NARAYANA ENGINEERING COLLEGE::GUDUR
NAAC 'A' GRADE (AUTONOMOUS)
Dhurjati Nagar, Gudur, Tirupati Dist., AP - 524101
Est : 2001

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

FIELD VISIT REPORT

Visit: 33/11 kV Electrical Substation
Date: 11-02-2026
Class: II & III Year B.Tech – EEE

1. Introduction

The Department of Electrical & Electronics Engineering organized a field visit for II and III year students to a 33/11 kV Electrical Substation on 11th February 2026. The visit was arranged to provide practical exposure to students on Substation operation and distribution system, which form a core part of their academic curriculum. The visit helped students bridge the gap between theoretical knowledge and real-time industrial applications.

2. Objectives of the Visit

The main objectives of the field visit were:

- To understand the construction and working of a 33/11 kV substation.
- To observe various substation components such as:
  - Power Transformers
  - Circuit Breakers
  - Isolators
  - Bus Bars
  - Lightning Arresters
  - Current Transformers (CTs)
  - Potential Transformers (PTs)
- To study protection systems and relay coordination.
- To understand earthing systems and safety practices.
- To learn about load distribution and feeder management.

3. About the 33/11 kV Substation

The 33/11 kV substation receives electrical power at 33 kV from the transmission network and steps it down to 11 kV for distribution to local feeders.

Major Equipment Observed:

3.1 Power Transformer

- Rating: 33/11 kV
- Oil-cooled transformer
- Equipped with:
  - Conservator tank
  - Breather
  - Buchholz relay
  - Radiators
  - Oil level indicator
  - Temperature indicators

Students were explained about transformer protection and cooling methods.

3.2 Circuit Breakers

- Used for fault interruption.
- Types discussed:
  - Vacuum Circuit Breaker (VCB)

The operating mechanism and tripping conditions were explained.

3.3 Isolators

- Used for maintenance isolation.
- Operated under no-load conditions.
- Importance of interlocking system was discussed.

3.4 Current Transformers (CT) & Potential Transformers (PT)

- Used for measurement and protection.
- Stepping down current and voltage to measurable levels.
- Connected to meters and relays.

3.5 Lightning Arresters

- Installed for protection against lightning surges.
- Connected between line and earth.

3.6 Bus Bars

- Arranged in bus configuration.
- Distribution of power to outgoing feeders.

3.7 Control Room

Students observed:

- Control panels
- Protection relays
- Feeder control switches
- Indication lamps
- Metering instruments

The working of protective relays and alarm systems was demonstrated.

4. Safety Measures Observed

The substation staff explained:

- Use of Personal Protective Equipment (PPE)
- Proper earthing system
- Danger boards and safety signage
- Fire protection systems
- Safe operating procedures

Students were instructed about maintaining safe distance from live equipment.

5. Learning Outcomes

After the visit, students were able to:

- Understand practical layout of a 33/11 kV substation.
- Identify substation components physically.
- Learn real-time protection schemes.
- Understand load management and feeder operations.
- Gain awareness of industrial safety standards.

6. Faculty Coordinators

The visit was accompanied by:

- Mr. K. Kumar, Assitant Professor
- Mr. M. Ramu, Assistant Professor
- Dr. I. Jagadeesh, Assistant Professor
- Mr. M. Guru Prasad, Assistant Professor

(Department of EEE, NECG)

7. Conclusion

The field visit to the 33/11 kV substation was highly informative and beneficial for II and III year EEE students. It provided valuable practical exposure and enhanced their understanding of power system engineering concepts. The interaction with substation engineers helped students gain insights into real-time operations and maintenance practices.

The Department of EEE expresses sincere thanks to the substation authorities for permitting the visit and sharing their technical knowledge.