Industrial Site Visit to Rangil Water Treatment Plant, Ganderbal

1. Introduction

On 12th September 2024, the students of the B.Tech 8th semester, Civil Engineering Batch (2020), from the Institute of Technology, University of Kashmir, visited the Rangil Water Treatment Plant, Ganderbal, as part of their academic curriculum. The purpose of the visit was to provide students with practical exposure to the water treatment process and to bridge the gap between theoretical knowledge and real-world applications in civil engineering.The visit was organized under the supervision of the Civil Engineering Department, accompanied by faculty members, ensuring the students could interact with industry experts and gain insights into the operations of a water treatment facility.

2. Objective of the Visit

The primary objective of the visit was to:

- Understand the various stages involved in water treatment.
- Observe the functioning and operations of the Rangil Water Treatment Plant.
- Study the technical and engineering aspects of water purification, filtration, and supply systems.
- Enhance the practical understanding of water resource management and treatment technologies.

3. Overview of the Rangil Water Treatment Plant

Rangil Water Treatment Plant is one of the major facilities providing potable water with a capacity of 30 MGD (Million Gallons Per Day) to Srinagar city and nearby areas. Located in the Ganderbal district, the plant has a significant capacity to treat and supply safe drinking water from the Sindh River. The water is treated through multiple processes to remove impurities and meet the required health and safety standards.

4. Key processes observed

During the visit, the students were guided by the plant's technical staff, who explained the entire water treatment process in detail. The key processes observed were:

a) Raw Water Intake: The students were shown how water is drawn from the Sindh River and transported to the treatment plant. They learned about the intake structure, the screening process to remove large debris, and the initial assessment of water quality.

b) Coagulation and Flocculation: The next process explained was coagulation, where chemicals like alum are added to the raw water to aggregate small particles into larger clumps (flocs). Flocculation further enhances the process, allowing these particles to settle.

c) Sedimentation: The students observed the sedimentation tanks, where the flocs settle at the bottom, leaving clearer water on top. This phase removes suspended solids from the water.

d) Filtration: The plant's filtration units, consisting of sand and gravel filters, were demonstrated to the students. This stage removes smaller particles, bacteria, and organic material that could not be settled in the previous step.

e) Disinfection: The final step observed was the disinfection process, where chlorine is added to the water to eliminate harmful microorganisms, ensuring the water is safe for consumption.

f) Storage and Distribution: After the water is treated, it is stored in large reservoirs before being distributed to Srinagar and surrounding regions. The students learned about the pipeline network and the importance of maintaining water quality throughout the distribution process.

5. Interaction with Plant Engineers

Following the detailed walkthrough of the plant, students had an interactive session with the plant engineers as shown in Figures 1 & 2. The technical staff explained the importance of water quality monitoring, regular maintenance of treatment units, and compliance with water safety standards as per BIS and WHO. The engineers also addressed questions raised by the students, particularly focusing on the challenges of managing water supply during peak demand and the impact of environmental factors on water treatment efficiency.


Fig.1& 2 Interaction of students with plant staff.

6. Learning Outcomes

The industrial visit was highly beneficial for the students, providing them with practical knowledge and insight into the complexities of water treatment systems. The key takeaways from the visit include:

- A comprehensive understanding of water treatment processes, from raw water intake to the final distribution of clean water.
- The critical role of chemical and mechanical engineering principles in ensuring water safety and quality.
- Awareness of the environmental and operational challenges faced by water treatment plants.
- The importance of efficient resource management in large-scale public utility projects.

7. Conclusion

The industrial visit to the Rangil Water Treatment Plant was a valuable learning experience for the students of the B.Tech 8th semester, Civil Engineering Batch (2020). It provided them with firsthand knowledge of water treatment technology and its real-world applications. The visit not only enhanced their technical skills but also underscored the significance of sustainable water management practices.

Acknowledgement

We would like to express our gratitude to the Rangil Water Treatment Plant's management and staff for their hospitality and for providing an in-depth understanding of their operations. Special thanks to the Civil Engineering Department at the Institute of Technology, University of Kashmir, for organizing this insightful visit.