

Substation Grounding Systems								
Component Classification Categories								
Criticality	I	X					Nuclear Switchyards	
	II		X				DC, SS, TDC, TSS locations that serve O'Hare & Midway Airports	
	III			X			Locations exclusive of Criticality I & II, DC locations and ≤34kV ESS locations	
	IV				X		DC locations	
	V					X	≤34kV ESS locations	
Duty Cycle	Heavy Load	N/A	N/A	N/A	N/A	N/A		
	Normal Load	N/A	N/A	N/A	N/A	N/A		
Service Condition	In Service	X	X	X	X	X		
	Spare	N/A	N/A	N/A	N/A	N/A		
Condition Monitoring Tasks								
		Task Frequencies				Failure Codes		Comments
None		N/A	N/A	N/A	N/A	N/A		
Time Directed Tasks								
		Task Frequencies				Failure Codes		Comments
None		N/A	N/A	N/A	N/A	N/A		
Failure Finding Tasks								
		Task Frequencies				Failure Codes		Comments
Visual Inspection		5W	5W	10W	3M	6M	1a-e	
Condition Directed Tasks								
		Task Frequencies				Failure Codes		Comments
None		N/A	N/A	N/A	N/A	N/A		

SUBSTATION GROUNDING SYSTEM FAILURE MODES

FAILURE MODES

- 1. Fails to provide adequate Substation Ground Path
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FAILURE CAUSES

- 1a. Frayed or Broken Connections/Straps
- 1b. Corroded Conductor
- 1c. Stolen Conductor
- 1d. Melted or Fused Conductor
- 1e. Loose Connections

MAINTENANCE TASKS

- Visual Inspection

SUBSTATION GROUNDING SYSTEM MAINTENANCE TASK DEFINITION

TASK	DEFINITION
Visual Inspection	Visual inspection of grounding system at equipment, structures, and fence. The scope includes: -- Check all visible ground connections for signs of looseness, contamination, flashover, or corrosion -- Check for missing conductors

SUBSTATION GROUNDING SYSTEM MAINTENANCE BASIS

Substation Grounding System Template Summary

The Preventive Maintenance program is documented via maintenance templates. Templates have been developed that address transmission, substation, and distribution equipment that is owned and maintained by Exelon Utilities. Each template documents the program tasks, frequencies, failure modes, and maintenance basis for the associated equipment. Tasks and associated frequencies are designed to address known failure modes of the equipment covered by the template. In general, the tasks included in the maintenance templates are the result of good industry practices, industry experience, and manufacturer recommendations.

References:

Internal reports and operating experience

Boundary Definition

The boundary of a grounding system includes:

- Ground Grid
 - Ground Connections/Straps
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Failure Experience

Failures are subject to ACE/RCI investigation. Findings/recommended corrective actions are incorporated into the template as required.

Vendor Recommendations

N/A

Disposition of Vendor Recommendations

N/A

Basis For Template Tasks

Visual Inspection: This inspection approximates real-time condition monitoring that can detect developing problems and degradation, and provides condition data used to initiate corrective actions.

GROUNDING SYSTEMS TEMPLATE DEVELOPMENT HISTORY

Revision 0		Date 06/17/2005
Writer	Mike Thompson (Strategic Programs)	
Reviewer(s)	1/28/05 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		Date 11/17/2006
Writer	George Leinhauser (Strategic Programs)	
Reviewer(s)		
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	
Reviewer(s)	Ken Wendt (Mgr. Material Condition), Drew Reindel (Mgr. T&S Engineering)	
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 3		Date 04/29/2011
Writer	Chris Stefanski (Material Condition)	
Reviewer(s)	Ken Wendt, Drew Reindel, Jim Crane	
Approver(s)	Bill Fluhler (ComEd) , Bill Sullivan (PECO)	
Reason Written	Modified criticality definitions and incorporated 10-week and 3-month inspection task frequencies	
Revision EU 0		Date 07/21/2014
Writer	Chris Stefanski (Exelon Utilities)	
Reviewer(s)	Ken Wendt, Tom Harrington, George Leinhauser, Ed Carmen	
Approver(s)	Michael Moy (UFAM ComEd) , J. Coffman(UFAM PECO), Cory Summerson (UFAM BGE)	
Reason Written	Changed document number to reflect applicability to Exelon Utilities. Added note regarding BGE maintenance programs.	

GROUNDING SYSTEMS TEMPLATE DEVELOPMENT HISTORY

Revision CE 0		Date 04/10/2015
Writer	Chris Stefanski (Exelon Utilities)	
Reviewer(s)	Kenneth Wendt (Material Condition)	
Approver(s)	Michael Moy (UFAM ComEd)	
Reason Written	Created to document the ComEd maintenance program tasks, frequencies, failure modes, and maintenance basis.	

Revision CE 1		Date 04/25/2018
Writer	Hugo Castaneda (Material Condition)	
Reviewer(s)	Dale Player (Mgr Material Condition)	
Approver(s)	Michael Moy (UFAM ComEd)	
Reason Written	3 yr review, no content changes.	