

**Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION**

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Case No. 19 of 2010

In the matter of

Petition filed by M/s. Shalivahana Green Energy Ltd., seeking termination of Biomass Energy Agreement dated June 7, 2006 executed between Shalivahana Green Energy Ltd. (formerly Shalivahana Projects Ltd.) and MSEDCL in respect of power generated at 10 MW plant at village Chanaka, Taluka Wani, District Yavatmal, and claim of Deemed Generation Charges in accordance with article 12.5 of the BEPA dated June 7, 2006.

Shri V.P. Raja, Chairman

Shri Vijay L. Sonavane, Member

M/s. Shalivahana Green Energy Ltd.
Post Box No. 1582, 7th floor,
Minerva Complex, S.D. Road,
Secunderabad- 500 003.

....Petitioner

1. M/s. Maharashtra State Electricity Distribution Co. Ltd.(MSEDCL)
Prakashgad Building, Plot No. G-9,
Bandra (East), Mumbai-400051.

2. The Chief Engineer (Commercial),
Maharashtra State Electricity Distribution Co. Ltd.,
Prakashgad, Bandra (East), Mumbai 400 051.

3. The Supdt Engineer,
Maharashtra State Electricity Distribution Co. Ltd.,
Circle Office, Administrative Building, 1st floor
Arni Road, Yavatmal – 445 001

4. Maharashtra State Electricity Transmission Co. Ltd.,
Prakashgad, Bandra (East),
Mumbai – 400 051.

..... Respondents

Present during the hearing:

For the Petitioner: Shri. V. KrishnaMoorthy
Shri. Jagadish F., Manager

For the Respondent: Shri. S. S. Dhande, CE (Commercial)
Shri. M. S. Kele, SE (Commercial)
Shri. A. V. Bute, Dy. EE

For IIT Bombay, Powai Dr. S. A. Soman

ORDER

Date: 15 June, 2012

M/s. Shalivahana Green Energy Ltd. (hereinafter referred to as “the Petitioner”) filed a Petition on affidavit before the Commission on 28 April, 2010 under Section (86)(1)(f) of EA, 2003 read with Regulation 19 of MERC (Conduct of Business) Regulation 2004, *inter-alia* seeking termination of Biomass Energy Purchase Agreement (“BEPA”) dated 7 June, 2006 executed by and entered into between Shalivahana Green Energy Ltd (formerly Shalivahana Projects Ltd.) and MSEDCL (hereinafter referred to as “the Respondent No.1”) in respect of power generated at 10 MW Biomass power project at Village Chanaka, Taluka Wani, District Yavatmal and claim of Deemed Generation Charges in accordance with article 12.5 of the BEPA dated 7 June, 2006.

2. The prayers of the Petitioner are as follows:

“

- a. *This Commission be pleased to hold and declare that the Respondent is liable to pay the deemed generation charges of Rs.7,49,12,184/- (Seven Crore, Forty Nine Lakh, Twelve Thousand, One Hundred Eighty Four only) along with the interest at the rate of 18% per annum from the date of the notice till payment and/or realization as per Article 12.5 of the BEPA;*
- b. *This Commission be pleased to order & direct the Respondent to pay the sum of Rs.7,49,12,184.00 (Seven Crore, Forty Nine Lakh, Twelve Thousand, One Hundred Eighty Four only) along with the interest at the rate of 18% per annum from the date of the notice till payment and/or realization as per Article 12.5 of the BEPA;*
- c. *This Commission be pleased to order & direct the Respondent to pay the sum of Rs.60,98,343.00 (Rupees Sixty Lakh, Ninety Eight Thousand, Three Hundred and Forty Three only) along with the interest at the rate of 18% per annum from the date of deducting the said amount till payment and/or realization;*
- d. *In the interim, till the disposal of the captioned petition, the Respondent be enjoined by an order from imposing the penalty for the purported short supply of reactive power under clause 12.2 of the BEPA;*
- e. *That any other and further reliefs as this Commission may deem fit and proper in the facts and circumstances of the case; and*
- f. *For costs. ”*

3. The Petitioner in its Petition submitted as follows-

3.1 The Petitioner is a part of Shalivahana Group of companies and has set up a 10 MW power plant at Survey No. 52, 53 and 54, Village Chanaka, Tehsil Wani, Dist. Yavatmal, Maharashtra (hereinafter referred to as “**the said plant**”). The Petitioner is a generating company as defined in section 2(28) of the EA, 2003 and operates a generating station in Yavatmal District.

3.2 The Respondent No. 1 is a distribution licensee authorized to operate the distribution system for supplying electricity in Maharashtra State. The Respondent No. 1 entered into a Biomass Energy Purchase Agreement (“hereinafter referred to as **BEPA**”) dated 7 June, 2006 with the Petitioner for purchasing the energy generated by the Petitioner’s said plant based on various terms and conditions mentioned in the BEPA (signed by the Respondent No. 2).

3.3 As per article 4.2.3 of BEPA, Respondent No. 1 had contracted to purchase the entire electricity generated by the Petitioner's said plant and under article 4.2.4 also contracted to make the payment of tariff to the Petitioner in the manner as set out in the Article 12.1 (e) of the said BEPA.

3.4 Under Article 12.1 (e) (1) of the said BEPA, the Petitioner is entitled to recover the Fixed charge component and the Variable charge component of the tariff and under Article 12.1 (e) (2) of the BEPA, the Petitioner's said plant is entitled to recover the fixed charge component of the tariff for generation (including the deemed generation) up to the threshold PLF level of 80%.

3.5 Deemed generation as per the said BEPA means if the project holder is capable of generating power but the Respondent No. 1 / MSETCL systems fails to evacuate / absorb the power except under force majeure conditions at the Respondent No. 1 / MSETCL's end, as may be determined in accordance with the Article 12 section 12.5, the Respondent No. 1 would have to pay the fixed charge component but up to the threshold PLF of 80%.

3.6 Under the said BEPA, after getting the technical feasibility report from the Respondent No. 3 above, the Petitioner's said plant was interconnected with the Respondent's grid at 33/11 kV substation at Shindola, Tal. Wani. Thereafter, the Commercial Operation Date ("COD") was declared on 17 January, 2008 in respect of the Petitioner's said plant. The Petitioner mentioned that since that day it had been generating electricity in accordance with the terms of the BEPA and the Respondent No. 1 is obliged to procure, purchase and receive electricity at the point of delivery.

3.7 The Petitioner mentioned that in spite of its said plant generating electricity in accordance with installed capacity, it could not operate the said plant at the optimum capacity due to severe constraints in the Respondent No. 1's system such as over voltage/under voltage, earth fault in overhead lines causing frequent tripping of the Petitioner's said plant. Due to which only 4.5 MW to 5.5 MW of power was injected into the Respondent No. 1's grid as against the 10 MW installed capacity. Therefore the Petitioner was constrained to operate the said plant at only about 45% of the installed capacity. The issue with the system constraints and non-evacuation of power from the Petitioner's said plant was right from the beginning and the Petitioner made repeated representations before the officers of the Respondent No. 1. The

Petitioner approached the Respondent No. 3 to resolve the issue as early as within the 10 days of the COD. However, no correctives steps were taken by the Respondents.

3.8 The Petitioner mentioned that it continued to make continuous and repeated representations to all the concerned authorities of the Respondent No. 1 to strengthen the line between Shindola Substation and Wani 66 kV substation by replacing the insulators and the conductors, as some conductors had snapped causing frequent tripping due to earth faults. This regular tripping caused heavy damage to the said plant's equipment particularly to the turbine set as Seven Teeth of Gear wheel in Gear Box damaged resulting in a loss of over Rs. 60,00,000/- (Rupees Sixty Lakh only) to the Petitioner. The Petitioner stated that it had to replace the damaged system to continue to perform its obligations as per the BEPA.

3.9 Since the situation had not improved, the Petitioner operated its plant at sub-optimum level and therefore the Petitioner demanded the payment of deemed generation charges in lieu of the losses being suffered by it in spite of the Petitioner was not being in fault. The Petitioner has given a reference of the Respondent 2's letter dated 5 September, 2008 written to the Respondent No. 3, wherein the Respondent No. 3 was requested to process deemed generation payment. In view of this, the Petitioner claimed an amount of Rs. 7,49,12,184/- (Rupees Seven Crore, Forty Nine Lakh, Twelve Thousand, One Hundred Eighty Four only) in lieu of deemed generation charges to be payable by the Respondent No. 1. The Petitioner submitted that no payments were made to it by the Respondent No. 1 in lieu of deemed generation charges as contemplated by the BEPA till date, despite repeated reminders.

3.10 The Petitioner further submitted that thereafter suddenly in the month of the December 2009 itself, the issues regarding the said plant's grid connectivity and the issues of non-evacuation of 100% energy generated by the Petitioner's said plant was resolved and from the end of December 2009, the Respondent No. 1 was off taking the entire 100% energy generated by the Petitioner's said plant.

3.11 Thereafter, the Petitioner received a notice dated 25 March, 2010 from the Respondent No. 3, informing the Petitioner about the deduction of Rs. 0.25/- per RkVAh for the period from 17 January, 2008 to 28 February, 2010, totaling to a sum of Rs. 60, 98, 343/- (Rupees Sixty Lakh, Ninety Eight Thousand, Three Hundred, Forty Three only). According to the Respondent No. 3, there was a failure on the part of the Petitioner to supply reactive power equivalent to at

least 36% of the active power as per Clause 12.2 of BEPA. The Petitioner apprehended that the Respondent No. 3 for the past three years from the date of commissioning of the said plant has been taking monthly meter readings and till date not raised this particular issue of supply of less reactive power.

4. Based on the Petitioner's above submission, the Commission admitted the Petition and a notice was issued to the Petitioner, the Respondents and the four authorized consumer representatives on 14 July, 2010. Subsequently, the hearing was held in this matter on 3 August, 2010 in the office of the Commission. Shri. Gaurav Joshi, Advocate and Shri. Jagdish F., Manager appeared on behalf of the Petitioner and Shri. N. G. Naru, C.E. (Comm) and Shri. R. G. Sonavane, S.E. (Comm) appeared on behalf of the Respondent No. 1. During the hearing, the Respondent No. 1 contended that they have not received the copy of the Petition. Further, the Respondent No. 1 requested the Commission to give them 15 days time to file the reply on the Petition. The Commission directed the Petitioner to serve copies of the Petition on the Respondents immediately and directed the Respondents to file their reply/ies on or before 16 August, 2010 and also directed them to serve copies of the same on the Petitioner.

5. In line with the Commission's above directives, the Respondent No. 2 vide its letter dated 16 August, 2010 submitted following point wise reply on this matter:-

5.1 All the allegations made by the Petitioner in its Petition are without any basis and are denied verbatim. The Petitioner has made claims of Rs. 7,49,12,184/- (Rupees Seven Crore, Forty Nine Lakh, Twelve Thousand, One Hundred and Eighty Four only) along with interest @ 18 % on the ground that it could not operate its said plant at optimum capacity due to severe constraints in the Respondent No.1's system despite generating electricity in accordance with the installed capacity. The Petitioner further averred that the fault which lay with the Respondent No. 1's system varied from over voltage/under voltage, earth fault in overhead lines, thereby causing frequent tripping of the Petitioner's said plant. The Petitioner also made a claim of Rs. 60,98,343/- (Sixty Lakh, Ninety Eight Thousand, Three Hundred and Forty Three only) which was an amount deducted as penalty for not supplying reactive power as per Clause no. 12.2 of BEPA. However, all the above claims of the Petitioner are not maintainable under the BEPA dated 7 June, 2006.

5.2 Further it is submitted that, as per BEPA, a corridor for evacuation of power was provided to the Petitioner. Accordingly, a 33 kV line having adequate current carrying capacity i.e. 270 amperes (more than 15 MW) was made available for evacuation of power. However, the Petitioner was unable to generate the power as per the installed capacity as the Petitioner's said plant underwent several breakdowns and shutdowns due to its internal problems and due to inadequate protection measures in the system of the Petitioner's said plant.

5.3 Further, it is submitted that after carrying out the alteration in AVR panel and transformer cooling system by the Petitioner in the month of November 2009, the electricity generation from the Petitioner's said plant into the Respondent No. 1's system had gone up remarkably, to the tune of nearly 100% without any change or alteration in the evacuation system of the Respondent No. 1. The Petitioner had accepted in its legal notice dated 1 February, 2010 that 100% evacuation of power was being done at that time. The Respondent No. 2 has brought into the notice of the Commission that the above condition was achieved without any change or alteration in Respondent No. 1's system and the problem of evacuation vested with the Petitioner's said plant itself.

5.4 The Respondent No. 2 pointed out that at the time of COD, the power to the tune of 62 to 65% was being injected into the Respondent No. 1's system. The Annual Capacity test for the year 2008-09 was carried out from 25.03.2009 to 28.03.2009 (i.e. for 72 hrs as per article 10.4 of the said BEPA) in the ideal conditions i.e. on full load on system bus and withdrawal of load shedding and the declared capacity of the plant was found to be 7.596 MW against the installed capacity of 10 MW. It is submitted that the Petitioner was not generating the power to the tune of installed capacity even in the ideal conditions, during the above mentioned test. However, after carrying out the alterations in the said plant, the annual capacity test was again conducted during 28.10.2009 to 31.10.2009 (i.e. for 72 hrs.) for the year of 2009-10, that time it was observed that the declared capacity of the plant was 9.72 MW against the capacity of 10 MW.

5.5 Moreover the Respondent No. 2 also submitted that the damaging of the gear wheels of the turbine of the said plant had no connection with the tripping and the same was due to the internal fault / problems of the Petitioner's said plant itself.

6. The second hearing in this matter was held on 23 August, 2010 in the office of the Commission. Shri. Gaurav Joshi, Advocate and Shri. Jagdish F., Manager appeared on behalf of Petitioner. Shri. Abhishek Mitra, Advocate, Shri. N. G. Naru, C.E. (Comm) and Shri. R.G. Sonavane, S.E. (Comm) appeared on behalf of Respondent No. 1.

6.1. During the hearing, the Petitioner stated that, they have not received a copy of the reply submitted by the Respondents. Further, the Petitioner stated that, there was a technical problem due to which 100% evacuation of power was not taking place, but from December, 2009 onwards the Petitioner was able to inject 100 % power into the Respondent No. 1's grid. However, the Respondent No. 1 stated that initially the Petitioner's said plant was not supporting the dynamics of the Respondent No. 1's system. The Automatic Voltage Regulator (AVR) from the Petitioner's end was not functioning properly. The evacuation facility at the transmission side is owned and maintained by Maharashtra State Electricity Transmission Company Ltd. (MSETCL) and thus the responsibility of evacuating the power lies jointly with MSETCL and the Respondent No. 1.

6.2 Having heard the parties, the Commission opined that, since the matter is technical in nature, an advice from expert Electrical Engineer needs to be taken. Further, the Commission observed that, it is necessary to ascertain the real cause for the inability of 100% evacuation of power till December, 2009. Furthermore, the Commission observed that on receipt of the report from the Technical expert, the same shall be forwarded to both the Petitioner as well as the Respondents. Thereafter, a suitable date for the next hearing in this matter will be fixed after giving both the parties' reasonable time to make their written submissions before the Commission. Moreover, on the request of the Petitioner, the Commission allowed the Petitioner to implead MSETCL as a Respondent in this matter.

7. In line with the Commission's above observations, the Commission appointed IIT Bombay as a Technical expert to study and ascertain the technical issues related to the Petition.

8. IIT-Bombay vide its letters dated 5 January, 2011 and 4 April, 2011 brought to the notice of the Commission that for further investigation in this matter the detailed report / presentation will be sought from MSEDCL / MSETCL along with necessary data such as feeder-log details, single line diagram (SLD) of the said plant including capacities of the associated feeders / transformers etc. by clearly identifying the location of the power plant, the grid or the point of interconnection from where the power was to be evacuated. Similarly, the necessary data from the Petitioner also sought w.r.t protection system details, feeder-log details, relay type and setting data, details of earth fault relays for the said plant etc.

9. Subsequently, the Commission directed the Respondent No. 1 and the Petitioner to furnish the above details to IIT Bombay with a copy to the Commission within a week's time. Accordingly, the Petitioner and the Respondent No. 1 submitted the details to IIT Bombay. The Respondent No. 1 in its additional submissions dated 21 April, 2011 submitted as follows-

9.1 The Petitioner's said plant is connected to 33 KV feeder of 33/11 kV Shindola substation which is around 4 km from the said plant and 33/11 KV substation is further connected to 66 kV Wani substation which is at a distance of 26 kms. The load on the 33 kV Shindola substation is nearly 2.5 MW and the total load on all 33 KV feeders emanating from 66 kV Wani substation is nearly 13 to 15 MW. During the load shedding, the load on the Shindola substation is zero and at Rajur substation, there is a load of around 3.5 to 4 MW, due to HT consumers connected on express feeders. At any instance, there is a load of at least 9 MW on 33 kV bus at Wani substation, hence there no islanding condition due to load shedding.

9.2 No automatic re-closure system is deployed at 33 KV Shindola substation or 66 KV Wani substation. However, during the capacity testing of said plant, all 33 kV feeders were kept "ON" and the load test was carried out for 72 hrs. The Respondent no. 1 further submitted that, during the load shedding period, as load on 33 kV feeder was cut off, there was a substantial increase in the voltage level at 33 kV bus of Shindola and Wani substation. However, the Petitioner was not able to inject the power into the Respondent No. 1's system due to the Petitioner's systems constraints of limitation of maximum system voltage of 36.5 kV and for this neither the Respondent no. 1 nor MSETCL were responsible at that time.

9.3 Further, the Respondent No. 1 submitted that, the disturbances/jerks in the Respondent No. 1 's system were due to transient fault or switching transient on account of 'Cut Off' or switching 'ON' of 33 KV feeder line. However, any generating company should be capable of withstanding such transients. The Petitioner had not graded their protection system properly due to which the said plant tripped frequently.

9.4 After the detailed analysis of tripping data submitted by the Petitioner, it is observed that, the billing and check meter data showed only 7 nos. of tripping during the month of November 2010. Whereas, the tripping data submitted by the Petitioner shows total 64 nos. of tripping of the power plants including 7 nos. of failure events. Thus remaining 57 nos. of tripping to the said plant were due to problems at Petitioner's end. As these 57 nos. of power failure events had not been registered by Billing and Check meter data and due to these trippings, the said plant went to home load on the earth fault, only because of improper relay settings at the Petitioner's end.

9.5 Similarly, tripping data for December 2010 submitted by the Petitioner shows that out of 50 nos. of tripping of the said plant, only 6 power failure events were registered by Billing and Check meter. Hence, for frequent tripping to the Petitioner's said plant the Respondent/MSETCL system was not responsible. At present, after resolving the problem at the Petitioner's end, the power from the said plant is being evacuated properly without any changes or any modifications at the Respondent No.1's system.

10. Based on submissions made by the Petitioner and the Respondents and after the detailed scrutiny of this case, IIT Bombay submitted the final report to the Commission on 30 August, 2011. IIT Bombay's observations in this matter are as follows-

10.1 Respondent No. 1 was requested to provide the feeder logs of the 33 KV Shindola feeder, for the year 2008 and 2009, with the feeder logs for December 2008 and 2009 being the minimum required data. Respondent No. 1 has provided the 33 KV Shindola feeder log data for only 48 days. So, due to unavailability of the complete records over the said interval, this data that appears to be on random dates and is considered to be representative of all days in the interval under disputes.

10.2 The feeder logs consist of feeder voltage, current, power (MW) and time of recording. A statistical analysis was carried out based on the voltage data provided by these feeder logs. The minimum voltage has a mean of 33.66 KV with a standard deviation of 1.42 and the maximum voltage has a mean value of 35.65 KV with a standard deviation of 0.59.

10.3 The Petitioner's generator over voltage setting is 110% (36.3 kV) with instantaneous time setting which is not as per the IEEE guide for AC generator protection. As per IEEE guide for AC generator protection, the instantaneous unit should be set at 130-150% (42.9 to 49.5 KV) and the inverse time unit should be set at 110%. The instantaneous setting of 110% appears to be conservative and could be responsible for inadvertent tripping of the Petitioner's generators, hence it is suggested that instantaneous setting be revised to 130% and inverse time setting of 110% with 10 sec. time.

10.4 Also it is seen that a vector surge relay is provided for the Petitioner's generator. It is suggested that this relay be disconnected as it is prone to malfunction. It can be replaced by an under frequency plus rate of change of frequency relay. However, the Petitioner should carry out necessary protection systems study to validate these suggestions.

10.5 The feeder availability has been inferred from feeder logs of the 33 KV Shindola feeder provided by the Respondent No. 1. The period under consideration i.e. from 17 January, 2008 (date of COD) to 30 November, 2009 consist of 681 days, out of which said plant was out of operation for the period of 14 days only. It is observed that the 33 kV Shindola feeder availability is 92.7%.

10.6 It is submitted that with the limited data availability, it is not possible to clarify the reasons for non-availability of the feeder and as to whether these are due to faults on the Respondent No. 1's feeder or due to the problem at the Petitioner's end. Furthermore, it is suggested that it would have been beneficial, if the complete record on feeder availability in this period were made available. Hence, IIT Bombay recommended that the Commission make submission of feeder availability data mandatory for distribution/transmission companies by which such complaints of non-availability of evacuation feeders can be transparently handled.

10.7 From the single line diagram, it is inferred that load on the 33 kV Wani feeder is available even during the load shedding as there are three express feeder being fed from this bus viz. Rajur (8 MVA), Kumbharkhani (2 MVA) and Kolarpimpri (3 MVA). Express feeders are generally not tripped during load shedding and hence, this load will be available to evacuate the Petitioner's said plant. Therefore, the complaint from the Petitioner regarding the load not being available due to load shedding is incorrect.

10.8 It is observed that the 33 kV circuit breaker of the Shindola- Wani feeder is not in service and is by-passed using jumpers. This result in the 33 KV of the Petitioner's incomer breaker tripping for faults on the Shindola to Wani feeder, resulting in loss of supply for the 3.15 MVA, 11 KV load at Shindola and also lower availability of Shindola feeder. It is recommended that 33 KV circuit breaker on Shindola to wani feeder be replaced.

10.9 This report has primarily addressed the issue of availability of the Respondent No. 1's network for evacuation of the Petitioner's generation. Based on the records submitted by the Petitioner as well as the Respondents, IIT-Bombay concluded that there is no prima facie case that the Respondent No. 1's network was not available for evacuation of generation. The problem could have been solved by proper relay setting and transformer tap setting at the Petitioner's end.

10.10 The Respondent No. 1 may also have to reduce its 33 kV Shindola bus voltage by adjusting the transformer taps. Hence, IIT-Bombay prima-facie concluded that both the Petitioner as well as the Respondent No. 1 are at fault, for the reasons listed below-

- a. The Petitioner did not set relays correctly and did not take adequate care to co-ordinate its relay settings with the Respondent No. 1 and adjust its transformer tap settings to account for relatively higher minimum voltages at the Respondent No. 1's end.
- b. The Respondent No. 1 has not maintained feeder availability logs notwithstanding an agreement with the Petitioner. The Respondent No. 1 had not advised the Petitioner about the same and maintaining higher voltage at Shindola bus.
- c. There seems to be lack of technical competence at both the Petitioner and the Respondent No. 1 ends, leading to lack of evacuation of generation. While taking a

final decision, the Commission may take into consideration the above shortcomings of both the Petitioner and the Respondent No. 1.

11. Based on the Commission's ruling under *Para 6 (6.2)* as mentioned above, the final report on this matter submitted by IIT Bombay, was forwarded to both the Petitioner and the Respondent No. 1 with the direction to both of them to submit their comments to the Commission within a week's time. Accordingly, the Petitioner vide letter dated 22 September, 2011 submitted its comments on the above IIT Bombay report. The Petitioner's point wise submission is as follows-

11.1 There is a frequent tripping of the Petitioner's 33 kV incoming feeder for earth faults in the Respondent No. 1's system due to absence of breaker at Shindola for 33 kV Shindola-Wani feeder (as it is bypassed). Thus, even if the small 3 MW load at Shindola sub-station is lost; the evacuation of power is not possible. Further the Petitioner submitted that, it is not clear from the report as to whether the Respondent No. 1 has not submitted the data or IIT-Bombay could not conclude on that subject due to non-availability of data from the Respondent No. 1. The sub-station logs and feeder trip data is supposed to be maintained by the Respondent No. 1 and the same should be made available to IIT-Bombay.

11.2 The Petitioner is of the view that the relay settings for all the feeders at Shindola and Wani areas along with tripping logs should have been investigated by IIT-Bombay. In the absence of the Respondents records, the Petitioners' record should be accepted by IIT-Bombay, based on this technical inputs, IIT-Bombay may like to re-examine its report.

11.3 The Petitioner submitted that the Bus voltages at Shindola, Wani and the vicinity areas are on the higher side. If the power is to be pushed up to the Wani or beyond it, the voltages have to be higher at the Petitioner's end. The Petitioner further submitted that, the normal voltages remain very high close to 110%. Even with the tap reduction at Wani, the said plant got trip out in 10 seconds later, which is not a relief. Further, as per the BEPA, the Petitioner had to generate the reactive power of about 33%, failing which; the penalty amount had been deducted by the Respondent No. 3 in the past. The Respondent No. 1 has to curtail the voltages by at least 6-7%, so that the contingencies like load shedding and associated voltage rise can be taken care of.

11.4 However, the Respondent No. 1 had not anticipated the high voltage problems in that area and inserted the reactive power clause in to the BEPA. By pushing the reactive power in to the grid when the voltages are normally higher than the rated, there will be increase in voltage leading to tripping of the Petitioner's said plant /generator. IIT Bombay may look into the reactive power clauses of the BEPA vis-à-vis the voltage profile and the above mentioned problems on technical grounds.

11.5 The Petitioner contended that, even if there is no load at Wani or Shindola, 10 MW generation at the Petitioner's said plant would eventually find the way through the 66/33 kV Wani feeder and towards Warora and meets the load somewhere in the grid (minus losses), provided the voltages were on the lower sides and closer to the nominal values and generation voltage at the Petitioner's said plant could be maintained at higher level. But the steady state voltages were high during the load shedding and even during normal condition. And even after maintaining the unity power factor, these situations were persisting in the Respondent No. 1's system. These factors are beyond the control of the Petitioner and are under the jurisdiction of the Respondent No. 1 or even with MSETCL.

11.6 The Petitioner submitted that, the data furnished by the Respondent No. 1 is randomly for 48 days out of total 677 days which is less than 10% of the time under consideration which is insufficient to decide the case. The Petitioner further submitted that, the case can be understood only if data is available for the entire period under consideration is made available to IIT-Bombay.

11.7 The Petitioner opined that the feeder trip logs must be examined along with hourly readings which are only at Shindola station. IIT-Bombay worked out availability of 92%. This figure required to be recomputed using CERC norms for the availability calculation. IIT-Bombay does not accept the Petitioner's argument regarding the non-availability of load. The Petitioner expressed that hourly logs is only at Shindola station and those for Wani and vicinity needs to be examined by IIT Bombay. Not only that the tripping details and logs at vicinity and protection aspects of the feeders at Wani etc. are required to be examined by IIT Bombay. Unless such comprehensive analysis is done, the conclusion is scientifically not acceptable.

12. The Respondent No. 2 vide its letter dated 30 September, 2011 submitted its reply on the Report submitted by the IIT-Bombay as follows-

12.1 The Petitioner contended that it was able to generate power but was not able to evacuate it due to system constraints of the Respondent No. 1. The case of the Petitioner is not tenable in light of the observations and conclusion in the Report of IIT Bombay. It is submitted that even though the logs of 33 kV Shindola feeder is not available for all days of the year 2008 & 2009, the representative data on random dates is provided by the Respondent No. 1. These dates include the number of tripping, tripping duration, Min. voltage, Max. voltage of 33 kV Shindola feeder.

12.2 It is seen that a vector surge relay is provided for the Petitioner's generator, it is suggested that this relay be disconnected as it is prone to malfunction. Due to improper relay setting and mal-operation of protection system of the Petitioner, the Petitioner's generator tripped frequently. The said plant of the Petitioner underwent several breakdowns and shutdown due to its internal problems.

12.3 Further, it is submitted that 33 kV Shindola feeder's availability was about 92.7%. The non-availability of the feeder is only due to problems at the Petitioner's end. The complaint of the Petitioner regarding the non-availability of the load during load shedding is declared incorrect. The 33 kV circuit breaker of the Shindola to Wani feeder is not in service and has bypassed using jumpers. But even if the 33 kV circuit breaker of Shindola-Wani feeder would have been in service then in case of tripping of 33 kV Shindola feeder, the Petitioner generator had been isolated from the grid connectivity.

12.4 Only after carrying out alteration in the AVR panel and transformer cooling system by the Petitioner in his system in the month of November 2009, the power was injected in to the Respondent No. 1's system had gone up remarkably, to the tune of nearly 100% without any change or alteration in the evacuation system of the Respondent No. 1. Moreover, the Petitioner has also applied for incentives for generation above 80% PLF for the FY 2009-10 and FY 2010-11. It is submitted that the same was achieved without any change or alteration in the Respondent No. 1's system and the problem with evacuation lied with the Petitioner itself and therefore the question of deemed generation does not arise at all.

12.5 It is submitted that damaging of gear wheel of the turbine set, as claimed by the Petitioner has no connection with the tripping of the 33 KV Shindola feeder and the same was due to internal fault / problems of the said plant of the Petitioner. Further, the IIT-Bombay has carried out detailed analysis of problems related to evacuation of power and the Petitioner's 33 KV incoming feeder tripping details by approaching both the parties. Therefore, the report of IIT-Bombay may be considered as final for deciding the case.

13. After considering the above submissions made by the Petitioner and the Respondent No. 1, the hearing in this matter was held on 3 October, 2011. Shri. C. Venketerao, Plant Manager and Shri. Jagdish F., Manager, appeared on behalf of the Petitioner. Shri.S. S. Dhande, CE (Commercial), Shri M. S. Kele, S.E and Shri. M. S. Baig, S.E appeared on behalf of the Respondent No.1. Dr. S. A. Soman appeared on behalf of IIT Bombay, Powai.

13.1 During the hearing, the Petitioner once again reiterated that, the fault which lay down with the system is from the Respondent No. 1's end due to which the Petitioner was unable to inject the power into the Respondent No. 1's Grid. Whereas the Respondent No. 1 submitted that the fault that occurred was due to non-adequate protection measures in the system of the Petitioner.

13.2 IIT-Bombay submitted that, there seems to be a lack of technical competence at both Petitioner's as well as Respondent No. 1's ends. Furthermore, the Respondent No. 1 did not submit the adequate feeder log data. Even where records are available, the availability of the 33 kV Shindola feeder seems to be on lower side.

13.3 Having heard the parties, due to insufficient feeder log data submitted by the Respondent No. 1 to IIT-Bombay, the Commission directed the Respondent No. 1 to submit all the necessary feeder log data during the disputed period to IIT-Bombay with copy to the Commission. Furthermore, the Commission directed IIT-Bombay to look in to the present matter with respect to the necessary data available with the Petitioner and the Respondent No. 1 and also directed to give its recommendation with respect to all factual conditions.

14. In line with the above directives, the Respondent No. 1 submitted the data regarding the previous and present relay settings at the Petitioner's said plant, Month-wise tripping report of 33 kV Shindola feeder from 66 kV Wani substation, Month-wise (from January 2008-December 2009) Maximum & Minimum voltage at 33 kV Shindola sub-station etc.

15. In addition to above submission, the Petitioner submitted that due to frequent tripping of the incoming 33 KV breaker at the Petitioner substation for various reasons, continuous 72 hrs test could not be taken, the plant was re-synchronized for 4 to 5 times but could not run continuously. In order to overcome the overvoltage problem the Petitioner maintained Power Factor at 0.99 for sending the active power but on other hand, getting penalized by the Respondent No. 3 to an amount about 3-4 lakh per month for not delivering the reactive power of 36%.

16. Thereafter, IIT Bombay in its final report dated 16 November, 2011, submitted as follows-

16.1 The Respondent No. 1 has submitted the data for the period under consideration. This data was cross verified from the log sheets and only a slight variation was found in the results. It is observed that the minimum voltage has a mean of 31.94 KV with Standard Deviation of 2.19. Similarly, the maximum voltage has a mean value of 34.97 KV with a Standard Deviation of 0.33. As per Central Electricity Authority (Grid Standards) Regulations, 2010, the minimum and maximum allowable voltages at 33 KV level are 30 KV and 36 KV respectively. Thus maximum feeder voltage is acceptable as per the grid standard.

16.2 Further, IIT Bombay considered the voltage regulation due to the impedance of feeder. For a 33 KV feeder with ACSR panther conductor with an A.C resistance of 0.1738 ohms/km and a 10 MW unity power factor load over 30 Km (26 km for Shindola- Wani and 4 Km for Shindola- Petitioner's said plant), the voltage at the sending end would be 36.7 KV which is not significantly different from the maximum allowable bus voltage at Shindola 36 KV. As per latest data provided by the Respondent, the vector surge relay at the Petitioner's plant side is bypassed. As recommended earlier this is advisable that this relay is prone to mal-operation. It can also be replaced by an under frequency with rate of change of frequency relay. However, the Petitioner should carry out necessary protection system studies to validate these suggestions.

16.3 In the period under the consideration, tripping data from the Respondent No. 1's side, 33 KV Wani-Shindola feeder is available for the period of 18 months, sufficient enough to draw an inference on availability of this feeder. It is observed that the feeder was not available for the total of 178.27 hrs out of 13176 hrs (529 days) i.e. availability of feeder was 98.65%. It was earlier incorrectly reported that the 33 KV circuit breaker of the Shindola-Wani feeder is not in service and has been bypass by using jumpers. However, in light of single line diagram submitted by the Respondent No. 1 this is 3.15 MVA transformer feeder breaker and may lead to the tripping of 33 KV circuit breaker at Wani for Shindola transformer fault also. It should be noted that although, the Wani –Shindola tripping data does not indicate any adverse impact of Shindola transformer faults, it is recommended that this faulty circuit breaker be replaced.

16.4 Finally IIT-Bombay concluded that based on the additional records submitted by the Respondent No. 1; there is no prima facie case that the Respondent No. 1's network was not available for evacuation of generation.

17. Subsequently, the hearing in this matter was held on 18 November, 2011. Shri. Jagdish F., Manager, appeared on behalf of the Petitioner. Shri M. S. Kele, S.E, Shri. A.V. Bute, Dy. EE and Shri. Rahul Sinha, Advocate appeared on behalf of the Respondent No.1. Dr. S. A. Soman of IIT Bombay, was also present during the hearing.

18. During the hearing, the Petitioner sought time to analyze the submission made by the Respondent No. 1 to IIT-Bombay. The Commission directed Respondent No. 1 to serve the copy of its complete set of submission on the Petitioner for detailed analysis. Further the Commission directed the Petitioner to study the submission made by the Respondent No. 1. The Petitioner may discuss the issues related to technical matter with the IIT Bombay, if required.

19. Aggrieved upon the IIT Bombay's second (final) report, the Petitioner vide its letter dated 19 December, 2011 submitted its comments as follows-

19.1 The Petitioner submitted that, IIT-Bombay has not addressed its earlier comments nor replied to the same. The several operational problems of the grid in the vicinity of the Petitioner's generator have to be considered together by the IIT Bombay. The Petitioner

further submitted that for injecting the power in to the Respondent No. 1's grid, first of all 33 kV feeder to Wani should be available and secondly, the voltages in the vicinity should be at nominal values. Further, the relays in the Respondent No. 1's system should clear the faults and not stress the generator at the Petitioners' end.

19.2 The sufficient amount of power could not be generated because of non-availability of evacuation feeder and whenever it was available; the voltages in the vicinity were high and so the Petitioner was unable to inject the power as it was close to tripping levels. As such the Petitioner automatically should be given deemed generation benefit.

19.3 The Petitioner further submitted that, there is a reactive power clause expecting from the Petitioner to inject reactive power of about 36% of exported MW, which could not be achieved as the voltages were close to 110%.

20. Based on all above submissions, the hearing in this matter was held on 21 December, 2011. Shri. Jagdish F, Manager and Shri. V. Krishnamoorthy, GM, appeared on behalf of the Petitioner. Shri. Rahul Sinha, Advocate and Shri. R. G. Sonwane, SE appeared on behalf of the Respondent No. 1 and Dr. S. A. Soman appeared on behalf of IIT Bombay, Powai.

20.1 During the hearing, the Petitioner submitted its comments on IIT-Bombay report and its electrical tripping and break-down data with effect from January 2008 to September, 2009. The Petitioner stated that due to earth fault problem, the Respondent No. 1's feeder was not available to off-take the power from the Petitioner's plant and due to excessive high voltages at the vicinity buses the Petitioner was unable to push the power into the Respondent No. 1's grid. Furthermore, the Petitioner requested the Commission that, IIT-Bombay should also consider the tripping and break down data submitted by the Petitioner.

20.2 IIT Bombay stated that, in case of voltage situations there is no prima facie case that the Respondent No. 1's network was not available for evacuation of the power. There could be a problem from the generator's end and not with the wire. As far as the wire data is concerned, the Respondent No. 1's network was available at 98.65% and the voltages were within the technical limit.

20.3 Moreover, the Respondent No. 1 submitted that, based on the billing meter and check meter data, its feeder was available for most of the time and problem of tripping was due to improper relay co-ordination from the Petitioner's end.

20.4 Having heard the parties, Commission directed the Respondent and IIT Bombay to submit their reply on the Petitioner's above submission before the next date of hearing.

IIT Bombay's Submission

21. Accordingly, IIT Bombay vide its letter dated 22 January, 2012 submitted its comments in response to the Petitioner's submission, are as under-

21.1 IIT-Bombay submitted that, the findings are based upon the substation log data submitted by Respondent No. 1. Based on the physical inspection of the log sheets, IIT Bombay believed that the records are authentic. The results indicate 98.65% availability of Wani feeder, which clearly indicates that the network was available.

21.2 Further IIT-Bombay submitted that, the arguments presented by the Petitioner on high voltage problem are technically not admissible. The Respondent No. 1 has to provide voltage between technical limits and not necessarily at nominal values. Some part of the grid may have voltages below nominal value and some parts have above nominal values. So long as they are within the stipulated limits, there would not be any complaints from the generator's end. The voltage at a particular location depends on supply end voltage, loads, feeder length etc. A load at the end of a long radial feeder can have voltage below the nominal value. Perhaps, no where in the World does a Utility promise to a consumer connection with a fixed voltage at the nominal value. In fact, in India, in variance with worldwide practice, even frequency is not promised to be maintained at the nominal value or in a tight band around the same.

21.3 It was observed that during the disputed period, the over voltage relay of the generator was conservatively set and vector surge relay which is prone to malfunction was used and no efforts to control voltages by adjusting the transformer tap carried out at generator's end. For such variations, like 36.7 kV, the Petitioner could have to adjust transformer taps (or use OLTCs/ULTCs), so that generator voltages remains within the limits.

21.4 IIT Bombay stated that the requirement of the reactive power from the generator is based upon the assumption that rural/semi-urban distribution systems typically suffer from low voltage problems. Reactive power support from the generator in the distribution system should lead to reduce the reactive power requirement from the grid, which improves the voltage profile in the distribution system in the vicinity of the generator. In this case, Respondent No. 1 is maintaining Wani substation voltage already above the nominal value. Hence IIT-Bombay opined that the Petitioner should not be asked to provide reactive power support.

MSEDCL's Submission

22. The Respondent No. 2 vide its letter dated 23 January, 2012 submitted its comments on the Petitioner's submission, are as follows-

22.1 The Petitioner's claimed of non-evacuation of power mainly is attributable to two factors i.e. High voltage at Wani-Shindola bus and frequent tripping of 33 KV Wani-Shindola feeder. However, as per the IIT Bombay's first as well as second report the voltage at Wani-Shindola bus is found within the grid standards i.e. between 30 KV to 36 KV.

22.2 The 33 KV Wani-Shindola feeder availability calculated by the IIT Bombay was 92.7% based on the partial data and the availability recalculated as 98.65% after submitting the complete data by IIT Bombay is "acceptable". IIT Bombay also pointed out the actual reasons for the non-evacuation of power from the Petitioner's plant. As per the IIT Bombay report the vector surge relay is prone to mal-operations and should be bypassed.

22.3 The tripping data submitted by the Petitioner pertains to the tripping of the Petitioner's generator. Hence, has no relevance in regard of evacuation network. The tripping of the Petitioner's said plant was due to their internal faults and hence the data submitted by the Petitioner cannot be considered for calculation of feeder availability. Based on the billing meter and check meter data of month of November, 2010 and December, 2010, its feeder was available for most of the time and problem of tripping was due to improper relay co-ordination from the generators end. Hence the claim of deemed generation charges is not admissible and is denied.

22.4 The Respondent took the proactive steps to solve the power evacuation problem created by the Petitioner. However, the problem was with the Petitioner and not with the Respondent No. 1's network. Hence the Respondent No. 1 and the consumers of the Respondent No. 1 cannot be penalized for the fault of Petitioner by admitting deemed generation charges.

23. Based on above submissions, the hearing in this matter was held on 25 January, 2012. Shri. Jagdish F, Manager and Shri. V. Krishnamoorthy, GM appeared on behalf of the Petitioner. Shri. M.S. Kele, SE and Shri. A.V. Bute, Dy (EE) appeared on behalf of the Respondent No.1. Dr. S.A Soman appeared on behalf of IIT Bombay, Powai.

23.1 During the hearing, Dr. S.A Soman, IIT Bombay reiterated that the records are authentic and are based on the physical inspection of the log sheets. The results indicate 98.65% availability for Wani feeder which clearly indicated that the Respondent No. 1's network was available to evacuate the power. Further, IIT Bombay submitted that, the arguments presented by the Petitioner on high voltage problem are technically not admissible.

23.2 It was found that, the over voltage relay setting of the generator was conservative; vector surge relay which is known to malfunction was used and no efforts to control voltages by adjusting the transformer tap was carried out at generators end. Moreover, IIT Bombay submitted that, as far as the reactive power issue is concerned the voltage in the Respondent No. 1's network is already above the nominal value, hence the Petitioner should not be asked for the reactive power support.

DECISION WITH REASONS

23.4 Having heard all the parties and after considering the material placed on record, the Commission's views are as follows;

23.4.1 As indicated in IIT Bombay's report dated 16 November, 2011 and 22 January 2012, based on the physical inspection of log sheets, it was inferred that the 33 KV Wani –Shindola feeder connecting the Generator's grid was available for 98.65% time, which is more than sufficient to infer that the Respondent No. 1's ("MSEDCL") network was available. Further, the distribution licensees have to provide voltage within technical limits (i.e. minimum and

maximum) and not necessarily at nominal values, which the Respondent No.1 has complied with. As per Central Electricity Authority's (Grid Standard Regulations 2010), the minimum and maximum allowable voltage at 33 KV voltage level are 30 KV and 36 KV respectively. Thus, maximum feeder voltage for 33 KV Shindola substation is acceptable as per grid standards.

So long as the grid voltages are within the stipulated limits, the consumer's complaints cannot be entertained. The voltage at a particular location depends on supply end voltage, loads, feeder length etc. The voltage and frequency variation is the grid issue and hence, the utility cannot promise to a consumer connection with fixed voltage at nominal value. The Petitioner could have adjusted the transformer taps accordingly so that the generator voltage is within the limit. The overvoltage protection as indicated in the IIT report and in the various documentation submitted by the Petitioner and the Respondent No. 1, was conservatively set and vector surge relay was bypassed. Later on, the Petitioner carried out necessary changes and it is seen that they were able to evacuate the power satisfactorily, thus conforming the diagnosis by IIT. Thus, from the technical report submitted by IIT Bombay, it can be concluded that;

- 1) The Respondent has been able to demonstrate the availability of feeder and voltages are within the permissible limits, barring few exceptions.
- 2) It is also found out that after carrying out technical modifications at the generator's transformer end, the Petitioner is able to evacuate the power from their generator satisfactory into the Respondent No.1's grid.

23.4.2 It is observed that this technical matter could have been resolved at the initial stage by proper co-ordination between the Petitioner and the Respondent No. 1. Based on IIT Bombay's report it is found that the availability of the Respondent No. 1's network was 98.65% during the disputed period. On the other hand, due to inadequate protection system deployed at the Petitioner's said plant, the power was unable to evacuate and injected into the Respondent No. 1's grid. And, only after carrying out the necessary modification/alterations at the Petitioner's said plant, the nearly 100% power is evacuated. Under these circumstances, the Petitioner's claims under Clause no. 12.5 of BEPA for the payment of deemed generation from the Respondent is unjustified and stands rejected.

23.4.3 The Clause no. 12.2 of BEPA can be reproduced as follows-

“12.2 Reactive Energy (KVARH):

- a) *The Project holder shall supply reactive power (RkVAh) equivalent to at least 36% of the active power (kWh) supplied to MSEDCL system on monthly basis. In case of failure to do so MSETCL/MSEDCL shall charge the shortfall at the rate of Rs. 0.25/kVARh or such other rate if any, as may be stipulated by the MERC from time to time.*
- b) *MSEDCL in the project holder’s monthly energy bill will adjust the reactive energy charges.*
- c) *MSEDCL reserves the right to give the notice the project holder to take suitable steps to maintain the required power factor and to avoid the drawl of reactive power from the system failing which MSEDCL will be entitled to disconnect the facility from the grid after expiry of 45 days period from the date of such notice.”*

The requirement of the reactive power from the generator is based upon the assumption that rural/semi-urban distribution systems typically suffer from low voltage problems. Reactive power support from the generator in the distribution system should lead to reduce the reactive power requirement from the grid, which improves the voltage profile in the distribution system in the vicinity of the generator. However, the Respondent No. 1 is maintaining Wani substation voltage already above the nominal value. Hence, in normal case, the Petitioner’s generator need not be asked for reactive power support.

From the IIT Bombay report, it is clear that the voltage profile at the Respondent’s system is already maintained at higher side as compared to nominal voltage level but found to be within the permissible technical limits. The intention behind the supply of reactive power into the grid is to improve the line voltage profile for steady state grid operation. Under these circumstances, as the Respondent’s system voltage is already maintained on higher side, it may not be technically feasible for the Petitioner to supply the reactive power into the Respondent No. 1’s grid. Hence, the applicability of reactive power supply clause is not relevant in this case, for this time period.

Considering the above facts, the Commission hereby directs the Respondent No. 1 to refund the amount without interest which was deducted for short supply of reactive power during the period (i.e. January 2008 to February 2010) to the Petitioner within sixty days from the date of this Order.

With the above, the Case No. 19 of 2010 stands disposed of.

Sd/-
(Vijay L. Sonavane)
Member

Sd/-
(V. P. Raja)
Chairman