

## **'Non-traction' high voltage apparatus and substations/compounds**

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### **Method**

#### **Routine Examination**

A routine inspection shall be carried out whenever a HV sub-station or compound is visited.

- a) Listen for any unusual noise before entering.
- b) Carry out a visual inspection of all HV equipment for signs of leakage/damage/corrosion/overheating, listen for any unusual noises and check for any abnormal smell to confirm that integrity has not been compromised.
- c) Carry out a visual inspection of security and vandal/intruder preventative devices, confirm satisfactory condition and establish site integrity.
- d) Check emergency exits operate correctly and that safe access/egress is not impeded.
- e) Check operation of lighting.
- f) Carry out a functional test of the telephone.

### **All Sites**

#### **Refurbishment, modification, repair or relocation**

Where the HV equipment has undergone refurbishment, modification, repair or relocation carry out pressure test on the high voltage system in accordance with NR/SP/ELP/21014 to establish its integrity is satisfactory.

#### **'E' Examination**

Perform the routine examination in section 1 and:

- a) Check that the key safe is present and secure.
- b) Check presence, security and condition of any special tools/equipment and any associated storage facilities.
- c) Visually examine high voltage switchgear, control-gear, protection and telecommunications equipment, battery chargers, distribution boards, switches, cables, cable boxes, etc. and confirm integrity has not been compromised.
- d) Check the operation of battery chargers, check electrolyte levels and battery condition.
- e) Check all protection relays, reset where appropriate, and record details of any trip indications in the sub-station log book.
- f) Visually examine breathers and renew if necessary.

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- g) Check condition of labels, safety sign, notices and fixings, repair/renew.
- h) Check that ventilation ducts, louvers, airbricks, etc. allow free movement of air, clear any obstructions.
- i) Confirm heating and ventilation system settings are correct and that the equipment works satisfactorily.
- j) Check thermostat is set correctly and confirm operation of heaters.
- k) Remove debris and vegetation, and suitably treat affected area to prevent further growing.
- l) Visually examine for signs of vermin, birds, nesting, etc. and arrange removal/prevention as necessary.

### **Oil Switchgear**

#### **'I' Examination or after every trip.**

- a) Examine and overhaul the circuit breaker/switch cubicle.
- b) Examine and overhaul those parts of the circuit breaker subject to deterioration caused by switching fault current.
- c) Examine and overhaul, without dismantling the equipment, conductor insulation, conductor supports, insulators, bushings and any means provided for preventing direct contact with circuit conductors to check that there is no significant deterioration.
- d) Examine and overhaul the high voltage contact latching mechanism to confirm correct operation.
- e) Examine and overhaul the switchgear operating mechanism. Operate from all local and remote trip push-buttons to confirm correct operation.
- f) Examine and, if necessary, overhaul the switchgear to confirm that Isolating and Interlocking arrangements are functioning correctly.
- g) Examine and overhaul connections.
- h) Renew circuit breaker/switch insulating oil after on-site dielectric test of new oil.
- i) Examine hinges, catches and locks and lubricate.
- j) Examine, overhaul and test the earthing system to establish its integrity.
- k) Check labels and locks relating to safety and operation are correct and visible.
- l) Carry out visual inspection and functional tests to confirm that the switchgear and associated control circuits, relays, contactors, indicators etc. operate

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correctly including those not normally energised during normal operation e.g trip circuits.

- m) Clean equipment exterior and report on condition of paintwork, carryout sufficient repairs to prevent corrosion.

### **'J' Examination**

By dismantling, examine and overhaul the equipment.

## **Vacuum Switchgear**

### **'I' Examination**

- a) Examine and, if necessary, overhaul air insulated chambers and, in the case of withdrawable circuit breakers the circuit breaker cubicle.
- b) Examine and, where necessary, overhaul those parts of the circuit breaker subject to deterioration caused by switching fault current.
- c) Examine and overhaul, without dismantling the equipment, conductor insulation, conductor supports, insulators, bushings and any means provided for preventing direct contact with circuit conductors to check that there is no significant deterioration.
- d) Check the integrity of vacuum Interrupters by testing in accordance with the manufacturer's instructions. Trend closed contacts 'Low Resistance' readings and vacuum 'Insulation Resistance' readings with previous.
- e) Examine and overhaul the switchgear operating mechanism to confirm correct operation.
- f) Examine and overhaul the switchgear to confirm that isolating and interlocking arrangements are functioning correctly.
- g) Examine and overhaul connections so far as is reasonably practicable to check the electrical and mechanical properties are satisfactory.
- h) Examine hinges, catches and locks and lubricate if necessary.
- i) Examine, overhaul and test the earthing system to establish its integrity is satisfactory.
- j) Check labels and locks relating to safety and operation are correct and visible.
- k) Carry out visual inspection and functional tests to confirm that the switchgear and associated control circuits, relays, contactors, indicators etc. operate correctly including those not normally energised during normal operation e.g. trip circuits.