

**REPORT ON 10 DAYS INTERNSHIP IN
RAYALASEEMA THERMAL POWER PLANT
ANDHRA PRADESH (APGENCO)**

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 **PEDDAMALLU JAGADEESWAR REDDY** (41140701) who carried out the **THERMAL POWER PLANT** Internship during the period June 2023.

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DECLARATION

I **PEDDAMALLU JAGADEESWAR REDDY** here by declare that the Report entitled **INTERNSHIP** done by me **AT RAYALASEEMA THERMAL POWER PLANT ANDHRA PRADESH (APGENCO)** is submitted in partial fulfilment of the requirements for the award of Bachelor of Engineering degree in ELECTRICAL AND ELECTRONICS ENGINEERING.

DATE:05-06-23 to 15-

06-23 PLACE:

ANDHRAPRADESH

A handwritten signature in blue ink, appearing to read 'Peddamallu Jagadeeswar Reddy', with a long diagonal stroke extending from the end of the signature.

**SIGNATURE OF
THE CANDIDATE**

ACKNOWLEDGEMENT

I am pleased to acknowledge My sincere thanks to the Board of Management of **SATHYABAMA** for their kind encouragement in doing this Internship project and for completing it successfully. We are grateful to them.

I convey our thanks to **Dr. N. M. Nandhita., Dean, School of Electrical and Electronics Engineering** and **Dr. S. Radhika, Head of The Department, Dept. of Electrical and Electronics Engineering** for providing us necessary support and details at the right time during the progressive reviews.

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CHAPTER 1

INTRODUCTION ABOUT THE COMPANY

RTPP, or the Rayalaseema Thermal Power Plant, is a prominent asset under the purview of the Andhra Pradesh Power Generation Corporation Limited (APGENCO). Situated in the Rayalaseema region of the Indian state of Andhra Pradesh, RTPP plays a pivotal role in meeting the growing energy demands of the region. This thermal power plant exemplifies APGENCO's commitment to reliable electricity generation and its dedication to serving the energy needs of the state.

RTPP boasts state-of-the-art technology and infrastructure, ensuring efficient and sustainable power production. It forms an integral part of APGENCO's diversified energy portfolio, which includes a range of power generation sources such as thermal, hydro, and renewable energy. The strategic location of RTPP allows it to tap into local resources effectively and contribute significantly to the energy grid.

Beyond its primary function of power generation, RTPP aligns with APGENCO's broader mission of promoting energy efficiency, environmental sustainability, and technological innovation in the energy sector. It actively engages in initiatives aimed at reducing carbon emissions, conserving resources, and advancing cleaner energy solutions.

This introduction provides a glimpse into RTPP's role as a crucial asset within APGENCO's operations, highlighting its contribution to the energy landscape of Andhra Pradesh and its ongoing efforts to provide reliable and responsible power generation for the region's development and prosperity.

WORKING OF POWER PLANT

The Rayalaseema Thermal Power Plant (RTPP) operated by the Andhra Pradesh Power Generation Corporation Limited (APGENCO) is a thermal power plant that generates electricity through the combustion of fossil fuels, typically coal. Here's an overview of the working of RTPP:

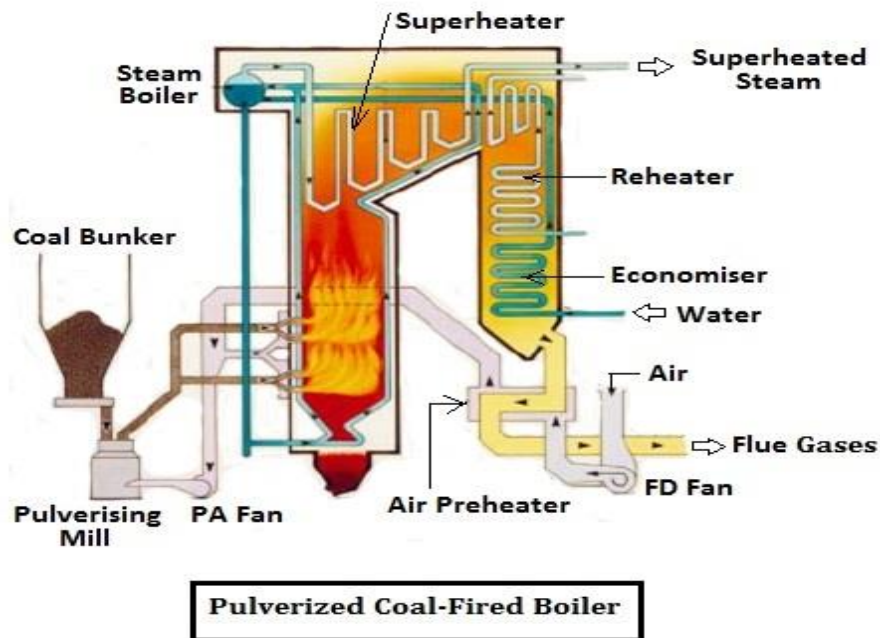
1.1 Fuel Supply: RTPP primarily uses coal as its fuel source. The coal is transported to the power plant through railways and unloaded at the coal handling plant.

1.2 Coal Preparation: Fuel Supply The coal undergoes various processes in the coal handling plant, in Fuel Supply clouding crushing, screening, and blending. This prepares the coal for combustion by ensuring uniform quality and size.



1.2.1 Combustion: The pulverized coal is then fed into the boiler furnace, where it is burned at high temperatures. The combustion process releases a significant amount of heat energy.

1.3 Boiler: The heat generated by burning coal is used to convert water into steam. RTPP typically employs a boiler system, which contains water-filled tubes. As the coal burns, it heats the water, turning it into high-pressure steam.



1.4 Steam Turbine: The high-pressure steam is directed into a steam turbine. The steam's pressure causes the turbine blades to spin. As the steam expands and loses pressure, it releases its energy, which is converted into mechanical energy as the turbine rotates.



1.5 Electric Generator: The steam turbine is connected to an electric generator. As the turbine rotates, it drives the generator's rotor, creating an electromagnetic field that induces an electric current in the generator's stator windings.

1.6 Electricity Generation: The electric current produced by the generator is in alternating current (AC) form. It is then converted into high voltage AC and sent to the transformer yard for voltage transformation and transmission.

1.7 Transmission and Distribution: electricity generated at RTPP is transmitted at high voltages through power Transmission and Distribution: The lines to substations. These substations lower the voltage and distribute the electricity to homes, businesses, and industries across the region.

1.8 Environmental Controls: RTPP also incorporates environmental control measures to reduce emissions of pollutants like sulfur dioxide, nitrogen oxides, and particulate matter. These measures typically include the use of scrubbers, electrostatic precipitators, and other technologies to minimize environmental impacts.

1.9 Monitoring and Maintenance: RTPP operates around the clock and requires regular monitoring, maintenance, and inspection to ensure its safe and efficient operation. Skilled personnel are responsible for these tasks to prevent downtime and maintain reliability.

In summary, RTPP operates as a conventional thermal power plant, where the energy stored in coal is converted into electricity through a series of processes involving combustion, steam generation, and mechanical-electrical conversion. It plays a crucial role in meeting the electricity needs of the region served by APGENCO.

CHAPTER 2

NATURE OF WORK DONE

The nature of work done in this power plant Stage-3 is power generation using coal. I have observed is that how the turbines works and operation of relays connection of relays types of relays and I observed that the cooling towers and operation of cooling towers and how to maintain the equipment with safe operation and what safety procedures should be taken while entering into the plant uses of relays circuit breakers, transformers and gaining the knowledge about the input coal capacity and output and observing the overall power plant.



- Relay's connection setup



- Over all View of Power Plant

CHAPTER 3

3. METHODS AND PROCESSES

The Rayalaseema Thermal Power Plant (RTPP) operated by the Andhra Pradesh Power Generation Corporation Limited (APGENCO) follows a set of methods and processes to efficiently generate electricity from thermal sources. Here's an overview of the key methods and processes involved:

3.1 Coal Handling and Preparation:

Fuel Supply: RTPP primarily uses coal as fuel. Coal is transported to the power plant via railways and unloaded at the coal handling plant.

Coal Preparation: The coal undergoes various processes, including crushing, screening, and blending, to ensure uniform quality and size.

3.2 Combustion Process:

Boiler: The prepared coal is fed into the boiler, where it is burned at high temperatures. The combustion process generates a significant amount of heat energy.

Heat Recovery: Heat generated from burning coal is used to convert water into high-pressure steam in the boiler.

3.3 Steam Generation and Turbine Operation:

Steam Turbine: High-pressure steam from the boiler is directed into a steam turbine.

Turbine Operation: Steam pressure causes the turbine blades to rotate, converting steam's energy into mechanical energy as the turbine spins.

3.4 Electricity Generation:

Generator: The steam turbine is connected to an electric generator. As the turbine rotates, it drives the generator's rotor, generating electricity through electromagnetic induction.

3.5 Transformation and Transmission:

Transformer Yard: The electricity produced is converted into high voltage AC (alternating current) and sent to the transformer yard for voltage transformation.

Transmission: High-voltage electricity is transmitted through power lines to substations, where voltage is lowered and distributed for end-users.

3.6 Environmental Controls: RTPP employs environmental control measures to reduce emissions and comply with environmental regulations. These include:

3.7 Flue Gas Desulfurization (FGD): Removes sulphur dioxide (SO₂) from exhaust gases.

3.8 Electrostatic Precipitators (ESP): Collects particulate matter from flue gases.

Selective Catalytic Reduction (SCR): Reduces nitrogen oxide (NO_x) emissions.

Ash Handling Systems: Manages and disposes of ash generated during combustion.



3.9 Water Treatment:

RTPP requires a consistent supply of cooling water for its operations. Water is sourced, treated, and circulated to prevent scaling and corrosion in the boiler and condenser.

Monitoring and Control: Advanced control systems and monitoring equipment are used to maintain optimal operating conditions, efficiency, and safety.

Regular inspections and maintenance activities are conducted to ensure the plant's reliability.

Safety Protocols: RTPP adheres to strict safety protocols to prevent accidents and ensure the well-being of its employees.

Waste Management: Waste generated during the coal handling process and ash from combustion are managed and disposed of following environmental guidelines.

Efficiency Improvement: Ongoing efforts to improve plant efficiency, reduce emissions, and adopt cleaner technologies are essential aspects of RTPP's operations.

In summary, RTPP employs a series of well-defined methods and processes to efficiently generate electricity from thermal sources while adhering to environmental regulations and safety standards. Continuous maintenance, monitoring, and modernization efforts are integral to its smooth and sustainable operation.



CHAPTER 4

4.KNOWLEDGE AND EXPERIENCE:

- Gained knowledge about the power plant.
- About the maintenance of equipment's
- Working of Relay's and cooling towers.
- How to connect the Relay's.
- Study about Relays and different types of Relays.
- Studied circuit breakers, their working & and different types of circuit breakers.
- Studied about the chimney.

4.1 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 through 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

