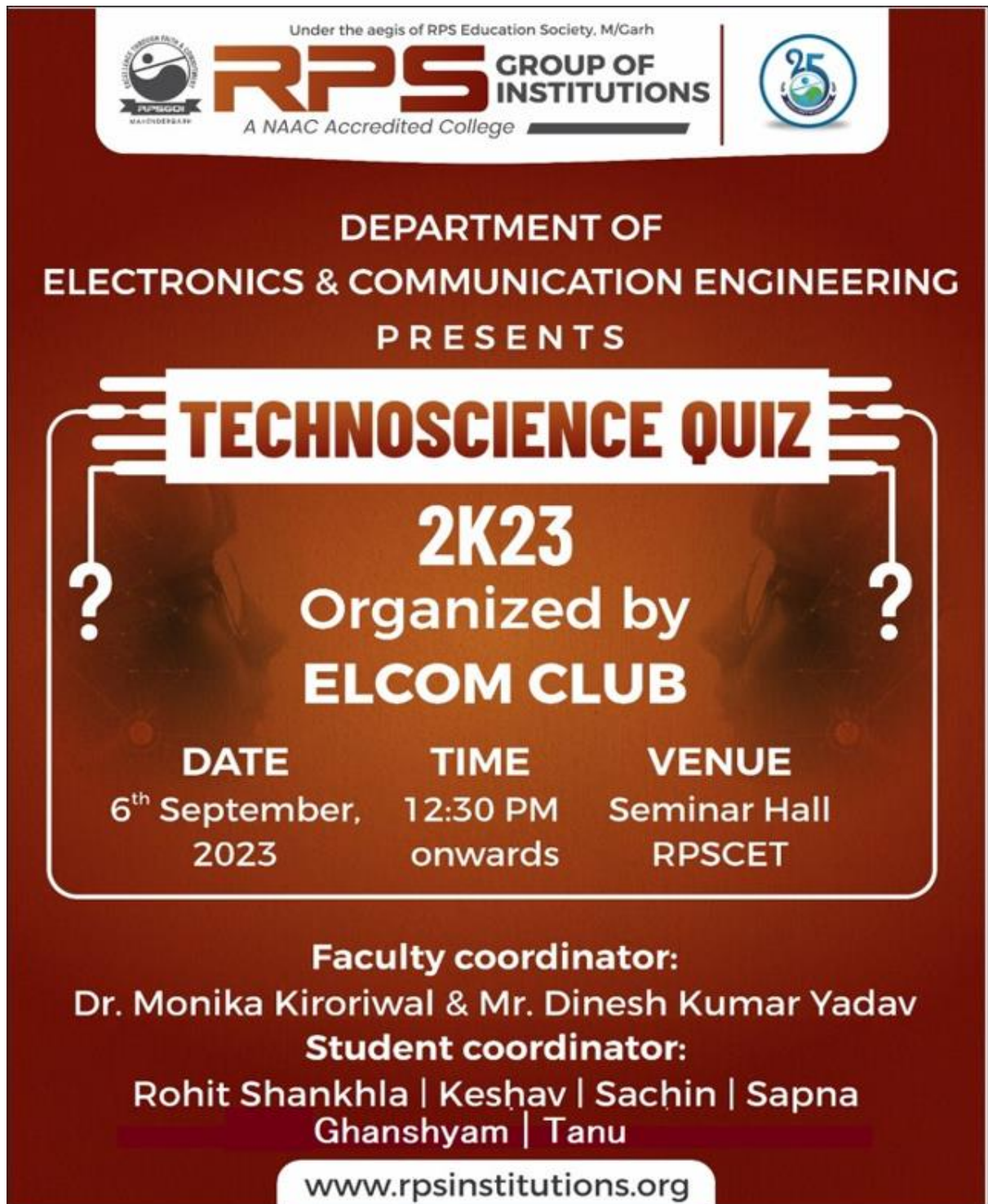


# ACTIVITY NO. - 1

## TECHNOSCIENCE QUIZ 2K23



The poster features a dark red background with white and gold text. At the top, it includes the RPS Group of Institutions logo and a 25th anniversary emblem. The central text is framed by a white border with question marks at the corners. The event details are presented in a table format.

Under the aegis of RPS Education Society, M/Garh

**RPS** GROUP OF INSTITUTIONS  
A NAAC Accredited College

25

DEPARTMENT OF  
ELECTRONICS & COMMUNICATION ENGINEERING  
PRESENTS

**TECHNOSCIENCE QUIZ**

**2K23**

Organized by  
**ELCOM CLUB**

DATE	TIME	VENUE
6 <sup>th</sup> September, 2023	12:30 PM onwards	Seminar Hall RPSCET

**Faculty coordinator:**  
Dr. Monika Kiroriwal & Mr. Dinesh Kumar Yadav

**Student coordinator:**  
Rohit Shankhla | Keshav | Sachin | Sapna  
Ghanshyam | Tanu

[www.rpsinstitutions.org](http://www.rpsinstitutions.org)

A **TechnoScience Quiz 2K23** is organized by Electronics and Communication Engineering (ELCOM CLUB) on 6<sup>th</sup> September 2023. TechnoScience Quiz is a quiz that tests your knowledge of various topics related to technology and science. It can cover a wide range of subjects from different fields. This quiz may include multiple-

choice questions, true/false statements, and open-ended questions to evaluate the knowledge. To prepare for such a quiz, it's essential to review basic principles, and theories involved in technology and science, and stay updated with current developments and discoveries.

For the successful organization of this event, Rohit Shankhla (7<sup>th</sup> Sem.), Keshav (5<sup>th</sup> Sem.), and Sachin, Sapna, Ghanshyam, and Tanu (3<sup>rd</sup> Sem.) worked as student coordinators under the guidance of faculty coordinators Dr. Monika Kiroriwal and Mr. Dinesh Kumar Yadav.

1. Event started with a screening test on 4<sup>th</sup> September 2023, which includes 25 MCQ basic question of science, general knowledge, current affairs, discoveries in science and basic aptitude questions. In this 1<sup>st</sup> stage of quiz, all ECE semesters students are appeared in the test. There were 40 students who appeared in this test, out of them 24 students selected on the basis of secured marks.



2. In the second stage, all 24 students divided into 8 teams with 3 students in each.



### Teams Structure

Team A	Team B	Team C	Team D
1. Ayush (20EC04)	1. Mahender (21EC35)	1. Yogesh (20EC14)	1. Nakul (22EC40)
2. Raman (23EC39)	2. Pushpa (22EC16)	2. Naveen (22EC18)	2. Anil (20EC02)
3. Anshu (23EC01)	3. Kawal (23EC03)	3. Ujjwal (20EC15)	3. Varsha (22EC04)

Team E	Team F	Team G	Team H
1. Praveen (22EC73)	1. Yashraj (20EC13)	1. Devender (20EC05)	1. Jitender (22EC10)
2. Nitin (21EC06)	2. Lakshay (21EC17)	2. Rahul (22EC33)	2. Kajal (22EC14)
3. Aman (21EC29)	3. Manish (21EC07)	3. Riya (23EC40)	3. Vinika (22EC13)



3. Our participants were motivated by HODs of CSE Department and EE Department. They shared their knowledge and experience in the field of science and technology.



4. In the third stage three rounds were there. First Round began with a big round of applause by students. This round is to test the Basic General Knowledge of students.



At the end of this round two teams were eliminated:- Team D from group 1 and Team F from group 2.

5. There were 6 teams in the second round. This round is of basic general awareness, general discoveries in science.







In this round, based on secured marks again two teams were eliminated. Team C from group 1 and Team G from group 2.

6. Third round was of Image round, in which some pictures were displayed, related to places, famous persons including scientists, players, and literature.



At the end of 3<sup>rd</sup> round two more teams were out from both the group:- Team A from group 1 and Team H from group 2.

7. Last Round was of technical questions related to electronics & communication engineering and latest technology. Team B and Team E participated in this round.



At the end of this round, Team B secured their winner position and Team E was runner up.

The prize distribution started with a melodious speech by Director and Dean Sir.



The prize was given by the Director and Dean of RPS College of Engineering and Technology to team B and Team E.





Technoscience quiz is a valuable opportunity to assess knowledge, receive feedback, and use the results as a tool for further learning and improvement in the fields of science and technology.

ACTIVITY INCHARGE

HOD ECE



# ACTIVITY NO. - 2

## INDUSTRIAL VISIT

KAYNES TECHNOLOGY INDIA PVT. LTD., MANESAR,  
GURUGRAM

on

03-10-2023

EXECUTED BY: MR. SANDEEP, Dr. MONIKA KIRORIWAL, Dr. NIRANJAN YADAV & MR.  
RAVI

PARTICIPANTS: ECE & EE (2<sup>nd</sup> & 3<sup>rd</sup> YEAR STUDENTS)

## KAYNES 2023

Kaynes Technology is a leading **end-to-end** and **IoT solutions-enabled integrated electronics manufacturer** in India. They have capabilities across the entire spectrum of ESDM services.

Kaynes has over three decades of experience in providing Conceptual Design, Process Engineering, Integrated Manufacturing and Life Cycle Support for major players in the Automotive, Industrial, Aerospace and Defence, Outer-space, Nuclear, Medical, Railways, Internet of Things (“IoT”), Information Technology (“IT”) and other segments. They have advanced manufacturing infrastructure that enable them to manufacture products at variable or flexible volumes across all industry verticals.



On October 03, 2023 a group of students from the ECE and EE departments, along with faculty members, embarked on an industrial visit to KAYNES Technology, MANESAR. This was intended to provide students with practical exposure to the PCBA (printed circuit board assembly).

The group departed from RPS GOI, Campus at 9:30 AM and arrived at 12:15 PM.

1) **Seminar session:** In this session, an orientation program is executed by the representatives of company. They provide a brief introduction of their company.









## 2) Exploring Knowledge:

Here, we were divided into groups of 15 students and then we explored different sections under the supervision of instructor of the industry.



## 3) Automatic circuit designing lab:



Equip the lab with a range of electronic components, including resistors, capacitors, transistors, diodes, ICs, and various sensors. Ensure you have the necessary test equipment like oscilloscopes, function generators, multimeters, and power supplies.



#### 4) Automatic assembling and testing lab:

An automatic assembling and testing lab is a specialized facility equipped with automated machinery and systems for the efficient assembly and testing of products, typically in manufacturing or production environments. These labs are designed to streamline the production process, improve quality control, and reduce labor costs by using robotics, computer-controlled equipment, and sensors.





The group then travelled back to the campus and arrived at 4:15 PM.

Overall the industrial visit provided the students with a great learning experience and an opportunity to apply their theoretical knowledge to real – world situations. The visit was enjoyable and memorable experience for the students, and they appreciated the efforts made by the faculty members to organize and coordinate the trip.

Team Members visited:

1. Mr. Sandeep Yadav
2. Mr. Niranjana Yadav
3. Mr. Ravi
4. Dr. Monika

Students Visited :

1. ECE 3<sup>rd</sup> sem (41 Students )
2. ECE 5<sup>th</sup> sem (18 Students)
3. EE 3<sup>rd</sup> sem(12 Students)
4. EE 5<sup>th</sup> sem (09 Students)

Total Students Visited = 80

ACTIVITY INCHARGE

HOD ECE



# ACTIVITY NO. - 3

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## INDUSTRIAL VISIT

DEPARTMENT OF ECE & EE

INDUSTRIAL VISIT AT 132 KV SUBSTATION

HVPNL,

Pali (Distt. Mahendragarh)

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The department of Electronics & Communication Engineering & Electrical engineering, Rao Pahlad Singh college of Engineering and Technology, Balana had organized a one-day Industrial visit to 132 KV Substation HVPNL, Pali on 13<sup>th</sup> October, 2023. There were 48 students from B.Tech (EE and ECE) morning shift along with two teaching faculties Mr. Karambir Sheoran and Mr. Ravi Kumar. We had coordinated with Shri Bir Singh (SSE) & Shri Dinesh (JE) Substation, Pali. At 10:00 AM, we reached at Substation HVPNL, Pali. After reaching there, Shri Bir Singh & Shri Dinesh received us with a warm welcome.

Shri Dinesh sir had explained the working substation in depth. Then we were taken to the control room. In the control room, every quantity of the substation is continuously monitored and we observed the real time data of substation on the panel. Shri Dinesh had brought us to battery room & explained its importance in substation. We interacted with Dinesh sir and had a great technical discussion.

## **OBJECTIVE OF VISIT**

Our main purpose for this visit is to be familiar with industrial environment and to get practical knowledge of electrical power transmission and distribution. Being final year students, we will get to know about basic industrial functioning of power transmission and distribution. Students will also get familiar with Transformer maintenance, circuit breaker, Transformer isolator, bus bar, Protective relays, Lightning arresters, Load break switches, SCADA system, Current and voltage Transformer and Battery room.

## **EQUIPMENT IN A 132 KV SUB-STATION**

The equipment required for a transformer Sub-Station depends upon the type of Sub-Station, Service requirement and the degree of protection desired. 132KV EHV Sub-Station has the following major equipments:

- Bus-bar
- Insulators
- Isolating Switches
- Circuit breaker
- Protective relay
- Instrument Transformer
- Current Transformer
- Voltage Transformer
- Metering and Indicating Instrument
- Miscellaneous equipment
- Transformer
- Lightning arrestors
- Line isolator
- Wave trap





Figure 1: Circuit Breaker

**Bus-bar:** When a no. of lines operating at the same voltage have to be directly connected electrically, bus- bar are used, it is made up of copper or aluminium bars (generally of rectangular X-Section) and operate at constant voltage. The bus is a line in which the incoming feeders come into and get into the instruments for further step up or step down. The first bus is used for putting the incoming feeders in LA single line. There may be double line in the bus so that if any fault occurs in the one the other can still have the current and the supply will not stop. The two lines in the bus are separated by a little distance by a Conductor having a connector between them. This is so that one can work at a time and the other works only if the first is having any fault.

**Insulators:** The insulator serves two purposes; they support the conductor (or bus bar) and confine the current to the conductor. The most commonly used material for the manufacture of insulators is porcelain. There are several types of insulators (i.e., pin type, suspension type etc.) and their use in Sub-Station will depend upon the service requirement.



Figure 2: Isolator

**Isolating Switches:** In Sub-Station, it is often desired to disconnect a part of the system for general maintenance and repairs. This is accomplished by an isolating switch or isolator. An isolator is essentially a knife Switch and is design to often open a circuit under no load, in other words, isolator Switches are operated only when the line is which they are connected carry no load. For example, consider that the isolator is connected on both side of a circuit breaker, if the isolators are to be opened, the C.B. must be opened first.

**Circuit breaker:** A circuit breaker is an equipment, which can open or close a circuit under normal as well as fault condition. These circuit breaker breaks for a fault which can damage other instrument in the station. It is so designed that it can be operated manually (or by remote control) under normal conditions and automatically under fault condition. The use of SF6 circuit breaker is mainly in the substations which are having high input KV input, say above 132KV and more. The gas is put inside the circuit breaker by force i.e., under high pressure. When if the gas gets decreases there is a motor connected to the circuit breaker. The motor starts operating if the gas went lower than 20.8 bar.

There is a meter connected to the breaker so that it can be manually seen if the gas goes low. The circuit breaker uses the SF6 gas to reduce the torque produce in it due to any fault in the line. The circuit breaker has a direct link with the instruments in the station, when any fault occurs alarm bell rings.

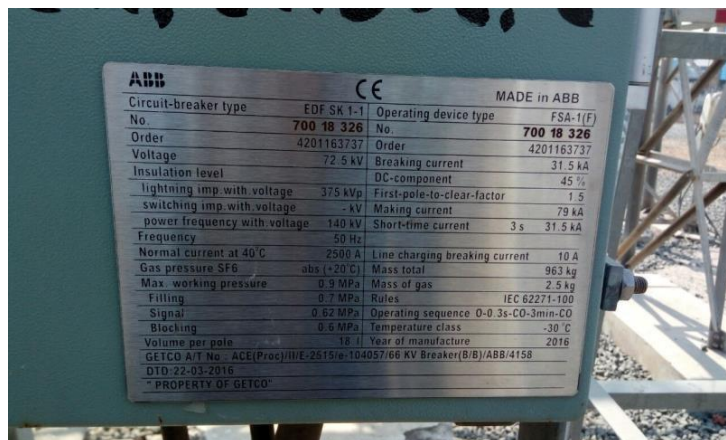


Figure 3: Circuit Breaker Name plate

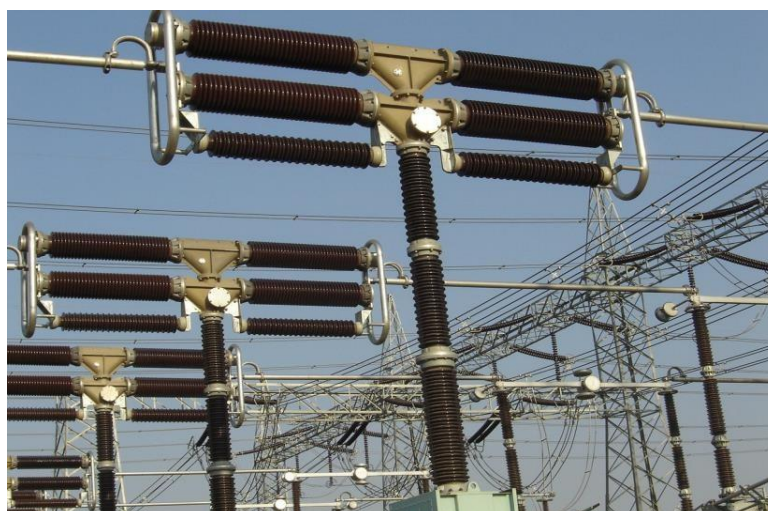


Figure 4: Circuit Breaker



**Protective relay:** A protective relay is a device that detects the fault and initiates the operation of the C.B. to isolate the defective element from the rest of the system". The relay detects the abnormal condition in the electrical circuit by constantly measuring the electrical quantities, which are different under normal and fault condition. The electrical quantities which may change under fault condition are voltage, current, frequency and phase angle. Having detected the fault, the relay operates to close the trip circuit of CB.

**Instrument Transformer:** The line in Sub-station operates at high voltage and carry current of thousands of amperes. The measuring instrument and protective devices are designed for low voltage (generally 110V) and current (about 5A). Therefore, they will not work satisfactory if mounted directly on the power lines. This difficulty is overcome by installing Instrument transformer, on the power lines. There are two types of instrument transformer-

1. **Current Transformer:** A current transformer is essentially a step-down transformer which step down the current in a known ratio, the primary of this transformer consists of one or more turn of thick wire connected in series with the line, the secondary consists of thick wire connected in series with line having large number of turns of fine wire and provides for measuring instrument, and relay a current which is a constant fraction of the current in the line. Current transformers are basically used to take the readings of the currents entering the substation. This transformer steps down the current from 800 amps to 1amp. This is done because we have no instrument for measuring of such a large current. The main use of this transformer is: (a) distance protection (b) backup protection (c) measurement.
2. **Potential Transformer:** It is essentially a step – down transformer and step down the voltage in known ratio. The primary of these transformer consists of a large number of turns of fine wire connected across the line. The secondary way consists of a few turns and provides for measuring instruments and relay a voltage which is known fraction of the line voltage.
3. **C V T:** A capacitor voltage transformer (CVT) is a transformer used in power systems to step-down extra high voltage signals and provide low voltage signals either for measurement or to operate a protective relay. In its most basic form, the device consists of three parts: two capacitors across which the voltage signal is split, an inductive element used to tune the device to the supply frequency and a transformer used to isolate and further step-down the voltage for the instrumentation or protective relay. The device has at least four terminals, a high-voltage terminal for connection to the high voltage signal, a ground terminal and at least one set of secondary terminals for connection to the instrumentation or protective relay. CVTs are typically single-phase devices used for measuring voltages in excess of one hundred kilovolts where the use of voltage transformers would be uneconomical. In practice the first capacitor, C1, is often replaced by a stack of capacitors connected in series. This results in a large voltage drop across the stack of capacitors that replaced the first capacitor and a comparatively small voltage drop across the second capacitor, C2, and hence the secondary terminals.

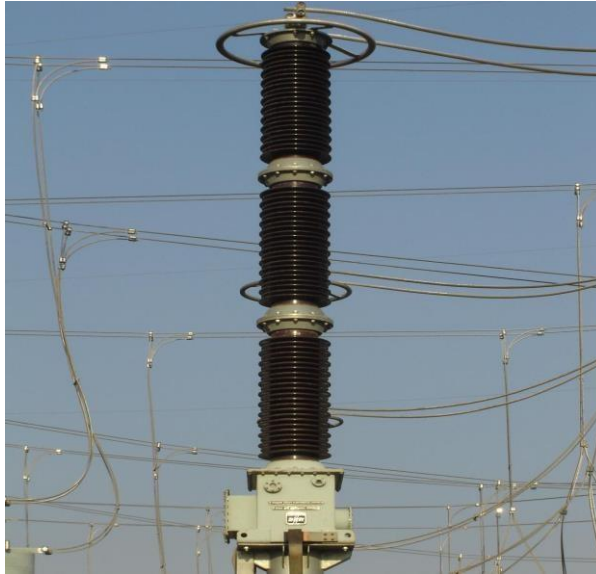


Figure 6: capacitor voltage transformer

**Metering and Indicating Instrument:** There are several metering and indicating Instrument (e.g., Ammeters, Volt-meters, energy meter etc.) installed in a Substation to maintain which over the circuit quantities. The instrument transformers are invariably used with them for satisfactory operation.

**Miscellaneous equipment:** In addition to above, there may be following equipment in a Substation:

- i) Fuses
- ii) Carrier-current equipment
- iii) Sub-Station auxiliary supplies

**Transformer:** There are two transformers in the incoming feeders so that the two lines are step down at the same time. In case of a 132KV or more KV line station autotransformers are used. While in case of lower KV line such as less than 132KV line double winding transformers are used Autotransformer.

Transformer is static equipment which converts electrical energy from one voltage to another. As the system voltage goes up, the techniques to be used for the Design, Construction, Installation, Operation and Maintenance also become more and more critical. If proper care is exercised in the installation, maintenance and condition monitoring of the transformer, it can give the user trouble free service throughout the expected life of equipment which of the order of 25-35 years. Hence, it is very essential that the personnel associated with the installation, operation or maintenance of the transformer is through with the instructions provided by the manufacture diverted around the protected insulation in most cases to earth.





Figure 7: Power transformer

**Auto transformer:** Transformer is static equipment which converts electrical energy from one voltage to another. As the system voltage goes up, the techniques to be used for the Design, Construction, Installation, Operation and Maintenance also become more and more critical. If proper care is exercised in the installation, maintenance and condition monitoring of the transformer, it can give the user trouble free service throughout the expected life of equipment which is of the order of 25-35 years. Hence, it is very essential that the personnel associated with the installation operation or maintenance of the transformer is through with the instructions provided by the manufacture.

**Lightning Arrester:** To discharge the switching and lightning voltage surges to earth.

**Wave trap:** Wave trap is an instrument used for tripping of the wave. The function of this trap is that it traps the unwanted waves. Its function is of trapping wave. Its shape is like a drum. It is connected to the main incoming feeder so that it can trap the waves which may be dangerous to the instruments here in the substation.



Figure 8: Wave Trap

## SINGLE LINE DIAGRAM (SLD)

A Single Line Diagram (SLD) of an Electrical System is the Line Diagram of the concerned Electrical System which includes all the required ELECTRICAL EQUIPMENT connection sequence wise from the point of entrance of Power up to the end of the scope of the mentioned Work. As these feeders enter the station they are to pass through various instruments. The instruments have their usual functioning.

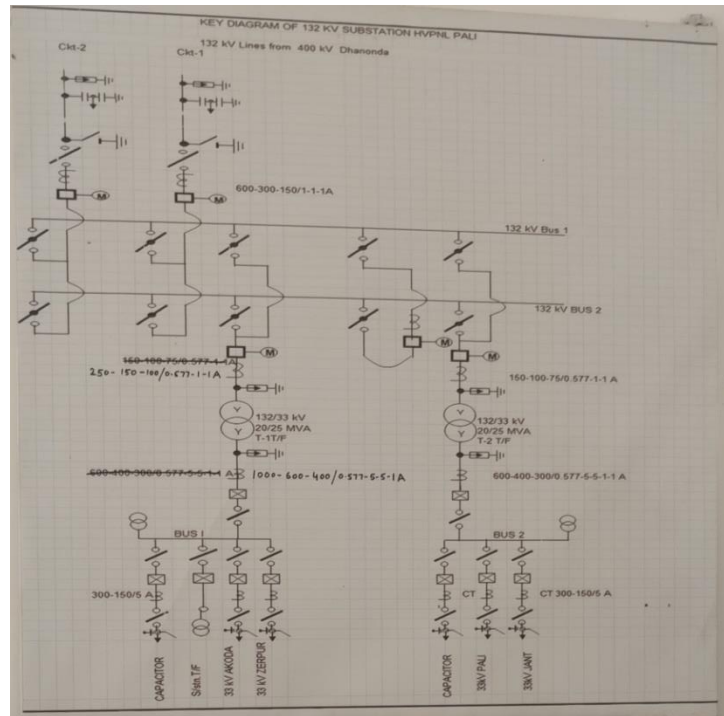


Figure 9: SLD of 132 KV Substation HVPNL, Pali

## CONTROL & RELAY ROOM

The control room has various control panels which shows the information like incoming power, outgoing power, frequency, time common to all sub-stations, status of various lines (healthy, faulted, under outage or maintenance), status of various protective instruments like isolators, circuit breaker, temperature of various instruments, working tap of transformer etc.

The DAS (Data Acquisition System) is used to accumulate the data received from various sources. The relay room is separate from the control room. The protection system is so fast that it can detect a fault within 30ms and hence the circuit breaker can be operated within as less as 80ms. For 400KV side C.B., one time auto re-closure is allowed in order to clear the faults automatically.

**BATTERY ROOM:** The control panels and relays of the sub-station required DC supply of 110 V. The DC supply is made with the help of battery bank reserve normally kept in a separate room called battery room. The batteries used in this sub-station are Nickel-Cadmium (NI-Cd) batteries. These batteries re-used due to their advantages like low maintenance, longer life (15-20 years) etc. Batteries at sub-station Storage battery system is used in emergency situation for the working of electrical equipment. To open and close the switch gear. For indication and control. Emergency lighting Relay and interlocking equipment for working of alarm circuit.



## CONCLUSION

Now from this report we can conclude that electricity plays an important role in our life. We are made aware of how the transmission the transmission of electricity is done. We too came to know about the various parts of the substation system. The three wings of electrical system viz. generation, transmission and distribution are connected to each other and that too very perfectly. Thus, for effective transmission and distribution a substation must:

- Ensure steady state and transient stability
- Effective voltage control
- Prevention of loss of synchronism
- Reliable supply by feeding the network at various points
- Fault analysis improvement in respective field
- Establishment of economic load distribution

We are very grateful to 132 KV Substation HVPNL, Pali for giving permission for this visit. Students got an opportunity to know regarding practical aspects about what they are learning in theory. We hope that such kind of permission will be given in future also. It was an informative, interesting and a successful visit.

Activity Incharge

HOD ECE