MPS/KSERC/2014-15/011 March 26, 2015

The Secretary

Kerala State Electricity regulatory Commission,

C.V. Raman Pillai road, Vellayambalam,

Thiruvananthapuram -695010

Sir,

Sub:

Request to re- fix the Tariff of the 10.00 MW combined Thermal cum Co- Generation plant at Kanjikode, Palakkad - reg

With reference to the above subject we here by submit the tariff Petition to re-determine the tariff for our 10.00 MW combined Thermal cum Co- Generation power plant along with the Demand draft for Rs 10,000/- (Rs Ten thousand Only) towards petition fee.

We request your good office to kindly accept the same and do the early action.

Thanking you,

Sincerely yours,

A.SENTHILKUMAR

MANAGING DIRECTOR

ENCLOSED;

1. Tariff Petition – 6 copies
2. DD for Rs 10,000/ (No.805103 dated24.03.2015 issued by SBI, Kanjikode, Palakkad)

BEFORE THE KERALA STATE ELECTRICITY REGULATORY COMMISSION, C.V. RAMAN PILLAI ROAD, VELLAYAMBALAM, THIRUVANANTHAPURAM.

PETITION NO.

DATE:

IN THE MATTER OF:

Re -fixing the Tariff of the of the 10.00 MW combined Thermal cum Co generation Power Plant of M/s MPS Steel castings Pvt Ltd, 476 Wise Park, Kanjikode, Palakkad, Kerala.

Petitioner

A.SENTHILKUMAR

MANAGING DIRECTOR

M/s MPS Steel castings Pvt Ltd,

476, Wise Park, Kanjikode,

Palakkad, Kerala.

AFFIDAVIT VERYFYING THE APPLICATION ACCOMPANYING FILING OF APPLICATION FOR FIXING COST OF GENERATION

I, **A. Senthilkumar, S/o Arumugaswamy** aged 35 years residing at 213, ATD road, Race course, Coimbatore, Tamilnadu do solemnly affirm and state as follows:

I am the managing director of the M/s MPS Steel castings Pvt Ltd, 476, Wise Park, Kanjikode Palakkad and the petitioner in the above matter and I am duly authorized by the company to make this affidavit on its behalf. I solemnly affirm on this 25th day of March 2015.

(i). Contents of the above petition are true my information, Knowledge and belief. I believe that no part of it is false and no material has been concealed there from.

(ii). The statements made in paragraphs of the accompanying application are true to my knowledge and are based on the information and advise received which I believe to be true and correct.

Deponent

VERIFICATION

I, the above mentioned deponent, solemnly affirm at Palakkad on this 25th day of March 2015 that the contents are true to my information, knowledge and belief that no part of it is false and that no material has been concealed there from.

Deponent

Solemnly affirmed and signed before me.

Advocate and Notary

SYNOPSIS

1. M/s M.P.S Steel Castings (P) Ltd (hereinafter referred to as the **Petitioner**) have been functioning from 2006 March onward and contributing the State's economy by generating employment and infrastructure facilities. Petitioner had set up a 10 MW combined Co- generation cum Thermal Power Plant at 476, Wise Park, Kanjikode in Palakkad District, Kerala (hereinafter referred to as **Power Plant**). Construction of the Power Plant was started on 01.04.2005, it was synchronized with the State Grid on 13.09.2008 and thereafter on 19.03.2009 the Power Plant was declared to be under Commercial Operation. The plant was started with the intension of using it as a captive power plant ie. Whole of the energy generated from this plant is to be used in the Sponge Iron plant and the group concerns of M/S M.P.S Steel Ltd situated at different locations within Kanjikode Industrial Area. For this purpose power had to be transported from wise park unit to various locations. In order to do that, we had to get open access permission. To get permission for open access, the capacity of the plant should be at least 10 MW at that time. That is why the company thought of adding 4 MW thermal plant with the 6 MW Co-generation plant so that total capacity is 10 MW.

3. The Power Plant is designed so as to generate electricity by recovering the flue gas generated during the sponge iron manufacturing process and by burning the coal in the fluidized bed Combustion Boiler. The Power Plant has a Single Turbine coupled with an Alternator and four boilers (3 Waste Heat Recovery Boilers (hereinafter referred to as **WHRB**), each boilers are designed to generate 2.00 MW power (3x2 = 6) and One Fluidized Bed Combustion Boiler (hereinafter referred to as **FBC**) designed for 4.00MW power). Thus the capacity is 10.00 MW.

3. The company approached the Hon'ble Commission for the determination of Tariff. On 20.06.2009 this Hon'ble Commission passed the order determining the tariff for sale of power at the rate of Rs. 2.31 per unit for a period of 5 years. According, PPA had signed with the KSEB for 5 Years. The Company was producing 6.00MU per month and after the usage, the power was pumped to the KSEB grid from 19.2.2009. The PPA got expired on 19.02.2014. Mean while the company was taken over by a new management (M/s Senthil Group, Coimbatore). Due to the reason of change of new management the company could not approach Hon'ble commission for re fixing the tariff and the company continued to give power to KSEB at the same rate fixed by the commission on 2.06.2009 for the period of one year by extending the validity of the PPA.

4. Now due to hike in the cost of raw materials, labor costs etc, the company is failed to produce power at the rate of Rs 2.31. The Company still supplying the power to KSEB with a condition that, the company will again approach the Hon'ble commission for fixing new tariff and once the commission fix new tariff the KSEB has to purchase at the new rate fixed by the commission. The same has been agreed by the KSEB Vide their letter No. DREP/Plg.III/MPS/20144-15/427 DATED 16.2.2015.

5. In view of the above we are filing the present Petition before this Hon'ble Commission seeking determination of tariff. The detailed technical Particulars and the Levelised tariff details are enclosed here with.

PRAYER:

Considering the circumstances as detailed in the preceding paragraphs, MPS may humbly request before the Hon'ble Commission to kindly re-fix the tariff at a minimum of Rs 4.50 and modify the PPA accordingly.

TECHNICAL DETAILS

PROCESS OF THE 10.00 MW POWER PLANT:

The power plant is designed to generate 10.00 MW electric power. The system has a Single Turbine coupled with an Alternator and four boilers (Three Heat Recovery Steam Generators (HRSG), each boilers are designed to generate 2.00 MW power (3x2 =6) and One Fluidized Bed Combustion Boiler (FBC) designed for 4.00MW power). Thus the capacity is 10.00 MW.

Out of 10.00 MW, The 6.00 MW power is generated through, three numbers of Heat Recovery Steam Generators (HRSG) by Burning the Coal inside the Kiln and by utilizing the flue gases, generated during the process of sponge iron manufacturing.

The process of sponge iron manufacturing and power generation through Heat Recovery Steam Generator (HRSG) are as follows:

Rotary Kiln (3x 100TPD) inclined at an angle of 1.43 degree and it is connected with variable AC motor. Due to the inclination and the rotary motion of the kiln the material moves from the feed end of the kiln to the discharge end. The kiln has seven shell air fans mounted on the top, which blow air in the respective zones to maintain the required temperature profile. A mixture of Iron ore, Coal is feed in to the kiln, at 800.degree C, the Iron Ore gets roasted and in the coal, the volatile matter starts getting released. The Iron ore which is in the form of hematite gets reduced to magnetite then to metallic iron. This is called Sponge Iron and during this process flue gas will be librated as follows:

Fe_2O_3 (Iron Ore) +CO (Coal) =Fe_3O_4 + CO_2 (Flue gas)

Fe_3O_4 + CO = FeO + CO_2

FeO + CO = Fe (Sponge Iron) + CO_2 (Flue gas)

In practice to produce one MT of sponge iron 1.45 MT of Iron ore and 0.800 MT of coal are required. This combination is more sufficient for maintaining the temperature of around 800 degree C as well as for process.

Depending upon the condition and quality of the Ore the coal consumption will vary.

The heat available in the flue gas is recovered and converted in to steam through Heat recovery Steam Generators, Capacity 3x10TPH (HRSG) and the steam expands in the Turbine through a common header to produce power.

The HRSG is designed as:

1. The gas quantity should be 24000Nm3/hr
2. The temperature of flue gas should be 950 ^{0}C when it reaches the Boiler.
3. The steam pressure should be 67 kg/cm2 and
4. The steam temperature should be 485+/- 5 Degree C.
5. Exhaust gas temperature at the Inlet of radiant chamber at the ^{0}C 950

Exhaust gas analysis	(% by vol.)
- CO_2	: 19.00
- H_2O	: 15.00
- N_2	: 61.70
- O_2	: 03.00
- CO	: 00.50
- CH_4	: 00.80
Gas density (Calculated Kg/Nm^3)	: 1.322

The performance of WHRB will vary if there is any change in the above parameters.

ADVANTAGES OF HRSG THAN FBC:

1. Due to the burning the Coal inside the Kiln the temperature of the flu gas will be saturated. Once the HRSG recover the Steam then the flow and Pressure of the steam will be stable and hence there will be constant power output.

2. Since, the Coal is burned at the inside of the kiln and hence there is no need of Consumables like Bed materials and secondary fuel oils.

3. The Librated flue gas is being used for combustion. So the additional auxiliary equipments like primary Air fans, FD fan, fuel nozzles, Air nozzles etc can be avoided.

4. The system is compact one and hence it can be installed in a small area.

5. There is no need of separate ESP, Ash Silo, and Ash Conveying System.

16. All the parameters will be controlled at Kiln. So, it is easy for maintenance.

8. Simplest structure and design.

DIS ADVANTAGE:

The main disadvantage of the HRSG is whenever the kiln gets Shutdown then there will not be a power production.

FBC BOILER:

Another 4.0MW power is generated by burning Coal in to the FBC Boiler (Fluidized Bed Combustion Boiler). The produced steam will be feed to the common header and it will get mingle with the existing steam from HRSG and the steam expands in the Turbine to produce power. The technical details are same as the WHRB and the capacity of the boiler is 17TPH. The fuel consumption will depend upon the GCV of the fuel, VM and the ash condition. The efficiency of this type of boiler is 80-85%.

TECHNICAL SPECIFICATION:

1. STEM GENERATING UNIT:

1.1. PLANT CAPACITY : 10.00 MW (4.00MW + 6.00 MW)

1.2. TYPE OF SYSTEM : Bubbling Fluidized bed Combustion System Heat Recovery Steam Generator

1.3. BOILER CAPACITY : 17/67/4851105 3x10/67/485/105

(TPH / Kg/sqcm / Degree C/ Degree C)

1.4. FUEL : Coal Coal + Flue gas

1.5. QUANTITY : One Three

2. TG SET:

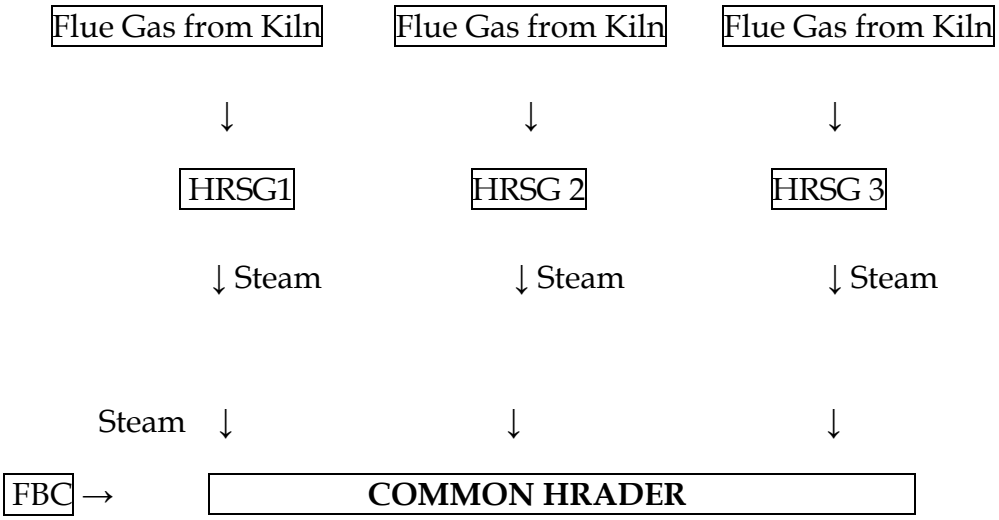
2.1. TYPE OF TURBINE : Multistage, Horizontal shaft Geared Straight Condenser Turbine.

2.2. TURBINE INLET PARAMETERS : 43/64/480

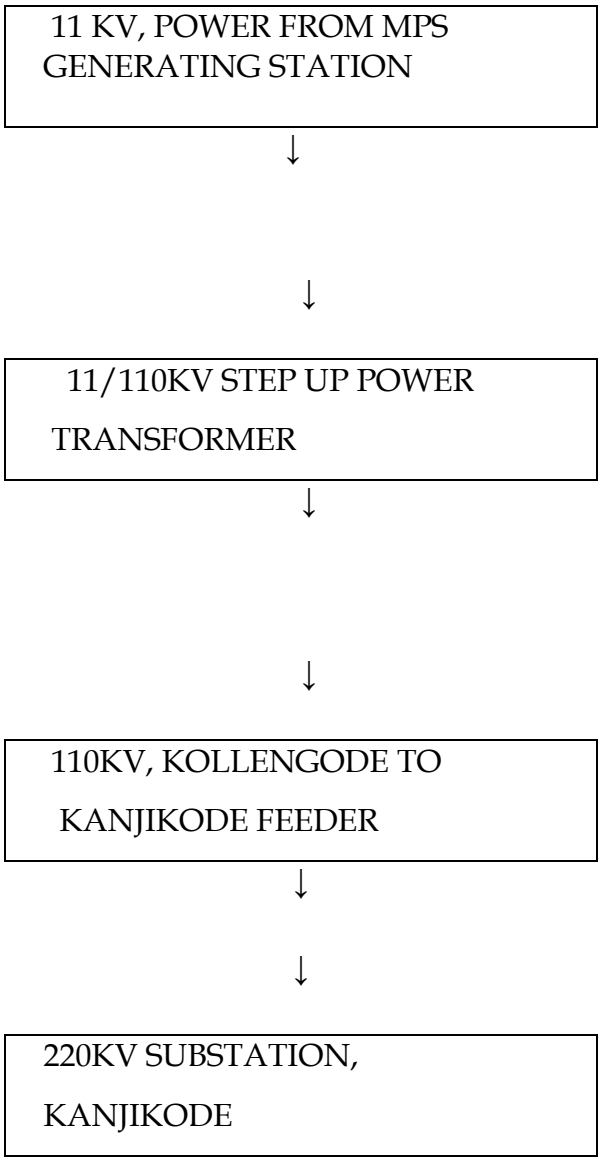
2.3. BLEED STEAM : 4.30@4.5

2.4. CONDENSING STEAM : 0.10

PROCESS CHART



EVACUATION SYSTEM:



Project cost incurred for 10.00 Mw plant:

Cost of plant and Machinery	Rs	33, 55, 67,000.00
Cost of Building	Rs	6, 03, 04,260.00
Electrical equipment	Rs	4, 75, 08,067.00
Land cost for 10.6 Acres	Rs	51, 00,000.00
TOTAL	**Rs**	**44, 84, 79, 327. 00**

Even though there are 4 boilers but they are coupled with a single Turbine and Generator. Cooling tower, Ro plant, Electrical control System, evacuation system, DCS system, condensation system are common and hence the cost for thermal portion and for Co generation portion cannot be identified/separated.

It may kindly be noted that project cost for thermal power stations is generally taken as Rs.4.50 crores per MW. This is for projects of capacity in the range above 100 MW .For small thermal projects cost per MW will be higher. Whereas per MW cost for MPS is **Rs 4.85/- .** The same may be considered.

(A). FOR 4.00 MW THERMAL PORTION:

NORMS OF OPERATION THE COAL FIRED POWER PLANTS AS PER CERC REGULATION NO.L-7/25(5)/2003 DATED 26TH MARCH 2004.

(16)(i). Target availability for recovery of full capacity

charges (Fixed) – 80%

(16)(ii). Target Plant Load Factor (PLF) for Incentive -80%

(16)(iii). Gross station Heat Rate

During stabilization period - 2600 KCal/KWh

During subsequent period - 2500 KCal/KWh

(16)(iv). Secondary fuel oil Consumption –

During stabilization Period - 4.5 ml/KWh

During subsequent period - 2.0 ml/KWh

(16)(v). Auxiliary Energy consumption(With Cooling Tower) - 9.0%

(16)(vi). Stabilization period - 180 days

ANNUAL ENERGY GENERATION :

CAPACITY OF THE PLANT - 4.00 MW

AUXILIARY CONSUMPTION -9.00 %

PLANT LOAD FACTOR - 80 %

POWER GENERATION PER ANNUM =

NET GENETATION- AUX.POWER

(I) NET GENERATION

= 4x24x365x1000x80 % = 28.03 MU

(II) AUXILIARY CONSUMPTION

= (4x24x365x1000x80 %) x 9 % = 2.52 MU

GROSS POWER (EX BUS ENERGY) = 28.03 – 2.52 = 25.51 MU

(OR)

PER ANNUM AVAILABILITY = 2.55 CRORE UNITS

ANNUAL FUEL COST :

AVAILABLE DATA:

1. Station Heat Rate For coal Fired Stations

   During stabilization period - 2600 KCal/KWh

   During subsequent period - 2500 KCal/KWh

   Secondary fuel oil Consumption –

   During stabilization Period - 4.5 ml/KWh

   During subsequent period - 2.0 ml/KWh

2. GCV of the Indonesian coal (ARB Basis) – 3386V Kcal/KWh
3. Annual Ex bus Energy - 2.55 Crore Units

FUEL REQUIRED PER KWH = (STATION HEAT RATE / GCV OF THE COAL)

Fuel Required for 1 st Year (For 180 Days) : 2600/3386 = 0. 768 Kg /Kwh

Fuel Required for (For another 185 Days) : 2500/3386 = 0.738 Kg/KWh Average for the 1st year = **0.753 Kg OR = 0.000753 MT/KWh**

Fuel Required for the 1st Year = 25.51 MU x 0.000753 = 19209.03 MT

Fuel Required for 2 nd year = 25.51M U x 0.000738 = 18826.38 MT

PRIMARY FUEL (COAL) COST /ANNUM:

Cost of per ton Indonesian Coal Rs - 3000.00 (Refer enclosed Invoices Transportation Charge Rs - 1100 (Refer enclosed Invoice)

Net Rs - 4100.00

Per ton cost of Indonesian Coal Rs - 4100.00

Fuel cost for 1st year - 4100*19209.03 = 78757023

Rs - 7.88 Crores

Fuel cost for 2nd to 25th years - 4100 x 18826.38 = 77188158

Rs - 7.72 Crores

SECONDARY FUEL (OIL) COST /ANNUM:

During stabilization period - 4.5 ml/KWh

During subsequent period - 2.0 ml/KWh

Diesel cost Per Liter - Rs 55.07

25.51 MU x 4.5 ml = 1, 14,795 Liters

Cost for the 1st Year (180Days) - 114795 x 55.07 = 63, 21,761

Rs 0.63 Crores

Cost for the 1st Year (185Days) - 25.51 MU x 2ml = 51,020 Liters

- 51020 x 55.07 = 2809671

Rs 0.28 Crores

(B).FOR 6.00 MW POWER THROUGH HRGS:

TOTAL POWER GENERATION PER ANNUM:

= 6x24x365x100x55 %

= 28.91 MU

AUXILIARY CONSUMPTION

= (6x24x365x1000x55 %) x 9 %

=2.61 MU

GROSS POWER (EX BUS ENERGY) = 28.91 – 2.61

= 26.3 MU

POWER GENERATION THROUGH 6.00Mw HRSG

= 26.3 MU

OR

2.63 Crore UNIT per annum

FUEL COST :

15% of the FBC's coal consumption can be taken as per MN& R letter no . **3/19/2006 CPG date 26.12.2006**) the same has also considered in the earlier commission's order.

Accordingly,

Coal cost per annum for FBC is Rs 7.72 +0.28 Crores = 8.00 CRORES

15% of the above is (8*15%) = 1.20 Crores per annum

FUEL COST FOR WHRB - RS 1.20 C ORES PER ANNUM