

Structures & Lightning Masts								
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	N/A	N/A	N/A	N/A	N/A		
	Spare	N/A	N/A	N/A	N/A	N/A		
Condition Monitoring Tasks								
None		N/A	N/A	N/A	N/A	N/A	Failure Codes	Comments
Time Directed Tasks		Task Frequencies				Failure Codes		Comments
None		N/A	N/A	N/A	N/A	N/A	Failure Codes	Comments
Failure Finding		Task Frequencies				Failure Codes		Comments
Visual Inspection		5W	5W	10W	3M	6M	1b, 2a-b	
Detailed Visual Inspection - Lightning Mast		1Y	AR	AR	AR	AR	1a	AR- Performed based on results of routine Visual Inspection
Detailed Visual Inspection - Switchyard Static Wire		1Y	AR	AR	AR	AR	1a	
Condition Directed Tasks		Task Frequencies				Failure Codes		Comments
None		N/A	N/A	N/A	N/A	N/A	Failure Codes	Comments

Structures and Masts Failure Modes

FAILURE MODE	FAILURE CAUSES	MAINTENANCE TASKS
1. Fails to Provide Lightning Protection	1a. Structure Failure	Detailed Visual Inspection
1. Fails to Provide Lightning Protection	1b. Mechanical Fastening	Visual Inspection
2. Fails to Maintain Structure Integrity	2a. Metal fatigue	Visual Inspection
2. Fails to Maintain Structure Integrity	2b. Foundation Failure	Visual Inspection

Structures and Masts Task Definitions

TASK	DEFINITION
Detailed Visual Inspection - Lightning Mast	Visually inspect the full surface area of the lightning mast taking specific notice of joints and any attachments.
Detailed Visual Inspection - Switchyard Static Wire	Inspection performed from ground level. -- Identification of locations with broken wire strands, including number strands broken
Visual Inspection	Visual assessment, from ground level, of the condition of the equipment. Items to check include: -- Check for signs of corrosion or weld failure -- Check for chipping / peeling paint -- Verify structural integrity, look for cracks or loose hardware. -- Check for cracks / degradation of foundation

Structure and Mast Maintenance Basis

Lightning Masts and Structures 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:

None

Boundary Definition

The boundary of the Electrical Structure, as studied, begins at the base of the concrete foundation and ends at the base of the electric equipment it supports. Components within the boundaries include concrete foundations, steel, and support insulators. Boundaries exclude operating control rods and switch handle gearbox, which are considered part of the equipment they would be used to operate, should they be present. The static wire inspections covered by this template includes the wires up to and including the transmission line disconnects, not the transmission lines leaving the station.

Failure Experience

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

Structure and Mast Maintenance Basis

Detailed Visual inspection - Lightning Mast: A comprehensive visual inspection of the surface area of the mast is recommended periodically. Ensure that integrity of the structure is maintained.

Detailed Visual Inspection - Switchyard Static Wire : Wire spans installed above conductor wires to shield conductors from lightning. Also included are "static wire accessories" which include attachment clamp, armor rod, vibration dampers and full tension and non-tension splices.

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.

STRUCTURES AND MASTS TEMPLATE DEVELOPMENT HISTORY

Revision 0		Date 06/17/2005
Writer	George Leinhauser (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 12/29/2006
Writer	George Leinhauser (Strategic Programs)	
Reviewer(s)		
Approver(s)	Kathy McHugh (FAM Maintenance Planning)	
Reason Written	Task and periodicity review / update. General template 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	

STRUCTURES AND MASTS TEMPLATE DEVELOPMENT HISTORY

Revision 4		Date 09/28/2011
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 12/14/2012
Writer	Chris Stefanski (Material Condition)	
Reviewer(s)	Ken Wendt, Drew Reindel, Jim Crane	
Approver(s)	Bill Fluhler (UFAM ComEd) , J. Coffman (UFAM PECO), Chris Lotz (UFAM BGE)	
Reason Written	Changed document number and document template to align with Exelon Utilities Management Model. Modified Criticality definitions; Changed Detailed Visual Inspection - Lightning Mast at ComEd substations not associated with Criticality I locations to As Required	

Revision EU 1		Date 07/21/2014
Writer	Chris Stefanski (Exelon Utilities)	
Reviewer(s)	Ken Wendt, George Leinhauser, Tom Harrington, Ed Carmen	
Approver(s)	Michael Moy (UFAM ComEd) , J. Coffman(UFAM PECO), Cory Summerson (UFAM BGE)	
Reason Written	Changed applicability note regarding BGE maintenance programs. Changed criticality definition to include applicability to BGE - Calvert Cliffs nuclear switchyard.	

Revision EU 2		Date 11/04/2014
Writer	Chris Stefanski (Exelon Utilities)	
Reviewer(s)	Ken Wendt, George Leinhauser, Tom Harrington	
Approver(s)	Michael Moy (UFAM ComEd) , J. Coffman(UFAM PECO), Cory Summerson (UFAM BGE)	
Reason Written	Added 1Y detailed static wire inspection to Nuclear/Generation switchyards as noted.	

Revision CE 0		Date 04/22/2015
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.	

STRUCTURES AND MASTS TEMPLATE DEVELOPMENT HISTORY

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.	