

A Report on an Industrial Visit to

**Kadana Hydro Electric Power plant,  
Lunawada & Panam Dam  
Panchmahal**

*Organized by*

*Training and Placement Cell*

**Department of Mechanical Engineering**

**Diploma (5<sup>th</sup> Semester)**

**Date of Visit: 18<sup>th</sup> & 19<sup>st</sup> September, 2017**



**Chhotubhai Gopalbhai Institute of Technology,  
Uka Tarsadia University, Bardoli.**

## Schedule of Visit:

Date: 18-09-2017

Time		Location
To	From	
12:00 (Night)	-	Departure from Surat and CGPIT (Bardoli)
12:30 a.m.	-	Reached at Swagat petrol pump, Surat
12: 30 a.m.	7: 00 a.m.	Reached to VIP guest house, Kadana Dam
7 :15 a.m.	9:00 a.m.	Fresh and break fast
09:00a.m.	11 :00 a.m.	Visit to kadana dam site
11 :00 a.m.	1:00 p.m.	Visit to hydro electric power plant at dam
1 :00 p.m.	3 :00 p.m.	Lunch at VIP Guest house
3 :00 p.m.	5 :00 p.m.	Departure from Kadana dam to Panam dam
5:00 p.m.	6:30 p.m.	Visit to panam dam
6:30 p.m.	9:30 p.m.	Krishna hotel, Halol
10:30	11:30	Dinner at Krishna hotel

Date: 19-09-2017

Time		Location
To	From	
8:00 a.m.	10:00 a.m.	Breakfast at Krishna hotel
10:30 a.m.	1:30 p. m.	Reached at Vishal khadi, Rajpipala
1: 30 p.m.	3: 00 p.m.	Visit to vishal khadi

3 :00 a.m.	4:00 p.m.	Lunch
04:00p.m.	-.	Departure from vishal khadi
8 :00 p.m.	-	Reached at Maliba campus, Bardoli
8 :00 p.m.	9 :30 p.m.	Dinner at Maliba campus
9 :30 p.m.	10 :30 p.m.	Reached at Surat

**No. of students visited: 37**

*Special thanks to Mr. J. M. Pateliya, Deputy executive Engineer at Kadana dam for permission this industrial visit.*

## **Kadana Dam:**

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 meta-greywackes. 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 proprieties 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.

## **Kadana Dam Information:**

- 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>

## **Hydro Electric Power Plant:**

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 fell 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 149rpm.



Kadana Dam site



Catchment Area of Kadana Dam



*Group Photo at Kadana Dam*

## **Panam Dam:**

The information of panam dam is following.

<b>Information</b>	
Location	Vill.: Kel Dezar, Tal: Santrampur Dist.: Panchmahals
Purpose	Irrigation, Water Supply, Power Generation & Fisheries
River	<u>Panam</u> ( Tributary of Mahi)
Area of catchment	2312 km <sup>2</sup>
Mean annual runoff in the catchment	26 Mm <sup>3</sup>
Mean annual rainfall	940 mm
Year of commencement of construction work	1971
Year of completion	1999
<b>Dam</b>	
Type	Masonry
Bed Rock	Quartzite & Phyllite
Maximum height above the lowest point of foundation	56.36 m
Length at the top of the dam	269.45 m
Total Volume Content:	
Concrete	0.71 Mm <sup>3</sup>

Masonry	2.88 Mm <sup>3</sup>	
Earthwork	2.68 Mm <sup>3</sup>	
<b>Reservoir</b>		
Area at full reservoir level	89.80 Km <sup>2</sup>	
Gross storage capacity	737.60 Mm <sup>3</sup>	
Effective storage capacity	698.84 Mm <sup>3</sup>	
Area under submergence		
a) Forest	b) Waste land	c) Culturable
a) 1686 ha	b) 2075 ha	c) 5229 ha
No. of villages under submergence	6 partial, 36 full	
<b>Canal</b>		
Length of canal	99.725 km	
Capacity	21.00 m <sup>3</sup> /s	
Gross command area	58273 ha	
Culturable command area	36405 ha	



Panam Dam

### **Vishal Khadi:**

Vishal Khadi Campsite is a campsite situated on the way to Rajpipla-Netrang road. It is around 20 km away from Rajpipla. The site is surrounded by several forest areas, namely, Karjan forest area, Dedyapada forest area and Dang forest area, and fertile agricultural plains and river valleys. The sightseeing includes the bathing ghats on the River Narmada at Chandod and Garudeshwar, the fort at Dabhoi, waterfalls, the Jain temples of Jagadia. One can also go for boating to the nearby Karjar River as the back waters of the river extend till the campsite.



The site consists of separate cottages with attached toilets and bathrooms and it also has tent accommodations. It can be reached easily as regular State Transport buses are available from Rajpipla in the morning. It can also be reached by Jeeps or sharing auto rickshaws.

**Facilities:**

- Orientation Centre
- 4 Cottages with attached bath & toilet facilities
- 5 Tented Accomodations with separate bathing & toilet facilites
- Separate Kitchen & Dining places
- Food available with the help of EDC (Eco Tourism Development Committee)
- Separate area for Campfire
- Machaans for landscape & wildlife viewing
- A Watch Tower



Vishal Khadi View



Group Photo at Vishal Khadi