

Performance Evaluation of Thermal Utility Equipment

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ABSTRACT: In this project we do the performance evaluation of thermal utility equipment/application. As we know the in power plant/industry there are number of equipment like compressor,turbine,boiler.water pump, cooling tower, heat exchanger,preheater,superheater so on. As this equipment are mechanical there should be loss of energy, more fuel consumption,lead to environment pollution. Leakages due to improper flow rate. In order to overcome this problem we would like to do the performance analysis of thermal utility equipment. This can be done application new technique.data collection, analysis of performance, market survey.

1. INTRODUCTION

Considering the vast potential of energy savings and energy efficiency in various sectors of industries, the Government of India enacted the Energy conservation Act, 2001. The Act provides for a legal framework, Institutional arrangement and a regulatory mechanism at the Central and State level to embark upon energy efficiency drive in the country. Under the provisions of the Act, Bureau of Energy Efficiency has been established with effect from 1st March 2002 by merging erstwhile Energy Management Centre of Ministry of Power. The Bureau would be responsible for implementation of policy, program and coordination of implementation of energy conservation activities. Important features of the Energy conservation Act. The activities undertaken in the above provisions focus on energy intensive industries and commercial sector through establishment of energy management system, capacity building of energy professionals, implementation of performance of evaluation of thermal utility, establishments of specific energy consumption norms .

2. PROBLEM IDENTIFICATION

Generally an efficiency of plant decreases due to following reasons

1. Load variation
2. Base line preparation
3. Measurement error

3. AIM & OBJECTIVE

Aim

To do the Performance evaluation of each equipment separately.

Objectives

1. To understand operation philosophy of plant in details.
2. To take details of measurements of each require parameter.
3. To take details of Measures.

4. METHODOLOGY

A. INSPECTION AND DATA COLLECTION

We would like to do inspection of overall plant.In that one we would like to find out the capacity of plant, actual consumption of plant, efficiency of plant and other factor that are require to inspected. Data collection is require for each parameter. For example Collect the design specification of water pumps and motors. The following Table represents the list of specifications for the same.

TABLE : SPECIFICATIONS OF PUMPS & MOTORS

Particulars
ID code
Application

Particulars
Make
Type of the pump
Model
Fluid to be pumped
Density of the fluid
No of stages
Rated suction pressure, kg/cm ²
Rated discharge pressure, kg/cm ²
Rated total pressure, kg/cm ²
Rated flow, m ³ /h
Rated efficiency, %
Input kW of the pump
Speed of the pump
Year of commissioning
Motor Kw
Motor make
Motor voltage
Rated current of motor
Motor frame
Motor rpm
Rated motor efficiency
Minimum recirculation required
Type of flow control system installed

- Collect the above information for all pumps (Above. rating) in the cooling water circuit
- Collect the Performance Characteristics curves of all pumps
- Compile design, P. G. Test, previous best and last energy audit value with respect to cooling tower and cooling water system along with the condensers.
- If the pumps are operated in parallel, then it is advised to collect the performance curves for the parallel operation of the pumps.
- Schematic diagram of Water pumping network (which depict the source, pumps in operation & stand by, line sizes and users).
- Water and pressure equipments at the users as per the design requirements.
- Brief description of the system, in which pumps are used (for example, if pumps are used for supplying water to condenser, then add a brief write up about the cooling water system).

B.MEASUREMENT

- In this section I would like to measure the performance of existing devices by using measuring instrument. For that I require some basic measuring instrument. Assume all instrument are available in existing plant. Some measuring instrument are “pressure gauge, flue gas analyser, ultrasonic flow meter,
- For example water Pump operating parameters to be monitored for each pump
 - Discharge
 - Head (suction & discharge)
 - Valve position
 - Temperature
 - Load variation
 - Simultaneous power parameters of pumps
 - Pumps operating hours and operating schedule
 - Pressure drop in the system (between discharge and user point)
 - Pressure drop and temperatures across the users (heat exchangers, condensers, etc)
 - Pump /Motor speed
 - Actual discharge pressure and required / prevailing pressure at the user end User area pressure of operation and requirement

C. TEST

After measuring the performance of require instrument, we will go for conducting a test. For example, in order to check the quality of steam /flue gas, the test should conducted to ensure that it will not have any impurity.

D. ANALYSIS

Analysis leads to perform a calculation on data collection.

E. MARKET SURVEY

Market survey lead to utilization of new technique over a exist one. Also it lead to utilization of any alternative method over a existing method.

F. COMPARISON

Compare the difference between the existing value and data collected from market survey. State the correction that require.

G. TANGIBAL & INTANGIBAL BENEFITS

Tangibal benefits: Tangibal benefits are possible saving of energy conserve.

Intangibal benefits: Intangibal benefits are saving of money, environment pollution free, ecofriendly

REFERENCES

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3. [www. Energyconservation.co.in](http://www.Energyconservation.co.in)