

## **A REPORT ON INDUSTRIAL VISIT TO “Sardar Sarovar Dam & Statue Of Unity”**

Department of Civil Engineering, GCET had organized one day educational visit to “Sardar Sarovar Dam and Statue of Unity” on 27<sup>th</sup> July 2023. 30 students from GCET and ADIT, 2 faculty members and one lab assistant had visited the Statue of Unity (Viewing Gallery & Museum), Sardar Sarovar Dam (A-Frame -Top of the dam), River Bed Power House (R.B.P.H.), Canal Head Power House (C.H.P.H.) and Narmada Main Canal (0- Ch. HR).

### **Aim of Visit:**

The objective of the visit is to make students learn and understand about the concept of main components and construction of Storage Head works (Sardar Sarovar Dam), Hydroelectric Power Plant (R.B.P.H. & C.H.P.H.), Distribution works and Canal Regulating Works (Narmada Main Canal & NMC Head Regulator 0-Chainage). Also, to make them aware about construction of Tall Structures (Statue of Unity) as they are studying the subjects like Hydraulic Engineering.

### **About Visit:**

The visit was commenced from G H Patel College of Engineering & Technology at 6:30 AM and students were first taken to *Sardar Sarovar Dam* (A-Frame -Top of the dam) at 10:30 AM. The visit was possible with the support of Mr. Nikhil Shastri, AE, Sardar Sarovar Dam, and his colleague Mr. Kayasth Pranav, AE, Hydropower plant. Mr. Pratik and his team have joined us for the visit and guided us at various locations of the storage head site (Sardar Sarovar Dam Top). Students were explained about the history, construction and functioning of Sardar Sarovar Dam by Pratik Sir. They were informed about different components and significance of the dam and reservoir. Then, the explanation about fundamental working and design of Sardar Sarovar Dam was given to students by faculty Prof. Rajiv Bhatt. The details of Sardar Sarovar Dam are given here:

### ***Sardar Sarovar Dam***

Sardar Sarovar Project (SSP) - An Milestone of Engineering is a perfect example where engineering meets technology. Sardar Sarovar Project is constructed on the river Narmada which originates from Amarkantak, Madhya Pradesh and ends in Gulf of Khambhat, Gujarat trailing a length of 1312 km. It is the fifth largest in the country, comprising 30 Major Dams, 135 Medium

Dams and about 3000 Minor Dams along the total length. The SSP is located near Navagam, Gujarat.

The Sardar Sarovar Project is known as the Most Controversial Project in Indian history. The reason behind it is the political and social obstructions faced while construction of the dam. The main public figure behind it was Medha Patkar.

Sardar Sarovar Dam is a concrete gravity dam across river Narmada, 1210 meters (3970feet) in length and with a maximum height of 163 m above the deepest foundation level, is constructed up to the crest level of spillway i.e. 121.92 m which is the second largest gravity dam in the world with an aggregate volume of 6.82 million m<sup>3</sup>.

After that the students were taken to River Bed Power House (R.B.P.H.) and well guided by the faculty member. The entrance of R.B.P.H has a huge tunnel opening which was formed by cutting the adamant rocks of mountains of Vindhya and Satpura Ranges. The power house is located under a mountain. When we entered the power house, we were amazed to see the heavy machineries like turbines and gantry girder to carry and transfer the load of heavy machineries. The power house was 200 m long, 23 m wide and 53 m tall. The River Bed Power House comprises of six reversible Francis type turbine having a power generation capacity of 200 MW each. The turbines were supplied by M/S Sumitomo Corporation, Japan. The power generation capacity of the River Bed Power House is 1200MW. The minimum water head required for power generation is 128.68 m. The diameter of the penstock is 22 feet. The power generation cost is 30 paise per unit. The power generated by the SSP is shared among three states – Gujarat (16%), Madhya Pradesh (57%), and Maharashtra (27%). The share of power supply was decided on the basis of the scale of people affected due to construction of dam. Approximately 193 villages in Madhya Pradesh and 19 villages of Gujarat were submerged in the basin of the reservoir. It is an engineering marvel, and we were explained the whole procedure of power generation.

After the RBPH, discussion was continued for the Canal Head Powerhouse (C.H.P.H.) which consists of five Kaplan turbines having generation capacity of 50 MW each.

Then students were taken to the starting point of the main canal (0m – Chainage) of the dam. The SSP comprises of canals of length 67000 km, making it the world's longest lined canal network.

Finally, after completing the visit of Sardar Sarovar Dam and Canal head regulator everyone went for the lunch. The visit of Garudeshwar weir was cancelled due to heavy rain.

Finally, all the students were taken to the Statue of Unity and faculty member started explaining about Statue of Unity with its construction and what different challenges they have faced during the construction. The details of Statue of Unity are given here below:

## *Statue of Unity*

The statue of unity depicts the Indian independence activist Sardar Vallabhbhai Patel who was the first home minister of India. He is highly respected for his leadership in uniting 562 princely states to form the single large Union of India. It is located in the state of Gujarat, India.

It is the world's tallest statue with a height of 182 meters. It is located on a river island facing the Sardar Sarovar Dam on river Narmada, 100 kilometers southeast of the city of Vadodara. The construction process started by L&T in October 2013 with budget of \$420 million and designed by sculptor Ram V. Sutar. And finally, it was inaugurated by Indian Prime Minister Shri. Narendra Modi on October 31<sup>st</sup>, 2018. The whole project was completed in 42 months only.

The core of the statue utilized 210000 cubic metres of cement concrete, 6500 tonnes of structural steel and 1700 tonnes of bronze plates. The statue till the shoulder is made up of concrete and the head part is made up of steel. Self-compacting cement of M65 grade were used for the construction.

The most interesting part is the height of statue which is from its base 240 m with a base of 58 m and statue of 182 m. The height of 182 was specifically chosen to match the number of seats in the Gujarat Legislative Assembly.

The statue is divided into five zones of which only three are accessible to the public. There are a memorial garden and a museum which we have visited and enjoyed a lot. There was gallery at a height of 153 meters and we reached there by 2 lifts which can carry 26 each at a time and the gallery can hold up to 200 people.

It was mesmerizing experience clubbed with bunch of knowledge for all. After completing the visit of Statue of Unity the students were taken back to college campus at 12:10 PM.

# Photo Gallery

