

Control Cable Junction Boxes within Switchyards							
Component Classification Categories							
Criticality	I	X					Nuclear Switchyards
	II		X				DC, SS, TDC, TSS locations that serve O'Hare & Midway Airports
	II			X			Locations exclusive of Criticality I & II, DC locations and ≤ 34 kV ESS locations
	III				X		DC locations
	IV					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	
<b>Condition Monitoring Tasks</b>		<b>Task Frequencies</b>				<b>Failure Codes</b>	<b>Comments</b>
Detailed Visual Inspection		8Y	AR	AR	AR	AR	1a-d, 2a-b AR is based on routine external inspections
<b>Time Directed</b>		<b>Task Frequencies</b>				<b>Failure Codes</b>	<b>Comments</b>
None		N/A	N/A	N/A	N/A	N/A	
<b>Failure Finding Tasks</b>		<b>Task Frequencies</b>				<b>Failure Codes</b>	<b>Comments</b>
Visual Inspection		5W	5W	10W	3M	6M	1a-b
<b>Condition Directed Tasks</b>		<b>Task Frequencies</b>				<b>Failure Codes</b>	<b>Comments</b>
None		N/A	N/A	N/A	N/A	N/A	

## CONTROL CABLE JUNCTION BOXES FAILURE MODES

FAILURE MODE	FAILURE CAUSES	MAINTENANCE TASKS
1. Control Cable Box Failure	1a. Rust/Corrosion	Visual Inspection
1. Control Cable Box Failure	1a. Rust/Corrosion	Detailed Visual Inspection
1. Control Cable Box Failure	1b. Cabinet Hardware	Visual Inspection
1. Control Cable Box Failure	1b. Cabinet Hardware	Detailed Visual Inspection
1. Control Cable Box Failure	1c. Lid/Door Gasket Failure	Detailed Visual Inspection
1. Control Cable Box Failure	1d. Foreign Infestation	Detailed Visual Inspection
2. Control cable failure/damage	2a. Wiring	Detailed Visual Inspection
2. Control cable failure/damage	2b. Terminal blocks	Detailed Visual Inspection

## CONTROL CABLE JUNCTION BOX MAINTENANCE TASK DEFINITION

TASK	DEFINITION
Detailed Visual Inspection	<p>This is a thorough external and internal inspection of the cabinet which includes:</p> <ul style="list-style-type: none"> <li>- Visually verify wires are crimped within their lugs. Don't attempt to pull a wire out of a lug.</li> <li>- Check the terminals blocks for cracking or any other type of deterioration.</li> <li>- Check the lid/door seal is intact.</li> <li>- Check for rust/corrosion.</li> <li>- Check for any indication of animal or insect infestation.</li> <li>- Check any "weep" holes to make sure they are not plugged.</li> <li>- Check that the box is properly grounded.</li> <li>- Make sure conduits, cables and box have adequate supports.</li> <li>- Check that heaters are operational, if applicable.</li> </ul>
Visual Inspection	<p>This is an external inspection that approximates real-time condition monitoring. It can detect developing problems and degradation, and provides condition data used to initiate corrective actions. These items should be checked:</p> <ul style="list-style-type: none"> <li>- Check for rust/corrosion</li> <li>- Check condition of the paint</li> <li>- Check condition of any latches</li> <li>- Check condition of hinges</li> <li>- Check for any missing hardware such as cover screws etc.</li> </ul>

# CONTROL CABLE JUNCTION BOX MAINTENANCE BASIS

## Control Cable Junction Box 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:

---

N/A

### Boundary Definition

---

The boundary of a control cable junction box for the purpose of this document is defined to include the control cable junction box and the cabling, terminal blocks etc. contained with the control cable junction box.

Excluded from this treatment are: Structures on which junction box is mounted and incoming conduits.

### Failure Experiences

---

Control cable junction box failures are subject of RCI investigation IR #354285 regarding LGS Unit 1 SCRAM on 7/18/2005. Findings are incorporated into the template as required to address recommended corrective actions .

### Vendor Recommendations

---

N/A

### Disposition of Vendor Recommendations

---

N/A

### Basis for Template Tasks

---

**Detailed Visual Inspection:** Time based periodic detailed inspection of control cable junction boxes to address and repair items that fail or degrade over time.

**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.

## CONTROL CABLE JUNCTION BOXES TEMPLATE DEVELOPMENT HISTORY

<b>Revision 0</b>		<b>Date 06/17/2005</b>
Writer	John Horwath (Real Time Analysis)	
Reviewer(s)	11/05/04 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	
<b>Revision 1</b>		<b>Date 01/26/2007</b>
Writer	John Horwath (Real Time Analysis)	
Reviewer(s)		
Approver(s)	Kathy McHugh (FAM Maintenance Planning)	
Reason Written	Minor formatting cleanup. Modified monthly task to 5W to aid in clarity of requirement.	
<b>Revision 2</b>		<b>Date 4/5/2007</b>
Writer	John Horwath (Real Time Analysis)	
Reviewer(s)	Chris Stefanski, Terry Whalen, Nuclear Switchyard System Engineers	
Approver(s)	Bill Fluhler (FAM Maintenance Planning)	
Reason Written	Revised Maintenance Task and Maintenance Basis definitions.	
<b>Revision 3</b>		<b>Date 11/30/2010</b>
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.	
<b>Revision 4</b>		<b>Date 04/29/2011</b>
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	

## CONTROL CABLE JUNCTION BOXES TEMPLATE DEVELOPMENT HISTORY

<b>Revision EU 0</b>		<b>Date 12/14/2012</b>
Writer	Chris Stefanski (Material Condition)	
Reviewer(s)	Ken Wendt, Drew Reindel, Jim Crane	
Approver(s)	Bill Fluhler (ComEd) , J. Coffman (PECO), Chris Lotz (UFAM BGE)	
Reason Written	Changed document number and document template to align with Exelon Utilities Management Model. Changed Detailed Visual Inspection to As Required (AR) at ComEd substations outside Nuclear switchards	

<b>Revision EU 1</b>		<b>Date 05/30/2014</b>
Writer	Steven Scalcucci (Material Condition)	
Reviewer(s)	Ken Wendt, George Leinhauser	
Approver(s)	Michael Moy (ComEd) , J. Coffman (PECO), Chris Lotz (UFAM BGE)	
Reason Written	Changed the frequency of the detailed visual inspection for the Nuclear Switchyards from 4Y to 8Y.	

<b>Revision EU 2</b>		<b>Date 07/21/2014</b>
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 to limit applicability of this document to Calvert Cliffs (CCNPP) switchyard.	

<b>Revision CE 0</b>		<b>Date 01/16/2015</b>
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.	

<b>Revision CE 1</b>		<b>Date 01/18/2018</b>
Writer	Hugo Castaneda (Material Condition)	
Reviewer(s)	Dale Player (Manager Material Condition), Greg Hitzke (T&S Equipment Stds)	

## CONTROL CABLE JUNCTION BOXES TEMPLATE DEVELOPMENT HISTORY

Approver(s)	Michael Moy (UFAM ComEd)
Reason Written	3 Year Review. Minor formatting update, no other changes.