

# Investigation of the Ways to Improve the Performance of a Power Plant

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*Abstract- Nowadays many companies are interested to improve their production system. It has become important in globalize and competitive market for the survival. The companies are looking to their production systems in the different direction to get the competitive advantages. But the most important is to find out the problem of the production system to make improvements. The evaluation of power plant performance is one of the most important tasks at any power station. Without its availability records, the plant staff cannot determine ways to improve performance of the equipment and make the plant a profit-centre for the company. The causes of unavailability must be thoroughly analyzed to identify the areas for performance improvement. The major portion of the coal available in India is of low quality, high ash content and low calorific value. The traditional grate fuel firing system have got limitation and are techno economically un viable to meet the challenges of the future. Fluidized bed combustion has emerged as a viable alternative and has significant advantages over conventional firing system and offers multiple benefits and compact boiler design, fuel flexibility, higher combustion efficiency and reduced emission of noxious pollutants such as Sox and Knox. The fuels burnt in these include coal, washer rejects, rice husk, biogases and other agriculture wastes. The Fluidized Bed Boiler (FBB) has a wide capacity range-0.5t/hr to over 100t/hr. In this Paper thesis, a part of the production system of a company is studied to find the problems of the production system to make the improvements and to recommend some points to the company for the achievements of its goals. For this purpose, the overall equipment effectiveness calculations have been used to see the current situation of the production system of the company. These calculations of the O.E.E. of the different production work stations make the clear picture of the problems. It calculates the availability of the production system which shows that maintenance system's effectiveness.*

**Keywords:** Production, Performance, Fluidized Bed Chamber, Effectiveness.

## I. INTRODUCTION

The global power sector facing many issues but most fundamental challenge is demand of energy. Energy is most important things for industrial purpose, human's daily uses. And agriculture purpose so it's having an important role in the world. Basically energy generated by five major type-

- 1) Hydro power
- 2) Thermal power
- 3) Solar Energy,

- 4) Nuclear Power.
- 5) Wind energy.

All these type of Energy play different role, different efficiency and cost. Hydro Power not has good efficiency and it is used limited areas where water source's is available. Nuclear power generation plant have is not be easy to established because it is high cost, controlling and its material not easily available. Thermal (coal) Energy is the best option for generating power by high efficiency, good availability and combustion. In the world, wastage does not used in a proper way according to his quality. Some developed countries utilized our wastage to reproducing product's or other things; hence the agriculture wastage is good for using generation of energy, like -Rice husk, Biomass, Bagas, soya husk and etc.

The challenges vary from region to region. While rapidly growing economies in the developing world are hungry for practically any power to support economic growth and provide basic modern energy services to their people, industrialized countries are focusing on ensuring secure electricity supplies at competitive prices in an environmentally acceptable way. Coal and Biomass material is good combination for generating Energy, because coal and biomass material have high efficiency and good steam generating to power. These type of materials are long time generating energy materials because availabilities of coal is good in India and all countries totally depended to agriculture firms. Solar Energy and wind energy another best option but at present time's they are not used in broad areas in India.

## II. FAILURE NOTICE IN OPERATION & LOSSES

**FAILURES-** Some failures and losses directly affected of a power plant. These losses and failures are point out by observation methods and data collection techniques. These types of failures

- 1) Caustic Attack
- 2) Oxygen Fitting:
- 3) Hydrogen Damage:
- 4) Acid Attack:
- 5). Stress Corrosion Cracking (SSC):
- 6) Waterside Corrosion Fatigue
- 7) Super Heater Fireside Ash Corrosion:
- 8) Water Wall Fireside Corrosion
- 9) Short-term overheat:
- 10) Long-term overheat.
- 11). Dissimilar metal weld (DMW) failure:
- 12) Erosion
- 13) Mechanical fatigue.

**Losses:** By men power and machine's some losses are generated. These losses created by low maintenance system or not proper skilled worker. The losses are shown as:

**A. Down time losses****Breakdown losses: Setup and adjustment losses:****B. Speed losses Speed losses:****C. Defect or Quality losses****1) Quality defect and rework losses:****2) Yield losses****III. .RESARCH METHODOLOGY**

Research methodology is a very important and big chapter for increasing performance of a power plant. Research mythology has been given as a systematic method of gaining new knowledge and by this find out the way to reducing the error which are generated in a production system. By using research mythology decides the goals and by this selection of the process for achieving decided goals is too easy. Basically this chapter defining by some important factor these areas-

**1. Positivism and Hermeneutics**

Positivism has the roots in empirical scientific tradition. The positivist considers the complete knowledge while the hermeneutic is more understandable for the practical mind. Positivism has the belief that human being can get the knowledge in only two ways i.e. what we can sense (empirical knowledge) and what we can workout with our logical aptitude. Any one can find the fact with the help of empirical knowledge.

**2 Qualitative and Quantitative methods**

The two main ways are used in the research called as quantitative or qualitative, which will be used is based on the available information. The qualitative analysis is theoretical and less nearer to the raw data as compare to the quantitative analysis. Word or sentences are used in the qualitative method but mathematical figures are used in quantitative method. Like as the terms "less than" or "bigger than" can be used in qualitative method but the exact figures are used in the case of quantitative method. In the quantitative method, the researcher gathers the data and carefully examines it. The attempt is made to find the relations between different sets of facts. The researchers calculate and use the scientific technique to get the result. In the qualitative method, the researcher is more interested in the knowledge of people.

**3 Data collection technique**

There are two types of data which are collected for the research purpose, primary data and secondary data. Primary data mean new data. While secondary data mean the data which already exist. The methods used to collect the new data are observations, interviews and experiments. There are some problems to the use of the data. One problem is the compatibility and the other trustworthiness.

**4 Inductions and Deduction**

Induction and deduction are two different ways of making the decisions. Empirical facts are the base for the conclusions in Induction approach. It is vital to understand that inductive conclusion cannot be hundred percent accurate. This is only because of the empirical

material is the base of the conclusion. Logic is used to make the conclusions in the deduction approach.

**IV. MANAGEMENT SYSTEM**

Management is a big word, because all Industries in world and other organizations firms follow the management system. Without management nothing any firms worked properly and fall down. Management is processes in which every work done in predetermines time with the help of predefine or selected process. Thermal power station will become important as hydro resources are inadequate. The concept of a modern thermal station is that it should be situated at such a place that the basic requirement of fuel, water and land should be satisfied, Basically thermal station are two types-

1. Pit head stations.
2. Load demand station.

Pit head stations are those which are near to the source of fuel and load demand station are those which are near to the load currents. The thermal station is like any other industry. The basic requirements are-

1. Supply of raw material as competitive cost. Coal and oil are the raw material required for thermal power plant.
2. Access to the market for its products.
3. Lab ours force of the size and quantity required.
4. Means of disposal of any trade off lines that is by products.

The other factor to be considered for selecting the site is:

1. Load demand.
2. Land.
3. Site requirement.
4. Access for constructions.
5. Transmission lines.
6. Clearances.

**V.CONCLUSION**

We take pleasure in studying of Fluid Pac steam Boiler. Fluid Pac Boiler with its high performance and automatic modern styling confirms to the most exacting standards of safety, performance and efficiency. Assured of satisfactory performance for the Fluid Pac Boiler, which is manufactured latest engineering techniques, modern production equipments. To avoid failure the product should be designed in correct dimensions. The failure of tubes can be reduced by using some of the composite material, which is capable of with standing from higher loads, temperature and pressure. The maintenance is the parts of the production system. Every system needs maintenance for attaining its best position for the production otherwise the problems of quality, short stops and failures become more and more which lead the company towards the losses. The maintenance has the direct contact with the production system to keep the production machines as much as possible to the best conditions to minimize the disturbance in the production

and as a result the production will be more with high quality

Thus the O.E.E. is the tool for the company to assess the current situation and to start to make the improvements from particular point. The maintenance is the sporting activity which helps to make the improvements in the current condition and to improve the value of O.E.E.

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