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Report on
Industrial Visit
to
"33 kV/11 kV Substation, Madanapalle"
Organised by
Department of Electrical and Electronics Engineering
In Association with IIIC and ISTE Chapter, MITS
Date: 01.11.2025

Coordinator: Mr. Ramesh Kumar R
Submitted by: Mr. Ramesh Kumar R, Assistant Professor, Dept. of EEE
Participants: B. Tech-II Yr / I Sem-EEE Students
Total No of participants: 60
Faculties Accompanied:

Mr. R. Ramesh Kumar
Dr. K Lakshmikhandan
Mr. Madhu

Introduction:

On 1st November 2025, a group of B.Tech. II Year/I Sem -EEE students from Madanapalle Institute of Technology, Madanapalle, Andhra Pradesh, embarked on an industrial visit to the 33 kV/11 kV Substation, Madanapalle. The purpose of the visit was to provide students with practical insights into the operation, maintenance, and functioning of a substation.

Objectives of the Visit:

- Gain practical knowledge about the operation and management of electrical substations and their role in power transmission and distribution.
- Understand the main components of a substation, including transformers, circuit breakers, isolators, bus bars, and protection systems.
- Learn about the voltage transformation process, load management, and safety measures implemented in substation operations.
- Observe the real-time monitoring, control, and protection mechanisms used to ensure reliable and uninterrupted power supply.
- Explore career opportunities and research possibilities in the areas of power systems, substation automation, and electrical protection engineering.

Activities during the Visit:

The visit commenced with a guided tour of the substation facilities, where students were accompanied by a team of experienced engineers and technicians, who explained the overall layout and operation of the substation. The team provided detailed insights into the flow of electrical power from transmission lines to distribution networks, highlighting the role of each component in ensuring system reliability.

Students attended interactive sessions covering topics such as the working principles of power transformers, circuit breakers, isolators, and protective relays, along with demonstrations of load management and fault detection systems. They observed the control room operations and monitoring processes that ensure the safe and continuous supply of electricity.

The engineers also discussed substation safety protocols, grounding systems, and maintenance procedures, emphasizing the importance of operational discipline and emergency preparedness. The session concluded with an open discussion, where students engaged with the technical staff to understand the challenges in power distribution, substation automation and gaining practical exposure to the functioning of modern electrical substations.

Sustainable Development Goal (SDG) Mapping

Focus Area	Related SDG	SDG Badge
Understanding power transmission, distribution, and grid reliability	Affordable and Clean Energy	SDG 7
Promoting safe, efficient, and sustainable electrical infrastructure	Industry, Innovation and Infrastructure	SDG 9
Enhancing technical education, practical exposure, and skill development in electrical engineering	Quality Education	SDG 4
Encouraging awareness of safety standards and environmental responsibility in power systems	Climate Action	SDG 13

Program Outcomes (PO) Mapping

Activity Aspect	Related PO
Understanding substation components, power flow, and voltage transformation	**PO1 – Engineering Knowledge**
Observing the operation of transformers, circuit breakers, and protection systems	**PO2 – Problem Analysis**
Exposure to safety standards, earthing systems, and operational regulations	**PO6 – The Engineer and Society**
Awareness of electrical safety measures and sustainable power distribution practices	**PO7 – Environment and Sustainability**
Interaction with substation engineers and technical staff	**PO8 – Ethics & PO9 – Individual and Team Work**
Discussion on substation automation and emerging technologies	**PO12 – Life-long Learning**

Conclusion:

The Industrial Visit to the 33 kV/11 kV Substation was highly informative and enriching. Students gained a clear understanding of the operation and significance of substations in the power transmission and distribution network. The Assistant Executive Engineer and the technical team provided detailed explanations about the working of transformers, circuit breakers, isolators, and protective relays, along with their specifications and safety mechanisms.

Acknowledgments:

We thank our Chancellor, Pro Chancellor Vice Chancellor, Registrar, Principal, Vice-Principal-Administration, Dean (School of Engineering) and the HoD/EEE for giving us the permission to experience such an insightful Industrial visit to 33 kV/11 kV Substation, Madanapalle. We extend our sincere thanks to the management and staff of Substation for their hospitality and cooperation in organizing this Industrial visit.

R. Ramesh Kumar

Coordinator

Head of the Department/ EEE