

Smt. Indira Gandhi College of Engineering
 Estd. : 1993-94 (Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to
 University of Mumbai) Academic Year- 2023-24

Industrial Visit At

Mahatransco Mahape - 220 KV/ 22 KV Substation

Subject Incharge – M.M.Ansari

Electrical Department

CERTIFICATE

This is to certify that the industrial visit at Mahatransco Mahape- 220 KV/22 KV substation.

on [6th February 2024 ,Tuesday] from 9.15 am -5.15 pm has been completed successfully.

I.V Incharge (S.B.Konade) Subject Incharge M.M.Ansari)

Head Of The Department (N.B.Joshi)

AKNOWLEDGEMENT

We Students of third year course of electrical engineering of Smt. Indira Gandhi College of Engineering, Ghansoli It is indeed a matter of great pleasure and proud privilege to be able to attend this industrial visit at Mahatransco Mahape- 220 KV/22 KV substation. This industrial visit was all successful with the help of our Industrial Visit Incharge Mr .S.B.Konade and PSPS Subject Incharge Mr. M. Ansari , we are highly indebted of him. For his invaluable guidance and appreciation for this report. It is due to his enduring efforts, patience and enthusiasm, which has given a sense of direction and purposefulness to this industrial visit and ultimately made it a success. We would also like to thank our head of department Prof. Mr. Nishant Joshi for giving us this opportunity and guidance and encouragement. We would also like to express our deep regards and gratitude to our principal Dr. Sunil S. Chavan.

COLLEGE VISION AND MISSION

VISION

To serve and have a transformative impact on society by constantly pursuing excellence in technical education, innovation and entrepreneurship for human development with strong ethical values.

MISSION

M1 :- Serve and help transform society by graduating talented, broadly educated engineers equipped with state of art technology resources for developing sustainable solutions.

M2 :- Academic excellence in science, engineering and technology through dedication to duty, commitment to research innovation in learning and faith in human values.

M3 :- Cultivate the spirit of entrepreneurship and the connection between academia and industry that fosters problem solving through collaboration.

M4 :- Enable the student to develop into outstanding professionals with high ethical standards capable of creating, developing and managing global engineering enterprises.

DEPARTMENT VISION AND MISSION

VISION

To mould socially committed, ethical and competent electrical engineers.

MISSION

M 1 :- To provide conducive environment for teaching & learning.

M 2 :- To provide educational programs for improvement in academics and ethics.

M 3 :- To motivate students for participation in social & industrial activities.

PROGRAM OUTCOMES

S.No	Course Outcome	Program Outcome
1	Engineering Knowledge	Apply the knowledge of mathematics, science, engineering fundamentals and engineering specialisation to solve a complex engineering problem.
2	Problem Analysis	Identify, formulate, research literature, and analyse complex engineering problems using appropriate knowledge and tools to predict the behaviour of a system or component under given conditions.
3	Design & Development of Solutions	Design and develop engineering solutions to meet specified needs and enhance existing engineering designs to meet required standards. Consideration is given to public health, safety, and environmental considerations.
4	Investigation	Use research knowledge to investigate complex issues and design solutions to address critical areas of concern in the advanced practice of electrical engineering.
5	Modern Tool Usage	Use and apply appropriate computer-aided tools, resources, and engineering software to enhance problem solving and design activities.
6	Engine & System Design	Apply engineering design to produce solutions that meet specified needs and enhance existing designs. This includes selection of appropriate standards, specifications, and materials.
7	Environment & Sustainability	Use and apply appropriate engineering and design tools, resources, and engineering software to enhance problem solving and design activities.
8	Ethics	Apply ethical principles and conduct to professional responsibilities and to the design, development, and construction of engineering systems.
9	Individual & Team Work	Function effectively as an individual and as a member or leader in a team to address a variety of engineering activities.
10	Communication	Communicate effectively in writing and orally, including the preparation of reports, proposals, and presentations, and the use of technical communication tools.
11	Life-Long Learning	Recognize the need for, and engage in, continuing education and professional development.
12	Project Management	Apply project management to the design and development of engineering systems and projects.

ABSTRACT

The Mahatransco Mahape Substation, located in Maharashtra, India, is a critical component of the region's electrical infrastructure. This substation plays a major role in the transmission and distribution of electrical power across various industrial, commercial, and residential sectors in the surrounding area. Operating at voltage levels of 220 kV and 22 kV, the substation serves as a vital link in the electricity supply chain, ensuring reliable and uninterrupted power supply to meet the demands of diverse consumers.

Objectives of Industrial Visit

1. To understand the layout of Substation.
2. To understand the environmental and safety norms related to substation.
3. To understand the different parts of Substation.
4. To understand the operating coordination between different switchgear equipment.
5. To understand the power line carrier communication.
6. To understand the adoption of new technology in substation.

Highlights of things learned during visit

Since the strength of the electrical third year department is 54 students, for easier management students were split into two slots. The first slot had strength of 27 students, while the second slot had rest of the 27 students.

As we entered the substation firstly the attendance was being recorded and the total count of the students was taken into consideration then both the groups were allowed to enter in the substation as we entered the substation , we were introduce to the engineer of the substation were he gave us some overview of the substation and he shared that how the substation is being connected to various cities etc



IMPORTANCE OF THE SUBSTATION

The importance of the Mahatransco Mahape 220 kV/22 kV substation lies in its critical role within the electrical power infrastructure of the region. Here are several key points highlighting its significance:

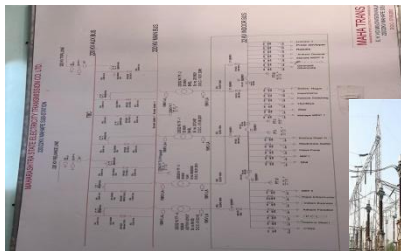
1. **Power Distribution Hub:** The substation serves as a major hub for distributing electrical power to various industrial, commercial, and residential consumers in the surrounding area. It acts as a pivotal point where electricity from high-voltage transmission lines is stepped down to lower voltages suitable for local distribution.
2. **Reliable Power Supply:** The substation ensures a reliable and uninterrupted power supply to meet the demands of diverse consumers, including industrial facilities, commercial establishments, and residential areas. It plays a crucial role in minimizing power outages and maintaining continuity in electrical service provision.
3. **Voltage Regulation:** Voltage regulation is essential for maintaining the quality and stability of electrical supply. The substation employs various equipment and mechanisms to regulate voltage levels and ensure that electricity delivered to consumers meets specified standards for voltage consistency.
4. **Grid Connectivity:** As part of the broader electrical grid network, the substation facilitates

the seamless integration of power generated from diverse sources, including conventional power plants and renewable energy installations. It enables efficient transfer and distribution of electricity across different parts of the grid.

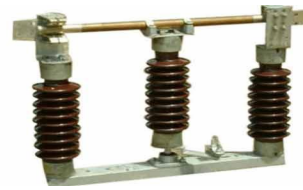
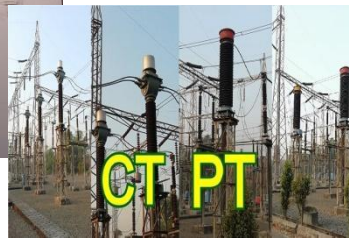
5. **Load Balancing:** The substation contributes to load balancing within the electrical grid by managing the distribution of power based on demand fluctuations. It helps prevent overloading of transmission lines and equipment, thereby enhancing the overall reliability and efficiency of the electrical system.

6. **Safety and Security:** Ensuring the safety of personnel and equipment is a primary concern within the substation. The facility is equipped with various safety measures, protocols, and monitoring systems to mitigate risks associated with high-voltage operations, thereby safeguarding both employees and the public.

7. **Supporting Industrial Growth:** Reliable and efficient electrical infrastructure, including substations like Mahatransco Mahape, is essential for supporting industrial growth and economic development in the region.



LAYOUT OF THE SUBSTATION



SOME OF THE IMPORTANT COMPONENTS OBSERVED IN THE VISIT

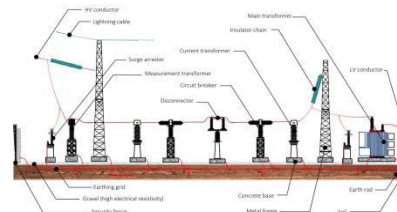
Potential Transformer: "PT" typically refers to a Potential Transformer. A Potential Transformer, also known as a Voltage Transformer (VT), is a type of instrument transformer used to step down high voltages to safer and more manageable levels for metering, protection, and control purposes.

Current Transformer: "CT" typically refers to a Current Transformer. A Current Transformer is a type of instrument transformer used to step down high currents in the power system to levels suitable for measurement, protection, and control purposes.

1. **Isolators** : In a substation, isolators, also known as disconnect switches or isolating switches, are crucial components used to isolate sections of electrical equipment or circuits for maintenance, repair, or safety purposes.
2. **Circuit breakers** : In a substation, circuit breakers, also known as disconnect switches or isolating switches, are crucial components used to isolate sections of electrical equipment or circuits for maintenance, repair, or safety purposes.



3. **Surge Arresters** : In a substation, a surge arrester, also known as a surge diverter or lightning arrester, is a protective device designed to limit transient overvoltage events caused by lightning strikes or switching operations.



4. **Fuses** : Fuses are important protective devices used in substations to safeguard electrical equipment and circuits from overcurrent conditions
5. **Earthing**: In a substation, earthing plays a critical role in providing a safe path for fault currents to flow to the ground, thereby preventing damage to equipment and

ensuring the safety of personnel. This is typically achieved through the use of grounding rods, conductors, or grounding grids connected to various components of the substation.

These were some important components that we observed at the substation .

CONCLUSION

A conclusion for an industrial visit to the Mahatransco Mahape 220 KV/22 KV substation could highlight the following key points:

Educational Experience: The visit provided an insightful educational experience, allowing students to gain a practical understanding of the operation and management of a high-voltage substation.

Infrastructure Overview: Participants had the opportunity to observe firsthand the various components of the substation, including transformers, circuit breakers, switches, and control systems, gaining insight into their roles and functionalities.

Safety Protocols: The importance of safety protocols in such environments was emphasized, with a focus on the measures in place to protect personnel and equipment from electrical hazards.

Technological Advancements: Insights into the latest technological advancements and innovations employed in the substation underscored the continual evolution of electrical infrastructure to meet growing energy demands efficiently.

We Third year electrical department would like to thank all the faculties for teaching us about the importance of industrial automation and their working with Realtime examples.

Thank you,

Regards,

Smt. Indira Gandhi college of Engineering, Ghansoli