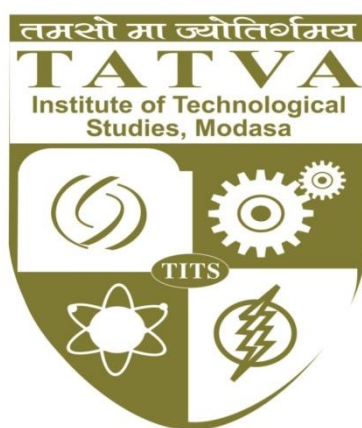




Gujarat Technological University



TATVA INSTITUTE OF TECHNOLOGICAL STUDIES,

MODASA

(Department Of Electrical Engineering)

Thermal Power Plant, Wanakbori

(Industrial Visit Report)

ACKNOWLEDGEMENT

The industrial visit at **Thermal Power Plant, Wanakbori** was impossible to us without the efforts and valuable inputs from collage and faculties. We are here extending to our great acknowledgement and appreciation to following persons with their memorial inputs that are not limited only those mentioned below.

The first and the most acknowledged is **Prof H P Chauhan, HOD Sir** who was very helpful to us. As a Head of Department, he has inspired us in industrial visit. Not only that as giving the permission of industrial visit, his academic guidance, fairness and responsiveness to kind of queries remains him as a role model, thereof we are extending our gratitude to **H P Chauhan, HOD Sir**.

Prof N L Solanki (Asst. Prof. of Electrical Engineering Department) who was faithful to us, he is also always ready for solving problem related to industrial visit and academic.

We are thankful to each and every member of electrical department from deep of our heart.

TATVA INSTITUTE OF TECHNOLOGICAL STUDIES, MODASA
(Department Of Electrical Engineering)

Department of Electrical Engineering has organized an industrial visit of Thermal Power Station, Wanakbori (GSECL) for degree and diploma final year students. 36 students along with 3 faculty members visited the thermal power station on 7th AUG, 2019.





WTPS has 7 units each of 210 MW. So, the total installed capacity of the plant is 1470 MW.

Following sections of the WTPS are visited.

- 1) Training center
- 2) Coal and ash handling plant
- 3) Boiler section
- 4) Turbine/Generator floor
- 5) Electrical control room (Unit No.3)
- 6) Cooling tower

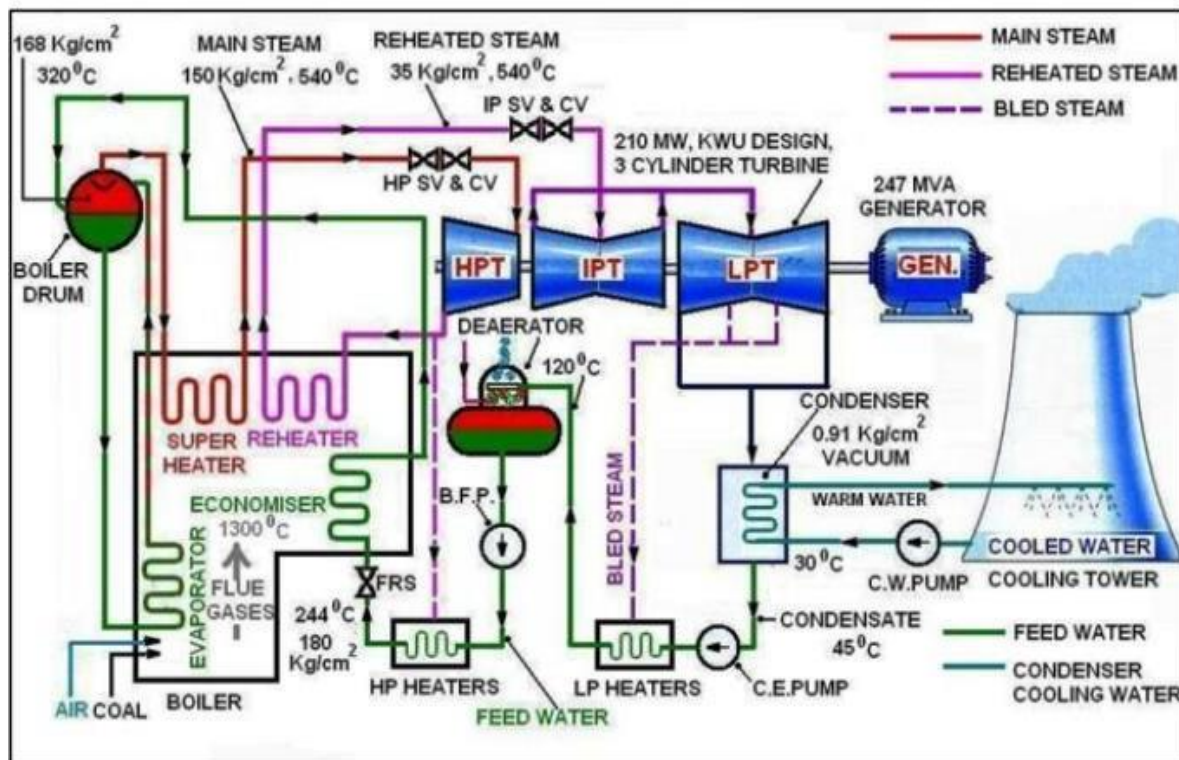
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Wanakbori Thermal Power Station is a coal-fired power station in Gujarat, India. It is located on the bank of Mahi river in Kheda district. There are seven units of each 210 MW capacity.

Stage	Unit Number	Installed Capacity (MW)	Date of Commissioning	Status
Stage I	1	210	March 1982	Running
Stage I	2	210	January, 1983	Running
Stage I	3	210	March, 1984	Running
Stage I	4	210	March, 1986	Running
Stage I	5	210	September 1986	Running
Stage I	6	210	November 1987	Running
Stage II	7	210	December 1998	Running
Stage III	8	800	-	Under Erection

GSECL has recently entrusted BHEL with an Order for setting up an 800-MW supercritical Coal- Based project at Wanakbori in Gujarat on EPC basis.

Basic Working of TPS, Wanakbori:



At the training center, J S Gadvi Sir (DE, TPS Wanakbori) explained the working cycle of thermal power station. Students visited various small scale models of equipments used in the power plant. We collected very important practical data like temperature, pressure, quantity of coal, etc. used for the power generation.

We visited the coal and ash handling plant where gadvisir guided us. The 210 MW unit consumes 125 ton coal per hour to generate the electricity. So, bulk amount of coal is transported through railway and with the help of Wagon Tripler coal is transferred to the coal storage area.

To start the ignition of the boiler residual furnace oil (RFO) or light diesel oil (LDO) is used which is transported through tanker wagon by railway. After the combustion of coal in boiler furnace, ash is produced which is collected and treated by ash handling plant.

The ash is used for many industrial applications like production of cement, ceramic, etc. At boiler section we visited FD fan, ID fan, PA fan, APH, boiler furnace area and other auxiliary devices essential for boiler operation.

Each boiler unit has 2 FD fans, 2 ID fans and 2 PA fans. The boiler consumes 125 ton pulverized coal per hour with 720 ton of air to generate heat at the temperature of 1200-1300o At turbine/generator floor, students visited HP, IP and LP sections of turbine coupled with generator.

Superheated steam at 140 kg/cm² pressure and 545^o C temperature is fed to the turbine. Generator has capacity of 210 MW at 15.75 kV, 9050 A. The control room of power plant is the brain of the entire plant. We visited control room of unit no. 3. It is equipped with DCS facility provided by ABB Ltd.

ALL the important data were displayed in real time mode like MW, MVA, frequency, power factor, phase current, etc. on the display screen. There are 7 natural draught cooling towers (NDCT) used for cooling of circulating water of condenser. Water is sprayed at the height of 21 meters in the tower and due to natural draught of air, its temperature is reduced by 10^o C and this water is pumped in to condenser tubes for condensation of steam exhausted from LP turbine.

Switch yard consists of two sections, 220 kV and 400 kV. The voltage of unit no. 1, 2 and 3 is stepped up from 15.75 kV to 220 kV and the power is transmitted at 220 kV level.

There are 7 outgoing transmission lines at 220 kV voltage level. The voltage of unit no. 4, 5, 6 and 7 is stepped up from 15.75 kV to 400 kV and the power is transmitted at 400 kV level.

There are 4 outgoing transmission lines at 400 kV voltage level. The visit was very fruitful as we observed each of energy conversion stages used in power plant starting from fuel section to switch yard.

We collected very important information like practical data which are not available in books and other literature. Many of our doubts are cleared by the discussion with experts of the plant.

Feedbacks:

It is great experience of Thermal Power Plant, Wanakbori. It is very useful to students because students can observe working of TPS and its various working Cycles like Ash Handling cycle, Gases cycle, Water cycle, Steam cycle, Electrical cycle. They can understand working of Boiler, Alternator, Pump, Cooling Tower, Control room.

FROM: Prof H P Chauhan (HOD Electrical)

It is nice industrial visit at TPS; Wanakbori. It will help to students in their studies also. I have gather lot of information about working of Thermal Power plant and its different working cycles.

From: Prof N L Solanki (Asst. Prof.)

It is nice visit. We got lots of information about thermal power plant. It is exciting to see how control system works. It is beyond the typical text book of our study.

From: Visited Students

Report BY:

Deep A Maheta

B.E. Elect (sem-7),

T.I.T.S. Modasa

Ref. & Guide By:

Prof H P Chauhan

(HOD Electrical)

Prof N L Solanki

(Asst. Prof.)

Thank YOU...

