

SUBSTATION FOUNDATIONS								
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, DCs, and ≤34 kV ESS locations	
	IV				X		DC locations	
	V					X	≤34 kV 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		
Failure Finding Tasks								
		Task Frequencies				Failure Codes		Comments
Visual Inspection		5W	5W	10W	3M	6M	1a-e, 2a-e	
Time Directed Tasks								
		Task Frequencies				Failure Codes		Comments
None		N/A	N/A	N/A	N/A	N/A		
Condition Directed Tasks								
		Task Frequencies				Failure Codes		Comments
None		N/A	N/A	N/A	N/A	N/A		

FOUNDATION FAILURE MODES

FAILURE MODE	FAILURE CAUSES	MAINTENANCE TASKS
1. Fails to Support Structure	1a. Deteriorated Foundation (Lack of Air Entrainment)	Visual Inspection
1. Fails to Support Structure	1b. Foundation Disturbed By New Construction	Visual Inspection
1. Fails to Support Structure	1c. Foundation Hit By Obstacle (Truck, etc.)	Visual Inspection
1. Fails to Support Structure	1d. Loss of Structural Fill Due to Retaining Wall Failure	Visual Inspection
1. Fails to Support Structure	1e. Anchor Corrosion or Failure	Visual Inspection
2. Fails to Remain Level	2a. Foundation Disturbed by New Construction	Visual Inspection
2. Fails to Remain Level	2b. Foundation Hit By Obstacle (Tractor, etc.)	Visual Inspection
2. Fails to Remain Level	2c. Foundation Settlement (Poor Soil Conditions)	Visual Inspection
2. Fails to Remain Level	2d. Foundation Heaving (Due to Frost Action)	Visual Inspection
2. Fails to Remain Level	2e. Anchor Corrosion or Failure	Visual Inspection

FOUNDATION MAINTENANCE TASK DEFINITION

TASK	DEFINITION
Visual Inspection	Visual assessment of the condition of the equipment. Items to check include: <ul style="list-style-type: none">-- Verify foundation deflection and rotation, structure shall be upright and plumb-- Verify area surrounding foundation is stable/intact (erosion/sink holes)-- Verify condition of exposed concrete foundation is sound-- Verify condition of exposed concrete in areas of recent construction-- Anchor corrosion or failure

FOUNDATION MAINTENANCE BASIS

Foundation Template Summary

The Preventive Maintenance program is documented via Performance Centered Maintenance (PCM) templates. Templates have been developed that address all transmission, substation, and distribution equipment that is owned, and / or, maintained by EED. 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 PCM templates are the result of good industry practices, industry experience, and manufacturer recommendations.

References:

Internal reports and operating experience

Building Code Requirements for Concrete, ACI Committee 318, Publication 318-83

ASCE Substation Structure Design Guide

NEMA SG 6

Boundary Definition

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.

Failure Experiences

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

Vendor Recommendations

None

Disposition of Vendor Recommendations

None

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.

FOUNDATION TEMPLATE DEVELOPMENT HISTORY

Revision 0		Date 06/17/2005
Writer	Steve Pylypczak (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 11/13/2006
Writer	Steve Pylypczak (Strategic Programs)	
Reviewer(s)		
Approver(s)	Kathy McHugh (FAM Maintenance Planning)	
Reason Written	Task and periodicity review / update. General scrub.	
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, 3-month and 6-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.	

FOUNDATION TEMPLATE DEVELOPMENT HISTORY

Revision CE 0		Date 03/31/2015
Writer	Chris Stefanski (Exelon Utilities)	
Reviewer(s)	Ken Wendt	
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 03/28/2018
Writer	Hugo Castaneda (Material Condition)	
Reviewer(s)	Dale Player (Mgr Material Condition)	
Approver(s)	Michael Moy (UFAM ComEd)	
Reason Written	3yr review, with minor format changes. No content changes.	