

# Industrial Visit Report

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**GOVERNMENT POLYTECHNIC COLLEGE, VALSAD**  
**ELECTRICAL ENGINEERING DEPARTMENT**  
**INDUSTRIAL VISIT REPORT**



- Organizer** : ELECTRICAL ENGINEERING DEPARTMENT,  
GOVERNMENT POLYTECHNIC COLLEGE,  
VALSAD
- Industry Visited** : Ukai thermal and hydro power  
station, Near Ukai Dam, Ukai  
Via: Vyara,  
Dist.: Tapi, Gujarat – 394651  
Website - <https://www.gsecl.in/>
- Officials involved from Industry** : Shri. Ritesh N Patel Training Superintendent
- Date** : October 24, 2024
- Transportation** : Bus
- Total Students** : 46 boys 11 girls total 58 students
- Students belongs to course** : 3<sup>rd</sup> Sem, diploma in electrical engineering.
- Faculty Accompanied** : (02 M 02 F)  
Mr. Naresh C Kumavat  
Mr. Nirav S Patel  
Ms. Anjana D Patel  
Ms. Dharmishtha C Patel
- Coordinator** : Mr. Harshad N Lad

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## Industry Profile – Ukai Hydro and thermal power station

The Ukai Dam, constructed across the Tapi River, is the second largest reservoir in Gujarat after the Sardar Sarovar. It is also known as Vallabh Sagar. Constructed in 1972, the dam is meant for irrigation, power generation and flood control. Having a catchment area of about 62,255 km<sup>2</sup> and a water spread of about 52,000 hectares, its capacity is almost same as that of the Bhakra Nangal Dam. The site is located 94 km from Surat.



Main Hydro Total Cost	22.87 Cr	
Commissioning date of Main Hydro Units		
Unit # 1 (75 MW)	08-07-1974	
Unit # 2 (75 MW)	13-12-1974	
Unit # 3 (75 MW)	22-04-1975	
Unit # 4 (75 MW)	04-03-1976	
Max. Generation (for Monsoon Year)	1976-77	1261.217 Mus
Max. Generation (Monthly)	Sept-2013	221.267 Mus
Max. Generation (Daily)	25-09-1998	7.689 Mus

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## SPILL WAY

Specification of Spill Way is given below

1	Spill Way Channel	Length = 1524 Meter, Width = 259 Meter Depth = 18.29 Meter
2	Spill Way Gates	1) Numbers = 22 nos 2) Types = Radial Gates. 3) Area = 15.545 m × 14.783 m. 4) Weight = 100 Tones Each.
3	Discharge Capacity	49490 m <sup>3</sup> /sec. Maximum=59920 m <sup>3</sup> /sec
4	Over all Crest Length	425.195 m.

## TURBINE

Specification of turbine is given below

1	Type	Reaction Type, Kaplan, Vertical Shaft, Feathering propeller type.
2	Make	Bharat Heavy Electricals LTD.
3	Head	1) 47.8 m (156.82 ft.) Rated Head. 2) 57.2 m (18.66 ft.) Max head. 3) 34.4 m (112.86 ft.) Min head.
4	Output power	1) 1,05,000 Metric HP 2) 1,20,750 Metric HP Max
5	Speed	150 RPM (clockwise rotation)
6	Run away Speed	1) 300 RPM with cam 2) 350 RPM Without Cam

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7	Water Discharge	6000 cusec (101 m <sup>3</sup> /sec) at 75 MW.
8	Nos. of guide Vanes	24 nos.
9	Size of guide vanes	6660 mm × 19.4 mm
10	Main shaft dia.	900 mm
11	Runner hub dia.	3160mm
12	Runner blades	6 nos. Each having Weight of 5 tones & design to withstand 1700 tones hydraulic.
13	Spiral inlet dia.	6500 mm
14	Largest transport item of turbine	Inner top cover half size 6.1m × 3.5m × 3.0m
15	Efficiency	98 % at the full water level.
16	Weight of turbine with shaft And runner disc	140 MT
17	Bearing	Turbine guide bearing 1 no having 8 nos. pads.

### GENERATOR

Specification of generator is given below

1	Nos. of Generator	4 Nos
2	Sr. no. of Generator	3000107, 3000108, 3000109, 3000110 respectively
3	Type	G25 Vertical Umbrella Type Salient Pole Rated 83333 KVA, 0.9 p.f., 11KV (± 5%) 3 phase, 4370 AMPS. Rated KVAR 56000 at Zero leading P.F.
4	Make	Bharat Heavy Electrical Ltd.
5	Stator Windings: Slots	384, winding coils 384
Joint 1) Series joint		264

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	2) Pole to pole joint	108
	3) Bus Bar joints	12
	<ul style="list-style-type: none"> <li>❖ Stator resistance per phase at 200=0.003415 ohm.</li> <li>❖ Field resistance at 200 C=0.15 ohm.</li> <li>❖ Rotor excitation at no load &amp; 100% voltage= 608 amp.</li> <li>❖ Rotor excitation at rated output &amp; voltage = 1052 Amp.</li> <li>❖ Excitation voltage = 180 v.</li> </ul>	
6	Speed	150 RPM
7	Overall dia.	4127.5 ×2 =8255.0 mm
8	Heaviest package for shipment	
	❖ Thrust bearing housing size 04.34m long × 4.12 m width × 2.6 m high having weight 55 tones.	
9	Weight of generator side	275 MT
10	Heaviest assembly to be lifted by crane weighting 220 tones.	
11	Bearing	1 no – thrust bearing having 12 pads. 1 no – Generator guide bearing having 24 pads.

Ukai Thermal Power Station is an operating power station of at least 1110-megawatts (MW) in Ukai, Tapi, Gujarat, India with multiple units, some of which are not currently operating.

Unit name	Status	Fuel(s)	Capacity (MW)	Technology	Start year
Unit 1	Retired	coal: bituminous	120	subcritical	1976
Unit 2	Retired	coal: bituminous	120	subcritical	1976
Unit 3	Operating	coal: bituminous	200	subcritical	1979
Unit 4	Operating	coal: bituminous	200	subcritical	1979
Unit 5	Operating	coal: bituminous	210	subcritical	1985

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Unit 6	Operating	coal: bituminous	500	subcritical	2013
Unit 7	Permitted	coal: bituminous	800	supercritical	2028 (planned)
Unit 8	Announced	coal: unknown	800	supercritical	2030 (planned)

## Objective of Industrial Visit

- 1) To interact the students with actual industry personals.
- 2) To make them aware of the industrial procedures required to enter in any company.
- 3) To experience them about the importance of all Departments in the Industry.
- 4) To prepare the students for the selection of carrier path in various industry.

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## Ground report

Our Industrial visit journey was started at 6 am from GPV Campus and reached the Ukai thermal power station Ukai at 09:45 am. After completion of entry procedure at the Pass Office to enter inside the Ukai TPS Gate-1, the CISF officers welcome us and guided about plant. After this introduction about TPS, Mr. R M Patel sir, the in charge of our visit were gone to training center. Shri. R M Patel and his team members has guided in detail about the Ukai TPS plant and GSECL. Also aware about safety with live examples of daily activity with comparative data. Demonstrated all the components of thermal power plant. Also, he has explained in detail about the boiler, turbine and generator construction parameters, working mechanism of plant, fuel and ash handling, and fuel sources all over the country. Representative of TPS has guided all of us about the advantage and accidents of thermal power plant with live examples.

In the last part of visit, two batches of the students were divided and one batch was headed for cooling tower and second batch was entered in generator room with proper safety personal protective equipment (PPE's). All details about actual power plant work function were given by Representative of TPS and every step was explained about power generator with live demo of working generator. After that they shows us battery room, control room, switch gear section, switch yard and explain working and importance of each and every component deeply. Many students have asked the queries and the instructor has solved them very cleverly and politely. After plant visit the students were headed for the delicious lunch.

After completion of plant visit, a short meeting was arranged with Shri. R M Patel (Training Superintendent) of Ukai TPS. We showed our gratitude by giving Token of love to Shri. R M Patel and his team members those who help during visit of Ukai TPS, and promised to continue this activity every year for the benefit of the students.

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Also Shri. R M Patel sir inspired the student about, how to choose a carrier and many other important aspects related to interview.

After plant visit the students were headed for the delicious lunch. After taking the lunch we headed towards Ukai HPS. After completion of entry procedure at the Pass Office to enter inside the Ukai HPS, the CISF officers welcome us and guided about plant. After this introduction about HPS, Mr. M N Patel sir, the in charge of our visit, divided us in two batches of the students and one batch was headed for generator and second batch was entered in turbine room with proper safety personal protective equipment (PPE's). All details about actual power plant work function were given by Representative of HPS and every step was explained about power generator with live demo of working generator. After that they shows us control room, switch gear section, switch yard and explain working and importance of each and every component deeply. Many students have asked the queries and the instructor has solved them very cleverly and politely.

Buses were departed from the Ukai HPS to the respective routes as earlier decided and reached safely to respective places.

Name Of the subject	Electrical Power Generation and Transmission
Subject Code	4330903
CO covered	Supervise functioning of Thermal power plant, Hydro power plant and nuclear power plant.



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Industrial of Visit: Ukai Thermal power plant



Industrial of Visit: Ukai Hydro power plant

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## Student's feedback



**Raj Ramesh Kushwaha**  
(236290309147)

Our department of electrical engineering visited Ukai thermal and hydro power plant, the 500 MW thermal power plant and 300 MW hydro power plant at Ukai in Vyara Gujarat. Officials involved in the visit from Ukai TPS and HPS gave detailed information and described energy source of plant and demonstrated how power station is working. All students enjoyed the visit and gained some knowledge of Industry. I would also like to thank our departmental organizing committee for arranging this visit.



**Savaliya Manan  
Ashokbhai**  
(236290309153)

It was amazing experience to visit Ukai thermal and hydro power plant. It has a modernized campus. The guide who escorted us explained every detail of the power plant. The safety of the visitors was looked after by providing a safety wears and equipment's. It was a place worth to visit, as it provided lot of knowledge and live experience.

**Subject Coordinator**

**Head of department**