A TIP FOR ENERGY CONSERVATION

Recently we had an opportunity to be in a paper mill on a proposal for a new Captive power plant. The customer had explained his difficulties that due to recession the project is shelved. The subject of discussions had drifted to the excess power consumption in their boiler house. The customer said that their power consumption is more than that of a similar capacity plant elsewhere. The boiler is a Husk fired fluidized bed combustion boiler with underbed firing system supplied by a south based boiler manufacturer. The boiler specifications are 12 TPH, 10.5 Kg/Cm^2, saturated steam.

When asked about the steam demand of the plant, the plant manager informed that the a maximum of 5 TPH would be the steam demand.. We reacted immediately that the oversized equipment would draw more power as the dampers kill the energy. The customer discussed about the means of reducing the power consumption.

We studied the draft equipment layout. We had proposed to install a smaller FD fan and Primary air fan. The customer did not want to take a risk. The customer desired that any modification shall be done without disturbing the existing draft equipment. Then it was decided to add the right size FD and PA fans. The locations of the fans were finalized in such a way that with minimum down time, the new Fans could be connected to the existing system. The ID fan was left as it is. We suggested that a variable frequency drive is installed for ID fan. Incidentally by the reduction of speed of the impeller, the life of the fan impeller would also increase. The power consumption figures were calculated to be half of the present load. The payback was very attractive. The customer went ahead with the proposal for new draft equipment and variable speed drive.

The following are the facts and figures of energy saved:

BEFORE MODIFICATION		**AFTER MODIFICATION**	
Total Installed Power (KW)	**73.0 KW**	**Total Installed Power (KW)**	**42.2 KW**
Total power consumed /Day	1,752 KW	Total Power consumed /Day	1,012.8 KW
Total power consumed /Year	5,60,640 KW	Total power consumed /Year	3,24,096 KW
Total Power Cost per Year	5,60,640 X 4.00	Total Power Cost per Year	3,24,096 X 4.00
	RS. 22,42.560.00		**RS. 12,96,384.00**
Net Saving per Year	**RS. 22,42,560.00 - RS. 12,96,384.00 = RS. 9,46,176.00**		
NET SAVING PER MONTH	**RS. 9,46,176.00 DIVIDED BY 12 MONTH = RS. 78,848.00**		

MODIFICATION COST

FD Fan with Motor	**:**	Rs. 1,65,500.00
PA Fan with Motor	**:**	Rs. 90,000.00
AC Variable Speed Drive for ID Fan	**:**	Rs. 2,30,000.00
Ducting for FD and PA Fan	**:**	Rs. 65,000.00
Erection cost for above Works	**:**	Rs. 15,000.00
Total	**:**	**Rs. 5,65,500.00**
18% Interest for Investment	**:**	**Rs. 1,01,790.00**
Total Expenditure	**:**	**Rs. 6,67,290.00**
Therefore Feed Back Period	**:**	**Rs. 6,67,290.00 / Rs. 78,848.00 = 8.46 Months**

If you are interested to do similar modification in your boiler to save energy, please do not hesitate to write to us for permanent solution & suggestions. Fill in the enclosed data sheet if you need our assistance.

BOILER ENERGY SAVING DATA SHEET **ANNEXURE - I**					
Company Name and Address		Contact Persons		Phone Nos.	
Make of Boiler		Design steam Temp.		Deg C	
Design Boiler Capacity	Kg/Hr	Present Steam Capacity		Kg/Hr	
Design boiler Pressure	Kg/Cm^2	Present Steam Pressure		Kg/Cm^2	
No of compartments design		No of Compartments in operation			

Fuel Fired				
Fuel Firing rate				
Cost of fuel per ton				
Cost of power / unit				
Type of furnace				

FAN PARAMETERS							
ID FAN		**FD FAN**		**PA FAN**		**SA FAN**	
Flow		Flow		Flow		Flow	
Pressure		Pressure		Pressure		Pressure	
Temp.		Temp.		Temp.		Temp.	
Motor		Motor		Motor		Motor	
Speed		Speed		Speed		Speed	
Orientation		Orientation		Orientation		Orientation	
Drive Arrgt.		Drive Arrgt.		Drive Arrgt.		Drive Arrgt.	

TEMPERATURE PROFILE		**BOILER ACCESSORIES (TICK IN THE BOX)**			
Furnace Temperature		Steam Drum		Bank Tubes	
Shell Outlet Temp.		Mud Drum		Air Heater	
Air Heater inlet Temp.		Shell		MDC	
Air Heater Outlet Temp.		Bed Coils		Economiser	
MDC outlet Temp.		Water wall		Under Bed Feeding System	
		Over bed Feeding System			

PRESENT MOTOR POWER CONSUMPTION					
	Installed KW/HP	Consumed KW/HP		Installed KW/HP	Consumed KW/HP
ID Fan			SA Fan		

FD Fan			Feed Pump		
PA Fan					

Enclose a copy of General Arrangement drawing of the boiler.

SECOND HAND BOILER DATA SHEET →ANNEXURE - II

As part of our business, we are dealing second hand boilers also. At present, we need a boiler capacity 6 TPH, 10.54 kg/cm^2 pressure of any fuel firing system. If you have any boilers to sale, please furnish the details of the boiler and send this date sheet to us to do interact regarding this

Company Name and Address		Contact Persons		Phone Nos.	
Make of Boiler		Design steam Temp.		Deg C	
Design Boiler Capacity	Kg/Hr	Present Steam Capacity		Kg/Hr	
Design boiler Pressure	Kg/Cm^2	Present Steam Pressure		Kg/Cm^2	
No of compartments design		No of Compartments in operation			

Fuel Fired					
Type of furnace					
HEATING SURFACE AREA					
Total area	Economiser	Bank	Super heater	Water wall	Air heater
PRESENT MOTOR POWER CONSUMPTION					
	Installed KW/HP	Consumed KW/HP		Installed KW/HP	Consumed KW/HP
ID Fan			SA Fan		
FD Fan			Feed Pump		
PA Fan					

ITEM FOR SALE (TICK IN THE BOXES)							
PHS Systems		FH system		Main Oil tank		Day Oil tank	
Basic boiler		Chimney		Control panel		Supp. Structure	
Ducting		Bunker		Dust Collect system		Refractory	
Feed water tank		Fans & Motors		Ash feeder		Pumps	
Fuel feeder		Valves		Water level gauge		LLG	
All gauges		Cables		Burners		Blowdown system	

PURPOSE OF SELLING				
Expected Price for the scope				
Enclosures	Latest IBR Inspection Certificate		Boiler GA Drawing	