To Improve The Boiler Efficiency And Waste Heat Recovery In Sugar Based Co-Generation Plant

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Abstract- *This project includes those boilers which either use the waste heat in gases and ash coming out of boiler at high temperature or use the waste as a fuel in the incinerators The boiler which use industrial dirty gases for power generation are not included as it is a subject of the own. In present plant co-generation is the combined production of two forms of useful energy from the same fuel. In industry, two form and required useful energy are thermal and electrical, co-generation systems are sequential in nature because the exhaust from producing one form of energy is used as in put for producing the next form of energy. Energy conservation is reduce of energy per unit of product, changing from a scale fuel to a more readily available fuel energy. Conservation is essential and economical to prolong our existing resources and indirectly. The burning of bagasse is very much hampered due to presence of ash, because, it becomes soft and sticky in the furnaceThe temperature of gas leaving the furnace and entering into the convection surfaces must be low enough to prevent to fouling. This temperature is dictated by the ash fusion temperature which is dependent on the content of alkalies and have direct bearing on slagging tendencies. Therefore, these ingredients should be kept at minimum at atmospheric air before use.*

Keywords- bolier, turbine, co-generation plant,bagasse, etc..

I. INTRODUCTION

1.1 GENERAL INTRODUCTION

Vitalitymight be characterized as the limit with regards to energetic movement. Vitality is available in nature in different structures. The different types of vitality utilized by humankind for various purposes comprise for lighting, warming, cooking, running hardware, transportation and for different applications. It is significant asset for all country building exercises, which keep the nation's wheels of advance moving at a quickened pace. Without vitality the exercises of humanity will reach a stop and the life on the earth end up inconceivable. Vitality might be gotten from coal, oil, gas, biofuels, for example, wood, vegetable oil, baggase and so forth.

India stand first in unadulterated sweetener creation speaking to 10% of the world age. In any case, till starting late the finally of bagasse delivered has been obliged to power and steam age for prisoner use in the sugar plants.

This has brought about the over all change in the hardware plan and proficiency levels, bringing about lesser toxins. With the establishment of contamination control types of gear in carbon dioxide and other lethal gases are wiped out. The emanation of carbon dioxide and other dangerous gases like sulfur oxides and nitrogen oxide are a risk to the supportability of individuals. Carbon dioxide is a green house gas that is one of the significant supporters of an Earth-wide temperature boost. Alternate advantages of co-age are to be specific.

- Contribution to power generation.
- Savings / conservation of fossil fuels.
- Improved profitability to the sugar factory.

The most encouraging biomass power producing fuel is baggase. Baggase is the strong sinewy material. Which leaves the last will after extraction of juice. The fuel i.e. baggasse is promptly accessible at site, along these lines, constraining the vehicle cost to the degree of interior taking care of amid pounding season for expanded power age with baggasse purchased from neighboring areas, the fuel transportation cost-would add to the inputs, but to the limited extent.

Keeping above contemplations in see, the opportunity has already come and gone to concentrate towards vitality preservation. Preserving vitality is a national need wherein each person at whatever level can take an interest and help. By vitality preservation, we can spare 10 to 30% of vitality through basic activity. If there should be an occurrence of businesses, for example, control plants the vitality$ protection is must. In this examination our consideration is

centered around vitality inspecting. Vitality review serves to recognize all the vitality streams into an office and measure vitality use as indicated by discrete capacity. Vitality review is an indispensable connection in the whole vitality administration chain. The vitality chief is proposing game-plan and assessing their outcomes, required a point by point data base from which to work. The data base is delivered by vitality review an indispensable component in the general vitality administration program. The general program incorporates other administrative and operational exercises and obligations. In any case, the review procedure is the most critical piece of the program and is fundamental to the program's usage. The term review means an investigation of the info and yield parameters to assess inconsistencies assuming any. Vitality review additionally intends to distinguishing, assessing and investigating different types of vitality info and yield. Be that as it may, the extent of the vitality review does not end here. With the assistance this data, potential territories of vitality preservations are distinguished in order to survey. The particular vitality input both as far as cost and additionally outright amount.

1.2 SCOPE OF THE PROJECT

- Detailed study of layout and processes in the plant.
- Detailed study of equipments used in the plant.
- Performance evaluation of boiler and turbine in the plant.
- Energy uses in the plant.

1.3 THE PROCESS AND EQUIPMENT

Sugar$plants are chiefly contributing applicationsfor co-age, since baggasse, one of the waste items from the factory, is accessible nearly at no cost as sustain stock to fuel the steam generator's of the co-gen plant. However to date sugar plants had constrained power and warmth age to take care of just their own particular demand and henceforth their current vitality potential has not been abused.The proposed co-gen program goes for essentially enhancing the vitality effectiveness of the sugar manufacturing plant, empowering the plant to send out the surplus energy to the state, matrix. Vitality productivity and the fare of energy to the framework is influenced practical by the work of high weight and temperature to steam cycles and by the use of the surplus bagasse to deliver more steam and subsequently greater power. For example, process called to most extreme power design should need to utilize straight gathering or extraction-cum consolidating turbine for control age, accommodating the extension and buildup of the surplus steam utilized as a part of the cycle.

II. EQUIPMENTS

Mills.
Boiler.
Vacuum system.
Spray coling.
Moving blades.

Figure 1:

III. APPLICATIONS OF BOILER AND CO-GENERATION PLANT, TURBINE

1. Boliers Are Wadely Used In Sugar Industries To Provide Energy.
2. Boiler is used to burn the bagass.
3. CHP is used in utility sector, industrial and commercial sector.
4. turbin is used in power generation.

IV. CASE STUDY

Improvement in efficiency of boiler

In the present studyIt can be seen that the operation of boiler efficiency was 52. 54% be fore over haul and 58. 98% after overhaul against a design value 60.00% to losses due to moisture in air, moisture in fuel and moisture generated from H_2 is fuel uncontrollable.The dry stack loss was 8.74% before overhaul and 7.06% after overhaul against 3.67% which can be controlled by reducing the excess air supplied to the combustion.The losses due to unbends in fly ash and bottom ash can be controlled by to controlling the coarse from bagasse mill.

Particular's	Before overhaul	After overhaul
Dry stack loss	8.74	7.06
Wet stack loss	19.55	29.02
Combustibles in ash loss	1.415	1.663
Radiation and unaccounted losses	8.15	0.81
Sensible heat in water vapour	9.31	2.1
Moisture in combustibles air loss	0.23	0.025
Sensible heat loss of bottom ash	0.028	0.27
Sensible heat loss of fly as	0.04	0.073
Total loss	47.46	41.02
Boiler efficiency	52.52%	58.98%

Table:-Efficiency evaluation of boiler: before and after overhaul.

Particular's	Before overhaul	After overhaul
Total heat flow to turbine T/hr	34717.22	35994.44
Turbine heat rate kg/ kwh	9457.488	9027.40
Turbine heat rate k cm/ kwh	2259.28	2156.54
Turbine efficiency %	39.07	39.13

Table :- Result of turbine efficiency test.

V. CONCLUSIONS

In this task, an endeavor is made to gather thorough information, count of kettle and turbine proficiency for cogeneration, before upgrade and after update. From the perceptions and figuring performed in past part the accompanying conclusions are drawn.The kettle productivity has expanded from 52. 54% to 58.98% the significant reasons from having lower productivity is low quality of bagasse and air spillages.Efficiency of the kettle is increments by 6.44 after redesign.It is evaluated that, expanding to kettle effectiveness by 6.44% will spare a yearly bagasse of 21,900 tons.By expanding the kettle proficiency by 6.44 will spare a yearly cost of 76.65 lakhsThe turbine under went capital overhaul and has improved in performance from 39.07% to 39.13%.Efficiency of the turbine is expanded by 0.06% after upgrade, will spare a yearly cost of 4,60000 lakh.

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