DEPARTMENT OF MECHANICAL ENGINEERING

Industrial Visit Report – Sri Lakshmi Ganapathi Engineering Works (Kumar Pumps & Motors), Tenali, Andhra Pradesh

The II B.Tech students of the Mechanical Engineering Department visited Sri Lakshmi Ganapathi Engineering Works (Kumar Pumps & Motors), Tenali, Andhra Pradesh for an industrial visit on 17.03.2025. The purpose of the visit was to gain practical exposure to industrial operations. As part of the visit, 55 students and 2 faculty members observed the machining processes where they received a brief overview of the processes.

Kumar Pumps and Motors, also known as Sri Lakshmi Ganapathi Engineering Works, is a leading manufacturer of pumps and electric motors based in Tenali, Andhra Pradesh. With over four decades of experience, the company offers a diverse range of products, including piston pumps, submersible pumps, centrifugal monobloc pumps, high-pressure pumps, and electric motors.

Students have visited the following sections in the machine shop:

CNC, VMC & HMC MACHINES :

The pumps components are machined on the high tech Computerised Numerical Controlled machines for high accuracy and interchangeability.

The visit provided an opportunity to understand the role of CNC, Vertical Machining Centers (VMC), and Horizontal Machining Centers (HMC) in achieving high accuracy and interchangeability in manufacturing processes.

The visited facility specializes in the manufacturing of precision-engineered pump components. The company utilizes advanced machining technologies to ensure superior quality and high performance of their products. The integration of CNC, VMC, and HMC machines has significantly enhanced productivity, reduced manual errors, and improved component consistency.

Machining Processes Observed: During the visit, we observed the following key processes:

- **CNC Machining:** Automated control of machine tools to execute precise and complex machining operations, ensuring minimal human intervention and high repeatability.
- **VMC (Vertical Machining Center):** Used for milling and drilling operations, ideal for machining pump casings and impellers with intricate designs.
- **HMC (Horizontal Machining Center):** Preferred for its ability to perform multi-face machining in a single setup, reducing cycle time and improving efficiency in producing pump housings and covers.

Key Observations and Learnings:

- The adoption of CNC, VMC, and HMC machines has improved manufacturing precision, leading to enhanced product quality.
- The use of automated tool changers and programmed machining sequences has minimized production downtime.
- The interchangeability of machined components ensures easy assembly and maintenance of pumps.
- Real-time monitoring and quality control systems ensure defect-free production.

CNC GRINDING MACHINES :

Micron precision and accuracy is achieved in the manufacture of Shafts and Rotors for longer fault-free performance of pumps.

The visit provided an opportunity to understand how these machines are utilized for high-accuracy grinding operations in manufacturing industries.

The visited facility specializes in high-precision component manufacturing using advanced CNC grinding technology. CNC grinding machines are employed for achieving superior surface finishes, tight tolerances, and enhanced productivity in various industrial applications.

Machining Processes Observed: During the visit, we observed the following key processes:

- **CNC Grinding Operations:** Utilization of automated grinding machines for achieving high accuracy in finishing metal and non-metal components.
- **Types of Grinding:** Cylindrical grinding, surface grinding, and centerless grinding were demonstrated to show different applications in machining.

- **Automation & Control:** The machines were equipped with advanced computer controls, allowing precise control of parameters such as speed, feed rate, and depth of cut.
- **Quality Inspection:** Real-time monitoring and precision measuring instruments were used to ensure compliance with required specifications.

Key Observations and Learnings:

- CNC grinding machines significantly enhance accuracy and consistency in component production.
- Automated tool changers and adaptive control systems optimize grinding efficiency and minimize material wastage.
- The use of CNC technology reduces manual intervention, improving safety and reducing operator fatigue.
- Quality control measures such as in-process gauging ensure defect-free production.

Electrical Discharge Machining and Wire Electrical Discharge Machining

The industry visit was conducted to gain practical insights into Electrical Discharge Machining (EDM) and Wire Electrical Discharge Machining (Wire EDM). These advanced machining techniques are used for high-precision manufacturing of intricate and hard-to-machine components.

The visited facility specializes in EDM and Wire EDM machining processes, primarily used for tool and die making, aerospace, automotive, and medical industries. These non-traditional machining processes use electrical discharges to remove material with high accuracy.

During the visit, we observed the following key processes:

- **EDM (Electrical Discharge Machining):** This process uses controlled electrical sparks to erode material from conductive workpieces. It is particularly useful for machining hard materials like carbide and hardened steel.
- **Wire EDM (Wire Electrical Discharge Machining):** A thin wire electrode is used to cut complex shapes with high precision, commonly used for making intricate dies and molds.
- **Dielectric Fluid System:** The role of dielectric fluid in flushing away debris and preventing unwanted arcing was explained.
- **CNC Integration:** Advanced CNC controls in EDM and Wire EDM machines enable automated operations, ensuring high precision and repeatability.

Key Observations and Learnings:

- EDM and Wire EDM allow machining of extremely hard and delicate materials without mechanical stress.
- High accuracy and fine surface finishes can be achieved using these processes.
- CNC-controlled EDM enhances efficiency and repeatability, reducing manual errors.
- The use of Wire EDM enables complex and intricate profile cutting with minimal material wastage.

Finally, Dr. A.V.S Ram Prasad, Associate Professor, and Mr. Karimulla Syed Assistant Professor, expressed their gratitude to the management of Kumar pumps and motors for facilitating the industrial visit.

Prepared by | Authorized by

Dr. A. V. S Ram Prasad | HOD-ME