

110 KV Switchyard Maintenance and Monitoring Robot

Team Abhiyantra under **Department of Electrical Engineering** was assigned with a consultancy project of developing a robot for maintenance and monitoring of **TATA Power Company Ltd.** 110 KV switchyard, Borivali on August 12, 2022.

On February 15, 2023 within seven months of project assignment Team Abhiyantra developed and dispatched a task specific wheeled semi-automatic robot to TATA Power company Ltd. The designed robot consisted of an on-board SCARA assembly with the end effector embedded with both, cleaning and greasing functionality, for thermal scanning a detachable assembly was provided which acts as a peripheral to the main robot when required.

Team:



Team Abhiyantra, consisting of the following members:

1. Chinmay Hemant Pawar	Head	BE ELEC
2. Ronish Thangadurai Nadar	Co-Head	BE EXTC
3. Kaustubh Sudesh More	Treasurer	BE ELEC
4. Craig Joseph Pereira	Co-Treasurer	BE EXTC
5. Atharva Nitin Choudhari	Electronic designer	BE EXTC
6. Pratik Satyawar Mahankal	Software developer	BE CMPN
7. Shreyansh Lalit Jain	Public relations	BE ELEC
8. Vineeth Gangadhar Puthran	Mechanical designer	BE MECH

Principal Investigator:

Mr. Pratik Rahate, Assistant Professor, Department of Electrical Engineering

Funds:

Funds of **Rs 8,90,000/-** were provided by TATA Power company Ltd. to Team Abhiyantra, Department of Electrical Engineering for the research and development of the robot.

Objective:

The requisites provided by the company included the following:

1. Cleaning of 110 KV insulator post.
2. Greasing of isolator joints, placed above the insulator post, 5.5m above ground level.
3. Automatic thermal Scanning and wireless monitoring of the switchyard.
4. Development of monitoring webpage

Results:

The developed robot can autonomously monitor the complete switchyard and report to the control room. Tasks performed during the surveillance will include detecting hotspots caused due to flow of high current and collecting the daily surveillance data for further analysis for the company.

Cleaning of the insulator post is done remotely considering the safety and voltage levels. Thereby the Robot is equipped with a SCARA assembly which utilises pressurised fluids for cleaning purposes. Additionally, according to the SOP, the task of greasing should be followed once the insulators are cleaned for smooth motion of the isolators.

The developed robot is capable of performing all the above-mentioned tasks and meets the industry standards.



Fig.1 Robot.