MONITORING REPORT- Version: 03

Date: 23/01/2009

Methodology: AMS-II.B/ Version 07

Verification Period: 1st April 2001- 31st March 2006

Indian Rayon & Industries Limited

Unit Jaya Shree Textiles

"Thermal Efficiency Improvement Initiatives in Coal Fired Boiler System"

Reference No.: UNFCCC 00000266

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1. General Information

1.1 Project Activity

The project activity includes energy efficiency improvement measures adopted in the coal-fired boiler system of Jaya Shree Textiles in order to reduce the coal consumption for steam generation and result in direct carbon dioxide emission reductions. The energy efficiency improvement measures include

- Installation of bed modulation system
- Implementation of an automatic Furnace Draft control system

1.2 Project Commissioning

Date of Project Commissioning: 1st April 2001

1.3 Monitoring Period

The monitoring period is chosen from 01/04/2001 to 31/03/2006 (both days included).

1.4 Monitoring Protocol

The monitoring protocol requires the following parameters to be monitored for the computation of emission reductions:

- Quantity of Coal used
- Gross Calorific Value of Coal
- Fixed Carbon Content (C%) in Coal
- Heat energy input
- Steam Load
- Steam Pressure
- Steam Enthalpy
- Feed Water Load
- Feed Water Temperature
- Feed Water Enthalpy
- Output Enthalpy
- Technical Losses
- Boiler Efficiency
- Number of Truck Trips

Please refer to the following section for a detailed description of the Monitoring Protocol:

Serial No.	Parameter	Monitoring Equipment	Monitoring Record(s)	Uncertainty Analysis
Parameters required to be monitored for the computation of Emission Reductions				
1.4.1	Quantity of Coal used	Measured-Weigh bridge and Pay-loaders	Boiler Log Book and Daily Reports	The coal received by JST from collieries is measured in a weigh bridge installed at the Store Section as and when coal is received. Thereafter, the coal is weighed in pay-loaders, transported to the boiler section and subsequently consumed in the boiler. In JST, coal is consumed only in the boiler section of the plant. It has been verified by the Verifier during site visit. The following practices followed in the plant will ensure the reliability of the parameter under consideration: 1. The weigh bridge at the Store Section of JST is calibrated once in a year to ensure accurate measurement of coal received. 2. The pay-loaders are weighed in the weigh bridge after filling up with coal. The tare weight (empty weight) of the pay-loaders is marked on the pay-loaders. The difference between the two is recorded as 'Coal Audited' (*i.e.* quantity of coal transported to the boiler section of the plant) in the Daily Report on a daily basis by the Boiler Operator. The same is subsequently reviewed by the Boiler In-charge and audited by third party statutory auditor. 3. The quantity of coal consumed in the boiler is determined from the quantity of coal transported to the boiler section of the plant (*i.e.* Coal Audited) after consideration of 3% carpet loss during transportation. The same is recorded on a daily basis in the Boiler Log Book and in the Daily Report prepared by the Boiler In-charge. 4. The Daily Report is presented by the Boiler In-charge in the morning meeting, chaired by the AGM (Engineering). Discrepancies, if any, are documented as 'History' and appropriate corrective actions are undertaken immediately. 5. The monthly quantity of coal received by JST and transported to the boiler section of the plant is also audited annually by third party statutory auditor. This will also ensure the reliability of the parameter under consideration.

Serial No.	Parameter	Monitoring Equipment	Monitoring Record(s)	Uncertainty Analysis
Parameters required to be monitored for the computation of Emission Reductions				
1.4.2	Gross Calorific Value of Coal	Measured-Bomb Calorimeter	Store Quality Control (SQC) Reports	The gross calorific value of coal is determined on a weekly basis in the in-house laboratory of JST with random samples drawn from coal stock maintained at the Store Section of the plant. The following practices followed in the plant will ensure the reliability of the parameter under consideration: 1. The gross calorific value of coal is monitored in the in-house laboratory of JST with the help of a Bomb Calorimeter following the standard testing procedure *i.e.* IS: 1350(2)-1970. The Bomb Calorimeter is calibrated once in a year as per the standard calibration procedure in order to ensure accurate measurement 2. The weekly report on gross calorific value of coal is also presented by the SQC In-charge in the morning meeting, chaired by the AGM (Engineering). Discrepancies, if any, are documented as 'History' and appropriate corrective actions are undertaken immediately.
1.4.3	Fixed Carbon Content (C%) in Coal	Estimated	Store Quality Control (SQC) Reports	The fixed carbon content in coal is determined on a weekly basis in the in-house laboratory of JST with random samples drawn from coal stock maintained at the Store Section of the plant. The following practices followed in the plant will ensure the reliability of the parameter under consideration: 1. The fixed carbon content in coal is monitored in the in-house laboratory of JST following the standard testing procedure *i.e.* IS: 1350(2)-1970. 2. The weekly report on fixed carbon content in coal is also presented by the SQC In-charge in the morning meeting, chaired by the AGM (Engineering). Discrepancies, if any, are documented as 'History' and appropriate corrective actions are undertaken immediately.

Serial No.	Parameter	Monitoring Equipment	Monitoring Record(s)	Uncertainty Analysis
Parameters required to be monitored for the computation of Emission Reductions				
1.4.4	Heat energy input (E_{input})	Calculated	Monthly Report	1. The parameter is calculated with 'Quantity of Coal used' and 'Gross Calorific Value of Coal', determined as explained above. The uncertainty level of both these parameters is 'low'. This will ensure reliability of the parameter under consideration. 2. The Monthly Report is prepared based on the Daily Reports by the Boiler In-charge. The same is also presented by the Boiler In-charge in the morning meeting, chaired by the AGM (Engineering). Discrepancies, if any, are documented as 'History' and appropriate corrective actions are undertaken immediately.
1.4.5	Steam Load	Measured-Steam Flow Meter	Boiler Log Book and Daily Reports	The steam generation data is monitored on a daily basis with the help of a Stem Flow Meter. The following practices followed in the plant will ensure the reliability of the parameter under consideration: 1. The Steam Flow Meter is calibrated by the supplier and the calibration will remain valid for the entire crediting period. This will ensure higher reliability of the parameter being monitored. 2. The parameter is recorded on a daily basis in the Boiler Log Book by the Boiler Operator. The same is subsequently reviewed and the Daily Report is prepared by the Boiler In-charge. 3. The Daily Report is presented by the Boiler In-charge in the morning meeting, chaired by the AGM (Engineering). Discrepancies, if any, are documented as 'History' and appropriate corrective actions are undertaken immediately.

Serial No.	Parameter	Monitoring Equipment	Monitoring Record(s)	Uncertainty Analysis
Parameters required to be monitored for the computation of Emission Reductions				
1.4.6[1]	Steam Pressure	Measured-Pressure Gauge	Boiler Log Book and Daily Reports	The steam pressure data is monitored on a four hourly basis with the help of a Pressure Gauge. The following practices followed in the plant will ensure the reliability of the parameter under consideration: 1. The Pressure Gauge is calibrated in the in-house laboratory of JST on a regular basis with a Master Calibrator following the standard calibration procedure *i.e.* ISO/IEC: 17205-2005 to ensure accuracy of the parameter being monitored. The Master Calibrator is calibrated by an accredited third party to ensure reliability of the in-house calibration system. 2. The parameter is recorded on a four hourly basis in the Boiler Log Book by the Boiler Operator. The same is subsequently reviewed and the Daily Report is prepared by the Boiler In-charge which consists of the daily average steam pressure. 3. The Daily Report is presented by the Boiler In-charge in the morning meeting, chaired by the AGM (Engineering). Discrepancies, if any, are documented as 'History' and appropriate corrective actions are undertaken immediately.
1.4.7	Steam Enthalpy (E_{steam})	Calculated	Monthly Report	1. The parameter is calculated with 'Steam Load' and 'Steam Pressure' using Steam Tables[2]. Steam load and steam pressure are determined as explained above. The uncertainty level of both these parameters is 'low'. This will ensure reliability of the parameter under consideration. 2. The Monthly Report is prepared based on the Daily Reports by the Boiler In-charge. The same is also presented by the Boiler In-charge in the morning meeting, chaired by the AGM (Engineering). Discrepancies, if any, are documented as 'History' and appropriate corrective actions are undertaken immediately.

[1] The steam temperature has not been included in the Monitoring Plan in accordance with the guidance of the Registered PDD.
2 The steam temperature is constant at a particular steam pressure.

Serial No.	Parameter	Monitoring Equipment	Monitoring Record(s)	Uncertainty Analysis
Parameters required to be monitored for the computation of Emission Reductions				
1.4.8	Feed Water Load	Estimated	Boiler Log Book and Daily Reports	The feed water consumption data is determined from the steam load *i.e.* steam generation data considering a maximum (standard) blow down of 3%. The following practices followed in the plant will ensure the reliability of the parameter under consideration: 1. The standard blow down of 3% is periodically checked by conducting 'Blow Down Test' with daily steam generation data and corresponding feed water consumption data for a particular day. The feed water consumption data for that particular day is measured with the help of a Water Flow Meter installed at the feed water line. The Water Flow Meter is calibrated during installation and at regular intervals as specified by the supplier. This will ensure accuracy of the 'Blow Down Test' results which have been provided to the Verifier. 2. The parameter is recorded on a daily basis in the Boiler Log Book by the Boiler Operator. The same is subsequently reviewed and the Daily Report is prepared by the Boiler In-charge. 3. The Daily Report is presented by the Boiler In-charge in the morning meeting, chaired by the AGM (Engineering). Discrepancies, if any, are documented as 'History' and appropriate corrective actions are undertaken immediately.

Serial No.	Parameter	Monitoring Equipment	Monitoring Record(s)	Uncertainty Analysis
Parameters required to be monitored for the computation of Emission Reductions				
1.4.9[3]	Feed Water Temperature	Measured-Thermo-couple based Digital Meter	Boiler Log Book and Daily Reports	The feed water temperature data is monitored on a four hourly basis with the help of a Thermo-couple based Digital Meter. The following practices followed in the plant will ensure the reliability of the parameter under consideration: 1. The Thermocouple based Digital Meter is a micro-chip based device of higher accuracy level. The same is not required to be calibrated. However, the same is calibrated periodically to ensure accuracy. . 2. The parameter is recorded on a four hourly basis in the Boiler Log Book by the Boiler Operator. The same is subsequently reviewed and the Daily Report is prepared by the Boiler In-charge which consists of the daily average feed water temperature. 3. The Daily Report is presented by the Boiler In-charge in the morning meeting, chaired by the AGM (Engineering). Discrepancies, if any, are documented as 'History' and appropriate corrective actions are undertaken immediately.
1.4.10	Feed Water Enthalpy ($E_{feedwater}$)	Calculated	Monthly Report	1. The parameter is calculated with 'Feed Water Load' and 'Feed Water Temperature' using Steam Tables[4]. Feed water load and feed water temperature are determined as explained above. The uncertainty level of both these parameters is 'low'. This will ensure reliability of the parameter under consideration. 2. The Monthly Report is prepared based on the Daily Reports by the Boiler In-charge. The same is also presented by the Boiler In-charge in the morning meeting, chaired by the AGM (Engineering). Discrepancies, if any, are documented as 'History' and appropriate corrective actions are undertaken immediately.

[3] The Feed Water pressure has not been included in the Monitoring Plan in accordance with the guidance of the Registered PDD.
4 The steam temperature is constant at a particular steam pressure.

Serial No.	Parameter	Monitoring Equipment	Monitoring Record(s)	Uncertainty Analysis
Parameters required to be monitored for the computation of Emission Reductions				
1.4.11	Output Enthalpy (E_{output})	Calculated	Monthly Report	1. The parameter is calculated as a difference between the monitored values of 'Steam Enthalpy' and 'Feed Water Enthalpy' following the guidance of the Registered PDD. The uncertainty level of both the parameters is 'low' as explained above. This will ensure reliability of the parameter under consideration. 2. The Monthly Report is prepared based on the Daily Reports by the Boiler In-charge. The same is also presented by the Boiler In-charge in the morning meeting, chaired by the AGM (Engineering). Discrepancies, if any, are documented as 'History' and appropriate corrective actions are undertaken immediately.
1.4.12	Technical Losses ($TL_{baseyear}$/ $TL_{crediteyear}$)	Calculated	Monthly Report	1. The technical losses in the baseline scenario are calculated based on the 'Output Enthalpy', as monitored above, and the 'Boiler Efficiency' in the baseline scenario. The uncertainty level of 'Output Enthalpy' is 'low' as explained above. The 'Boiler Efficiency' in the baseline scenario is determined based on reliable plant records and the same is validated by the Validator and the Executive Board of UNFCCC at the time of registration of the project activity with UNFCCC. This will ensure a lower uncertainty level of the parameter under consideration. 2. The technical losses in the project scenario are calculated as a difference between the 'Heat energy input' and 'Output Enthalpy', as monitored above. The uncertainty level of both the parameters is 'low' as explained above. This will ensure reliability of the parameter under consideration. 3. The Monthly Report is prepared based on the Daily Reports by the Boiler In-charge. The same is also presented by the Boiler In-charge in the morning meeting, chaired by the AGM (Engineering). Discrepancies, if any, are documented as 'History' and appropriate corrective actions are undertaken immediately.

Serial No.	Parameter	Monitoring Equipment	Monitoring Record(s)	Uncertainty Analysis
Parameters required to be monitored for the computation of Emission Reductions				
1.4.13	Boiler Efficiency (BE)	Calculated	Monthly Report	1. The 'Boiler Efficiency' is calculated based on the monitored values of 'Output Enthalpy' and 'Heat energy input'. The uncertainty level of both the parameters is 'low' as explained above. This will ensure reliability of the parameter under consideration. 2. The Monthly Report is prepared based on the Daily Reports by the Boiler In-charge. The same is also presented by the Boiler In-charge in the morning meeting, chaired by the AGM (Engineering). Discrepancies, if any, are documented as 'History' and appropriate corrective actions are undertaken immediately.
1.4.14	Number of Truck Trips	Measured	Monthly Report	The parameter is recorded as and when coal is received through trucks at the Store Section of the plant. However the parameter has no implication on the computation of emission reduction resulting from the project activity under consideration.

2. Monitored Results

Monitored Results for 1st April 2001 to 31st March 2002

Monitored Parameters for the year 2001-2002												
Months	Quantity of Coal Used	Coal-Audited	Gross Calorific Value of Coal	Heat Energy Input	Steam Load	Steam Pressure	Steam Pressure	Steam Enthalpy	Feed water Load	Feed Water Temerature	Feed Water Enthalpy	Number of Truck Trips
Units	(tons)	(tons)	(kCal/kg)	(kCal)	(tons)	(Bar)	(kg/cm^2)	(kCal)	(tons)	(°C)	(kCal)	
April 2001	527.025	543.325	5882	3099962521	3314.283	8.83	9.00	2199626663	3413.711	65	221750976.16	60
May 2001	551.803	568.869	5731	3162382592	3299.440	8.83	9.00	2189776109	3398.423	65	220757912.20	81
June 2001	522.030	538.175	5828	3042389383	3175.233	8.83	9.00	2107341806	3270.489	64	209182284.53	54
July 2001	535.318	551.874	5927	3172828482	3267.094	8.83	9.00	2168308547	3365.107	65	218593702.77	0
August 2001	526.026	542.295	5723	3010447656	3259.193	8.83	9.00	2163064737	3356.969	65	218065058.44	82
September 2001	494.555	509.850	5905	2920344323	3003.017	8.83	9.00	1993045301	3093.107	72	222571022.63	71
October 2001	513.138	529.008	5586	2866387527	3284.651	8.83	9.00	2179960929	3383.191	72	243444608.63	8
November 2001	511.639	527.463	5777	2955739138	3708.065	8.83	9.00	2460972534	3819.307	73	278648479.63	76
December 2001	607.220	626.000	5719	3472691180	4251.840	8.83	9.00	2821865858	4379.395	74	323894082.07	0
January 2002	644.856	664.800	5840	3765959040	4490.640	8.83	9.00	2980352905	4625.359	74	342085243.27	0
February 2002	604.989	623.700	5699	3447832311	4215.270	8.83	9.00	2797595040	4341.728	73	316763228.28	32
March 2002	667.108	687.740	5621	3749812944	4649.122	8.83	9.00	3085534679	4788.596	73	349365763.07	78
2001-2002	6705.706	6913.099	5770	38666777097	43917.847	8.83	9.00	29147445109	45235.382	70	3165122361.67	542

Monitored Results for 1st April 2002- 31st March 2003

Monitored Parameters for the year 2002-2003												
Months	Quantity of Coal Used	Coal-Audited	Gross Calorific Value of Coal	Heat Energy Input	Steam Load	Steam Pressure	Steam Pressure	Steam Enthalpy	Feed water Load	Feed Water Temerature	Feed Water Enthalpy	Number of Truck Trips
Units	(tons)	(tons)	(kCal/kg)	(kCal)	(tons)	(Bar)	(kg/cm^2)	(kCal)	(tons)	(°C)	(kCal)	
April 2002	661.4042	681.860	6129	4053746342	4436.670	8.83	9.00	2944534036	4569.770	73	333400686.55	0
May 2002	606.5536	625.313	5783	3507699527	4268.118	8.83	9.00	2832669060	4396.161	73	320734553.50	77
June 2002	533.0199	549.505	5670	3022222550	3725.325	8.83	9.00	2472427803	3837.085	73	279945525.05	0
July 2002	492.2566	507.481	6126	3015563748	3433.325	8.83	9.00	2278632921	3536.325	74	261541744.12	157
August 2002	418.6229	431.570	5837	2443501867	2983.500	8.83	9.00	1980092569	3073.005	74	227275248.80	0
September 2002	469.5770	484.100	5442	2555438034	3290.220	8.83	9.00	2183656837	3388.927	73	247248861.63	0
October 2002	541.5122	558.260	5709	3091493150	3967.590	8.83	9.00	2633214239	4086.617	73	298150887.17	0
November 2002	490.0586	505.215	5720	2803134906	3449.909	8.83	9.00	2289639474	3553.406	74	262805077.61	66
December 2002	554.5005	571.650	5573	3090231287	3893.900	8.83	9.00	2584307844	4010.717	73	292613363.93	0
January 2003	552.0445	569.118	5905	3259822536	4064.200	8.83	9.00	2697332736	4186.126	72	301221505.17	53
February 2003	449.0557	462.944	5566	2499443915	3196.900	8.83	9.00	2121722116	3292.807	72	236940856.72	40
March 2003	500.0544	515.520	5654	2827307578	3599.856	8.83	9.00	2389156398	3707.852	73	270516955.71	0
2002-2003	6268.6599	6462.536	5760	36169605438	44309.512	8.83	9.00	29407386033	45638.798	73	3332395265.96	393

Monitored Results for 1st April 2003- 31st March 2004

Monitored Parameters for the year 2003-2004												
Months	Quantity of Coal Used	Coal-Audited	Gross Calorific Value of Coal	Heat Energy Input	Steam Load	Steam Pressure	Steam Pressure	Steam Enthalpy	Feed water Load	Feed Water Temerature	Feed Water Enthalpy	Number of Truck Trips
Units	(tons)	(tons)	(kCal/kg)	(kCal)	(tons)	(Bar)	(kg/cm^2)	(kCal)	(tons)	(°C)	(kCal)	
April 2003	552.044	569.118	5905	3259822536	4064.200	8.83	9.00	2697332935	4186.126	74	309600179.11	78
May 2003	449.056	462.944	5566	2499443915	3196.900	8.83	9.00	2121722116	3292.807	72	236940856.72	0
June 2003	500.054	515.520	5654	2827307578	3588.857	8.83	9.00	2381856304	3696.522	73	269690388.15	3
July 2003	552.044	569.118	5905	3259822536	4064.200	8.83	9.00	2697332869	4186.126	74	309600171.49	138
August 2003	449.056	462.944	5566	2499443915	3196.900	8.83	9.00	2121722116	3292.807	73	240236180.48	79
September 2003	500.054	515.520	5654	2827307578	3599.856	8.83	9.00	2389156398	3707.852	73	270516955.71	0
October 2003	552.044	569.118	5905	3259822536	4064.200	8.83	9.00	2697333002	4186.126	72	301221534.81	0
November 2003	449.056	462.944	5566	2499443915	3196.900	8.83	9.00	2121722182	3292.807	74	243531511.86	0
December 2003	500.054	515.520	5654	2827307578	3599.856	8.83	9.00	2389156664	3707.852	72	266806299.69	84
January 2004	672.210	693.000	5565	3740848650	4327.094	8.83	9.00	2871810516	4456.907	73	325166422.20	4
February 2004	730.410	753.000	5565	4064731650	4702.649	8.83	9.00	3121059272	4843.728	73	353388105.32	80
March 2004	757.667	781.100	5565	4216416855	4877.193	8.83	9.00	3236900627	5023.508	72	371531819.79	36
2003-2004	6663.751	6869.846	5673	37781719241	46478.806	8.83	9.00	30847105002	47873.170	73	3498230425.31	502

Monitored Results for 1st April 2004- 31st March 2005

Monitored Parameters for the year 2004-2005												
Months	Quantity of Coal Used	Coal-Audited	Gross Calorific Value of Coal	Heat Energy Input	Steam Load	Steam Pressure	Steam Pressure	Steam Enthalpy	Feed water Load	Feed Water Temerature	Feed Water Enthalpy	Number of Truck Trips
Units	(tons)	(tons)	(kCal/kg)	(kCal)	(tons)	(Bar)	(kg/cm^2)	(kCal)	(tons)	(°C)	(kCal)	
April '04	748.8303	771.990	5565	4167240620	4818.6546	8.83	9.00	3198049997	4963.214	72	357138524.55	78
May '04	723.3484	745.720	5565	4025433846	4656.2789	8.83	9.00	3090284313	4795.967	72	345103916.82	38
June'04	739.1497	762.010	5546	4099324236	4756.3607	8.83	9.00	3156706712	4899.052	74	362327153.17	4
July'04	701.9308	723.640	5600	3930812480	4518.4108	8.83	9.00	2998783861	4653.963	73	339543230.14	21
August'04	695.3736	716.880	5716	3974755498	4476.2012	8.83	9.00	2970770147	4610.487	72	331757310.88	64
September'04	734.3385	757.050	5575	4093937138	4725.4010	8.83	9.00	3136159345	4867.163	72	350226957.76	59
October'04	694.3745	715.850	5655	3926687798	4469.7698	8.83	9.00	2966501748	4603.863	73	335888024.14	42
November'04	720.3511	742.630	5578	4018118436	4635.3932	8.83	9.00	3076422869	4774.455	73	348334060.30	118
December'04	718.3529	740.570	5602	4024212946	4624.1222	8.83	9.00	3068942519	4762.846	72	342720596.71	42
January'05	754.1944	777.520	5634	4249131250	4854.8390	8.83	9.00	3222064899	5000.484	74	369828973.23	76
Febraury'05	691.3772	712.760	5602	3873095074	4570.3528	8.83	9.00	3033256784	4707.463	73	343446495.08	67
March'05	902.4298	930.340	5672	5118581826	5896.1658	8.83	9.00	3913173818	6073.051	72	436999147.92	28
2004-2005	8824.051	9096.960	5609	49501331146	57001.950	8.83	9.00	37831117011	58712.009	73	4263314390.69	637

Monitored Results for 1st April 2005- 31st March 2006

Monitored Parameters for the year 2005-2006												
Months	Quantity of Coal Used	Coal-Audited	Gross Calorific Value of Coal	Heat Energy Input	Steam Load	Steam Pressure	Steam Pressure	Steam Enthalpy	Feed water Load	Feed Water Temerature	Feed Water Enthalpy	Number of Truck Trips
Units	(tons)	(tons)	(kCal/kg)	(kCal)	(tons)	(Bar)	(kg/cm^2)	(kCal)	(tons)	(°C)	(kCal)	
April '05	1014.087	1045.450	5565	5643391373	6525.557	8.83	9.00	4330888863	6721.324	72	483646991.19	91
May '05	949.145	978.500	5565	5281991925	6109.764	8.83	9.00	4054934774	6293.057	73	459128004.92	52
June'05	954.141	983.650	5565	5309791883	6139.810	8.83	9.00	4074875537	6324.004	74	467714674.61	14
July'05	969.127	999.100	5565	5393191755	6235.966	8.83	9.00	4138692457	6423.044	73	468611634.18	150
August'05	1029.073	1060.900	5565	5726791245	6623.227	8.83	9.00	4395710729	6821.924	74	504540174.21	85
September'05	932.461	961.300	5565	5189145465	5997.597	8.83	9.00	3980491456	6177.524	72	444516767.16	38
October'05	1017.683	1049.158	5565	5663407342	6547.671	8.83	9.00	4345565573	6744.101	72	485285995.79	48
November'05	933.359	962.226	5565	5194144059	6002.241	8.83	9.00	3983573857	6182.308	73	451048024.06	102
December'05	989.109	1019.700	5565	5504391585	6368.087	8.83	9.00	4226378801	6559.129	74	485104236.35	67
January'06	1087.820	1121.464	5565	6053718745	6972.025	8.83	9.00	4627201237	7181.186	73	523924006.44	47
Febraury'06	956.139	985.710	5400	5163148980	6062.600	8.83	9.00	4023633051	6244.478	72	449334554.70	49
March'06	746.727	769.822	5565	4155537647	4808.187	8.83	9.00	3191102649	4952.432	73	361318905.14	41
2005-2006	11578.871	11936.980	5551	64278652004	74392.730	8.83	9.00	49373048985	76624.512	73	5584173968.75	784

3. Computation of Emission Reductions

Emission Reductions for 1st April 2001 to 31st March 2002

Computation of Emission Reductions for the year 2001-2002										
Months	Output Enthalpy	Baseline Boiler Efficiency	Baseline Technical Losses	Boiler Efficiency	Technical Losses	Reduction in Losses	Coal Reduction	Fixed Carbon Content (C%) in Coal	Emission Co-efficienct of Coal	Emission Reductions
	(kCal)	(%)	(kCal)	(%)	(kCal)	(kCal)	(kgs)	('%)	($kgCO_2$/kCal)	(tons)
April 2001	1977875687	53.93	1689806040	63.80	1122086834	567719207	96518	0.5395	0.000336	191
May 2001	1969018197	53.93	1682238608	62.26	1193364395	488874213	85303	0.5350	0.000342	167
June 2001	1898159521	53.93	1621700214	62.39	1144229862	477470352	81927	0.5554	0.000349	167
July 2001	1949714845	53.93	1665746711	61.45	1223113637	442633074	74681	0.5487	0.000339	150
August 2001	1944999678	53.93	1661718290	64.61	1065447978	596270312	104188	0.5334	0.000342	204
September 2001	1770474278	53.93	1512611814	60.63	1149870044	362741769	61430	0.5443	0.000338	123
October 2001	1936516321	53.93	1654470499	67.56	929871207	724599293	129717	0.5046	0.000331	240
November 2001	2182324054	53.93	1864477324	73.83	773415084	1091062240	188863	0.5447	0.000346	377
December 2001	2497971776	53.93	2134152224	71.93	974719404	1159432820	202733	0.5325	0.000341	396
January 2002	2638267662	53.93	2254014578	70.06	1127691378	1126323200	192864	0.5444	0.000342	385
February 2002	2480831812	53.93	2119508627	71.95	967000499	1152508127	202230	0.5283	0.000340	392
March 2002	2736168916	53.93	2337656908	72.97	1013644028	1324012880	235548	0.5119	0.000334	442
2001-2002	25982322747	53.93	22198101836	66.95	12684454350	9513647486	1656002	0.5352	0.000340	3233

Emission Reductions for 1st April 2002 to 31st March 2003

Computation of Emission Reductions for the year 2002-2003										
Months	Output Enthalpy	Baseline Boiler Efficiency	Baseline Technical Losses	Boiler Efficiency	Technical Losses	Reduction in Losses	Coal Reduction	Fixed Carbon Content (C%) in Coal	Emission Co-efficienct of Coal	Emission Reductions
	(kCal)	(%)	(kCal)	(%)	(kCal)	(kCal)	(kgs)	(%)	($kgCO_2$/kCal)	(tons)
April 2002	2611133350	53.93	2230832269	64.41	1442612992	788219277	128605	0.5356	0.000320	253
May 2002	2511934507	53.93	2146081339	71.61	995765020	1150316318	198913	0.5459	0.000346	398
June 2002	2192482277	53.93	1873156043	72.55	829740272	1043415771	184024	0.5222	0.000338	352
July 2002	2017091177	53.93	1723309951	66.89	998472571	724837380	118321	0.5350	0.000320	232
August 2002	1752817320	53.93	1497526520	71.73	690684547	806841973	138229	0.5573	0.000350	282
September 2002	1936407975	53.93	1654377934	75.78	619030059	1035347875	190251	0.5421	0.000365	378
October 2002	2335063352	53.93	1994970757	75.53	756429798	1238540960	216945	0.5304	0.000341	422
November 2002	2026834397	53.93	1731634111	72.31	776300509	955333602	167016	0.5327	0.000341	326
December 2002	2291694480	53.93	1957918387	74.16	798536806	1159381581	208035	0.5018	0.000330	383
January 2003	2396111231	53.93	2047127258	73.50	863711305	1183415952	200409	0.5443	0.000338	400
February 2003	1884781259	53.93	1610270442	75.41	614662656	995607786	178873	0.5242	0.000345	344
March 2003	2118639443	53.93	1810068120	74.93	708668135	1101399985	194800	0.5188	0.000336	371
2002-2003	26074990767	53.93	22277273132	72.40	10094614671	12182658461	2124424	0.5325	0.000339	4141

Emission Reductions for 1st April 2003 to 31st March 2004[5]

Computation of Emission Reductions for the year 2003-2004										
Months	Output Enthalpy	Baseline Boiler Efficiency	Baseline Technical Losses	Boiler Efficiency	Technical Losses	Reduction in Losses	Coal Reduction	Fixed Carbon Content (C%) in Coal	Emission Co-efficienct of Coal	Emission Reductions
	(kCal)	(%)	(kCal)	(%)	(kCal)	(kCal)	(kgs)	(%)	($kgCO_2$/kCal)	(tons)
April 2003	2387732756	53.93	2039969074	73.25	872089780	1167879294	197778	0.5443	0.000338	395
May 2003	1884781259	53.93	1610270442	75.41	614662656	995607786	178873	0.5242	0.000345	344
June 2003	2112165916	53.93	1804537437	74.71	715141661	1089395776	192677	0.5188	0.000336	367
July 2003	2387732697	53.93	2039969024	73.25	872089839	1167879185	197778	0.5443	0.000338	395
August 2003	1881485936	53.93	1607455069	75.28	617957979	989497090	177775	0.5242	0.000345	342
September 2003	2118639443	53.93	1810068120	74.93	708668135	1101399985	194800	0.5188	0.000336	371
October 2003	2396111467	53.93	2047127459	73.50	863711070	1183416390	200409	0.5442	0.000338	400
November 2003	1878190671	53.93	1604639746	75.14	621253244	983386502	176677	0.5242	0.000345	340
December 2003	2122350364	53.93	1813238561	75.07	704957214	1108281348	196017	0.5435	0.000352	391
January 2004	2546644094	53.93	2175735614	68.08	1194204556	981531057	176376	0.5240	0.000345	-
February 2004	2767671167	53.93	2364570982	68.09	1297060483	1067510499	191826	0.5335	0.000352	-
March 2004	2865368808	53.93	2448039354	67.96	1351048047	1064215089	191234	0.5383	0.000355	-
2003-2004	27348874577	53.93	23365620882	72.89	10432844665	12900000000	2272221	0.5319	0.000344	3342

[5] *The Emission Reduction has been considered upto the period December 2003 as the PLF upto this period matches with that of the baseline period. For the period from Januray 2004 to the rest of the monitoring period under consideration, no Emission Reduction can be claimed as the PLF value exceeds the baseline PLF value range.*

Emission Reductions for 1st April 2004 to 31st March 2005

Computation of Emission Reductions for the year 2004-2005										
Months	Output Enthalpy	Baseline Boiler Efficiency	Baseline Technical Losses	Boiler Efficiency	Technical Losses	Reduction in Losses	Coal Reduction	Fixed Carbon Content (C%) in Coal	Emission Co-efficienct of Coal	Emission Reductions
	(kCal)	(%)	(kCal)	(%)	(kCal)	(kCal)	(kgs)	(%)	($kgCO_2$/kCal)	(tons)
April '04	2840911472	53.93	2427144131	68.17	1326329147	1100814984	197810	0.5299	0.000349	-
March '04	2745180396	53.93	2345355902	68.20	1280253450	1065102452	191393	0.5358	0.000353	-
June'04	2794379559	53.93	2387389404	68.17	1304944677	1082444727	195176	0.5491	0.000363	-
July'04	2659240630	53.93	2271932917	67.65	1271571850	1000361068	178636	0.5307	0.000347	-
August'04	2639012836	53.93	2254651220	66.39	1335742662	918908558	160761	0.5441	0.000349	-
September'04	2785932387	53.93	2380172529	68.05	1308004751	1072167778	192317	0.5409	0.000356	-
October'04	2630613724	53.93	2247475405	66.99	1296074074	951401331	168241	0.5347	0.000347	-
November'04	2728088808	53.93	2330753635	67.89	1290029627	1040724008	186577	0.5427	0.000357	-
December'04	2726221922	53.93	2329158653	67.75	1297991024	1031167630	184071	0.5407	0.000354	-
January'05	2852235926	53.93	2436819224	67.13	1396895324	1039923900	184580	0.5263	0.000343	-
Febraury'05	2689810289	53.93	2298050228	69.45	1183284785	1114765443	198994	0.5188	0.000340	-
March'05	3476174670	53.93	2969883796	67.91	1642407156	1327476641	234040	0.5430	0.000351	-
2004-2005	33567802620	53.93	28678787044	67.81	15933528525	12745258519	2272596	0.5364	0.000351	0

Emission Reductions for 1st April 2005 to 31st March 2006

Computation of Emission Reductions for the year 2005-2006										
Months	Output Enthalpy	Baseline Boiler Efficiency	Baseline Technical Losses	Boiler Efficiency	Technical Losses	Reduction in Losses	Coal Reduction	Fixed Carbon Content (C%) in Coal	Emission Co-efficienct of Coal	Emission Reductions
	(kCal)	(%)	(kCal)	(%)	(kCal)	(kCal)	(kgs)	(%)	($kgCO_2$/kCal)	(tons)
April '05	3847241872	53.93	3286906551	68.17	1796149501	1490757051	267881	0.4323	0.000285	-
March '05	3595806769	53.93	3072091961	68.08	1686185156	1385906805	249040	0.4935	0.000325	-
June'05	3607160862	53.93	3081792376	67.93	1702631020	1379161356	247828	0.4814	0.000317	-
July'05	3670080823	53.93	3135548297	68.05	1723110932	1412437365	253807	0.4617	0.000304	-
August'05	3891170555	53.93	3324437198	67.95	1835620690	1488816508	267532	0.4681	0.000308	-
September'05	3535974689	53.93	3020974183	68.14	1653170776	1367803408	245787	0.4845	0.000319	-
October'05	3860279578	53.93	3298045368	68.16	1803127764	1494917603	268629	0.4458	0.000294	-
November'05	3532525833	53.93	3018027639	68.01	1661618226	1356409413	243739	0.5211	0.000343	-
December'05	3741274564	53.93	3196372957	67.97	1763117021	1433255936	257548	0.4773	0.000314	-
January'06	4103277231	53.93	3505651389	67.78	1950441514	90534555	16269	0.4315	0.000284	-
Febraury'06	3574298496	53.93	3053716282	69.23	1588850484	-	-	0.3921	0.000266	-
March'06	2829783744	53.93	2417637112	68.10	1325753903	-	-	0.4825	0.000318	-
2005-2006	43788875017	53.93	37411201314	68.13	20489776987	12900000000	2318059	0.4643	0.000307	0

4. Summary of the Annual Emission Reductions

Summary of Emission Reduction	
Year	Emission Reductions
April 2001 – March 2002	3233
April 2002 – March 2003	4141
April 2003 – March 2004	3342
April 2004 – March 2005	0
Aril 2005 – March 2006	0
Total	10717