INSTALLATION AND MAINTENANCE OF CURRENT TRANSFORMER

- **LV & MV INSTRUMENT TRANSFORMERS**

a) VISUAL INSPECTION

- Check and confirm that there is no damage occurred during transit.
- Clean the entire surface of the instrument transformer using a dry and clean cloth without any solvents.
- Dimension verification as per approved drawing.

b) PRE-COMMISSIONING TESTING

- **POLARITY TEST**

This test can be conducted with null detector or centre zero milli ammeter (DC) with battery (cell)

- **Ratio test**

This test can be carried out by injecting the maximum rated current on the primary near to rated value and measure the secondary current respectively. However ratio error and phase displacement cannot be measured by this method.

- **High voltage test**

For LV system, high voltage test 1000V Meggar can be used for primary & secondary. For MV system (3.3KV-33KV) high voltage side (Primary) 5000V Meggar, LV side (secondary) 1000V Meggar can be used.

- **Measurement of winding resistance.**
- **Knee pointvoltagetest for PX class.**
- **Composite error test for protection class.**

c) INSTALLATION

- LV CT should be mounted with suitable fasteners depend upon the size and weight. Minimum M6 fasteners should be used.
- MV CT should be mounted with suitable fasteners depend upon the size and weight. Minimum M8 fasteners should be used.
- All electrical equipment should have 2 earthing bolts.
- For ring type LV and MV CT, suitable bus bar should be passed through the centre of the CT and bus bar should not touch the body of the CT.

- For MV Ring type CT equipotential cable to be connected with primary bus bar.
- LV&MV Wound primary / Bar primary CT, primary terminals surface should be free from burr and dust and tightened with suitable fasteners
- Un-used LT secondary terminal should be shorted.
- Torque values as indicated by manufacturer should be followed for tightening primary and secondary terminals
- Points marked with earth symbol must be earthed in service
- Every secondary terminal should be bought out to the terminal block before charging the CT.
- Prior to connection of the CT, the terminal markings, labels, drawings and winding diagrams provided by the manufacturer should be checked, and connections made accordingly. All terminal marks likes P1, S1, C1 shall have the same polarity at any instant.

d) <u>MAINTENANCE</u>

- Clean the surface of CT (using a dry and clean cloth without any solvent) and tighten the fasteners once in every 6 months.
- High voltage test also be conducted (Same procedure as of pre-commission test).

e) <u>STORAGE</u>

- The units should be stored only in indoors, in clean and dry conditions
- Ambient temperature should be between 20° C to 40° C
- Direct or diffused sun light should not fall on the unit
- The units should be stored in a dust free manner
- Storage location and method should not lead to condensation on the surface of the unit
- Units should be safe from any kind of degradation of the surface, and should not be exposed to pollutants or chemicals

INSTALLATION AND MAINTENANCE OF VOLTAGE TRANSFORMER

- **LV & MV INSTRUMENT TRANSFORMERS**

a) VISUAL INSPECTION

- Check and confirm that there is no damage occurred during transit.
- Clean the entire surface of the instrument transformer using a dry and clean cloth without any solvent.
- Dimension verification as per approved drawing.

b) PRE-COMMISSIONING TESTING

- **POLARITY TEST**

This test can be conducted with null detector or centre zero mille ammeter (DC) with battery (cell)

- **Ratio test**

This test can be carried out by injecting the maximum rated voltage on the primary near to rated value and measure the secondary voltage respectively. However ratio error and phase displacement cannot be measured by this method

- **High voltage test**

For LV system, high voltage test 1000V Megger can be used for primary & secondary.

For MV system (3.3KV-33KV) high voltage side (Primary) 5000V Megger, LV side (secondary) 1000V Megger can be used.

NOTE: High voltage test does not apply to single pole or three pole VT if one end of primary winding is earthed

c) INSTALLATION

- LV VT should be mounted with suitable fasteners depending upon the size and weight. Minimum M6 fasteners should be used.
- MV VT should be mounted with suitable fasteners depending upon the size and weight. Minimum M8 fasteners should be used.
- All electrical equipment should have 2 earthing bolts.
- Fuse continuity has to be checked.

- Prior to connection of the VT, the terminal markings, labels, drawings and winding diagrams provided by the manufacturer should be checked, and connections made accordingly. Supply should be given only to the identified primary terminals.
- Un-used LV terminals should be kept open.
- Torque values as indicated by manufacturer should be followed for tightening primary and secondary terminals.
- Points marked with earth symbol must be earthed in service.

d) <u>MAINTENANCE</u>

- Clean the surface of VT (using a clean and dry cloth without solvents) and tighten the fasteners once in every 6 months.
- High voltage test also to be conducted (same procedure as of pre-commission test).

e) <u>STORAGE</u>

- The units should be stored only in indoors, in clean and dry conditions
- Ambient temperature should be between 20° C to 40°C
- Direct or diffused sun light should not fall on the unit
- The units should be stored in a dust free manner
- Storage location and method should not lead to condensation on the surface of the unit
- Units should be safe from any kind of degradation of the surface, and should not be exposed to pollutants or chemicals