

Before the  
**MAHARASHTRA ELECTRICITY REGULATORY COMMISSION**  
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Case No. 77 of 2011

In the matter of

**Petition of The Tata Power Co. Ltd. seeking direction upon MSETCL to grant connectivity to 60.48 kWp Rooftop Solar Power Project at Tata Power's Carnac Receiving Station**

**Shri V.P. Raja, Chairman  
Shri Vijay L. Sonavane, Member**

The Tata Power Co. Ltd.  
Bombay House  
24, Homi Modi Street  
Fort, Mumbai – 400 001

... Petitioner

Vs.

Maharashtra State Electricity Transmission Co. Ltd.  
Rep. by the Managing Director  
Prakashganga, Plot No. C-19  
E- Block, Bandra-Kurla Complex  
Bandra (East), Mumbai 400 051

... Respondent

**ORDER**

**Dated: September 2, 2011**

The Tata Power Company Ltd. (TPC) filed a Petition on affidavit before the Commission on June 1, 2011, under Section 86 (1) (e) of the Electricity Act, 2003 (“2003 Act”), seeking direction upon MSETCL to grant connectivity to a 60.48 kWp Rooftop Solar Power Project at Tata Power's Carnac Receiving Station. The Maharashtra State Electricity Transmission Company Ltd. (MSETCL) has been impleaded as Respondent in the matter. The Tata Power Company Ltd. vide its Petition made the following prayers:-

1. *“To direct STU to grant connectivity & long term open access to Tata Power’s 60.84 kWp Rooftop Solar Power Project at Carnac Bunder, Mumbai.*
2. *Clarify that energy from the power project may be purchased by a distribution licensee under the MERC (Transmission Open Access) Regulations 2005 to allow the connectivity of such Roof Top Solar projects.*
3. *Condone any inadvertent omissions/ errors / shortcomings and permit Tata Power to add / change/ modify / alter / this filing and make further submissions as may be required at a future date.*
4. *Any other relief that Hon’ble Commission may deem fit.”*

2. TPC submitted that as part of expanding its Renewable generation portfolio and to support the cause of renewable energy (RE) generation, it has commissioned a 60.48 kWp Rooftop Solar Power Project in January 2011 at its Corporate Office, Carnac Bunder, Mumbai, which is located in the same premises of 220/110/33/22 kV transmission substation owned by the Tata Power - Transmission business (TPC-T). The electricity generated from this Rooftop Solar Project will be purchased by TPC-Distribution (TPC-D) to meet its Solar based Renewable Purchase Obligations specified by the Commission at the tariff as determined for Rooftop PV based Solar Technology by the Commission in accordance with MERC (Renewable Energy Tariff) Regulations, 2010. Further, TPC clarified that the Rooftop Solar Project at Carnac, Mumbai has 336 number of panels (28 arrays each containing 12 modules), size of each panel is 1587 mm x 790 mm, area occupied is 549 m<sup>2</sup>, continuous rating is 60 kVA with all phases equally loaded and output voltage is 400 volts three phase, 4 wire, grid tracking.

3. TPC stated that Regulation 13.1 of the MERC (State Grid Code) Regulations, 2006 requires approval of STU for grant of connectivity to Intra State Transmission System (InSTS), as reproduced below:

*“13.1: Application for establishing new arrangement or modifying existing arrangement of connection to and/or use of the InSTS shall be submitted by concerned Transmission Licensee or user to the State Transmission Utility”*

In view of the above, Tata Power-Solar, the developer of the Solar project, made an application to State Transmission Utility (STU) for connectivity of the said Solar project to Intra State Transmission System (InSTS) and long-term open access (LTOA) to supply power to TPC-Distribution through InSTS. Tata Power referring to Regulation 13.1 of MERC (State Grid

Code) Regulations, 2006, stated that there is no lower limit for exemption of the permission of STU for a generating plant getting connected to the InSTS.

4. TPC submitted that the STU, vide its letter dated May 4, 2011, rejected the grant of connectivity and long-term open access for TPC's Rooftop Solar project on the ground that as per MERC (Transmission Open Access) Regulations, 2005, there are no guidelines for granting Open Access for load/ generation less than 1 MW and hence, advised TPC to take up the matter with the Commission for necessary guidelines.

5. In the present Petition, TPC contended that the STU has erred in its observation on the application made by TPC, to the extent of the following:

- a) The application made by TPC was for connectivity under Clause 13.1 of the State Grid Code Regulations and not for open access as such. However, the STU has not permitted the connection on the reason that open access has been sought for less than 1 MW.
- b) Even if it is assumed that the application is for open access on transmission system for the 60.48 kWp Solar Rooftop Plant, it is submitted that there is no such limit prescribed either in the MERC (Transmission Open Access) Regulations, 2005, or the guidelines and procedures framed by the STU under the MERC (Transmission Open Access) Regulations, 2005.
- c) Besides, under Section 39 (2) (d) (i) of the Electricity Act, 2003 wherein the functions of STU have been specified, the STU is mandated to provide non-discriminatory open access to its transmission system for use by Generating Companies on payment of the transmission charges, and there is no restriction on the eligibility for transmission open access only to a generator having capacity of more than 1 MW.

6. In view of the above, TPC submitted that the Electricity Act, 2003, MERC (Transmission Open Access) Regulations, 2005 and the guidelines & procedures framed by the STU under the MERC (Transmission Open Access) Regulations, 2005, permits connection of any generator within the State to the intra-State transmission network and stated that the restriction of 1 MW is applicable to consumers who wish to take power supply under open access and not applicable to generators.

7. Further, TPC submitted that the 60.48 kWp Solar project of Tata Power at Carnac qualifies as Solar Rooftop as per Regulation 2.1 (cc) of MERC (Terms and Conditions for Determination of RE Tariff) Regulations, 2010. Due to availability of appropriate space at Carnac Transmission Receiving Station of TPC-T, TPC considered it more practical to connect the Rooftop Solar project in the Carnac Receiving station of TPC-T. The nearest interconnection point for the same is 415 V station auxiliary bus of TPC-T. The 415 V auxiliary bus is part of the assets of TPC-T Mumbai Licensed area business. TPC added that it has assessed the technical feasibility of connecting to transmission network of TPC-T and had obtained certification from TPC-T that the generation from Solar Project can be absorbed in the transmission network of TPC-T.

8. In this context, TPC contended that neither the Electricity Act, 2003 nor any Regulations of the Commission specify minimum value of voltage above which it may qualify for transmission, and hence, submitted that even 415 V of station auxiliary bus at Carnac TPC-T substation would qualify as transmission voltage for the purpose of connection to this Solar Plant.

9. The Commission, vide letter dated June 3, 2011, directed TPC to implead Maharashtra State Electricity Transmission Company Ltd.(MSETCL) as respondents in the above matter. The Commission, vide its Notice dated June 7, 2011, scheduled a hearing in the matter on June 27, 2011, and directed TPC to serve a copy of the Petition, along with its accompaniments to MSETCL and the four authorised consumer representatives viz. a) Prayas (Energy Group), b) Mumbai Grahak Panchayat, c) The Vidarbha Industries Association and d) Thane Belapur Industries Association.

10. Prayas, vide letter dated June 27, 2011 submitted that the Petition filed by TPC cannot be seen in isolation as it raises various issues generic to all such small scale Renewable Energy and decentralised projects, which will need grid connectivity in near future. Prayas added that there is an urgent need to formulate a coherent approach for dealing with such cases in a comprehensive manner in the wake of all distribution licensees as well as open access consumers being required to meet the RE procurement obligations, including solar power. Besides, Prayas stated that this will be relevant in scenarios where decentralised systems (previously off grid or otherwise), which may now want to inject their surplus generation into the grid. Further, Prayas also stated that while adopting such a comprehensive approach in the

matter, the same should clarify various aspects such as a) connections interface norms, b) Metering and Energy Accounting Norms, c) Issues related to scheduling of such power, d) Tariff for such power, etc.

11. During the hearing held on June 27, 2011, TPC made a detailed presentation on the background of its Petition and prayed that STU may be directed to grant grid connectivity and long-term open access to TPC's 60.84 kWp Rooftop Solar power project. MSETCL highlighted that if the connectivity of the Solar project is to be considered at InSTS, it will result in raising several issues related to metering and accounting of energy generated from the said project. During the hearing, the comments made by Prayas (as mentioned in the above Para) on the current Petition were also referred by the Commission.

12. After hearing the Petitioner, the Respondents and the submission of Prayas, the Commission suggested to form a Technical Committee under Director (EE), MERC, consisting of representatives from TPC, STU, SLDC and co-opted members of experts/consultants, viz., Shri. Ajit Pandit and Shri. G.S Rao to examine all technical issues and accounting issues associated with the said Solar Project. The Committee was also asked to prepare a report and to make a detailed presentation to the Commission.

13. The Committee vide letter dated June 28, 2011, scheduled the first meeting of the Technical Committee on July 5, 2011 and asked the Petitioner and Respondent to comply with the following requirements:

- a) TPC was asked to provide a complete Single Line Diagram of Carnac 110 kV Receiving Station Auxiliary Supply System indicating number of Auxiliary Station Transformers in the system.
- b) What are the TPC Distribution or BEST Distribution facilities in the nearby area of Carnac Receiving Station or closer to the proposed connectivity of TPC Solar Rooftop project?
- c) In view of the increasing penetration of renewable energy sources to the grid, the Central Electricity Authority (CEA) has come up in March 2011 with a *Draft Central Electricity Authority (Technical Standards for Connectivity of distributed generation resources) Regulation, 2010.*"

TPC was requested to provide information on how the grid connection of the said project is complying with the aforesaid CEA draft Regulations.

- d) The STU was requested to visit the TPC's Solar Rooftop Project at Carnac and finalise the grid connectivity and metering arrangements with appropriate licensee.

14. TPC, vide its letter dated July 7, 2011, submitted the following responses to the queries raised by the Commission as outlined in Para 13.

- a) TPC submitted the Single Line Diagram (SLD) of the Carnac Receiving Station, and stated that the 60.48 kWp Solar Rooftop generating unit is connected to the LV side (415 V) of one of the four Auxiliary transformers, which feeds the auxiliaries of the Receiving Station.
- b) As regards the query on availability of any distribution facility of either TPC Distribution or BEST Distribution in the proximity of the Carnac Receiving Station, TPC submitted that Tata Power does not have any distribution network in nearby area except that there are 22 kV and 33 kV feeders emanating from the Receiving Station, and connecting to these feeders is not a feasible option. TPC added that the nearest distribution substation of BEST is around half a kilometre away and keeping in mind the size of the Solar Roof top project, it may not be economical to lay a long distance HV cable to inject into the network of a distribution licensee.
- c) As regards compliance of the Solar power plant with the *Draft Central Electricity Authority (Technical Standards for Connectivity of distributed generation resources) Regulation, 2010*, TPC submitted that the Solar Rooftop plant is very small in size, which is connected to the transmission system through 415 V and the impact of this on the transmission system is very minimal as compared to normal generating Station. Notwithstanding this, TPC submitted that most of the conditions, which are required by the aforesaid CEA draft Regulations, are being complied by the Solar power plant. TPC also made point-wise submission depicting the compliance or deviations of the Solar Plant with the technical standards as specified in the said draft CEA Regulations.

15. In response to the directive to visit TPC's 60.48 kWp Solar Rooftop Project, STU vide its letter dated July 12, 2011 submitted that the visit was made on July 4, 2011 and provided the following observations about the said Rooftop PV Solar power project:

- a) 220kV substation of TPC at Carnac is having 220kV, 110kV, 33kV and 22kV primary voltage levels. There are four station transformers of 33 /0.415 kV (2 Nos) and 22/0.415

kV (2 Nos), which are feeding auxiliary consumption of 220kV, 110kV substations auxiliaries and corporate office building loads located in the same premises.

- b) 60.48 kW Rooftop Solar Generator is synchronized with 415 V bus of 415 V side of 22/0.415 kV station transformer. 400-415 V DC Voltage generated by Solar Project routed through control panel having DC breaker, inverter, Transformer, A.C. synchronizing breaker and other associated equipments. The Solar control panel is provided with various types of protection. Further, TPC has not yet carried out the measurement of harmonic content, D.C. injection and flicker. The meter is installed near 415Volt bus bar panel of (22/0.415kV) station transformer.
- c) Auxiliary consumption of 220 kV Carnac substation including the energy consumed by TPC's corporate offices located in the buildings at Carnac S/S is being treated as transmission loss by TPC-T.
- d) Protection trials and breaking capacities of breakers in the solar control panel were not confirmed by officials of STU.

16. STU mentioned the following additional points on the Solar Project along with the aforesaid reply dated July 12, 2011:

- a) STU clarified that 415 voltage level cannot be treated as part of InSTS. Chapter-7 of the MERC (Terms and Conditions of Renewable Energy Tariff) Regulations, 2010 specified the tariff norms for grid connected PV system with installed capacity more than 3 MW or as may be approved by MNRE.
- b) STU also submitted the key technical features of Guidelines by MNRE for "Rooftop solar PV and small solar generation program" states that Rooftop solar project below 100 kW to be connected to 440 Volt Distribution network and above 100 kW upto 2 MW to be connected to below 33 kV voltage level. It also states that local distribution utility would sign a PPA with the project at tariff determined by SERC and Distribution Utility would provide certificate of power purchased monthly basis based on the joint meter readings.
- c) The development of Rooftop PV and Small solar power generation is envisaged by MNRE through distribution network of distribution utility only.
- d) STU also clarified that presently auxiliary consumption of all the EHV substations of MSETCL is billed by MSEDCL and not accounted under MSETCL transmission loss.
- e) In view of the above observations and the fact that auxiliary consumption of EHV substation of TPC and the building in the premises is the part of energy purchased by

the concerned distribution licensee, STU suggested that connectivity for Rooftop solar project should be treated as connectivity to the concerned Distribution Utility.

### **First Meeting of Technical Committee**

17. The first Meeting of the Technical Committee constituted for detailed study of technical aspects and accounting issues of TPC's Solar Rooftop Project was held on July 5, 2011. The major points discussed by the Committee are as follows:

- a) TPC submitted that MNRE guidelines may not be applicable in case of TPC solar rooftop project as they are not seeking benefits under Generation Based Incentives (GBI) scheme of MNRE. For this Solar Rooftop PV plant, ABT meters have been installed and there will be no problem in energy accounting.
- b) STU gave the brief details of their visit to TPC's Carnac Rooftop Solar Project and informed that the plant is producing about 250 kWh per day and TPC is complying with the connectivity technical standards required under CEA Draft Regulations except harmonics measurement facilities. Further, STU sought clarification whether 415 V aux. bus can be considered part of InSTS or not. Also, any fault in solar power plant may cause tripping of auxiliary transformer; so necessary safety measures should be taken.
- c) TPC explained that there is no lower limit of voltage and Capacity for grid connectivity, so permission should be granted for connectivity.
- d) Shri. Ajit Pandit, co-opted member of the Committee, sought clarification as to what are the Inter-connection/Interface Points defined under Connection Agreement by TPC-T for Carnac Substation and whether 415 V Station Auxiliary Bus could be termed as Interconnection Point for the purpose of Connection Agreement. He further suggested that TPC solar rooftop project grid connectivity case may be considered as a unique case. Since, the power from solar project will be purchased by TPC-D, for the purpose of energy accounting, the same may have to be treated as embedded generation by distribution utility and may be accounted by SLDC accordingly.
- e) During discussions, it was felt that energy accounting for such small scale projects is very difficult. SLDC needs to study the feasibility of energy accounting for such small scale rooftop solar project.
- f) Shri. G. S Rao (MERC), co-opted member of the Committee, suggested that TPC may choose to connect solar power plant to the auxiliary bus bar of TPC corporate office by separating the station auxiliary supply. There are four Auxiliary transformers (two nos.



connected to 22kV and two connected to 33kV) which are part of InSTS. These four transformers are presently feeding the station auxiliary load as well as corporate office load of TPC. At present there is no distribution network of either TPC-D or BEST at TPC's Carnac S/S to take care of office building load. Hence, it is suggested to separate out Station Auxiliary load and TPC office load so that Auxiliary transformers, which are supplying to TPC office, can become a part of TPC-D asset and rooftop plant can be connected to TPC-D network.

g) TPC was asked to study the feasibility of the alternatives of embedded generation suggested by Shri Ajit Pandit and feasibility of segregating station aux. supply and TPC's corporate office loads as suggested by Shri G S Rao and present their views on July 13, 2011 in the next meeting.

18. TPC vide its letter dated July 15, 2011 submitted the responses towards the feasibility study asked to be conducted by the Committee on two suggestions evolved in the Committee's first meeting. As regards the feasibility of the alternatives of embedded generation, TPC submitted that the generation from Solar would be a very small fraction of the total generation in the State. TPC added that in case the Commission agrees, they are willing to consider the present generation connectivity as embedded generation for energy accounting. Further, TPC submitted that such suggested approach would not entail any change except that (i) such generation being a very small quantity and (ii) this project being unique case, is being considered as embedded generation in the distribution assets for the purpose of accounting.

19. As regards the feasibility of the alternative of separating station auxiliary and re-connecting rooftop solar power plant to station auxiliary catering to corporate office load, TPC highlighted that there exists four auxiliary transformers at Carnac Receiving Station feeding four different 415 V bus sections and all the four bus sections are feeding mixed loads, i.e., a mix of office load and auxiliary load. TPC added that the Solar Plant is injecting into one of the 415 V bus section, which is feeding primarily the auxiliary consumption of the Carnac Receiving Station and hence, making such 415 V bus section (which is feeding the auxiliary bus) as part of Distribution asset may not be desirable as it would give rise to other regulatory complications. TPC also examined the possibility of shifting the injection of Solar plant on to the 415 V bus which is primarily feeding the office load and has noted that this bus section is in another building and injecting into such bus section would involve laying of a long distance 415 V cable, which as per TPC was not the optimum solution. TPC further highlighted that the

suggested option to transfer the 415 V assets where such injection is taking place into the distribution network, will effectively mean that the auxiliary consumption of a Transmission substation are being fed from a distribution licensee which needs to be examined in detail from the regulatory angle.

### **Second Meeting of the Technical Committee**

20. The second Meeting of the Technical Committee constituted for detailed study of technical aspects and accounting issues of TPC's Solar Rooftop Project was held on July 13, 2011. The major points discussed by the Committee are as under:

- a) Maharashtra State Load Despatch Centre (MSLDC), on the present Petition, submitted that energy consumed by the EHV substations to meet its own requirement is usually billed by the concerned Distribution Licensee and therefore, the network from station auxiliary transformer to LT network is deemed to be a part of Distribution Licensee. Hence, in the current case, where TPC's 60.48 kWp Solar Rooftop project is connected at 415 V level of station auxiliary transformer of Carnac substation, the connectivity at such voltage level cannot be the part of transmission system and thus, the same may be treated as connectivity to the distribution network.
- b) MSLDC and MSETCL pointed that the auxiliary consumption in a MSETCL Sub-Station is billed by MSEDCL, even though it is an asset of MSETCL. MSLDC and MSETCL stated that if TPC follows a similar methodology, then its solar roof top plant will get connected to TPC-D distribution network and there will be no accounting and connectivity issues.
- c) MSLDC further submitted that in case STU grants connectivity to the TPC Solar rooftop project as connectivity to InSTS, then MSLDC would require on-line 15 minute time block-wise energy meter data for energy accounting.
- d) MSLDC added that if such type of connectivity is granted, enormous number of solar generators may come and ask for connectivity to STU and this will lead to huge number of generators being required to be brought into purview of ABT mechanism.
- e) Shri G. S Rao (MERC) reiterated that TPC may choose to connect solar power plant to the auxiliary bus bar of TPC corporate office by separating the station auxiliary supply.

21. The various issues identified and deliberated in the Committee meetings are as under:

- a) Whether 415V Auxiliary bus can be considered part of InSTS or not?

- b) Can Interconnection Point for Grid Connectivity be defined as 415 Volt Auxiliary bus of TPC's Transmission Substation?
- c) Whether the load/consumption of the Corporate Offices of TPC located in the same premises can be treated a part of Auxiliary Consumption of Transmission Substation?
- d) Whether Auxiliary Consumption of EHV Substation should be treated as part of Transmission Loss?
- e) Tata Power Solar is using roof space of TPC's Transmission substation without paying any consideration. Should any compensation for the same be paid to TPC-T?

22. Based on discussions in the matter, the Committee agreed that the issues of the present Petition have to be addressed as a unique case and suggested the following approach:

- a) The consumption of office building at Carnac Bunder cannot be treated as part of Auxiliary Consumption of Transmission Substation of Carnac of TPC-T. The same will have to be treated as energy supplied by concerned distribution licensee (i.e., TPC-D)
- b) The said energy consumption of corporate office building needs to be metered and accounted for separately, as distinct from Auxiliary Consumption of Transmission Substation. In the absence of separate feeder level measurement or combined load prevalent at feeder (i.e., station auxiliary load and corporate office building load – lifts, lighting, etc), an estimate of proportion of station auxiliary load and commercial building load based on connected load may be considered for sharing.
- c) Accordingly, Station Auxiliary Bus (415 V) to which Rooftop Solar PV plant is presently connected should be treated as part of asset of TPC-D supplying consumption of commercial building.
- d) The energy injection by said Rooftop PV solar plant should be metered separately and considered as purchased by TPC-D (copy of agreement/arrangement for purchase between TPC-Solar Group and TPC-D should be submitted) towards fulfilment of solar RPO obligation of TPC-D.
- e) The benefit of compensation/lease rentals, if any, towards use of rooftop of TPC-T by TPC-Solar Group should be made available to TPC-T on commercial principles, in accordance with provisions of Section 41 of 2003 Act for use of assets of transmission licensee.

23. The Commission held a second hearing in the matter on July 25, 2011 where the Study Report and suggested approach of the Committee on the present Petition were presented before the Commission. During the hearing, the Commission directed TPC, STU and MSLDC to submit their views on the suggested approach on the Petition by the Committee.

24. TPC vide its response dated August 4, 2011 made the following submissions on the suggested approach of the Committee on the present Petition:

- a) TPC requested that the issue of separating out the station auxiliary consumption and treatment of such consumption needs to be deliberated further and should be taken up separately.
- b) Consumption of offices, which are related to business area, is to be treated as a part of receiving station. However, as regards meeting consumption requirement of “other offices” TPC agreed to supply to the “other offices” through TPC-D.
- c) As regards availability of separate metering arrangement for energy consumption by TPC’s corporate building office and for auxiliary facilities, TPC submitted that it has separate metering arrangement for the offices located at Carnac Receiving station and they are keeping separate account for the same.
- d) TPC agreed with the suggested approach of the Committee and will transfer the requisite asset to TPC-D. Thus, after transferring of the asset, Solar rooftop plant will be connected to TPC-D network and become the embedded generation of TPC-D.
- e) As regards the suggested approach of separately metering the energy injection of the Solar Rooftop power plant, TPC submitted that it has installed “Elster” make ABT meter for measurement of such energy injection. TPC-D added that it has already entered into PPA to purchase Solar power injected into TPC-D network.
- f) As regards the suggested approach of making available to TPC-T the benefit of compensation/lease rentals, if any, towards use of rooftop of TPC-T by TPC-Solar Group, TPC submitted the following computation for arriving at the value of Rental amount.

<b>Sr. No.</b>	<b>Particulars</b>	<b>Unit</b>	<b>Value</b>
1	Capital Cost considered for working out Solar Tariff	Rs.Lakh/MW	1690
2	Cost of Land considered in the above	Rs.Lakh/MW	5
$3=2/1 \times 100$	Fraction of Land Cost	%	0.30%
4	Solar Rooftop Tariff	Rs/kWh	18.41
$5=3 \times 4$	Tariff Contribution due to land Cost	Rs/kWh	0.054
6	Estimated Generation per year from 60.48 kW Rooftop project at CUF of 19%	kWh	100663
$7=5 \times 6$	Revenue Contribution due to Land Cost	Rs per annum	5483

In view of the above computation, TPC submitted that the value of Rental works out to around Rs 5500/ annum, which is very small and requested not to consider the same for this Petition.

25. STU, vide its affidavit dated July 28, 2011 submitted that STU is of the same opinion as suggested by the Committee that the energy injected by the Rooftop PV Solar power plant should be metered separately and be considered as purchased by TPC-D. STU further submitted that the Station Auxiliary Bus (415 V) to which Rooftop Solar Plant is presently connected should be treated as a part of TPC-D supplying to commercial building and hence connectivity of Rooftop PV Solar Power Plant to 415V of Station auxiliary is to be treated as connectivity to concerned Distribution Licensee. STU added that even if any Solar Rooftop Plant is not availing the benefit of MNRE GBI scheme, it should follow the technical guidelines issued by MNRE for that scheme. STU requested the Commission to issue guidelines regarding treatment of Auxiliary consumption of EHV Sub-station. It was further stated by STU that if it is decided by the Commission to treat the auxiliary consumption as the energy supplied by the concerned Distribution licensee then the tariff for that energy may also be specified by the Commission.

26. MSLDC, vide affidavit dated August 8, 2011 made the following submissions on the suggested approach of the Committee on the present Petition:

- a) MSLDC submitted that Orders in Case Nos. 31 of 2006 and 42 of 2006 deal with IBSM and FBSM. The Commission has already defined the G < > T & T < > D interface points for calculation of In-STS loss in its Order dated September 29, 2006. Accordingly, MSLDC is preparing the IBSM bills from Oct-2006 and all the utilities are signing the bills. The interconnection point of 60.48 kW solar plant of TPC-Solar at 415 Volts is not envisaged in the above Orders.
- b) MSLDC requested the Commission to clarify whether the auxiliary consumption of the EHV sub-stations (and administrative building as considered by TPC) shall be a part of transmission loss, so that uniform policy can be adopted by all the Utilities in the State of Maharashtra and energy accounting purpose.
- c) 415 voltage levels cannot be a part of transmission system and this connectivity may be treated as connectivity to the distribution network. This type of connection may come in future, thus, MSLDC requested the Commission to give clear demarcation between transmission and distribution network.
- d) MNRE guidelines (Rooftop PV & Small Solar Power Generation to the grid under JNNSM) mentions that solar plant below 100 kW shall be connected to LT level, i.e. 400 V or 230 V and interconnection should be at the nearest distribution transformer /sub-station.
- e) Further, MSLDC referring to Clause 17.1 of the MERC (Renewable Purchase Obligation, its Compliance and Implementation of REC Framework) Regulations, 2010,; stated that the contention of TPC in its letter dated 15th July 2011, “.....*would involve laying of a long distance 415 volt cable. We are of the opinion that this is not the most optimum solution.*” is not acceptable.

27. The Commission scheduled a third hearing in the matter on August 11, 2011. During the hearing, TPC, STU and MSLDC reiterated their views on the suggested approach on the Petition by the Committee, which was earlier submitted on affidavit by them.

28. Having heard the Parties along with the materials placed on record, and after considering the deliberations by the Technical Committee appointed by the Commission in the matter, the following issues arise for consideration:

- a) Can Interconnection Point for Grid Connectivity be defined as 415 V Auxiliary bus of TPC's Transmission Substation?

- b) Whether the load/consumption of the Corporate Offices of TPC located in the same premises be treated as a part of Auxiliary Consumption of Transmission Substation?
- c) Should Auxiliary Consumption of EHV Substation be treated as part of Transmission Loss?
- d) What is the appropriate methodology for connectivity, metering and energy accounting of the energy generated from the 60.48 kWp Solar Rooftop project of TPC so as to effect purchase of solar power generated from the said project by TPC-D to meet its Solar based Renewable Purchase Obligations specified by the Commission?
- e) In view of uniqueness of this case wherein the Generator (Tata Power-Solar) and the purchaser (Tata Power-Distribution) of energy from the Solar project being under the same parent Company (The Tata Power Company Ltd), how to ensure monitoring and verification of the Joint meter readings (JMR) for assessing the energy generated by the Project? Who should be the appropriate authority to perform third party check on the aforesaid meter readings?
- f) Tata Power Solar is using roof space of TPC's Transmission substation without paying any consideration. Should TPC-T be suitably compensated for the same? If so, what should be the appropriate level of compensation?

29. Before dwelling on the issues listed above, the Commission would like to place its observations on record on the peculiar nature of the 60.48 kWp Solar Rooftop Power Plant and the grid connectivity framework of the power plant, as under:

- a. The 60.48 kWp Solar Rooftop Power Project of TPC referred in the present Petition is of small size as compared to the other conventional and non conventional generating plants seeking connectivity to the grid and is the first instance of rooftop small solar power project case in the State which is brought before the Commission since announcement of Jawaharlal Nehru National Solar Mission (JNNSM) at the national level.
- b. The Central Electricity Authority is yet to formulate and notify grid connectivity standards and regulations, which shall govern connectivity related aspects for such distributed generation sources. It is understood that CEA is in the process of initiating expert consultation on the subject and has prepared draft Central Electricity Authority (Technical Standards for Connectivity of the distributed generation resources) Regulation, 2010.

- c. Although grid connectivity of projects of smaller size (kW scale distributed generating source), particularly Solar Rooftop projects are envisaged in the existing Regulatory framework, viz., provisions of MERC (Terms and Conditions of Determination of RE Tariff) Regulations, 2010, the same is envisaged to be seeking connectivity to the grid of Distribution network and shall be treated as embedded generation of the connected Distribution Licensee. However, the current Project of TPC is injecting power into 415 V auxiliary bus section, which is feeding primarily the auxiliary consumption of the Carnac Receiving Station and thereby using transmission assets of TPC-T.
- d. The nearest distribution Substation of BEST is around half a kilometre away from the 60.48 kWp Solar Rooftop Power Project of TPC. This prima facie shows the non-availability of any Distribution network in the proximity of the Solar Power Project. This has led TPC to connect the project to its own Receiving Station, which is a part of the TPC-Transmission asset and on the Rooftop of which, the Project is installed.
- e. The energy generated from the Solar Rooftop Power Project shall be purchased by TPC-Distribution towards fulfilment of solar RPO obligation of TPC-D.

In view of the above, the Commission recognises that this project needs to be treated as unique case and the issues raised need to be addressed, particularly in view of the fact that as per Section 86(1)(e) of Electricity Act 2003, the Commission is mandated to promote generation from renewable sources of energy by *inter alia* providing suitable measures for connectivity with the grid. The Commission is also mandated under Section 30 as follows:-

*“30. The State Commission shall facilitate and promote transmission, wheeling and inter-connection arrangements within its territorial jurisdiction for the transmission and supply of electricity by economical and efficient utilisation of the electricity.”*

30. As regards the first issue as to whether Interconnection Point for Grid Connectivity can be defined as 415 V Auxiliary bus of TPC’s Transmission Substation, it would be worthwhile to highlight the definition of Inter-connection Point for Solar power projects as specified in the MERC (Terms and Conditions of Determination of RE Tariff) Regulations, 2010. The relevant extract of the said Regulations 2.1 (p) is reproduced as under:



*"2.1 In these Regulations, unless the context otherwise requires,-*

*...*

*"(p) 'Inter-connection Point' shall mean interface point of renewable energy generating facility with the transmission system or distribution system, as the case may be:*

*1. in relation to wind energy projects and Solar Photovoltaic Projects, inter-connection point shall be the line isolator on outgoing feeder on HV side of the pooling sub-station;*

*Provided the Pooling Sub-station shall mean the sub-station at project site of the windfarm or solar power plant, as the case may be, and shall constitute step-up transformer and associated switchgear, and to the LV side of which, multiple (more than one) generating unit(s) (i.e. wind turbine generators or solar PV modules/arrays/inverter units) are connected." (Emphasis Added)*

Further, it is noted that technical standards for interconnection of distributed generating sources such as rooftop PV systems are yet to be formulated and notified by CEA. However, as per Clause 7 of Regulation 2 of Draft CEA (Technical Standards for Connectivity of the Distributed generation resources) Regulations, 2010, the Inter-connection Point for connectivity to distribution system of distribution licensee (G < > D) is defined as under:

*"(7) "Interconnection Point" means a point on the electricity system, including a sub-station or a switchyard, where the interconnection is established between the facility of the requester and the electricity system and where electricity injected into the electricity system can be measured unambiguously for the requester."*

The present connectivity arrangement of Solar Rooftop project at 415 V auxiliary bus of TPC's Transmission Substation cannot be treated as the HV side of the pooling substation and hence cannot be treated as inter-connection point (G < > T) of InSTS network in accordance with the MERC RE Tariff Regulations, 2010. In this context, the present connectivity arrangement need to be seen as unique case and needs separate dispensation.

31. As regards the second issue of treatment of consumption of corporate office, as submitted by TPC, there exists separate metering arrangement to record consumption of corporate office and auxiliary consumption of receiving station and TPC is already maintaining separate accounts of the same. It is clarified that the consumption of the corporate office building can neither be treated as part of auxiliary consumption of the receiving station nor be treated as part of transmission loss.

32. As regards the third issue raised by MSETCL and MSLDC for devising uniform policy across State for treatment of auxiliary consumption of receiving stations to be treated as part of transmission loss or to be treated as energy supplied by concerned distribution licensee, the Commission is of the view that such issue of accounting and treatment of auxiliary consumption of transmission grid substations cannot be addressed as part of present proceedings and needs to be taken up through separate regulatory process with involvement of various stakeholders as it involves various regulatory issues such as development of norms, specification of consumption category, applicable tariff rate, if necessary, accounting treatment by transmission licensee and distribution licensee, etc. The Commission advises MSETCL/MSLDC to undertake detailed study in the matter over the next two months and make appropriate submissions by separate filings.

33. As regards the fourth issue for evolving an appropriate methodology for connectivity, metering and energy accounting of the energy generated from the 60.48 kWp Solar Rooftop project of TPC, the Commission observes that the same issue has been deliberated in the Technical Committee Meetings and recommendations of the Technical Committee have been recorded under para 22 (a) to (d) of this Order. Further, based on affidavits filed and the submissions made during the hearings by all the concerned parties, the Commission observes that the concerned parties, (viz. TPC, MSETCL and MSLDC) have also consented and agreed to implement the recommendations of Technical Committee as elaborated under para 22 (a) to (d).

34. The Commission is of the view that the above suggested approach is appropriate in the present case and rules that the necessary steps should be taken up by all concerned Parties to implement the same with immediate effect. It is also clarified that the accounting treatment and credit for solar power generated shall be applicable with effect from the date of commissioning of the said rooftop solar power project. The Commission directs TPC, MSETCL and MSLDC

to submit compliance report to the Commission outlining the actions taken in this respect within four weeks from date of issuance of this Order.

35. As regards the fifth issue of third party verification of energy injection by the 60.48 kWp Solar Rooftop project of TPC, the Commission opines that such third party verification is necessary to ensure validity and cross-checking of the process of joint meter reading involving the Generator (Tata Power-Solar) and the purchaser (Tata Power-Distribution) of energy from the Solar project, who are two separate divisions of the same parent Company (The Tata Power Company Ltd). Hence, the Commission is of the view that MSLDC would be the appropriate authority to verify and establish fairness of the process of Joint Meter Reading undertaken by Tata Power-Solar and Tata Power-Distribution for the 60.48 kWp Solar Rooftop project. The Parties should also explore feasibility of sharing of metered data of solar power generation over communication links with MSLDC at regular intervals. Further, MSLDC, in consultation with TPC, should devise appropriate protocol for verification and certification of metered data at regular intervals at least once in every quarter.

36. As regards the sixth issue of whether compensation/lease rentals are payable to TPC-T towards use of rooftop of TPC-T by TPC-Solar Group, the Commission observes that TPC has requested the Commission not to consider the same, i.e., TPC-Solar need not compensate TPC-T towards use of rooftop of TPC-T by TPC-Solar Group as this cost is negligible compared to the capital cost of the solar project. Therefore, the Commission rules that TPC-Solar need not compensate TPC-T for the same. Further the Commission rules that the above ruling has been given considering the present project as a unique case and thus should not be considered as a precedent for any other rooftop solar PV case.

With the above observations and rulings, the Petition filed by TPC in Case No. 77 of 2011 is disposed off.

Sd/-  
(Vijay L. Sonavane)  
Member

Sd/-  
(V.P. Raja)  
Chairman

Sd/-  
(Kuldip N. Khawarey)  
Secretary