

7. INSPECTION AND TEST PROCEDURES

7.1 Switchgear and Switchboard Assemblies

1. Visual and Mechanical Inspection

1. Inspect physical, electrical, and mechanical condition including evidence of moisture or corona.
 2. Inspect anchorage, alignment, grounding, and required area clearances.
 3. Prior to cleaning the unit, perform as-found tests, if required.
 4. Clean the unit.
 5. Verify that fuse and/or circuit breaker sizes and types correspond to drawings and coordination study as well as to the circuit breaker's address for microprocessor-communication packages.
 6. Verify that current and voltage transformer ratios correspond to drawings.
7. Inspect bolted electrical connections for high resistance using one of the following methods:
1. Use of low-resistance ohmmeter in accordance with Section 7.1.2.3.
 2. Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or Table 10.12.
 3. Perform thermographic survey in accordance with Section 9.
8. Confirm correct operation and sequencing of electrical and mechanical interlock systems.
1. Attempt closure on locked-open devices. Attempt to open locked-closed devices.
 2. Make key exchange with devices operated in offnormal positions.
9. Lubrication requirements
1. Use appropriate lubrication on moving current-carrying parts.
 2. Use appropriate lubrication on moving and sliding surfaces.
10. Perform as-left tests.
11. Inspect insulators for evidence of physical damage or contaminated surfaces.
12. Verify correct barrier and shutter installation and operation.
13. Exercise all active components.
14. Inspect mechanical indicating devices for correct operation.

* Optional



7. INSPECTION AND TEST PROCEDURES (CONTINUED)

7.1 Switchgear and Switchboard Assemblies

15. Verify that filters are in place and/or vents are clear.
16. Perform visual and mechanical inspection of instrument transformers in accordance with Section 7.10.
17. Inspect control power transformers.
 1. Inspect for physical damage, cracked insulation, broken leads, tightness of connections, defective wiring, and overall general condition.
 2. Verify that primary and secondary fuse ratings or circuit breakers match drawings.
 3. Verify correct functioning of drawout disconnecting and grounding contacts and interlocks.

2. Electrical Tests

1. Perform electrical tests on instrument transformers in accordance with Section 7.10.
2. Perform groundresistance tests in accordance with Section 7.13.
3. Perform resistance measurements through bolted electrical connections with a low resistance ohmmeter, if applicable, in accordance with Section 7.1.1.
4. Perform insulationresistance tests on each bus section, phasetophase and phasetoground, for one minute in accordance with Table 10.1.
- *5. Perform an overpotential test on each bus section, each phase to ground with phases not under test grounded, in accordance with manufacturer's published data. If manufacturer has no recommendation for this test, it shall be in accordance with Table 10.2. The test voltage shall be applied for one minute. Refer to Section 7.1.3 before performing test.
- *6. Perform insulation-resistance tests on control wiring with respect to ground. Applied potential shall be 500 volts dc for 300 volt rated cable and 1000 volts dc for 600 volt rated cable. Test duration shall be one minute. For units with solid-state components or control devices that can not tolerate the applied voltage, follow manufacturer's recommendation.
7. Perform system function tests in accordance with Section 8.

* Optional



7. INSPECTION AND TEST PROCEDURES (CONTINUED)

7.1 Switchgear and Switchboard Assemblies

8. Control Power Transformers

1. Perform insulation resistance tests. Perform measurements from winding to winding and each winding to ground. Test voltages shall be in accordance with Table 10.1 unless otherwise specified by manufacturer.
2. Verify correct function of control transfer relays located in switchgear with multiple power sources.

9. Voltage Transformers

1. Perform insulation resistance tests. Perform measurements from winding to winding and each winding to ground. Test voltages shall be in accordance with Table 10.1 unless otherwise specified by manufacturer.
2. Verify secondary voltages.

10. Verify operation of switchgear/switchboard heaters.

3. Test Values

1. Compare bus connection resistances to values of similar connections.
2. Bolt torque levels should be in accordance with Table 10.12 unless otherwise specified by manufacturer.
3. Microhm or millivolt drop values shall not exceed the high levels of the normal range as indicated in the manufacturer's published data. If manufacturer's data is not available, investigate any values which deviate from similar bus by more than 50 percent of the lowest value.
4. Insulation resistance values for bus and control power transformers shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 10.1. Values of insulation resistance less than this table or manufacturer's minimum should be investigated. Overpotential tests should not proceed until insulation resistance levels are raised above minimum values.
5. Bus insulation shall withstand the overpotential test voltage applied.
6. Control wiring minimum insulation-resistance values should be comparable to previously obtained results but not less than two megohms.

* Optional

