

Maintenance Task

<u>PM No.</u>	<u>Title</u>	<u>Frequency</u>
E97	VOLTAGE REGULATOR (MEDIUM VOLT)	SEMIANNUAL ANNUAL EVERY THREE YRS

WARNING: THIS CHECKLIST IS NORMALLY ACCOMPLISHED BY A QUALIFIED CONTRACTOR. DO NOT ACCOMPLISH WITH PERSONNEL WHO ARE NOT SPECIFICALLY QUALIFIED TO PERFORM WORK ON HIGH VOLTAGE (ABOVE 4.16 KV) EQUIPMENT.

NOTE: RCM PROCEDURE CM-0002 (QUALITATIVE INFRARED THERMOGRAPHY) IS TO BE COMPLETED IN CONJUNCTION WITH THIS MAINTENANCE CHECKLIST.

MAINTENANCE TASK DESCRIPTION

1. Clean, inspect, and adjust the regulator (Semi-Annual).
2. Perform an infrared inspection (3 Years).

SPECIAL INSTRUCTIONS:

1. Work to be accomplished by technicians certified to work on high voltage circuits.
2. De-energize, tag, and lock out circuit. DANGER - CHECK THAT CIRCUITS ARE DEAD BEFORE STARTING WORK.

WARNING: YOU DO NOT HAVE TO ACTUALLY TOUCH HIGH VOLTAGE EQUIPMENT TO RECEIVE A LETHAL SHOCK. GETTING TOO CLOSE IS SUFFICIENT.

3. Schedule outage with operating personnel.
4. Follow site safety procedures and your supervisor's instructions.
5. Record and report to your supervisor any equipment damage or deficiencies found while performing this maintenance task.
6. Record test results in the component maintenance log.
7. Obtain and review manufacturer's maintenance instructions.
8. Tests to conform to manufacturer procedures and standard values.

PROCEDURES: (SEMIANNUAL)

1. Operational check with regulator in service. NOTE: VERIFY SUFFICIENT CLEARANCE FROM MEDIUM VOLTAGE TERMINALS BEFORE COMPLETING THIS CHECK - SKIP THIS PROCEDURE IF SUFFICIENT CLEARANCE CAN NOT BE VERIFIED.
 - a. Place automatic controller in manual.
 - b. Decrease voltage by several taps.
 - c. Place automatic controller in automatic.
 - d. Observe that voltage returns to the band edge after the time delay expires.
 - e. Place automatic controller in manual.
 - f. Raise voltage by several taps.
 - g. Place automatic controller in automatic.
 - h. Observe that voltage returns to the band edge after the time delay expires.
2. De-energize and tag out the unit.
3. Check all connections for tightness.
4. Inspect and clean insulators and cable terminators.
5. Inspect and torque connections.
6. Draw an oil sample and analyze in accordance with ASTM D1816-84, D877-87 (Dielectric Strength), ASTM D971-91 (Interfacial Tension), and D1533-88 (Water). Recondition/replace oil based on analysis.
7. Untank the regulator:

NOTE: DO NOT REMOVE THE MAIN CORE-AND-COIL ASSEMBLY FROM OIL. USE BLOCKING.

 - a. Check all connections for tightness.
 - b. Check all contacts for wear.
8. Retank the regulator.
9. Remove tags and return circuit to service.

Maintenance Task

TOOLS, MATERIALS, AND EQUIPMENT: (SEMIANNUAL)

1. Electrician's tool set and micro-ohmmeter.
2. Torque wrench.
3. Oil sampling materials.
3. Vacuum cleaner and cleaning material.

PROCEDURES: (3 YEARS)

1. Perform infrared test in accordance with test equipment manufacturer's instructions.
2. Recover panels at conclusion of test.
3. Analyze hot spots. If severe, initiate corrective action.

GUIDELINES FOR INTREPRETING THERMOGRAPHIC-INFRA-RED SURVEY DATA:

1. Up to 3 °C above ambient: No immediate action necessary.
2. 3 °C to 7 °C: Correct at next routine shutdown.
3. 7 °C to 15 °C: Correct prior to routine maintenance.
4. Over 15 °C: Correct as soon as possible.

TOOLS, MATERIALS, AND EQUIPMENT: (3 YEARS)

1. Electrician's tool set.
2. Infrared test equipment.