



Energising India since 1969...

Technical Associates Limited



**TECHNICAL
ASSOCIATES
LIMITED**

An ISO 9001 : 2015 & ISO 45001 : 2018 Company

ABOUT US

Technical Associates Ltd. (TAL) is one of India's most respected, reliable, and well regarded pure-play transformer specialists in the manufacturing of Power and Extra High Voltage (EHV) Transformers. Wherever electrical energy is generated, transmitted and distributed, TAL offers power transformation products, services & solutions meeting customer and end user requirements. The experience & expertise in the transformers industry dates back to 1969, when TAL was established in Lucknow, Uttar Pradesh, INDIA.

Today, with an annual manufacturing capacity of 20,000 MVA, TAL has grown into a well established company and is amongst the Top Ten OEMs of Power and EHV Transformers in India.

TAL is in excellent position to shape tomorrow's mobility, with its Power Transformer solutions for railway products & services covering:

1. METRO
2. Track side applications
3. Mass Rapid Transit System (MRTS)
4. Green Energy Grid Connected Renewable Transformers
5. Repair and Refurbishment of Ageing Transformers for Energy Efficiency
6. Re-Manufacturing for Power/ Range/ Life enhancement/ Augmentation
7. Service & maintenance

ENGINEERING EXCELLENCE

The bridge between design and commissioning of a product is embedded in engineering excellence that adapts and reflects system design requirements. TAL is today one of the most accepted and approved engineering partners for standardised and customized solutions in the transformer industry.

Transformers for railway applications are characterised by the following:

- a) Frequent short circuits
- b) Repeated switching operations
- c) Frequently and rapidly varying loads and overloads
- d) Harmonic generation in the 25 KV power supply system

Such stringent requirements are challenges. TAL has licensed reputed international software for design of Power Transformer. Iterations from software-based design & in-house engineering strength help to mitigate the above challenges, as below:

A. Short circuit Forces on Windings

- a) Calculates dynamic ability of windings to withstand short-circuit forces
- b) Maps the leakage field distribution
- c) Calculates precisely radial & axial mechanical forces at every turn/disc of the windings
- d) Estimates stresses
- e) In eight areas of the windings, suggests Factor of Safety

B. Transient Voltage Distribution

- a) Calculates precisely the impulse voltages transferred in each disc of the windings and to other windings (e.g. tapping coil) during the entire wave duration



- b) Another programme maps the electrostatic field distribution for test voltages
- c) Estimates the safety factors based on the dielectric strength of the composite insulation (paper + oil duct + barrier)

C. Harmonics & Cooling

- a) Suggests efficient cooling design, by guided oil flow
- b) Efficient cooling design takes care of harmonic losses
- c) Ensures winding hot spots are not exceeded beyond the permissible limits

D. Calculations are validated by:

- a) Finite element methods
- b) Up-to-date simulation
- c) Testing tools
- d) Inputs of relevant field feedback & solution

E. Engineering output for Railway and Metro applications excels at:

- a) Dielectric, Electromagnetic and Thermal performance of the transformers
- b) Dynamic Short Circuit Withstand capability
- c) Short Duration Over Load
- d) Lightning Impulse Withstand Capability
- e) Noise & Vibration Reduction
- f) Application of 3 D Modelling for Mechanical Structure
- g) Eliminates Mechanical Mis-Match and Fouling
- h) Adequate Structural Strength
- i) Optimised standardisation

F. All the above ensures a performance of:

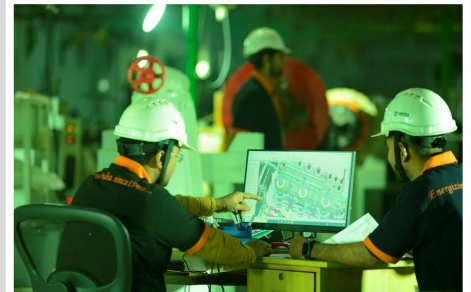
- a) Continuity & sustainability of Power
- b) Reliability of operation
- c) Safety

G. This software is a tool for review of every design, which enables TAL to produce:

- a) Energy- efficient
- b) Low noise-environmental friendly
- c) Continued improvement of failure rate percent per year (FRPCPY)
- d) Continued improvement of Mean time between failure (MTBF)
- e) Low cost of ownership



132 KV, 20/25 MVA Power Transformer for Agra Metro



EXPERTISE AND EXPERIENCE

Led by seasoned technocrats through its history, TAL has supplied approximately 3000 Numbers of Power and EHV Transformers, both in India and overseas. We have a 2 decade manufacturing experience of 132 KV transformers and have been manufacturing 220 KV class transformers for more than a decade. Over the last 50 years, 1,50,000 MVA (One Hundred Fifty Thousand MVA) equivalents of Transformers have been successfully supplied by TAL and are in satisfactory operation in our customer networks. TAL is proud to be a manufacturer of choice for robustness, quality, and value for money, to:

1. All major Transmission utilities in India
2. National and international companies like Larsen & Toubro, Siemens India, Kalpataru Power Transmission Limited, Bajaj Electricals, Techno Electric, TBEA India, NTPC, Alstom, AREVA T&D India Limited

FACILITIES

EHV Power transformers are manufactured by TAL out of its state of the art facility at Sitarganj, Uttarakhand. Spread out over an area of 12.5 acres with total covered manufacturing area of approx. 23,000 sq mtr, this is one of India's largest transformer manufacturing setups. Featuring heights of up to 22 mtr in its manufacturing bays, adequate lifting capacity up to 300 MT, and all modern equipments including Vertical Winding machines, high capacity assembly stations, climate controlled winding and assembly areas and capability for conducting all routine and type tests in-house (including Impulse & Temperature Rise), TAL's manufacturing setup is one of the most modern setups in India today.

The factory and its manufacturing processes have also been certified in compliance to ISO 45001:2018 - the Standard for Occupational Health & Safety Management System in the work place, and ISO9001:2015 – the standard for quality assurance.

Our test facilities have been assessed and accredited by the National Accreditation Board for Testing and Calibration Laboratories (NABL) for compliance with ISO/IEC 17025:2017 upto 400 KV, 500 MVA, offering further proof of robustness of the quality of transformers manufactured by us.

QUALITY POLICY

We, at Technical Associates, are committed to achieve total satisfaction of our customers by:

- Effectively implementing and continually improving the Quality System
- Delivering on time, products conforming to agreed specifications at competitive prices
- Collectively and individually striving to do things right - the first time and every time-both in personal life as well as at the work place
- Continuous up-gradation of technology and active involvement of all employees and associates in productivity improvement



WAY FORWARD

Technical Associates Limited (TAL) as a brand, has always led the way with authenticity and with this ethos at the core, TAL is checking into newer, relevant areas of mobility & energy. With an organisational commitment to Continuous Learning, Commitment to Quality, Continued Improvement, and Innovative approach to its Products, Processes and People, TAL has successfully catered to the requirements of its many customers with updated manufacturing equipment, skilled workforce, quality product, timely supplies, service, and support.

Our vision for the future of mobility hinges on key defining parameters of:

- a) Deliver faster, greener, more reliable and safe transport
- b) Better value for customers with Best in Class Energy Efficiency
- c) Products & Services comply with latest railway guidelines and standards
- d) A Connected, Sustainable and Inclusive Future to shape tomorrow's mobility

With this vision, we hope to be a partner in the growth of Indian Railways, contributing to a prosperous, energy efficient & green planet.



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