

Commercial Building High Voltage Transformer Room Visual Inspection

1.0 Maintenance Objective & Frequency

The objective of this procedure is to perform a systematic visual inspection of the high voltage transformer room and its equipment to identify early signs of deterioration, overheating, oil leaks, or environmental hazards. This inspection aims to prevent catastrophic transformer failure, ensure personnel safety, and maintain electrical system reliability.

Frequency: Monthly, or as specified by local electrical codes and insurance requirements. Additional inspections are required after severe weather events, electrical faults, or any abnormal system operation.

2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** This is a visual inspection only. Do not open any energized panels or enclosures. Maintain a minimum approach distance of 3 meters (10 feet) from all exposed high voltage components unless properly trained and equipped with appropriate PPE.
- **Arc Flash Hazard:** The transformer room is an arc flash boundary. Wear appropriate arc-rated clothing (minimum 8 cal/cm²), safety glasses with side shields, and voltage-rated gloves (Class 00 or higher) when entering the room.
- **Lockout/Tagout:** If any abnormal condition requires de-energizing the transformer, follow the facility's LOTO procedure. Do not attempt any corrective maintenance without proper authorization and LOTO.
- **PPE:** Hard hat, safety glasses, arc-rated long-sleeve shirt and pants, leather work boots, and hearing protection (if ambient noise exceeds 85 dBA).

3.0 Required Tools, Parts & Lubricants

- Flashlight (explosion-proof if required by area classification)
- Infrared thermometer (non-contact, laser sighted)
- Digital multimeter (CAT III or higher, for verifying absence of voltage on accessible test points only)
- Clipboard, inspection checklist, and pen (or tablet with ServiceGrid app)
- Camera (for documenting anomalies)
- Insulating mat (for standing on if floor is damp or conductive)
- Disposable gloves (for handling any oily rags or debris)

4.0 Step-by-Step Maintenance Procedure

1. Verify that the transformer room door is closed and locked. Ensure only authorized personnel are present. Confirm that the room is clean, dry, and free of combustible materials.
2. Don all required PPE as specified in Section 2.0. Ensure arc-rated clothing is properly fastened and no exposed skin is present.
3. Visually inspect the transformer tank for any signs of oil leaks, corrosion, or physical damage. Pay special attention to welds, gaskets, and the base of the tank. Document any oil stains or drips.

4. Check the oil level gauge (if visible) and compare to the temperature-corrected level markings. Record the oil level and ambient temperature. If the level is below the minimum mark, flag for corrective action.
5. Inspect all bushings and insulators for cracks, chips, or contamination (dust, salt, or carbon tracking). Use the flashlight to examine the underside of bushings. Report any damage immediately.
6. Using the infrared thermometer, scan the transformer tank surface, bushings, and connection points for hot spots. Compare readings to baseline data. Any temperature rise greater than 10°C above ambient or a 15°C difference between phases requires investigation.
7. Listen for abnormal sounds such as humming, buzzing, or crackling. A steady low hum is normal; any intermittent or high-pitched noise indicates potential arcing or loose connections.
8. Inspect the cooling system: radiators, fans, and oil pumps (if present). Ensure fans spin freely and are not obstructed. Check for oil leaks around cooling fins. Verify that thermostats and control wiring are intact.
9. Examine the grounding system: check that the ground conductor is securely connected to the transformer tank and the building ground grid. Look for signs of corrosion or loose connections. Verify that the ground rod is not damaged.
10. Inspect the transformer room environment: check for water leaks, condensation, or signs of rodent/insect infestation. Ensure ventilation grilles are unobstructed and the room temperature is within the transformer's rated range (typically 0-40°C).
11. Verify that all warning signs, labels, and arc flash boundaries are legible and properly posted. Replace any missing or faded signs.
12. Document all findings on the inspection checklist. Take photographs of any anomalies. If any critical issues are found (e.g., active oil leak, hot spot >15°C delta, arcing sound), immediately notify the facility manager and do not leave the transformer unattended until it is de-energized or secured.

5.0 Verification & Return to Service

1. If no critical issues were found, the transformer is safe to remain in service. Ensure the room is left clean and the door is locked.
2. If minor issues were noted (e.g., low oil level, minor leak, dirty insulators), schedule corrective maintenance within the next 30 days. Update the work order in ServiceGrid with the findings and recommended actions.
3. If critical issues were identified, do not return the transformer to service until it has been de-energized, evaluated by a qualified electrical engineer, and repaired. Follow the facility's emergency shutdown procedure.
4. Complete the inspection report and sign off on the PM work order in ServiceGrid. Attach any photographs and temperature readings to the work order for future reference.
5. Review the inspection history for any recurring issues and adjust the PM frequency or scope if necessary.

Regulatory Disclaimer: This document is a generic maintenance template provided for educational and informational purposes only. It does not constitute professional engineering or reliability advice. The end-user assumes all liability for validating all step sequences, torque specs, and LOTO protocols against specific machinery OEM manuals before deployment to a live production floor.