INDUSTRIAL VISIT REPORT

STAR CEMENT PLANT

A complete report on industrial visit organised by **National Institute of Technology, Meghalaya** for the students of **Electrical and Electronics Engineering [3rd Semester]** in order to get the practical knowledge and exposure of the industry, which was supported by field engineers and supporting staffs of **Star Cement Ltd. , Meghalaya .**

Department of Electrical Engineering

Date: 15-11-2023

Branch :3rd SEM Electrical and Electronics Engineering

Number of students: 24

Objective of visit:

The primary objectives of the industrial visit were:

1. To offer students a hands-on experience with actual industrial procedures and operations.
2. To reduce the knowledge gap between classroom theory and real-world application in an industrial setting

3. To give students insight into the daily operations and assist them in understanding how industries actually run.

4. to introduce students to the newest tools, technology, and equipment utilized in industry.

5. To help students learn the credentials and skill sets needed for various positions in the industry.

6. to give students a better understanding of possible career routes in the industry.

7. To create opportunities for students to interact with industry professionals.

8. To allow students to ask questions and seek advice from experienced professionals in the field.

9. To enable students to see how the theoretical concepts learned in the classroom are applied in a practical, real-world setting.

10. To motivate students by showcasing successful industrial practices and achievements.

11. To promote collaboration and interaction between educational institutions and the industry

Industry overview

One of India's fastest-growing cement brands, **Star Cement Limited** is the top cement company in Northeastern India. Star Cement Ltd. has made a name for itself in the area as the most reputable supplier of cement. With an emphasis on sustainable development, Star Cement has established a notable reputation in the Indian construction sector thanks to its superior quality cement. By actively protecting the environment, fostering economic growth, enhancing livelihoods and social development, and carrying out its social obligations, the brand upholds strong and accountable corporate governance.

Situated in the town of Lumshnong, Meghalaya, the company's 1.67 million tonnes per annum integrated cement plant spans 200 hectares of land and guarantees easy access to high-grade limestone. In addition, the company operates two grinding facilities: one in Sonapur, near Guwahati, Assam, with a capacity of two million tonnes annually, and another in Mohitnagar, near Siliguri, West Bengal, with a capacity of two million tonnes annually for cement.

Star Cement Ltd. plant Lumshnong, Meghalaya

The plant is ideally located in Meghalaya, near the mines that provide the best lime stones in India. With the most recent German technology available, Star Cement operates an integrated grinding unit capable of producing 1.67 million tonnes of material per annum (MTPA). The plant is Northeastern India's largest. The company also owns a 51 MW captive power generation facility and a 2.8 million tonnes per annum (MTPA) clinker capacity.

The cement plant boasts of a 24-hour automated camera in the burning zone, an automatic roto packer machine and a technologically advanced dry process rotary.

Details of the journey:

Embarking on an enlightening journey at 8 am from our institute, under the esteemed guidance of our Head of Department, **Dr. Shaik Affijulla**, and accompanied by **Prof. Gayadhar Panda** and four coordinating staff members, our five-hour voyage to the Lumshnong cement plant in Meghalaya was both educational and memorable. Fueling our minds with discussions on the potential roles of electrical engineers in the cement industry, we indulged in a delightful breakfast onboard amidst picturesque forests and mountains. The bus journey became a melting pot of shared excitement, laughter, and idea exchange, fostering a strong bond among students. As we approached our destination, the anticipation and high enthusiasm among us marked this industrial visit as a significant milestone, offering valuable insights into the practical aspects of our academic pursuits.

Observations and visit highlights:

❖ Hospitality

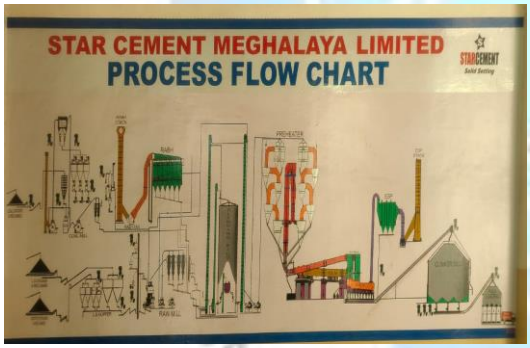
Our visit to the Star Cement Plant was marked by warm hospitality and a comprehensive exploration of the facility. Upon our arrival at 1:00 pm, Mr. Laxmaiah Munjala, the plant's head, extended a cordial welcome, accompanied by key personnel from various departments. The hospitality began with a refreshing break and a brief respite at their guest house, providing much-needed relaxation after a lengthy journey. A specially arranged lunch awaited us, fostering a sense of exclusivity and thoughtful consideration. Following this, our group convened for a detailed plant tour, gaining valuable insights into the plant's operations.

❖ Interactive session

The session at Star Cement Plant commenced with a distinguished moment as Mr. Laxmaiah Munjala, the esteemed Plant Head, honored our Professor Gayadhar Panda sir. This set the tone for an engaging interactive session. Mr. Laxmaiah Munjala provided a comprehensive overview of the company and the plant, detailing the diverse range of products manufactured. The Head of the Department presented a concise yet enlightening session on the manufacturing processes of various cements, elucidating on raw materials, manufacturing intricacies, and stringent safety protocols.

The emphasis on safety resonated as we were briefed on essential safety measures within the plant premises. Equipped with safety helmets and masks, we embarked on an immersive plant tour, gaining firsthand insights into the intricate operations. This interactive session not only enriched our understanding of cement manufacturing but also underscored the paramount importance of safety in industrial environment.


15/11/2023 13:49


STAR CEMENT MEGHALAYA LIMITED
PROCESS FLOW CHART

❖ Plant tour

The subsequent plant tour, led by the company's engineers, provided a hands-on experience of the operations. We were introduced to various machinery, including detailed explanations of their specifications, functions, and their significance in the industrial landscape. The engineers elucidated on the work processes and proper usage procedures, offering a comprehensive understanding of the manufacturing operations. This industrial visit not only enhanced our theoretical understanding but also provided practical insights into the application of the discussed concepts.

Machinery

During the insightful industrial visit, we gained valuable insights into the intricate and technologically advanced world of cement manufacturing. The process involves a myriad of sophisticated machinery, including a diverse array of motors, coolers, cement crushers, kilns, various feeders, grinding units, Reverse Air Bag Houses (RABH), heaters, preheaters, conveyer belts, hoppers, and the cutting-edge vertical roller mill, among others.

Some of the machineries involved are described below:

RABH: Reverse Air Bag Houses (RABH) play a pivotal role in cement plants by efficiently controlling air pollution. These systems utilize a unique mechanism where contaminated air passes through fabric bags, and reverse airflow dislodges particulate matter. This innovative technology ensures the capture of dust and pollutants, contributing to environmental sustainability.

KILN: The kiln in a cement plant plays a pivotal role in the production of cement, serving as the heart of the manufacturing process. This high-temperature, rotating furnace transforms raw materials into clinker through a complex series of chemical and physical reactions. The intense heat within the kiln ensures the proper formation of clinker, a crucial component in cement production.

PREHEATERS:

The cement plant's preheaters play a pivotal role in the manufacturing process, serving as crucial components that elevate efficiency. These innovative units preheat raw materials before entering the kiln, optimizing energy utilization and enhancing overall production quality.

CRUSHERS AND GRINDERS:

The cement plant's core machinery comprises crushers and grinders, pivotal in raw material processing. Crushers break down large materials, while grinders refine them into fine powder, essential for cement production.

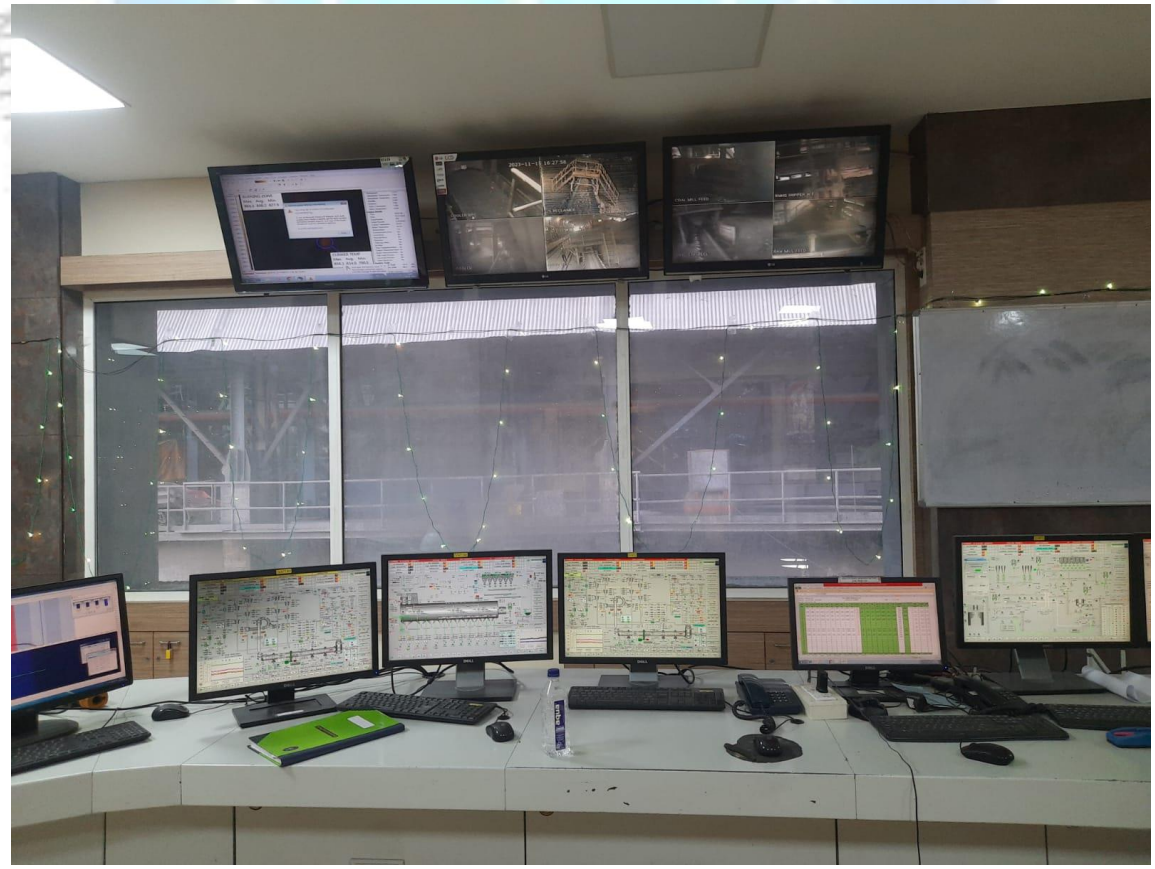
Fig: RABH fan main drive motor

Central control room:

Our exploration extended to the Central Control Room (CCR), situated at the heart of the plant, serving as the nerve center for overseeing and managing all plant activities. The CCR is equipped with computers, operated by a team of proficient experts. This high-tech control hub orchestrates and monitors the fully automated systems integral to the plant's operations. The visit to the CCR offered a fascinating glimpse into the convergence of cutting-edge technology and industrial precision, highlighting the carefully control mechanisms essential for optimizing efficiency and ensuring seamless functioning.

Power control panel

Exploring the HV/MV/LV Switchgear and Control Panels at the cement plant was an enlightening experience. These pivotal components play a crucial role in ensuring the seamless functioning of the plant's electrical distribution system. The High Voltage (HV), Medium Voltage (MV), and Low Voltage (LV) switchgear were meticulously organized and housed within dedicated control panels. Witnessing the intricate design and operation of these systems shed light on their vital role in managing power distribution throughout the facility.



Switchyard

The culmination of our industrial visit to the Star Cement plant marked a pivotal moment, as we delved into the critical aspect of ensuring a continuous and efficient power supply—the lifeblood of the entire operational framework. Recognizing the paramount importance of uninterrupted electricity, the company has invested in a robust 51 MW captive power generation facility.

At the heart of this power infrastructure is the cement plant's meticulously designed switchyard, serving as the nerve center that ensures the precise distribution of power. This integral component seamlessly integrates transformers, circuit breakers, and other vital elements, ensuring a faultless and unhindered flow of electricity throughout the plant.

Acknowledgements

We would like to express our sincere gratitude to the **National Institute of Technology, Meghalaya** and **Electrical Engineering Department** for providing us with the opportunity to go on an educational industrial tour to the **Star Cement plant, Lumshnong, Meghalaya**. This experience has been extremely beneficial in broadening our practical knowledge and understanding of the electrical aspects of industrial operations.

We extend our heartfelt thanks to **Dr. Shaik Affijulla, Head of Department**, and **Professor Gayadhar Panda** who played a pivotal role in organizing and facilitating this industrial visit. Their guidance and insights significantly enriched our learning experience.

We also indebted to, **Er. Laxmaiah Munjala, the plant head**, **Er. Arvind Rai, HoD Electrical** and the **entire team of Star Cement Ltd., , Lumshnong, Meghalaya** for their warm welcome, hospitality, and willingness to share their expertise with us.

B. tech 2nd year Electrical and Electronics engineering

National Institute of Technology, Meghalaya