

REPORT ON 10 DAYS INTERNSHIP IN SREE RAYALASEEMA HI-STRENGTH HYPO LIMITED

Submitted in partial fulfilment of the requirements for the completion of

PROFESSIONAL TRAINING

By

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**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

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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 **K.Midhuneshwar** (41140042) who carried out the **THERMAL POWER PLANT** Internship during the period May 2023 to June 2023.

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CHAPTER 1

INTRODUCTION ABOUT THE COMPANY

M/s. Sree Rayalaseema Hi-Strength Hypo Limited (SRHHL) a group company of TGV group established an industry for manufacturing inorganic and organic chemicals manufacturing at Gondiparla village, Kurnool mandal in Kurnool district, Andhra Pradesh. The unit obtained ISO 9001, ISO 14001 and OSHAS 18001 certifications. It is proposed to expand the manufacturing capacity of Mono Chloro Acetic acid production capacity from 16.7 TPD to 83.5 TPD, coal based co-generation power plant from 3 MW to 13 MW, inclusion of Sodium Methoxide plant of capacity 20 TPD in the existing site area of 35.45 ha. The capital cost for expansion is Rs. 150 crores, towards enhancement of production facility, pollution control equipment and additional equipment to enhance the capacity. Prior environmental clearance is mandated by Ministry of Environment and Forests, vide SO 1533, dated September 14, 2006, for synthetic organic chemicals manufacturing activity and power plant.

WORKING OF POWER PLANT

power plants uses electric generator to converts mechanical (rotation) into electrical energy. Electric generator works on the principle of Faraday's law of Electromagnetic Induction. As the moving coil (Copper coil) is placed in a magnetic field, voltage is induced across its two terminals. Initially coil is at rest position so voltage induced is zero. When coil starts rotating at a particular point, it cuts the maximum magnetic flux (Produced by magnets), voltage across the two terminal reaches the pic voltage. After 90 degrees of rotation, magnetic flux cut by the coil becomes almost equal to zero and voltage across two terminals becomes zero. Again after 90 degrees of rotation, coil cuts the maximum magnetic flux but with the opposite polarity so voltage across its two terminals reaches to negative peak and again after 90 degrees of rotation, voltage reaches to zero since the magnetic flux cut by the coil is almost zero.

Hence the power produced by power plants (Thermal power plants, Hydroelectric power plants and Windmills) is AC in nature.

1.1 COAL YARD

In a coal based thermal power plant, the initial process in the power generation is "Coal Handling". Here we buy coal from 3 countries 1) Indonesia 2) Thailand 3) India. The Indian coal and any other coal is mixed in 80:20 ratio. The coal is sent into the crusher and it is crushed into powder of 10mm and sent into the tubes of boiler. For full load of boiler we use 250tons per day or otherwise we use as per our requirement.

Coal crusher

Make: CG

Kw/hp:37/150

Amps: 63

1.2. BOILER

The type of Boiler use here is Circulating Fluidized Bed Combustion (C.F.B.C). The maximum temperature of this boiler is 800-900degrees. But here we maintain 410degrees for boiling the water in the boiler. The boiler is connected with 2 types of fans for cooling purpose 1) PA FAN (Primary Air Fan) 2)SA FAN (Secondary Air Fan)

1.2.1)PRIMARY AIR FAN (PA FAN)

KW – 160

HP – 200

RPM – 2972

Amps – 287

1.2.2)SECONDARY AIR FAN(SA FAN)

KW – 132

HP – 150

RPM – 2970

Amps – 216

1.3. TURBINE

The turbine generator in thermal power plant is connected to the shaft of the turbine. The turbine provides the mechanical energy input to the generator which is converted into electricity. The turbine generator in the thermal power plant is completely enclosed for safe operation, uses hydrogen gas as the cooling medium. The ventilation system including the fans and gas coolers, is self contained and completely enclosed to prevent dirt and moisture from entering the generator. The stator winding is directly cooled by demineralized water, and rotor winding are directly cooled by hydrogen. The stator core is also cooled by hydrogen. The turbine is rotated at 3000rpm by using steam. Steam enters the turbine with the pressure of 410atm. The generator produces 10MW, 11KV AC Supply and After generating

TURBO GENERATOR

Type QF-W12-2

Rated power -15MVA

Rated Power-12MW

Rated Voltage-11KV

Current-787.9Amps

Speed-3000Rpm/min

Insulation service-Classes-F/B

Stand No-GS/17064-2008

Frequency-50Hz

AC EXCITER

Type-TEL38/150-6

Power – 80KW

Frequency -150Hz

Connection – Star

Voltage - 265

Speed – 3000Rpm

Standard – GB155-2000

Current – 300Amps

Insulation Class- F

Excite current-223.8A

Powe Factor 0.8

Connection – Star

1.4. CHIMNEY

A thermal power plant chimney has important functions: To carry undesirable combustion or smoke out of the boiler.

Induced Draught Fan (ID Fan)

Make: KINLODKAR (Spectrum)

KW: 160kw

HP: 200amps

Rpm: 987 rpm

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.

Make: Crompton Greaves ltd

KW/HP: 15/20

Amps: 26amps

Rpm: 2920

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.

Make: SIEMENS

KW/HP: 110/150

Amps: 200amps

Rpm: 737rpm

1.8 Condensate Extraction Pump (CEP)

It is used to extract the condensate water from the condenser and pump it through the condensate polishing system and the LP heaters to the de-aerator feed water tank.

Make: ZHEJIANG (china)

Kw: 232

Hp: 30 amps: 41.8

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

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.

Conclusion:

Thermal power plants are goods that produce electricity. Moreover, these plants are important to customers and are presumed to have a service life of greater than twenty years. Accordingly, the reliability of a power plant is considered most important, followed by after-sales service and then economic efficiency. As demand for electrical power increases throughout the world, various plants intend to continue to strive to supply power plants that provide reliability, high performance and low price in accordance with the need of customers.

In conclusion, a thermal power plant is a complex facility designed to convert heat energy from the combustion of fossil fuels or other heat sources into electrical energy. The essential processes involved in a thermal power plant include fuel combustion, steam generation, mechanical energy conversion, electricity generation, and the management of waste heat. Key components like boilers, steam turbines, generators, and cooling systems are crucial in this energy conversion process.