Chapter 3

Technology and industry survey

3.1 Need for industry visit

Industry visits play a crucial role in bridging the gap between theoretical learning and practical exposure. For engineering students, visiting industrial facilities allows for an understanding of real-world applications of classroom concepts, helping to develop skills essential for problem-solving, innovation, and system design. Industry visits provide direct insight into processes, equipment, and technologies currently in use, which is vital for modern engineering practices.

3.2 Objective of industry visits

The primary objective of the industry visits was to gain Practical knowledge and hands-on experience with modern production processes, particularly in the fields of air management systems and water generation from atmospheric moisture. The visits aimed to:

- Understand the working principles and designs of air dryers, which operate on the refrigeration cycle.
- Learn about the various stages of production and assembly.
- Observe the technical aspects of heat exchange systems and moisture separation.
- Recognize the innovative methods employed to enhance efficiency and sustainability in industrial processes.

3.3 Summary of industry visits

The objective was to gain knowledge about moisture separator machines and refrigeration cycle-operated air dryers, which also remove water from the air. Two industry visits were planned: the first to Yunik Air Solutions, and the second to the Meghdoot machine setup.

3.3.1 Yunik air solutions (ambernath)

Established in 2017, Yunik Air Solutions is a company based in Ambernath, Mumbai, specializing in the manufacturing of compressed air and cooling systems. Their product range

includes refrigerated air dryers, heatless air dryers, air filters, and automatic drain valves. These products are utilized across various industries such as automobile, chemical, beverage, printing and textile, cement plants, pharmaceutical, and more. The company emphasizes adherence to industry quality standards and offers sales and service support through their office in Greater Noida, Uttar Pradesh.

Fig 3.1 Yunik air solutions

At Yunik Air Solutions, the primary focus was on observing the production of refrigerated air dryers, including technologies such as the "Copper Coil-to-Copper Coil" heat exchange method. The team closely examined how moisture is effectively separated using evaporators, insulated with a thick layer for enhanced performance.

3.3.2 Meghdoot (Dadar)

Maithri Aquatech Pvt Ltd, based in Hyderabad, India, is a pioneering water technology company addressing water scarcity through innovative solutions. Their flagship product, MEGHDOOT, is an Atmospheric Water Generator (AWG) that extracts water from ambient air using advanced condensation techniques. This technology provides a decentralized method to produce clean, mineral-enriched potable water without relying on existing water sources, ensuring zero water wastage.

Fig no 3.2 Meghdoot machine setup

Meghdoot specializes in producing water from atmospheric air. The visit involved observing the water production process, which begins within minutes of the machine being turned on. The team noted the importance of components such as the large filter and water tank, which contribute to effective filtration and storage.

3.4 Output of industry visits

- Yunik Air Solutions

  The team gained an in-depth understanding of the construction and operational principles behind refrigerated air dryers. The importance of effective moisture separation, insulation, and the heat exchange process was emphasized, highlighting how these factors contribute to system efficiency.

- Meghdoot

  The visit showcased how the Meghdoot machine efficiently generates water from air using a large-scale filtration and water storage system. The machine's ability to start producing water rapidly upon activation demonstrated the potential for real-world applications in diverse environmental conditions.