TRANSMISSION CORPORATION OF TELANGANA LIMITED
VIDYUT SOUDHA, HYDERABAD-82

Website: www.tstransco.in CIN No: U40102AP2014SGC094248

From
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To
The Commission Secretary,
TSERC,
5th Floor,Singareni Bhavan,
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Lr.No.CE/Comml&RAC/SE/DE/Comml/AE-BL&C/F./D.No.160 /2022,dt:13 .04.2022

Sir,

Sub: TSTRANSCO–Draft Model Connection Agreement as per TSERC Regulation No. 4 of 2018 (State Electricity Grid Code Regulation) – Response to the comments and suggestions received from the stakeholders - Submitted – Reg.

Ref: 1. TSERC (State Electricity Grid Code) Regulation 2018, Regulation No. 4 of 2018, Dt.18.12.2018
2. Comments and suggestions received from the stakeholders

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With reference to the comments and suggestions received from the stakeholders in connection with model connection agreement, the response to the above comments is herewith submitted.

Encl: As above

Yours Faithfully,

Chief Engineer
Commercial & RAC
TSTransco

18/4/22
JD TE
OSD (TE)
Received 18/4/2022

Copy submitted to:
The Joint Managing Director/Fin., Comml & HRD/TSTRANSCO/VS/Hyderabad.

CSF 658
CST
DATE 18/4/22

19/4/22

Response for the comments received:

Based on the comments from the following stakeholders , the response has been prepared as given below:

- Aryhama Solar Private Limited
- Sarvotam Care
- Telangana Open Access Developers Association
- Argo Solar Private Limited.

S.No	Clause No in the model connection agreement	Comment	Response
1		**Generic Clause:** Telangana State electricity Grid Code 2018, clause 13.1 stipulates that standard format of application shall be prepared by STU. Request this STANDARD FORMAT that covers all scenarios under draft connection agreement be published.	The application for grid connectivity for generator is already available with TSTRANSCO/DISCOMs. The same can be modified and used for all the scenarios. (However, in case of pure bulk load consumers they can approach concerned Discom for service connection.)
2		**Generic Clause:** It is a settled legal jurisprudence that any statute, regulation or order shall be made applicable prospectively. Therefore,this connectionagreement shall be made applicable prospectively i.e.,for projects getting sanctioned/commissioned after this connection agreement is approved by this Honourable commission	Adherence to Grid code and grid connectivity should be applicable to all generators. This request for connection agreement to be made applicable prospectively only cannot be considered as per the Clause 15.2 of TSERC Grid code Regulations (4 of 2018).
3	Pg 7; No.20 of Definitions	**Definition of Installed Capacity for solar generators:** **Challenge:** This definition causes confusions and leaves with discretionary interpretation of DISCOMS/TRANSCO whether it should be AC transformer capacity of inverter capacity that need to be considered. **Change suggested:** For solar the AC capacity is summation of name plate capacities of all installed inverters.	As per clause 16A of CEA (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019" Installed Capacity of Wind Generating Stations and Generating Stations using Inverters, means the summation of the Name Plate Capacities of Wind Turbines or Solar Generating units as the case may be". As the Inter Connection Point will be at AC side i.e. after the Inverter, AC

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		The design and installation of solar capacity on DC side should be leftto generator. The relationship between DISCOM/TRANSCO is only in terms of AC Capacity, which is in line with Advisory/ Clarifications provided by Grid Solar Division, MNRE, GoI	capacity of Solar Generating units has to be taken as Installed Capacity of Solar Plant. MNRE also clarified on 5th November,2019 that ,"Contracted Capacity " is the capacity(MW) in AC terms. As per CERC Deviation Settlement Regulations,2022, Dt: 14.03.2022, Available Capacity for Solar and Wind Generators is the Cumulative Capacity Rating of Wind Turbines or Solar Inverters that are capable of Generating Power in a Time Block. Hence as submitted earlier, the definition of "Installed Capacity in case of Solar/wind generating stations and generating stations using Inverters means the Summation of name plate capacities of Wind Turbines or Solar Generating units in terms of AC capacity in KW" shall be considered.
4	Pg19 ; Clause 2.2(b)	As per 2.2(b) ,mentions that unlessthere is a commercial arrangement between the parties regarding evacuation of power, generator shall not inject/ draw power from/into IN-STS network. Challenge: (1)What is this commercial arrangement in case of solar open access plants?? (2)At what stage of project development generator needs to enter this commercia l arrangement?? (3)What arethe pre-requisitesand application to entersuchcommercialarrangement?? (4)What are the timelines for DISCOM/TRANSCO to enter such commercial arrangement once such application is received?	1) Commercialarrangement includes the PPA between the generator and the DISCOM/TRADER or between the generator and the consumer under approved open access (as the case maybe). 2) The details of the commercial arrangement must be submitted to STU/DISCOM (depending on the voltage level) prior to injection/Withdrawal of power from grid. 3) The procedures shall be followed as per regulations of TSERC 4) The timelines shall be followed as per regulations of TSERC 5) Considering the grid security,

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		(5)Generator should be allowed to inject/ draw power intogrid even application for such commercial arrangement has been requested/in-progress. Unless above 4 questions are categorically answered, this COMMERCIAL ARRANGEMENT requirement can be left to interpretations as per convenience of DISCOM/ TRANSCO	Generator cannot be allowed unless a commercial agreement is available.
5	Pg20 ; Clause 2.2(j)	The features talked about in this clause requires a lot of capital investment and running operational expenses from Generator side. As such, data from small solar plants that run at less than 20% PLF is of least significance for SLDC to manage. Hence, we request commission to consider acapacity of more than 10 MW for solar projects to make this requirement mandatory. Solar projects less than 10 MW capacity shall be exempted from providing such telemetering and other provisions contemplated under this clause.	As per clause -18 of TSERC Grid Code Regulations (4 of 2018), the user shall provide communication facilities considering the guidelines issued by SLDC. Even though, PLF is 20 %, it varies from 0 to 100 % in a day. Hence, data regarding such plants is essential for SLDC.

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6	Pg 21; Clause 2.2 (m) (viii), (ix) & (x)	**Additional Features of Solar inverters as per CEA Technical Regulations,2019:** This requirement shall be made applicable prospectively i.e. for solar projects getting commissioned after approve of this connection agreement assome of these features are not possible to retrofit and might require replacement of entire solar inverter, that calls for complete change of project design architecture, which is practically not possible after such project is commissioned. As a matter of fact Central Electricity Authority(Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019 at clause 83, has provided clarification that generating stations already commissioned before the regulation or commissioned with 6 (six) months of publishing of this regulations shall comply with provisions as if they were not amended	Will be followed as per regulations of TSERC & CEA.
7	Pg 22; Clause 2.4	**Substation Grounding:** Talks about responsibility of both parties to substation grounding. As such generator is paying the applicable wheeling and transmission charges that includes maintenance of substation and its equipment to DISCOM/TRANSCO and hence generator shall be relieved of this responsibility.	It is to be understood that the substation grounding at the respective substations to the interconnection point has to be maintained by STU/DISCOM (at their substation) and the generator (at their substation). This is as per the CEA (Technical Standards for Connectivity to Grid) Regulations, 2007
8	Pg 22; Clause 2.5 (b)	Once the solar plant is commissioned, DISCOM/ TRANSCO becomes the owner of metering equipment as per metering code and hence putting the scope of NABL testing on the user is not appropriate as user is no more the owner of meters after	As per the CEA (installation and operation of meters) regulations 2006, “all interface meters installed at the points of interconnection for the purpose of electricity accounting shall be owned by supplier of electricity”. Supplier of Electricity means generator in case of generating stations and

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		commissioning of the plant.	licensee in case of consumers.
9	Pg 23; Clause 2.8	There is a great sense of confusion created by DISCOM/ TRANSCO on Power Quality subject. The principle regulation CEA(Technical Standards for connectivity to the grid) regulations, 2007 stipulates: "The project of the generator shall not cause voltage and current harmonics on the grid which exceed the limits specified in IEEE 519 standards" Amendment regulation 2013 (Applicable for generating stations using inverters such as solar) stipulates: "Harmonic current injections from a generating station shall not exceed the limits specified in IEEE519 " This regulation takes into account of the fact that, solar invertors take grid voltage and frequency as reference to operate and they are not voltage source but a current source and hence mandates only to limit current harmonics from a generating station during day time/generation time. In this context, IEEE 1547 standard that was published in 2018, specifically for Fuel cells and photovoltaics upto 35 KV.	This clause is taken from the Grid code Clause 12 (iv) For generating stations using invertors, the power quality parameters such as harmonics, DC injection,flicker etc., must be in accordance with the CEA (Technical Standards for Connectivity to the Grid),2013. Further, Any generator injecting the power into the grid will inject both voltage and current duly fulfilling the conditions required grid synchronization. Hence, even for generators using inverters injecting the converted voltages and currents having harmonic content into the grid will affect the grid as these harmonics are absorbed by the Grid. Hence, it is mandatory to test both the voltage and current harmonics at the interfacing point of generator.

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		In thiscontext, we request Honourable commission to include following portion at clause 2.8 1.For generating stations using invertors, only current injections shall not exceed limits under IEEE standard (As per CEA Technical Standards for connectivity to the grid Amendment regulations 2013) 2.IEEE 1547 standard has to be used for solar projects connected at 33KV and below.	

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10	Pg 26 &27; Clause 2.12 (d) (i), (ii) & (iii)	**Bay and Line maintenance Charges:** We draw Honourable Commission ' s attention to the Order on Transmission Tariff for 4th Control Period (FY2019-20 TO FY2023-24) Dated: 20-03-2020 & Order on Wheeling Tariff for 4th Control Period (FY2019-20 TO FY2023-24) Dated: 29-04- 2020, wherein DISCOM/ TRANSCO has mentioned revenue requirement for the universe of bay's and transmission lines installed without exception to the Bays & transmission lines belonging to generators and consequently respective wheeling and transmission tariffs are determined. As a matter of fact, DISCOMs / TRANSCO has not included non-tariff income received from charges so collected so far from generators in the subject matter . Therefore, when generators are already paying applicable wheeling/ transmission charges why should they be paying line & bay maintenance charges again This is double charging the generator for the same work and hence generator should be relieved from paying such charges.	The transmission tariff includes the bays and lines maintained by TSTRANSCO and does not include O&M charges for the bays belonging to generators. Hence, any bay maintenance charges done by the TSTRANSCO shall be levied on generators

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11.	Applicability of the connection agreement (Page No. 2; Connection Case-6)	Is there an application format notified by concerned authority for bulk consumers who intend to set up captive generating plants without option to sell surplus power to grid? Current TSTRANSCO website provides application formats only for Open Access Consumers or Generators, and the format for bulk consumers willing to set up captive power generation stations is not available. Request Hon'ble Commission to kindly clarify the procedure to be followed by such bulk consumers willing to set up captive plants with details of the application format, authority to be approached, timelines for signature by respective authorities, designated signatories to connectivity agreement on behalf of TRANSCO/DISCOM, and metering infrastructure to be adopted. Also kindly clarify the captive generation capacity limits for bulk consumers who intend to set up captive power plants with or without option to sell surplus power to grid.	The same application is applicable to bulk load consumers who intend to avail connectivity for In-house generators. TSTRANSCO/STU filed the draft connection agreement to the Honorable TSERC for approval. The draft includes the timelines pertaining to entering the connection agreement. With respect to applicability, Clause 15.1 of the TSERC Grid Code (4 of 2018) states that the connection agreement shall be signed as per the categories defined.
12	Applicability of the connection agreement (Page No. 3; clause -2)	With reference to provisions given in Electricity Act 9 (1) towards the rights of bulk consumers to install and operate captive generating plants, kindly elaborate the role/responsibility of TRANSCO/ DISCOM in the process of a bulk consumer's setting up a captive generating plant with or without option to sell excess power to Grid. Should the bulk consumer take any feasibility approval from TRANSCO/DISCOM prior to planning the setting up of captive generating plant? If so please list out the timelines for approval and any	As per, Section 7 of Electricity Act ,2003, any generator may establish, operate and maintain a generating station as per the provisions of the Act provided if the generator complies with the technical standard relating to the connectivity with the grid as per Section 73(b). As per section 73(b), CEA has made regulations for connectivity with the grid in which it states that the requestor (includes a generating company or a captive generating plant or a bulk load consumer), who wishes to seek connectivity with the grid at

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		grounds for refusal of permission or deemed permission in case of delay in response from TRANSCO/ DISCOM. Currently there is no clarity on when the bulk consumer should approach TRANSCO/ DISCOM with the intention to sign the Connection Agreement. Hence, kindly clarify the total process flow till the signing of the proposed connection agreement for bulk consumers who intend to set up new captive generating stations	33KV and above shall enter a connection agreement with appropriate transmission utility in case of connection to ISTS/In-STS network. Considering these regulations and Clause 13 of the TSERC Grid code Regulations, (4 of 2018), the user shall submit an application to TSTSRANSCO/DISCOMs (depending on voltage level) for processing of grid connectivity and on approval, work completion of the plant, shall sign a connection agreement before connecting to the grid. TSTRANSCO/STU filed the draft connection agreement to the Honorable TSERC for approval. The draft includes the timelines pertaining to entering the connection agreement. With respect to applicability, Clause 15.1 of the TSERC Grid Code Regulations (4 of 2018) states that the connection agreement shall be signed as per the categories defined
13	SACAD & Communication facilities (Page No.32; Clause 2.15)	1) Is SCADA or any such Data Communication System (DCS) required to be provided by all bulk consumers, with or without existing captive generating plants? If yes, kindly specify the timeline for existing bulk consumer with or without captive generating systems to install such SCADN DCS from the date of signing connection agreement. 2) If no, then kindly specify whether bulk consumers, intending to set up new captive generating plants without sale of surplus power to DISCOMs, should install SCADA/ DCS, and if there is any threshold MW capacity limited	As per Caluse 18 of the TSERC Grid Code Regulations(4 of 2018), all users of the intra state transmission system shall provide telecommunication and SCADA facilities at their respective ends based on the connection agreement. Further, as per CEA regulations (Technical Standards for Communication System in Power System Operations) Regulations, 2020, all users (including bulk consumers) of regional/interstate/intra-state transmission systems shall provide reliable data and voice communication and tele-protection for power system.

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		beyond which it is mandatory. 3) Since SCADA/ DCS systems are costly to procure, install and maintain, we request the Hon'ble Commission to kindly exempt bulk consumers with captive generating stations having less than 5 MW capacity from the requirement of SCADA/ DCS connectivity with SLOG.	Bulk Consumer with Generation irrespective of Generation Capacity (Including Captive) has to provide data to SLDC. Bulk Consumers connecting at EHT has to integrate bay data to connecting substation. TSTransco is proposing to integrate all EHT stations to SLDC so, all Existing bulk consumers connecting at EHT will be integrated. However , new bulk consumer has to integrate the bay to existing DAS of the connecting substations if the DAS is not available the generator has to procure DAS & necessary communication equipment and integrate the data to SLDC.
14	Applicability of the connection agreement	The Solar Rooftop Net Metering guidelines notified by Hon'ble Commission provide option for sale of surplus power to Grid under Net Metering mechanism, only for Solar Rooftop Plants. However, if a LT or 11 kV consumer intends to set up Captive Power Plant based on Solar or Wind or other RE sources or any fossil fuel sources, and with or without option to sell power to grid, then there is no clarity on the regulatory framework, capacity limits, approval process and connectivity requirements for setting up such captive generating plants. Hence, in view of Section 9(1) of Electricity Act, 2003, giving rights to consumers to set up captive generating plants, we request the Hon'ble Commission to clarify the procedure, process flow and connection agreements to be entered by Consumers who are connected to DISCOMs at voltage levels below 33 kV, to set up captive	As per the TSERC Grid Code Regulations (4 of 2018) Connection Agreement is applicable for users connected at 33 kV level and above, and hence this comment is not relevant to Connection Agreement.

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		generating plants without option to sell surplus power to Grid.	
15	Page 25, Clause (b)	Only if it is warranted in our bay area.	Will be followed as per the approval of TSERC.
16	Page 25, Clause (c)	We shall consider only after submission of proof that the damage occurred due to our negligence.	Will be followed as per the approval of TSERC.