

Instrument Transformers - Combination Current / Potential						
Component Classification Categories						
Criticality	I	X				Nuclear Switchyards ≥220 kV as defined in the respective Nuclear Plant Interface Requirements (NPIRs)
	II		X			DC, SS, TDC, TSS locations that serve O'Hare & Midway Airports
				X		• Next Terminal Out [Equipment 220kV & Up] from Nuclear Switchyards (as defined in the respective NPIRs) • Critical Transmission Interconnections • Critical Equipment / Locations per AM-CE-P034-R0001
	III				X	All other locations
Duty Cycle	Heavy Load	N/A	N/A	N/A	N/A	
	Normal Load	N/A	N/A	N/A	N/A	
Service Condition	In Service	X	X	X	X	
	Spare	N/A	N/A	N/A	N/A	
Condition Monitoring Tasks						
Power Factor Test	Task Frequencies	8Y	8Y	8Y	AR	1a, 1b
Time Directed Tasks	Task Frequencies					Failure Codes
None	Task Frequencies	N/A	N/A	N/A	N/A	Comments
Failure Finding Tasks	Task Frequencies					Failure Codes
Visual Inspection	Task Frequencies	5W	5W	10W	10W	1a, 2a-b
Thermography	Task Frequencies	1Y	1Y	1Y	1Y	1b, 3a
Condition Directed Tasks	Task Frequencies					Failure Codes
None	Task Frequencies	N/A	N/A	N/A	N/A	Comments

FAILURE MODE

- 1. Fails to Provide Adequate Insulation Level

- 2. Fails to Maintain Boundary Integrity
- 2. Fails to Maintain Boundary Integrity

- 3. Fails to Provide Correct Output

FAILURE CAUSES

- 1a. Cracked/Broken Bushing
- 1a. Cracked/Broken Bushing
- 1b. Insulation Breakdown
- 1b. Insulation Breakdown

- 2a. Weld Failure
- 2b. Tank Corrosion

- 3a. High Resistance Connections

MAINTENANCE TASKS

- Visual Inspection
- Power Factor Test
- Power Factor Test
- Thermography

- Visual Inspection
- Visual Inspection

- Thermography

TASK	DEFINITION
Power Factor Test	Electrical loss measurement, usually performed using Doble power factor equipment.
Thermography	Infrared inspection of electrical equipment and power path components to identify any hot spots that may exist. Scope includes: <ul style="list-style-type: none"> <li data-bbox="491 386 827 409">-- Transformer and tank <li data-bbox="491 425 806 448">-- Primary connections <li data-bbox="491 464 852 487">-- Secondary connections
Visual Inspection	Visual assessment of the condition of the equipment. Items to check include: <ul style="list-style-type: none"> <li data-bbox="491 604 1331 626">-- Check gas density monitor indicates within "normal" limits <li data-bbox="491 643 1121 665">-- Check for signs of corrosion or weld failure <li data-bbox="491 682 949 704">-- Check for damage to insulator <li data-bbox="491 721 1180 743">-- Check for abnormal contamination on insulator <li data-bbox="491 760 1041 782">-- Check for unusual noises and smells

Instrument Transformer – Combination CT / PT 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 a combination CT/PT for the purpose of this document is defined to include the instrument transformer, primary and secondary windings, the insulating medium, the external insulator, and the secondary cabinet and its components.

Excluded from this template are the meters that are fed by the CT/PT.

Failure Experiences

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

Vendor Recommendations

OEM manuals were referenced and interviews conducted during the development of this template.

Disposition of Vendor Recommendations

Recommendations were incorporated into the template as appropriate based on operating experience.

Basis For Template Tasks

Power Factor Test: Provides indication of insulation degradation and, in some instances, component failure. The test is best applied as a trending tool.

Thermography: Used to check primary electrical connections for heating or signs of bad connections.

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.

Revision 0		Date 11/17/2006
Writer	Chris Stefanski (Strategic Programs)	
Reviewer(s)	Component Experts	
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 04/29/2011
Writer	Chris Stefanski (Material Condition)	
Reviewer(s)	Ken Wendt, Drew Reindel, Jim Crane	
Approver(s)	Bill Fluhler (ComEd)	
Reason Written	Modified criticality definitions and incorporated 10-week inspection task frequency	

Revision 3		Date 04/28/2014
Writer	Steven Scalcucci (Material Condition)	
Reviewer(s)	Ken Wendt (Mgr. Material Condition), Greg Hitzke (Sr. Engineer, T&S Equipment Standards)	
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 02/20/2015
Writer	Chris Stefanski (Exelon Utilities)	
Reviewer(s)	Ken Wendt, Greg Hitzke, Tu Liang	
Approver(s)	Michael Moy (UFAM ComEd)	
Reason Written	Administrative changes to align with common format for OpCo template documents. No changes to maintenance program.	

Revision 5		Date 02/12/2018
Writer	Chris Stefanski (Exelon Utilities)	
Reviewer(s)	Dale Player (Mgr Material Condition), Greg Hitzke (T&S Equipment Stds)	

Approver(s)	Michael Moy (UFAM ComEd)
Reason Written	3 year review with minor format changes. No content change.

Revision 5		Date 09/04/2019
Writer	Kevin Chamberlain (Material Condition)	
Reviewer(s)	Greg Hitzke (T&S Equipment Stds)	
Approver(s)	Michael Moy (UFAM ComEd)	
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.	