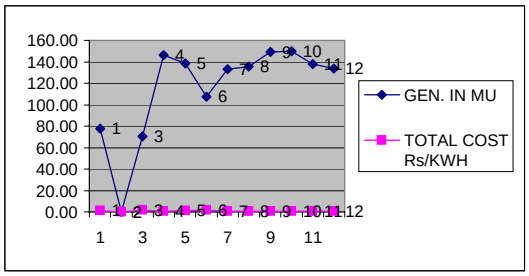
Name **Mr. Rajiv Jha**
Email jharajeev181@rediffmail.com

Case study

	SGTP # 3													
MONTH	GEN. IN MU	PUF %	SEC OIL IN KL.	SP. OIL ML/Kwh	COST OF OIL Rs. / KWH	OIL C.V. IN KCAL/LIT]	COAL CONS. IN MT	SP.COAL CONS Kg/kwh	COST OF COAL Rs. / KWH	COAL C.V. IN KCAL/KG]	TOTAL COST Rs/KWH	HEAT RATE Kcal/Kwh	SP.ENERGY CONS.IN KWH/UNIT OUTPUT IN KWH	1KcaL=4.1858KJ
Apr-03	77.70	51.39	222.00	2.86	0.40	10000.00	61531	0.79	0.79	3636	1.19	2908	3.4	3600KJ=1KWH
May-03	0.00	0.00	0.00		0.00	10000.00	0	0.00	0.00	3717	0.00	0	0.0	
Jun-03	70.54	46.65	516.00	7.31	1.02	10000.00	52991	0.75	0.75	3789	1.78	2919	3.4	
Jul-03	146.13	93.53	82.00	0.56	0.08	10000.00	109378	0.75	0.75	3693	0.83	2770	3.2	
Aug-03	138.39	88.57	206.00	1.49	0.21	10000.00	106995	0.77	0.77	3590	0.98	2791	3.2	
Sep-03	107.66	71.20	686.00	6.37	0.89	10000.00	88135	0.82	0.82	3449	1.71	2887	3.4	
Oct-03	133.06	85.17	78.00	0.59	0.08	10000.00	103638	0.78	0.78	3620	0.86	2825	3.3	
Nov-03	135.72	89.76	113.00	0.83	0.12	10000.00	99187	0.73	0.73	3793	0.85	2781	3.2	
Dec-03	149.45	95.66	28.00	0.19	0.03	10000.00	106400	0.71	0.71	3870	0.74	2757	3.2	
Jan-04	149.80	95.88	26.00	0.17	0.02	10000.00	112443	0.75	0.75	4005	0.77	3008	3.5	
Feb-04	137.90	96.90	16.00	0.12	0.02	10000.00	98376	0.71	0.71	4089	0.73	2918	3.4	
Mar-04	133.70	85.57	169.00	1.26	0.18	10000.00	94675	0.71	0.71	4072	0.89	2896	3.4	
TOTAL	1380.05	74.81	2142.00	1.55	0.22	10000.00	1033749	0.75	0.75	3796	0.97	2859	3.3	



SGTPS - #3 Calculation of Partial Losses and reasons for increase/decrease in specific fuel/cost of fuel.

S.No.	PARTICULARS	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	2003-04
1	Generation @ 100 %	151.200	156.240	151.200	156.240	156.240	151.200	156.240	151.200	156.240	156.240	146.160	156.240	1844.640
2	Actual Generation	77.701	0.000	70.540	146.132	138.385	107.658	133.062	135.718	149.452	149.800	137.903	133.702	1380.053
3	Forced Outages	0.794	0.000	28.325	0.802	0.949	6.930	1.449	2.765	0.000	0.279	4.760	15.974	63.027
4	Planned Outages	48.252	156.240	39.182	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	243.674
5	Availability	102.155	0.000	83.693	155.438	155.291	144.270	154.791	148.435	156.240	155.961	141.400	140.266	1537.940
6	Partial loss	24.454	0.000	13.153	9.306	16.906	36.612	21.729	12.717	6.788	6.161	3.497	6.564	157.887
(A)	Main Boiler													
1	Pressure Parts Leakage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.127	0.110	0.237
2	Drum Pressure Restriction	0.000	0.000	0.000	1.451	0.000	0.000	0.000	0.000	0.000	0.208	0.000	0.000	1.659
3	Air Heaters	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.355	0.000	0.000	0.000	0.000	0.355
4	Furnace	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	Furnace Draught	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	High flue gas / Steam temperature	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7	Aging	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	Miscellaneous / Others	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Total "A"	0.000	0.000	0.000	1.451	0.000	0.000	0.000	0.355	0.000	0.208	0.127	0.110	2.251
(B)	Boiler Auxiliaries													
1	I.D.Fan	1.108	0.000	0.876	0.401	0.000	1.911	0.450	0.000	0.000	0.000	0.000	0.000	4.746
2	F.D.Fan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	P.A.Fan	0.000	0.000	0.000	0.000	0.000	0.000	0.818	0.000	0.000	0.000	0.000	0.000	0.818
4	Milling System	4.907	0.000	5.616	4.270	5.130	0.000	0.000	0.302	0.449	0.511	1.549	4.569	27.303
5	R.C.Feeders	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	Precepitators	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7	Miscellaneous / Others	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.382	0.000	0.000	0.112	0.494
	Total "B"	6.015	0.000	6.492	4.671	5.130	1.911	1.268	0.302	0.831	0.511	1.549	4.681	33.361
(C)	Main Turbine													
1	Vibration/Eccentricity	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	Differential	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	High Curtis Wheel Pressure	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	High Exhaust Temp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	Low Vacuum	0.000	0.000	0.000	0.000	0.000	0.000	0.330	0.000	0.000	0.000	0.000	0.000	0.330
6	Startup / Shutdown	2.531	0.000	2.466	0.401	1.415	3.413	1.242	1.211	0.000	0.220	0.000	0.832	13.731
7	Bearing Failure	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	Axial Shift	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	Control Valve	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	Condenser	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11	Last Stage Blade Problem	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12	Miscellaneous / Others	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Total "C"	2.531	0.000	2.466	0.401	1.415	3.413	1.572	1.211	0.000	0.220	0.000	0.832	14.061

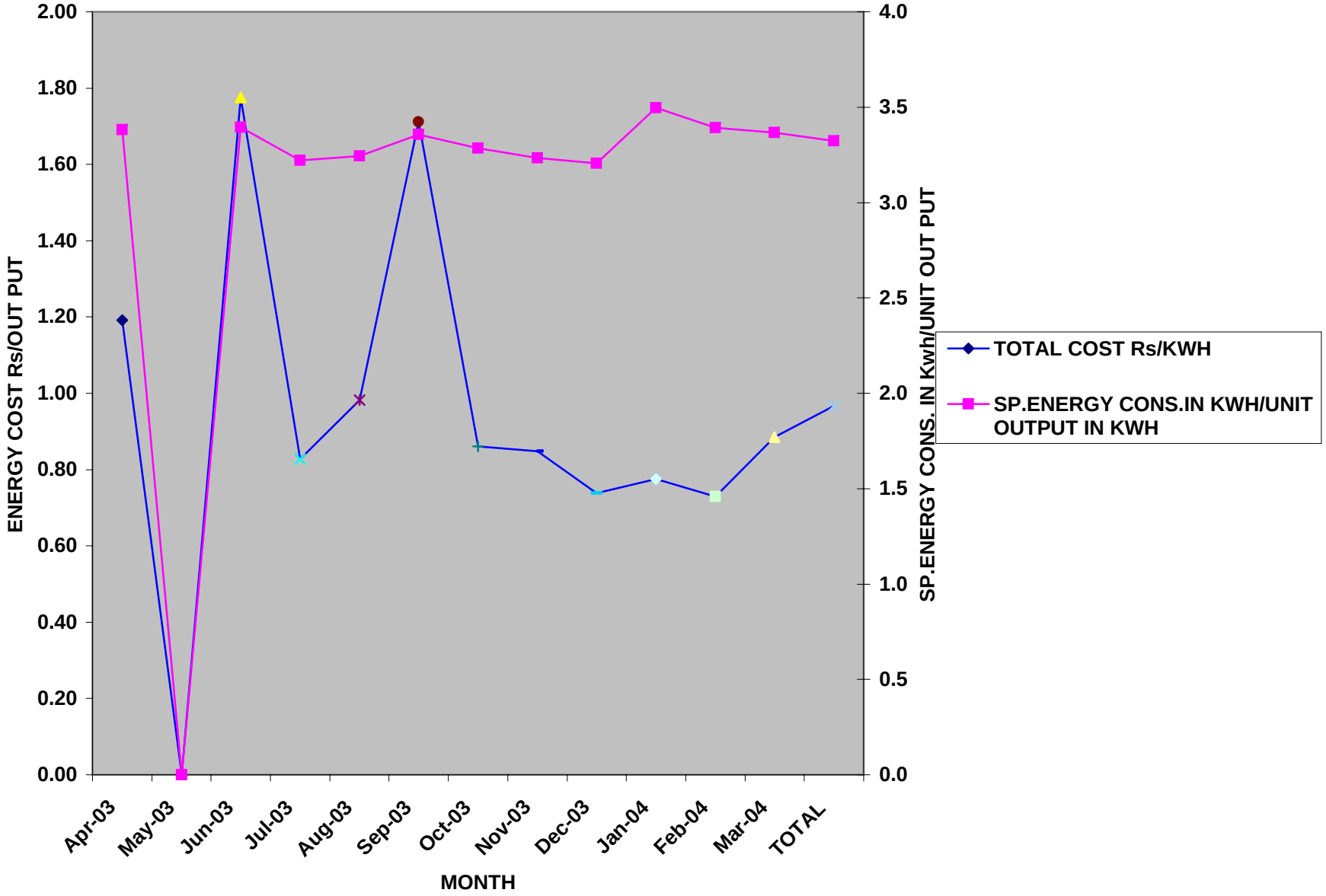
(D)	Turbine Auxiliaries													
1	B.F.Pump	0.000	0.000	0.000	0.000	1.135	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.135
2	Regenerative System	0.000	0.000	0.000	0.412	0.000	1.813	0.745	0.000	0.000	0.000	0.000	0.000	2.970
3	C.W.Pump	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	Condensate Pump	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	Miscellaneous / Others	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Total "D"	0.000	0.000	0.000	0.412	1.135	1.813	0.745	0.000	0.000	0.000	0.000	0.000	4.105
(E)	Generator													
1	Hydrogen Pressure / Purity	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	Winding Temp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	Excitor	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.376	0.000	0.000	0.000	0.376
4	Generator Cooling System	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	Seal Oil System	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	Miscellaneous / Others	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Total "E"	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.376	0.000	0.000	0.000	0.376
(F)	Electrical													
1	Main Transformer Temp.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	Auxiliary Supply	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	Grid System	0.000	0.000	0.000	0.000	0.000	0.000	1.896	2.582	0.674	2.491	0.883	0.382	8.908
4	Miscellaneous / Others	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.693	0.000	0.693
	Total "F"	0.000	0.000	0.000	0.000	0.000	0.000	1.896	2.582	0.674	2.491	1.576	0.382	9.601
(G)	General													
1	Coal Feeding	0.000	0.000	0.000	0.000	0.000	11.659	0.898	0.000	0.191	0.166	0.000	0.000	12.914
2	Coal Shortage	15.908	0.000	0.000	0.000	4.312	11.690	3.906	6.834	2.812	0.742	0.000	0.000	46.204
3	Poor Quality Coal	0.000	0.000	1.878	0.000	0.000	0.000	0.000	1.433	1.037	0.879	0.000	0.559	5.786
4	Wet Coal	0.000	0.000	0.000	0.423	1.650	1.363	0.800	0.000	0.000	0.000	0.000	0.000	4.236
5	Fuel Oil Shortage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	D.M.Water	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7	Cooling Water Shortage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	Operational Problems	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	Ash Handling System	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	Miscellaneous / Others	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.134	0.000	0.000	0.134
	Total "G"	15.908	0.000	1.878	0.423	5.962	24.712	5.604	8.267	4.040	1.921	0.000	0.559	69.274
(H)	Backing Down	0.000	0.000	2.316	1.949	3.265	4.763	10.644	0.000	0.867	0.810	0.246	0.000	24.860
	Total (A to H)	24.454	0.000	13.152	9.307	16.907	36.612	21.729	12.717	6.788	6.161	3.498	6.564	157.889
	Total 3 + 4 + 5 = 1	151.200	156.240	151.200	156.240	156.240	151.200	156.240	151.200	156.240	156.240	146.160	156.240	1844.640
	Total 5 - 2 = 6	24.454	0.000	13.153	9.306	16.906	36.612	21.729	12.717	6.788	6.161	3.497	6.564	157.887
	Total 2 + 3 + 4 + 6 = 1	151.200	156.240	151.200	156.240	156.240	151.200	156.240	151.200	156.240	156.240	146.160	156.240	1844.640

Partial loss are filled in yellow colour

Reasons for Partial loss are filled in Blue colour that is leading to ups and downs in the graph.

OUTAGES OF SANJAY GANDHI THERMAL POWER STATION DURING 2003-04

SNO.	COMPLEX	UNIT	CAP.	DT_OUT	TIME_OUT	DT_BACK	TIME_BACK	OUTAGE	HRS.LOST	GEN.LOSS (MU)	CAUSE OF OUTAGE
1	S.G.T.P.S.	3	210	04/09/03	19:45	04/09/03	21:30	1.8	1.45	0.3675	6.6 SUPPLY FAILED
2	S.G.T.P.S.	3	210	04/19/03	8:50	04/19/03	10:52	2.0	2.02	0.427	FURNACE PRESSURE HIGH
3	S.G.T.P.S.	3	210	04/21/03	10:14	04/23/03	0:00	61.8	61.46	12.971	UNLOADING OF MILLS DUE TO COAL SHORTAGE
4	S.G.T.P.S.	3	210	04/24/03	0:00	06/08/03	18:35	1098.6	1098.35	230.7025	A.O.H
5	S.G.T.P.S.	3	210	06/10/03	10:55	06/10/03	14:31	3.6	3.36	0.756	LOW VACCUM
6	S.G.T.P.S.	3	210	06/12/03	7:10	06/12/03	11:30	4.3	4.2	0.91	ALL COAL MILL TRIPPED
7	S.G.T.P.S.	3	210	06/13/03	12:38	06/18/03	14:53	122.3	122.15	25.6725	TUBE LKG.
8	S.G.T.P.S.	3	210	06/19/03	2:00	06/19/03	4:15	2.3	2.15	0.4725	CONDENSER PR. HIGH
9	S.G.T.P.S.	3	210	06/21/03	9:50	06/21/03	12:17	2.5	2.27	0.5145	HOT POINT ON CLAMP ON Y PHASE
10	S.G.T.P.S.	3	210	07/28/03	10:14	07/28/03	14:03	3.8	3.49	0.8015	GENERATOR TRANSFORMER JUMPER CLAM HOT
11	S.G.T.P.S.	3	210	08/19/03	23:07	08/20/03	1:20	2.2	2.13	0.4655	FURNACE PRESSURE HIGH
12	S.G.T.P.S.	3	210	08/21/03	0:03	08/21/03	2:20	2.3	2.17	0.4795	FURNACE PRESSURE HIGH
13	S.G.T.P.S.	3	210	09/03/03	6:56	09/03/03	15:54	9.0	8.58	1.883	FURNACE PRESSURE HIGH
14	S.G.T.P.S.	3	210	09/03/03	17:25	09/03/03	17:55	0.5	0.3	0.105	DRUM LEVEL HIGH
15	S.G.T.P.S.	3	210	09/03/03	19:50	09/04/03	4:10	8.3	8.2	1.75	FURNACE PRESSURE HIGH
16	S.G.T.P.S.	3	210	09/07/03	18:35	09/07/03	21:08	2.6	2.33	0.5355	FURNACE PRESSURE HIGH
17		3	210	09/25/03	2:15	09/25/03	5:05	2.8	2.5	0.595	FURNACE PRESSURE HIGH
18		3	210	10/05/03	4:09	10/05/03	7:18	3.2	3.09	0.6615	GENERATOR STATOR EARTH FAULT
19		3	210	10/24/03	10:21	10/24/03	10:56	0.6	0.35	0.1225	M.S.STOP VALVE SHUT OFF
20		3	210	10/31/03	11:35	10/31/03	14:25	2.8	2.5	0.595	INSTRUMENT LINE FELL DOWN
21		3	210	10/31/03	15:25	10/31/03	15:45	0.3	0.2	0.07	MAIN STEAM TEMP. HIGH
22		3	210	11/01/03	11:40	11/01/03	13:47	2.1	2.07	0.4445	BFP UNLOADED (DRUM EMPTY)
23		3	210	11/01/03	14:43	11/01/03	16:11	1.5	1.28	0.308	BFP UNLOADED (DRUM EMPTY)
24		3	210	11/03/03	21:30	11/04/03	7:05	9.6	9.35	2.0125	SYSTEM DISTURBANCE
25		3	210	01/10/04	17:22	01/10/04	18:42	1.3	1.2	0.28	DRUM LEVEL HIGH
26		3	210	02/29/04	1:20	03/03/04	21:35	92.3	92.15	19.3725	PRIMARY S.H.T.L.
27		3	210	03/04/04	2:51	03/04/04	4:46	1.9	1.55	0.4025	FURNACE DISTURBANCE
28		3	210	03/17/04	19:45	03/17/04	22:02	2.3	2.17	0.4795	FURNACE DISTURBANCE
29		3	210	03/27/04	7:30	03/27/04	9:47	2.3	2.17	0.4795	MAIN STEAM TEMP. HIGH
										303.275	


2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
ENERGY COST Rs/OUT PUT
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
SP.ENERGY CONS. IN Kwh/UNIT OUT PUT
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Dec-03
Jan-04
Feb-04
Mar-04
TOTAL
MONTH
TOTAL COST Rs/KWH
SP.ENERGY CONS.IN KWH/UNIT OUTPUT IN KWH