KINGS COLLEGE OF ENGINEERING
Recognised under 2(f) & 12(B) of UGC
Approved by AICTE, New Delhi.
Affiliated to Anna University, Chennai.

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

ACADEMIC YEAR 2022-23 (EVEN)

Report - Industrial Visit

Place Visited : 230 / 110 kV Sub-Station, Thirukannurpatty, Thanjavur.

Date of Visit : 30.03.2023 & 31.03.2023

Number of Beneficiaries: 38 – Students (III EEE) & 04 Staff Members on 30.03.2023

30 – Students (II EEE) & 04 Staff Members on 31.03.2023

As part of our curriculum, department has arranged one day field visit for second and third year EEE students at 230 / 110 kV Sub-Station, Thirukannurpatty, Vallam road, Thanjavur.

Objectives of Industrial Visit at Sub-Station:

The objective of an industrial visit is to provide an insight regarding internal working of industries.

- To gain Practical knowledge of Electrical power distribution and transmission and power line carrier communication.
- To get familiarized with different electrical equipments and working of a substation.
- To study various parts of the substation and how they are operated.
- To have interaction with experts and learn industry-specific workings and wisdom, eventually leading the students to understand better management skills, leadership skills, team player attitude, etc.

Introduction of TANGEDCO (Tamil Nadu Generation and Distribution Corporation):

Tamil Nadu Electricity Board was restructured as per G.O.114 dated 08.10.2008 by establishing a holding company with the name "TNEB Ltd" and two subsidiary companies namely "Tamil Nadu Transmission Corporation Ltd.,"(TANTRANSCO) and "Tamil Nadu Generation and Distribution Corporation Ltd (TANGEDCO). There are a total of 1012 sub-stations of various capacities in the state. Out of them, 83 sub-stations have a capacity of 400kV each.

The Students visited the following places at 230kV Sub-station:

- Control house
- Battery room
- Switchyard

Snapshot at Sub-station

The following points were discussed during the visit:

Lightning Arrestor:

Lightning Arrestor is the first member of the electrical substations. It protects the substation equipment from transient high voltage and also limits the duration and amplitude of the flow of current.

Power Transformer:

Power transformers are used for stepping up the voltage for transmission at generating station and for stepping down the voltage for further distribution at main step-down transformer substations.

Make : APEX

Capacity : 100MVA

Ratio : 230/110/11kV

Amps : 251 / 525

Students discussed with resource person Er.G.Murugadoss

Instrument Transformer:

Instrument transformer is used to reduced high voltages and currents to a safe and practical value which can be measured by conventional instruments (normally range is 1A or 5A for current and 110 V for voltage).

Current Transformer:

A current transformer is a device for the transformation of current from a higher value to a lower value. Instrument Transformer – A voltage transformer may be defined as an instrument transformer for the transformation of voltage from a higher value to the lower value.

Bus-Bar:

It is one of the most important elements in an electrical power substation. It is a type of conductor carrying an electrical current to which many connections are made.

Wave Trapper

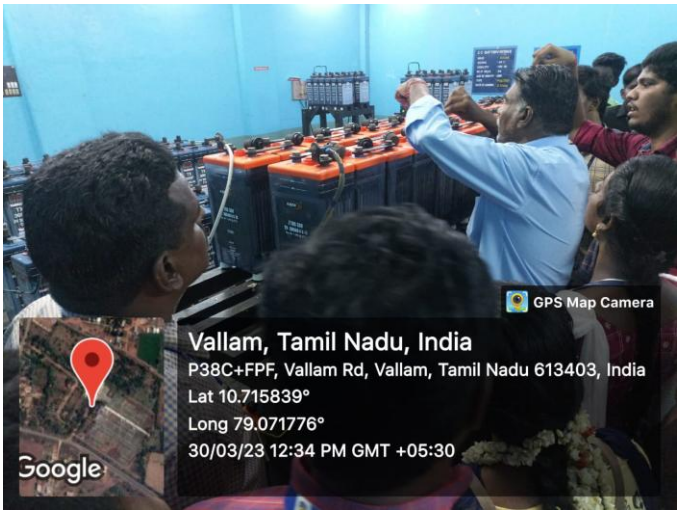
It is placed on incoming lines for trapping the high-frequency wave. The high-frequency wave which is coming from the remote substation disturbs the waves of voltage and current.

Isolator

It is a type of switches which is employed only for isolating the circuit when the current has only been interrupted. The isolator is called disconnected switches operates under no load condition.

Circuit Breaker:

The circuit breaker is a type of electrical switches which is used for opening or closing of electrical circuit whenever faults occur in the system.



Students visited battery room

Battery:

Station Battery Details:

DETAILS	BATTERY -1	BATTERY-2
Make	AAJCO	HBL
Type	7TBS30	T 3005
Capacity	300Ah	300Ah
No. of Cells	55	55
Volt / Cell	2V	2V
Acid Sp. Gravity	1240	1200
Voltage	2V	2V
Boost Current 'A'	5A	5A
Tricle Current 'mA'	300mA	300mA
Temperature	27ºC	27ºC

In electric power stations and large capacity substations, the operation and automatic control circuits the protective relay system, as well as emergency lighting circuits, are supplied by station batteries.

Layout of 230/110 kV Sub-station

Capacitor Bank:

This device is inbuilt with capacitors that are connected either in series or else parallel. They will enhance the capacity of ripple current of the power supply, and it removes the unnecessary characteristics within the system. The capacitor bank is an efficient method for preserving power factor as well as power-lag problem correction.

Insulator:

The insulator is used for insulating as well as fixing the bus-bar systems in substations. Insulators are separated into two types namely post type & bushing type.

Switchyard:

Snapshot at switchyard

The switchyard is the inter-connector among the transmission as well as generation, & equal voltage is maintained in this device. Switchyards are used to transmit the power which is generated from the substation at the preferred level of voltage to the near transmission line or power station.

TANGEDCO- Testing Facilities at R & D, Chennai:

Transformer Oil Testing

Sl.No.	Name of the Test	Equipment used
1.	**Dissolved Gas Analysis (DGA) Test** To detect and quantify fault gases dissolved in Transformer oil so as to identify incipient faults in Transformers	Gas Chromatograph with Head Space Auto Sampler Make: Perkin Elmer, U.S.A. Model: ARNEL CLARUS 580.
2.	**Flash Point Test** To determine the Flash Point of the Transformer Oil.	Fully Automatic Pensky Martens closed cup test kit Make: ANTON PAAR. (Temp. Measurement up to 350 ˚C)

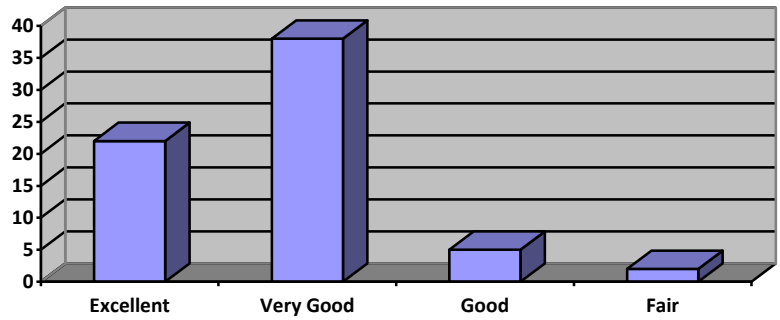
On Going Projects at TANGEDCO:

- World Bank aided Coastal Disaster Risk Reduction Project(CDRRP)
- Dam Rehabilitation and Improvement Project (DRIP)

Outcome:

- Industrial visits help students to enhance their interpersonal, communication skills, and teamwork abilities.
- At the end of this visit, students should be able to improve their knowledge relevant to transmission, distribution, protection switchgear and electrical machines. Opportunity to learn new technologies and areas.

Students Feedback:



Prepared by

6/4/23

6/4/23

6/4/2023

Coordinator

(Mr.S.R.Karthikeyan,

AP/EEE)

HOD

Principal