

| | | | |
|-------------------------------|---|--------------------|-------------------|
| Laboratory | Technical Associates Limited, 8th Km, Faizabad Road, Ismailgang, Lucknow, Uttar Pradesh | | |
| Accreditation Standard | ISO/IEC 17025: 2005 | | |
| Discipline | Electrical Testing | Issue Date | 11.09.2015 |
| Certificate Number | T-2592 | Valid Until | 10.09.2017 |
| Last Amended on | - | Page | 1 of 3 |

| S.No. | Product / Material of Test | Specific Test Performed | Test Method Specification against which tests are performed | Range of Testing / Limits of Detection |
|--------------|--|---|--|---|
| I. | TRANSFORMERS & REACTORS | | | |
| 1. | Power Transformer (40 MVA 132 kV) | Measurement of Voltage ratio , Polarity & check of phase Displacement | IS 2026-1: 2011 IEC 60076-1: 2000 | 1 to 100 |
| | | Measurement of Winding resistance | IS 2026-1: 2011 IEC 60076-1: 2000 | 1 mΩ to 100 Ω |
| | | Insulation resistance measurement | IS 2026-1: 2011 IEC 60076-1: 2000 | 10 MΩ to 150 GΩ |
| | | Capacitance & Tan Delta measurement | IS 2026-1: 2011 IEC 60076-1: 2000 | Cap. 100 pF to 15000 pF Tan Delta 0.01 % to 100 % |
| | | Measurement of No load loss & current | IS 2026-1: 2011 IEC 60076-1: 2000 | 1 kW to 25 kW, |
| | | Measurement of short circuit Impedance & Load loss | IS 2026-1: 2011 IEC 60076-1: 2000 | 1 kW to 200 kW, |
| | | Induced AC voltage test (only ACSD excluding partial discharge) | IS 2026-3: 2009 IEC IEC 60076-3: 2000 | 5 kV to 230 kV |
| | | Separate source AC with stand voltage test (Applied potential test) | IS 2026-3: 2009 IEC IEC 60076-3: 2000 | 2kV to 150 kV |
| | Measurement of Zero - Sequence Impedance in three phase Transformers | IS 2026-1: 2011 IEC 60076-1: 2000 | 1 % to 100 % | |

| | | | |
|-------------------------------|---|--------------------|-------------------|
| Laboratory | Technical Associates Limited, 8th Km, Faizabad Road, Ismailgang, Lucknow, Uttar Pradesh | | |
| Accreditation Standard | ISO/IEC 17025: 2005 | | |
| Discipline | Electrical Testing | Issue Date | 11.09.2015 |
| Certificate Number | T-2592 | Valid Until | 10.09.2017 |
| Last Amended on | - | Page | 2 of 3 |

| S.No. | Product / Material of Test | Specific Test Performed | Test Method Specification against which tests are performed | Range of Testing / Limits of Detection |
|--------------|--|---|--|---|
| | Power Transformer (40 MVA 132 kV) | Lightning impulse test (LI) for the Line terminal | IS 2026-3: 2009 IEC 60076-3: 2000 | 40 kVp to 900 kVp 45 kJ |
| | | Temperature rise test | IS 2026-2: 2010 IEC 60076-2:1993 | 1 °C to 55 °C |
| | | Determination of sound level test | IS 2026-10: 2009 & IS 13964 IEC 60076-10: 2000 & NEMA TR-1 | 40 dB to 120 dB |
| | | Measurement of harmonics of the NO- LOAD current | IS 2026-1: 2011 IEC 60076-1: 2000 | Upto 21 st Harmonics |
| | | Test on ON LOAD tap changer | IS 2026-1: 2011 IEC 60076-1: 2000 | AS PER STANDARDS |
| | | Measurement of the Power taken by Fans & oil Pumps Motors | IS 2026-1: 2011 IEC 60076-1: 2000 | 100 W to 3.5 kW |
| | | Magnetic circuit (isolation) Test | As per CBIP, publication 295 : March 2006 guide lines | 1 kV to 2 kV |
| | | Magnetic Balance test on three phase transformers | | 230 V to 415 V |
| | Measurement of Magnetizing current at Low voltage | | Upto 415 V , 5 A | |
| 2. | Distribution Transformer (1000 KVA 11 kV 3 Ph & 1 Ph) | Measurement of Voltage ratio , Polarity & check of phase Displacement | IS 2026-1: 2011 IEC 60076-1: 2000 | 1 to 100, & 415 V |

Laboratory **Technical Associates Limited, 8th Km, Faizabad Road, Ismailgang, Lucknow, Uttar Pradesh**

Accreditation Standard **ISO/IEC 17025: 2005**

Discipline **Electrical Testing** **Issue Date** **11.09.2015**

Certificate Number **T-2592** **Valid Until** **10.09.2017**

Last Amended on **-** **Page** **3 of 3**

| S.No. | Product / Material of Test | Specific Test Performed | Test Method Specification against which tests are performed | Range of Testing / Limits of Detection |
|--------------|--|---|--|---|
| | Distribution Transformer (1000 KVA 11 kV 3 Ph & 1 Ph) | Measurement of Winding resistance | IS 2026-1: 2011 IEC 60076-1: 2000 | 0.1 mΩ to 350 Ω |
| | | Insulation resistance measurement | IS 2026-1: 2011 IEC 60076-1: 2000 | 10 MΩ to 20 GΩ |
| | | Measurement of No load loss & current | IS 2026-1: 2011 IEC 60076-1: 2000 | Upto 1.5 kW, 11 kV, 3 Phase & 1 phase |
| | | Measurement of short circuit Impedance & Load loss | IS 2026-1: 2011 IEC 60076-1: 2000 | Upto 10 kW, 11 kV, 3 Phase & 1 phase |
| | | Induced AC voltage test(only ACSD excluding partial discharge) | IS 2026-3: 2009 IEC 60076-3: 2000 | 500 V to 22 kV |
| | | Separate source AC with stand voltage test (Applied potential test) | IS 2026-3: 2009 IEC 60076-3: 2000 | 2 kV to 28 kV |
| | | Lightning impulse test (LI) for the Line terminal | IS 2026-3: 2009 IEC 60076-3: 2000 | 40 kVp to 105 kVp, 15KJ |
| | | Temperature rise test | IS 2026-2: 2010 IEC 60076-2:1993 | 1 °C to 45 °C |
| | | Measurement of Magnetizing current at Low voltage | As per CBIP, publication 295 : March 2006 guide lines | 230 V to 415 V, 5 A |
| | | Magnetic Balance test on three phase transformers | | 230 V to 415 V |

~~-X-X-X-X-X-X-X-X-X-X-X-X-~~

**Rini Narayan
Convenor**

**N. Venkateswaran
Program Manager**