

JHARKHAND STATE ELECTRICITY REGULATORY COMMISSION, RANCHI

(CASE NO.10 OF 2013)

M/S. SAIL / BOKARO STEEL PLANT.....PETITIONER.

**Quorum: (1) T.Munikrishnaiah, Member (Engg.)
(2) Sunil Verma, Member (Finance)**

**ORDER
(24.03.2014)**

The petitioner BSL (Sail-Bokaro) has filed the petition for consideration of their Captive Power Plant as Co-generation plant.

Petitioner's submission:

- 1) The Bokaro Steel Limited is a unit of Sail Authority of India Limited a company incorporated in the year 1964 under the provisions of the Companies Act, 1956, a Maharatna Company. The Bokaro Steel Plant is having production capacity of 4.5MT of Crude Steel per annum.
- 2) That BSL being a flat steel producer and a power intensive large scale industry, consumes on an average 287 MW power on daily basis. The power requirement of BSL is catered from the following two sources:

Captive Power plant- Supplies 159 MW

Purchase from Damodar Valley Corporation (DVC)-128 MW
- 3) That the Captive Power Plant was installed during inception of the steel plant i.e. during 1968-72 wherein by-product gases generated in the integrated steel plant processes at Blast

Furnaces and Coke Ovens are also used as fuel. The high pressure (HP) steam thus generated is mainly used to drive turbo-blowers to supply hot air blast to the Blast Furnaces. Steam is also used to meet the other process steam requirement of the steel plant. Balance available steam is used for generation of electricity through six numbers of Turbo-Generators to total capacity of 302 MW (3x60+2x55+1x12).

- 4) That the total steam generation of the power plant from the year 2010-11 along with the break-up of steam used for process requirement in the steel plant and balance steam used for power generation is given in the table below:

Year	Total Steam Generated	Steam used for process	Steam used for Power generation	Steam used for Auxiliaries	% of steam used for power generation
2010-11	10530699	4899278	4681800	949621	44.5%
2011-12	9549310	4400013	4191572	957725	43.9%
2012-13	11550124	4851609	5839464	589051	50.55%

- 5) That detailed configuration of the captive power plant and data related to its steam generation, power generation, fuel usage including usage of process generated by-product gases (BF & Co gas) etc is enclosed in the Annexure-1,2,&3.

Prayer of the petitioner:

The petitioner was heard at length and their prayer are:

- (i) To recognize the captive power plant of capacity 302MW (3x60+2x55+1x12MW) at Bokaro Steel Limited as a co-generation power plant.
- (ii) To exempt Bokaro Steel Limited from applicability of Renewable Purchase Obligation as the captive power plant of Bokaro Steel Limited is a co-generation plant and not a Conventional Thermal Power Plant.

- (iii) To waive the Renewable Purchase Obligation of BSL applicable for consumption of captive generation during the preceding years of 2010-11, 2011-12 and 2012-13.

Findings of the Commission:

- 1) The Bokaro Steel Limited is a unit of Sail Authority of India Limited, a company incorporated in the year 1964 under the provisions of the Companies Act, 1956, a Maharatna Company. The Bokaro Steel Plant has a production capacity of 4.5MT of Crude Steel per annum.
- 2) That the Captive Power Plant was installed during inception of the steel plant i.e. during 1968-72 wherein by-product gases generated in the integrated steel plant processes at Blast Furnaces and Coke Ovens are also used as fuel. The high pressure (HP) steam thus generated is used to drive turbo-blowers to supply hot air blast to the Blast Furnaces. Steam is also used to meet the other process steam requirement of the steel plant. Balance available steam is used for generation of electricity through six numbers of turbo-generators with a total capacity of 302 MW (3x60+2x55+1x12).

3) Fulfillment of BSL Power Plant as Captive Power Plant:

The Captive Power Plant of the BSL satisfies the conditions of the Captive Power Plant; Section 9 read with clause 8 of section 2 of the Act says:

- i) Not less than 26% percent of the ownership is to be held by the captive user (s).
- ii) Not less than 51% of the aggregate electricity generated in such a plant, determined on an annual basis, is consumed for the captive user(s).

BSL has submitted that they have 50% equity in the above Captive Power Plant and also BSL is utilizing 100% power generated from the Captive Power Plant for their own purposes. Thus the Power Plant satisfies the conditions of Captive Power Plant.

- 4) The Commission has formulated Regulation for Renewable Power Purchase Obligation vide JSERC(Renewable Purchase Obligation & its Compliance) Regulation 2010, which specifies that every obligated entity has to fulfill the Renewable Purchase Obligation as specified by the Regulation.

The definition of the Captive user(s), obligated entity and Renewable Energy Sources specified in the Regulation are reproduce below:

2.1 (b) “Captive User(s)” means the end user of the electricity generated in a Captive generating Plant and the term “Captive Use” shall be construed accordingly;

2.1 (j) “Obligated entity” means the distribution licensee, consumer owning the captive power plants and open access consumer in the state of Jharkhand, who have to mandatorily fulfill renewable purchase obligation under these Regulations;

2.1 (n) “Renewable energy sources” means renewable sources such as small hydro, wind, solar including its integration with combined cycle, biomass including bagasse , bio fuel cogeneration, urban or municipal solid waste and such other sources as recognized or approved by MNRE;

- 5) The Commission specified in the above Regulation regarding Renewable Purchase Obligation and the same is reproduce below:

RENEWABLE PURCHASE OBLIGATION (RPO)

5.1 The minimum percentage of Renewable Purchase Obligation (RPO) as specified under Clause 5.2 of these Regulations shall be applicable to all Distribution Licensees in the State as well as to open access consumers and captive users within the State, subject to following conditions:

(a) Any person who owns a grid connected Captive generating plant with installed capacity of 5 MW and above (or such other capacity as may be stipulated from time to time) and consumes electricity generated from such plant for his own use; shall be subjected to minimum percentage of RPO (specified in Clause 5.2 of these Regulations) to the extent of his consumption met through such captive source;

(b) Any person having a contract demand of not less than 1 MVA and who consumes electricity procured from conventional fossil fuel based generation through

open access as per Section 42 (2) of the Act shall be subjected to minimum percentage of RPO (specified in Clause 5.2 of these Regulations) to the extent of his consumption met through such open access source.

Provided that the Commission may, by order, revise the capacity referred to under sub-clause (a) and sub-clause (b) above from time to time. Provided further that condition under sub-clause (a) above, shall not be applicable incase of Standby (or Emergency back-up) Captive generating plant facilities.

5.2 Every Obligated entity shall purchase electricity (in kWh) from renewable energy sources, at a defined minimum percentage of the total consumption of its consumers including T&D losses during a year shown as under:

Year	Minimum Quantum of purchase in (%) from renewable energy sources (in terms of energy in kWh)		
	Solar	Non-solar	Total
2010-11	0.25%	1.75%	2.00%
2011-12	0.50%	2.50%	3.00%
2012-13	1.0%	3.0%	4.00%
2013-14	1.0%	3.0%	4.00%
2014-15	1.0%	3.0%	4.00%
2015-16	1.0%	3.0%	4.00%

Provided that, such obligation to purchase renewable energy shall be inclusive of the purchases, if any, from renewable energy sources already being made by concerned obligated entity. Provided further that the power purchases under the power purchase agreements for the purchase of renewable energy sources already entered into by the Distribution Licensees and consented to by the Commission shall continue to be made till their present validity, even if the total purchases under such agreements exceed the percentage as specified hereinabove.

- 6) The BSL has prayed the Commission to consider their Captive Power Plant as Co-generation plant for the fulfillment of Renewable Purchase Obligation and waive the same for the preceding years of 2010-11, 2011-12 and 2012-13.

(7) Definition of Co-generation and its applicability.

As per section 2(12) of Indian Electricity Act, 2003 “Co-generation means a process which simultaneously produce two or more forms of useful energy (including electricity)”.

Co-generation is also a process whereby simultaneously electricity and heat are produced both of which are used. It is clear from the definition given in the section 2(12) of the Act that the legislature has not restricted the said process to mean production of energy from any form of fuel. It may be fossil fuel or may be non-fossil fuel.

Further, co-generation enables energy supply to all types of consumers with various benefits to both users and society at large.

(8) One of the functions of the State Commission is to promote co-generation and generation of electricity from renewable sources of energy. The relevant provision of the Electricity Act which stipulates this responsibility for the Commission is reproduced below:

Section 86(1)(e) of the Act reads as follows:

(e) Promote co-generation and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee.

9) The relevant APTEL orders regarding the fulfillment of the renewable power obligation also need to be taken into consideration.

(a) The summary of the APTEL judgment of Century Rayon Vrs. MERC in respect of appeal No. 57 of 2009 states as follows:

“45. Summary of our conclusion is given below:

(I) The plain reading of section 86(1) (e) does not, show that the expression ‘co-generation’ means cogeneration from renewable sources alone. The meaning of the term ‘co-generation’ has to be understood as defined in section 2 (12) of the Act.

(II) As per section 86(1)(e), there are two categories of ‘generators namely (1) co-generators (2) Generators of electricity through renewable sources of energy. It is clear from this section that both these categories must be promoted by the State Commission by directing the distribution licensees to purchase electricity from both of these categories.

(III) The fastening of the obligation on the co-generator to procure electricity from renewable energy procures would defeat the object of section 86(1) (e).

(IV) The clear meaning of the words contained in section 86(1) (e) is that both are different and both are required to be promoted and as such the fastening of liability on one in preference to the other is totally contrary to the legislative interest.

(V) Under the scheme of the Act, both renewable source of energy and cogeneration power plant, are equally entitled to be promoted by State Commission through the suitable methods and suitable directions, in view of the fact that cogeneration plants, who provide many number of benefits to environment as well as to the public at a large, are to be entitled to be treated at par with the other renewable energy sources.

(VI) The intention of the legislature is to clearly promote cogeneration in this industry generally irrespective of the nature of the fuel used for such cogeneration and not cogeneration or generation from renewable energy sources alone.

(10) Views of the other State Commissions:

- (a) Tamil Nadu Electricity Regulatory Commission in their order against the case No. 31 of 2011, stated as follows:

“4.8. The Commission observes that the Order of the APTEL as discussed above is subsequent to the issue of the Regulation by this Commission in 2008. From the above judgment it is observed that under the scheme of the Act, both renewable source of energy and cogeneration power plant, are equally entitled to be promoted by State Commission through suitable methods and suitable directions, in view of the fact that cogeneration plants, which provide many number of benefits to environment as well as to the public at large, are to be entitled to be treated at par with other renewable energy sources. Further, it is observed from the above judgment that the intention of the legislature is to clearly promote cogeneration in this industry generally irrespective of the nature of the fuel used for such cogeneration. It is also observed from the above judgment that the fastening of the obligation on the co-generator to procure electricity from renewable energy sources would defeat the object of section 86(1)(e). Since the above judgment is generic in nature, the Commission clarifies that the 2 x 25 MW cogeneration plant of the petitioner at Sahupuram, Tamil Nadu, being a cogeneration plant, would be treated similar to a renewable energy generator. Consequently, the consumer who consumes the energy generated by this cogeneration plant would be eligible for accounting the same for RPO subject to all other provisions of the RPO Regulations, 2010.

(b) Chhattisgarh Electricity Regulatory Commission in respect of petition No. 07 of 2013, concluded as follows:-

“31. In view of orders passed by Hon’ble Tribunal in Appeal No. 57 of 2009, 54 of 2012, 59 of 2012 and review order in appeal no IA 262 of 2012 in RP (DFR) No. 1311 of 2012 in APPEAL No. 57 of 2009, it is decided that captive/users /consumers consuming power to the extent of RPO specified under Regulation, 2011, from fossil fuel based co-generation plants shall be exempted from RPO for the year 2012-13. As per Hon’ble Tribunal judgment, definition of the obligated entity would not cover a case where a person is consuming power from co-generation plant. BSP as distribution licensee shall be exempted from RPO for the year 2012-13, so far as it consumes power to the extent of RPO specified under Regulation, 2011, from fossil fuel based co-generation plant. In case the energy consumption from co-generation power plant by the captive users/consumers/BSP is in excess with respect to RPO specified, then such excess consumption of co-generation power shall not be considered for RPO or any other purpose for the succeeding years. For subsequent control period i.e. 2013-16, RPO obligation shall be governed by Chhattisgarh State Electricity Regulatory Commission (Renewable Purchase obligation and REC framework Implementation) Regulations, 2013, to be notified by Commission.”

Commissions’ Order:

1. Based upon the above observations the Commission concludes as follows:-

In accordance with the relevant provisions of the Electricity Act, 2003 as also the National Electricity Policy, it is mandatory on the part of the State Commission to

give encouragement to co-generation in industries with reference to any type of fuel or nature of sources of energy whether conventional or non-conventional.

2. In Annexure-1,2 & 3 of its petition, BSL has submitted the details of steam utilized for heating purpose for power generation and the amount of fuel saved. It is clear from these details that the co-generation plant of BSL benefits the environment by saving both fossil fuel and Co2 emission to atmosphere. The Commission, therefore, considers the co-generation plant of BSL to have fulfilled the requirements of renewable purchase obligation percentage as specified in the JSERC (Renewable Purchase Obligation and its Compliance) Regulation, 2010.

3. In view of the legal provisions on the subject, the judgment of the APTEL and or other State Commissions referred to herein above, the Commission is of the opinion that the Captive Power Plant of Bokaro Steel Limited clearly fulfills all the requirements of a Co-generation plant and as such declares it to be a Co-generation plant and as a result the energy generation of the Co-generation plant will be considered for the fulfillment of the Renewable Power Obligation for the FY 2010-11,2011-12 and 2012-13. The co-generation will be considered for fulfillment of Renewable Power Purchase Obligation of steel plant only.

Sd/-

Member (Engg.)

Sd/-

Member (Finance)

Calculations of Captive Cogeneration from Non Fossil Fuel (BF/Co Gas) at Bokaro Steel Plant

	Details of Power			Fuel Consumption			Avg. Calorific Value of Fuel Used				Calculation of Fuel Wise Heat input					Calculation of Cogeneration through non fossil fuel i.e. BF and Co gas				
	Total power Gen	Aux Power	Net power Gen	Total Coal Used	Total By product Gases used		Furnace Oil	Coal	CO Gas	BF Gas	Furnace Oil	Through Coal	Through By product gases			Through Oil	Total Heat Input	% of Heat input through BF & Co Gas	Cogeneration through BF and Co Gas	
	MU			Tonnes	BF Gas	Co Gas	KL	Kcal/kg	Kcal/ m ³	Kcal/l			BF Gas	Co Gas	Total Gases					
					000 NM ³	G Cal														
2010-11	1,165.00	311.00	854.00	16,53,166	12,94,307	56,602	21,676	4,115	4,016	842	9,384	68,02,778	10,66,509	2,27,314	12,93,823	2,03,407.58	83,00,008	15.6%	181.6	
2011-12	1,058.00	265.00	793.00	14,93,663	9,07,681	21,373	21,358	4,399	3,984	852	9,384	65,70,624	7,73,344	85,150	8,58,494	2,00,423.47	79,29,541	11.3%	119.0	
2012-13	1,450.59	291.34	1,159.25	17,68,804	16,05,382	28,677	5,584	4,745	4,500	800	9,384	83,92,975	12,84,306	1,29,047	14,13,352	52,400.26	98,58,728	14.3%	208.0	

Note -1

1. Calorific value of Furnace Oil has been taken as 9384 Kcal/L as per Ministry of Power, Govt. of India circular dated 12.03.2007. As per the circular CV is 10050 Kcal/kg and density is 0.9337 Kg/L.

Details of Renewable Purchase Obligation of Bokaro Steel Plant and Cogeneration from Non-fossil fuel (BF & Co gas) at Captive Power Plant.									
Year	Captive Power Consumed	RPO applicable for consumption of Captive Power		Total Power Distributed by BSL as Distribution Licensee	RPO applicable for distribution of power as distribution Licensee		Total RPO applicable to Bokaro Steel Plant for both obligations i.e. for captive consumption and distribution of Power		Total captive Cogeneration from Non-fossil fuel i.e BF & Co gases
		Solar	Non-Solar		Solar	Non-Solar	Solar	Non-Solar	
	Million Units	Million Units	Million Units	Million Units	Million Units		Million Units	Million Units	Million Units
* 2010-11	587	1.4675	10.2725	172	0.4300	3.0100	1.8975	13.2825	181.6026
2011-12	793	3.965	19.825	262	1.31	6.5500	5.275	26.375	119.0487
2012-13	1159	11.59	34.77	293	2.93	8.79	14.52	43.56	208.0

* Calculation has been made for a period from August'2010 to March' 2011, in view of publication of Renewable Purchase Obligation and its compliance Regulation 10 (notification the 21st July' 2010).

**Fossil Fuel (Coal) Savings in the Process
Summary of Fossil Fuel Savings**

	Fossil fuel Saved due to usage of By Product Gases	Fossil Fuel Savings Due to Power Generation in BPTG	Fossil Fuel Savings Due To Turbo-Blowers Instead of Electric Blowers	Fossil Fuel Savings Due to Turbo-Compressors instead of Electric Compressors	Total Fossil Fuel (Coal) Savings
	Tonne	Tonne	Tonne	Tonne	Tonne
2010-11	291070	26119	80471	38898	436558
2011-12	195472	27622	75432	36462	334989
2012-13	332124	29818	71632	34625	468200
2013-14 (Till Jan' 14)	358230	24170	74887	36198	493485

Besides above Fossil Fuel Savings, additional Fossil Fuel Savings of About 150000 Tonne/annum is envisaged from 2014-15 after Commissioning of 36 MW Back Pressure Turbine which is expected by May' 14