.of classes delivered}-\text{all classes)}}{\text{YTD Sum (No.of classes planned}-\text{all classes)}} \times 100$$

4.5.4 Exceptions/Inclusions: N/A

4.5.5 Data Sources:

Classes delivered	LMS/Excel Document
Classes planned	LMS/Excel Document

4.5.6 Goal/Target: 90%

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4.6. Percentage of classes delivered vs. planned for Electric classes

4.6.1 Metric Type: Monthly & YTD

4.6.2 EU Book/PI Book Definition: This metric provides an indication of Electric Operations' ability to project the training required for the year as well as the ability of the Training department to execute that plan. Classes are counted in sessions, which may cut across a period (e.g., a week, with breaks in between).

4.6.3 Calculation:

Monthly:

$$\frac{\text{No.of classes delivered in current month} - \text{Electric operations}}{\text{No.of classes planned in current month} - \text{Electric operations}} \times 100$$

YTD

$$\frac{\text{YTD Sum (No.of classes delivered in current month} - \text{Electric operations)}}{\text{YTD Sum (No.of classes planned} - \text{Electric Operations)}} \times 100$$

4.6.4 Exceptions/Inclusions:

Exceptions / Inclusions	BGE	ComEd	PECO	PHI
Includes training of meter technicians.	•	•	•	•

4.6.5 Data Sources:

No. of classes delivered for Electric Operations	LMS/Excel Document
No. of classes planned for Electric Operations	LMS/Excel Document

4.6.6 Goal/Target: 90%

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4.7. Percentage of classes delivered vs. planned for Gas classes

4.7.1 Metric Type: Monthly & YTD

4.7.2 EU Book/PI Book Definition: This metric provides an indication of Gas Operations' ability to project the training required for the year as well as the ability of the Training department to execute that plan. Classes are counted in sessions, which may cut across a period (e.g., a week, with breaks in between).

4.7.3 Calculation:

Monthly:

$$\frac{\text{No.of classes delivered in current month}-\text{Gas operations}}{\text{No.of classes planned in current month}-\text{Gas operations}} \times 100$$

YTD

$$\frac{\text{YTD Sum (No.of classes delivered in current month}-\text{Gas operations}}{\text{YTD Sum (No.of classes planned}-\text{ Gas Operations}} \times 100$$

4.7.4 Exceptions/Inclusions:

ComEd does not have gas

4.7.5 Data Sources:

No. of classes delivered for Gas Operations	LMS/Excel Spreadsheet
No. of classes planned for Gas Operations	LMS/Excel Spreadsheet

4.7.6 Goal/Target: 90%

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PI Tiers 3 & 4 - Performance Indicator Procedure

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4.8. Percentage of classes delivered vs. planned for Customer Service

4.8.1 Metric Type: Monthly & YTD

4.8.2 EU Book/PI Book Definition: This metric provides an indication of Customer Service Operations' ability to project the training required for the year as well as the ability of the Training department to execute that plan. Classes are counted in sessions, which may cut across a period (e.g., a week, with breaks in between).

4.8.3 Calculation:

Monthly:

$$\frac{\text{No.of classes delivered in current month} - \text{Customer Service Operations}}{\text{No.of classes planned in current month} - \text{Customer Service Operations}} \times 100$$

YTD:

$$\frac{\text{YTD Sum (No.of classes delivered YTD} - \text{Customer Service operations}}{\text{No.of classes planned YTD} - \text{Customer Service Operations}} \times 100$$

4.8.4 Exceptions/Inclusions:

Exceptions / Inclusions	BGE	ComEd	PECO	PHI
Excludes training of meter technicians.	•	•	•	•

4.8.5 Data Sources:

No. of classes delivered for Customer Service Operations	LMS/Excel document
No. of classes planned for Customer Service Operations	LMS/Excel document

4.8.6 Goal/Target: 90%

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4.9. Level 1 Evaluation Rating: **Overall course quality & effectiveness of student instructions**

4.9.1 Metric Type: Monthly/YTD

4.9.2 EU Book/PI Book Definition: Overall student evaluation of training received

4.9.3 Calculation:

Monthly: $$\frac{\text{Sum of the scores obtained for all questions}}{\text{Total no.of questions for which a numerical response was received}} \times 20$$

YTD: $$\frac{\text{YTD Sum of the scores obtained for all questions}}{\text{YTD Sum (No.of questions for which a numerical response was received)}} \times 20$$

4.9.4 Exceptions/Inclusions:

Exceptions / Inclusions	BGE	ComEd	PECO	PHI
Evaluation will be delivered on classes > 4 hours in length.	•	•	•	•
Evaluation will be delivered on all LOTO training courses.	•	•	•	•
Contractors are not included	•	•	•	•

4.9.5 Data Sources:

Sum of scores for all questions	Level 1 Evaluations/LMS030 Report
Total No. of questions	Level 1 Evaluations/LMS030 Report

4.9.6 Goal/Target: 90%

*Denotes metrics not common to all Utilities

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4.10. Refresher training completion percentage

4.10.1 Metric Type: Monthly/YTD

4.10.2 EU Book/PI Book Definition: This metric is based upon the courses each utility has defined as Refresher training. This metric represents the ratio of completed Refresher training courses as compared to the total number of Refresher training courses planned for the year

4.10.3 Calculation:

Monthly: $$\frac{\text{Total Refresher courses completed in current month}}{\text{Total Refresher courses planned in current month}} \text{ X } 100$$

YTD: $$\frac{\text{YTD Sum of Refresher courses completed}}{\text{Total Refresher courses planned for the year}} \text{ X } 100$$

4.10.4 Exceptions/Inclusions:

Exceptions / Inclusions	BGE	ComEd	PECO	PHI
Employees on approved long or short term leave will be excluded	•	•	•	•

4.10.5 Data Sources:

Refresher courses completed	LMS/Excel Spreadsheet
Refresher courses planned	LMS/Excel Spreadsheet

4.10.6 Goal/Target:

i. EOY Goal is 98% (to cover new employees hired at year-end).
ii. Monthly, the YTD numbers should be increasing, but are based on the class schedule so an exact monthly on-track performance number is not available.

*Denotes metrics not common to all Utilities

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4.11. Percentage of employees that are out of compliance*

4.11.1 Metric Type: Monthly/YTD

4.11.2 EU Book/PI Book Definition: Given the number of Operator Qualification (OQ) tasks assigned to an individual employee within their profile, this metric indicates the expiration of employee qualifications beyond the grace period as it relates to specified tasks.

This metric indicates the number of employees with expired grace periods specified in the Operator Qualification program. For example, regarding data reported in May, employees performing tasks with a three month grace period prior to actual expiration are counted as falling out of date in February and out of compliance in May. For the same reporting period, employees performing tasks with a one month grace period prior to actual expiration are counted as falling out of date in April and out of compliance in May.

4.11.3 Calculation:

Monthly: $$\frac{\text{No.of employees that fell out of compliance for all assigned OQ tasks ONLY in current month}}{\text{No.of employees expected to be qualified for OQ in current month}} \times 100$$

YTD: $$\frac{\text{YTD No.of employees that fell out of compliance for all assigned OQ tasks}}{\text{No.of employees expected to be qualified for OQ YTD}} \times 100$$

4.11.4 Exceptions/Inclusions:

ComEd does not have Gas

Exceptions / Inclusions	BGE	PECO	PHI
Excludes employees on short/long term disability will be excluded	•	•	•

4.11.5 Data Sources:

No. Out Of Compliance	Hyperion LMS Report
No. expected to be qualified	Hyperion LMS Report

4.11.6 Goal/Target: 2%

*Denotes metrics not common to all Utilities

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4.12. Percentage of contractors that are out of compliance*

4.12.1 Metric Type: Monthly/YTD

4.12.2 EU Book/PI Book Definition: Given the number of Operator Qualification (OQ) tasks assigned to an individual contract employee within their profile, this metric indicates the expiration of contract employee qualifications beyond the grace period as it relates to specified tasks.

This metric indicates the number of contract employees with expired grace periods specified in the Operator Qualification program. For example, regarding data reported in May, contract employees performing tasks with a three month grace period prior to actual expiration are counted as falling out of date in February and out of compliance in May. For the same reporting period, contract employees performing tasks with a one month grace period prior to actual expiration are counted as falling out of date in April and out of compliance in May.

4.12.3 Calculation:

Monthly: $$\frac{\text{No.of contractors that fell out of compliance for all assigned OQ tasks ONLY in current month}}{\text{No.of contractors expected to be qualified for OQ in current month}} \times 100$$

YTD: $$\frac{\text{YTD No.of contractors that fell out of compliance for all assigned OQ tasks}}{\text{No.of contractors expected to be qualified for OQ YTD}} \times 100$$

4.12.4 Exceptions/Inclusions:

ComEd does not have gas

4.12.5 Data Sources:

No. Out Of Compliance	Hyperion LMS Report
No. expected to be qualified	Hyperion LMS Report

4.12.6 Goal/Target: 2%

*Denotes metrics not common to all Utilities

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4.13. Instructor observations completed

4.13.1 Metric Type: Monthly/YTD

4.13.2 EU Book/PI Book Definition: This metric provides Training Managers/Directors with an indication of the number of instructor observations for performance evaluation, in accordance with established expectations. Observations are carried out for each instructor, at least one time per first half (July 1st) and one time per second half of the year (December 31st). In each half of the year, multiple observations of an instructor are counted once.

4.13.3 Calculation:

Monthly: $\frac{\text{No.of unique instructors observed in current month}}{\text{Total no.of instructors on payroll in current month}}$ X 100

YTD: $\frac{\text{YTD Sum (No.of unique instructors observed)}}{2 * \text{Total no. of instructors on payroll}}$ X 100

4.13.4 Exceptions/Inclusions:

Exceptions / Inclusions	BGE	ComEd	PECO	PHI
Excludes contractors.	•	•	•	•
Includes every instructor reporting to the UT Department.	•	•	•	•
Excludes Instructional Designers/Support staff that do not deliver training.	•	•	•	•

4.13.5 Data Sources:

No. of unique instructors observed	A count of completed observation forms, sorted by month
Total no. of instructors	Human Resources/ePeople

4.13.6 Goal/Target: 50% complete by mid-year and 100% complete by year-end.

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5. Roles and responsibilities

5.1. CFAM

5.1.1 The Corporate Functional Area Manager provides governance and oversight, assuring consistency across EU Training and Qualification Functions, as it relates to the development of performance indicators and coordination of the submission process.

5.2. Responsible Executive

5.2.1 Drives continuous improvement through performance indicators. Typically a Vice President. Selects and approves Utility Functional Area Manager.

5.3. UFAM

5.3.1 Utility Functional Area Manager partners with other UFAMs, through participation in peer groups, for the development and coordination within a Utility.

5.4. PI Book Coordinator

5.4.1 The PI Book Coordinator generates and provides PI identification numbers. The Coordinator is also responsible for the upload of final and approved performance indicators for publishing on a monthly basis.

5.5. Metrics Coordinator

5.5.1 The metrics coordinator facilitates the collection and validation of data from various data sources and contact people for submission on a monthly basis.

6. Documentation

6.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

7. Terms and definitions

7.1. Apprentices:

7.1.1 Employee (New Hire) undergoing months of classroom and field instruction, leading to a specified discipline such as electric, gas, transmission, distribution, or substation.

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7.2. CFAM:

7.2.1 Corporate Functional Area Managers. An employee of Exelon Utilities who is responsible to drive consistency, best practices and innovation in the core Functions, perform audits of applicable Core Functions, report health of function at EU Staff meetings and serves as chair for Peer Groups.

7.3. Compliance Training:

7.3.1 Training sessions organized and implemented by the Utility Training group to ensure that field technicians are in compliance with regulatory requirements (e.g., OSHA, NERC) as it relates to specified tasks.

7.4. EU:

7.4.1 Exelon Utilities. This is the group which consists of BGE, ComEd, PECO and PHI. It was created to regulate best practices and enhance collaboration across the four utilities for the delivery of electricity and gas to customers.

7.5. HP:

7.5.1 Human Performance: All aspects of human action that is relevant to the safe operation of a hazardous task.

7.6. Initial Training:

7.6.1 Training that provides knowledge and skills required for individuals to safely and effectively perform tasks listed in the on a task list appropriate for a job, in an independent manner.

7.7. LMS:

7.7.1 Learning Management System: Software application for the record keeping and administration of courses or training programs and delivery of e-learning education courses.

7.8. LOTO:

7.8.1 Lock Out Tag Out. This is a safety procedure which entails the shutdown of machinery or equipment, to avoid the release of energy and thus mitigate hazards during service and maintenance operations.

7.9. OQ:

7.9.1 Operator Qualification. This is a Department of Transportation (DOT) required program to ensure a predefined level of competency for Gas Personnel as it relates to specific tasks.

7.10. OSHA:

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7.10.1 Occupational Safety and Health Administration. This is the primary federal agency charged with the enforcement of safety and health legislation in the United States.

7.11. PAG:

7.11.1 Performance Assessment Group, which is tasked with engaging Exelon employees in event free performance through commitment to human performance excellence.

7.12. PI:

7.12.1 Performance Indicators. These are a means through which the effectiveness of programs or operations within an organization can be quantified to align such an organization with its short and long term mission and vision.

7.13. Refresher Training:

7.13.1 This is training carried out to recall or reinforce previously acquired information or skills pertaining to gas and electric power delivery.

7.14. RVA:

7.14.1 Responsible Vehicle Accidents. An RVA is a motor vehicle accident in which the driver failed to do everything that reasonably could have been done to avoid the collision. The determination of preventability is based on criteria similar to that found in the National Safety Council's Guide to Determine Motor Vehicle Accident Preventability. Included in Rate: Commuting accidents occurring in Fleet vehicles.

7.14.2 These are accidents in which Exelon drivers are at fault. Examples includes collision with a stationary object or vehicle, failure to yield.

7.15. Trainees:

7.15.1 These are apprentices (see 7.1) at BGE.

7.16. UFAM:

7.16.1 A manager or above appointed by the sponsor and dotted lined to the corresponding Core Function CFAM, with oversight responsibility for a particular Core Function and all documents within. These responsibilities include Core Function health (Core Function metrics and PIs and health report out), Peer group participation (identify and champion best practices through Peer Group participation) and Controlled Documents. (Identify and manage SMEs and Document Writers, maintain UFAM PIs and identify, review, approve, submit and ensure accuracy and validity of all documents within their respective Core Function.

7.17. UT:

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7.17.1 Utility Training. This department is charged with the scheduling and delivery of quality, relevant training for the utility.

8. References

None

9. Attachments

Attachment A – List of Utility Training Clients

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PI Tiers 3 & 4 - Performance Indicator Procedure

Exelon Utilities Administrative Procedure

TQ-EU-1041

Revision No.: 3

10. Development history

Revision 0	**Date: 10/20/2014**
Writer	Dave Brzozowski, Julie Stewart
Reviewer(s)	Larry Burley, BGE Utility Training; George Michael Martin, ComEd Utility Training; Kim Keegan, PECO Utility Training; Julie Swart, Exelon Utilities Performance Assessment Manager
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Larry Burley, BGE Training; George Michael Martin, ComEd Training; Kim Keegan, PECO Training
Reason written	To document the Training Performance Indicator (PI) reporting requirements followed by all Exelon utilities in a controlled document

Revision 1	**Date: 5/1/2015**
Writer	Dave Deli, Dave Brzozowski
Reviewer(s)	Larry Burley, BGE Utility Training; Craig Chesley, ComEd Utility Training; Kim Keegan, PECO Utility Training;
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Larry Burley, BGE Utility Training; Craig Chesley, ComEd Utility Training; Kim Keegan, PECO Utility Training;
Reason written	To provide updates to the documentation of the Training Performance Indicator (PI) reporting requirements followed by all Exelon utilities in a controlled document

Revision 2	**Date: 6/30/2017**
Writer	Dave Deli, Dave Brzozowski

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Revision No.: 3

Revision 2	**Date: 6/30/2017**
Reviewer(s)	Larry Burley, BGE Utility Training; Craig Chesley, ComEd Utility Training; Kim Keegan, PECO Utility Training;
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Larry Burley, BGE Utility Training; G. Mike Martin, ComEd Utility Training; Kim Keegan, PECO Utility Training; Tyler White, PHI Utility Training
Reason written	To provide updates to the documentation of the Training Performance Indicator (PI) reporting requirements followed by all Exelon utilities in a controlled document. To Incorporate PHI.

Revision 3	**Date: 1/4/2018**
Writer	Charles Stanford, Distribution Field Engineering (ComEd)
Reviewer(s)	Larry Burley, Mgr Utility Trng (BGE); G. Michael Martin, Mgr Electric Ops Trng (ComEd); Kimberly Keegan, Mgr Trng Methods (PECO); Tyler White, Mgr Utility Trng (PHI)
Technical Approver(s)	N/A
Safety Approver(s)	N/A
UFAM Approver(s)	Larry Burley, Mgr Utility Trng (BGE); G. Michael Martin, Mgr Electric Ops Trng (ComEd); Kimberly Keegan, Mgr Trng Methods (PECO); Tyler White, Mgr Utility Trng (PHI)
Reason written	Removing reference to defunct ComEd dept ‘Distribution Testing’.

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Exelon Utilities Administrative Procedure

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Revision No.: 3

Attachment A

List of Utility Training Clients

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Utility Training Clients	BGE	ComEd	PECO	PHI
Transmission & Substation	•	•	•	•
Maintenance	•	•	•	•
Substation Shift Tech, Area Operator, Sub-Operator	•	•	•	•
Overhead Transmission	•	•	•	•
Underground Transmission		•		
Testing Group		•	•	•
Crew Leaders		•		•
First Line Supervisors Program		•		
Construction & Maintenance	•	•	•	•
Overhead Electrician, Aerial Line Mechanic	•	•	•	•
Underground Splicer	•	•	•	•
Service Operators, Overhead Electrician Specials (OESs), Troublemen	•	•	•	•
Special Services Group / Heavy Underground		•	•	•
Crew Leaders / Foreman		•		•
Gas Operations and Maintenance	•		•	•
Meter Services		•	•	•
Energy Techs, Senior Energy Techs		•	•	•
Meter Readers		•		
New Business Electric Distribution Designers	•	•	•	•

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Exelon Utilities Administrative Procedure

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New Business Gas Distribution Designers	•		•	•
Distribution Automation and Voltage Control	•	•		
Customer Care Representatives		•	•	

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Underground Splicer Training Program

Exelon Utilities Program
TQ-EU-P112
REV.1

Effective:	12/3/2019
Supersedes:	
Review Type:	3 Year
Core Function:	Training and Qualification

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1. Purpose

1.1 To establish the Underground Splicer training and qualification programs within Electric Ops, covering initial training and continuing training.

1.2 The programs are governed by the respective Training Advisory Committee and the Curriculum Review Committees (TAC/CRC)

2. Precautions and limitations

2.1. Precautions

2.1.1 OSHA 1910.269 Electric Power Generation, Transmission, and Distribution

2.2. Limitations

2.2.1 N/A

3. Prerequisites

3.1. N/A

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Underground Splicer Training Program

Exelon Utilities Program
TQ-EU-P112
REV.1

4. Program

4.1. SELECTION AND HIRING PROCESS

4.1.1 Candidates successfully meeting EU hiring criteria are required to:

4.1.1.1 Pass all entrance screening examinations (CAST Test)

4.1.1.2 Pass an Initial Hire Examination

4.1.1.3 Satisfactorily complete a structured interview with a hiring group representative. Results of the Initial Hire Examination will determine if the candidate is enrolled in the Advanced Hire Initial Training Program or is considered for placement in the Underground Splicer Initial Training and Qualification Program.

NOTE: For hiring practices that are currently governed by a union contract, refer to that document for specifics.

4.2. UNDERGROUND SPLICER INITIAL TRAINING AND QUALIFICATION PROGRAM

4.2.1 Initial training and evaluation consist of training on entry-level topics and tasks.

The training is performance based, and the evaluation is on knowledge and skills contained in the appropriate task groups.

The training will ensure that the candidate has demonstrated the skill and knowledge to safely and independently perform entry-level tasks and participate in the Underground OJT/OJQ process

4.2.2 EU Training personnel (supported/augmented by Electric Ops Line personnel) administer all progression training topics.

Training deemed necessary to meet Corporate or Industry Standards will be administered by EU Training personnel as required.

OJT training will be administered by EU Electric Ops personnel using line equipment and line personnel performing the training function.

(ComEd Only) Individuals who successfully complete Initial Splicer training will be assigned a unique Splicer ID# that they will use to affix to all primary joints that they make.

4.3. ADVANCED HIRE INITIAL PROCESS

4.3.1 Advanced hire initial training consists of:

4.3.1.1 Training on entry-level topics

4.3.1.2 Performance based evaluation on selected topics.

This training and evaluation combined with the results of the Advanced Hire Examinations ensures that fundamental knowledge and skills are present.

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Typically, C&M personnel with the help of EU instructors, administer the Advanced Hire Program.

4.3.2 Trainees will have a prescribed period to complete the Advanced Hire Program. Upon successful completion, candidates will receive additional training on specialty topics as appropriate.

Candidates who do not successfully complete the Advanced Hire Program training and evaluation within the prescribed time period will meet with a Performance Review Committee to determine if they will be retained in the program or released from employment.

4.4. CONTINUING TRAINING

4.4.1 Continuing training maintains and improves the performance level of personnel who have been qualified to independently perform tasks associated with Underground Splicing activities.

4.4.1.1 Required Topics—Required continuing training topics for the Underground Splicer disciplines

4.4.1.1.1 Are identified on Continuous Training Topics Matrix.

4.4.1.1.2 Are selected to meet corporate, industry, and OSHA standards and requirements.

4.4.1.2 Refresher Training—Refresher training topics for the listed disciplines may be extracted from initial and advanced training topics.

TAC/CRCs will review topics on an annual basis for topic selection and inclusion into Continuing Training.

The training may cover both theoretical as well as technical /hands on knowledge of the subject.

CRC reviews/other reviews will determine the format and methodology of the training to optimize the effectiveness.

Elimination of refresher training during a calendar year will require the approval of the respective Electric Ops VP(s)

Ongoing periodic training ensures the fundamental knowledge is maintained and enhanced by continuously refreshing core elements of the job in a challenging manner.

4.4.1.3 CRC Selected Topics—Additional continuing training topics are selected by each CRC in accordance with TQ-EU-Y003 Training and Qualification Process.

Topic selection is based on but not limited to the following areas:

Worker performance

New equipment or tools

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New or revised procedures

Industry Events

4.4.2 Continuing Training Hours

4.4.2.1 The number of hours of continuing training received by each trainee on an annual basis is determined by the continuing training content selection by the CRC/TAC.

4.5. TRAINING EXEMPTIONS

4.5.1 Training exemptions shall be

4.5.1.1 Conducted in accordance with the requirements of TQ-EU-P107 TSD Process Activities

4.5.1.2 Documented using TQ-EU-1039, Attachment TQ-EU-1039-2 OJT Training Waiver to Support Qualification Form.

4.6. INSTRUCTOR QUALIFICATIONS

4.6.1 Instructor and Subject-Matter Experts (SME) selection shall be in accordance with the requirements of TQ-EU-1039 Instructor Qualification.

4.6.2 The conduct of on the job training (OJT) and Task Performance Evaluation (TPE) shall be in accordance with the requirements of TQ-EU-1039 On-The-Job Training Administration and Evaluation Process

4.7. TRAINEE EVALUATION

4.7.1 Examinations are designed and constructed in accordance with the requirements of TQ-EU-P107 TSD Process Activities.

4.7.2 Program Pass/Fail standard criteria are as follows across EU Electric Ops, unless specific labor contracts or agreements specify otherwise.

4.7.2.1 The minimum passing criteria for all knowledge evaluations is 80%.

4.7.2.2 The minimum passing criteria for performance evaluations is detailed in the individual examination guides for each phase of progression examination.

4.7.2.3 Qualifications shall be removed/withheld for that task for the time of the initial failure until the remediation plan has been successfully completed.

4.8. REMEDIATION AND RE-EVALUATION

4.8.1 Remediation and re-evaluation shall be conducted in accordance with the requirements of TQ-EU-P107 TSD Process Activities.

4.8.2 A Performance Review Committee (PRC) shall be convened to determining qualification status, remediation, and re-evaluation methods/actions when any of the following occur:

4.8.2.1 Failure of a second consecutive knowledge or performance evaluation on the same topic/area.

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4.8.2.2 Failure to advance from one phase of progression training to the next.

4.9. PROGRAM MAINTENANCE

4.9.1 Program maintenance is performed in the TSD process in accordance with TQ-EU-P107 TSD Process Activities

4.9.2 The master task lists are reviewed at a minimum, on a two-year frequency in accordance with TQ-EU-P107 TSD Process Activities.

Results of the reviews are forwarded to the applicable training and line managers for review and disposition.

In addition to a formal task list revision, credit for task list revisions and review can be demonstrated through normal training reviews and documentation by the CRCs, this documentation should include follow-up items demonstrating that the appropriate program has been updated.

5. Roles and Responsibilities

5.1. EU Training and Line Organization responsibilities are outlined in TQ-EU-P117, “Training Adminstration Process”.

6. Documentation

6.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

7. Terms and Definitions

7.1. Climb School

7.1.1 A school that provides instruction in basic pole climbing techniques.

7.2. Continuing Training

7.2.1 Training that provides personnel with the knowledge and skill necessary to perform assigned duties independently in a safe, reliable, and efficient manner.

7.3. First Splicer School

7.3.1 Underground Splicer training that provides the basic knowledge and skills required for personnel to safely and effectively perform the all tasks associated with their job.

7.4. Master Task List

7.4.1 A list of tasks covering activities performed by Underground Splicers.

7.5. Second Splicer School

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7.5.1 Underground Splicer training that provides more advanced knowledge and skills required for personnel to safely and effectively perform the all tasks associated with their job.

7.6. Specialty Task Training

7.6.1 Advanced level Splicer training and associated training that provides the technical knowledge, skills and abilities required for personnel to safely and effectively perform the higher level tasks associated with the job that may or may not be required as a standard skill set of all Underground Splicer, such as Transmission joints and potheads

7.7. Splicer ID# (ComEd Only)

7.7.1 Skill related worker ID# assigned by Training after successful completion of splicer training and used to sign work product where necessary

7.8. Task to Training Matrix

7.8.1 A list of job tasks and the training that is required to perform each task.

7.9. Third Splicer School

7.9.1 Underground Splicer training that provides the training that enables splicers to make make more complex joints and to work on voltages from 120 to 34,000 volts in manholes, vaults, and on wooden poles.

7.10. Traditional Splicing School

7.10.1 Underground Splicer training that provides the knowledge and skills required for personnel to safely and effectively perform the all tasks associated with their job.

7.11. Training Systems Design (TSD)

7.11.1 The systematic training process by which an identified training need is analyzed, and the appropriate training is designed, developed, implemented, and evaluated (feedback) to support job performance and professional development.

8. References

8.1. LE-AC-401 – Records and Information Management Retention and Disposition..

8.2. TQ-EU-Y003 Training and Qualification Process

8.3. TQ-EU-1039 On-The-Job Training Process and On-The-Job Training and Evaluation

8.4. TQ-EU-P117 Instructor Qualification

8.5. TQ-ED-U105 Training Records

8.6. TQ-EU-P107 TSD Process Activities

9. Attachments

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Underground Splicer Training Program

9.1. None

10. Development history

Revision 0 TQ-ED-P112	**Date: 10/1/2004**
Writer	Dennis Knepper, Robert Warren
Reviewer(s)	Dennis Knepper, Robert Warren
UFAM Approver(s)	M.J. Roache
Reason written	To define the program to training and maintain qualification as an Underground Splicer within Construction and Maintenance.

Revision 1 TQ-ED-P112	**Date: 7/20/2007**
Writer	John Pietrucha (TQ)
Reviewer(s)	Tony Cameron - C&M Training; Bob Warren – T&S and Operating Training, Don Pellegrini (CM); Dan Gron (EP), Ken Bowman (PC), Bob Johnson (PC), Doreen Masalta (PC); Harry Laski (PC)
UFAM Approver(s)	Mike Pietrafitta
Reason written	To standardize the document number and format for this process and insert references to skill-related worker ID#s

Revision 2 TQ-ED-P112	**Date: 2/28/2011**
Writer	Mike Martin – ComEd Training
Reviewer(s)	Robert Crohan (C&M Training SPOC), Dan Galovich (C&M ComEd), Peter Singh (C&M PECO)
UFAM Approver(s)	Joe Gersna
Reason written	Periodic review

Revision 0 TQ-EU-P112	**Date: 12/9/2016**
Writer	Tim Jobes-ComEd Training
Reviewer(s)	Lawrence Czyzewski BGE, Mark Sappington PECO
UFAM Approver(s)	Mike Martin ComEd Training, Kim Keegan PECO Training, Larry Burley BGE Training, Tyler White PHI Training

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Underground Splicer Training Program

Exelon Utilities Program
TQ-EU-P112
REV.1

Revision 0 TQ-EU-P112	**Date: 12/9/2016**
Reason written	Procedure updated to EU, Moved to new template and updated references to new procedures.

Revision 1 TQ-EU-P112	**Date: 12/3/2019**
Writer	Patricia Batchelor- PECO Training
Reviewer(s)	Gina Wyatt, Norman Curtis
UFAM Approver(s)	Kim Keegan PECO Training, Larry Burley BGE Training, Dane Merkel PHI Training, Michael Meathe ComEd Training
Reason written	Updated Roles and Responsibilies section 5.1 to be consistent with the wording in the Overhead Construction Training Program Document.

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Substation Construction & Maintenance (SSC&M) Training Program

Exelon Utilities Program
TQ-EU-P114
Rev. 1

Effective:	7/24/2018
Supersedes:	N/A
Review Type:	3 Year
Core Function:	Training and Qualification

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1. Purpose

1.1. To provide guidelines for and describe the Substation Construction & Maintenance Mechanic training and qualification programs within T&S covering both initial training and continuing training.

1.1.1 The programs are governed by:

1.1.1.1 The respective Substation Construction & Maintenance (T&S) Department Leadership

1.1.1.2 T&S Training Advisory Committee (TAC)

1.1.1.3 T&S Curriculum Review Committees (CRC)

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Substation Construction & Maintenance (SSC&M) Training Program

Exelon Utilities Program
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1.2. Section 4 has been divided into the following subsections:

Subsection	Title	Page
4.4	Selection and Hiring Process	3
4.5	Substation Construction & Maintenance Mechanic Initial Training and Qualification Program	3
4.6	Advanced Hire Initial Process	3
4.6.1	Initial Training	3
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4.11	Remediation and Re-Evaluation	6
4.12	Program Maintenance	6

2. Precautions and limitations

2.1. Precautions

2.1.1 N/A

2.2. Limitations

2.2.1 Currently PHI uses contractors to perform this work. PHI will utilize this procedure if and when the work practices change.

3. Prerequisites

3.1. N/A

4. Program

4.1. Objective and Requirements

4.1.1 N/A

4.2. Compliance and Success Measures

4.2.1 N/A

4.3. Assumptions

4.3.1 N/A

4.4. Selection and Hiring Process

4.4.1 Candidates successfully meeting EU hiring criteria are required to

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4.4.1.1 Pass all entrance screening examinations (CAST Test)

4.4.1.2 Satisfactorily complete an Advanced Hire Examination

4.4.1.3 Satisfactorily complete a structured interview with a hiring group representative

Note: *Results of the Advanced Hire Examination will determine if the candidate is enrolled in the advanced hire initial training program or is considered for placement in Substation Construction & Maintenance Mechanic*

4.4.2 For hiring practices that are currently governed by a union contract, refer to that document for specifics.

4.5. Substation Construction & Maintenance Mechanical Initial Training and Qualification Program

4.5.1 Initial training and evaluation consists of training on entry-level topics and tasks. The training is performance based, and the evaluation is on knowledge and skills contained in the appropriate task groups.

The training will ensure that the candidate has demonstrated the skill and knowledge to safely and independently perform entry-level tasks.

4.5.2 EU Training personnel and supported/augmented by T&S Line personnel administer all progression training topics.
Training deemed necessary to meet Corporate or Industry Standards will be administered by EU Training personnel as required.

EU T&S personnel using line equipment and line personnel performing the training function will administer the OJT training.

4.6. Advanced Hire Initial Process (PECO Only)

4.6.1 Initial Training

4.6.1.1 Advanced hire initial training consists of training on entry level topics, self-study and evaluation on basic topics not covered in the Advanced Hire Exam and performance based evaluation on selected topics.

This training and evaluation, combined with the results of the Advanced Hire Examinations ensures that fundamental knowledge and skills are present. EU T&S personnel with the help of EU instructors, typically administer the advanced hire program.

4.6.1.2 Required Topics

4.6.1.2.1 Required continuing training topics for the Substation Construction & Maintenance Mechanic disciplines are identified in the Continuous Training Topics Matrix.

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4.6.1.2.2 These topics are selected to meet corporate, industry, and OSHA standards and requirements.

4.6.1.3 Refresher Training

4.6.1.3.1 Refresher training topics for the listed disciplines are extracted from initial and advanced training topics. CRC/TACs will review topics on an annual basis for topic selection and inclusion into Continuing Training

4.6.1.3.2 CRC/TACs will review topics on an annual basis for topic selection and inclusion into Continuing Training.

CRC reviews will determine the format and methodology of the training to optimize the effectiveness

4.6.1.3.3 Elimination of refresher training during a calendar year will require the respective T&S VP approval.

Note: *The ongoing periodic training ensures the fundamental knowledge is maintained and enhanced by continuously refreshing core elements of the job in a challenging manner.*

The training should cover both theoretical as well as technical /hands on knowledge of the subject.

4.6.1.4 CRC Selected Topics

4.6.1.4.1 Additional continuing training topics are selected by each CRC in accordance with TQ-EU-P117, Training Administration Process.

4.6.1.4.2 Topic selection is based on but not limited to the following areas:

4.6.1.4.2.1 Worker performance

4.6.1.4.2.2 New equipment or tools

4.6.1.4.2.3 New or revised procedures

4.6.1.4.2.4 Industry events

4.6.2 Continuing Training Hours

4.6.2.1 The number of hours of continuing training received by each trainee on an annual basis is determined by the continuing training content selection by the CRC.

4.7. Training Exemptions

4.7.1 Training exemptions shall be conducted in accordance with the requirements of TQ-EU-P107, Training Systems Development (TSD) Process, and documented using TQ-EU-1039-2 OJT Waiver Form.

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4.8. Instructor Qualifications

4.8.1 Instructor and Subject-Matter Experts (SME) used shall be in accordance with the requirements of TQ-EU-P117 Training Administration Process.

4.8.2 The conduct of on the job training (OJT) and Task Performance Evaluation (TPE) shall be in accordance with the requirements of TQ-EU-1039, On-The-Job Training (OJT) and On-the-Job Evaluation (OJE).

4.9. Trainee Evaluation

4.9.1 Examinations are designed and constructed in accordance with the requirements of TQ-EU-P107, Training Systems Development (TSD) Process.

4.10. Program Pass/Fail Standard Criteria

Note: *These are applied across EU SSC&M, unless specific labor contracts or agreements specify otherwise.*

4.10.1 The minimum passing criteria for all knowledge evaluations is 80%.

4.10.2 The minimum passing criteria for performance evaluations is detailed in the individual examination guides for each phase of progression examination.

4.10.3 Qualifications shall be removed/withheld for that particular task for the time of the initial failure until the remediation plan has been successfully completed.

4.11. Remediation and Re-evaluation

4.11.1 Remediation and re-evaluation shall be conducted in accordance with the requirements of TQ-EU-P107, Training Systems Development (TSD) Process.

4.11.2 A Performance Review Committee (PRC) shall be convened to determining qualification status, remediation, and re-evaluation Methods/actions when any of the following occur:

4.11.2.1 Failure of a second consecutive knowledge or performance evaluation on the same topic/area

4.11.2.2 Failure to progress from one phase of progression to the next.

4.12. Program Maintenance

4.12.1 Program maintenance is performed in the TSD process in accordance with TQ-EU-P107, Training Systems Development (TSD) Process.

4.12.2 The master task lists are reviewed at a minimum, on a two-year frequency in accordance with TQ-EU-P107, Training Systems Development (TSD) Process.

Results of the reviews are forwarded to the applicable training and line managers for review and disposition.

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In addition to a formal task list revision, credit for task list revisions and review can be demonstrated through normal training reviews and documentation by the CRCs, this documentation should include follow-up items demonstrating that the appropriate program has been updated.

5. Roles and Responsibilities

5.1. Managers

5.1.1 **ENSURE** compliance to this program.

5.2. Procedure Writers and Reviewers

5.2.1 **BE AWARE** that EU Training Group owns this program.

5.2.2 **BE AWARE** that EU Training Group subject matter expert and supervisors

5.2.2.1 Are accountable for the content of this program

5.2.2.2 Must review and approve any revisions to this program and applicable reference documents

5.2.3 ED Training and Line Organization

Note: *Refer to TQ-EU-P117, Training Administration Process*

5.3. Employees/Workers

5.3.1 All ED, contractor or vendor personnel performing work within the EU service area **SHALL COMPLY** with

5.3.1.1 This program

5.3.1.2 Safety Rule Book

5.3.1.3 Employee Code of Conduct

5.3.1.4 All other Corporate and EU policies, programs, procedures, and expectations appropriate to the work being performed.

6. Documentation

6.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

6.2. Training Records

6.2.1 Training records are maintained in accordance with TQ-EU-P105 Training Records Classification and Retention.

6.2.2 The current revision of the Task List and supporting documentation is available from the lead corporate or program instructor.

6.2.3 Program instructors are responsible for maintaining program/training material.

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6.2.4 Course Codes are used to identify and track Transmission and Substation/SSC training in the applicable training information tracking system or database.

6.2.5 Examination results and exam banks are available from the program instructor.

6.3. Training Schedule

6.3.1 Training dates for initial and continuing training are scheduled through CRC in accordance with training EU Training procedures and T&RMs.

6.3.2 EU line management and Training collaboratively coordinate training and qualification schedules.

7. Terms and Definitions

7.1. Five Day Qualification School

7.1.1 A school that provides instruction on climbing steel structures, substation techniques, confined space requirements, and safe work practices. (ComEd only)

7.2. Initial Training and Qualification

7.2.1 Training that provides knowledge and skills required for individuals to safely and effectively perform tasks on a task list appropriate for that job, in an independent manner.

7.3. Helper (ComEd)/3rd Class Technician (PECO)/SSC Technician Trainee (BGE) School

7.3.1 Entry-level Substation Construction & Maintenance Mechanic training that provides the knowledge and skills required for personnel to safely and effectively perform the elementary tasks associated with their job.

7.4. B Mechanic School (ComEd)/ 2nd Class Technician School (PECO)/ Substation Technician (BGE)

7.4.1 At the conclusion of this program the Helper (ComEd)/3rd Class Technician (PECO)/SSC Technician Trainee (BGE) is qualified as B Mechanics.
The B school instruction covers basic blueprint reading, conduit bending and installation, the use of basic devices, wiring, cable termination, vehicle and equipment operation, and electrical equipment maintenance.

7.5. B+ Mechanic School (ComEd only)

7.5.1 A school that provides instruction on live panel wiring, storm restoration, specialty tools, SF6 handling, transformer monitoring, and induced voltage detection. (ComEd only)

7.6. A Mechanic School (ComEd)/ 1st Class Technician School (Peco)/ Senior Substation Technician (BGE)

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7.6.1 Substation Construction & Maintenance Mechanic training that provides the technical knowledge, skills and abilities required for personnel to safely and effectively perform the higher level tasks associated with the job.
Completion of these schools qualifies the worker to perform work on all types of construction and maintenance with the exception of those skill considered specialty tasks.

7.7. Continuing Training

7.7.1 Training that provides personnel with the knowledge and skill necessary to perform assigned duties independently in a safe, reliable, and efficient manner.

7.8. Exemptions

7.8.1 A process that provides a means for evaluating and documenting previous training and/or experience that would allow a waiver of training in a particular area.

7.9. Master Task List

7.9.1 A list of tasks covering activities performed by Substation Construction & Maintenance Mechanics.

7.10. Specialty Task Training/Term School

7.10.1 Advanced level Substation Construction & Maintenance Mechanic training and associated training that provides the technical knowledge, skills and abilities required for personnel to safely and effectively perform the higher level tasks associated with the job that may or may not be required as a standard skill set of all Substation Construction & Maintenance Mechanics.

7.11. Task to Training Matrix

7.11.1 A list of job tasks and the training that is required to perform each task.

7.12. TSD (Training Systems Design)

7.12.1 The systematic training process by which an identified training need is analyzed, and the appropriate training is designed, developed, implemented, and evaluated (feedback) to support job performance and professional development.

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Substation Construction & Maintenance (SSC&M) Training Program

Exelon Utilities Program
TQ-EU-P114
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8. References

8.1. LE-AC-401 – Records and Information Management Retention and Disposition.

8.2. OSHA 1910.269

8.3. TQ-EU-P105 – Training Records Classification and Retention

8.4. TQ-EU-P107 – Training Systems Development (TSD) Process

8.5. TQ-EU-P117 – Training Administration Process

8.6. TQ-EU-1039 – On-The-Job Training (OJT) and On-the-Job Evaluation (OJE)

9. Attachments

9.1. TQ-ED-P114-1 Lessons Learned - Suggested Program Improvement

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Substation Construction & Maintenance (SSC&M) Training Program

Exelon Utilities Program
TQ-EU-P114
Rev. 1

10. Development history

Revision 0 (TQ-ED-P114)	**Date: 11/17/2005**
Writer	Deanne Steinmetz
Reviewer(s)	Ernest Sanchez, Robert Warren
UFAM Approver(s)	M.J. Roache
Reason written	To define the program to training and maintain qualification as an Transmission Underground Splicer within Transmission and Substation.

Revision 1 (TQ-ED-P114)	**Date: 11/20/2007**
Writer	John Pietrucha – C&M Training
Reviewer(s)	Tony Cameron - C&M Training , Bob Warren – T&S and Operating Training; Don Pellegrini (CM)
UFAM Approver(s)	Mike Pietrafitta
Reason written	To renumber and reformat as a Process and insert references to skill-related worker ID#s

Revision 2 (TQ-ED-P114)	**Date: 2/18/2011**
Writer	Mike Martin – ComEd Training
Reviewer(s)	Gus Ponce (ComEd T&S), Lori Cimaglia (ComEd T&S), Bob Pinto (PECO T&S), Darin Myers (T&S Training SPOC)
UFAM Approver(s)	Joe Gersna
Reason written	Periodic review

Revision 3 (TQ-ED-P114)	**Date: 5/20/2015**
Writer	Mike Smania – ComEd Training
Reviewer(s)	Tom Hornicak (ComEd T&S), Mike Martin (ComEd Training), Kim Keegan (PECO Training)
UFAM Approver(s)	Craig Chesley
Reason written	Add definitions for Five Day Qualification School and B+ School, and update procedure references

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Substation Construction & Maintenance (SSC&M) Training Program

Exelon Utilities Program
TQ-EU-P114
Rev. 1

Revision 4 (TQ-ED-P114)	**Date: 5/21/2015**
Writer	N/A
Reviewer(s)	N/A
UFAM Approver(s)	N/A
Reason written	Moved to new template; no content revisions included.

Revision 0 (TQ-EU-P114)	**Date: 11/2/2016**
Writer	Bara J. Hellman, Sr. Training Manager (PECO)
Reviewer(s)	Lawrence Czyzewski, Sr. Methods Specialist (BGE) ; Joseph Glowacki, Training Manager (ComEd)
UFAM Approver(s)	Larry Burley (BGE); Michael Martin (ComEd); Kimberly Keegan (PECO); Tyler White (PHI)
Reason written	Inclusion of BGE and moved to EU template.

Revision 1	**Date: 7/24/2018**
Writer	Dawn Owens, Training Manager, (ComEd)
Reviewer(s)	Joe Maly, Sr Training Specialist, (ComEd), Dave Brzozowski, Training Manager, (BGE) ; Patricia Batchelor, Training Manager (PECO), Christopher Archibald, Training Supervisor (BGE), Nick Lorde, Sr Training Specialist (PECO), Andrew Vahey, Training Manager, (DPL)
UFAM Approver(s)	Larry Burley (BGE); Michael Martin (ComEd); Kimberly Keegan (PECO); Anthony Harmon, (PHI)
Reason written	Minor edits. Removed Section 4.6.1.2 (PECO Only). Restructured Section 7 in progression order and defined entry-level job class per OpCo. Applied edit to limitation Section 2.2.1 to read: Currently PHI uses contractors to perform this work. PHI will utilize this procedure if and when the work practices change

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Substation Construction & Maintenance (SSC&M) Training Program

Exelon Utilities Program
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Attachment TQ-ED-P114-1
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Lessons Learned - Suggested Program Improvement
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Prog Line #	Topic	Revision / insertion / deletion

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Training Program

Exelon Utilities Program
TQ-EU-P128
Rev. 3

Effective:	10/29/2019
Supersedes:	TQ-ED-P128
Review Type:	3 Year
Core Function:	Training and Qualification

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Training Program

Exelon Utilities Program
TQ-EU-P128
Rev. 3

1. Purpose

The Training Program describes the training and qualification program for Exelon Utilities Employees. The programs consist of initial Training, Continuing Training, Emergent Training, and Targeted Training. The programs are owned by sustaining sponsors and governed by the Exelon Utility Training Advisory and Curriculum Review Committee(s).This program is applicable to all Exelon Utilities.

2. Precautions and limitations

2.1. Precautions

2.1.1 None

1.1. Limitations

2.1.2 None

3. Prerequisites

3.1. None

4. Program

4.1. Objective and Requirements

- The objective of the Training Program is to define what training is required prior to an employee being qualified to perform work independently, to establish ownership for tasks required for the program and to define how the program will be evaluated/measured and documented.

4.2. Compliance and Success Measures

Training Programs shall include the following areas in the main body:

- Prerequisites for admission to a training program shall be listed, if applicable.
- Initial Training and Qualification - A description of the initial training process defining the sequence, scope, and normal duration. A task to training matrix should be created for each training program and stored on the Utility Training website.
- The advanced hire process, if used, shall be described, including the methodology for determining the level where individuals enter the training cycle and/or how they are qualified to perform independently.

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- Continuing Training shall be described, if used, and where applicable, a list of topics and their periodicity should be provided.
- If training exemptions or waivers are to be allowed, the method for evaluating previous training and granting exemptions shall be fully described.
- The method used to evaluate trainees shall be defined. The criteria for pass/fail shall be listed, and the process for remediation and re-evaluation shall be defined.
- Event Free Performance Tools (EFPTs) shall be incorporated in training curriculum. Trainees evaluations/qualification should include a competence demonstration in the use of EFPTs. A trained and qualified employee should be proficient in understanding and use of the *Event Free Performance Tools* to recognize and address error-likely situations, thereby preventing adverse events.
- The documentation and record-keeping process shall be described within the Training Program.
- Scheduling responsibilities shall be described within the Training Program.
- References used in the generation of the Training Program document shall be listed in the appropriate section.
- Attachments used to provide additional information in the document shall be listed in the appropriate section and become part of the Training Program document.

4.3. Assumptions

4.3.1 None

5. Roles and Responsibilities

5.1. Line and Training department responsibilities are outlined in TQ-ED-P117, “Training Administration Process”.

6. Documentation

6.1. Training programs shall be posted to the Management Model Document Hierarchy and shall be reviewed at least every three years.

6.2. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

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7. Terms and Definitions

7.1. Advanced Hire Process:

7.1.1 A process that describes a methodology for bringing a worker into a job scenario at a level above the initial new hire based on previous experience or documented training.

7.2. Continuing Training:

7.2.1 Training that maintains skills, meets regulatory requirements, and improves the performance levels of job incumbents previously qualified to perform independently.

7.3. Exemptions:

7.3.1 A process that provides a means for evaluating and documenting previous training and/or experience that would allow a waiver of training in a particular area.

7.4. Initial Training and Qualification

7.4.1 Training that provides knowledge and skills required for individuals to safely and effectively perform tasks listed on a task list appropriate for that job, in an independent manner.

7.5. Task List:

7.5.1 A list of all tasks performed by personnel within a specific job classification.

7.6. Task to Training Matrix:

7.6.1 A cross-reference that compares tasks to the training that is required to assure an individual is qualified to perform the task.

7.7. Waiver of Training:

7.7.1 A process that takes advantage of previous training and/or experiences and enables line managers to grant qualification based on an employee's skills, rather than requiring an individual to complete the otherwise required training.

8. References

8.1. LE-AC-401 – Records and Information Management Retention and Disposition.

8.2. TQ-ED-P117 -Training Administration Process

9. Attachments

9.1. None

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Exelon

Training Program

Exelon Utilities Program
TQ-EU-P128
Rev. 3

10. Development history

Revision 0	**Date 06/28/2011**
Writer	Julie Swart, ComEd Training Manager
Reviewer (s)	Julie Snow, ComEd Training Manager, Mark Hackney, PECO Training Manager
Approver(s)	Joe Gersna, ComEd Director, Distribution Training, Dave MacFarland, PECO Manager Training, Methods, PA and QA
Reason Written	Reviewed in accordance with the document hierarchy review process and transferred to the appropriate document hierarchy template.

Revision 1	**Date 08/20/2014**
Writer	Annette Marshall-Craig, Sr. Training Specialist (PECO), Charon Walker-Brown, Sr. Training Specialist (BGE)
Reviewer (s)	Sheilah Caton, Manager, Customer Operations Training (PECO), Terry Olivi Manager, Customer Operations Training (ComEd), Mark Dolle, Manager Technical Training (BGE)
Approver(s)	Kimberly Keegan Manager, Methods, Training (PECO), Mike Martin, Director, Utility Training (ComEd), John Horner, Director Utility Training (BGE)
Reason Revised	TQ-ED-P128 was reformatted to comply with EU standard.

Revision 2	**Date 02/22/2016**
Writer	Harris, Kevin B
Reviewer (s)	Burley, Larry:(BGE); Chesley, Craig A:(ComEd); Keegan, Kimberly:(PECO); Martin, G Michael M:(ComEd); Sullivan, William J:(Exelon Utilities); Brzozowski, Dave E:(BGE)
Approver(s)	Kimberly Keegan Manager, Methods, Training (PECO), Mike Martin, Director, Utility Training (ComEd), John Horner, Director Utility Training (BGE)
Reason Revised	TQ-ED-P128 an item was added to section 4.2 regarding Event Free Performance Tools.

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Training Program

Exelon Utilities Program
TQ-EU-P128
Rev. 3

Revision 3	**Date: 10/29/2019**
Writer	Dane Merkel, Manager Utility Training (PHI)
Reviewer(s)	Kimberly Keegan Manager, Training & Methods (PECO), Eduardo Suarez, Manager, Elec Ops Training & Methods (ComEd), Larry Burley, Manager Utility Training (BGE), Dane Merkel, Manager Utility Training (PHI)
UFAM Approver(s)	Kimberly Keegan Manager, Training & Methods (PECO), Eduardo Suarez, Manager, Elec Ops Training & Methods (ComEd), Larry Burley, Manager Utility Training (BGE), Dane Merkel, Manager Utility Training (PHI)
Reason written	Align PHI to this procedure.

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Overhead Electrician Special / Troubleman / Service Operator Training Program

Exelon Utilities Program
TQ-EU-P133
Rev. 1

Effective:	12/4/2018
Supersedes:	TQ-ED-113
Review Type:	3 Year
Core Function:	Training and Qualification

This document applies to BGE, ComEd and PECO only. PHI integration is in progress and this disclaimer will be removed when PHI has been incorporated.

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Overhead Electrician Special / Troubleman / Service Operator Training Program

Exelon Utilities Program
TQ-EU-P133
Rev. 1

1. Purpose

This Training Program description describes the Overhead Electrician Special / Troubleman / Service Operator training and qualification programs within Distribution System Operations (DSO). The programs consist of initial training and continuing training. The programs consist of initial training and continuing training. The programs are owned by the respective overhead distribution department leadership, and are governed by the respective Training Councils and the Curriculum Review Committees (TC/CRC).

2. Precautions and limitations

2.1. Precautions

2.1.1 None

1.1. Limitations

2.1.2 None

3. Prerequisites

3.1. *OSHA 1910.269 – Electric Power Generation, Transmission, and Distribution*

4. Program

4.1. Overhead Electrician Special / Troubleman / Service Operator Initial Training and Qualification Program

4.1.1 Initial training and evaluation consists of training on entry-level topics and tasks. The training is performance based, and the evaluation is on knowledge and skills contained in the appropriate task groups. The training will ensure that the candidate has demonstrated the skill and knowledge to safely and independently perform entry-level tasks.

4.1.2 EU Training personnel, supported/augmented by line personnel, administer all training topics. Training deemed necessary to meet Corporate or Industry Standards will be administered by ElectricTraining personnel as required. OJT training will be administered by line personnel.

4.1.3 Continuing training maintains and improves the performance level of personnel who have been qualified to independently perform tasks associated with troubleshooting activities.

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4.1.3.1 Required Topics—Required continuing training topics for the overhead construction disciplines are identified in the Master Task List These topics are selected to meet corporate, industry, and OSHA standards and requirements.

4.1.3.2 Refresher Training—Refresher training topics for the listed disciplines are extracted from initial and advanced training topics. CRC/TCs will review topics on an annual basis for topic selection and inclusion into Continuing Training. CRC reviews will determine the format and methodology of the training to optimize the effectiveness. Diagnostic testing may be used to narrow the scope of or eliminate the need to perform refresher training. Elimination of refresher training during a calendar year will require the respective VP approval. The ongoing periodic training ensures the fundamental knowledge is maintained and enhanced by continuously refreshing core elements of the job in a challenging manner. The training should cover both theoretical as well as technical /hands on knowledge of the subject.

4.1.3.3 CRC Selected Topics—Additional continuing training topics are selected by each CRC in accordance with *TQ-EU-P117 – Training Administration Process*. Topic selection is based on but not limited to the following areas:

4.1.3.3.1 Worker performance

4.1.3.3.2 New equipment or tools

4.1.3.3.3 New or revised procedures

4.1.3.3.4 Industry Events

4.1.4 Continuing Training Hours

4.1.5 The number of hours of continuing training received by each trainee on an annual basis is determined by the line and training organizations and approved by executive leadership.

4.2. Training Exemptions

4.2.1 Training exemptions shall be conducted in accordance with the requirements of *TQ-EU-P107 – Training Systems Development (TSD) Process*, and documented using using the OJT Waiver Form contained within TQ-EU-1039 – On The Job Training and On The Job Evaluation Procedure (TQ-EU-1039-2).

4.3. Instructor Qualifications

4.3.1 Instructor and Subject Matter Experts (SME) use shall be in accordance with the requirements of *TQ-EU-P117 – Training Administration Process*.

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4.3.2 The conduct of on the job training (OJT) and On The Job Evaluation (OJE) shall be in accordance with the requirements of *TQ-EU-1039 – On The Job Training and On The Job Evaluation Procedure*.

4.4. Trainee Evaluation

4.4.1 Knowledge examinations are designed and constructed in accordance with the requirements of *TQ-EU-P107 – Training Systems Development (TSD) Process*.

4.4.2 Program Pass/Fail standard criteria are as follows across EU line organizations, unless specific labor contracts or agreements specify otherwise.

4.4.2.1 The minimum passing criteria for all knowledge evaluations is 80%.

4.4.2.2 The minimum passing criteria for performance evaluations is detailed in the individual examination guides for each phase of examination.

4.4.2.3 Qualifications shall be removed/withheld for that particular task for the time of the initial failure until the remediation plan has been successfully completed.

4.5. Remediation and Re-Evaluation

4.5.1 Remediation and re-evaluation shall be conducted in accordance with the requirements of *TQ-EU-P107 – Training Systems Development (TSD) Process*.

4.5.2 A Performance Review Committee (PRC) shall be convened to determining qualification status, remediation, and re-evaluation Methods/actions when any of the following occur:

4.5.2.1 Failure of a second consecutive knowledge or performance evaluation on the same topic/area.

4.5.2.2 Failure to progress in knowledge and skills from one phase of to the next

4.6. Program Maintenance

4.6.1 Program maintenance is performed in the TSD process in accordance with *TQ-EU-P107 – Training Systems Development (TSD) Process*.

4.6.2 The master task lists are reviewed at a minimum, on a two-year frequency in accordance with *TQ-EU-P107 – Training Systems Development (TSD) Process*. Results of the reviews are forwarded to the applicable training and line managers for review and disposition. In addition to a formal task list revision, credit for task list revisions and review can be demonstrated through normal training reviews and documentation by the CRCs, this documentation should include follow-up items demonstrating that the appropriate program has been updated

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5. Roles and Responsibilities

5.1. EU Training and Line Organization responsibilities are outlined in *TQ-EU-P117 – Training Administration Process*.

6. Documentation

6.1. Training Records

6.1.1 Training records are maintained in accordance with *TQ-EU-P105 – Training Records Classification and Retention Process.*

6.1.2 The current revision of the Task List and supporting documentation is available from the lead corporate or program instructor.

6.1.3 Program instructors are responsible for maintaining program/training material.

6.1.4 Course Codes are used to identify and track Overhead Electrician Special/Troubleman/Service Operator training in the applicable training information tracking system or database.

6.2. Training Schedule

6.2.1 Training dates for initial and continuing training are scheduled through EU Training and approved by the line organizations.

6.2.2 EU Training under the direction of EU line management coordinates training and qualification

7. Terms and Definitions

7.1. Continuing Training

7.1.1 Training that provides personnel with the knowledge and skill necessary to perform assigned duties independently in a safe, reliable, and efficient manner.

7.2. Overhead Electrician Special (OES) / Troubleman / Service Operator Program

7.2.1 The program requires formal classroom instruction and demonstration and structured, on-the-job (OJT) training to reinforce the classroom instruction.

7.3. Task to Training Matrix

7.3.1 A list of job tasks and the training that is required to perform each task.

7.4. Training Systems Design (TSD)

7.4.1 The systematic training process by which an identified training need is analyzed, and the appropriate training is designed, developed, implemented, and evaluated (feedback) to support job performance and professional development.

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Overhead Electrician Special / Troubleman / Service Operator Training Program

Exelon Utilities Program
TQ-EU-P133
Rev. 1

8. References

8.1. OSHA 1910.269 – Electric Power Generation, Transmission, and Distribution

8.2. TQ-EU-1039 – On The Job Training and On The Job Evaluation Procedure

8.2.1 TQ-EU-1039-2 – OJT Waiver Form

8.3. TQ-EU-P105 – Training Records Classification and Retention Process

8.4. TQ-EU-P107 – Training Systems Development (TSD) Process

8.5. TQ-EU-P117 – Training Administration Process

8.6. DOE-HDBU-107495 – Alternative Systematic Approaches to Training

9. Attachments

9.1. None.

10. Development history

Revision 0	**Date: 11/24/2015**
Writer	Tim Jobes, ComEd Training Manager
Reviewer(s)	Rodney Walker PECO, Sr. Training Specialist, Craig Menzel BGE Training Manager.
Approver(s)	Craig Chesley, (Director-Training ComEd), Kim Keegan, (Manager-Training PECO), Larry Burley, (Manager-Training BGE)
Reason Written	To define the program to training and maintain qualification as an Overhead Electrician Special/Troubleman within DSO.

Revision 1	**Date: 12/3/2018**
Writer	G. Wyatt, BGE Training Manager, Electric;
Reviewer(s)	N. Curtis, ComEd Training Manager; P. Batchelor, PECO Training Manager
UFAM Approver(s)	L. Burley, Manager, BGE Utility Training; G. Senbetta, Director, ComEd Utility Training; K. Keegan, Manager, PECO Training Methods PA & QA; A. Harmon, Manager, DPL Training;
Reason written	Routine update – removed progression; changed EED to Electric

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Area/Substation Operator Training Program

Exelon Utilities Program
TQ-EU-P1041
Rev. 0

Effective:	10/29/2019
Supersedes:	TQ-EU-1036
Level:	3
Review Type:	3 Year
Core Function:	Training and Qualification

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1. Purpose

To provide guidelines for Area Operator / Substation Operator training and qualification programs within EU. The programs consist of initial training and continuing training. The programs are owned by the respective Transmission Distribution System Organizations and are governed by the respective Training Advisory Committee and the Curriculum Review Committees (CRC/TAC).

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Exelon

Area/Substation Operator Training Program

Exelon Utilities Program
TQ-EU-P1041
Rev. 0

2. Precautions and limitations

2.1. Precautions

2.1.1 N/A

2.2. Limitations

2.2.1 This document applies to BGE, ComEd and PECO only. PHI integration is in progress and this disclaimer will be removed when PHI has been incorporated.

3. Prerequisites

3.1. N/A

4. Program

4.1. Selection and Hiring Process

4.1.1 Candidates must successfully meet all hiring criteria required for this position.

Note: For hiring practices governed by a union contract, refer to that document for specifics.

4.2. Area Operator / Substation Operator Initial Training and Qualification Program

4.2.1 Initial training and evaluation consists of training on entry-level topics and tasks. The training is performance based, with evaluations based on knowledge and skills appropriate to the task groups. The training will ensure that the candidate has demonstrated the skill and knowledge to safely and independently perform entry-level tasks.

4.2.2 EU Training personnel, supported/augmented by line personnel, administer all progression training topics. OJT training will be administered by line personnel.

4.3. Advanced Hire Initial Process (PECO Only)

4.3.1 Advanced hire initial training consists of training on advanced level topics, self-study and evaluation on basic topics not covered in the Advanced Hire Exam and performance based evaluation on selected topics. This training and evaluation, combined with the results of the Advanced Hire Examinations ensures that advanced knowledge and skills are present. Line personnel with the help of EU instructors, typically administer the advanced hire program.

4.3.2 Trainees will have a definitive timeline based on the training criteria to complete the advanced hire program. Upon successful completion, candidates will receive additional training on specialty topics as appropriate. Candidates who do not successfully complete the advanced hire program training and evaluation within the prescribed period of time will meet with a Performance Review Committee to determine if they will be retained in the program or released from employment.

4.4. Continuing Training

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4.4.1 Continuing training maintains and improves the performance level of personnel who have been trained to independently perform tasks and troubleshooting associated with Area/ Substation Operator activities. Required Topics—required continuing training topics are selected to meet corporate, industry, and OSHA standards and requirements. Topics are included to meet business needs, new technology, and Lessons Learned.

4.4.2 Refresher Training—Refresher training topics for the listed disciplines are extracted from initial and advanced training topics. CRC/TACs will review topics on an annual basis for topic selection and inclusion into Continuing Training. CRC reviews will determine the format and methodology of the training to optimize the effectiveness. Diagnostic testing may be used to narrow the scope of or eliminate the need to perform refresher training. Elimination of refresher training during a calendar year will require the respective VP approval. The ongoing periodic training ensures the fundamental knowledge is maintained and enhanced by continuously refreshing core elements of the job in a challenging manner. The training should cover both theoretical as well as technical /hands on knowledge of the subject.

4.4.3 CRC Selected Topics—Additional continuing training topics are selected by each CRC in accordance with TQ-EU-P117, "*Training Administration Process*." Topic selection is based on but not limited to the following areas:

4.4.3.1 Worker performance

4.4.3.2 New equipment or tools

4.4.3.3 New or revised procedures

4.4.3.4 Industry Events

4.4.4 Continuing Training Hours

4.4.4.1 The number of hours of continuing training received by each trainee on an annual basis is determined by the continuing training content selection by the CRC.

4.5. Training Exemptions

4.5.1 Training exemptions shall be conducted in accordance with the requirements of TQ-EU-P107, TSD Activities, and documented usingTQ-EU-1039-2, "*OJT Waiver Form*."

4.6. Instructor Qualifications

4.6.1 Instructor and Subject Matter Experts (SME) use shall be in accordance with the requirements of TQ-EU-P117, "*Training Administration Process*."

4.6.2 The conduct of on the job training and On The Job Evaluation (OJE) shall be in accordance with the requirements of TQ-EU-1039, "*On-the-Job Training (OJT) and On-the-Job Evaluation (OJE) Procedure*."

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4.7. Trainee Evaluation

4.7.1 Knowledge examinations are designed and constructed in accordance with the requirements of TQ-EU-P107, "*Training Systems Development (TSD) Process.*"

4.7.2 Program Pass/Fail standard criteria are as follows across EU line organizations, unless specific labor contracts or agreements specify otherwise.

4.7.2.1 The minimum passing criteria for all knowledge evaluations is 80%.

4.7.2.2 The minimum passing criteria for performance evaluations is detailed in the individual examination guides for each phase of progression examination.

4.7.2.3 Qualifications shall be removed/withheld for that particular task for the time of the initial failure until the remediation plan has been successfully completed.

4.8. Remediation and Re-evaluation

4.8.1 Remediation and re-evaluation shall be conducted in accordance with the requirements of TQ-EU-P107, "*Training Systems Development (TSD) Process*."

4.8.2 A Performance Review Committee (PRC) shall be convened to determining qualification status, remediation, and re-evaluation Methods/actions when any of the following occur:

4.8.2.1 Failure of a second consecutive knowledge or performance evaluation on the same topic/area

4.8.2.2 Failure to progress from one phase of progression to the next.

4.9. Program Maintenance

4.9.1 Program maintenance is performed in the TSD process in accordance with TQ-EU-P107, "Training Systems Development (TSD) Process."

4.9.2 The master task lists are reviewed at a minimum, on a two-year frequency in accordance with TQ-EU-P107, Training Systems Development (TSD) Process. Results of the reviews are forwarded to the applicable training and line managers for review and disposition. In addition to a formal task list revision, credit for task list revisions and review can be demonstrated through normal training reviews and documentation by the CRCs. This documentation should include follow-up items demonstrating that the appropriate program has been updated.

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5. Roles and responsibilities

5.1. EU Training and Line Organization

5.1.1 EU Training and Line Organization responsibilities are outlined in TQ-EU-P117, "*Training Administration Processs*."

5.1.2 Maintain and coordinate training schedule and qualification

5.2. CRC

5.2.1 The CRC is responsible for maintaining the training schedule (initial and continuing) and developing initial and continuing training and qualification

6. Documentation

6.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

6.2. Training Records

6.2.1 Training records are maintained in accordance with TQ-EU-P105, "*Training Records Classification and Retention Process.*"

6.2.2 The current revision of the Training Records Inventory is available from the Business Unit Lead and Records Manager.

6.2.3 Program instructors are responsible for maintaining program/training material.

6.2.4 Course Codes are used to identify and track Area/Substation Operator training in the applicable training information tracking system or database.

6.2.5 Examination results and exam banks are available from the program instructor.

7. Terms and definitions

7.1. Continuing Training

7.1.1 Training that provides personnel with the knowledge and skill necessary to perform assigned duties independently in a safe, reliable, and efficient manner.

7.2. Initial Training

7.2.1 Training on entry level topics and tasks specific to the job position.

7.3. Task to Training Matrix

7.3.1 A list of job tasks and the training that is required to perform each task.

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Area/Substation Operator Training Program

Exelon Utilities Program
TQ-EU-P1041
Rev. 0

8. References

8.1. LE-AC-401 – Records and Information Management Retention DispositionLE-AC-401 – Records and Information Management Retention and Disposition.

8.2. 29 CFR OSHA 1910.269, “Electric Power Generation, Transmision, and Distribution”

8.3. TQ-EU-1039, ”On The Job Training and On The Job Evaluation Procedure”

8.4. TQ-EU-1039-2, “OJT Waiver Form”

8.5. TQ-EU-P105, “Training Records Classification and Retention Process”

8.6. TQ-EU-P107, Training Systems Development (TSD) Process”

8.7. TQ-EU-P117, ”Training Administration Process”

9. Attachments

9.1. N/A

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Area/Substation Operator Training Program

Exelon Utilities Program
TQ-EU-P1041
Rev. 0

10. Development history

Revision 0 TQ-ED-1036	**Date: 10/1/2004**
Writer	Jan Clark, Marty Koelper
Reviewer(s)	Robert Warren
UFAM Approver(s)	M.J. Roache
Reason written	To define the program to training and maintain qualification as an Area Operator / Substation Operator within DSO.

Revision 1 TQ-ED-1036	**Date: 4/30/2011**
Writer	Mike Martin
Review(ers)	
UFAM Approver(s)	Joe Gersna
Reason written	3 yr review, updated department titles and definitions

Revision 0 TQ-EU-1036	**Date: 10/28/2016**
Writer	Patricia Batchelor, PECO, Mgr Training
Reviewer(s)	Lawrence Czyzewski, BGE, Sr. Methods Specialist; Joseph A. Glowacki, ComEd, Mgr Training
UFAM Approver(s)	UFAM Name, core function and title
Reason written	Inclusion of BGE, three year review, update of procedure so its in alignment with other EU procedures.

Revision 0 TQ-EU-P1041	**Date: 10/29/2019**
Writer	Dawn Owens, Mgr Training
Reviewer(s)	Dave Brzozowski, BGE, Mgr Training; Sheila Caton, PECO, Mgr Training; Dane Merkel & Anhony Harmon, PHI, Mgrs Training; Lorde Nock, PECO, Sr Trng Specialist
CFAM/ UFAM Approver(s)	Kim Keegan/PECO UFAM; Dane Merkel/PHI UFAM, Eduardo Suarez/ ComEd UFAM; Larry Burley/BGE UFAM and Lorinda Alms/EU CFAM
Reason written	Upon three year review, identified that the Program number was incorrect. New program number obtained = P 1041. TQ-EU-1036 document was archieved. PHI integration is still in progress. The program will be revised when PHI Area Operator / Substation Operator program is defined and ready to be integrated.

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Training and Qualification Policy

Exelon Utilities Policy

TQ-EU-Y003
Rev. 3

Effective:	12/12/2019
Supersedes:	TQ-ED-Y003
Review Type:	3 Year
Core Function:	Training and Qualification

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Training and Qualification Policy

Exelon Utilities Policy

TQ-EU-Y003
Rev. 3

1. Policy Statement

Training and Qualification core function will adhere to systematic training practices, industry standards and Utility safety rules, regulations and procedures. Training shall be provided to address initial, compliance, progression and continuing skill and knowledge requirements. All training will encompass safety skills and knowledge including but not limited to recognizing and mitigating job hazards. Accountability for ensuring an employee is current with training and has completed required training on time is the responsibility of the employee. Training records shall be retained.

2. Policy Intent

2.1. Provide guidance to Exelon Utilities regarding services associated with the Training and Qualifications core function.

2.2. Ensure Training and Qualification development and delivery services are consistent across all utilities.

2.3. Communicate the purpose for development and delivery of training, to confirm the principles around which Exelon Utilities' training is based and to set the expectation for training records to be created and retained.

3. Precautions and Limitations

3.1. Precautions

3.1.1 None

3.2. Limitations

3.2.1 This policy is limited to training conducted by employees and/or contractors performing training on behalf of the Utilities.

4. Applicability

4.1. This policy applies to all employees of the Utilities whose work practices interface with any aspect of the Training and Qualifications core function.

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5. Implementation

5.1. This policy shall be implemented by establishing and maintaining:

5.1.1 Training material in accordance with approved company processes, procedures, safety rules, industry standards, Event Free Performance Tools and regulatory requirements, in order to address the operational and developmental needs of the employees.

5.1.2 Training programs in support of business goals.

5.1.3 Vice President Sponsorship for the activities and performance of the Training and Qualification core function.

5.1.4 Training programs developed, scheduled, and conducted, given personnel resources and facility availability, to maintain employee's job progression.

5.1.5 The understanding that Training is considered a work assignment. To minimize delays within the progression of training, every employee is responsible to attend scheduled training programs.

5.1.6 All training programs shall use a systematic training approach known as A.D.D.I.E. (Analysis, Design, Development, Implementation, and Evaluation).

5.1.7 Delivery methods designed to support learning objectives include, classroom training, 'hands-on' / practical exercises, on-the-job training, (task books and on the job evaluations), web-based training and/or a blended approach using several methodologies.

5.1.8 Training will be documented and training records shall be retained.

5.1.9 Documents which provide guidelines and considerations for moving a training program from initial inception to completion and evaluation.

5.1.10 Develop common training, assessment and qualification programs, where applicable.

5.1.11 Create a structure for program and course development and approval.

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Exelon

Training and Qualification Policy

Exelon Utilities Policy

TQ-EU-Y003
Rev. 3

6. Development History

Revision 0	**Date: 10/8/2013**
Writer	Julie Swart – Training and Qualification CFAM
Reviewer(s)	Christie McMullen (BGE) VP Support Services John Horner (BGE) Training Manager Rita Stols (ComEd) VP Support Services Joe Gersna (ComEd) Training Manager Ellen Cavanaugh (PECO) VP Support Services, Kimberly Keegan (PECO) – Training Manager,
Reason written/revised	Updated to align with the new Core Functions and strategy associated with the Management Model

Revision 1	**Date: 6/3/2016**
Writer	Sharon Sasada (BGE) – Sr. Training Specialist
Reviewer(s)	Larry Burley (BGE), Manager Training Terry Olivi (ComEd), Manager Training Sheilah Caton (PECO), Manager Training Carol Dodson (BGE) VP Support Services Issac Akridge (ComEd) VP Support Services Ellen Cavanaugh (PECO) VP Support Services,
Reason written/revised	Updated to align with the new Core Functions and strategy associated with the Management Model

Revision 2	**Date: 12/12/2016**
Writer	Sharon Sasada (BGE) – Sr. Training Specialist
Reviewer(s)	Larry Burley (BGE), Manager Training Terry Olivi (ComEd), Manager Training Sheilah Caton (PECO), Manager Training Carol Dodson (BGE) VP Support Services Issac Akridge (ComEd) VP Support Services Ellen Cavanaugh (PECO) VP Support Services,
Reason written/revised	To incorporate PHI.

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Training and Qualification Policy

Exelon Utilities Policy

TQ-EU-Y003
Rev. 3

Revision 3	**Date: 12/2/2019**
Writer	Larry Burley (BGE) – Manager Training
Reviewer(s)	Larry Burley (BGE), Manager Training Eduardo Suarez (ComEd), Manager Training Kimberly Keegan (PECO), Manager Training Dane Merkel (PHI), Manager Training Elizabeth O'Connor (BGE) VP Support Services Mark Falcone (ComEd) VP Support Services Amy Hamilton (PECO) VP Support Services Mike Poncia (PHI) VP Support Services
Reason written/revised	Minor edits with updates to incorporate ADDIE

Approved:

Stephen Woerner 12/ 02 /19

Approver: Steve Woerner President & COO BGE **Date**

Terry Donnelly 12/ 02 /19

Approver: Terry Donnelly President & COO ComEd **Date**

John McDonald 12/ 02 /19

Approver: John McDonald SVP & COO PECO **Date**

J Tyler Anthony 12/ 02 /19

Approver: J Tyler Anthony SVP & COO PHI **Date**

Carim Khouzami 12/ 02 /19

Approver: Carim Khouzami SVP & COO Exelon Utilities **Date**

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Vegetation Management QA/QC for Distribution Tree Maintenance Work

ComEd Process
VM-CE-P006
Rev. 2

Effective:	4/30/2020
Supersedes:	Rev.1
Review Type:	3 Year
Core Function:	Program and Work Management

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1. Purpose

The Vegetation Management QA/QC process is designed to ensure that all preventative maintenance work is performed to Distribution Clearance Guidelines.

2. Precautions and limitations

2.1. Precautions

2.1.1 None.

2.2. Limitations

2.2.1 This process is limited to Distribution Preventative Mantenance work.

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Vegetation Management QA/QC for Distribution Tree Maintenance Work

ComEd Process
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Rev. 2

3. Process

3.1. Quality Assurance and Quality Control

3.1.1 Tree contractor completes cycle maintenance in accordance with the Distribution Clearance Guidelines.

3.1.2 QA/QC Inspector checks auditor's database for circuits that are ready for review.

3.1.3 QA/QC Inspector cross references Distribution Preventative Maintenance (DPM) schedule against auditor's database as a validation check for work they should be seeing in their que.

3.1.4 A closure packet is created for each completed circuit by the tree contractor. The tree contractor then sends closure packets electronically via email to ComEd and the QA/QC contractor within 7 days of a circuit closing.

3.1.5 QA/QC Inspector ensures that the circuit inspection and reports are completed within 30 calender days of the date the circuit is closed.

3.1.6 QA/QC Inspector checks the closure packet for all the required documents and ensures applicable documents are recorded in InfoCenter, an internal ComEd database. Closure packet requirements include:

3.1.6.1 Circuit Map should be highlighted with highlighting for lift and manual work, additional work required, customer taps, and mowing locations.

3.1.6.1.1 Lift work – orange

3.1.6.1.2 Manual work – green

3.1.6.1.3 Customer tap – blue

3.1.6.1.4 Mowing locations – purple

3.1.6.1.5 Additional Work locations – red

3.1.6.2 VM Circuit Closure Form

3.1.6.3 ComEd Distribution Circuit Closure Checklist

3.1.6.4 Distribution Fixed Price Strategic Tree Removal Crew Form

3.1.6.5 Daily Chemical Report

3.1.6.6 VM Distribution Circuit Concerns Form – used to record location(s) of resistant customers, established leads, and other concerns that should not result in reliability impacts to the feeder.

3.1.6.7 Priority Tree Removal Form – used to document trees that are unsafe to work and are a potential risk to reliability.

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3.1.6.8 VM Customer Refusal Form – used to document location(s) where customers will not allow clearnace guidelines to be achieved.

3.1.6.9 VM Additional Work Required (AWR) Form – used to document location(s) where tree work is incomplete and requires follow-up work.

3.1.6.10 VM Request for Scheduled Outages Form – used to document location(s) where conductor must be de-energized. The form caputures information needed to schedule an outage. This does not replace the AWR form, which must also be competed for a scheduled outage.

3.1.7 QA/QC Inspector performs a field inspection of 100% of the circuit to ensure compliance with the Distribution Clearance Guidelines VM-CE-P061.

3.1.8 QA/QC Inspector uses work planning software to collect inspection data. The QA review is summarized on the VM QA Inspection Form and each deficiency is documented through the VM QA Report Form. Multiple deficiencies at the same address will be treated as one deficiency. Deficiencies include:

3.1.8.1 Insufficient Clearance – Vegetation that does not meet ComEd's Vegetation Management Distribution Clearance Guidelines.

3.1.8.2 Poor Cuts – Pruning cuts that do not meet ANSI A300 standards.

3.1.8.3 Skips – A tree or location that has not been worked.

3.1.8.4 Dead Overhang – Any dead branches directly above a conductor.

3.1.8.5 Vines – Living vine(s) on pole, guy wire, or any other equipment that have not been cut. Vines are typically cut in two places and herbicide is apply to the cut stump.

3.1.8.6 34kV Overhang – Any vegetation directly above a 34kV.

3.1.8.7 Removal Deficiency – Stumps not cut flush with the ground or incomplete removal.

3.1.8.8 Herbcide Deficiency – Herbicide not applied, herbicide log missing or incorrect.

3.1.9 QA/QC Inspector records priority tree location(s) in electronic work planning software.

3.1.10 QA/QC Inspector uploads the QA/QC data to database after the circuit review is complete.

3.1.11 QA/QC Inspector downloads deficiency data weekly in order to generate the VM QA Inspection & Report Forms. Both forms are then emailed to the Tree Contractor Supervisor and Senior Vegetation Program Manager (SVPM).

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3.1.12 General Foreman (GF) ensures deficiency locations are completed within 30 days of QA completion. Documentation of completion shall be returned to the SVPM.

3.1.12.1 GF may appeal deficiency location to SVPM; a field visit may be performed with SVPM to make a final ruling on the status of a deficiency.

3.1.12.2 SVPM may utilize the QA/QC Inspector for a second inspection to ensure that the deficiency has been corrected.

3.1.13 SVPM closes deficiencies in the internal ComEd database.

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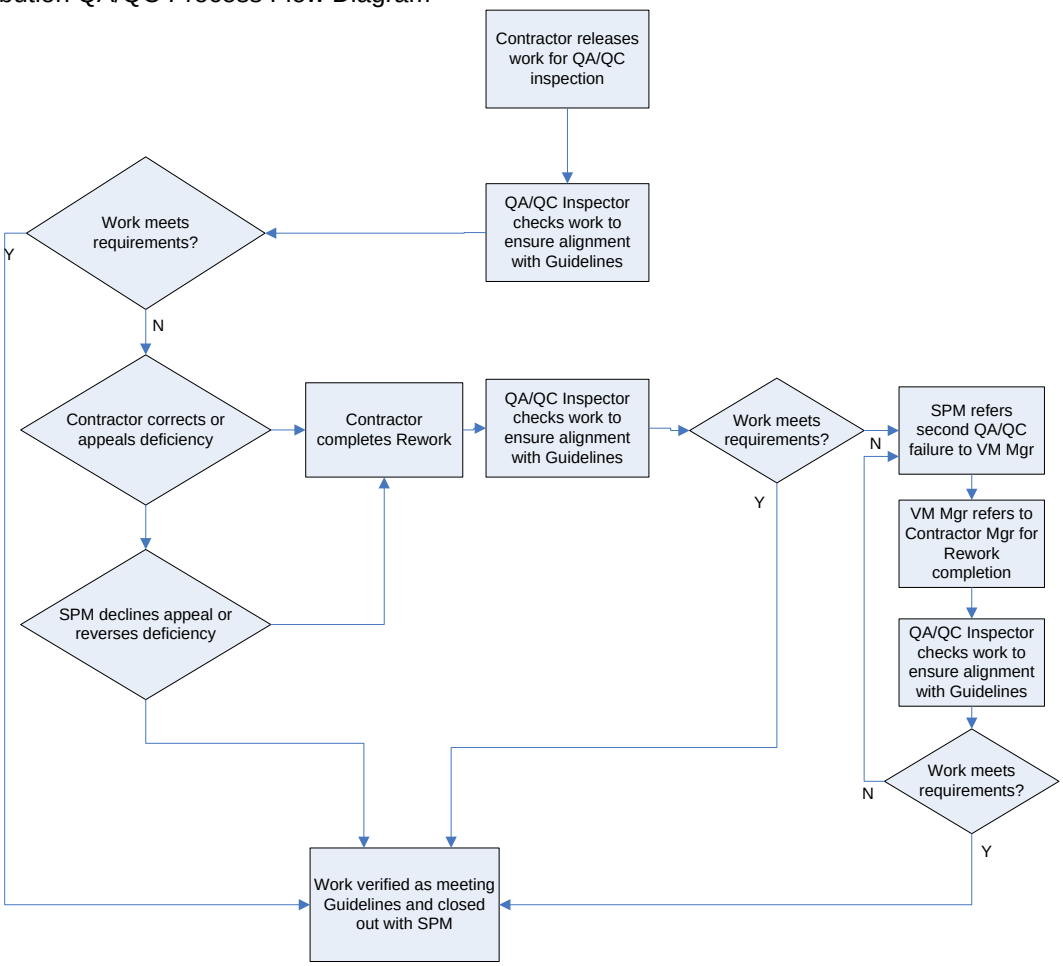
Vegetation Management QA/QC for Distribution Tree Maintenance Work

ComEd Process
VM-CE-P006
Rev. 2

3.2. Distribution QA/QC Process Flow Diagram



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3.3. Process listing

#	Process Element	Description	Performed By
1	Trimming work is completed on a circuit	Tree Contractor completes trimming work and submits work packets for QA/QC inspection	Contractor
2	Work packets ready for QA/QC review	QA/QC Inspector checks auditor's database for pending work and obtains closure packets	QA/QC Inspector
3	QA/QC Inspection performed	QA/QC Inspector verifies work has been completed according to Distribution Clearance Guidelines	QA/QC Inspector
4	Contractor Reworks	Tree Contractor performed rework as required, or appeals decision to SVPM	Tree Contractor
5	Deficiency Appeals	SVPM reviews appealed deficiency locations and determines if rework is required	SVPM
6	Final QA/QC Inspection performed	QA/QC Inspector checks that deficiency work has been completed according to Distribution Clearance Guidelines	QA/QC Inspector
7	Circuit work & QA/QC review complete	All work verified by QA/QC inspector or SVPM as meeting Distribution Clearance Guidelines and close in datebase	SVPM

3.4. Assumptions

3.4.1 None.

4. Roles and Responsibilities

4.1. Senior Vegetation Program Manager (SVPM)

4.1.1 Work scheduling and tracking

4.1.2 QA and QC tracking

4.1.3 Write and publish the Distribution Clearance Guidelines

4.1.4 Verify contractor met the Distribution Clearance Guidelines

4.2. Contractor Supervisor

4.2.1 Accountable for tree contractor's performance

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4.2.2 Serve as the interface between SVPM and the tree contractor

4.3. General Foreman (GF)

4.3.1 Field implementation of tree contractor activities

4.3.2 Serve as point of contact with SVPM

4.3.3 Maintain required records in accordance with ComEd procedures

4.3.4 Resolve issues where external constraints prevent trimming work from being completed according to Distribution Clearance Guidelines

4.4. QA/QC Inspector

4.4.1 Perform QA/QC inspections on all work performed by the tree contractors

4.4.2 Ensure completed work is in accordance with ComEd Distribution Clearances Guidelines

4.4.3 Maintain required records in accordance with ComEd procedures

5. Documentation

5.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

5.2. Documentation generated during performance of this document shall also be filed in accordance with Distribution Clearance Guidelines.

Click here to enter text. Click here to enter text.

6. Terms and Definitions

6.1. Auditor's Database

6.1.1 Access database containing QA information.

6.2. Circuit Map

6.2.1 Detailed drawings that indicate the location of a distribution or transmission line, transformers, switches, phase, voltage, overhead or underground installation, and other features.

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6.3. Tree Contractor

6.3.1 Performs vegetation management work on behalf of ComEd.

6.4. Customer Refusal

6.4.1 A third party preventing ComEd from maintaining vegetation clearance in accordance with Distribution Clearances Guidelines by refusing to allow tree contractor to remove or trim necessary vegetation.

6.5. Deficiency

6.5.1 Does not meet Distribution Clearances Guidelines; must be re-worked and must be documented and tracked until acceptable.

6.6. General Foreman (GF)

6.6.1 Contracted level of supervision directly responsible for the execution of vegetation management work processes and policies.

6.7. Preventive Maintenance Program

6.7.1 Planned vegetation management activities performed on a cyclical basis .

6.8. QA/QC Inspector

6.8.1 Individual that performs Quality Assurance or Quality Control checks on all work performed by contracted work force.

6.9. Senior Vegetation Program Manager (SVPM)

6.9.1 A ComEd employee and subject matter expert who manages the vegetation management process and enforces all applicable policies and procedures.

6.10. Tree Contract Supervisor

6.10.1 Contract representative that directly supervises the contracted management team and the work force directly responsible for executing the work.

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Vegetation Management QA/QC for Distribution Tree Maintenance Work

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6.11. Vegetation Management QA Report Form (VMRF)

6.11.1 Used to provide detailed information about deficiencies.

7. References

7.1. ANSI A300 Standards

7.1.1 The American National Standards for Tree Care Operations

7.2. ANSI Z133A Standards

7.2.1 The American National Standards for Safety Requirements for Arboriculture Operations

7.3. ComEd Vegetation Management Distribution Clearance Guidelines, VM-CE-P061

8. Attachments

8.1. None

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Vegetation Management QA/QC for Distribution Tree Maintenance Work

ComEd Process
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Rev. 2

9. Development history

Revision 0	**Date: 7/18/2014**
Writer	John Wolters, ComEd SVPM, Vegetation Management
Reviewer(s)	Merle Turner, Transmission Manager, Vegetation Management Emily Kramer, Distribution Manager, Vegetation Management
UFAM Approver(s)	Craig Chesley, Vegetation Management Manager
Reason written	Updating Process to ComEd format

Revision 1	**Date: 7/14/2017**
Writer	Kevin Jury, Distribution Manager, Vegetation Management
Reviewer(s)	Nick Day, Paul Miceli, Jay Mahoney, Sean Redman, Shannon Peters, all ComEd SVPMs, Vegetation Management
UFAM Approver(s)	Emily Kramer, Vegetation Management Manager
Reason written	3-year required update.

Revision 2	**Date: 4/30/2020**
Writer	John Wolters, ComEd SVPM, Vegetation Management
Reviewer(s)	Kevin Jury, Katie Runyan, Paul Miceli, Sean Redman, Nick Day, Jay Mahoney, Shannon Peters
UFAM Approver(s)	Emily Kramer, Vegetation Management Manager
Reason written	3-year required update

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ComEd Vegetation Management Distribution Clearance Guidelines

ComEd Process
VM-CE-P061
Rev. 1

Effective:	12/23/2017
Supersedes:	VM-ED-P025
Review Type:	3 Year
Core Function:	Preventive Maintenance

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1. Purpose

1.1. To provide vegetation clearance guidelines from the electric distribution system.

1.2. ComEd's Vegetation Management practices are developed in compliance with the National Electric Safety Code (NESC), American National Standards Institute (ANSI), and Occupational Safety and Health Administration (OSHA).

2. Precautions and limitations

2.1. Safety

2.1.1 OSHA and ANSI Z133 requirements.

2.2. Precautions

2.2.1 Compliance with all applicable agreements and restrictions.

2.2.2 Environmental Compliance.

2.3. Limitations

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ComEd Vegetation Management Distribution Clearance Guidelines

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2.3.1 This vegetation management program is not intended to and cannot be used to determine contractor's safety practices or work procedures. Our contractor, as an independent contractor, is a qualified expert in vegetation control and shall always determine its own safety practices, work procedures, and personnel policies.

2.3.2 ComEd cannot guarantee pruning will be performed to the minimal recommended clearances based on the structure of the tree and the type of conductor.

2.3.3 Large tree trunks or major limbs of established trees may be allowed to remain within the recommended distribution clearance zone if all of these criteria are met: (1) movement of either the conductor or the tree will not result in contact between the tree and the conductor, (2) the tree is not easily or readily climbed without the use of ladders or specialized climbing equipment, and (3) there is no evidence of re-growth or sprouting from the tree trunk towards the conductor.

2.3.4 The clearance distances described in the Distribution Clearance Guidelines are at the time of maintenance.

3. Process

3.1. Cyclic maintenance of the distribution system is essential to economical and reliable customer service. The objective is to return to a location for repeat maintenance at the most economical time before conditions change and cause an outage. Cycle length is the amount of time between pruning operations and considers tree growth rates in the area. ComEd's cycle length is 4 years.

3.2. Guidelines for use of ComEd Recommended Clearance Table.

3.2.1 The ComEd Recommended Clearance Table provides clearances that should be adequate to protect ComEd equipment under normal operating conditions following trimming to ANSI A300 Standards. Special clearances may be needed at times because of field conditions, or when ANSI A300 Standards cannot be achieved. This document does not provide clearances to prevent all outages or prevent contact from vegetation.

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ComEd Vegetation Management Distribution Clearance Guidelines

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3.2.2 ComEd Recommended Clearance Table.

Table 1	Recommended Clearance Table for ALL Trees (in feet) at the time of maintenance.				
Proximity to Conductors	Growth Rate	Secondary (120 – 480v)	Primary (2-13.2kV)	Primary Aerial Cable (2-13.2kV)	Primary (34kV)
Side	Slow	4	6	4	10
	Fast		8		12
	Very Fast		10		14
	Conifers	3-4	3-4	3-4	6
Over	Slow	4	6	4	No Overhang Allowed
	Fast		8		
	Very Fast		10		
	Conifers	4	6, plus swing distance	6	No Overhang Allowed
Under	Slow	6	8	4	8
	Fast	8	12		12
	Very Fast	10	14		14
	Conifers	2	6	4	6

3.2.2.1 Isolated Secondary (no primary wire on pole) will not be maintained as part of the standard maintenance, but may be addressed on a case-by-case basis under corrective maintenance.

3.2.2.2 Service Wires will not be maintained as part of standard maintenance, but may be addressed on a case-by-case basis under corrective maintenance.

3.2.2.3 Street Light wires will not be maintained as part of standard maintenance, but may be addressed on a case-by-case basis under corrective maintenance.

3.2.2.4 All non-energized equipment including poles and guy wires shall be cleared of vegetation at the time of maintenance.

3.2.2.5 Remove hard contact that may damage equipment.

3.2.2.6 Remove all dead branches overhanging primary conductors.

3.2.2.7 No overhang on 34kV, unless otherwise directed by ComEd.

3.2.2.8 Remove fast growing trapped trees when ANSI Pruning Standard Practices cannot be acheived.

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3.2.2.9 Large tree trunks or major limbs of established trees may be allowed to remain within the recommended distribution clearance zone if all of these criteria are met: (1) movement of either the conductor or the tree will not result in contact between the tree and the conductor, (2) the tree is not easily or readily climbed without the use of ladders or specialized climbing equipment, and (3) there is no evidence of re-growth or sprouting from the tree trunk towards the conductor.

3.3. Summary of Species by Average Rate of Growth on the ComEd System.

3.3.1 The following list is a reference guide to assist trimming crews in deciding the average amount of trimming necessary in order to maintain a 4-year distribution maintenance cycle for a variety of tree species common to the ComEd service area. The list is presented as a reference only and should be adjusted as necessary due to site conditions. Tree species not listed in **Table 2** shall be categorized as slow, fast, or very fast based on site conditions and trimmed accordingly.

ComEd Vegetation Management Distribution Clearance Guidelines

ComEd Process
VM-CE-P061
Rev. 1

3.3.2 ComEd Species Table

Table 2	Common Trees in ComEd Service Territory	
Slow Growth		
Oaks	Ginko	Norway Maple
Cedar	Hemlock	Sugar Maple
Beech	Hawthorn	
Fast Growth		
Ash	Linden	Catalpa
Locust	Birch	Sycamore
Cherry	Red Maple	Elm
Box Elder	Hackberry	
Very Fast Growth		
Tree-of-Heaven	Weeping Willow	Silver Maple
Poplar	Cottonwood	Black Walnut
Mulberry		

3.3.3 Conifers

3.3.3.1 Proper Clearance between conductors and conifers can be achieved by the following:

3.3.3.1.1 Removal.

3.3.3.1.2 Topping the tree six feet below the primary voltage conductors, and two feet below the secondary.

3.3.3.1.3 Side trimming for three to four feet of clearance from the primary conductors provided no climbable portion of the tree is within six feet of the primary.

3.3.3.1.4 Raising the tree up 10 feet from the ground or other climbable object, and side trimming to meet Section 3.2.2.9.

3.3.3.1.5 No overhang should be within six feet of the primary, and overhanging branches above six feet should be tipped back to provide *swing* distance in case of snow loading or breakage.

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ComEd Vegetation Management Distribution Clearance Guidelines

ComEd Process
VM-CE-P061
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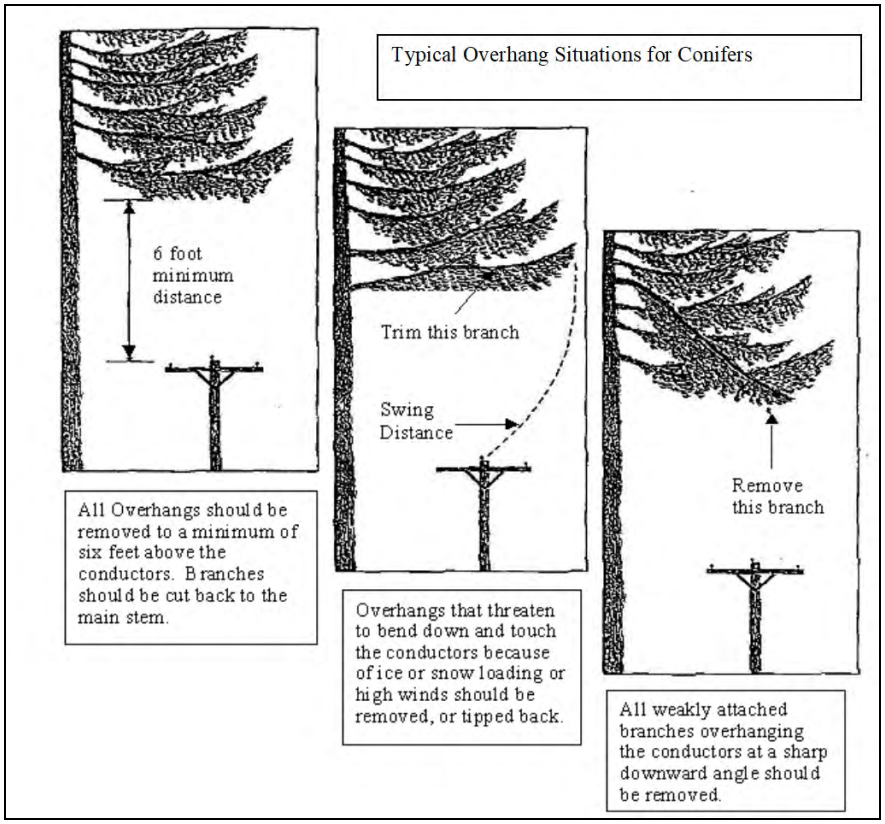
3.3.3.2 Example of Conifer Overhang Clearance Situations



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3.3.4 All vines on ComEd Equipment should be cut in two locations creating a clear visual gap and sprayed with herbicide.

3.4. Special Conditions

3.4.1 Climbable Trees

3.4.1.1 The primary goals of the vegetation management program are *Safety* and *Reliability*. Trees that can be readily climbed and are within close proximity of the wires pose a potential threat to an individual climbing the tree.

3.4.1.2 A climbable tree is a tree bearing sufficient limbs within 10 feet of the ground, or other climbable object, so that it can be readily climbed without the aid of a ladder, or specialized climbing equipment. If the tree is readily climbable and any portion of the tree is large enough to support a person within 6 feet of the conductors it is considered a climbable tree, and needs to be addressed accordingly.

3.4.1.3 Acceptable mitigation for climbable trees are:

3.4.1.3.1 Removal.

3.4.1.3.2 Raising the tree up 10 feet from the ground or other climbable object, and side trimming to meet the main stem requirements.

3.4.1.3.3 Trim so that no portion of the tree that can support a person is within 6 feet of the primary conductor.

3.4.2 Conditions that may require additional clearances are:

3.4.2.1 Excessive slack in the span increasing blow-out (conductor sway to the side) in mid-span.

3.4.2.2 Trimming that will remove more than 25% of the crown causing excessive re-growth.

3.4.2.3 Long spans that will have increased sag under load or in hot weather.

3.4.2.4 Trees lacking proper taper in main stems or branches, resulting in increased movement under windy conditions.

3.4.2.5 Trapped trees under a 3-phase, which need to be severely topped.

3.4.2.6 A *Very Fast Growing* tree as listed in the species average growth rate table. (Table 2 of this document).

3.4.3 Conditions that may require less clearance (not intended for 34kv) are:

3.4.3.1 A mature tree with very little new growth towards the conductor.

3.4.3.2 A slow growing tree near a pole where wire sag and sway will not be a problem.

3.4.3.3 Compatible low growing vegetation, which will not reach the conductors even during maximum sag, pose a reliability risk, or have any climbable portion within 6 feet of primary conductors.

3.4.4 Trimming Double-Circuit:

3.4.4.1 When trimming multiple circuits, trim all circuits on the pole, including 69kV and 138kV.

3.5. Tree Pruning Techniques for Utility Clearance

3.5.1 ANSI A300 guidelines shall be followed.

3.6 Process Elements

#	Process Element	Description	Performed By
3.2	Guidelines for the Use of ComEd Recommended Clearance Table	Provides guidelines to ComEd and Contractors for creating clearance between distribution voltages conductors and vegetation	Vegetation Management personnel and Tree trimming Contractor
3.3	Summary of Species by Average Rate of Growth on the ComEd System	Used to guide users in determining proper use of the clearance table based on typical growth rates of tree species.	Vegetation Management personnel and Tree trimming Contractor
3.4	Special Conditions	Guides users in determining proper implementation of utility pruning to create clearance between distribution voltage conductors and vegetation	Vegetation Management personnel and Tree trimming Contractor
3.5	Tree Pruning Techniques	Describes typical pruning techniques used for utility pruning	Vegetation Management personnel and Tree trimming Contractor

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3.7 Assumptions

3.7.1 All work will be performed by trained line clearance qualified arborists.

3.7.2 Workers will use the ANSI A300 and Z133.1 standards during execution of work.

ComEd Vegetation Management Distribution Clearance Guidelines

ComEd Process
VM-CE-P061
Rev. 1

4. Roles and Responsibilities

4.1. Vegetation Management Personnel

4.1.1 Manage the vegetation management program to ensure that the goals of the program are met.

4.2. ComEd Tree trimming contractor

4.2.1 Perform tree and vegetation maintenance in accordance with the clearance guidelines.

5. Documentation

5.1. Documentation generated during performance of this document shall be filed in accordance with Exelon Corporate Procedure LE-AC-401 – Records and Information Management Retention and Disposition.

6. Terms and Definitions

6.1. ANSI A300

6.1.1 American National Standards Institute Standard Practices for Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance.

6.2. ANSI Z133.1

6.2.1 American National Standards Institute Safety Requirements for Pruning, Repairing, Maintaining, and Removing Trees, and Cutting Brush.

6.3. Branch Bark Ridge

6.3.1 A ridge of bark in a branch crotch that marks where branch and trunk tissue meet and often extends down the trunk.

6.4. Branch Collar

6.4.1 Raised ring around the branch of tree.

6.5. Brush

6.5.1 Naturally occurring trees or other woody material, which is capable of growing into the conductors that is less than 4" in diameter at breast height (DBH).

6.6. Climbable Tree

6.6.1 A tree, which is easily or readily climbed without the use of ladders or specialized climbing equipment.

6.7. Conifer

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6.7.1 Cone bearing tree.

6.8. Conductor

6.8.1 Any equipment designed/intended to carry voltage.

6.9. DBH

6.9.1 Diameter at Breast Height, which is measured at 4.5 feet above the ground.

6.10. Distribution

6.10.1 Circuits with voltages under 69kV.

6.11. Established Lead

6.11.1 A main stem of a tree that is at least 4" in diameter at the height of the conductor being trimmed.

6.12. Hard Contact

6.12.1 Vegetation contact on the conductor or equipement resulting in equipment damage.

6.13. Isolated Secondary

6.13.1 A secondary wire running pole-to-pole with no primary voltage conductors located on the pole.

6.14. Multi-Stem

6.14.1 A tree with multiple stems that split above the ground-line and no visible bark seam down to the ground. If the tree splits at the ground-line, or has a visible seam down to the ground, they are considered multiple trees.

6.15. NESC

6.15.1 National Electric Safety Code

6.16. OSHA

6.16.1 Occupational Safety and Health Administration

6.17. Open Wire Secondary/Service

6.17.1 A service or secondary conductors where the hot and neutral wires are strung separately in a vertical or horizontal configuration.

6.18. Overhang

6.18.1 Limbs or branches of a tree, which are located directly over the conductors.

6.19. Over Clearance

6.19.1 The distance between a tree limb located above the conductor, and the nearest energized conductor.

6.20. Primary Voltage Conductor

6.20.1 A high voltage distribution circuit (2.4kV – 34kV) feeding the distribution transformers. This conductor usually is not insulated, but may have a weather coating.

6.21. Primary Aerial Cable

6.21.1 A high voltage distribution conductor where the insulated primary phases are strung inside a flexible cable with the primary neutral.

6.22. Primary Spacer Cable (i.e. Hendrix Cable)

6.22.1 A high voltage distribution conductor where the insulated primary phases are strung in brackets supported by the primary neutral.

6.23. Pruning

6.23.1 Synonymous with trimming. The term pruning is used to better align with industry standard ANSI A300 terminology.

6.24. Secondary / Service Cable

6.24.1 A secondary or service conductor where the hot wires are wrapped around a neutral wire and strung together.

6.25. Service Wire

6.25.1 A low voltage conductor (120-480 volts), which feeds a single building or customer.

6.26. Secondary Wire

6.26.1 A low voltage pole-to-pole conductor (120-480 volts), which feed multiple buildings or customers.

6.27. Side Clearance

6.27.1 The side clearance is the distance between a tree limb located to the side of the conductor, and the nearest energized conductor.

6.28. Topping

6.28.1 Removal of the top and upright branches of a tree with many internal cuts

6.29. Tree

6.29.1 A woody plant that is more than 4" in diameter at DBH.

6.30. Under Clearance

6.30.1 The under clearance is the distance between a tree or tree limbs located under the circuit, and the nearest energized conductor.

7. References

7.1. ANSI A300 (Part 1 and Part 7).

ComEd Vegetation Management Distribution Clearance Guidelines

ComEd Process
VM-CE-P061
Rev. 1

7.2. ANSI Z133 for Arboricultural Operations-Safety Requirements.

7.3. Pruning Trees Near Electric Utility Lines by Dr. Alex L. Shigo.

7.4. Best Management Practices Utility Pruning of Trees.

8. Attachments

8.1. None

9. Development history

Revision 0	**Date: 12/4/2014**
Writer	Sean Redman, Vegetation Management Senior Project Manager (SPM)
Reviewer(s)	Emily Kramer, Manager of Distribution Vegetation Management; Merle Turner, Manager of Transmission Vegetation Management
UFAM Approver(s)	Craig Chesley, Manager of Vegetation Management
Reason written	ComEd only document; incorporate all attachments into body of document

Revision 1	**Date: 12/23/2017**
Writer	Kevin Jury, Manager of Distribution Vegetation Management
Reviewer(s)	Nick Day, Jason Mahoney, Sean Redman, John Wolters, Paul Miceli, Katie Runyan, Shaun Wismer, and Shannon Peters, all Vegetation Management SPMs, Vegetation Management
UFAM Approver(s)	Emily Kramer, Manager of Vegetation Management
Reason written	Clarification. Removed referenced to equipment and stand alone secondary from the clearance table.

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Work Screening And Prioritization

Exelon Utilities Process
WM-EU-P014
Rev. 20

Effective:	5/11/2020
Supersedes:	WM-ED-P014
Review Type:	3 Year
Core Function:	Project and Work Management

This document applies to BGE, ComEd and PECO only. PHI integration is in progress and this disclaimer will be removed when PHI has been incorporated.

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1. Purpose

This process provides governance for screening and prioritizing incoming corrective maintenance work that will effectively and efficiently:

1.1. Validate the appropriateness of incoming Work Requests and Work Orders.

1.2. Check for duplication of previously assigned work.

1.3. Assign the appropriate priority.

1.4. Identify work for inclusion in Seasonal Readiness preparations.

1.5. Identify work impacted by NERC CIP compliance requirements

1.6. Validate Work Requests or Work Orders are properly coded in the Work Management system of record.

1.7. Direct work items to the correct work group and schedule date.

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1.8. Protect the Work Control Schedule by directing high priority work to the FIN team.

1.8.1 Work orders for non-Corrective Maintenance categories would be entered as Priority 40s and managed according to Need Date and work plan.

1.8.2 This document will provide a prioritization process that focuses on a balanced evaluation of operational, reliability, and financial impacts in a safe manner.

2. Precautions and limitations

2.1. Precautions

2.1.1 This document agreed to by BGE UFAM based on Work Management Transformation project plan and Passport implementation scheduled for May 2015. BGE is currently using the priority definitions, and maintaining backlogs in Maximo and WMS.

2.1.2 Individual(s) conducting work at an Exelon facility impacted by NERC CIP standards shall adhere to Exelon's NERC CIP Security Policy (RC-AC-POL3-001)

2.1.3 *This document contains specific content resulting from an ACE Investigation. This document shall identify such content by bracketing ComEd* **[ACE:01754429**] *to identify the specific referenced restriction. Any item identified as ACE Investigation shall not be deleted without authorization from the Core Function UFAM(s)."*

2.2. Limitations

2.2.1 This document does not address priorities during storm restoration events.

2.2.2 As the procedure is based upon work requests and work orders that reside in Asset Suite 8, PHI will be excluded from compliance until such time as they are Integrated into Asset Suite 8 and the work management processes and procedures.

3. Process

3.1. Summary

3.1.1 Any individual or organization requiring Corrective Maintenance work must generate a Work Request; for Design or Engineering work a Service Request is required. Work initiated through predefined maintenance inspection programs (ex/ Circuit Patrols) may generate a work order without needing a work request.

3.1.2 Work Requests shall be associated with a specific asset or location.

3.1.3 Originator recommends priority and provides detailed information about the deficiency in the work request, using the attached Priority Decision tool to assign the priority. (Attachment 1).

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3.1.4 The work request is submitted for approval to the appropriate Work Management organization.

3.1.5 All Priority 10 work that meets the FIN Team criteria must be given directly to the FIN team FLS or the On Call Supervisor during off-shift hours. Priority 20 work should be completed by FIN as resource allocation allows.

3.1.6 Originator identifies any safety and/or environmental concerns and incorporates into the work request description to facilitate evaluation by the work screening committee. Specifically identify any safety issues for employees when operating any equipment or devices required to perform the work, (i.e. hard to operate, difficult to switch, etc.) so proper actions can be taken to ensure the employees ability to safely complete the work.

3.1.7 Work Control Coordinator (WCC) chairs the Work Screening Committee (WSC), which meets regularly to disposition all work requests and work orders to the planning group, back to the originator, or to a support organization for additional information.

3.1.7.1 All Work Requests will be converted (Rolled) to a Work Order within:

3.1.7.1.1 5 calendar days for Priority 10-20 (Priority 10, typically are addressed immediately).

3.1.7.1.2 14 calendar days for Priority 30 and customer commitments (Priority 41 and 47).

3.1.7.1.3 30 calendar days for all other Priority 40s.

3.1.7.2 A report will be reviewed daily by each region to ensure aging unactioned (approval did not take place) work requests are dispositioned prior to going over their respective limit of days as described in section 3.1.7.1.

3.1.7.2.1 The daily report may be generated via Hyperion or other reporting tool.

3.1.7.2.2 The report will be reviewed by the work control coordinator, a work week manager or other designee within work management.

3.1.7.2.3 Each region should check the entire report, to ensure that any misdirected work requests are reviewed and addressed.

3.1.7.3 Steps taken for unactioned (approval did not take place) Work Requests:

3.1.7.3.1 If the originator submits a WR that does not contain sufficient information for a Work Planner to begin the process of preparing a Work Package, the Work Screening Committee should request additional information from the originator or the appropriate designee and should <u>not</u> approve the WR. If sufficient additional information is not returned by the originator in accordance with 3.1.7.1, the Work Request shall be escalated to the department head for disposition:

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3.1.8 Priorities of submitted work are evaluated by the WSC on its impact, or potential impact to safety, system integrity, reliability, operations, security, and regulatory requirements. Special attention will be given to safety and/or environmental concerns/issues identified by the originator as described in the work request. Any work that has been identified as having safety issues for employees when operating any equipment or devices required to perform the work, (i.e. hard to operate, difficult to switch, etc.) will be discussed so proper actions can be taken to ensure the employees ability to safely complete the work.

3.1.9 All work is evaluated with a focus on identifying a balanced approach to operational, reliability, and financial impact. Priorities are not to be based upon resource or material availability.

3.1.10 The WSC will validate or assign a priority to all approved work requests.

3.1.11 The WSC must validate any requests for priority changes and document appropriately.

3.1.12 The WSC or the Work Control Coordinator must be notified and authorize coding changes when the work is reassigned from one work group to another.

3.1.13 The WSC must validate coding for Summer (SUMR) or Winter (WNTR) Readiness preparation work in accordance with WM-EU-P026 Seasonal Readiness.

3.1.14 Deficiencies identified during a PRC-005 Preventive maintenance activity not able to be corrected during the PM shall have a corrective maintenance work request or service request initiated in the Work Management system with a work coding of (NPRC).

3.1.15 The Work Management organization ensure approved work is scheduled appropriately.

3.1.16 If manpower required does not match manpower available inside of scope freeze, then affected Work Week Manager(s) is responsible for collaborating with WSC and WCC to resolve the issue and ensure highest priority work is scheduled accordingly.

3.1.17 For work with an established Need Date, WCC and/or the Work Week Manager is responsible for getting approval from Job Owner for a revised Need Date.

3.1.18 Resource or material availability.

3.2. Process Flow Diagram

3.2.1 None

3.3. Process listing (list key process elements)

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#	Process Element	Description	Performed By
N/A	N/A	N/A	N/A

3.4. Assumptions

3.4.1 None

4. Roles and Responsibilities

4.1. Area Maintenance Engineer (AME)

4.1.1 Provide technical and operational input on screening and prioritization of work.

4.1.2 Periodically review CM backlog for identification of Seasonal Readiness (SUMR or WNTR) preparation work.

4.1.3 When necessary, perform investigations to support appropriate prioritization of Corrective Maintenance issues.

4.1.4 Acts as the Operation Compliance Owner (OCO) single point of contact for Work Screening Committee meetings.

4.2. Operation Compliance Owner (OCO)

4.2.1 Ensures compliance at the Business Unit or Shared Services level for NERC CIP standards.

4.2.2 Single Point of Contact (SPOC) for field personnel if suspected deviations from the NERC CIP baseline configuration are identified.

4.3. On Call Frontline Supervisor (FLS)

4.3.1 Shall act as single point of contact for Operations for all emergent Work Requests after normal working hours.

4.3.2 Notifies the appropriate Work Management department of all initiated emergent work activities.

4.3.3 Notifies appropriate FIN work teams of carry over emergent work.

4.4. Field Operations Representative

4.4.1 Participates on the Work Screening Committee as required.

4.5. FIN Team Supervisor (or Designee)

4.5.1 Reviews all generated Work Requests to select, prioritize, and approve for FIN team execution.

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4.5.2 Participates in the Work Screening meetings as required by the Work Screening Committee.

4.5.3 Approves return of work to Work Management if it could not be accomplished under the FIN process.

4.5.4 Notifies the appropriate Work Management group of all initiated emergent work activities.

4.6. Originator (Work Request)

4.6.1 Prior to creating a work request, reviews Work Management system of record to ensure an existing Work Request (WR) or Work Order (WO) hasn't already been created in the system.

4.6.2 Submits a Work Request to the appropriate Work Screening committee utilizing the Work Initiation and Work Coding processes.

4.6.3 For work performed in more than one unique work location or asset, the Originator is required to create Work Request for each location or asset. Example: vegetation brings wire down in one location and a fault occurs burning wire down on the way to a substation in another location, this requires two different Work Requests.

4.6.4 Assigns a suggested priority to the Work Request and supplies quality information about the deficiency.

4.6.5 Considers if the work being initiated has a seasonal (Summer or Winter) impact the Seasonal Readiness process. Work Requests (and Work Orders) for Seasonal Readiness preparation works are to be coded in Work Management system of record, with the appropriate code (SUMR or WNTR).

4.6.6 Individual(s) conducting work at an Exelon facility impacted by NERC CIP standards shall adhere to Exelon's NERC CIP Security Policy (RC-AC-POL3-001)

4.6.7 Consider if the work being initiated impacts a wetland area per Wetland Management Protection Program. Environmental impact work is to be coded in Work Management system of record with the appropriate code (ENV).

4.6.8 Deficiencies identified during a PRC-005 Preventive maintenance activity not able to be corrected during the PM shall have a corrective maintenance work request or service request initiated in the Work Management system with a work coding of (NPRC). Work Requests will have NERC added to the schedule backlog field *ComEd* **[ACE:01754429**]

4.6.9 Notifies the FIN Team or appropriate On Call Supervisor (FLS) Or Manager of Priority 10 work.

4.6.10 Provides detailed information on the equipment or system condition on the Work Request to facilitate priority evaluation by the regional Work Screening Committee.

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4.6.11 The Originator or designated representative will participate in the Work Screening Committee meeting / call so as to provide additional detail on submitted requests.

4.6.12 Consider if the work being initiated has any safety concerns that need to be identified and reviewed with all the working groups involved. Provide detailed information on all safety concerns/issues to facilitate proper evaluation by the regional work screening committee. Specifically identify any safety issues for employees when operating any equipment or devices required to perform the work, (i.e. hard to operate, difficult to switch, etc.) so proper actions can be taken to ensure the employees ability to safely complete the work.

4.7. Designated Authority (TSO/DSO)

4.7.1 Participate in the work screening review.

4.7.2 Submits Work Request with suggested priority in accordance with work initiation and screening process.

4.7.3 Provide operational information to support proper prioritization of Work Requests.

4.8. Work Control Coordinator (WCC)

4.8.1 Chairs the local Work Screening Committee meeting that reviews, prioritizes and ensures proper Work Management System coding.

4.8.2 Ensures that at a minimum the following code values are addressed:

Note: Further Work Coding instructions are provided in WM-ED-2001, Work Coding Procedure.

4.8.2.1 Work Requests:

4.8.2.1.1 Priority

4.8.2.1.2 Discipline

4.8.2.1.3 Job Type

4.8.2.2 Work Order:

4.8.2.2.1 Work order Type

4.8.2.2.2 Priority

4.8.2.2.3 Discipline

4.8.2.2.4 Job Type

4.8.3 Ensures that the following code values are addressed as appropriate:

4.8.3.1 Work Requests:

4.8.3.1.1 Need Date

4.8.3.1.2 Description

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4.8.3.1.3 Primary Equipment Group Type

4.8.3.1.4 Primary Equipment I.D.

4.8.3.1.5 Location Sequence I.D.

4.8.3.1.6 Failure

4.8.3.1.7 Schedule Group

4.8.3.1.8 Schedule Backlog (SUMR/WNTR Seasonal Readiness)

4.8.3.1.9 Schedule Backlog (ENV – Environmental Concern)

4.8.3.1.10 NERC Code

4.8.3.2 Work Orders:

4.8.3.2.1 Need Date

4.8.3.2.2 Primary Equipment Group Type

4.8.3.2.3 Primary Equipment Group I.D.

4.8.3.2.4 Location Sequence I.D.

4.8.3.2.5 Failure

4.8.3.2.6 Schedule Backlog (SUMR/WNTR Seasonal Readiness)

4.8.3.2.7 Schedule Backlog (ENV – Environmental Concern)

4.8.3.2.8 Schedule Group

4.8.3.2.9 Work Order Group

4.8.3.2.10 Discipline

4.8.3.2.11 NERC Code

4.8.4 WCC will interact with the Work Manager, Work Week Managers, Work Planners, Engineering, Scheduler, Operations, and the Work Screening Committee to ensure that the appropriate work is included in the Work Control Schedule.

4.8.5 Ensure that all work entering the schedule through the Work Screening Committee adheres to the WM-EU-P017, Scope Change Request.

4.8.6 Assign action items to investigate or resolve prioritization and scheduling issues.

4.8.7 When discussing work performed at NERC CIP facilities, ensure the Operation Compliance Officer, or their designee, coordinates with the Work Screening Committee.

4.9. Work Planner

4.9.1 Reviews department's work scope and determines if Work Screening committee is correct in their resource identification.

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4.9.2 Responds to appropriate Work Screening committee to reassign correct work group if necessary.

4.9.3 Reviews daily screening items and validates / update schedule group, discipline and EPS Project codes to ensure data integrity.

4.10. Work Screening Committee (WSC)

4.10.1 Should meet daily (Monday thru Friday) to review, prioritize and ensure proper Work Management System coding on all Work Requests and Work Orders originated since the previous meeting. Work Requests and Work Orders not accepted by the WSC or requiring further information will be returned to the originator with an explanation or a request for clarification.

4.10.2 Validates coding for Summer (SUMR) or Winter (WNTR) Readiness preparation work in accordance with WM-EU-P026 Seasonal Readiness.

4.10.3 Deficiencies identified during a PRC-005 Preventive maintenance activity not able to be corrected during the PM shall have a corrective maintenance work request or service request initiated in the Work Management system with a work coding of (NPRC). Work Requests will have NERC added to the schedule backlog field. *ComEd* **[ACE:01754429**]

4.10.4 Validates out of configuration items and Work Management System coding with the Designated Authority.

4.10.5 Reviews the priority of out of configuration list daily.

4.10.6 Assigns Priority 10 Work Orders to the FIN team in accordance with,WM-EU-P002 FIN Team.

4.10.7 Ensures that all work entering the schedule through the Work Screening Committee adheres to the WM-EU-P017, Scope Change Request.

4.10.8 Ensures that the Daily Task Creation Report, Task Completion Notes Report and other operational Reports are reviewed daily for any mischarging between capital and O&M.

5. Documentation

5.1. None

6. Terms and Definitions

6.1. Corrective Maintenance (CM):

6.1.1 Maintenance performed to correct system equipment or component conditions that render them incapable of performing their designed function or correct conditions identified from Preventive Maintenance activities.

6.2. Corrective Maintenance (CM) Backlog:

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6.2.1 The total number of open Corrective Maintenance tasks. The CM backlog is a key indicator of system material condition.

6.3. Critical Customer:

6.3.1 Customers that require special attention such as hospitals, major airports, major sporting complexes, and others that have a significant safety, health, business, political, military, government or media impact.

6.4. Functional Equipment Group (FEG):

6.4.1 Grouping of equipment and related components that are in an associated group and can be efficiently bundled, safely isolated and worked together in a scheduled work window.

6.5. Preventive Maintenance (PM):

6.5.1 Inspection, diagnostic and physical maintenance performed at set intervals with the intent of assessing or improving equipment material condition and thus preventing a component or sub-component performance failure.

6.6. Priority Definitions:

6.6.1 Priorities are assigned to work based on the criteria established in WM-EU-P014-1, Priority Decision Tool. Strict adherence to priority criteria is required to ensure disciplined execution of scheduled work unimpeded by unnecessary organizational reaction to misclassified work. The Transmission and Distribution System Operations departments play a key role in prioritizing work properly. Priorities are defined as follows:

6.6.1.1 Priority 10:

6.6.1.1.1 Immediate response required; work item 24/7 until complete or until compensatory actions allow downgrading the priority. Priority 10 CM's should not exceed 3 days. These items will have direct and immediate impact to safety, CAIDI or SAIFI.

6.6.1.2 Priority 20:

6.6.1.2.1 Priority 20s are typically completed within 14 days and should not exceed 30 days. Workdown plan shall be created for Priority 20s that exceed 30 days. These items have a high probability of affecting CAIDI, SAIFI or Safety.

6.6.1.3 Priority 30:

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6.6.1.3.1 Priority 30s are typically completed within 9 months and should not exceed 1 year. A workdown plan shall be created for priority 30's that exceed 1 year. These items have a moderate probability of affecting CAIDI or SAIFI if not addressed within a year's timeframe. For Priority 30s that require completion before the 9 month target, an agreed upon Need Date shall be established through the Work Screening Committee in concurrence with the Job Owner. Work shall be coded to ensure job remains scheduled to meet agreed upon Need Date. Any changes to the agreed upon Need Date requires approval from the Job Owner (ex/ AME, Reliability Engineer, etc.) Work based on a specific program timetable (Seasonal readiness, etc) shall be completed by the proposed Need Date, and if work exceeds the need date a workdown plan shall be developed.

6.6.1.4 Priority 40:

6.6.1.4.1 Work <u>not</u> meeting the criteria for a priority 10, 20, or 30 corrective maintenance. Priority 40 corrective maintenance work shall be completed not to exceed the predominant maintenance cycle interval (Ex/ FEG cycle or cyclic circuit inspection). Impact on SAIFI/CAIDI would result only if the condition degrades. A Priority 40 CM shall not exceed 1 year past the predominant maintenance cycle, a workdown plan is required.

6.7. Seasonal Readiness Corrective Maintenance:

6.7.1 Work that is performed to prepare equipment for upcoming seasonal (Summer and Winter) extreme periods. This work is identified, coded and managed in accordance with the Seasonal Readiness process.

6.8. Work Screening Committee (WSC):

6.8.1 This group meets regularly to review, prioritize and ensure proper work management system coding for all Work Requests and Work Orders originated since the previous meeting. A cross-discipline group shall consist of, but not limited to, the Work Control Coordinator, Work Week Manager, FIN Team representative, Engineering, Designated Authority representative (DSO and TSO), Field Operations representative, Work Planning representative. The Work Control Coordinator has the authority to require attendees as appropriate.

6.9. Deficiencies identified during a PRC-005 Preventive maintenance activity not able to be corrected during the PM shall have a corrective maintenance work request or service request initiated in the Work Management system with a work coding of (NPRC). Work Requests will have NERC added to the schedule backlog field. *ComEd* **[ACE:01754429]**

7. References

7.1. AM-EU-P033 – Transmission and Substations Thermography Program Guide

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7.2. Distribution OH Circuit Inspection

7.3. CM-CE-P321-R0001 – Overhead Distribution Circuit Inspection Checklist

7.4. PECO – Overhead Distribution Circuit Inspection and Thermography Patrol Procedure-CM-PE-1125

7.5. BGE (Pending)

7.6. WM-EU-P010 – Work Management Process

7.7. WM-EU-P013 – Work Initiation

7.8. WM-EU-P017 – Scope Change Request

7.9. WM-EU-5001 – Workweek Preparation of the Work Control Schedule

7.10. WM-EU-P002 - FIN Team

7.11. WM-EU-P022 – Tallyboard Process

7.12. WM-EU-P026 – Seasonal Readiness

7.13. CM-CE-P321-R0001 – OVERHEAD DISTRIBUTION CIRCUIT INSPECTION CHECKLIST: provides the priority basis for ComEd Maintenance Inspectors performing circuit inspections in the field.

7.14. OVERHEAD DISTRIBUTION CIRCUIT INSPECTION AND THERMOGRAPHY PATROL PROCEDURE for PECO.

7.15. RC-AC-POL3-001 – NERC CIP Cyber Security Policy

8. Attachments

8.1. WM-EU-P014-1, Work Management Priority Decision Tool.

8.2. WM-EU-P014-2, T&S Equipment Priorities.

8.3. WM-EU-P014-3, Guidance for establishing priorities for Cable Faults.

8.4. Distribution Work Screening Meeting checklist and T&S Distribution Work Screening Meeting checklist.

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Work Screening And Prioritization

Exelon Utilities Process
WM-EU-P014
Rev. 20

9. Development history

Revision 0	**Date: 6/1/2004**
Writer	Harry Laski
Reviewer(s)	Bob Gilbertson, Robert Cassity, Paul Hinderman
UFAM Approver(s)	Robert Fisher
Reason written	Work Management Processes

Revision 1	**Date: 3/11/2005**
Writer	Paul Hinderman (WM Programs)
Reviewer(s)	Michael McMahan (VP WM) Harry Laski (WM Programs) Harry Sullens (WM Programs) Maureen Byers (WM)
UFAM Approver(s)	Michael McMahan (VP WM) Harry Laski (WM Programs) Maureen Byers (WM)
Reason written	Clarify process flow of work screening and work prioritization

Revision 2	**Date: 4/17/2006**
Writer	Bob Gilbertson & Harry Laski (Work Management)
Reviewer(s)	Laski, Harry, Freitag, Judy A.; Martino, Vito; Madsen, Robert M.; McDonald, Charles D.; McBride, William P.; Cimaglia, Loretta A; Brann, Michael A.; Kao, Ben (Team assigned for review) and all appropriate FAMs.
UFAM Approver(s)	Harry Laski, Mike McMahan and the Management Model FAMs
Reason written	Align the Work Screening and Prioritization with current organizations, processes the Management Model Element, added Priority 41 & 47 for customer commitments and Gas priority examples. This revision's theme was for more clarity for each priority.

Revision 3	**Date: 7/7/2006**
Writer	Bob Gilbertson & Harry Laski (Work Management)
Reviewer(s)	Rick Sanner & Harry Laski (Work Management)
UFAM Approver(s)	Harry Laski & Mike McMahan
Reason written	This revision does not change the intent or scope of the document; just adds clarity for Seasonal Readiness WM-EU-P026.

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Exelon

Work Screening And Prioritization

Exelon Utilities Process
WM-EU-P014
Rev. 20

Revision 4	**Date: 12/8/2006**
Writer	Bob Gilbertson & Harry Laski (Work Management)
Reviewer(s)	Harry Laski (Work Management) and a team selected for development of this revision
UFAM Approver(s)	Harry Laski & Mike McMahan and appropriate FAMs
Reason written	Inclusion of Observed Material Condition and field inspection criteria matrix

Revision 5	**Date: 6/18/2006**
Writer	Bob Gilbertson (Work Management)
Reviewer(s)	Erika Bonelli, Ed Nolan, Doug Dale, John Jamicich, Mark Baranek, Sharon Pluskis, Dale LaGesse
UFAM Approver(s)	Peter Singh & Rick Sanner Governance and Oversight
Reason written	Inclusion requirement to notify the Work Screening Committee or the Work Control Coordinator if discipline changes are made to a Work Order task.

Revision 6	**Date: 10/10/2007**
Writer	Keith Muehleisen (Work Management)
Reviewer(s)	Ed Nolan, Doug Dale, Kathy McVey-Ryan, Suzanne Shaw
UFAM Approver(s)	Peter Singh & Rick Sanner Governance and Oversight
Reason written	Timely conversion of Work Requests to Work Orders by the Work Planners based on priority.

Revision 7	**Date: 12/17/2007**
Writer	Bob Gilbertson (ComEd Work Control)
Reviewer(s)	PECO Work Managers, ComEd Work Managers: Dan Galovich, Mark Baranek, Erika Bonelli, Sharon Pluskis and all appropriate FAMs
UFAM Approver(s)	Peter Singh & Rick Sanner Governance and Oversight WM FAMs
Reason written	Enhancement of the WR to WO conversion for more clarity and the action taken if the conversion from a WR to WO does not occur in the time required.

Revision 8	**Date: 7/14/2009**
Writer	Bob Gilbertson (ComEd Work Control)

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Revision 8	**Date: 7/14/2009**
Reviewer(s)	PECO Work Managers, ComEd Work Managers: Dan Galovich, Mark Baranek, Erika Bonelli, Sharon Pluskis and all appropriate FAMs
UFAM Approver(s)	Dale LaGesse & Joe Garvey, WM UFAMs
Reason written	Addition of 30-day window for Priority 20 work

Revision 9	**Date: 6/15/2010**
Writer	Chris Stefanski (Material Condition)
Reviewer(s)	ComEd: Michelle Blaise, Reliability and Capacity Expansion; Miguel Ortega and Brian Graham, T&S Engineering; Bill Fluhler, Material Condition; Lori Cimaglia, T&S Construction; Dan Galovich, C&M; Robert Pinto, DSO PECO – J. Coffman, Distribution Engineering; Drew Davis & Drew Reindel, T&S Engineering; Frank Gabrieli, T&S Construction; Peter Singh, Work Management; Nicole Levine, DSO; Joe Garvey, C&M. EED: Jennifer Sterling, Transmission Strategy and Compliance
UFAM Approver(s)	Dale LaGesse & Joe Garvey, WM UFAMs
Reason written	Reinforce representation by CM request originator or designee at the Work Screening Committee Meeting.

Revision 10	**Date: 7/5/2010**
Writer	Sharon Pluskis, Michelle Jones, Vicki Lynn, and Timothy McGuire
Reviewer(s)	Bill Gannon, Cheryl Maletich, ComEd Work Managers: Dan Galovich,
UFAM Approver(s)	Dale LaGesse & Joe Garvey, WM UFAMs
Reason written	Reference to priority changes for ATO and sump pumps. Additional verbiage in regards to slipped link terminations, Environmental references, and a attendance/check list to assure attendance and critical questions are asked during work screening call meeting

Revision 11	**Date: 9/24/2010**
Writer	Sharon Pluskis
Reviewer(s)	ComEd Work Managers: Dan Galovich,
UFAM Approver(s)	Dale LaGesse & Joe Garvey, WM UFAMs

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Revision 11	**Date: 9/24/2010**
Reason written	Reference to inoperable building alarms or other security related systems at ComEd facilities

Revision 12	**Date: 11/16/2011**
Writer	Kim Keegan
Reviewer(s)	PECO Work Management Managers: K. Keegan, E. Nolan, N. Brown
UFAM Approver(s)	Dale LaGesse & Bill Sullivan WM UFAMs
Reason written	Reference PECO only change for review of Daily Task Creation Report, Task Completion Notes Report and the CABLEY Task Finish Report are reviewed daily for any mischarging between capital and O&M.

Revision 13	**Date: 7/16/2012**
Writer	Becky Owens
Reviewer(s)	ComEd and PECO Work Management Managers:
UFAM Approver(s)	Dale LaGesse & Bill Sullivan WM UFAMs
Reason written	Evaluate approach to flag WR/WO as Safety and Environmental concerns and provide guidance on higher priorities and reference in the revision to this process document.

Revision 14	**Date: 4/12/2013**
Writer	Drew Davis
Reviewer(s)	Dale LaGesse
UFAM Approver(s)	Dale LaGesse, Drew Davis
Reason written	Revised scope freeze from T-5 to T-4

Revision 15	**Date: 7/28/2014**
Writer	Robert J. Johnson
Reviewer(s)	Dale Lagesse, Drew Davis, Radha Pillutla
UFAM Approver(s)	Dale LaGesse, Drew Davis, Robert J. Johnson
Reason written	Moved to new template. Updated priority 30 and 40 definitions, eliminated outdated priorities.

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Revision 16	**Date: 8/29/2014**
Writer	Lanette Littlejohn-Brown
Reviewer(s)	Dale Lagesse, Drew Davis, Robert J. Johnson and all Regional Work Managers
UFAM Approver(s)	Dale LaGesse, Drew Davis, Robert J. Johnson
Reason written	To correct a typo error in section 3.1.7.1

Revision 17	**Date: 1/29/2016**
Writer	Kirk Rae, Larry Laws, James McNulty, Steve Scalcucci, Andy Kang
Reviewer(s)	Joseph Bunch, Marguerite Neuman, Drew Davis
UFAM Approver(s)	Joseph Bunch, Marguerite Neuman, Drew Davis, Radha Pillutla
Reason written	Incorporated NERC CIP Program comments.

Revision 18	**Date: 04/13/2017**
Writer	Kyle Loucks
Reviewer(s)	Marguerite Neuman, Sean Kennedy, Roxanne Hill
UFAM Approver(s)	Marguerite Neuman, Steve Singh, Joe Genovese
Reason written	Added section 3.1.7.2 which addresses the requirement to review Unactioned work request reports. Also changed several referenced document titles to reflect new EU designator.

Revision 19	**Date: 1/14/2020**
Writer	Patrick Mintus
Reviewer(s)	Jeff Ancel, Mike Lee, Benjamin Shives, Christopher Lotz
UFAM Approver(s)	Colleen Doll, Charon Brown-Walker, Marguerite Neuman
Reason written	Added specific priority 20 criteria for nesting and clarifying wording for priority 40 wildlife issues.

Revision 20	**Date: 5/11/2020**
Writer	Margie Neuman, Manager Work Control

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Revision 20	**Date: 5/11/2020**
Reviewer(s)	Paul Glonek Engineer T&D , Margie Neuman Manager Work Control Rajesh Geevarghese (O&P CMT Review), Kinte Whitehead (CIP CMT Review)
UFAM Approver(s)	Doll, Colleen M (PECO), Moran, Michael (PHI), Neuman, Marguerite J:(ComEd), Walker-Brown, Charon Y (BGE)
Reason written	Added "Work Requests will have NERC added to the schedule backlog field to sections 4.6.8, 4.10.3, and 6.9, per ComEd **[ACE:01754429]**

Ask yourself if…?

Priority Decision Tool

- Public/Employee safety at reasonably determined immediate risk
- Customer completely or partially without power
- Customer voltage out of tariff
- Environmental incident such as: unmitigated leaking PCB equipment
- Equipment at risk of immediate failure and directly impacting the system based on diagnostics or inspection
- Single contingency situation exists for a critical customer as determined by the Designated Authority
- Out of configuration and exceeding emergency operational load limits
- Exceptional items as determined by Designated Authority
- Breach to security barrier
- Open damage, #1 Gas leak, No or low pressure, Blocked service (i.e. water or powder)
- Thermography readings with action level "red" per AM-ED-P033.

12-11-06 Priority 10

Then priority is:

YES → **Priority 10**

NO

- Tagging for slipped lead terminations, Line Clearance and Floating Conductor (including 34 KV Static) tasks, mainline broken cross arms and damaged equipment with public access or environmental impact
- Critical levels of insulating liquids or gasses as defined in Attachment WM-ED-P014-2, and/or with recommendations from Engineering High probability of failure as a result of diagnostic testing or visual
- Any inoperable building entry alarm or other security related system that is installed for the purpose of security at -facilities including substations or reporting centers
- Fused components out of configuration and exceeding normal operational load limits
- Protective relay or communication system alarm repair(evaluate back up relays)
- Main Stem circuits out of configuration
- Cable faults with more than 20 single phase residential transformers, 10 commercial transformers, or secondary service faults with 1:2
- Non-critical ATO customers on single line
- Thermography with action level "yellow" for items specifically identified in AM-ED-P033 to be scheduled inside scope freeze

<u>Sump Pump defects including broken or damaged pump, pipe system and electrical system or debris preventing discharge, in vaults identified within OP-CE-P062.</u>

12-11-06 Priority 20 Examples.pdf

- #2 Gas leak,
- Water intrusion investigation
- Visual Examples of Priority 20 deficiencies can be found at: Priority20 Examples.pdf

Then priority is:

YES → **Priority 20**

NO

- Diagnostic program response for retest or evaluation of unknown condition
- Other corrective maintenance activities that have a moderate probability of effecting CAIDI or SAIFI

YES

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Priority Decision Tool (continued)

NO

- The extent of condition assessments that are time driven in response to corrective action and should be coordinated with equipment outages
- Customer requirement:
  - Priority 41 indicates a customer commitment to the day
  - Priority 47 indicates a customer commitment to the week (Intent - Not to move the activity out of the week as scheduled). Examples include:
  - Rubber-up to make safe
  - Customer complaints that need a schedule date – i.e. power quality issues
  - Key stakeholder commitments made in accordance with EX-ED-3002, Commitment Management Procedure
- Condition based work requested as a result of testing or analysis that should be scheduled the next available outag
- Instrument/meters used in diagnostic evaluation such as CB operations counter, compressor run-hour meter.
- Fully functional components that may be subject to generic problems identified through operating experience, trend analysis, and /or OEM notification. These items identify potential vulnerabilities that may threaten future equipment and/or system integrity.
- Code requirement items with no/low reliability impact.
- Bulged, Leaking or Collapsed Joints found in an underground manhole as stated in CM-CE-P319 Inspection Process for Distribution Manholes And Components. - If other work is required in the same manhole, the line with the bulged, leaking, or collapsed joint must be de-energized in accordance with Safety Procedure SA-ED-P427. As schedules and workload permit, repair of these joints should be bundled and completed along with the other work in the manhole while the line has been removed from service
  - #3 Gas leak
  - Permanent repairs for water blockage
  - Code requirement items with no/low reliability impact.
- Visual Examples of Priority 40 deficiencies can be found at: Priority 40 Examples.pdf

YES → **Priority 40**

NO

- Notify Originator and redirect the Work Request/Work Order to be cancelled with appropriate documentation

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T&S Equipment Priorities

Priority	Equipment	Situation	Reference*
10	Battery	Open cell / Open circuited	Engineering
	Battery Charger	Charger failure	Engineering
	Transformers, OCB's, LTC's, Primary Compartments	Re-samples due to elevated gassing. The presence of acetylene in a transformer main tank. These samples are initiated by Engineering.	Engineering
	Gas Breaker	Low gas alarm	Engineering
	Thermography on all equipment and connections	Action level red	AM-ED-P033 pg. 9-10
	Transformer Alarms	Major or minor alarms generated by oil-line monitoring systems	EP-5810-E On-Line Power Transformer Monitoring system
20	Oil Samples on all equipment	Re-samples due to oil quality out of specification	OP-ED-140-802 pg. 9
	Oil Sample on newly installed transformer (1st Sample) Only if transformer is an emergent activity	Baseline oil sample after the unit has been in service for 1 week	Engineering
	Transformer	Oil level at or below low mark	FBE04-23 pg. 3
	Transformer Alarms	Major or minor alarms generated by oil-line monitoring systems	EP-5810-E On-Line Power Transformer Monitoring system
	Nitrogen	Major alarm triggered (all 300 MVA regardless if in alarm or not.	
	Fans	Summer Mode (May1 – Oct 15)	
	Fans	Consider duration and fan count running vs. non running	
	OCB	Oil level at or below low mark	FBE04-23 pg. 3 Use General Rules
	Desiccant	More than 75% color change, if free water or ice visible	
	Gas CB	Low gas level	Engineering
	Thermography on all equipment and connections	Action level yellow	AM-ED-P033 pg. 9-10
	Current and Potential Transformers for Revenue Metering	Associated with revenue metering at generating stations or interconnection tie lines	PJM Manual 01 Section 5
	Bushing	Loss of oil / low oil	TB-05-004
		Overfilled	TB-05-004
		Sight glass unreadable	TB-05-004
		Darkened oil	TB-05-004
		Moisture in glass	TB-05-004
	Building entry alarm or other security related system	Inoperable	
	Nesting material	Encroaching on live parts (where fatality or outage is likely to occur due to phase or ground spacing based on wingspan)	
30	Thermography on all equipment and connections	Action level yellow	AM-ED-P033 pg. 9-10
	Nitrogen	Pressure related to ambient temperatures	
	Fans	Winter Mode (Oct 16 – April 30)	
	Desiccant	Less than 25% color change	
	Oil Sample on newly installed transformer (2nd Sample) Only if transformer is an emergent activity	Baseline oil sample after the unit has been in service for 5 weeks	Engineering

System conditions dictate equipment availability and shall be discussed with DSO/TSO operations and are the primary factor (s) for the priority decisions that will be made.

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T&S Equipment Priorities

AME Reference Guide/Corrective vs. Observed Material Condition

Work Order Description	Priority 40 CM
Counters - Transformer LTCs	X
Counters - Non SCADA CBs	X
Counters – SCADA CBs	
Housekeeping Issues (Defined in WM-ED-15, Page 8, Minor Maint)	
Insulator - Cleaning	X
IR Scans - Any	
IR Scans - Equipment Bushings	X
IR Scans - Line of site less than 63º F	
IR Scans - Line of site greater than 63º F	X
IR Scans - Non-line of site less than 17º F	
IR scans - Non-line of site Between 17º F – 36ºF	X
Lighting - Security	X
Lighting - Elevated or on structure	
Oil Stains (With LO failure code removed)	
Painting - Aesthetics	
Painting – Metal integrity compromised	X
Rodent Habitation (Exterminator)	X
Rodent Intrusion (Reliability Related)	X
Signage – Human Performance	X
Signage – Non Human Performance	
Stenciling (Non Outage)	
Stenciling (Outage Required)	X
Switchyard Grading - Wildlife Intrusion	X
Switchyard Grading - Spread gravel and low spots	
Wildlife - Aesthetics or excrement	
Wildlife – Not Encroaching, but reliability related	X

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Guidance for establishing priorities for Cable Faults

PRIORITY	Situation and System		
	Main Stem	**Primary URD (Fused Component)**	**Secondary or Service**
10	• Any fault creating outage, emergency, or safety conditions that requires immediate action. (See left)	• Any fault creating outage, emergency, or safety conditions that requires immediate action. (See left)	• Any fault creating outage, emergency, or safety conditions that requires immediate action. (See left) • Customer with well. • 240V required immediately.
20	• All others not previously noted.	• Non-critical ATO customer on single line. • More than 20 1-phase residential transformers at risk. • More than 10 commercial transformers at risk.	• 240V needed soon. • 1:2 installed. • Bad neutral
30		• All others not previously noted.	• Plated. • Temporary (made safe). • All others not previously noted.
40	NA	NA	NA

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N:\WM Procedures
Three Lincoln revision -Distribution Work Screening Meeting Checklist

N:\WM Procedures
Three Lincoln revision T&S Work Screening Meeting Checklist

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