Maharaja Agrasen Institute of Technology, Delhi
Department of Mechanical Engineering

EVENT REPORT **Date: 28 Feb, 2026**

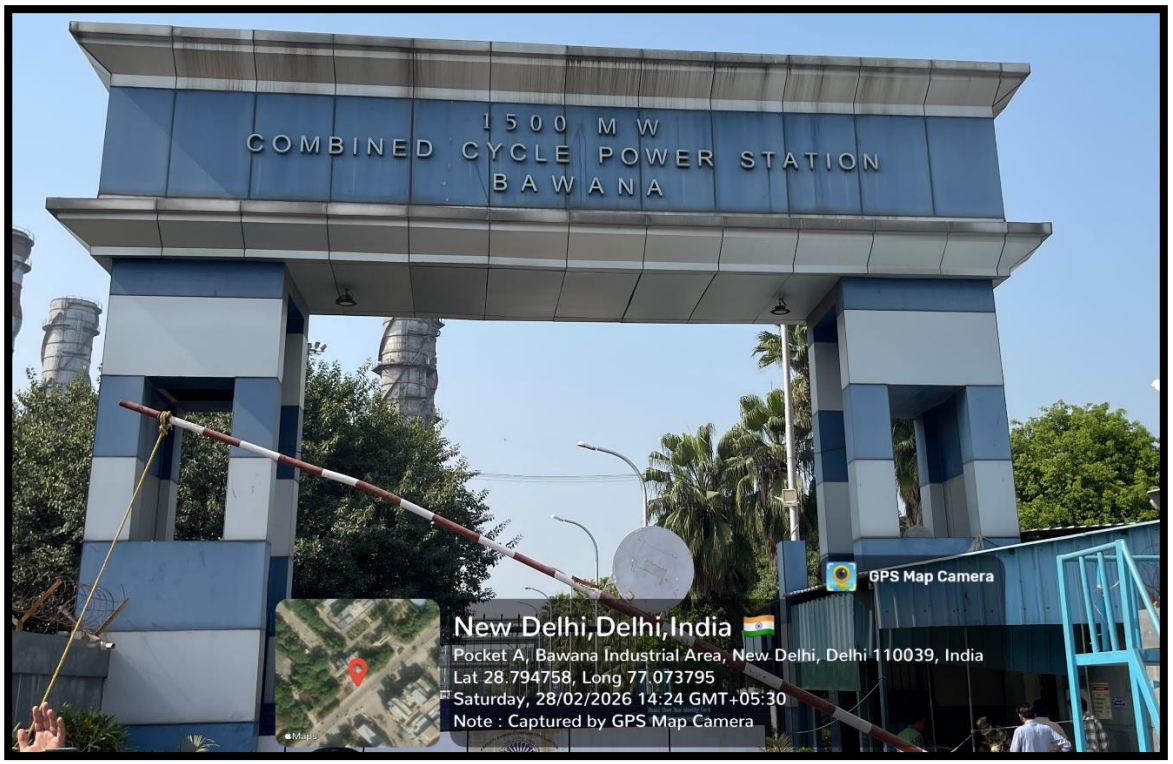
Name of Activity	**Industrial Visit to Pragati Power Corporation Limited, Bawana**
Date of Visit	**28th February 2026**
No. of Participants	**16 Students + 2 Faculty Members**

The **Department of Mechanical Engineering, Maharaja Agrasen Institute of Technology (MAIT)** organized an industrial visit to **Pragati Power Corporation Limited (PPCL), Bawana** on **28th February 2026**, providing students with an opportunity to observe the functioning of a large-scale power generation facility. Sincere gratitude is expressed to the management and technical staff of PPCL for providing the opportunity to visit their **1500 MW power plant** and for offering detailed explanations of the plant's components and operations. Through their guidance, our practical understanding of gas and steam turbine–based power generation was significantly enhanced.

The **Pragati-III Combined Cycle Power Plant (Bawana)**, operated by **PPCL under the Government of NCT of Delhi**, is one of India's largest gas-based power plants with a total installed capacity of **1500 MW**, consisting of two **750 MW units**. The plant uses **Combined Cycle Gas Turbine (CCGT)** technology with **four Frame 9FA Gas Turbines and two Steam Turbines supplied by BHEL**. It primarily runs on **Natural Gas/RLNG**, which helps reduce emissions, and uses treated water from the **Rithala Sewage Treatment Plant**, highlighting its environmentally sustainable approach.

The plant operates in a **2+1 configuration**, where exhaust heat from two gas turbines is used to run one steam turbine through a **Heat Recovery Steam Generator (HRSG)**. The high-temperature exhaust gases (around **650°C**) generate steam for additional power production, improving efficiency. A multi-stage water treatment system including **flocculation, membrane bioreactors, reverse osmosis, and mixed-bed exchangers** produces high-purity **demineralized (DM) water** for boiler use.

The visit helped students understand the working of **combined cycle power generation**, **SCADA-based automation**, and sustainable practices such as **wastewater reuse and low emission control**, thereby bridging the gap between theoretical learning and practical engineering applications.



Mapping with Program Outcomes:

The industrial visit to the **Pragati-III Combined Cycle Power Plant, Bawana** contributed to several **Program Outcomes (POs)** for Mechanical Engineering students. It enhanced **PO1 (Engineering Knowledge)** by helping students connect theoretical concepts of thermodynamics and power plant engineering with the practical operation of gas turbines, steam turbines, and HRSG systems. The visit also supported **PO2 (Problem Analysis)** and **PO3 (Design of Solutions)** by demonstrating how combined cycle technology improves efficiency through effective heat recovery. Exposure to **SCADA-based control systems** strengthened **PO5 (Modern Tool Usage)**, while

observing plant safety and operational practices highlighted **PO6 (Engineer and Society)**. Additionally, the plant's use of **Natural Gas/RLNG**, low emissions, and treated wastewater emphasized **PO7 (Environment and Sustainability)**, while the overall experience encouraged teamwork, communication, and continuous learning.

Mapping with Program Specific Outcomes:
The industrial visit to the **Pragati-III Combined Cycle Power Plant, Bawana** supported the **Program Specific Outcomes (PSOs)** of the Mechanical Engineering program. It contributed to **PSO1** by exposing students to modern power generation technologies, **PSO2** by helping them understand real industrial processes and automated monitoring systems such as SCADA, and **PSO3** by providing insights into large-scale engineering operations and encouraging interest in advanced studies and professional development in the energy sector.

Mapping with Sustainable Development Goals:
The industrial visit to the Pragati-III Combined Cycle Power Plant, Bawana aligns with several **Sustainable Development Goals (SDGs)**. It supports **SDG 7 (Affordable and Clean Energy)** by demonstrating efficient power generation through combined cycle technology using natural gas. The plant's use of treated wastewater and low emission levels reflects **SDG 12 (Responsible Consumption and Production)** and **SDG 13 (Climate Action)** by promoting sustainable resource utilization and reducing environmental impact. Additionally, the visit enhanced students' technical awareness and practical learning, contributing to **SDG 4 (Quality Education)** by linking academic knowledge with real-world industrial practices.

Subject Gap Fulfilled:
The industrial visit primarily addressed the academic gap for **2nd Year (3rd and 4th Semester)** students studying **thermal engineering subjects**. The visit to the **Pragati-III Combined Cycle Power Plant, Bawana** helped bridge the gap between theoretical concepts taught in **Thermal Engineering–I and Thermal Engineering–II** and their real industrial applications. Students observed the practical working of **gas turbines, steam turbines, Heat Recovery Steam Generators (HRSG), and power generation systems**, which strengthened their understanding of **thermodynamics, energy conversion, and power plant operations**. This experience complemented the classroom syllabus by providing practical exposure to **large-scale thermal power systems**.

Learning Outcomes of the Industrial Visit to PPCL, Bawana:

1. **Understanding of Combined Cycle Power Generation:** Students learned how gas turbines and steam turbines work together in a Combined Cycle Gas Turbine (CCGT) power plant to improve efficiency.
2. **Practical Knowledge of Power Plant Components:** Students observed the functioning of major components such as gas turbines, steam turbines, Heat Recovery Steam Generator (HRSG), compressors, and generators.

3. **Application of Thermodynamics Concepts:** The visit helped students relate theoretical concepts of thermodynamics and thermal engineering to real industrial power generation processes.
4. **Exposure to Modern Control Systems:** Students gained awareness of automated monitoring and control systems such as SCADA used for plant operation and safety.
5. **Understanding of Water Treatment Processes:** Students learned about water treatment methods used to produce demineralized (DM) water for boilers and cooling systems.
6. **Awareness of Environmental and Sustainable Practices:** The visit highlighted the use of natural gas fuel, treated wastewater, and emission control measures for sustainable power generation.
7. **Knowledge of Industrial Safety Practices:** Students observed the safety measures and operational protocols followed in a large-scale power plant.
8. **Enhanced Practical and Professional Insight:** The experience improved students' understanding of real industrial operations and career opportunities in the power and energy sector.

List of Participants:

Faculty Members: Dr. Deshdeep Gambhir, Ms. Surabhi Lata

S. No.	Name of the Participant	Enrollment No.	Group
1	Prashant Kumar	00114811124	4ME1
2	Albin K Jose	02414811124	4ME2
3	Yash Bansal	03914811124	4ME2
4	Randeep Kumar	09014813124	4ME2
5	Jaskirat Singh	90514811125	4ME3
6	Sabre Alam	90714811125	4ME3
7	Rishabh Aditya	91014811125	4ME3
8	Devansh Chawla	01214811123	6ME1
9	Tanmay Mathur	02114811123	6ME1
10	Sundaram	02414811123	6ME2
11	Akshat Shanker	60114811124	6ME3
12	Harsh Kumar Jha	60614811124	6ME3
13	Nadeem Hussain	60814811124	6ME3
14	Anubhav Tagore	00514803623	6M1
15	Krishna Sharma	60314803624	6M3
16	Karan Sharma	60514803624	6M3