



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME)

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

## DEPARTMENT OF MECHANICAL ENGINEERING

### GUEST LECTURE REPORT ON THERMAL POWER GENERATION

Event Type: **WORKSHOP**

Date / Duration: 12<sup>th</sup> December, 2022. 10.50 AM to 1.00 PM

Resource Persons: **Mr.S.Anand, General Manager (O&M), GENTING LANCO Power (India) Pvt.Ltd.**

#### **Profile:**

S. Anand is currently working as General Manager with Genting Energy the Malaysia based multinational Company. He was the General Manager at the 1476 MW Capacity Combined Cycle Power Plant near Vijayawada for 10 years. He has over 30 years' experience in Operation, Maintenance & Commissioning of Power Plants and worked in various capacities starting as a Graduate Engineer Trainee. He is also a BEE certified Energy Auditor and also has a Diploma in Industrial Safety.

Mr. Anand completed his B.Tech in Electrical & Electronics Engineering from Calicut University in the Year 1990 and completed 1 year training course in Operation & Maintenance of Thermal Power Plants from Power Engineers Training Society(currently called National Power Training Institute). He has undergone various trainings in Power Plant Operation at U.K, Malaysia & India.

Mr.Anand started his career in PowerPlants in the year 1991 and worked in mostly Thermal Power Plants. Currently he also provides Technical support to a 91.8 MW Wind Turbine farm.

This presentation will give insight on Power Generation in a Thermal Power Plant.



**Name of the Coordinators:**

1. Dr. P.Ravindra Kumar, Professor

**Audience:** Mechanical & Electrical Engineering 2<sup>nd</sup> Year Students

**Total Number of Participants:** 140

**Objective of the Event:**

The students are required to update the knowledge of mechanical and electrical engineering concepts and its usage in Industries on their domain. Mechanical engineers work in a wide range of industries and variable skills are required. The workshop aims at providing an opportunity to exchange the knowledge among students on thermal power generation and its effect on economics of power generation in India. This workshop also covers the scope for electrical engineering concepts in power industry.

**Topics covered:**

1) Main components of Power system – Generation, Transmission & Distribution

2) Different types of Power Generation-

- Thermal Power Stations
- Hydro Electric Power Stations
- Combined Cycle Power Plants
- Nuclear Power Plants
- Renewable (Biomass, Wind Turbines, Solar...)
- Co-generation Plants

3) Gas Turbine works on which Thermodynamic cycle – Brayton

4) Steam Turbine works on which Thermodynamic cycle – Rankine

5) Name some major equipment in a Power Plant

- Turbines – Steam and/or Gas
- Boilers (Heat Recovery Steam Generators)
- Feed Water Heaters
- Condenser
- Pumps
- Piping, Valves
- Compressors
- Generators
- Transformers
- Associated Electrical and Controls

6) Process of Power Generation in a CCPP:

Compressor draws air from atmosphere and discharges into combustion chamber at higher pressure. Fuel is injected and burned in the combustion chamber.

The resultant hot air-fuel mixture is expanded through turbine blades making them spin about a shaft. The spinning turbine drives a generator that converts the spinning energy into electricity.

Heat from the gas turbine is sent to a heat recovery steam generator (HRSG). The steam generated in the HRSG is used in the steam turbine to generate electricity.

7) Mentioned some advantages of Combined Cycle Power Generation

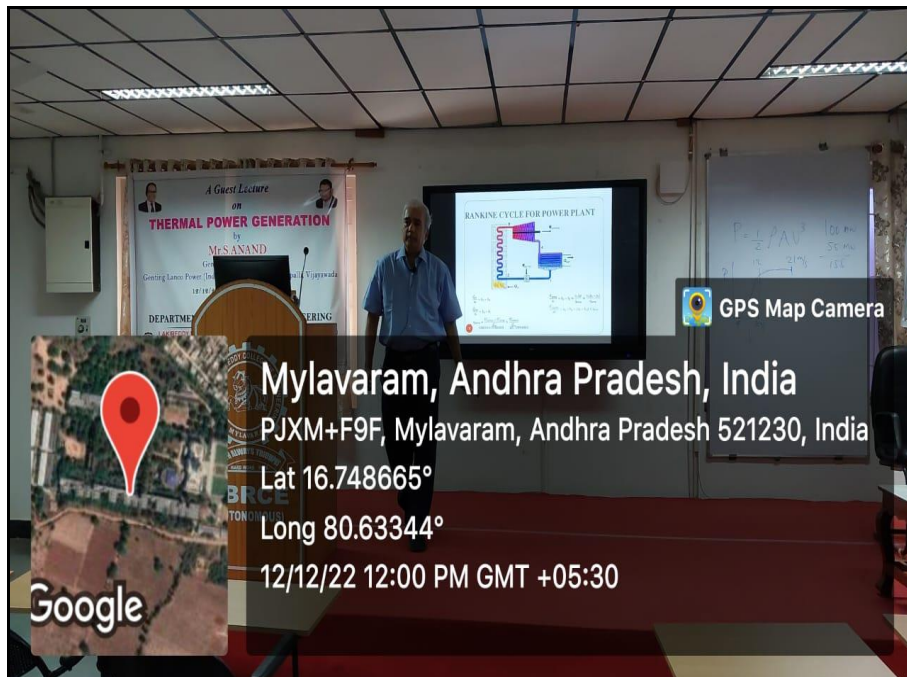
1. Higher Thermal Efficiency (56%)
2. Lower Installation Cost (Rs.5 Cr./MW)
3. Less Land Area requirement
4. Fuel Flexibility (Natural gas, HSD, Naphtha, Synthetic gas)
5. Flexible Duty Cycle
6. Shorter Installation Time (18-24 months)
7. Higher Reliability/Availability
8. Lower Operation & Maintenance Costs – less manpower requirement
9. Lower Aux. power consumption
10. Reduced Emission

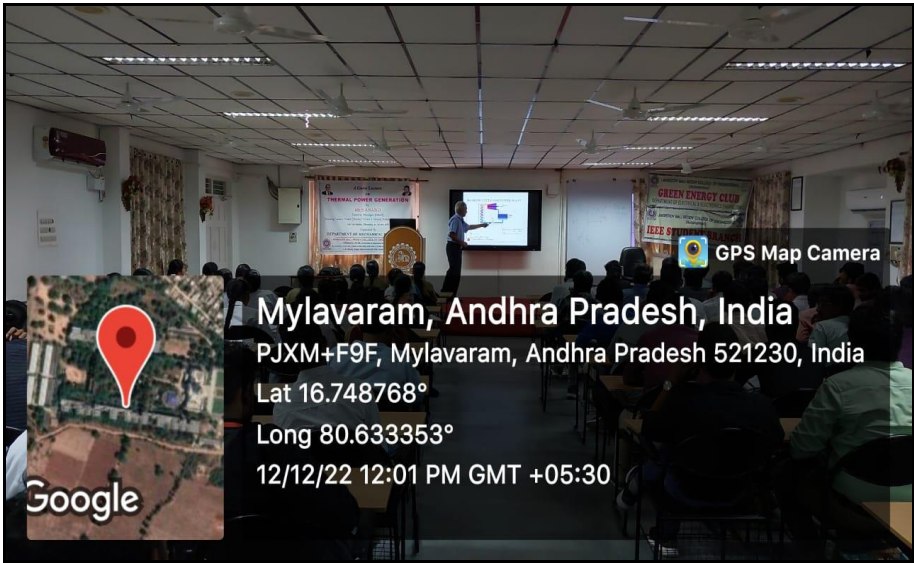
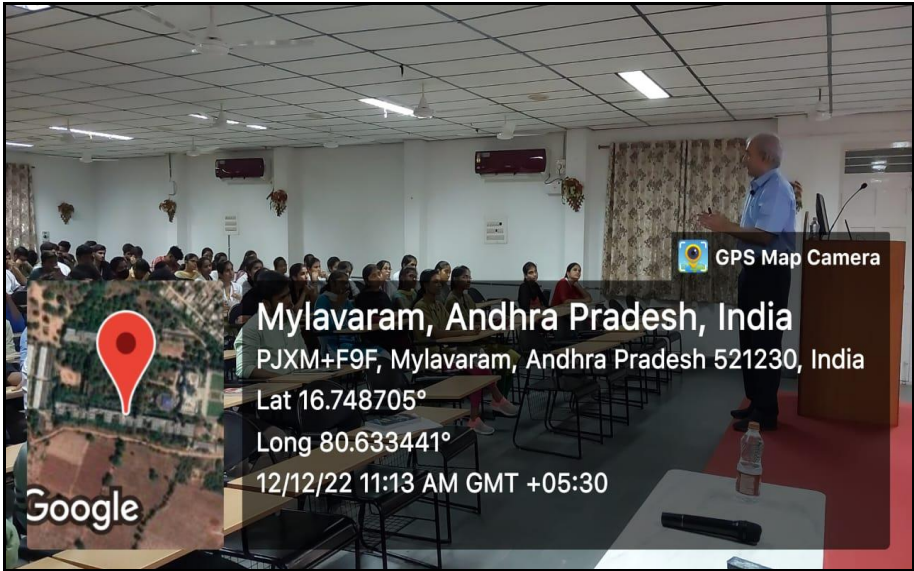
8) Performance of a Power Plant is measured on certain parameters:

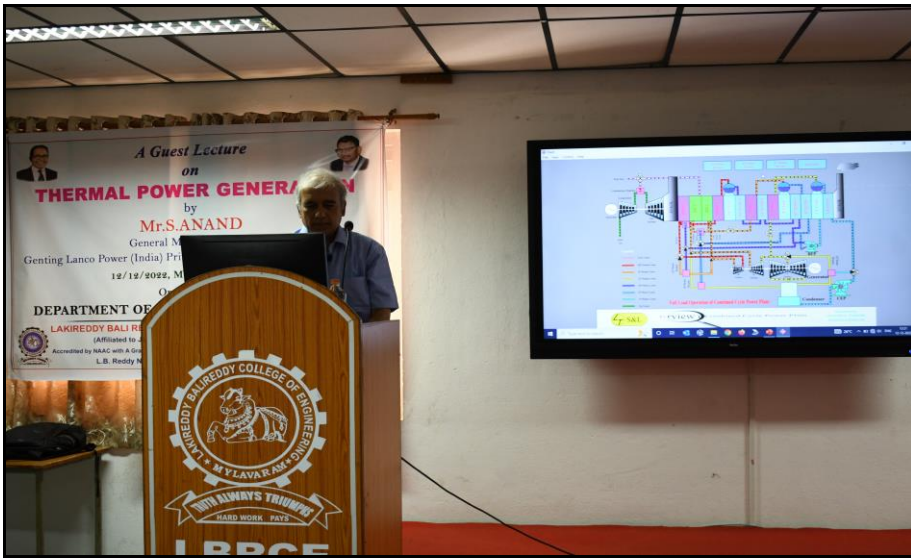
- Generation Capacity (MW)
- Efficiency (%)
- Heat Rate (Kcal/Kwh)
- Aux. Power Consumption (% of Gen.)
- Plant Load Factor (%)
- Availability (%)

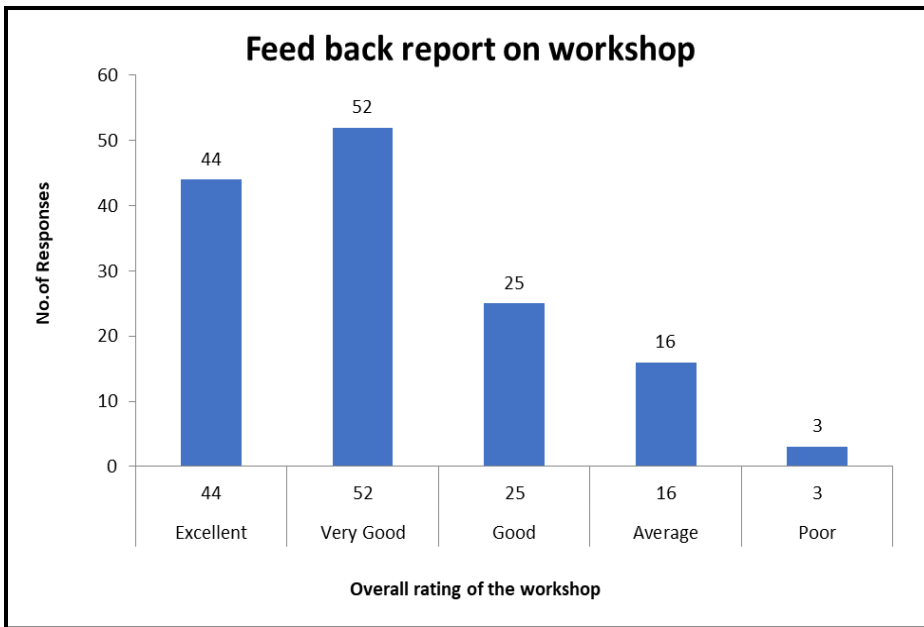
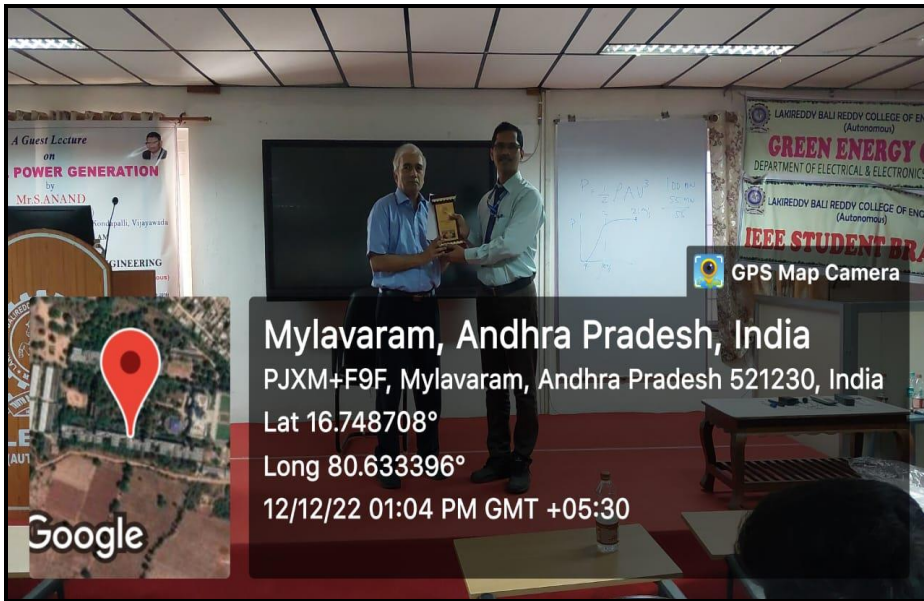
9) Examples for Non-Conventional Energy: Wind & Solar

10) Electrical connections in power plants









- Feedback Report :**
1. Very Good presentation with video and audio visuals.
  2. Solar power project workshops are required.

HEAD  
 Dept. of Mechanical Engineering  
 LAKIREDDY BALI REDDY COLLEGE OF ENGG  
 MYLAVARAM - 521 230, Krishna Dt, A.P.

**Hod Signature with stamp**