

# **D.A.DIPLOMA ENGINEERING AND TECHNOLOGY,MAHEMADAVAD(682)**



## **Department of Mechanical Engineering**

### **A REPORT ON INDUSTRIAL VISIT AT KADANA DAM, KADANA, MAHISAGAR**



**Visit Date : 27<sup>TH</sup> MARCH, 2019**

43 students of DIPLOMA 6<sup>th</sup> Semester (Mechanical And Civil Engineering) took bus facility from DADET, MAHEMDABAD to KADANA DAM, KADANA, MAHISAGAR along with the faculties Mr. DIXIT DAMOR, Mr. VINOD PATEL, Mr. DINESH BORKAR and Mr. RIYAJ MALEK.



## INTRODUCTION

Kadana Dam is an earthen and masonry dam on the Mahi River in Mahisagar district of Gujarat, India. The dam was constructed between 1979 and 1989. The dam supports a pumped-storage hydroelectric power-station. The first two generators were commissioned in 1990, the second two in 1998. The first two generators commissioned, Stage I, are reversible kaplan turbines that allow the power station to generate electricity during peak hours then pump it back into the reservoir during low demand hours such as night.

### KANADA DAM INFO:

- Construction began-1979
- Opening date- 1989
- Location-Panchmahal district of Gujarat (INDIA).
- River-Mahi
- Height-66m(217ft.)
- Electricity users-Gujarat(panchmahal,godhra),Madhya Pradesh.
- Length-575m(1886ft.)
- Turbine-4 (Francis Type)
- Capacity-240MW
- Active capacity- 1,203,000,000 m<sup>3</sup>
- Catchment area- 25,520 km<sup>2</sup>

Kadana dam, Gujara. The primary objective to build the Kadana Dam on River Mahi was to control floods in the catchment area. It is a frequent occurring in the central Gujarat getting flooded, whenever around 10lakh cusec water is released from the Kadana dam. With heavy rains in the catchment areas of Rajasthan huge quantity of water is being released in the dam. The level in the Kadana dam has rose to 412.75 ft during the monsoon season. Villages in Central Gujarat will be flooded again as about 10lakh cusec water has been released from the Kadana dam. With heavy rains in the catchment areas of Rajasthan huge quantity of water is being released in the dam. On the other hand there is a warning of heavy rainfall in the state during next 48 hours.

This has put the administration on high alert. According to flood control alert has been sounded in Kheda, Panchmahal, Anand and Vadodara districts. People in the low-lying areas have been evacuated. The level in the Kadana dam has rose to 412.75 ft. In the morning 4.56lakh cusecs was being released which was increased to 10lakh cusecs at 10 am. A multipurpose composite masonry-cum-earth dam is being constructed 3 km upstream of the Kadana village situated on the banks of river Mahi. The low grade regionally metamorphosed rocks of the Aravalli system exposed around Kadana are quartzites, phyllites and metagreywackes. The rock formations are complexly folded, jointed and sheared.

The earlier part of the present work deals with the geological set up, petrography and physico-mechanical properties of the rocks. Attitudes of the structure discontinuities and the nature of the rock types have been studied. Engineering geological investigations mainly deal with the properties such as bulk density, porosity, water absorption, uniaxial compressive strength, static modulus of elasticity, Poisson's ratio, ultrasonic wave velocity and dynamic modulus of elasticity. The later part of the thesis describes the model studies carried out for the foundation rock composites and the analysis of the investigations with reference to the uniaxial compressive strength and static modulus of elasticity of the composites.

Kadana Dam came up in 1979 with a 35-million dollar funding from the International Bank for Reconstruction and Development (World Bank) and the International Development Association (IDA). The dam was constructed over a period of 10 years. With a catchment area of 25,000 square kilometres and 750 millimetres of annual rainfall, this earthen and masonry dam can have a maximum discharge of about 50,000 cubic metres of water a second.

At the entrance of the power plant eyes should be stunned after see enormous crane which is used to for turbine and handle other mechanism. Power plant is divided in two parts

(1) CONTROL ROOM

(2) TURBINE AREA

### **CONTROL ROOM**

Central ac control room is used to control the speed and pressure of the water as well as turbine. Basic layout of the whole power plant is available here. Large number of digital and analogue meter looks like a Hollywood movie set. One board shows the accident occurs in the power plant. Everywhere sign board indicates for the safety first.

### **TURBINE AREA**

Automatic lift is available for reach to the turbine area but as per my consideration use the ladder because while moving on the ladder large number of machine shown and thousands of meter long wire looks like a gauze of the spider.

In this section turbine blade and runner's voice produce jarring effect on ear. Workers are helpful for guide that how turbine is work. College teachers only give theoretical knowledge but practical knowledge is only gain by the workers. It is a lifetime experience to feel the vibration of the turbine blade and practically watch the shaft & runner of the turbine standing on the huge Francis turbine.

One ladder in the turbine section is lead at the end of the turbine when flow of water is thrown on the buckets. The sound of the water is overwhelming but very threat. Heartbeats reach near to 90. Breathtaking experience.

How many turbine are work is depends on the flow of the water. Speed of the turbine shafts is also depends on the flow of water. When we visit, shaft is rotates at 149 rpm.

IT is an astonishing place for technical purpose and picnic. One trip refreshes your heart as well as mind with lot's knowledge and full of joy.

Stage ⇅	Unit Number ⇅	Installed Capacity (MW) ⇅	Date of Commissioning ⇅	Status ⇅
Stage I	1	60	1990 March	Operational
Stage I	2	60	1990 September	Operational
Stage II	3	60	1998 January	Operational
Stage II	4	60	1998 May	Operational

With an aim to explore beyond academic arenas, Electrical Engineering Department, School of Engineering & Applied Science, Rai University, Ahmedabad organized an industrial visit to G.S.E.C.L Kadana Hydro Power Plant, District Mahisagar on 4th October 2017. Total of thirty two students and two faculty members from Electrical Department visited Kadana Hydro PowerPlant.

The purpose of the industrial visit was to provide a rare opportunity to Rai University students to interact and learn about actual industrial environment. The students studied and were aware of the field of generation as well as practical concepts in the world of power generation.



CATCHMENT AREA OF DAM

The power station is located at Kadana Dam on Mahi River in Mahisagar District which is 190 km from Ahmedabad. There are four units of hydro turbines, each of 60 MW with total installed capacity of 240 MW. All the units are of BHEL make. The dam was constructed between 1979 and 1989 and supports the pumped-storage hydroelectric power-station. The first two generators were commissioned in 1990, the second two in 1998. The first two generators commissioned, Stage I, are reversible Kaplan turbines that allow the power station to generate electricity during peak hours then pump it back into the reservoir during low demand hours such during evening hours. Kadana Hydro Power Plants have been operated and handled by Gujarat State Electricity Corporation Limited (GSECL).

The visit provided the students many new understanding in power sector unit, such as layouts of a Hydro Power Station, the amount of power generated from there, the costing system of power generation, knowledge on the location and rating of the equipments, control room working, and functions of switch yard and distribution systems.

