

Substation Transformer Inspection (Ready-for-Start)

ComEd Training and Reference Material (T&RM)
CM-CE-303002-R0005
Rev. 9

Work performed on assets identified as a BES CYBER SYSTEM shall adhere to:

- RC-AC-PCS3-007 NERC CIP Configuration Control and Change Management Process.
- RC-AC-PGM3-003 NERC CIP Cyber Security Training Program
- RC-AC-PGM3-005 NERC CIP Access Management Program

ComEd prohibits livening of Protection System Equipment without verifying all Preventive Maintenance (PM) Work Orders in Asset Suite per AM-CE-9095.

Please Print

Location: _____

Equipment: _____

Work Orders and Task Numbers: _____

Checklist Completion: _____ Completed by: _____

Any questions, call your Supervisor.

The Supervisor and Person-in-Charge must review checklists for accuracy after completion of *Additions, Replacements, Maintenance, or Testing*, and verbally verify in person or by phone that each line item is completed before authorizing equipment to be energized.

IMPORTANT: The last person to release clearance shall ensure that each department has completed their related checklists when applicable.

Items must be initialed or marked *N/A*, and all issues must be addressed before *Final Sign-off*.

Department	Checklist completed by (print first and last name)	FINAL SIGN-OFF (Signatures)	Start Date/Time	Completion Date/Time
SSM				
TG				
Other				
AO				
TS Services				

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section 1 – Prelivening Equipment Review

#	TASKS	SSM	TG	TS Services	AO	Other	Peer check	Notes Added
1	Main tank and LTC oil samples dielectrically analyzed and found acceptable in cases where oil has been disturbed or may be in question (as applicable: before oil processing equipment is removed from site).							
2	Spray nozzle used in vacuum oil fill process is removed from underside of transformer cover.							
3	Pressure relief devices are secured and in place with the flag in the DOWN or RESET position.							
4	Visually inspect arresters petticoats: no foreign material, clean, undamaged; lead to top terminal connector tight with visual sign of no-ox compound.							
5	Visually inspect bushings: petticoats clean and undamaged; lead to bushing flag connector tight with visual sign of no-ox compound.							
6	Verify proper bushing oil levels. Oil should be visible in the sight glass. It should 100% full, not be low. Verify proper gauge indicator type levels.							
7	Visually verify Transformer Secondary cables installed are appropriate KV size and ratings per specifications of Unit.							
8	Removed testing leads and mousing wire.							
9	Removed fall protection equipment/structures.							
10	Shipping brace in low voltage compartment (doghouse) removed. Compartment vented as applicable.							
11	Fireproofing installed around low side cable at penetrations in compartment as applicable.							
12	Bushing UST taps, when provided, tightened and filled, per ComEd Spec C-1200.							
13	Bushing potential device grounding switch left in proper position.							
14	Rapid Rise Relay (Sudden Pressure) installed, connected & tested. Isolation Valve left in proper position (typically OPEN if equipped). *If Vacuum Filled SPR /PRD must be tested and TG Notified*							

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#	TASKS	SSM	TG	TS Services	AO	Other	Peer check	Notes Added
15	Trip cut-out (or 63CO selector switch) left in ON position unless otherwise tagged.							

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#	TASKS	SSM	TG	TS Services	AO	Other	Peer check	Notes Added
16	Verify all applicable wildlife mitigation has been installed to current specifications; e.g., bushings, arrester covers, fuse cutout covers, bare leads, line guards, etc.							
17	Verify main tank oil level gauge corresponds to oil level with respect to the oil temperature. Record ruler measurement of oil level Record oil temperature							
18	Verify LTC oil level is appropriate for transformer temperature.							
19	Verify Primary and/or Secondary Cable Compartment oil level is appropriate for transformer temperature.							
20	Verify Conservator tank oil level gauge operational. Oil level proper with respect to oil temperature.							
21	Verify Bucholtz Relay or Gas Detector has been bled with a minimum of one-quart air free oil drained, verify that COPS tank valve to Main tank is in "OPEN" condition.							
22	Verify alarms clear and no alarm signal present.							
23	Main Tank nitrogen pressure at proper PSI with respect to oil temperature.							
24	Liquid temperature gauge min/max hands RESET.							
25	Liquid temperature gauge has been tested and calibrated.							
26	Winding temperature gauge min/max hands RESET.							
27	Winding temperature gauge has been tested and calibrated.							
28	Verify proper pump rotation and oil flow gauges are operational.							
29	Interlocks (permissive, trips, etc.) with adjacent equipment functioning properly.							
30	SCADA interface verified. If SCADA is not operational, a decision must be made by the Designated Authority (DA) and equipment Specialist if transformer can be put in service without the SCADA interface.							
31	No-load tap changer set on correct tap, as applicable, as specified by Distribution Planning or Transmission Planning and also locked or secured when possible.							

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#	TASKS	SSM	TG	TS Services	AO	Other	Peer check	Notes Added
32	Verify the Core Test Ground is reconnected after testing.							
33	Control cabinet circuit breakers left in ON position unless otherwise tagged.							
34	Control cabinet heater, thermostat, and controls left in ON position unless otherwise tagged.							
35	All cooler/radiator/header valves are open and properly fastened open.							
36	Verify all Transformer Monitoring valves are in open position.							
37	All valve configurations proper for startup and operation.							
38	No abnormal oil leaks on transformer.							
39	Verify proper fan rotation.							
40	Fan and pump controls left in proper operating position, and verify all Drain plugs removed from fan motor if applicable.							
41	Local aux power left in normal position unless otherwise tagged.							
42	LTC functionally checked (16L to 16R if any maintenance was performed), and left in one of the following positions: A) Neutral for new install or as directed by DA. B) "As Found" for transformers removed from service. As Found Position _							
43	LTC local/remote switch(es) set to <i>remote</i> unless otherwise tagged.							
44	LTC oil filtration system turned ON and set for maximum run time or continuous operation unless otherwise specified (Waukesha MFDB). Ensure that filter is replaced (as applicable.)							
45	LTC min/max drag hands reset.							
46	Verify condition of Dehydrator, Desiccant and Oil Cup Level are acceptable, per Tech Bulletin TB-08-002, rev.1. Remove shipping caps from Maintenance Free Dehydrating Breathers (MFDB)							

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47	Monitoring equipment turned on and functioning.							
48	Verify case grounds installed on the Main Tank, LV Cubicle							
49	Nameplate secured to transformer.							
50	Equipment Labeling present and correct per Print or Spec.							
#	TASKS	SSM	TG	TS Services		Other	Peer check	Notes Added
51	Alarms, Trips, and Annunciators are operable, checked clear at annunciator panel, and switches left closed. Alarms unable to be cleared prior to release must be communicated to DA & Equipment Specialist to obtain consensus & permission.							
52	The proper Tag must be attached to related out-of-configuration equipment. Make related notes in notes section of this checklist.							
53	Relay protection scheme checked normal with test switch(es) in proper position and instrument transformers (CTs and PTs) functional							
54	If additional substation and/or relaying equipment was modified, complete form CM-CE-303002-R0003 (Field Equipment and Transformers <2000 kVA and Substation Equipment and Relays Ready-for-Start Inspection).							
55	Verify PM Work Orders exist per to AM-CE-9095.							
56	Create add/change-sheets and submit for entry into Cascade/Asset Suite 8 (new or replacement).							
57	Ensure all equipment nameplate data has been recorded, and send to both the Work Planner, and the T&S Substation Engineer for entry into Cascade/Asset Suite 8 per CM-CE-P012.							
58	Operating Instructions are accurate and complete and conform to standards							
59	Un-dispatched grounds removed prior to release of ZOP.							
60	Worker's Alteration Log Cleared or status reported to DA with consensus to energize.							

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61	Communicate any "Quiet Time" needed for Transformer to the Designated Authority when applicable. Document the name of the specific LD or TD, the date and time of the contact.							
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Section 2 – Post-livening follow-up Items

This section may be completed after clearance is released to the Designated Authority.

#	Follow-up Items	SSM	TG	Other	Peer Check	Notes
1	Create work requests for follow-up DGA oil samples of all oil filled compartments as follows: <u>LTC (Selector and Transfer) and Main Tank:</u> <ul style="list-style-type: none"> • 1-week follow oil samples as Pri 20/s. • 5-week follow up oil samples as Pri 30/s. <u>HV Cable Cubicle and LV Cable Cubicle</u> <ul style="list-style-type: none"> • 1-week follow up oil samples as Pri 20's 					
2	Create requests for IR Scan and visual inspection of the unit & equipment scheduled within 5 days after energizing if needed or directed by Substation Engineering.					

Return completed checklist to your Supervisor

I certify the equipment complies with ComEd standards, and is ready-for-service.

Name: _____	Name: _____
Date: _____	Date: _____
Title: _____	Title: _____

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Region: _____

Region: _____

Supervisor Review:

Before Supervisor authorizes equipment to be released for service, Supervisor shall obtain verbal confirmation either in-person or by phone from the Person-in-Charge that each applicable item on this checklist has been verified to be complete and complies with CM-CE-303002.

Review and address discrepancies/issues, and verify:

- Abnormal Conditions have been properly addressed or resolved, and documented.
- Checklist is completed and signed by the Person-in-Charge.
- Supervisor signs this checklist after completion by field personnel, and equipment has been placed in service.

Supervisor signs below after reviewing Checklist & Comments for accuracy and completion. All notes must be properly filled out and addressed.

Supervisor and Department

Signature to Authorize

Date

Supervisor and Department

Signature to Authorize

Date
