



Department of Electrical Engineering  
High Voltage Laboratory  
Indian Institute of Technology Madras, Chennai- 600 036

TR / 05 / 07-08

Date:10.05.2007

IMPULSE VOLTAGE TESTING OF 10 /16 MVA, 33 kV/ 11 kV,  
THREE PHASE POWER TRANSFORMER

**1.0 General Data :**

Name of the manufacturer : M/s Supreme Power Equipment Private Ltd.,  
Chennai – 602 107.

Testing Required by : - do -

**2.0 Technical Data:**

Type of specimen : One No.10 /16 MVA, 33kV/ 11 kV Three phase  
power transformer with “ON LOAD” tap  
changer as per manufacturer’s drawing Nos.  
SPE/RD/3/215, SPE/RD/2/202, & SPE/GA/2/200

Nominal ratings as per nameplate or as  
submitted by the manufacturer : VA Rating : 10 /16 MVA  
Voltage Ratio : 33 / 11 kV  
Vector Group : Dyn11  
Serial Number : SPEL 2081

Test Conducted : Impulse Voltage withstand test

As per : IS 2026 – 1981 (Part III), Clause 13 – in general

Tested during : 10-05-2007.

Other conditions specifically  
agreed to if any : Tap switch shall be kept at 1, 5 and 17 while  
testing of 1U, 1V and 1W phases of High  
voltage windings respectively

### 3.0 Test data:

- 3.1 General Remarks : The insulation resistance of the windings and the winding temperature were not measured.
- 3.2 Test Conditions : Test was conducted as per testing arrangement shown in the attached drawing No.TR/05/07-08
- Test Voltage polarity : Negative
- Test Voltage : 170 kV<sub>peak</sub> for H.V. winding  
75 kV<sub>peak</sub> for L.V. winding
- Wave shape : 1.2/50  $\mu$ s with in permissible tolerance.

### 3.3 Atmospheric conditions

- Averages room temperature : 36 ° C
- Average barometric pressure : 758 mm Hg
- Averages relative humidity : 60 %

### 3.4 Testing

Full and chopped voltage waves were applied in the following sequence:

- One full wave of 50-60% BIL in 10 $\mu$ s sweep
- One full wave of 100% BIL in 10 $\mu$ s sweep
- One chopped wave of 50-60% BIL in 1 $\mu$ s sweep
- Two chopped waves of 100% BIL in 1 $\mu$ s sweep
- Two full waves of 100% BIL in 10 $\mu$ s sweep

Minor discrepancies in the neutral current were found between 100 % full wave lightning impulse voltage applications while testing the 1V & 1W phase of HV winding and 2U phase of LV winding . Three additional 100% full wave lightning impulse voltages were applied as per Standards. No discrepancies in voltage and current wave shape were found, during the additional three applications of impulse voltage.

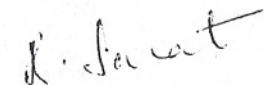
The wave shapes of the applied voltages and neutral currents have been recorded during all the applications. Typical oscillographic recordings of the applied voltages and neutral currents are appended.

### 4.0 Comments / Results:

Under the conditions detailed in sections 2 and 3, the transformer is considered to have withstood the impulse voltage test.

Encl: Drawing No.TR / 05 / 07 - 08 &  
Typical oscillograms.

10/5/07



( R. Sarathi )

HEAD

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