Verification Report for

Project : TEIL Biomass Grid Supply Power Project, Khatauli, Uttar Pradesh

UCR Project ID : 261

Name of Verifier	SQAC Certification Pvt. Ltd.
Date of Issue	August 29, 2023
Project Proponent	Triveni Engineering and Industries Ltd. (TEIL)
UCR Project Aggregator	Carbon Equalizers, Katni
Work carried by	Mr. Santosh Nair
Work reviewed by	Mr. Praful Shinganapurkar

Summary:

SQAC Certification Pvt. Ltd. has performed verification of the "TEIL Biomass Grid Supply Power Project, Khatauli, Uttar Pradesh, India". The purpose of the project activity is to generate electricity using renewable biomass and thereby reduce GHG emissions by displacing fossil fuel dominated grid based electricity with biomass based renewable electricity.

Verification for the period**: 01/01/2013 to 31/12/2022**

The GHG emission reductions were calculated on the basis of UCR Standard for Baseline Grid Emission Factor, CDM UNFCCC Methodology, ACM0006: Grid connected renewable electricity generation (Ver.16.0). The verification was done remotely by way of video calls / verification, phone calls and submission of documents for verification through emails.

SQAC is able to certify that the emission reductions from TEIL Biomass Grid Supply Power Project, Khatauli, Uttar Pradesh, India, (UCR ID – 261) for the period **01/01/2013 to 31/12/2022** amounts to **8,62,201 tCO_2 (8,62,201 CoUs)**

Detailed Verification Report:

Purpose:

The project activity involves the renewable biomass (bagasse) based electricity generation within the Triveni Engineering & Industries Ltd (TEIL) plant located at City: Khatauli, State: Uttar Pradesh. This UCR project activity involves the installation of two 23 MW turbo generators along with two high pressure (86 kg/cm^2) 120 TPH capacity boilers commissioned in 19/10/2005 and 17/12/2006. The total installed capacity is hence 46 MW.

The power generated from the turbines is utilised for captive consumption and the surplus power is exported to the grid. Power is generated both in the sugar season and off-season at 11 kV and stepped-up on-site to 132 kV before being transmitted to the nearby UPPCL sub-station located at Khatauli.

Office of Executive Engineer
Electricity Distribution Division
PASCHIMANCHAL VIDYUT VITRAN NIGAM Ltd.
Muzaffarnagar (Uttar Pradesh)

Certificate of commissioning

This is to certify that M/s Triveni Engineering & Industries Ltd. Unit-Khatauli, Distt. Muzaffarnagar (U.P.) is having valid Power Purchase Agreement with PVVNL. The commissioning details of their bagasse based co-generation units as per PPA & our records are as follows :-

Unit Number, Capacity and Date of Commissioning Details		
Unit No.	Capacity	Date of Commissioning
1	23.0 MW	19/10/05
2	23.0 MW	17/12/06

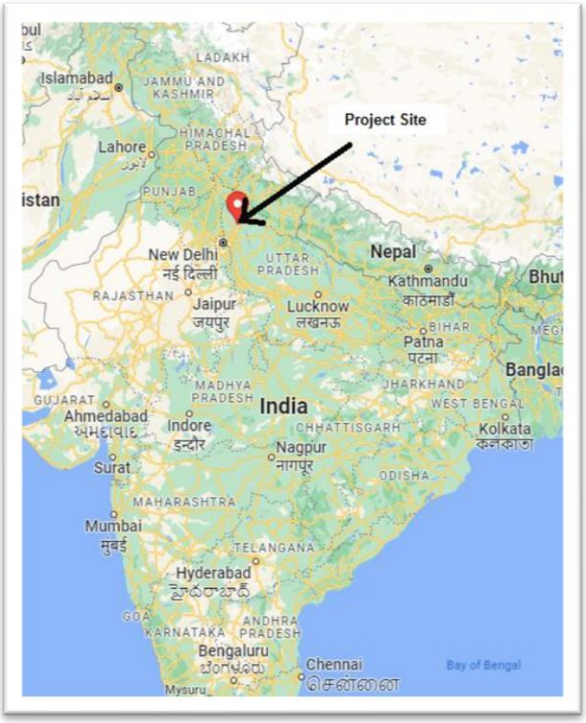
UPPCL Nodal Officer
Executive Engineer (Distribution)
Location: Muzaffarnagar

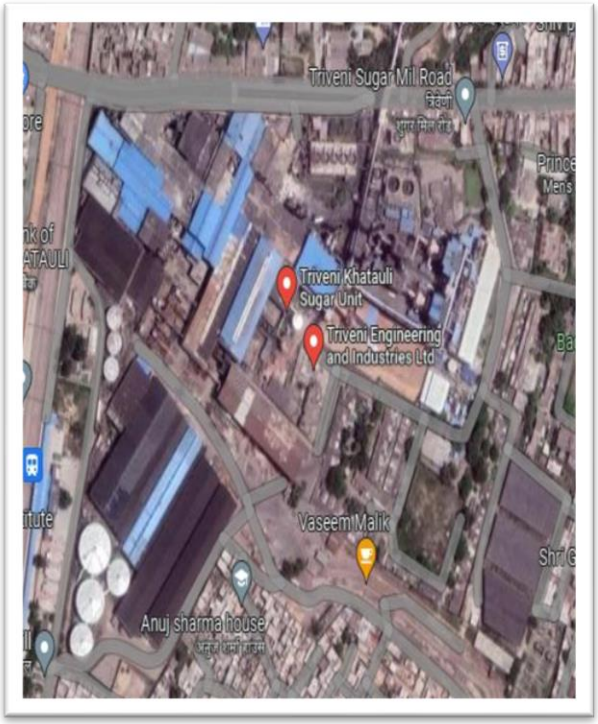
अधीक्षण अभियन्ता
विद्युत वितरण खण्ड
मुजफ्फरनगर

The UCR project activity is the construction and operation of a power plant/unit that uses renewable energy sources and supplies renewable electricity to the grid. The UCR project activity is thus the displacement of electricity that would be provided to the grid by more-GHG-intensive means and provides long-term benefits to the mitigation of climate change. The UCR project activity qualifies under the environmental additional positive list of pre-approved project types under the UCR carbon incentive model for issuance of voluntary carbon credits.

Location of project activity:

Country	: India
Village	: Sheikhpura,
City	: Khatauli,
District	: Muzaffarnagar
State	: Uttar Pradesh (UP)
Pin	: 251201
Latitude	: 29^0 16’ N
Longitude	: 77^o 42' E





Scope:

The scope covers verification of emission reductions from the project - TEIL Biomass Grid Supply Power Project, Khatauli, Uttar Pradesh, India, (UCR ID – 261).

Criteria:

Verification criteria is as per the requirements of UCR Standard.

Description of project:

The UCR project activity is a grid-connected biomass (bagasse-based) cogeneration power plant with a high-pressure steam-turbine configuration. The high-pressure boilers are fired by bagasse, a biomass by-product from the sugar manufacturing process, to generate steam which in turn is fed to the steam turbine to generate power. The overall business is integrated with alcohol distillation and power generation. The power co-generation units generate biomass-based power for captive consumption of the sugar plant and the sale of surplus power to the state grid. The project plant exports power to the Uttar Pradesh Power Corporation Limited (UPPCL), in absence of the project activity, UPPCL would have withdrawn electricity from northern regional grid.

The project activity has commissioned two (2) boilers with nominal capacity of 120 tons per hour (TPH) and outlet steam configuration of maximum capacity 87 kg/cm^2, 515^{o}C and two turbo generators with rating of 23 MW each (total 46 MW). The cogeneration cycle for the plant is designed as an energy efficient regenerative cycle.

The power is generated at 11 kV level. The internal consumption requirements for auxiliaries and equipment of the sugar plant and the cogeneration plant are met by stepping down voltage level to 415V. The exportable power is stepped up to 132 kV and paralleled with the UPPCL grid at the substation in Khatauli.

	Phase-1	**Phase-2**
Turbine		
Capacity (MW)	23	23
Steam Pressure	84 kg/cm^2 (G)	84 kg/cm^2 (G)
Steam temp.	510 °C	510 °C
Year of Commissioning	2005	2006
Boiler		
Capacity (Tons/hr)	120	120
Year of Commissioning	2005	2006
Steam temp.	86 kg/cm^2 (G)	86 kg/cm^2 (G)
Steam pressure	515±5 °C	515±5 °C

INSTRUMENT DETAILS	
Steam Flow:	
Make	Rosemount.
Sr. No	S 0226515
Steam Pressure:	
Make	Rosemount
Sr. No	S 0226501
Steam Temperature:	
Make	Rosemount
Sr. No	S-225016

Level of Assurance:

The verification report is based on the information collected through interviews conducted over video calls / phone calls, supporting documents provided during the verification, Project Concept Note (PCN) / Monitoring Report (MR), submitted to SQAC. The verification opinion is assured provided the credibility of all the above.

Review of the following documentation was done by SQAC Verifier, Mr. Santosh Nair, who is experienced in such projects.

Documentation Verified:

- Project Concept Note (PCN)
- Monitoring Report (MR)
- JMR's
- Month wise Quantity of biomass residue combusted in the project plant.
- Commissioning Certificate
- Calibration Certificates
- Power Purchase Agreement
- Invoices

Sampling:

Not applicable

Person interviewed:

1. Mr. Ashish Awasthi : Triveni Engineering and Industries Ltd.
2. Mr. Manish Saxena : Triveni Engineering and Industries Ltd.
3. Mr. Vipin Jindal : Triveni Engineering and Industries Ltd.
4. Mr. Vikas : Triveni Engineering and Industries Ltd.


CERTIFICATE OF CALIBRATION

Issued by :
YADAV MEASUREMENTS PRIVATE LIMITED
Plot no. F-373-375 RIICO Bhamashah Industrial Area,
Kaladwas ,Udaipur-Rajasthan-313003, INDIA
Tel: 0091-294-2650127,28, Fax: 0091-294-2650129
Email: Yadav.Measurements@ymllabs.com
website: www.yadavmeasurements.com
CIN number: U31909RJ2003PTC018450

CC-2735

Certificate No.: YMPL/327491/119117 ULR-CC273520000003362F Page 1 of 4

1	Name and address of customer	:-	M/s Triveni Engineering & Industries Ltd. Cogen Power Plant, Sugar Unit, Vill:-Sheikhpura, Post: Khatauli, Distt:- Muzaffarnagar Uttar Pradesh-251201
2	Reference		
	Service request form number	:-	2020-21/426
	Date of receipt of EUC	:-	1-Sep-2020
	Condition of EUC on receipt	:-	Satisfactory
3	Location of calibration	:-	132 kV Sub Station, Khatauli, Muzaffarnagar (U.P)
4	Calibration Details		
	Date of issue	:-	2-Sep-2020
	Date of calibration	:-	1-Sep-2020
	Due Date of calibration	:-	31-Aug-2021
5	Description of equipment under calibration		
	Name	:-	3-Phase Energy Meter
	Sr.No.	:-	APM04213 (Main)
	Rack No.	:-	APS00984
	Make	:-	Secure Meters Ltd.
	Type	:-	R3M021-234, 3Ph,4Wire
	Model	:-	Apex
	Voltage	:-	3x63.5 V (p-n)
	Current	:-	Ib: 1A, Imax: 1.2A
	Voltage Ratio	:-	/110V/√3
	Current Ratio	:-	/1A
	Class	:-	0.2s For Active 0.5s For Reactive
	Meter constant	:-	160 imp/Unit
	Unit	:-	Wh, VArh
	Frequency	:-	50Hz
6	Environmental conditions of measurements		
	Temperature	:-	27.9-28.4°C
	Relative Humidity	:-	55-60%
	Weather	:-	Clear
7	Witnessed by		
		:-	Mr. Sonam Singh EE EDD, Khatauli Mr. Vipin Gupta EE (T&C), Muzaffarnagar Mr. Vikas Upadhyay EE (Trans.), Muzaffarnagar Mr. Gaurav Dutt AE (T&C), Sub Div. Nara Muzaffarnagar Mr. Dharmendra Kumar SDO (Trans.), Muzaffarnagar Mr. Tejwant SDO (Dist.) Khatauli Mr. Vikas Aggarwal GM(PP) Mr. G.Suresh Sr.Manager Triveni Engg. & Ind. Ltd., Khatauli

Checked by : (JAPIN) (SACHIN YADAV)

Approved by : Tej Singh Dhanoa

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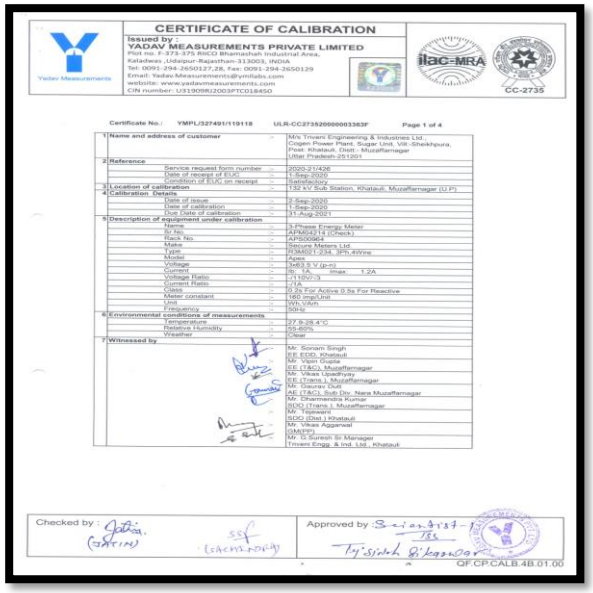
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website: www.yadavmeasurements.com
CIN number: U31909RJ2003PTC018450

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Certificate No.: YMPL/327491/119118 ULR-CC273520000003363F Page 1 of 4

1	Name and address of customer	:-	M/s Triveni Engineering & Industries Ltd., Cogen Power Plant, Sugar Unit, Vill:-Sheikhpura, Post: Khatauli, Distt:- Muzaffarnagar Uttar Pradesh-251201
2	Reference		
	Service request form number	:-	2020-21/426
	Date of receipt of EUC	:-	1-Sep-2020
	Condition of EUC on receipt	:-	Satisfactory
3	Location of calibration	:-	132 kV Sub Station, Khatauli, Muzaffarnagar (U.P)
4	Calibration Details		
	Date of issue	:-	2-Sep-2020
	Date of calibration	:-	1-Sep-2020
	Due Date of calibration	:-	31-Aug-2021
5	Description of equipment under calibration		
	Name	:-	3-Phase Energy Meter
	Sr.No.	:-	APM04214 (Check)
	Rack No.	:-	APS00984
	Make	:-	Secure Meters Ltd.
	Type	:-	R3M021-234, 3Ph,4Wire
	Model	:-	Apex
	Voltage	:-	3x63.5 V (p-n)
	Current	:-	Ib: 1A, Imax: 1.2A
	Voltage Ratio	:-	/110V/√3
	Current Ratio	:-	/1A
	Class	:-	0.2s For Active 0.5s For Reactive
	Meter constant	:-	160 imp/Unit
	Unit	:-	Wh, VArh
	Frequency	:-	50Hz
6	Environmental conditions of measurements		
	Temperature	:-	27.9-28.4°C
	Relative Humidity	:-	55-60%
	Weather	:-	Clear
7	Witnessed by		
		:-	Mr. Sonam Singh EE EDD, Khatauli Mr. Vipin Gupta EE (T&C), Muzaffarnagar Mr. Vikas Upadhyay EE (Trans.), Muzaffarnagar Mr. Gaurav Dutt AE (T&C), Sub Div. Nara Muzaffarnagar Mr. Dharmendra Kumar SDO (Trans.), Muzaffarnagar Mr. Tejwant SDO (Dist.) Khatauli Mr. Vikas Aggarwal GM(PP) Mr. G.Suresh Sr.Manager Triveni Engg. & Ind. Ltd., Khatauli

Checked by : (JAPIN) (SACHIN YADAV)

Approved by : Tej Singh Dhanoa

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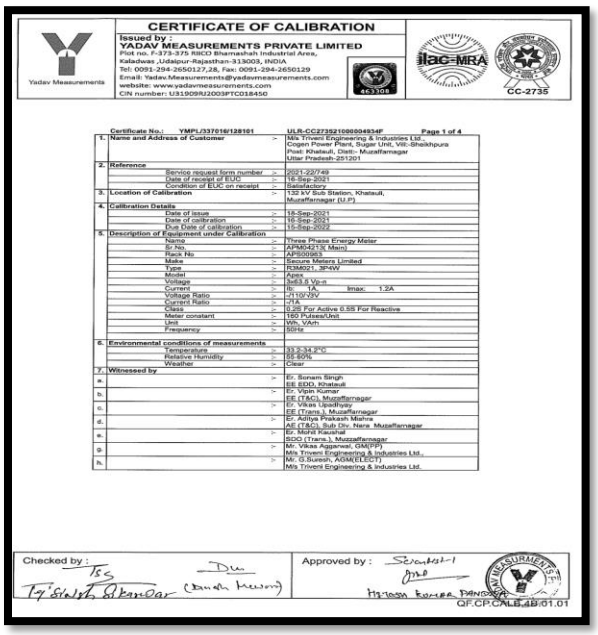
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CIN number: U31909RJ2003PTC018450

CC-2735

Certificate No.: YMPL/337016/128101 ULR-CC273521000004934F Page 1 of 4

1.	Name and Address of Customer	:-	M/s Triveni Engineering & Industries Ltd., Cogen Power Plant, Sugar Unit, Vill:-Sheikhpura Post: Khatauli, Distt:- Muzaffarnagar Uttar Pradesh-251201
2.	Reference		
	Service request form number	:-	2021-22/749
	Date of receipt of EUC	:-	16-Sep-2021
	Condition of EUC on receipt	:-	Satisfactory
3.	Location of Calibration	:-	132 kV Sub Station, Khatauli, Muzaffarnagar (U.P)
4.	Calibration Details		
	Date of issue	:-	16-Sep-2021
	Date of calibration	:-	16-Sep-2021
	Due Date of calibration	:-	15-Sep-2022
5.	Description of Equipment under Calibration		
	Name	:-	Three Phase Energy Meter
	Sr.No.	:-	APM04213(Main)
	Rack No.	:-	APS00984
	Make	:-	Secure Meters Limited
	Type	:-	R3M021_3P4W
	Model	:-	Apex
	Voltage	:-	3x63.5 V(n-n
	Current	:-	Ib: 1A, Imax: 1.2A
	Voltage Ratio	:-	/110V/√3V
	Current Ratio	:-	/1A
	Class	:-	0.2S For Active 0.5S For Reactive
	Meter constant	:-	160 Pulses/Unit
	Unit	:-	Wh, VArh
	Frequency	:-	50Hz
6.	Environmental conditions of measurements		
	Temperature	:-	33.2-34.2°C
	Relative Humidity	:-	55-60%
	Weather	:-	Clear
7.	Witnessed by		
a.		:-	Er. Sonam Singh EE EDD, Khatauli
b.		:-	Er. Vipin Kumar EE (T&C), Muzaffarnagar
c.		:-	Er. Vikas Upadhyay EE (Trans.), Muzaffarnagar
d.		:-	Er. Aditya Prakash Mishra AE (T&C), Sub Div. Nara Muzaffarnagar
e.		:-	Er. Mohit Kaushal SDO (Trans.), Muzaffarnagar
f.		:-	Mr. Vikas Aggarwal, GM(PP) M/s Triveni Engineering & Industries Ltd.,
g.		:-	Mr. G.Suresh, AGM(ELECT) M/s Triveni Engineering & Industries Ltd.
h.			

Checked by : Tej Singh Dhanoa (Dinesh Kumar)

Approved by : Hitesh Kumar Panchal

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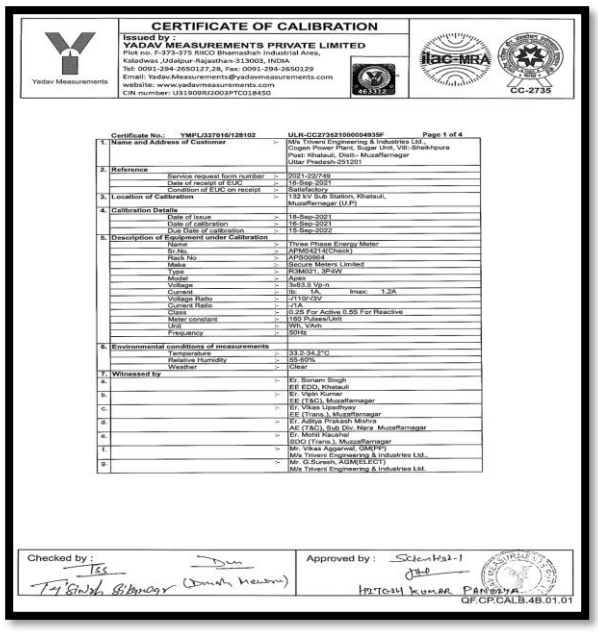
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website: www.yadavmeasurements.com
CIN number: U31909RJ2003PTC018450

CC-2735

Certificate No.: YMPL/337016/128102 ULR-CC273521000004935F Page 1 of 4

1.	Name and Address of Customer	:-	M/s Triveni Engineering & Industries Ltd., Cogen Power Plant, Sugar Unit, Vill:-Sheikhpura Post: Khatauli, Distt:- Muzaffarnagar Uttar Pradesh-251201
2.	Reference		
	Service request form number	:-	2021-22/749
	Date of receipt of EUC	:-	16-Sep-2021
	Condition of EUC on receipt	:-	Satisfactory
3.	Location of Calibration	:-	132 kV Sub Station, Khatauli, Muzaffarnagar (U.P)
4.	Calibration Details		
	Date of issue	:-	16-Sep-2021
	Date of calibration	:-	16-Sep-2021
	Due Date of calibration	:-	15-Sep-2022
5.	Description of Equipment under Calibration		
	Name	:-	Three Phase Energy Meter
	Sr.No.	:-	APM04214(Check)
	Rack No	:-	APS00984
	Make	:-	Secure Meters Limited
	Type	:-	R3M021_3P4W
	Model	:-	Apex
	Voltage	:-	3x63.5 Vp-n
	Current	:-	Ib: 1A, Imax: 1.2A
	Voltage Ratio	:-	/110V/√3V
	Current Ratio	:-	/1A
	Class	:-	0.2S For Active 0.5S For Reactive
	Meter constant	:-	160 Pulses/Unit
	Unit	:-	Wh, VArh
	Frequency	:-	50Hz
6.	Environmental conditions of measurements		
	Temperature	:-	33.2-34.2°C
	Relative Humidity	:-	55-60%
	Weather	:-	Clear
7.	Witnessed by		
a.		:-	Er. Sonam Singh EE EDD, Khatauli
b.		:-	Er. Vipin Kumar EE (T&C), Muzaffarnagar
c.		:-	Er. Vikas Upadhyay EE (Trans.), Muzaffarnagar
d.		:-	Er. Aditya Prakash Mishra AE (T&C), Sub Div. Nara Muzaffarnagar
e.		:-	Er. Mohit Kaushal SDO (Trans.), Muzaffarnagar
f.		:-	Mr. Vikas Aggarwal, GM(PP) M/s Triveni Engineering & Industries Ltd.,
g.		:-	Mr. G.Suresh, AGM(ELECT) M/s Triveni Engineering & Industries Ltd.

Checked by : Tej Singh Dhanoa (Dinesh Kumar)

Approved by : Hitesh Kumar Panchal

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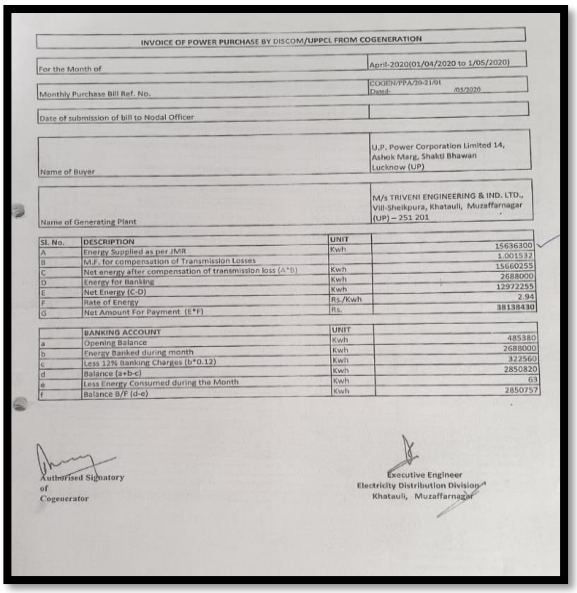


INVOICE OF POWER PURCHASE BY DISCOM/UPPCL FROM COGENERATION

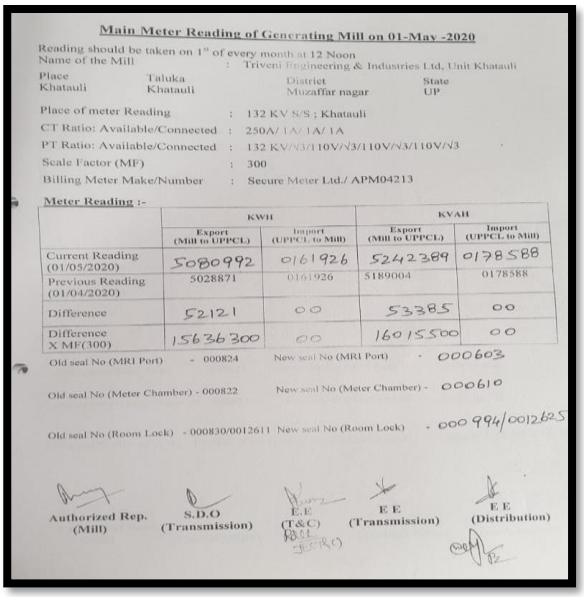
For the Month of	April-2020(01/04/2020 to 1/05/2020)
Monthly Purchase Bill Ref. No.	COGEN/PPA/39-21/01 Dated /04/2020
Date of submission of bill to Nodal Officer	
Name of Buyer	U.P. Power Corporation Limited 14, Ashok Marg, Shakti Bhawan Lucknow (UP)
Name of Generating Plant	M/s TRIVENI ENGINEERING & IND. LTD., Vill-Sheikpura, Khatauli, Muzaffarnagar (UP) – 251 201

Sl. No.	DESCRIPTION	UNIT	
A	Energy Supplied as per JMR	Kwh	15636300
B	M.F. for compensation of Transmission Losses		1.001532
C	Net energy after compensation of transmission loss (A*b)	Kwh	15660255
D	Energy for Banking	Kwh	2688000
E	Net Energy (C-D)	Kwh	12972255
F	Rate of Energy	Rs./Kwh	2.94
G	Net Amount For Payment (E*F)	Rs.	38138430

	BANKING ACCOUNT	UNIT	
a	Opening Balance	Kwh	485380
b	Energy Banked during month	Kwh	2688000
c	Less 12% Banking Charges (b*0.12)	Kwh	322560
d	Balance (a+b-c)	Kwh	2850820
e	Less Energy Consumed during the Month	Kwh	63
f	Balance B/F (d-e)	Kwh	2850757

Authorised Signatory of Cogenerator

Executive Engineer
Electricity Distribution Division-I
Khatauli, Muzaffarnagar



Main Meter Reading of Generating Mill on 01-May -2020

Reading should be taken on 1st of every month at 12 Noon
Name of the Mill : Triveni Engineering & Industries Ltd, Unit-Khatauli

Place: Khatauli | Taluka: Khatauli | District: Muzaffar nagar | State: UP

Place of meter Reading : 132 KV S/S ; Khatauli
CT Ratio: Available/Connected : 250A/1A/1A/1A
PT Ratio: Available/Connected : 132 KV/√3/110V/√3/110V/√3/110V/√3
Scale Factor (MF) : 300
Billing Meter Make/Number : Secure Meter Ltd./ APM04213

Meter Reading :-

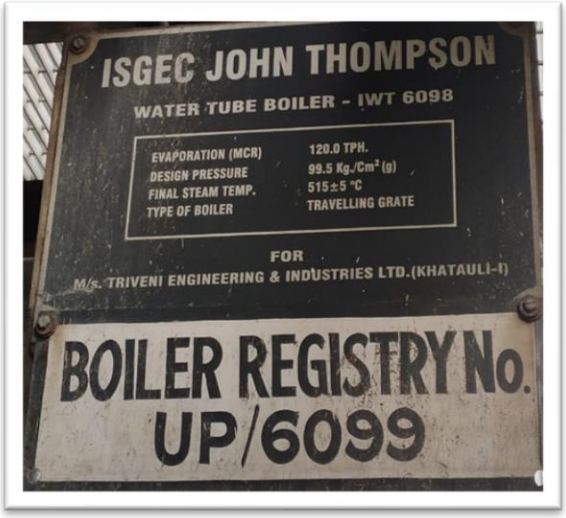
	KWH		KVAH	
	Export (Mill to UPPCL)	Import (UPPCL to Mill)	Export (Mill to UPPCL)	Import (UPPCL to Mill)
Current Reading (01/05/2020)	5080992	0161926	5242389	0178588
Previous Reading (01/04/2020)	5028871	0161926	5189004	0178588
Difference	52121	00	53385	00
Difference X MF(300)	15636300	00	16015500	00

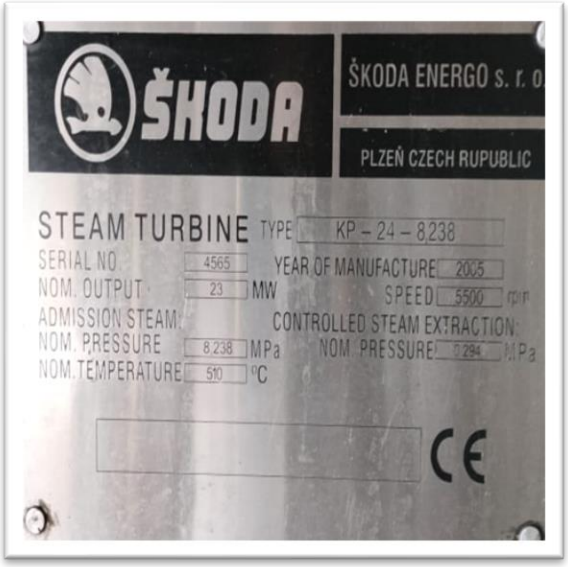
Old seal No (MRI Port) - 000824 New seal No (MRI Port) - 000603

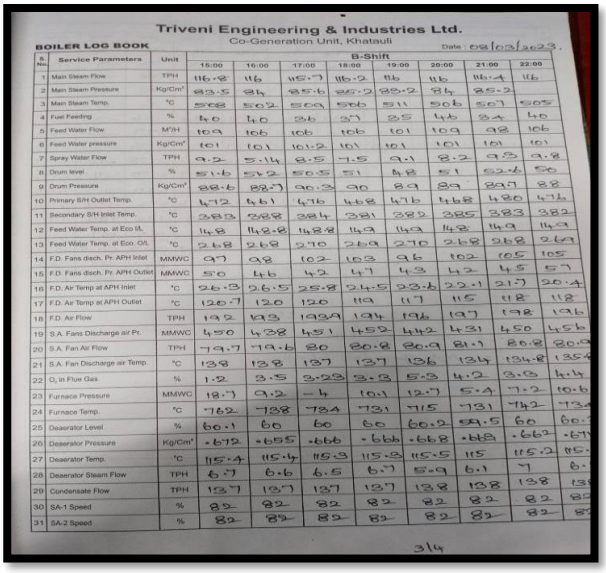
Old seal No (Meter Chamber) - 000822 New seal No (Meter Chamber) - 000610

Old seal No (Room Lock) - 000830/0012611 New seal No (Room Lock) - 000994/0012625

Authorized Rep. (Mill) | S.D.O (Transmission) | E.E (T&C) | E E (Transmission) | E E (Distribution)





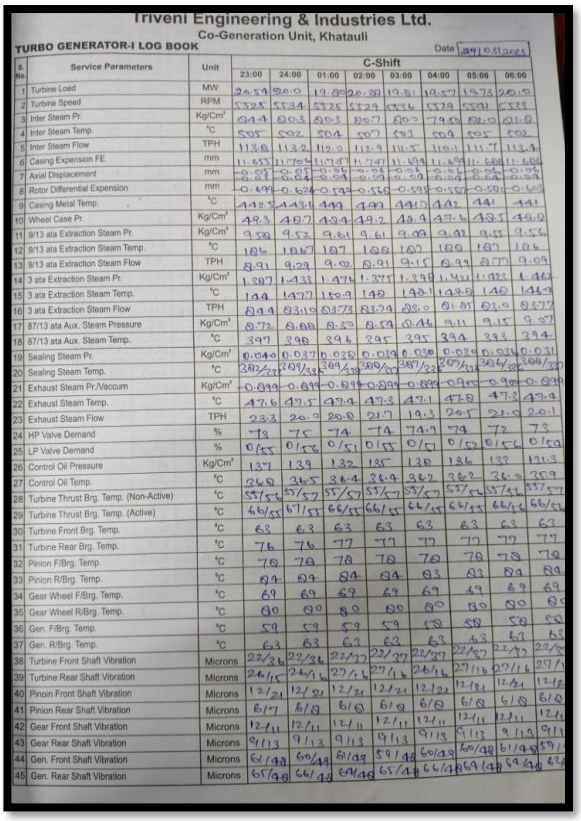


Triveni Engineering & Industries Ltd.
Co-Generation Unit, Khatauli

BOILER LOG BOOK Date : 08/03/2023.

S. No.	Service Parameters	Unit	B-Shift 15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00
1	Main Steam Flow	TPH	116·8	116	115·7	116·2	116	116	116·4	116
2	Main Steam Pressure	Kg/Cm²	83·5	84	85·6	85·2	85·2	84	85·2	
3	Main Steam Temp.	°C	508	502	509	506	511	506	507	505
4	Fuel Feeding	%	40	40	36	37	35	46	54	46
5	Feed Water Flow	M³/H	109	106	106	106	101	109	98	106
6	Feed Water pressure	Kg/Cm²	101	101	101·2	101	101	101	101	101
7	Spray Water Flow	TPH	9·2	5·14	8·5	7·5	9·1	8·2	9·5	9·8
8	Drum level	%	51·6	51·2	50·5	51	48	51	52·4	50
9	Drum Pressure	Kg/Cm²	88·6	88·7	90·3	90	89	89	89·7	88
10	Primary S/H Outlet Temp.	°C	472	461	476	468	476	468	480	476
11	Secondary S/H Inlet Temp	°C	383	388	384	381	382	385	383	382
12	Feed Water Temp. at Eco I/L	°C	148	148·8	1488	149	149	148	149	149
13	Feed Water Temp. at Eco. O/L	°C	268	268	270	269	270	268	268	269
14	F.D. Fans disch. Pr. APH Inlet	MMWC	97	98	102	103	96	102	105	105
15	F.D. Fans disch. Pr. APH Outlet	MMWC	50	46	42	47	43	42	45	57
16	F.D. Air Temp at APH Inlet	°C	26·3	26·5	25·8	24·5	23·6	22·1	21·7	20·4
17	F.D. Air Temp at APH Outlet	°C	120·7	120	120	119	117	115	118	118
18	F.D. Air Flow	TPH	192	193	1939	194	196	197	198	196
19	S.A. Fans Discharge air Pr.	MMWC	450	438	451	452	442	431	450	456
20	S.A. Fan Air Flow	TPH	79·7	79·6	80	80·8	80·9	81·1	80·8	80·9
21	S.A. Fan Discharge air Temp.	°C	138	138	137	137	136	134	134·8	135·4
22	O_2 in Flue Gas	%	1·2	3·5	3·28	3·8	5·3	4·2	3·8	4·4
23	Furnace Pressure	MMWC	18·7	9·2	−4	10·1	12·7	5·4	7·2	10·6
24	Furnace Temp.	°C	782	788	784	731	715	731	742	734
25	Deaerator Level	%	60·1	60	60	60	60·2	59·5	60	60
26	Deaerator Pressure	Kg/Cm²	·672	·655	·666	·666	·668	·668	·662	·671
27	Deaerator Temp.	°C	115·4	115·4	115·3	115·9	115·5	115	115·2	115
28	Deaerator Steam Flow	TPH	6·7	6·6	6·5	6·7	5·9	6·1	7	6·5
29	Condensate Flow	TPH	137	137	137	137	138	138	138	138
30	SA-1 Speed	%	82	82	82	82	82	82	82	82
31	SA-2 Speed	%	82	82	82	82	82	82	82	82

314

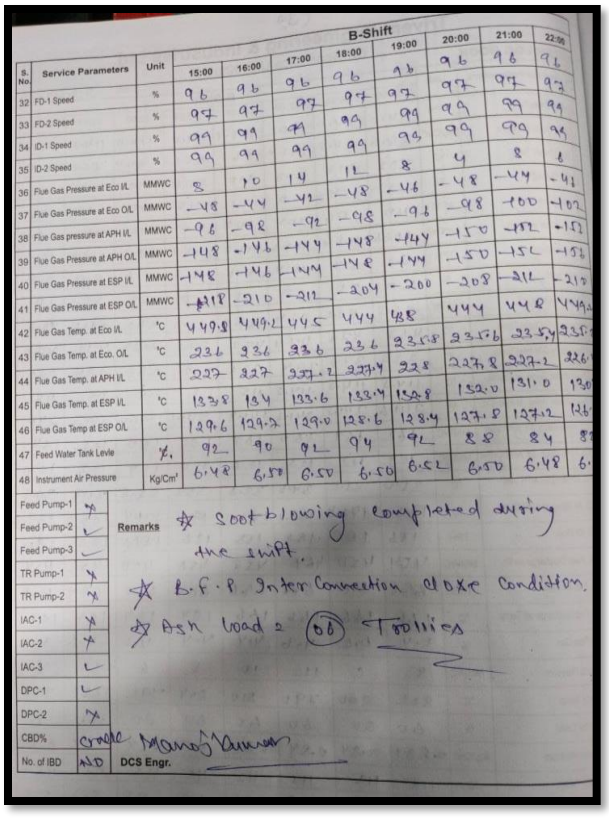


Triveni Engineering & Industries Ltd.
Co-Generation Unit, Khatauli

TURBO GENERATOR-I LOG BOOK

Date 29/01/2023

S. No.	Service Parameters	Unit	C-Shift 23:00	24:00	01:00	02:00	03:00	04:00	05:00	06:00
1	Turbine Load	MW	20.54	20.0	19.90	20.38	19.81	19.57	19.75	20.0
2	Turbine Speed	RPM	5525	5534	5525	5529	5536	5529	5531	5529
3	Inter Steam Pr.	Kg/Cm²	804	803	803	807	803	799	802	811
4	Inter Steam Temp.	°C	505	502	504	507	503	503	505	502
5	Inter Steam Flow	TPH	113.8	113.2	112.0	112.9	111.5	110.1	111.7	113.4
6	Casing Expension FE	mm	11.655	11.704	11.787	11.747	11.699	11.699	11.688	11.606
7	Axial Displacement	mm	-0.07 / -0.03	-0.07 / -0.04	-0.06 / -0.04	-0.06 / -0.04	-0.05 / -0.03	-0.05 / -0.04	-0.06 / -0.04	-0.06 / -0.04
8	Rotor Differential Expension	mm	-0.699	-0.624	-0.589	-0.566	-0.595	-0.550	-0.501	-0.565
9	Casing Metal Temp.	°C	443	443	444	444	444	442	441	441
10	Wheel Case Pr.	Kg/Cm²	48.3	48.7	49.4	49.2	48.4	47.6	48.1	48.0
11	9/13 ata Extraction Steam Pr.	Kg/Cm²	9.58	9.52	9.61	9.61	9.64	9.62	9.55	9.56
12	9/13 ata Extraction Steam Temp.	°C	186	186.7	187	188	187	188	187	186
13	9/13 ata Extraction Steam Flow	TPH	8.91	9.29	9.00	8.91	9.15	8.99	8.77	9.09
14	3 ata Extraction Steam Pr.	Kg/Cm²	1.387	1.433	1.474	1.375	1.398	1.421	1.423	1.462
15	3 ata Extraction Steam Temp.	°C	144	147.7	150.9	148	148.1	143.8	140	144.9
16	3 ata Extraction Steam Flow	TPH	84.9	83.19	83.73	83.94	83.0	81.81	82.0	83.77
17	87/13 ata Aux. Steam Pressure	Kg/Cm²	8.72	8.68	8.80	8.59	8.46	8.11	8.15	8.57
18	87/13 ata Aux. Steam Temp.	°C	397	398	396	395	395	394	393	394
19	Sealing Steam Pr.	Kg/Cm²	0.040	0.037	0.035	0.019	0.030	0.029	0.034	0.031
20	Sealing Steam Temp.	°C	282/332	269/332	289/332	280/332	287/332	267/332	264/332	268/332
21	Exhaust Steam Pr./Vaccum	Kg/Cm²	-0.899	-0.899	-0.899	-0.899	-0.899	-0.900	-0.900	-0.899
22	Exhaust Steam Temp.	°C	47.6	47.5	47.4	47.3	47.1	47.0	47.2	47.4
23	Exhaust Steam Flow	TPH	23.3	20.9	20.0	21.7	19.3	20.5	21.0	20.1
24	HP Valve Demand	%	73	75	74	74	74.9	73	72	73
25	LP Valve Demand	%	0/55	0/55	0/51	0/55	0/57	0/52	0/56	0/54
26	Control Oil Pressure	Kg/Cm²	137	139	132	135	128	126	132	131.5
27	Control Oil Temp.	°C	360	365	364	364	362	362	364	359
28	Turbine Thrust Brg. Temp. (Non-Active)	°C	55/55	55/57	55/57	55/57	55/57	55/54	55/52	55/57
29	Turbine Thrust Brg. Temp. (Active)	°C	66/55	67/57	66/55	66/55	66/55	66/53	66/54	66/56
30	Turbine Front Brg. Temp.	°C	63	63	63	63	63	63	63	63
31	Turbine Rear Brg. Temp.	°C	76	76	77	77	77	77	77	77
32	Pinion F/Brg. Temp.	°C	78	78	78	78	78	78	78	78
33	Pinion R/Brg. Temp.	°C	84	84	84	84	83	83	84	84
34	Gear Wheel F/Brg. Temp.	°C	69	69	69	69	69	69	69	69
35	Gear Wheel R/Brg. Temp.	°C	80	80	80	80	80	80	80	80
36	Gen. F/Brg. Temp.	°C	59	59	59	59	58	58	58	58
37	Gen. R/Brg. Temp.	°C	63	63	63	63	63	63	63	63
38	Turbine Front Shaft Vibration	Microns	22/36	22/36	22/33	22/37	22/37	22/37	22/37	22/36
39	Turbine Rear Shaft Vibration	Microns	26/15	26/16	27/16	27/16	26/16	27/16	27/16	27/16
40	Pinoin Front Shaft Vibration	Microns	12/21	12/21	12/21	12/21	12/21	12/21	12/21	12/21
41	Pinion Rear Shaft Vibration	Microns	6/7	6/8	6/8	6/8	6/8	6/8	6/8	6/8
42	Gear Front Shaft Vibration	Microns	12/11	12/11	12/11	12/11	12/11	12/11	12/11	12/11
43	Gear Rear Shaft Vibration	Microns	9/13	9/13	9/13	9/13	9/13	9/13	9/13	9/13
44	Gen. Front Shaft Vibration	Microns	61/48	60/48	61/48	59/48	60/48	60/48	61/48	59/48
45	Gen. Rear Shaft Vibration	Microns	65/48	66/48	64/48	65/48	66/48	64/48	64/48	67/48



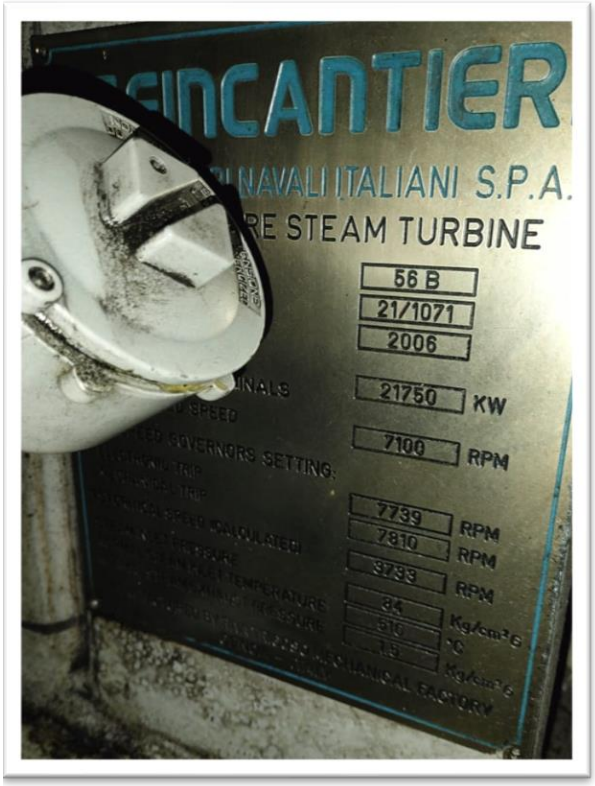
B-Shift

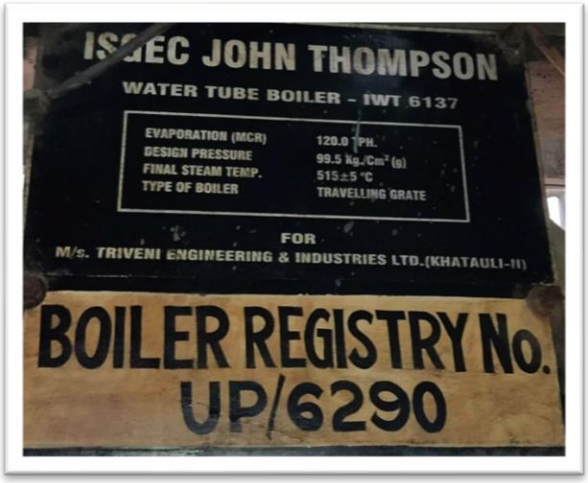
S. No.	Service Parameters	Unit	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00
32	FD-1 Speed	%	96	96	96	96	96	96	96	96
33	FD-2 Speed	%	97	97	97	97	97	97	97	97
34	ID-1 Speed	%	99	99	99	99	99	99	99	99
35	ID-2 Speed	%	99	99	99	99	98	99	8	8
36	Flue Gas Pressure at Eco I/L	MMWC	8	10	14	11	8	4	-44	-41
37	Flue Gas Pressure at Eco O/L	MMWC	-48	-44	-42	-48	-46	-48	-44	-41
38	Flue Gas pressure at APH I/L	MMWC	-96	-98	-92	-98	-96	-98	-100	-102
39	Flue Gas Pressure at APH O/L	MMWC	-148	-146	-144	-148	-144	-150	-152	-152
40	Flue Gas Pressure at ESP I/L	MMWC	-148	-146	-144	-148	-144	-150	-152	-152
41	Flue Gas Pressure at ESP O/L	MMWC	-218	-210	-212	-204	-200	-208	-212	-212
42	Flue Gas Temp. at Eco I/L	°C	449.8	449.2	445	444	448	444	448	444.2
43	Flue Gas Temp. at Eco. O/L	°C	236	236	236	236	235.8	235.6	235.4	235.8
44	Flue Gas Temp. at APH I/L	°C	227	227	227.2	227.4	228	227.8	227.2	226.4
45	Flue Gas Temp. at ESP I/L	°C	133.8	134	133.6	133.4	132.8	132.0	131.0	130.4
46	Flue Gas Temp at ESP O/L	°C	129.6	129.2	129.0	128.6	128.4	127.8	127.2	126.4
47	Feed Water Tank Levle	%	92	90	92	94	92	88	84	82
48	Instrument Air Pressure	Kg/Cm²	6.48	6.50	6.50	6.50	6.52	6.50	6.48	6.46

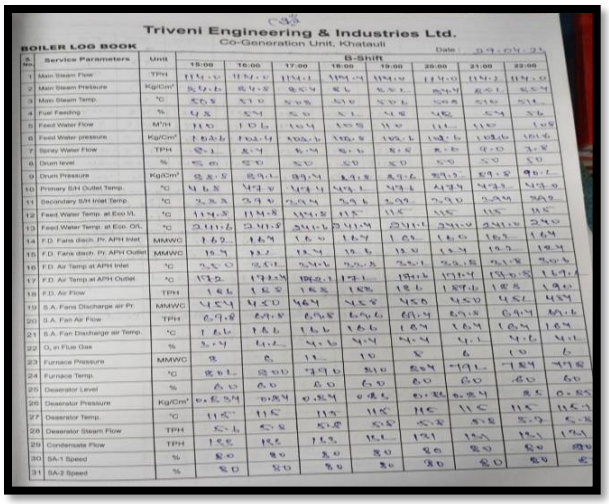
Feed Pump-1	✓	
Feed Pump-2	✓	
Feed Pump-3	—	
TR Pump-1	✓	
TR Pump-2	✓	
IAC-1	✓	
IAC-2	✓	
IAC-3	✓	
DPC-1	✓	
DPC-2	✓	
CBD%		
No. of IBD	NIL	

Remarks
☆ Soot blowing completed during the shift.
☆ B.F.P. Inter Connection Valve Condition.
☆ Ash load = (66) Tonnes

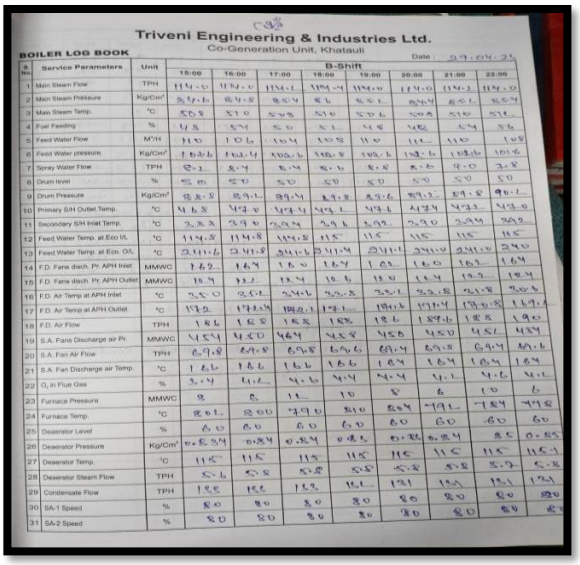
DCS Engr.



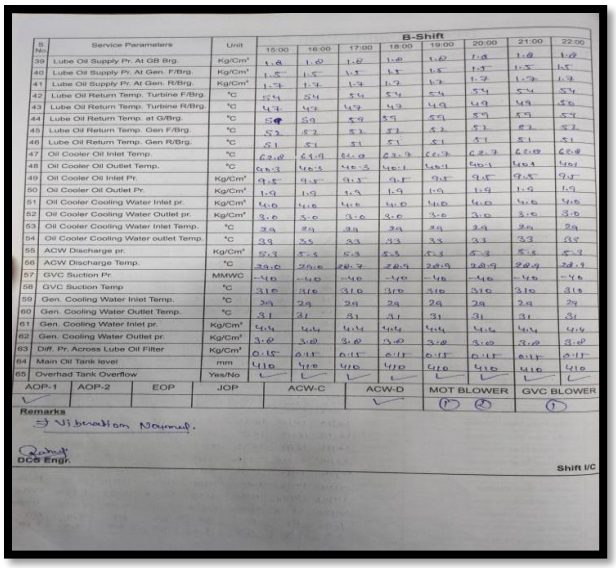



Triveni Engineering & Industries Ltd.
Co-Generation Unit, Khatauli
BOILER LOG BOOK
Date : 09-04-23

S. No.	Service Parameters	Unit	B-Shift 15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00
1	Main Steam Flow	TPH	114.0	114.0	114.1	114.4	114.0	114.0	114.2	114.0
2	Main Steam Pressure	Kg/Cm²	84.6	84.8	84.4	84	84.1	84.4	84.1	84.4
3	Main Steam Temp.	°C	508	510	508	510	508	508	510	510
4	Fuel Feeding	%	48	54	50	51	48	48	54	56
5	Feed Water Flow	M³/H	110	106	104	108	110	111	110	108
6	Feed Water pressure	Kg/Cm²	104.6	104.4	104.6	104.8	104.6	104.6	104.6	104.6
7	Spray Water Flow	TPH	8.2	8.4	8.4	8.6	8.8	8.8	9.0	7.8
8	Drum level	%	50	50	50	50	50	50	50	50
9	Drum Pressure	Kg/Cm²	88.8	89.1	89.4	89.8	89.6	89.3	89.8	90.1
10	Primary S/H Outlet Temp.	°C	468	472	472.4	472.1	472.1	471.4	472.3	472.0
11	Secondary S/H Inlet Temp.	°C	383	390	390.4	389.6	389.9	389.0	389.4	389
12	Feed Water Temp. at Eco I/L	°C	114.8	114.8	114.8	115	115	115	115	115
13	Feed Water Temp. at Eco. O/L	°C	241.6	241.8	241.6	241.4	241.1	241.0	241.0	240
14	F.D. Fans disch. Pr. APH Inlet	MMWC	162	164	160	164	162	160	163	164
15	F.D. Fans disch. Pr. APH Outlet	MMWC	184	182	184	186	182	184	185	184
16	F.D. Air Temp at APH Inlet	°C	350	350	346.6	352.8	352.6	352.8	351.8	350.6
17	F.D. Air Temp at APH Outlet	°C	192	192.4	192.1	192.1	191.8	191.4	192.0	191.4
18	F.D. Air Flow	TPH	186	188	188	188	186	184.6	188	190
19	S.A. Fans Discharge air Pr.	MMWC	454	450	464	458	450	450	452	454
20	S.A. Fan Air Flow	TPH	69.8	69.8	69.8	69.6	69.4	69.8	69.4	69.6
21	S.A. Fan Discharge air Temp.	°C	186	186	186	186	184	184	184	184
22	O₂ in Flue Gas	%	3.4	4.2	4.6	4.4	4.4	4.2	4.6	4.2
23	Furnace Pressure	MMWC	8	8	12	10	8	6	10	6
24	Furnace Temp.	°C	801	800	799	810	804	798	784	798
25	Deaerator Level	%	60	60	60	60	60	60	60	60
26	Deaerator Pressure	Kg/Cm²	0.834	0.834	0.834	0.834	0.834	0.834	0.84	0.834
27	Deaerator Temp.	°C	115	115	115	115	115	115	115	115
28	Deaerator Steam Flow	TPH	5.6	5.8	5.8	5.8	5.8	5.8	5.8	5.8
29	Condensate Flow	TPH	198	198	198	196	198	196	196	196
30	SA-1 Speed	%	80	80	80	80	80	80	80	80
31	SA-2 Speed	%	80	80	80	80	80	80	80	80


Triveni Engineering & Industries Ltd.
Co-Generation Unit, Khatauli
BOILER LOG BOOK
Date : 09-04-23

S. No.	Service Parameters	Unit	B-Shift 15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00
1	Main Steam Flow	TPH	114.0	114.0	114.1	114.4	114.0	114.0	114.2	114.0
2	Main Steam Pressure	Kg/Cm²	84.6	84.8	84.4	84	84.1	84.4	84.1	84.4
3	Main Steam Temp.	°C	508	510	508	510	508	508	510	510
4	Fuel Feeding	%	48	54	50	51	48	48	54	56
5	Feed Water Flow	M³/H	110	106	104	108	110	111	110	108
6	Feed Water pressure	Kg/Cm²	104.6	104.4	104.6	104.8	104.6	104.6	104.6	104.6
7	Spray Water Flow	TPH	8.2	8.4	8.4	8.6	8.8	8.8	9.0	7.8
8	Drum level	%	50	50	50	50	50	50	50	50
9	Drum Pressure	Kg/Cm²	88.8	89.1	89.4	89.8	89.6	89.3	89.8	90.1
10	Primary S/H Outlet Temp.	°C	468	472	472.4	472.1	472.1	471.4	472.3	472.0
11	Secondary S/H Inlet Temp.	°C	383	390	390.4	389.6	389.9	389.0	389.4	389
12	Feed Water Temp. at Eco I/L	°C	114.8	114.8	114.8	115	115	115	115	115
13	Feed Water Temp. at Eco. O/L	°C	241.6	241.8	241.6	241.4	241.1	241.0	241.0	240
14	F.D. Fans disch. Pr. APH Inlet	MMWC	162	164	160	164	162	160	163	164
15	F.D. Fans disch. Pr. APH Outlet	MMWC	184	182	184	186	182	184	185	184
16	F.D. Air Temp at APH Inlet	°C	350	350	346.6	352.8	352.6	352.8	351.8	350.6
17	F.D. Air Temp at APH Outlet	°C	192	192.4	192.1	192.1	191.8	191.4	192.0	191.4
18	F.D. Air Flow	TPH	186	188	188	188	186	184.6	188	190
19	S.A. Fans Discharge air Pr.	MMWC	454	450	464	458	450	450	452	454
20	S.A. Fan Air Flow	TPH	69.8	69.8	69.8	69.6	69.4	69.8	69.4	69.6
21	S.A. Fan Discharge air Temp.	°C	186	186	186	186	184	184	184	184
22	O₂ in Flue Gas	%	3.4	4.2	4.6	4.4	4.4	4.2	4.6	4.2
23	Furnace Pressure	MMWC	8	8	12	10	8	6	10	6
24	Furnace Temp.	°C	801	800	799	810	804	798	784	798
25	Deaerator Level	%	60	60	60	60	60	60	60	60
26	Deaerator Pressure	Kg/Cm²	0.834	0.834	0.834	0.834	0.834	0.834	0.84	0.834
27	Deaerator Temp.	°C	115	115	115	115	115	115	115	115
28	Deaerator Steam Flow	TPH	5.6	5.8	5.8	5.8	5.8	5.8	5.8	5.8
29	Condensate Flow	TPH	198	198	198	196	198	196	196	196
30	SA-1 Speed	%	80	80	80	80	80	80	80	80
31	SA-2 Speed	%	80	80	80	80	80	80	80	80



S. No.	Service Parameters	Unit	B-Shift 15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00
39	Lube Oil Supply Pr. At GB Brg.	Kg/Cm²	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
40	Lube Oil Supply Pr. At Gen. F/Brg.	Kg/Cm²	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
41	Lube Oil Supply Pr. At Gen. R/Brg.	Kg/Cm²	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
42	Lube Oil Return Temp. Turbine F/Brg.	°C	54	54	54	54	54	54	54	54
43	Lube Oil Return Temp. Turbine R/Brg.	°C	47	47	47	47	49	49	49	50
44	Lube Oil Return Temp. at G/Brg.	°C	58	59	59	59	59	59	59	59
45	Lube Oil Return Temp. Gen F/Brg.	°C	52	52	52	52	52	51	52	52
46	Lube Oil Return Temp. Gen R/Brg.	°C	51	51	51	51	51	51	51	51
47	Oil Cooler Oil Inlet Temp.	°C	62.8	61.9	61.8	62.9	62.9	62.9	62.9	62.8
48	Oil Cooler Oil Outlet Temp.	°C	46.3	46.5	46.5	46.1	46.1	46.1	46.4	46.1
49	Oil Cooler Oil Inlet Pr.	Kg/Cm²	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
50	Oil Cooler Oil Outlet Pr.	Kg/Cm²	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
51	Oil Cooler Cooling Water Inlet pr.	Kg/Cm²	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
52	Oil Cooler Cooling Water Outlet pr.	Kg/Cm²	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
53	Oil Cooler Cooling Water Inlet Temp.	°C	29	29	29	29	29	29	29	29
54	Oil Cooler Cooling Water outlet Temp.	°C	33	33	33	33	33	33	33	33
55	ACW Discharge pr.	Kg/Cm²	5.3	5.4	5.3	5.5	5.5	5.3	5.5	5.3
56	ACW Discharge Temp.	°C	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9
57	GVC Suction Pr.	MMWC	-40	-40	-40	-40	-40	-40	-40	-40
58	GVC Suction Temp.	°C	310	310	310	310	310	310	310	310
59	Gen. Cooling Water Inlet Temp.	°C	29	29	29	29	29	29	29	29
60	Gen. Cooling Water Outlet Temp.	°C	31	31	31	31	31	31	31	31
61	Gen. Cooling Water Inlet pr.	Kg/Cm²	4.6	4.6	4.4	4.6	4.6	4.6	4.6	4.6
62	Gen. Cooling Water Outlet pr.	Kg/Cm²	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
63	Diff. Pr. Across Lube Oil Filter	Kg/Cm²	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
64	Main Oil Tank level	mm	410	410	410	410	410	410	410	410
65	Overhad Tank Overflow	Yes/No	L	L	L	L	L	L	L	L

AOP-1	AOP-2	EOP	JOP	ACW-C	ACW-D	MOT BLOWER	GVC BLOWER
✓					✓	① ②	①

Remarks
⇒ Vibration Normal.

DCS Engr.

Shift I/C

Applied methodologies and standardized baselines:

UCR Protocol Standard Baseline

SECTORAL SCOPE - 01 Energy industries (Renewable/Non-renewable sources)

TYPE I - Renewable Energy Projects (Large Scale)
UCR Positive List Environmental Additionality

SCALE - Large Scale

CATEGORY- ***ACM0006 Large-scale Consolidated Methodology***
Electricity and heat generation from biomass, Version 16.0
This methodology is applicable to project activities that operate biomass (co-) fired. power and-heat plants. The project activity includes the installation of new plants at a site where currently power or heat generation occurs. The new plant replaces or is operated next to existing plants (capacity expansion projects). Project types included under this methodology are co-generation of power and heat using biomass. Typical activities include capacity expansions, as is the the current UCR project activity.

UCR CoU Standard is used to determine the baseline grid emission factor for the 2013 - 2022 period.

Application of methodologies and standardized baselines

- The project activity is a power generation project using a biomass (bagasse) and displaces CO_2 emissions from electricity generation in power plants that are displaced due to the project activity. Since the project activity utilises biomass (bagasse) for the generation of power and supplies it to the local grid, it displaces fossil fuel (coal), and hence it meets the primary applicability criteria of the methodology.

- The project activity is a power-and-heat plant that encompasses cogeneration plants, i.e., power-and-heat plant in which at least one heat engine simultaneously generates both process heat and power. The total installed capacity of project activity is 46 MW which is acceptable as per the applied large-scale methodology.

- The installation of a new biomass residue fired power generation unit, which replaces or is operated next to existing power generation capacity fired with either

fossil fuels or the same type of biomass residue as in the project plant (power capacity expansion projects) is also included in this methodology.

- For the purposes of this methodology, heat does not include waste heat, i.e., heat that is transferred to the environment without utilization, for example, heat in flue gas, heat transferred to cooling towers or any other heat losses.

- The biomass used by the project plant is not stored for more than one year. The biomass used by the project plant is not processed chemically or biologically (e.g., through esterification, fermentation, hydrolysis, pyrolysis, bio or chemical degradation, etc.) prior to combustion.

- The Project Activity uses biomass residues from a production process (e.g., production of sugar), and the implementation of the project does not result in an increase of the processing capacity of (the industrial facility generating the residues) raw input (e.g., sugar) or in other substantial changes (e.g., product change) in this process.

- The project activity unit does not co-fire fossil fuel and/or does not exceed the limit of 25% co-firing fossil fuel criteria as per the UCR Protocol for such projects.

- Biomass generated power is used for direct grid supply and for meeting the captive needs at the facility. The project activity involves the grid-connected bagasse-based electricity generation capacity involving the installation of facilities for allowing the export of electricity to the regional grid.

- Biomass is not sourced from dedicated plantations. The existing installed turbogenerators are fired by bagasse, a by-product of the sugarcane processing and a biomass residue.

- Bagasse is burnt in boilers as generated from the sugar mill and does not require any specific technology for its preparation before combustion. No fuel preparation equipment has been installed at site for preparation of bagasse. Hence no significant energy quantities are required to prepare the biomass residues for fuel combustion.

- The project activity also does not include any GHG emissions related to the decomposition or burning of biomass. The baseline heat emissions for the project activity are not included in the project boundary nor does it claim for emission reductions from heat.

Applicability of double counting emission reductions

The biomass boilers and turbines are constructed by the project proponent within the project boundary. The biomass boilers, turbines and energy meters have unique IDs, which is visible on the units.

The UCR project activity had been registered as a VCS project activity under the title Bagasse based Co-generation Power Project at Khatauli (Project ID 101).

VCS Registration Date	15/07/2009
VCUs Issued (Period 1)	19/10/2005 – 31/03/2006
VCUs Issued (Period 2)	01/04/2006 – 18/03/2007

The UCR project activity had been registered as a CDM project activity under the title: Bagasse based Co-generation Power Project at Khatauli (Project ID 0826).

CDM Registration Date	19/03/2007
Crediting Period	19/03/2007 – 18/03/2017 (Fixed)
CERs Issued (Period 1)	59267 CERs (Period 19/03/2007 – 31/03/2008)
CERs Issued (Period 2)	50776 CERs (Period 01/04/2008-31/05/2010)
CERs Issued (Period 3)	28312 CERs (Period 01/06/2010-29/02/2012)

However the UCR project activity has never been issued voluntary carbon credits for the current 2013 - 2022 vintage years and there is no double counting of the credits envisioned. Although the Project Proponent is eligible to claim UNFCCC CDM CERs until 18/03/2017, the Project Proponent has decided not to claim any further credits under the CDM program (i.e., post 29/02/2012) and is seeking CoUs under the UCR program. Additionally, the same has been stated in the undertaking provided in the Double Counting Avoidance Assurance Document (DAA) by TEIL dated 09.08.2023.

Project boundary, sources and greenhouse gases (GHGs)

The project boundary includes the physical, geographical site(s) of:

(a) the project power plant and all power plants connected physically to the electricity system that the project activity is connected to.

Leakage Emissions (LE_y)

Leakage emissions is not applicable as the project activity does not use technology or equipment transferred from another activity.

Hence $LE_y = 0$

	Source	GHG	Included?	Justification/Explanation
Baseline	GHG Emissions from fossil fuel in Grid Baseline Power Generation	CO_2	**Included**	Major source of GHG emissions
		CH_4	Excluded	Excluded for simplification. This is conservative.
		N_2O	Excluded	Excluded for simplification. This is conservative.
	Uncontrolled burning or decay of surplus biomass residue	CO_2	Excluded	Excluded for simplification. This is conservative.
		CH_4	Excluded	Excluded for simplification. This is conservative.
		N_2O	Excluded	Excluded for simplification. This is conservative.
Project Activity	Emissions from Biomass Project Activity On-site fossil fuel and electricity consumption due to the project activity (stationary or mobile)	CO_2	Excluded	No fossil fuel / electricity is consumed at the project site due to the project activity. Biomass residue transportation using default values is applied. This is conservative.
	Transportation of biomass residue	CH_4	Excluded	Excluded for simplification. This is conservative.
	Combustion of biomass residue for electricity and / or heat generation Storage of biomass residue	N_2O	Excluded	Excluded for simplification. This is conservative.

Project Emissions (PE_y)

The project emissions (PE_y) under the methodology may include:

- CO_2 emissions from transportation of biomass residue to the project site,
- CO_2 emissions from on-site consumption of fossil fuels due to project activity,
- CO_2 emissions from electricity consumption at the project site that is attributable to the project activity and
- CH_4 emissions from combustion of biomass.

where

PET_y = Default project emissions resulting from transport of biomass residues as determined by following the provisions from the TOOL12, taking into account the following transport routes:

- For biomass residues:
  (i) If the biomass residues are consumed without further processing, the route shall include only the transport of the biomass residues between the biomass processing facility or the biomass generation site and the biomass residues utilization facility.
  (ii) As an alternative to the monitoring of the parameters needed to calculate the emissions from the transportation, project proponents may apply the following options.

- For large-scale project activities, apply a net-to-gross adjustment of 10%, i.e., multiply the emission reductions determined based on the applied methodology by 0.9 to determine the final amount of emission reductions that can be claimed.

$PEFF_{CO2,\ y}$ = are the CO_2 emissions during the year y due to fossil fuels co-fired by the generation facility in tons of CO_2,

$PE_{EC,y}$ = are the CO_2 emissions during the year y due to electricity consumption at the project site that is attributable to the project activity in tons of CO_2,

GWP_{CH4} = is the Global Warming Potential for methane valid for the relevant commitment period and,

$PE_{Biomass,CH4,y}$ = are the CH_4 emissions from the combustion of biomass during the year y.

The proposed project activity does not have any CO_2 emissions due to fossil fuel co-firing and from electricity consumption at site. The project activity also doesn't include the CH_4 emissions from the combustion of biomass.

Hence,
$\mathbf{PEFF_{CO2,y}} = 0$,
$\mathbf{PE_{EC,\ y}} = 0$ and,
$\mathbf{PE\ _{Biomass,CH4,y}} = 0$.

Establishment and description of baseline scenario (UCR Protocol)

The baseline scenario identified is:

> *Renewable energy technologies that displace technologies using fossil fuels, wherein the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity, times an emission factor for the fossil fuel displaced.*
>
> The baseline emissions due to displacement of electricity are determined by net quantity of electricity generation as a result of the project activity (incremental to baseline generation) during the year y in MWh times the CO_2 emission factor for the electricity displaced due to the project activity during the year y in tons CO_2/MWh
>
> Given that steam and electric power generation for internal consumption is part of the present project activity, emission reductions are only claimed from on-site incremental power generation that is injected to the grid. Therefore, the baseline scenario is the emission of GHG from the present electricity generation mix of the UPPCL grid in the northern region.

Emission Reductions (ERy) is the emission reduction due to the project activity is calculated as the difference between the baseline emissions and the sum of the project emissions and the leakage:

$\mathbf{ER_y = BE_y - (PE_y + LE_y)}$

$\mathbf{BE_y}$= Baseline emissions in year y (t CO_{2e})

$\mathbf{BE_y = EG_{pj,y} * EF\ _{grid,y}}$

Where:

$\mathbf{EG\ _{grid,y}}$ = Quantity of net electricity generation that is fed into the local grid as a result of the implementation of the project activity in year y (MWh)

$\mathbf{EF_{grid,y}}$ = The CO_2 emission factor for grid connected power generation in year y calculated using UCR Standard emission factor (0.9 tCO_2/MWh).

PE_y = Project activity emissions are calculated by applying a net-to-gross adjustment of 10%, i.e., multiply the emission reductions determined based on the applied methodology by 0.9 to determine the final amount of emission reductions that can be claimed.

LE_y = Leakage emissions = 0

For this methodology, it is assumed that transmission and distribution losses in the electricity grid are not influenced significantly by the project activity and are therefore not accounted for and also the UCR grid emission factor results in conservative estimates of the carbon credits.

Direct off-site emissions in the project activity arise from the biomass residue transport. However, the biomass is generated from the in-house processes pertaining to the sugar processing industry, hence, biomass residue transport is only accounted if biomass residue is imported from outside the project boundary. The same type of CO_2 emission occurs during transportation of coal from coal mines to thermal power plants (supplying power to state grid).

The biomass is collected from the nearby sources and is transported by trucks to the project site. Each truck laden with biomass is weighed on the electronic weighbridge and the corresponding readings are noted in the plant log books. For the current monitoring period no biomass residue was collected from outside, thus for this monitoring period, the value of this parameter is zero, however, using the UCR principles of conservativeness, transport emissions are calculated by applying a net-to-gross adjustment of 10%, i.e., multiply the emission reductions determined based on the applied methodology by 0.9 to determine the final amount of emission reductions. The reported values of the quantity of biomass transported can be verified against the plant records.

	Net Quantity of Electricity Supplied to the Grid in KWH												
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Total**
2013	21332400	16819200	20877900	12353700	0	6280200	9489300	0	0	0	0	14457600	**101610300**
2014	19497300	17204100	18974400	12985500	0	0	0	0	0	0	3018600	18494400	**90174300**
2015	19652100	17775000	16735500	16671000	908100	0	0	0	0	0	3880500	16742400	**92364600**
2016	18635400	17808600	17657100	4501800	0	0	0	0	0	18900	14396700	20278500	**93297000**
2017	17883900	16143000	16955100	14762700	270600	409200	0	0	0	2417700	17774100	19087200	**105703500**
2018	19507200	18603300	18336900	18176400	12581400	0	0	0	28200	0	12843600	19545300	**119622300**
2019	18306900	15909000	17195700	16952700	11458200	0	0	0	0	398700	16349400	16737900	**113308500**
2020	12162300	10756200	8627100	15636300	16845900	6763200	0	0	0	1361400	18222300	19132800	**109507500**
2021	18859800	17648700	18253200	18253200	14597100	0	0	0	0	76200	13084200	19153500	**119925900**
2022	15423600	16361700	18458100	17444100	14816100	0	0	0	0	509100	17699700	18228000	**118940400**

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
MWh supplied to the grid	101610.3	90174.3	92364.6	93297	105703.5	119622.3	113308.5	109507.5	119925.9	118940.4

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Baseline Emissions y (tCO2)	91449	81156	83128	83967	95133	107660	101977	98556	107933	107046	**958005**
Emission Reductions (0.9* BE) (tCO2)	82304	73040	74815	75570	85619	96894	91779	88700	97139	96341	**862201**

Total emission reductions (ER_y) = **8,62,201** tCO_2 (**8,62,201** CoUs)

Conclusions:

Based on the audit conducted on the basis of UCR Protocol, which draws reference from UCR Standard for Baseline Grid Emission Factor, CDM UNFCCC Methodology ACM0006: Grid connected renewable electricity generation (Ver.16.0), the documents submitted during the verification including the Data, Project Concept Note (PCN) / Monitoring Report (MR), SQAC is able to certify that the emission reductions from the project - TEIL Biomass Grid Supply Power Project, Khatauli, Uttar Pradesh, India (UCR ID – 261) for the period **01/01/2013 to 31/12/2022** amounts to **8,62,201 tCO_2 (8,62,201 CoUs)**

SQAC Certification Pvt. Ltd. Mapusa-Goa

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