

**REPORT ON 8 DAYS INTERNSHIP IN
KOTHAGUDEM THERMAL POWER STATION
TELANGANA (TSGENCO)**

Submitted in partial fulfilment of the requirements for the completion of

PROFESSIONAL TRAINING

By

PASIKANTI JASWANTH (Reg. No. 41140060)



**DEPARTMENT OF ELECTRICAL AND ELECTRONICS
ENGINEERING**

SCHOOL OF ELECTRICAL AND ELECTRONICS

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

Accredited with grade “A++” by NAAC

JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI – 600119

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

BONAFIDE CERTIFICATE

This is to certify that this Internship Report submitted for EPICS is the bonafide work of **PASIKANTI JASWANTH** (41140060) who carried out the **THERMAL POWER PLANT** Internship during the period 23-May-2023 to 30-May-2023.

EXTERNAL GUIDE
Dr. C . Bhuvaneswari, M.E., (Ph.D.)

HEAD OF THE DEPARTMENT
Dr. S . Radhika, M.E., (Ph.D.)

Submitted for Professional Training held on 04 October 2023

Internal Examiner

External Examiner

DECLARATION

I **PASIKANTI JASWANTH** here by declare that the Report entitled **KOTHAGUDAM THERMAL POWER PLANT** done by me **AT PALWANCHA TELANGANA (TSGENCO)** is submitted in partial fulfilment of the requirements for the award of Bachelor of Engineering degree in **ELECTRICAL AND ELECTRONICS ENGINEERING**.

DATE: 23-05-23 to 30-05-23

PLACE: TELANGANA



SIGNATURE OF THE CANDIDATE

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CHAPTER 1

Kothagudem thermal power station is a coal fired thermal power generating station with total installed capacity of 1720MW out of which KTPS-A station which was constructed in two stages-stage-I consists of two units 1 & 2 and stage-II consists of two units 3 & 4 each of 60MW capacity. The KTPS-B station, stage-III consists of two units 5 & 6 of each 120MW (Renewed) capacity and KTPS-C station, stage-IV consists of two units 7 & 8 each of 120MW (Renewed). During 1996, one more stage KTPS-V stage was constructed which consists of two units 9 & 10 each of 250MW. In 2010 another stage KTPS-VI stage was constructed which has one unit stage 11 of 500MW

1.1 Installed Capacity:

Thus the total installed capacity of the plant is:

KTPS-A Station: $4 \times 60 = 240\text{MW}$ (commissioned in the year 1966)

KTPS-B Station: $2 \times 120 = 240\text{M}$ (commissioned in the year 1973)

KTPS-C Station: $2 \times 120 = 240\text{MW}$ (commissioned in the year 1976)

KTPS-V Station: $2 \times 250 = 500\text{MW}$ (commissioned in the year 1996)

KTPS-VI Station: $1 \times 500 = 500\text{W}$ (commissioned in the year 2011)

TOTAL= 1720MW

1.2 Primary fuel supply:

For thermal power plant main supply is fuel so the coal and water is mandatory

Coal is used as fuel because it has more heating capacity

1.2.1 Supply of coal

In a coal based thermal power plant, The supply of coal to the KTPS is from Singereni Collieries Company Ltd.(S.C.C.L.) from Manuguru, Yellandu and Rudrampur mines. The average distance pf S.C.C.L coalmines by rail is around 50 KM. The annual coal requirements are about 70 lakh tones and the annual coal bill works out to be about Rs.700 Crores.



1.2.2 Supply of water:

The Kinnerasani Project which is 10 KM away from the plant is the oraly source of water supply to the KTPS. The Kinnerasani dam was constructed at a cost of Rs. 5.6 Crores and was maintained by the Irrigation department up to March 1998

The project was taken over by APSEB/APGENCO on 01.04.1998. Remedial and modernization works at a cost of Rs. 5.6 crores have been carried out to enstare storing of water to full reservoir level of 407 ft.



1.3 400KV Switch Yard :

A power system network needs switchgear for its switching and or isolation under normal and abnormal operating conditions. The two functions of switchgear in any power system are:

1. To permit the plant and distributors (transmission lines) to be conveniently put into and taken out of service.
2. To enable the same plant and lines- when they become faulty- to be rapidly and safely isolated by automatic means.

The switchgear and protection control panels are installed at each voltage level at each switching point for normal routine switching, control and monitoring and automatic switching during abnormal and faulty operating conditions such as short circuits, under voltage, overloads. Every electric circuit needs a switching device and a protective device. The switching and protective devices have been developed

in various forms. Switch gear is a general term covering a wide range of equipment concerned with switching and protection.



1.3.1 400KV Switch Gear:

It consists of 400 KV circuit breakers, isolators, bus bars, current transformers, potential transformers, capacitor voltage transformers, lightning arresters, line trap, power transformers etc. frequency - 50Hz

1.3.2 415V System Gear:

In 415 V system there are two types i.e. 3-phase, 3 wire system which will feed the supply to the 3-phase, 4 wire system is used mainly for 1-phase loads which are used for 1-phase welding transformers and lighting.

1.4. CHIMNEY

A thermal power plant chimney has important functions: To carry undesirable combustion or smoke out of the boiler. The dry ash which is obtained from the boiler is exhausted by the use of chimney.



1.4.1 FEED WATER PUMP

It is used to remove impurities from the boiler feed water and as such protect the pump.

Make: ABB

AMPS: 318amps

RPM: 2979rpm

Class: 631c3

1.5 DM Transfer pump

DM water is required because we can't use raw water for steam generation as it will form scale inside the water wall tubes ,which affects the heat transfer rate and if the impurities enters along with the steam inside the turbine it will erode the blades of the turbine.



DM water treatment storage tank and transfer pump

1.6 EMERGENCY OIL PUMP (EOP)

It is used to provide oil to all bearings at a lower pressure than normal, but still sufficient to preclude bearing damage during emergency shutdown.

Type: Z2-61

KW: 5.5kw

Volts: 110volt

Amps: 61.3amps

Rpm: 1000rpm

Excitation: Shunt

1.7 Cooling Tower (CT)

The function of cooling tower (CT) is to reduce the hotness of a water stream through expelling high temperature from water and transmitting it to the air.



Inside cooling tower

CHAPTER 2

NATURE OF WORK DONE

The nature of work done in this power plant is power generation using coal. I have observed is that how the coal is transferred into the crusher and that coal is crushed into 10mm and then it is sent into the boiler at the same time the water is into the boiler with out any purities present in it. The water is converted in to steam at 470degrees and sent into the turbine which is connected to the generator and alternator. the steam hits the turbine blades and the turbine is rotated at 3000rpm then the electricity is produced. Here AC current is generated. The generated current is sent to the HT Breaker and it is connected to the 3 panels. The HT Breaker is of 1600Amps, 11kv and it is directly sent to the stepdown transformer where 11kv is converted to 420v.and it is supplied to the factory SRHHL1, SRHHL2, SRHHL3 and etc



This is turbine here the steam is sendes into the turbines and the mechanical energy is obtained and electric energy is generated

CHAPTER 3

METHODS AND PROCESSES

The working process of a thermal power plant involves several stages and components to convert heat energy from the combustion of a fuel source into electrical energy. Here is a step-by-step overview of the working process of a typical thermal power plant:

3.1 Fuel Combustion:

The process begins with the combustion of a fuel source, such as coal. Combustion produces high-temperature heat energy through the burning of fuel and the release of chemical energy.

3.2 Boiler:



The high-temperature heat generated from combustion is used to heat water in a boiler.

The water is heated to produce high-pressure steam.

3.3 Steam Turbine:

The high-pressure steam is directed into a steam turbine. As the steam flows through the turbine blades, it expands and exerts force, causing the turbine to rotate. The rotation of the turbine is used to convert the kinetic energy of the moving steam into mechanical energy.

3.4 Generator:

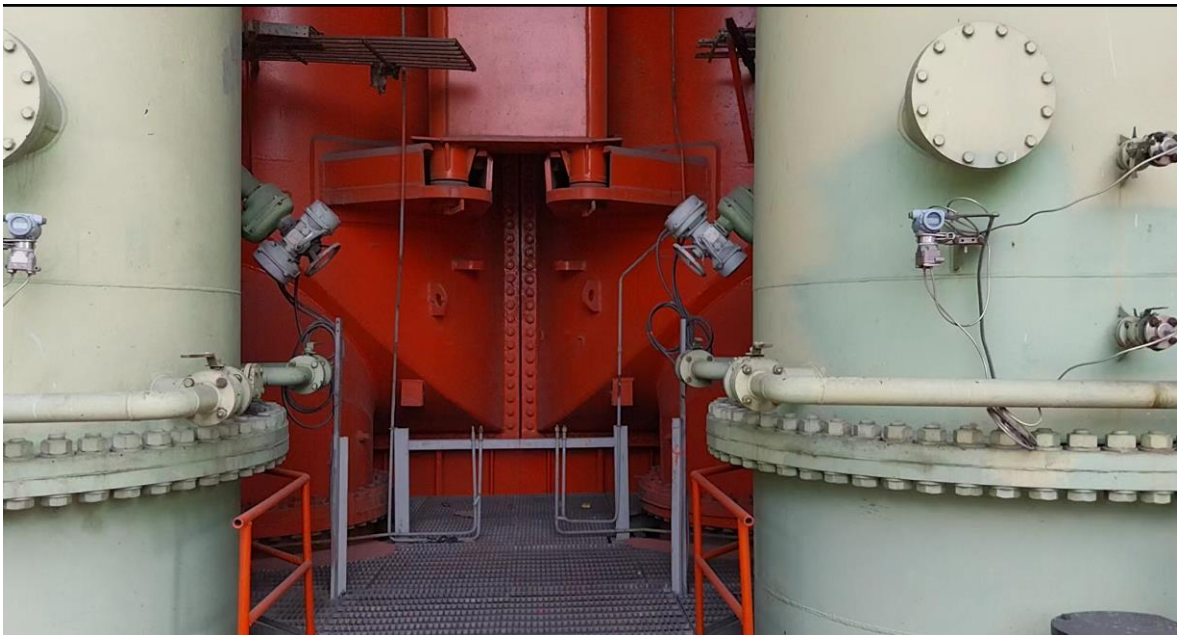


The rotating shaft of the steam turbine is connected to an electric generator.

The mechanical energy from the turbine is used to rotate the generator rotor within a magnetic field.

Electromagnetic induction generates electrical current in the generator's windings, producing electrical energy.

3.5 Condenser:



After passing through the steam turbine, the low-pressure steam is directed to a condenser.

In the condenser, the steam is cooled and condensed back into water

Cooling System:

A cooling system is essential to maintain proper operating temperatures in the power plant.

Cooling water, often sourced from cooling towers or natural bodies of water, is used to absorb heat from various components, including the condenser.

3.6 Electrical Distribution:



The electricity generated by the generator is sent through transformers and switchgear for voltage regulation and distribution.

It is transmitted through power lines to various parts of the factory

The working process of a thermal power plant involves the efficient conversion of heat energy into electrical energy, while also addressing environmental and safety considerations. Continuous monitoring, maintenance, and adherence to environmental regulations are essential aspects of the operation of a thermal power plant.

CHAPTER 4

Conclusion:

The 400 KV Switchyard at KTPS- VI Stage receives electrical power from 1X500 MW units and imported feeders like tie line -I and II via incoming transmission lines and delivers electrical power via the outgoing transmission line (2 Nos.).

The tasks associated with 400 K V Switchyard are.

1. Protection of Transmission system. (To isolate faulty sub-network feeder/line from the healthy network).
2. Controlling the exchange of power (to control the power transmission to load points as per requirement).
3. Maintaining the system frequency within targeted limits This can be done by lowering / raising of generation or load shedding).
4. Fault analysis and pinpointing the cause and subsequent improvement.
5. Communication, data transmission via power line carrier for the purpose of network monitoring, control and protection.