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Issue - #1

IGEN - Thermal Power Plant Corner

Estimation of saving due to control of de super heater water spray

De- super heater water spray before using soot blower = 30 TPH
De- super heater water spray after using soot blower = 7 TPH

Heat energy absorbed in the boiler due cleanliness of water walls after using soot blower = [(30 - 7) x 1000 x 173.4] = 3988200 Kcal / Hr

Due of absorption of this heat energy, additional steam generation in the boiler = 3988200 / 822.9 = 4.85 TPH

Steam required for soot blower = 110/24 = 4.58 TPH
Therefore excess steam available in the boiler = (4.85 - 4.58) = 0.27TPH

Now there are two options -

Options - I, Reduce fuel flow to stop generation of excess in the boiler and maintain MW generation constant.

Heat energy saving = 0.27 x 1000 x 822.9 = 222183 Kcal / Hr
Fuel saving = [222183 / (0.8 x 4600)] = 60.38 Kg / Hr
Yearly fuel saving = 7000 x 60.38 = 422.63 Tons
Yearly Cost saving = Rs 1800 x 422.63 = **Rs 7,60,735.27**

Options - II, Keep fuel flow constant and allow the excess steam to rise MW generation

Additional generation due to excess steam = 0.27/3.5 = 0.77 MW
Additional revenue that can be realized annually due to higher generation = 0.77 x 1000 x 7000 x 2 = **Rs 1,07,80,000.00**

Option II should be preferred because of higher financial gain. More over fine-tuning of fuel flow for maintaining generation at constant level is not practically possible.

Investment required for soot blower = Rs 4,00,00,000.00
Simple pay back period = 4,00,00,000.00 / 1,07,80,000.00 = 3.7 Years

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