

**SARVAJANIK COLLEGE OF ENGINEERING  
AND TECHNOLOGY**



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**FIELD TRIP REPORT :VIKRANT TRANSFORMERS**

3<sup>RD</sup> YEAR ELECTRICAL SHIFT 1

**COORDINATED BY:**

PROF. HEMIN MOTIWALA

PROF. NIKI PATEL

**DATE:**

14<sup>th</sup> JULY 2016

**PLACE:**

VIKRANT TRANSFORMERS, MAROLI

**DURATION:**

12:00 to 4:00 PM

**NO. OF STUDENTS:**

## Industry Description

**Vikrant Transformers** manufactures an extensive line of transformers and transformer styles. We design and manufacture a product that perfectly suits your specific application. This makes our product line as varied as the industries we serve. The products and industries list that follow demonstrate our capabilities.

- Distribution transformers upto 2000 KVA, 33 KV Class
- Step up transformers upto 2000 KVA, 33 KV Class
- Earthing Transformers
- Low voltage transformers for industrial applications
- Special transformers to meet customers' specific requirements.
- Furnace duty transformers.

Transformers are designed and tested as per ISS 2026-1977. The transformers are designed by highly technical and experienced design engineer.

We can undertake design manufacture and supply of copper wound transformers upto 2000 KVA capacity and voltage class upto 33 KV.

## Highlights of various parts of transformers

The students got to interact with the engineers as well as the workers there & found out more about the following parts

**Core:** The core is built up from interleaved cold rolled grain oriented steel laminations, coated with an insulating material which is both heat and oil resistant. The cores are assembled on steel channels and clamped in a manner to reduce vibration and inherent voice to minimum. All cores have mitred joints.

**Windings:** Transformers windings are designed to meet three fundamental requirements. **Mechanical, thermal and electrical.** They are cylindrical in shape and are assembled concentrically. Interlayer cooling ducts are provided to ensure that the temperature gradient between winding and oil and hence the hot spot temperature is kept as low as possible. This means that the rate of insulation deterioration is minimized and a high life expectancy is achieved. Insulation between layers and turns is based upon the impulse test level of the voltage class of the winding as specified in ISS 2026-1977.

**Tapping:** Tappings are provided on HV voltage  $\pm 2.5\%$  and  $\pm 5\%$ . Tap selection is effected by means of an off circuit tapping switch operated by an external handle on the cover.

**Tank:** The tank is made from mild steel which is electrically welded. Tank is adequately stiffened to withstand air pressure of 0.8 Kg/cm<sup>2</sup> and vacuum of 0.7 kg/cm<sup>2</sup>. All tanks are applied with one coat of Zinc Chrome primer and two coats of synthetic enamel paints. The inside of tank is provided with heat and oil resistance paints.

**Termination:** All the bushing and its metal parts are of high quality and confirming to the relevant ISS 3347.

**Overloads:** Transformers can be overloaded in accordance with ISS 6600.

**Vector Group:** The transformers are generally connected DY11 (Delta Star). However we can manufacture on any vector group as per ISS 2026-1977.

**Operating Conditions:** The standard range of transformers described in this specification are designed for continuous operation at rated voltage and frequency resulting top oil temperature rise of 500C by thermometer and 550c of winding of resistance.

**Insulation in impregnation:** The principal components of insulation are made from high quality pressure board / haldullingum / permawood. The oil used for impregnation confirms to IS 335.

**Ability to withstand short circuit:** In order to prevent deformation when subjected to short circuit forces, solid block end insulation backed up by substantial supporting frames is utilized. The axial end trust under fault conditions is minimized by the suitable distribution of the ampere turns over the length of the windings and by ensuring that the design dimensions are closely adhered to during manufacturing. The transformers designed and manufactured to withstand short circuit conditions as laid down in ISS 2026-1977.

**Tolerance:** No load losses, voltage ration, impedance voltage are subject to tolerance as per ISS 2026-1977.

**Fittings:** Following standard fittings are provided on transformer

- Oil conservator with plain oil gauge, filling hole with cap and drain plug.
- One Silica Gel dehydrating Breather
- One Off circuit externally operated tapping switch with position indicator, handle and locking device.
- 4 Bi Directional flat rollers.
- Explosion Vent
- 1 Thermometer Pocket.
- 1 Drain Valve with plug.
- 2 lifting lugs.
- 2 earthing terminals.

- 1 rating and diagram plate
- 1 Air release plug
- LT Cable Box

### **Optional Fittings**

Following fittings can be supplied with transformers on customer's request.

- HT Cable Box
- 4" Dial Thermometer with MRP / BSD
- 6" Dial Thermometer with MRP / RSD and set of alarm contacts ( 230 V, 60 m.A.)
- Double Float Buchholz Relay with alarm and trip contact.

Apart from the manufacturing & assembling of various parts of transformers, students were also able to witness various tests that they carry out on the manufactured transformer & the standards they follow. In case, the transformer fails one of the tests, it is resent to the manufacturing unit to relace/re-assemble it to assure quality.

The students also got to interact with the MD of the company & who discussed about the new IS standards coming into effect this year & how the company will have to bring about some chnages to meet those standards.

Overall, it was a nice learning experience covering

- enhancement in techical knowledge,
- practical exposure to industry working environment,
- overseeing the safety measures one needs to take while in field
- enterprenual skill enhancement



