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Report on Industrial Visit
to
Vikram Solar Power Plant, Kosuvaripalle, Andhra Pradesh
Organised by
Department of Electrical & Electronics Engineering
in Association with IIIC and ISTE Chapter, MITS
Date: 09.01.2026

Coordinator: Dr. Balaji Damodhar T S

Submitted by: Dr. Balaji Damodhar T S, Assistant Professor, Dept. of EEE

Participants: B. Tech-II Yr / II Sem-EEE Students

Total No of participants: 59

Faculties Accompanied: Dr. Balaji Damodhar T S, Mr. B. Karthick, Mrs. Sujatha.

Introduction

The Vikram Solar Power Plant located at Kosuvaripalle is a prominent utility-scale solar facility in the Annamayya District of Andhra Pradesh. Developed exclusively for Tirumala Tirupati Devasthanams (TTD), the project was commissioned on 01 April 2017 following an accelerated construction schedule. Spanning approximately 67 acres, the plant has an installed capacity of 10 MWp and was implemented under a Build, Operate, and Transfer (BOOT) model to ensure structured ownership and operational transition. The project reflects TTD's commitment to sustainable energy adoption and modernization of its power infrastructure.

Objectives of the Visit

The primary objectives of the industrial visit were:

- To understand the design, operation, and control of a utility-scale solar power plant
- To gain practical exposure to solar PV modules, inverter systems, substations, and grid integration
- To study real-time monitoring and performance evaluation using SCADA systems
- To familiarize students with renewable energy practices contributing to sustainability and carbon reduction.

Overview of the Solar Power Plant

The Kosuvaripalle site was strategically selected due to its high solar irradiance potential, enabling efficient energy generation. The plant operates as a grid-connected system, supplying power directly to the regional distribution network and enhancing the stability of the nearby Mudivedu substation while minimizing transmission losses. It utilizes high-efficiency polycrystalline photovoltaic modules rated between 310 Wp and 315 Wp, suitable for the region's thermal conditions.

Power generated at the plant is evacuated at 33 kV and synchronized with the grid through advanced string inverters. A comprehensive SCADA-based monitoring system enables real-time performance tracking, fault detection, and preventive maintenance. With an annual energy generation exceeding 1.55 crore units, the plant meets nearly 38.5% of Tirumala's energy demand, delivering significant economic and environmental benefits.

Activities Carried Out During the Visit

During the industrial visit, students were provided hands-on exposure to various sections of the solar power plant, including:

- Solar PV module arrays and string configurations
- Grid-connected inverter sections and power conversion units
- 33 kV substation and power evacuation systems
- Centralized control room and SCADA monitoring facilities

Technical staff explained the complete process of solar power generation, conversion, control, and grid integration. The visit was interactive and informative, enabling students to correlate classroom learning with real-world renewable energy systems. The plant also demonstrated the environmental and economic impact of solar energy, including annual CO_2 emission reduction of approximately 15,143 metric tonnes and cost savings of about ₹4.5 crore for TTD.

Sustainable Development Goal (SDG)

SDG	SDG Title	Relevance to the Industrial Visit
SDG 7	Affordable and Clean Energy	Exposure to utility-scale solar power generation and clean energy adoption.
SDG 9	Industry, Innovation and Infrastructure	Understanding modern renewable energy infrastructure and grid integration.
SDG 11	Sustainable Cities and Communities	Contribution of solar energy to sustainable urban and institutional power systems.
SDG 12	Responsible Consumption and Production	Efficient utilization of renewable resources and reduced dependence on fossil fuels.
SDG 13	Climate Action	Awareness of carbon emission reduction and climate change mitigation through solar energy.

PO Mapping for Industrial Visit – Vikram Solar Power Plant (New NBA)

Sl. No.	Program Outcome (PO)	Justification / Relevance to Visit
1	**PO1 – Engineering Knowledge**	Understanding of solar PV systems, inverters, substations, and grid-connected operation.
2	**PO2 – Problem Analysis**	Analysis of practical operational challenges in solar power generation and evacuation.
3	**PO5 – Modern Tool Usage**	Exposure to SCADA-based monitoring, protection systems, and control room operations.
4	**PO7 – Environment and Sustainability**	Awareness of renewable energy benefits and carbon emission reduction.
5	**PO9 – Individual and Team Work**	Group-wise learning and coordinated activities during the industrial visit.
6	**PO10 – Communication**	Technical interaction with plant engineers and reporting of observations.

Photograpghs

Conclusion

The Vikram Solar Power Plant at Kosuvaripalle is a notable example of successful utility-scale solar energy implementation. With an installed capacity of 10 MWp, the plant demonstrates reliable grid-connected operation and effective renewable energy integration. Advanced PV modules, inverter systems, and SCADA-based monitoring ensure efficient performance and operational stability. The industrial visit provided students with valuable practical exposure, strengthening their understanding of solar power plant design, operation, and grid integration.

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Coordinator

Head of the Department/ EEE

Head of the Department
Electrical & Electronics Engineering
Madanapalle Institute of Technology & Science
MADANAPALLE - 517 325