Design Modification Of Coal Transport System To Steam Boiler For Manufacturing Of Construction AAC Block

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Abstract -Boiler is an essential component for industry. Performance of boiler is very much concerned now a day because of energy crises. Multi nozzle system is continuously gaining importance due to its ability to spread the coal evenly at combustion chamber. Boilers is a most useful device for any industry for process and production.

There are basically two methods to calculate the efficiency of boiler, direct method and indirect method. Both the methods give different values as direct method does not consider any losses whereas indirect method gives the result by calculating all the losses. This paper also gives the description of calculation of efficiency for FBC boiler.

*Key Words***:** Coal , Coal transport system, Coal spreader, etc.

1.INTRODUCTION

Pulverized Coal is not sprayed in desired furnace area and coal place on bedlayer by layer and coal wastage is increase and heat is not gain efficient asper required.Due to less amount of coal burning the boiler Efficiency is decreased anddesired Temperature and Pressure is not achieve so this types problemmodify.

If the coal is feed manually then the wastage of coal is high and cost of coal is increase, auto feed system is very efficient and high rate of steam production at optimum cost .so modify the automatic coal feed system for the furnace and get best solution of above problem. After collecting the actual data and dimension of furnace modify the coal spreading system, nozzle position, coal spreader stocker.

2. LITERATUREREVIEW

To Calculate and improvement in the efficiency of FBC boiler

Boiler efficiency is very necessary to calculate because from this the entireperformance of the boiler can be known. It can be seen indirect method givesbetter efficiency. Byindirect method efficiency can be calculated in a detailedmanner.Therefore this method is very much useful to calculate boiler efficiencybecause from this method the entire losses can be known. The proposed methodcan be effectively and efficiently used for all FBC boilers regardless of thecapacity of the boiler.

3. Working and NewThings

We are change nozzle design and increase the coal spray area infurnace bed. By the use of multi nozzle in the coal spreadingsystem we can spread the coal evenly at the combustion chamber.

Actual boiler furnace dimensions:

Combustion/furnace Bed = (Length * Width) cm2
= (218.4 * 182.8) cm2
= 39941 cm2
Allowable area for coal sprayed on furnace bed=36619.28 cm2

Total number of coal nozzle: 2

Coal sprayed area through one nozzle =(152.40 * 54.610) cm2
=8321 cm2
Coal sprayed area through both nozzle= (2 * 8321) cm2
=16642 cm2
Total coal sprayed Area Percentage (%)
= (16642*100) / (36619.28)%
= **45.44 %**

Remain Percentage: **54.56 %**(coal not sprayed).

After coal nozzle modification boiler furnace bed dimensions and coal sprayed area on furnace bed:

Combustion/furnace Bed = (Length * Width) cm2
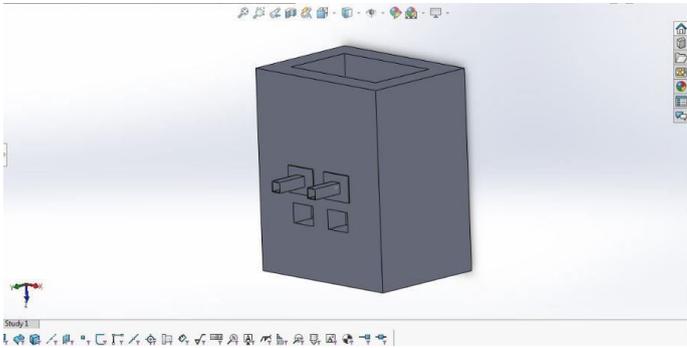= (218.4 * 182.8) cm2
= 39941 cm2

Fig -1&2: Furnace Design

Fig:-1

Allowable area for coal sprayed on furnace bed=36619.28 cm2

Total number of coal nozzle = 2

Multi coal nozzle shape = " **V**"

Total outlet of coal in furnace= 4

Total Coal sprayed area through all four nozzle outlet = 30495cm2

Coal sprayed area in percentage=83.27%

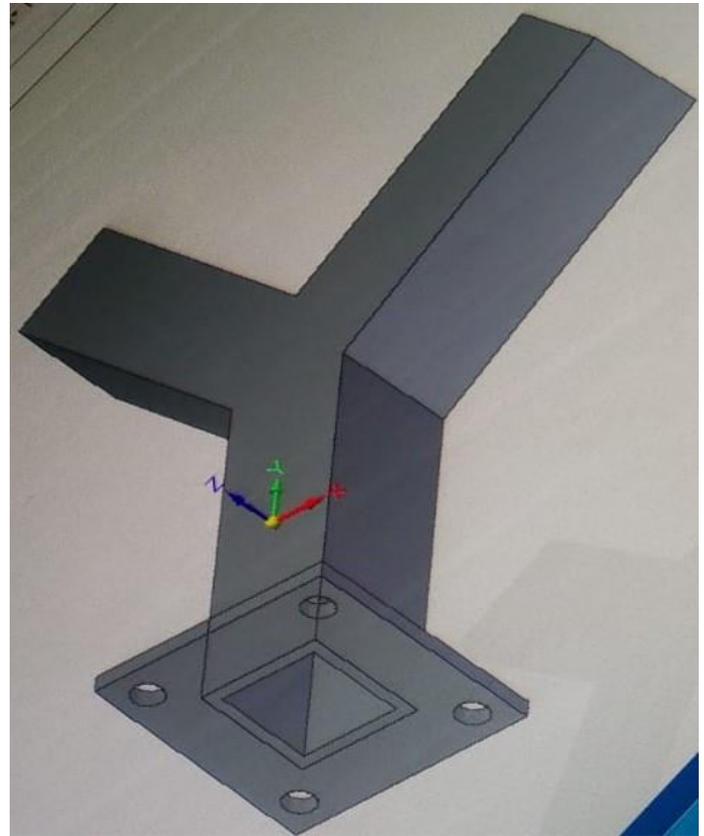After modification increase the area of coal sprayed in furnace bed in percentage:
=(After modification percentage) – (Actual boiler percentage)
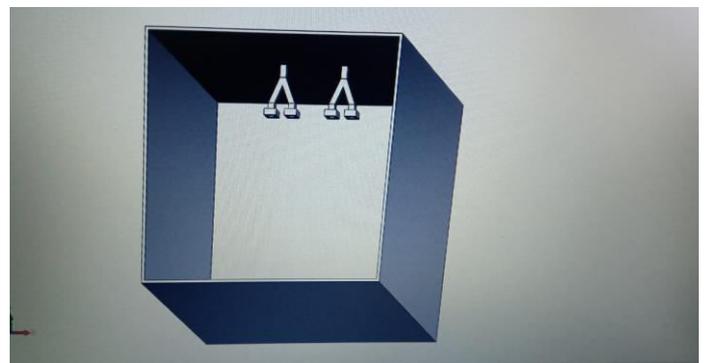=(83.27)% - (45.44)%
=37.83 %

After apply the multi nozzle system in boiler furnace total covered area is **83.27%**

4. " V " Shape Design Nozzle

"V" shaped nozzle design

Multi Nozzle Design

CONCLUSIONS:

So after modification of coal nozzle we can increase the **37.83 %** area for coal sprayed in furnace/combustion bed .

Finally total covered area of coal sprayed in boiler furnace is about **83.27%**

This is also of low cost and maintenance also low so this system is reliable for use.

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