

**BEFORE THE HON'BLE PUNJAB STATE ELECTRICITY REGULATORY
COMMISSION, CHANDIGARH**

Filing No.: _____

Case No.: PSERC/_____

In the Matter of Petition under Section 86 of Electricity Act, 2003 read with Regulations 45 & 46 of PSERC (terms & conditions for intra state open access) Regulations, 2011 for making amendments in PSERC (terms & conditions for intra state open access) Regulations, 2011 by

Incorporating provisions for levy of Transmission/ Wheeling Charges for over-utilisation of Open Access Capacity (over-injection/ over-drawal) by Open Access Customers

Increasing Transmission & Wheeling Charges for NRSE/ RE generators wheeling power within the State under open access

Incorporating measures to control dumping/ injection of harmonics by Open Access customers.

and

For allowing respondent no. 2 to charge transmission charges and SLDC operating charges for the actual maximum drawl of Northern Railway in excess of open access capacity w.e.f. commencement of open access i.e. 24.11.2019.

and

For approval of detailed procedure of STU for grant of connectivity to open access applicants connected at 132 kV & above under regulation 5 (1) of PSERC (terms & conditions for intra state open access) Regulations, 2011, as amended from time to time.

AND

In the Matter of Punjab State Transmission Corporation Limited (PSTCL), State Load Despatch Centre (SLDC).

.....**Petitioner**

Most Respectfully Showeth

1. That Government of Punjab notified the petitioner, Punjab State Transmission Corporation Limited (hereinafter referred to as PSTCL) as a State Transmission Utility (STU) along with responsibility to operate the Punjab State Load Despatch Centre (hereinafter referred to as SLDC) and Punjab State Power Corporation Limited (hereinafter referred to as PSPCL) as the distribution licensee vide its notification No. 1/9/08-EB(PR)196 dated 16th April, 2010.
 2. That Open Access in the State of Punjab is presently being governed by PSERC (Terms & Conditions for Intra-State Open Access) Regulations, 2011, as amended from time to time (hereinafter referred to as Open Access regulations), issued vide notification no. PSERC/Secy./Reg./57 dated 01.07.2011 and subsequently amended thereafter. The generators and consumers connected to/ embedded within the Punjab State Transmission/ Distribution System are availing open access for Sale/ Purchase/ Wheeling of power under the aforesaid Open Access regulations.
- **Proposal for additional Transmission, Wheeling & SLDC Charges on Over-Utilization of Open Access Capacity/ Over-Drawal:-**
 3. That as per the said Open Access regulations, STU has been notified as Nodal agency for grant of Long Term Access (LTA)/ Medium Term Open Access (MTOA), while SLDC has been notified as Nodal agency for Short Term Open Access (STOA).
 4. That as per the Open Access regulations and Tariff Orders issued by Hon'ble PSERC for each financial year, the transmission charges for use of intra-state transmission system are payable by the LTA/ MTOA customers based on the open access quantum in MW and by STOA customers based on the open access transactions in kWh.
 5. That in line with the procedure adopted by Nodal Agencies for Inter-State Open Access at Central Level (i.e. Central Transmission Utility (CTU) for LTA/ MTOA transactions and Nodal Regional Load Despatch Centre (RLDC) for STOA transactions), the intra-state transmission charges for LTA/ MTOA are levied on the approved/ contracted open access quantum in MW and intra-state transmission charges for STOA on scheduled energy in kWh.
 6. That sometimes the actual injection/ drawal by Open Access customers exceeds their contracted/ approved Open Access Capacity, though the transmission charges and/or wheeling charges for use of transmission and/ or distribution system are payable on the contracted/ approved open access capacity (in case of LTA/ MTOA customers) or scheduled quantum (in case of STOA customers) only, resulting in financial loss to the STU (PSTCL).

7. That Northern Railway- Ambala Division has been one of the first LTA customer, who has started availing Long Term Access (LTA) for purchase of upto 35 MW power w.e.f. 24.11.2019 for drawl at its 11 no. Traction Sub-Stations (TSS) within the State of Punjab connected to STU (PSTCL) at 132 kV/ 220 kV Voltage Level.
8. That the transmission charges determined by Hon'ble PSERC are being levied by PSTCL on the approved/ contracted open access capacity i.e. 35 MW for each month.
9. That it has been observed that on several occasions the actual drawal of Northern Railway has exceeded the contracted open access capacity of 35 MW, but till now the transmission charges have been levied by PSTCL for 35 MW only. A brief detail of actual maximum drawl quantum of Northern Railway and Number of Occasions when actual drawal of Northern Railway has exceeded the contracted LTA capacity of 35 MW is as under:-

Month	Actual Maximum Drawal during the month (MW)
November-2019 (w.e.f. 24.11.2019)	49.056
December-2019	46.749
January-2020	46.030
February-2020	43.284
March-2020	47.618
April-2020	27.157
May-2020	34.609
June-2020	37.067
July-2020	37.942
August-2020	45.908
September-2020	41.889
October-2020	32.347
November-2020	34.822
December-2020	39.050
January-2021	36.510
February-2021	35.032
March-2021	46.401
April-2021	43.290
May-2021	40.223
June-2021	45.620
July-2021	59.664

10. That from above table, it has been observed that the actual maximum quantum drawn by Northern Railway during Nov-19 to Jul-21 is upto 25 MW more than the contracted/ approved quantum of 35 MW and due to recovery of transmission

charges on contracted/ approved quantum instead of actual maximum drawn quantum, STU has incurred financial loss.

11. That no wheeling charges were applicable to Northern Railway, being connected directly to the transmission system of STU (PSTCL) or otherwise PSPCL may have suffered similar loss on account of wheeling charges for over-utilization of distribution system.
12. That beside Northern Railway, other Open Access Consumers/ Generators also sometimes over-draw/ over-inject resulting in over-utilization of transmission/ distribution system but are liable to pay transmission/ wheeling charges on the contracted/ approved quantum (in case of LTA/ MTOA customers) or scheduled quantum (in case of STOA customers) only.
13. That Haryana Electricity Regulatory Commission (HERC) vide its notification no. HERC/ 25/2012 dated 11.01.2012, had issued HERC (Terms and conditions for grant of connectivity and open access for intra-State transmission and distribution system) Regulations, 2012 (copy placed at **Appendix-1**). As per Regulation 51 of these regulations:-

“In case an open access consumer injects or draws more than the allocated capacity in the transmission and or distribution system beyond 10%, the open access consumer shall pay 150% of the applicable transmission and or wheeling charges for this excess injection / drawl than the allocated capacity. The charges for this excess injection / drawal beyond 10% shall be levied in accordance with the approved detailed procedure.

Provided that in case an open access consumer frequently injects or draws more than the allocated capacity then the nodal agency may revise the allocated capacity in the transmission and or distribution system in accordance with the approved detailed procedure. However, before doing this, opportunity shall be given to the open access consumer to explain its position.”

14. **That in view of above, it is prayed that a similar clause may be introduced in PSERC (Terms and Conditions for Intra-State Open Access) Regulations, 2011, so as to avoid any financial loss to the STU (PSTCL) on account of Over-utilization of open access capacity (over-injection / over-drawals) by Open Access Customers, who are not consumer of distribution licensee (and thus are not entitled to over-draw above allowed open access quantum and not subjected to levy of demand surcharge above sanctioned Contract Demand).**

15. That respondent no. 2 (PSTCL) may be allowed to charge transmission charges and SLDC operating charges for the actual maximum drawl of Petitioner (Northern Railway) in excess of open access capacity w.e.f. commencement of open access i.e. 24.11.2019.

- **Proposal for increasing in-kind Transmission & Wheeling Charges for NRSE/ RE generators wheeling power within the State under open access**

16. As per the Note below Regulation 25 of Open Access Regulations (copy of relevant pages placed at **Appendix-2**):-

“In case of wheeling of power generated from NRSE project for consumption within the State, transmission and wheeling charges shall be levied @ 2% of the energy injected into the State Grid, irrespective of the distance i.e. additional 2% of the total energy shall be injected at injection point(s). 10% of the average revenue realized by distribution licensee from such additional injection shall be passed on to the STU/Transmission licensee for compensating on account of transmission charges. In case of wheeling of power generated from NRSE project outside the state, full transmission and wheeling charges shall be leviable.

Provided that in case of wheeling of power for consumption within the State, generated from NRSE project in the State, achieving commercial operation (COD) from 09.07.2015 to 31.03.2017, no transmission and wheeling charges shall be leviable, irrespective of the distance, for a period of 10 (ten) years from its date of commercial operation (COD).”

17. In line with aforementioned regulations, the in-kind transmission and wheeling charges @ 2% of the energy injected have been applicable to NRSE/ RE generators wheeling energy under Open Access. The rate of 2% was decided way back in 2006 in line with NRSE Policy, 2006, which was retained by Hon'ble PSERC in Open Access Regulations, 2011 and by Govt. of Punjab in NRSE Policy, 2012. The relevant clause (3(i)) of prevailing NRSE Policy, 2012, (Copy placed at **Appendix-3**) has been reproduced hereunder:-

“Power Wheeling: *The PSPCL/LICENSEE/PSTCL will undertake to transmit/wheel the surplus power through its grid, and make it available to the producer for captive use in the same company units located in the State at a uniform wheeling charge of 2% of the energy fed to the grid or as amended from time to time by PSERC, irrespective of the distance from the generating station. Such wheeling and/or transmission of power shall be governed by Open*

Access Regulations /procedures. The captive power production and consumption by beneficiaries i. e. same group companies shall meet the requirements laid down in Electricity Rules 2005. Captive power generators will be required to seek permission of PSPCL/P SERC for laying of transmission line for taking power to destination of use in Punjab.”

18. That whereas the aforementioned clause of NRSE Policy 2012 is **applicable for captive use only**, it also empowers Hon'ble PSERC to amend/ revise the wheeling charge rate of 2% of energy. As such, it is proposed that **in line with the provisions of NRSE Policy, the in-kind transmission & wheeling charges (in shape of percentage of energy) needs to be made applicable/ confined only for captive use of energy.**
19. That presently, normal applicable transmission and wheeling charges for normal open access (STOA) customers work out to be 68+23=91 Paise/unit, whereas for NRSE projects the same comes to be only 2% of Applicable Tariff i.e. approx. 12 Paise/unit, resulting in loading of other general consumers. Thus, an amendment is required to increase the transmission & wheeling charge from 2% to 10%, so as to levy atleast 50% to 60% of the normal applicable charges to NRSE/ RE generators availing open access.
20. That further transmission charges @ 10% of revenue realized by distribution licensee are payable to STU/ transmission licensee in case of NRSE/ RE generators, while the transmission charges for normal open access (STOA) customers are around 25% of the Total transmission & wheeling charges. As such, share of transmission charges (in case of use of transmission system) are also required to be amended accordingly.

- **Injection/ Dumping of Harmonics by Open Access Customers/ Generators:-**

21. That Section 4.7.6 of PSERC (State Grid Code) Regulations, 2013, as amended from time to time (copy placed at **Appendix-4**) provides that “*Distribution Licensees and Open Access/ EHV Consumers directly connected to STS shall ensure that their loads do not affect STU system in terms of causing any unbalance in the phase angle and magnitude of voltage at the interconnection point beyond the limits prescribed and individual and Total Harmonic Distortion (THD) of voltage shall not exceed the values specified in clause 3(2) of the CEA Grid Standards. SLDC may direct the Distribution Licensees and Open Access/ EHV Consumers connected to STS to take appropriate measures to bring the Harmonics within permissible limit.*”

22. That Regulation 24 (24.1 to 24.8) of PSERC (Electricity Supply Code and related matters) (7th amendment) Regulations, 2020, (copy placed at **Appendix-5**) provides for installation of Power Quality meters for measurement of harmonics and control of harmonics (within prescribed limits) by Designated Consumer (which includes consumers using or engaged in any of following processes i.e Arc Furnace, Induction Furnace, Chloro alkaline unit, Billet heaters with total connected rating above 100 kVA, Surface hardening Machine & Electrolytic process industry, Electric Bell furnaces for annealing, Electro-slag refining/re-melting processes, IT/ITES, Malls, Petro-Chemical units, Railways, Pharmaceuticals and connected at a supply voltage of 11 kV & above or as may be decided by the Commission from time to time).
23. That Regulation 24.1 to 24.8 of Electricity Supply Code needs to be made applicable for all open access customers falling under above categories of Designated Consumer, especially which are connected to transmission system and/or are not consumer of distribution licensee e.g. Northern Railway (presently not covered under Electricity Supply Code), whose traction sub-stations are liable to inject/ dump harmonics into the transmission/ distribution system, thus jeopardizing grid stability and quality of supply.
24. **That in view of above, it is prayed that a similar clause may be introduced in PSERC (Terms and Conditions for Intra-State Open Access) Regulations, 2011, so as to ensure grid stability and quality of supply by limiting harmonics injection by Open Access Customers.**
- **Detailed Procedure of STU for grant of connectivity to open access applicants at 132 kV & above**
25. That as per regulation 5 (1) of PSERC (terms & conditions for intra state open access) Regulations, 2011, as amended from time to time:
- “Application procedure for Connectivity at 132 kV or above***
Applicant shall apply to the STU for connectivity in the Form prescribed in the detailed procedure to be laid down by the STU. The STU shall prescribe the procedure within a period of 30 days from the coming into force of these Regulations”
26. That till date, the open access applicants including entities seeking connectivity to transmission system of STU e.g. Northern Railway & Generators/ IPPs, were applying for connectivity to PSPCL as their consumer/ seller, and were being granted connectivity by PSPCL in line with the provisions of Electricity Supply Instructions Manual (ESIM) after grant of Feasibility Clearance by Feasibility Clearance Committee (FCC) and the need for formulation of separate procedure of STU for grant of connectivity didn't arise.

27. That now, Northern Railway is requesting STU (PSTCL) to grant connectivity to its upcoming TSS without involving PSPCL, in line with the provisions of PSERC (Terms & Conditions for Intra-State Open Access) Regulations, 2011 and State Grid Code. **Accordingly, a detailed procedure for grant of connectivity to open access applicants (connected with State transmission system), has been framed by STU (PSTCL) and the same is being enclosed at Appendix-6 for kind perusal and approval of Hon'ble Commission.**

PRAYER

In the facts and circumstances, it is most respectfully prayed that

1. **Hon'ble commission may kindly consider and make amendments in the PSERC (Terms & Conditions for Intra-State Open Access) Regulations, 2011, as proposed hereunder:-**

Regulation No.	Existing Provision	Proposed Provision	Remarks
23, 24 & 25	Transmission Charges, Scheduling & System Operation charges and Wheeling Charges		
	<p>Note: "In case of wheeling of power generated from NRSE project for consumption within the State, transmission and wheeling charges shall be levied @ 2% of the energy injected into the State Grid, irrespective of the distance i.e. additional 2% of the total energy shall be injected at injection point(s).</p>	<p>The Note is proposed to be substituted and renumbered as under: "25AA 1) In case of wheeling of power generated from NRSE project for captive use in the same company units located in the State, uniform wheeling and/or transmission charges shall be levied @ 10% of the energy injected/ scheduled for injection into the grid, irrespective of the distance from the generating station i.e. additional 10% of the total energy shall be injected/ scheduled at injection point(s).</p>	<p>1) To be in line with NRSE Policy 2016 (Clause 3 of Annexure-III) which specifies as under: "Power Wheeling: The PSPCL/LICENSEE/PSTCL will undertake to transmit/wheel the surplus power through its grid, and make it available to the producer for captive use in the same company units located in the State at a uniform wheeling charge of 2% of the energy fed to the grid or as amended from time to time by PSERC, irrespective of the distance from the generating station. Further, presently normal applicable transmission and wheeling charges for normal consumers work out to be 68+23=91</p>

Regulation No.	Existing Provision	Proposed Provision	Remarks
	<p>10% of the average revenue realized by distribution licensee from such additional injection shall be passed on to the STU/ Transmission licensee for compensating on account of transmission charges. In case of wheeling of power generated from NRSE project outside the state, full transmission and wheeling charges shall be leviable.”</p> <p>Provided that in case of wheeling of power for consumption within the State, generated from NRSE project in the State, achieving commercial operation (COD) from 09.07.2015 to 31.03.2017, no transmission and wheeling charges shall be leviable, irrespective of the distance, for a period of 10 (ten) years from its date of commercial operation (COD).</p>	<p>25% of the average revenue realized by distribution licensee from such additional injection shall be passed on to the STU/ Transmission licensee for compensating on account of transmission charges. In case of wheeling of power generated from NRSE project outside the state, full transmission and wheeling charges shall be leviable.”</p> <p>Provided that in case of wheeling of power for consumption within the State, generated from NRSE project in the State, achieving commercial operation (COD) from 09.07.2015 to 31.03.2017, no transmission and wheeling charges shall be leviable, irrespective of the distance, for a period of 10 (ten) years from its date of commercial operation (COD).</p>	<p>paaise/unit, whereas for NRSE projects the same comes to be only 2%*600=12 paaise/unit, resulting in loading of other general consumers. Thus, an amendment is being proposed so as to levy atleast 50% to 60% of the normal applicable charges.</p> <p>Also, transmission charges being about 25% of the transmission & distribution wheeling charges, share of transmission (in case of use of transmission system) is being proposed to be amended accordingly.</p>

Regulation No.	Existing Provision	Proposed Provision	Remarks
		<p>2) For Long Term Access (LTA) and Medium Term Open Access (MTOA) Customers; Applicable Transmission charges/ Scheduling & System Operation Charges/ Wheeling Charges shall be payable on the MW quantum/ capacity allowed for the open access.</p> <p>For Short Term Open Access (STOA) Customers; Applicable Transmission charges/ Wheeling Charges shall be payable on the kWh quantum of energy scheduled under open access.</p> <p>Provided that, for the injection/ drawl by LTA/ MTOA customers (who are not consumer of distribution licensee) in excess of the allowed quantum/ capacity, if any, the charges shall be payable @150% of the applicable Transmission/ Scheduling & System Operation/ Wheeling Charges specified in Regulations 23, 24 and 25 of these Regulations on such maximum excess quantum drawn during the month.</p>	<p>2) Provision has also been proposed for payment of higher applicable transmission, Scheduling & System Operation and Wheeling Charges for injection/ drawl in excess of the allowed/ scheduled quantum/ capacity for open access customers, who are not consumer of distribution licensee.</p>

Regulation No.	Existing Provision	Proposed Provision	Remarks
		<p>Provided further that, for the injection/ drawl by STOA customers (who are not consumer of distribution licensee) in excess of the scheduled quantum, if any, the charges shall be payable @150% of the applicable Transmission/ Wheeling Charges specified in Regulations 23 and 25 of these Regulations on the quantum of over-drawal/ over-injection.</p>	
29	New Clause 29(A)	<p>Where an open access customer falls under the category of “Designated Consumer” defined under Electricity Supply Code, 2014, as amended from time to time, the customer shall</p> <ul style="list-style-type: none"> • Install power quality meter and share the recorded data thereof with the transmission/ distribution licensee in line with the provisions of Electricity Supply Code. • Control the harmonics level at the Point of Common Coupling (PCC) in line with the provisions of Electricity Supply Code. The limits of voltage harmonics 	<p>To control dumping/ injection of harmonics by open access customers (especially who are connected to transmission system and/or are not consumer of distribution licensee e.g. Northern Railway) In line with the provisions of PSERC (Electricity Supply Code and related matters) (7th amendment) Regulations, 2020 and CEA Standards.</p>

Regulation No.	Existing Provision	Proposed Provision	Remarks
		<p>and current harmonics, Point of measurement i.e. PCC and other related matters shall be as per the IEEE 519-2014 namely “IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems”, as modified from time to time read along with Standards issued by Central Electricity Authority (CEA) from time to time.</p> <ul style="list-style-type: none"> • Provide adequate harmonic suppression units/ harmonic filters to avoid dumping of harmonics into Licensee's transmission/ distribution system, complying with the standards issued by CEA from time to time. <p>The measurements undertaken to determine compliance shall be carried out in accordance with the requirements as specified in IEC 61000-4-7 and IEC 61000-4-30. There shall be continuous measurement of harmonics with permanent Power Quality meters complying with the IEC 61000-4-30 Class-A meters</p>	

Regulation No.	Existing Provision	Proposed Provision	Remarks
		<p>for all new installations.</p> <p>Where the open access customer fails to install power quality meter within stipulated time (3 months from date of notification of this amendment) or the injection of harmonics exceeds the prescribed limits, such consumer shall be liable to pay a penalty to the transmission/ distribution licensee at the rate and in the manner as may be approved by the Commission from time to time. The penalty shall be without prejudice to the right of the transmission/ distribution licensee to take other punitive action as may be approved by the Commission.</p>	

2. Hon'ble Commission may allow respondent no. 2 (PSTCL) to charge transmission charges and SLDC operating charges to the petitioner (Northern Railway) for the actual maximum drawl of petitioner in excess of open access capacity w.e.f. commencement of open access i.e. 24.11.2019.
3. Hon'ble Commission may approve the detailed procedure of STU for grant of connectivity to open access applicants at 132 kV & above as enclosed at Appendix-6.

**Chief Engineer/ SLDC
PSTCL, Patiala**

Encl: As above (Appendix-1 to 6)

HARYANA ELECTRICITY REGULATORY COMMISSION**Notification****The 11th January, 2012**

Regulation No. HERC / 25 / 2012: - The Haryana Electricity Regulatory Commission, in exercise of the powers conferred on it by section 181 of the Electricity Act 2003 (Act 36 of 2003) and all other powers enabling it in this behalf, after previous publication, hereby frames the following regulations:-

Chapter – I**General**

1. Short title, commencement and interpretation. - (1) These regulations may be called the Haryana Electricity Regulatory Commission (Terms and conditions for grant of connectivity and open access for intra-State transmission and distribution system) Regulations, 2012.

(2) These regulations shall come into force from the date of their notification in the Haryana Government Gazette.

(3) These regulations shall extend to the whole state of Haryana.

(4) The Punjab General Clause Act 1898 (Act 1 of 1898) as applicable to the state of Haryana shall apply to the interpretation of these regulations

2. Scope and extent of application. – These regulations shall apply where an application has been made for grant of connectivity for the purpose of open access to the intra-state transmission and or distribution system and or where an application has been made for long term open access, medium term open access or short term open access for use of the intra-State transmission and or distribution system including when such system is used in conjunction with inter-State transmission system.

Provided that a generating station, including captive generating plant, or a consumer / person shall not be eligible to apply for long term or medium term or short term open access unless he has the connectivity or he applies for connectivity to the intra-State transmission or distribution system as the case may be.

Provided further that a person may apply for connectivity as well as long term or medium term or short term open access simultaneously.

51. Over injection / drawl from the system. - In case an open access consumer injects or draws more than the allocated capacity in the transmission and or distribution system beyond 10%, the open access consumer shall pay 150% of the applicable transmission and or wheeling charges for this excess injection / drawl than the allocated capacity. The charges for this excess injection / drawal beyond 10% shall be levied in accordance with the approved detailed procedure.

Provided that in case an open access consumer frequently injects or draws more than the allocated capacity then the nodal agency may revise the allocated capacity in the transmission and or distribution system in accordance with the approved detailed procedure. However, before doing this, opportunity shall be given to the open access consumer to explain its position.

52. Curtailment. – (1) If it becomes necessary to curtail power flow on a transmission corridor or distribution system for the reason of transmission or distribution constraints or for maintaining grid security, the transactions already scheduled may be curtailed by the SLDC.

(2) The short-term open access shall be curtailed first followed by the medium-term open access, which shall be followed by the long-term open access and amongst the open access consumers of a particular category, curtailment shall be carried out on pro rata basis. Distribution licensee shall be last to be curtailed.

(3) SLDC shall prepare guidelines for curtailment of open access, which shall be consistent with the provisions of Haryana Grid Code and other relevant regulations. The curtailment guidelines shall be prepared by SLDC within sixty (60) days from the date of notification of these regulations and shall form part of detailed procedure.

Chapter - XIII

Special provisions

53. Dispute resolution. - All disputes and complaints arising under these regulations shall be decided by the coordination committee within a period of 30 days from the date of receipt of application from the concerned party. Appeal against the decision of the coordination committee shall lie with the Commission. The decision of the Commission shall be final and binding.

54. Interpretation. - If a question arises relating to the interpretation of any provision of these regulations, the decision of the Commission shall be final.

55. Saving of inherent powers of the commission. - Nothing contained in these regulations shall limit or otherwise affect the inherent powers of the Commission from adopting a procedure, which is at variance with any of

PUNJAB STATE ELECTRICITY REGULATORY COMMISSION

NOTIFICATION

The 1st July, 2011

No. PSERC/Secy/Reg/57: In exercise of powers conferred under Section 42 read with Section 181 of the Electricity Act, 2003 (36 of 2003) and all other powers enabling the Commission in this behalf, based on the 'Statement of Reasons' issued vide No.PSERC/Secy/Reg/56 dated 29.06.2011, the Punjab State Electricity Regulatory Commission hereby frames the following Regulations, for Open Access in the State: -

CHAPTER 1

PRELIMINARY

1. Short Title and Commencement

- 1) These regulations shall be called the Punjab State Electricity Regulatory Commission (Terms and Conditions for Intra-state Open Access) Regulations, 2011.
- 2) These Regulations shall come into force from the date of their notification in the official Gazette of the State.

2. Extent of Application

These regulations shall apply to open access for use of intra-State transmission system and/or distribution systems of the licensees in the State, including when such system is used in conjunction with inter-State transmission system.

Note: A consumer/person whose premises are situated within the area of supply of a distribution licensee, seeking to receive supply from a person other than the distribution licensee of his area of supply; a generating company (including captive generating plant) or licensee seeking to supply to a consumer/person in the State, would need to apply for Open Access under these Regulations

⁸[Provided that the deviation settlement and other applicable matters for Wind and Solar Generating Stations, shall be as specified in the Punjab State Electricity Regulatory Commission (Forecasting, Scheduling, Deviation Settlement and Related Matters of Solar and Wind Generation Sources) Regulations, 2019, as amended from time to time.]

3. Definitions

- 1) In these regulations, unless the context otherwise requires
 - a) "Act" means the Electricity Act, 2003 (36 of 2003);
 - b) "Allotted Capacity" means the power transfer in MW between the specified point(s) of injection and point(s) of drawal allowed to a long-term /medium-term customer on the intra-State transmission system and the expression " allotment of capacity" shall be construed accordingly;
 - c) ⁸["Applicant" means a consumer, an electricity trader, distribution licensee or a generating company/station (including a captive generating plant) who has applied for open access including connectivity, if not already connected;]
 - d) "Bilateral transaction" means a transaction for exchange of energy (MWh) between a specified buyer and a specified seller, directly or

¹[1st Amendment issued vide Notification No. PSERC/Secy./Reg 67 dated 4th May, 2012]

²[2nd Amendment issued vide Notification No. PSERC/Secy./Reg 77 dated 13th Dec. 2013]

³[3rd Amendment issued vide Notification No. PSERC/Secy./Reg 87 dated 2nd Sept., 2013]

⁴[4th Amendment issued vide Notification No. PSERC/Secy./Reg 96 dated 17th Sept., 2014]

⁵[5th Amendment issued vide Notification No. PSERC/Secy./Regu. 103 dated 1st June, 2015]

⁶[6th Amendment issued vide Notification No. PSERC/Secy./Regu. 110 dated 21st Jan., 2016]

⁷[7th Amendment issued vide Notification No. PSERC/Secy./Regu. 112 dated 3rd Feb., 2016]

⁸[8th Amendment issued vide Notification No. PSERC/Secy./Regu. 138 dated 15th Feb., 2019]

⁹[9th Amendment issued vide Notification No. PSERC/Secy./Regu. 143 dated 17th Oct., 2019]

- 8) When capacity has been reserved consequent to bidding, the Open Access charges will be taken as determined through bidding:

Provided further that the charges so determined under this Regulation will be the floor price for the purpose of Regulation 18.

Note: ²["In case of wheeling of power generated from NRSE project for consumption within the State, transmission and wheeling charges shall be levied @ 2% of the energy injected into the State Grid, irrespective of the distance i.e. additional 2% of the total energy shall be injected at injection point(s). 10% of the average revenue realized by distribution licensee from such additional injection shall be passed on to the STU/Transmission licensee for compensating on account of transmission charges. In case of wheeling of power generated from NRSE project outside the state, full transmission and wheeling charges shall be leviable."]

⁶[Provided that in case of wheeling of power for consumption within the State, generated from NRSE project in the State, achieving commercial operation (COD) from 09.07.2015 to 31.03.2017, no transmission and wheeling charges shall be leviable, irrespective of the distance, for a period of 10 (ten) years from its date of commercial operation (COD).]

26. Cross subsidy surcharge

- 1) If open access facility is availed of by a subsidising consumer of a distribution licensee of the State, then such consumer, in addition to transmission and/or wheeling charges, shall pay cross subsidy surcharge determined by the Commission. Cross subsidy surcharge determined on Per Unit basis shall be payable, on monthly basis, by the open access consumers based on the actual energy drawn during the month through open access.

Provided that such surcharge shall not be leviable to a person who has established a captive generating plant for carrying the electricity to the destination of his own use.

⁴[Provided further that such surcharge shall not be leviable on power available with consumer(s) through open access to the extent of regulatory measures imposed due to shortage of power, other than peak load hour restrictions put by the distribution licensee, on the consumer(s) through advance notification.]

- 2) The cross subsidy surcharge shall be determined in accordance with the following formula:

Surcharge formula

$$S = T - C$$

where,

S is the cross subsidy surcharge

T is the average per unit realization from the relevant category of consumers

C is the combined average cost of supply of distribution licensee

- 3) The surcharge shall be paid to the distribution licensee of area where the premises of the consumer availing Open Access are located. In case of more than one licensees supplying in the same area, the licensee from whom the consumer was availing supply shall be paid the amount of surcharge.
- 4) The consumers availing Open Access exclusively on interstate transmission system shall also pay the same surcharge as determined under this Regulation.

GOVERNMENT OF PUNJAB
DEPARTMENT OF SCIENCE, TECHNOLOGY, ENVIRONMENT AND NON-CONVENTIONAL ENERGY

Notification

The 26th DECEMBER, 2012

No. 10/174/2012/STE(3)/4725 -The Governor of Punjab is pleased to formulate a 'New and Renewable Sources of Energy (NRSE) Policy – 2012', to develop and promote new and renewable sources of energy based technologies and energy conservation measures as well as providing financial & fiscal assistance, thereby addressing the problems arising from depletion of conventional sources of energy and environment pollution. This policy shall replace and supersede the previous policy notified vide No. 10/106/2006-STE (1)/5390 dt. 24th November, 2006, unless specifically stated otherwise hereunder. The Policy would be effective from the date of its notification in the official gazette of Punjab Government and shall remain in operation till the Government notifies the new policy. For giving effect to this policy, necessary amendments in various policies, rules & regulations, wherever necessary, shall be expeditiously undertaken by the concerned departments.

1. OBJECTIVES

1.1 Punjab has considerable potential in NRSE sector which is being harnessed. With a view to maximize the utilization of these resources; this policy aims to achieve the following objectives:

- To maximise and improve the share of new and renewable sources of energy to 10% of the total installed power capacity in the state by 2022. NRSE sector wise details are mentioned separately.
- To promote renewable energy initiatives for meeting energy / lighting needs in rural areas and supplementing energy needs in urban, industrial and commercial sectors.

1.2 Further, in order to achieve the aforesaid objectives, the following shall be the major strategic initiatives :-

station at its own cost in addition to all equipment required for evacuation of power in its own generating facility switchyard. All Associated equipment(s) at the PSPCL/LICENSEE grid substation for accepting energy from the project including up gradation required if any shall be provided by the PSPCL/LICENSEE including Check meters and associated CTs/PTs.

- (iii) PSPCL/LICENSEE approved main ABT meter having two independent registering facilities, one for the export of power to the grid and another for import from the grid will be installed on the HT side of Generator transformer in the switch yard at interconnection point by the producer. The meters and metering boxes will be sealed by the PSPCL/LICENSEE/PSTCL. The energy meter(s) and associated CTs/PTs etc. shall comply with the requirements of State Grid Code and CEA guidelines.
- (iv) Necessary current limiting devices will be installed in the generating equipment by the producer. Producer shall generate matching MVARs so that monthly average power factor does not exceed 0.90 or as specified from time to time.

3. Facilities by Punjab State Power/Transmission Corporation Limited:

- i) **Power Wheeling:** The PSPCL/LICENSEE/PSTCL will undertake to transmit/wheel the surplus power through its grid, and make it available to the producer for captive use in the same company units located in the State at a uniform wheeling charge of 2% of the energy fed to the grid or as amended from time to time by PSERC, irrespective of the distance from the generating station. Such wheeling and/or transmission of power shall be governed by Open Access Regulations /procedures. The captive power production and consumption by beneficiaries i. e. same group companies shall meet the requirements laid down in Electricity Rules 2005. Captive power generators will be required to seek permission of PSPCL/PSERC for laying of transmission line for taking power to destination of use in Punjab.

PUNJAB STATE ELECTRICITY REGULATORY COMMISSION**Notification****The 14th February, 2013**

No. PSERC/Secy./Regu./80 – In exercise of the powers conferred by Section 181 read with Section 86(1)(h) of the Electricity Act, 2003 (Central Act 36 of 2003) and all other powers enabling it in this behalf, the Punjab State Electricity Regulatory Commission hereby makes the following Regulations namely :-

A. Short title, extent and commencement

- (i) These Regulations may be called the Punjab State Electricity Regulatory Commission (Punjab State Grid Code) Regulations, 2013, in short, "State Grid Code (SGC)".
- (ii) These Regulations shall come into force with effect from the date of their publication in the official gazette of the Government of Punjab.
- (iii) These Regulations shall extend to whole of the State of Punjab.

B. Definitions

- (i) In this code, unless the context otherwise requires, terms will have meaning as defined hereunder:-

Defined Term	Definition
Act	The Electricity Act, 2003 (Central Act No. 36 of 2003), as amended from time to time
Active Energy	Active Energy means the electrical energy produced, flowing or supplied by an electrical circuit during a time interval, and being the integral of the instantaneous power with respect to time, measured in units of watt hours or standard multiples thereof. Unless otherwise qualified, the term "energy" refers to active energy.
Active Power	Active Power means the product of voltage and the in-phase component of alternating current measured in units of watts and standard multiples thereof.
Ancillary Services	In relation to power system (or grid) operation, the services necessary to support the power system (or grid) operation in maintaining power quality, reliability and security of the grid, e.g. active power support for load, reactive power support, black start, etc.
Apparatus	Electrical apparatus and includes all machines, fittings, accessories and appliances in which conductors are used.
Apparent Energy	Apparent Energy means the integral of the Apparent Power with respect to time. It is measured in Volt Ampere hour and standard multiples thereof.
Apparent Power	Apparent Power means the product of the root-mean-square (RMS) or effective value of the current and the root-mean-square value of the voltage. For AC circuits or systems, it is the square root of the sum of the squares of the active and reactive power and is measured in kilo volt-ampere (kVA) or multiples thereof.
Appendix	An Appendix to a Section of the State Grid Code.
Area Load Despatch Centre (ALDC)	Area Load Despatch Centre means a computerized load despatch centre of PSTCL which reports to SLDC.

¹ [1st Amendment issued vide Notification No. PSERC/Secy./Regu. 136 dated 07.01.2019 read with corrigendum issued vide notification no. PSERC/Secy./Regu. 141 dated 27.06.2019]

4.7 System Performance

- 4.7.1 All equipment connected to the State Transmission System shall be of such design and construction that enables STU to meet the requirement of Standards of Performance. Distribution Licensees and other Users shall ensure that their loads do not cause violation of these standards.
- 4.7.2 Any User seeking to establish new or modified arrangement(s) for Grid connection and/or use of transmission system of STU shall submit the application in the form as specified by STU.
- 4.7.3 For every new /modified Connection sought, STU shall specify the Connection Point, technical requirements and the voltage to be used, along with the metering and protection requirements as specified in the Metering Code and Protection Code.
- 4.7.4 SGS (except CPPs) shall make available to SLDC the up to date capability curves for all Generating Units, indicating any restrictions, to allow accurate system studies and effective operation of the State Transmission System. CPPs shall similarly furnish the net reactive capability that will be available for Export to / Import from the State Transmission System.

The State Transmission System rated frequency shall be 50.00 Hz and shall always remain within the 49.7 –50.2 Hz band as specified in IEGC.

- 4.7.5 The User shall be subject to the Grid discipline in respect of variation of voltage at the inter connection point prescribed by clause 3(1)(b) of the CEA Grid Standards (reproduced below).

Limits of Voltage Variation		
Nominal (kV)	Maximum (kV)	Minimum (kV)
765	800	728
400	420	380
220	245	198
132	145	122
110	121	99
66	72	60
33	36	30

- 4.7.6 Distribution Licensees and Open Access/EHV Consumers directly connected to STS shall ensure that their loads do not affect STU system in terms of causing any:

- (i) Unbalance in the phase angle and magnitude of voltage at the interconnection point beyond the limits prescribed.
- (ii) Individual and Total Harmonic Distortion (THD) of voltage shall not exceed the values specified in clause 3(2) of the CEA Grid Standards (reproduced below).

System Voltage (kV)	Total Harmonic Distortion (THD)	Individual harmonic of any particular frequency
765	1.5%	1.0%
400	2.0%	1.5%
220	2.5%	2.0%
33 to 132	5.0%	3.0%

SLDC may direct the Distribution Licensees and Open Access/EHV Consumers connected to STS to take appropriate measures to bring the Harmonics within permissible limit.

- 4.7.7 In the event of Grid disturbances in the Northern Regional grid, STU shall not be liable to maintain the system parameters within the normal range of voltage and frequency.
- 4.7.8 Insulation Co-ordination of the User's equipment shall conform to values as specified by STU from time to time out of those applicable as per Indian Standards / Codes. Short circuit current of switchgear shall not be less than its magnitude and time specified by STU from time to time.
- 4.7.9 Protection schemes and metering schemes shall be as detailed in the Protection Code and Metering Code.

4.8 Connection Point

4.8.1 State Generating Station (SGS)

Voltage may be 400/220/132/66 kV or as agreed with STU.

Unless specifically agreed with STU, the Connection point with generating station shall be the outgoing gantry of the feeders of power station switchyard. SGS shall operate and maintain all terminals, communication, metering and protection equipments owned by SGS within its jurisdiction. All electrical equipments including communication equipment from outgoing feeder gantry onwards shall be owned, operated & maintained by STU/Transmission licensee.

The provisions for the metering between generating station and STU/Transmission licensee system shall be as per the Metering Code.

4.8.2 Distribution Licensee

Voltage may be LV side of power transformer i.e. 220 kV, 132 kV, 66 kV or 33 kV or 11 kV or as agreed with STU.

Unless specifically agreed with Distribution Licensee, the Connection point with STU shall be the outgoing gantry of the feeder to Distribution Licensee or individual EHV consumer as the case may be, from STU sub-station.

STU shall operate and maintain all terminals, communication and protection equipments provided within its jurisdiction. The provisions for the metering between STU and Distribution Licensee systems shall be as per the Metering Code. Respective Users shall maintain their equipment beyond the outgoing gantry of feeders emanating from STU sub-station onwards.

4.8.3 Northern Regional Transmission System

For the Northern Regional Transmission System/CTU, the Connection, protection scheme, metering scheme and the voltage shall be in accordance with the provisions of IEGC.

4.8.4 IPPs, CPPs, Open Access Customers and other Consumers directly connected to STS

Voltage may be 400/220/132/66/33/ kV or as agreed with STU.

When IPPs, CPPs, EHV Consumers or the Open Access Customers own sub-stations, the Connection point shall be the terminal isolator provided just before the gantry of outgoing/incoming feeder in their premises.



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EXTRAORDINARY

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PUNJAB STATE ELECTRICITY REGULATORY COMMISSION

NOTIFICATION

The 18th September, 2020

No. PSERC/Secy/Regu.151.-In exercise of the powers conferred under Section 181 read with Sections 43, 44, 45, 46, 47, 48, 50, 55, 56, 57, 58, 59, 126, 127, 135, 152, 154 & 163 of the Electricity Act, 2003 (Central Act 36 of 2003) read with Electricity (Amendment) Act, 2007 (No. 26 of 2007) and all other powers enabling it in this behalf, the Punjab State Electricity Regulatory Commission hereby makes following regulations to amend the Punjab State Electricity Regulatory Commission (Electricity Supply Code and Related Matters) Regulations, 2014 including the first to sixth amendments thereof (hereinafter referred to as “the Principal Regulations”):-

1. SHORT TITLE, COMMENCEMENT AND INTERPRETATION

- 1.1 These Regulations may be called the Punjab State Electricity Regulatory Commission (Electricity Supply Code and Related Matters) (7th Amendment) Regulations, 2020.
- 1.2 These Regulations shall be applicable to all licensees (including entities exempted under Section 13 of the Act) in their respective licensed/supply areas and all consumers/persons in the State of Punjab.
- 1.3 These Regulations shall come into force from the date of their publication in the official gazette of the State.

2) Amendments in Regulation 2 of the Principal Regulations:

The following definitions shall be inserted in Regulation 2 of the Principal Regulations:-

(ra) Designated Consumer' means consumer using or engaged in any of following processes i.e Arc Furnace, Induction Furnace, Chloro alkaline unit, Billet heaters with total connected rating above 100 kVA, Surface hardening Machine & Electrolytic process industry, Electric Bell furnaces for annealing, Electro-slag refining/re-melting processes, IT/ITES, Malls, Petro-Chemical units, Railways, Pharmaceuticals and connected at a supply voltage of 11 kV & above or as may be decided by the Commission from time to time;

(zna) 'Maximum demand load current' means the current value at the point of common coupling

calculated as the sum of the currents corresponding to the maximum 15/30 minute demand during each of the twelve previous months divided by 12;

(zta) 'Point of Common Coupling (PCC)' means the point of metering, or any other point on supply system of distribution licensee, electrically nearest to the particular load at which other loads are, or could be, connected. For service to industrial users (i.e., manufacturing plants) via a dedicated service transformer, the PCC is usually at the HV side of the transformer. For commercial users (office parks, shopping malls, etc.) supplied through a common service transformer, the PCC is commonly at the LV side of the service transformer;

(zua) 'Power Quality Meter' means a device suitable for monitoring and recording of power quality. It shall be capable of accurate measurement, monitoring and recording of harmonics, sags, swells, flickers and other power quality parameters;

(zya) 'Short-circuit ratio' at a particular location means the ratio of the available short-circuit current, in amperes, to the load current, in amperes;

(zzda) 'Total Demand Distortion (TDD)' means the ratio of the root mean square of the harmonic content, considering harmonic components up to the 50th order, expressed as a percent of the maximum demand current;

(zzdb) 'Total Harmonic Distortion (THD)' means the ratio of the root mean square of the harmonic content, considering harmonic components up to the 50th order, expressed as a percent of the fundamental;

3) Amendments in Regulation 24 of the Principal Regulations:

The Regulation 24 of the Principal Regulations shall be substituted as under:-

24.1 The distribution licensee and the designated consumers shall control the harmonics level at the Point of Common Coupling (PCC). The limits of voltage harmonics by the distribution licensee in its electrical network, the limit of injection of current harmonics by the designated consumers, Point of measurement i.e PCC and other related matters shall be as per the IEEE 519-2014 namely 'IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems', as modified from time to time.

24.2 The measurements undertaken to determine compliance shall be carried out in accordance with the requirements as specified in IEC 61000-4-7 and IEC 61000-4-30. There shall be continuous measurement of harmonics with permanent Power Quality meters complying with the IEC 61000-4-30 Class-A meters.

Provided that where CTs/PTs of the existing installation/connection of the designated consumer are of lower accuracy class than mandated by IEC 61000-4-30 Class-A meters, the meters complying with the IEC 61000-4-30 Class-B may be installed as an interim measure.

24.3 The data measured and metered as mentioned in regulation 24.2 with regard to the harmonics, shall be captured by the distribution licensee each month or as may be decided by the Commission from time to time keeping in view the operational constraints. The data shall also be shared with the consumer periodically.

24.4 The designated consumers shall install power quality meters by 1st October, 2021 and share the recorded data thereof with the distribution licensee each month or as may be decided by the Commission.

- 24.5 The distribution licensee shall install power quality meters within three years starting from 1st October, 2021 in a phased manner covering at least 20% of the total identified locations on 11/33/66 kV feeders as may be approved by the Commission, in the first year and 40% each in subsequent two years.

24.6 Harmonic limits

Harmonic management in a power system is a joint responsibility involving both the end users and the distribution licensee, therefore harmonic limits are specified for both voltages and currents. The limits as mentioned below shall apply only at the Point of Common Coupling (PCC).

24.6.1 VOLTAGE HARMONICS

- (a) The distribution licensee shall control the line-to-neutral voltage harmonics at the Point of Coupling. The voltage harmonic distortion of the supply voltage shall be assessed in terms of the Total Harmonic Distortion (THD_v) considering harmonic components up to the 50th order. THD_v shall be taken as square root of the sum of squares of all voltage harmonics expressed as a percentage of the magnitude of the fundamental measured with following formula

$$THD_v = \sqrt{\sum_{h=2}^N V_h^2}$$

where

V_h represents the percent r.m.s value of the h^{th} harmonic voltage component, and N represents the highest harmonic order considered in the calculation.

- (b) Voltage distortion limits

Table 1

Bus Voltage V at PCC	Individual harmonic (%)	Total harmonic distortion (THD) (%)
$V \leq 1.0$ kV	5.0	8.0
1 kV $< V \leq 69$ kV	3.0	5.0
69 kV $< V \leq 161$ kV	1.5	2.5
161 kV $< V$	1.0	1.5 ^a

^aHigh-voltage systems can have up to 2.0% THD where the cause is an HVDC terminal whose effects will have attenuated at points in the network where future users may be connected.

For statistical evaluation, voltage harmonics shall be assessed for a period of not less than 7 continuous days. The short time 10 min values are accumulated over periods of one week and the 95th percentile values (i.e., those values that are exceeded for 5% of the measurement period) are calculated for each 7-day period for comparison with the recommended limits. The values are measured at PCC in normal operating condition.

24.6.2 CURRENT HARMONICS

The designated consumer shall limit the value of harmonic currents measured at Point of Common Coupling (PCC) measured over 10 minutes period to the values as given in table below:

(a) Current distortion limits (TDD) for system nominally rated through 120 V to 69 kV**Table 2**

Maximum harmonic current distortion in percent of I_L						
Individual harmonic order (odd harmonics)^{a, b}						
I_{sc}/I_L	$3 \leq h < 11$	$11 \leq h < 17$	$17 \leq h < 23$	$23 \leq h < 35$	$35 \leq h \leq 50$	TDD
<20*	4.0	2.0	1.5	0.6	0.3	5.0
20<50	7.0	3.5	2.5	1.0	0.5	8.0
50<100	10.0	4.5	4.0	1.5	0.7	12.0
100<1000	12.0	5.5	5.0	2.0	1.0	15.0
>1000	15.0	7.0	6.0	2.5	1.4	20.0

Note: * All power generation equipment is limited to these values of current distortion, regardless of actual I_{sc}/I_L ;

^aEven harmonics are limited to 25% of the odd harmonic limits above;

^bCurrent distortions that result in a dc offset, e.g., half-wave converters, are not allowed;

where

I_{sc} = maximum short-circuit current at PCC;

I_L = maximum demand load current (fundamental frequency component) at the PCC under normal load operating conditions;

(b) Values of Current distortion limits (TDD) for system rated above 69 kV through 161 kV**Table 3**

Maximum harmonic current distortion in percent of I_L						
Individual harmonic order (odd harmonics)^{a, b}						
I_{sc}/I_L	$3 \leq h < 11$	$11 \leq h < 17$	$17 \leq h < 23$	$23 \leq h < 35$	$35 \leq h \leq 50$	TDD
<20*	2.0	1.0	0.75	0.3	0.15	2.5
20<50	3.5	1.75	1.25	0.5	0.25	4.0
50<100	5.0	2.25	2.0	0.75	0.35	6.0
100<1000	6.0	2.75	2.5	1.0	0.5	7.5
>1000	7.5	3.5	3.0	1.25	0.7	10.0

Note: * All power generation equipment is limited to these values of current distortion, regardless of actual I_{sc}/I_L ;

^aEven harmonics are limited to 25% of the odd harmonic limits above;

^bCurrent distortions that result in a dc offset, e.g., half-wave converters, are not allowed;

where

I_{sc} = maximum short-circuit current at PCC;

I_L = maximum demand load current (fundamental frequency component) at the PCC under normal load operating conditions;

(c) Values of Current distortion limits (TDD) for system rated above 161 kV**Table 4**

Maximum harmonic current distortion in percent of I_L						
Individual harmonic order (odd harmonics) ^{a, b}						
ISC/IL	$3 \leq h < 11$	$11 \leq h < 17$	$17 \leq h < 23$	$23 \leq h < 35$	$35 \leq h \leq 50$	TDD
<25*	1.0	0.5	0.38	0.15	0.1	1.5
25<50	2.0	1.0	0.75	0.3	0.15	2.5
≥ 50	3.0	1.5	1.15	0.45	0.22	3.75

Note: * All power generation equipment is limited to these values of current distortion, regardless of actual ISC/IL;

^aEven harmonics are limited to 25% of the odd harmonic limits above;

^bCurrent distortions that result in a dc offset, e.g., half-wave converters, are not allowed; where

I_{sc} = maximum short-circuit current at PCC;

I_L = maximum demand load current (fundamental frequency component) at the PCC under normal load operating conditions;

For statistical evaluation, current harmonics shall be assessed for the period not less than 7 continuous days. The short time 10 min values are accumulated over periods of one week and the 95th & 99th percentile values (i.e., those values that are exceeded for 5% and 1% of the measurement period) are calculated for each 7- day period for comparison with the recommended limits. The values of TDD are measured at PCC in normal operating condition.

Provided that:

The weekly 95th percentile short time 10 min harmonic current values should be less than the value given in Table (2), (3) and (4) above, as applicable. However, the weekly 99th percentile short time 10 min harmonic current values should be less than 1.5 times the value given in Table (2), (3) and (4) above, as applicable .

24.7 In case the designated consumer fails to install power quality meter within the stipulated time, as specified in regulation 24.4 of these regulations or the injection of current harmonics, after the stipulated time as may be decided by the Commission, exceeds the limits as specified in regulation 24.6.2 above, such consumer shall be liable to pay a penalty to the distribution licensee at the rate and in the manner as may be approved by the Commission from time to time. The penalty shall be without prejudice to the right of the distribution licensee to take other punitive action as may be approved by the Commission.

24.8 In case the voltage harmonics in the distribution system exceeds the limits specified in regulation 24.6.1 above, the distribution licensee shall be liable to compensate the affected consumers of the feeder(s), after the stipulated date, at the rate and in the manner as may be approved by the Commission from time to time.

Sd/-

Secretary to the Commission

Punjab State Transmission Corporation Ltd.



Detailed Procedure

For

Grant of Connectivity in Intra-State Transmission System

PROCEDURE FOR GRANT OF CONNECTIVITY IN INTRA STATE TRANSMISSION SYSTEM

1. OUTLINE

1.1. This Procedure is in accordance with the various provisions of the Punjab State Electricity Regulatory Commission (Terms and Conditions for Intra-State Open Access Regulations), 2011, as amended from time to time (hereinafter referred to as "Open Access Regulations" or "the Regulations"). In case of any contradiction of this procedure with provisions of the Regulations, provisions of the Regulations shall prevail.

1.2. This Procedure shall apply to the Applications made for Grant of Connectivity to the transmission lines or associated facilities with such lines on the Intra-State Transmission System (hereinafter referred to as "InSTS"), received by the State Transmission Utility (STU) i.e. Punjab State Transmission Corporation Ltd (hereinafter referred to as "PSTCL"). This procedure shall come into effect from the date it is approved by the Hon'ble Punjab State Electricity Regulatory Commission (hereinafter referred to as "PSERC" or "the Commission").

1.3. Application for grant of connectivity to InSTS can be made by

1.3.1. A generating station (including RE/ NRSE generators), who wants to inject power in the Intra-State Transmission System (InSTS) for Sale to 3rd party/ wheeling for captive use under open access.

1.3.2. A consumer/ user who intends to avail supply from the Intra-State Transmission System (InSTS) under open access.

1.3.3 The Open Access customer (Generator/ Consumer) mentioned at Sr.No. 1.3.1/ 1.3.2 above shall be eligible for connectivity at the voltage level specified in the PSERC (Electricity Supply Code and Related Matters) Regulations, 2014, as amended from time to time (hereinafter referred at as "Supply Code").

Note: Generators selling power to the distribution licensee, In-Situ Captive generators and consumers of distribution licensee shall approach distribution licensee i.e. Punjab State Power Corporation Limited (hereinafter referred to as "PSPCL") for obtaining connectivity in line with the existing/ prevailing procedure stipulated in Electricity Supply Instructions Manual (ESIM) of PSPCL. The Applications for Connectivity made prior to the approval of this procedure shall also be processed as per the aforesaid prevailing procedure stipulated in ESIM.

1.4. The generators and users, already connected to the InSTS before approval of this procedure, shall not be required to make fresh application for connectivity for the same capacity and they shall be deemed to have already been granted connectivity(ies).

- 1.5 In case of multiple injection/ drawl locations, separate applications for grant of connectivity shall be made by applicant for each location.
- 1.6. The nodal agency for grant of "Connectivity, Long-Term Access and Medium-Term Open Access to the Punjab State Transmission System" shall be the STU i.e. PSTCL.
- 1.7. Applicant granted "Connectivity" with the grid at the point specified by STU shall have to approach STU at least more than 2 years prior to physical interconnection for obtaining Connection Offer. Further, applicant will have to sign "Connection Agreement" with STU prior to the physical inter-connection. After signing of the Agreement, Nodal Agency will provide a copy of the same to SLDC. In case the connectivity is granted to the Transmission system of a transmission licensee other than the STU, a tripartite agreement shall be signed between the applicant, the State Transmission Utility and such transmission licensee, in line with the provisions of Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007.
- 1.8 The Scheduling Jurisdiction of all State Utilities and State entities will remain with the State Load Dispatch Centre (SLDC). SLDC shall be responsible real time monitoring, issuance of switching instructions, energy accounting and management of Deviation Pool A/c etc. for such State utilities/State entities.
- 1.9 The applicant shall have to comply with the provisions of Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007, PSERC (Punjab State Grid Code) Regulations, 2013, (hereinafter referred to as "State Grid Code" or "SGC") and PSERC (Terms and Conditions for Intra-State Open Access Regulations), 2011, as amended from time to time (hereinafter referred to as "Open Access Regulations" or "the Regulations").
- 1.10 Applicant shall not have dual connectivity of Intra-State Transmission System (InSTS) and Inter-State Transmission System (hereinafter referred to as "ISTS").
- 1.11 The procedures along with requisite formats as described herein, shall be available on PSTCL and SLDC web site "www.pstcl.org" and "www.punjabsldc.org" respectively.

2 SUBMISSION OF APPLICATION

- 2.1. An Application for Grant of Connectivity to InSTS should be submitted in a sealed envelope with "Application for Grant of Connectivity" clearly marked on the envelope. The application shall be addressed to

Superintending Engineer/ Open Access,
Punjab State Transmission Corporation Limited
SLDC Building, 220 kV Sub-Station,
Ablowal, Patiala – 147001.
(E-Mail: se-opac@pstcl.org)

2.2. Application Format:-

An Application for Grant of Connectivity to InSTS shall be made as per the application format for connectivity and shall contain details such as geographical location of the generation project, unit-wise commissioning schedule, quantum of power to be interchanged (that is the quantum of power to be injected in the case of a generating station including a captive generating plant and quantum of power to be drawn in the case of consumer) with the Intra-State Transmission System [**FORMAT- 1** : "Application for Grant of Connectivity"].

2.3. Application Fee:-

2.3.1 Application shall be accompanied by a non-refundable fee as specified in the Regulations i.e. Rs. 2.00 Lakhs (excluding applicable taxes, if any).

2.3.2 Application fees is to be directly credited to PSTCL Account electronically through RTGS/ NEFT or through Demand Draft as per details given below:

- a) Payee : Accounts Officer/ ARR, PSTCL, Patiala
- b) Name of Bank : State Bank of India
- c) Branch : Mall Road, Patiala
- d) IFSC : SBIN0050012
- e) A/c No. : 65083682573

Provided that proof of payment directly credited to above PSTCL account must be attached with the application.

Any change in these account details or procedures shall be uploaded on PSTCL website.

2.4. Information required with the application:-

2.4.1 In line with Section 4.3 (i) of State Grid Code, Any applicant seeking to establish new or modified arrangements for connection to and/or use of the transmission system shall submit the following report, data and undertaking along with the application and processing fee to the STU (PSTCL):-

- (a) report stating purpose of proposed connection and/or modification, connection site, transmission licensee to whose system connection is proposed, description of apparatus to be connected or modification to apparatus already connected and beneficiaries of the proposed connection;
- (b) construction schedule and target completion date;

- (c) an undertaking that the user shall abide by the provisions of SGC, IEGC, Indian Electricity Rules and various standards including Grid Connectivity Standards made by the Authority pursuant to the Act for installation and operation of the apparatus;
- (d) For special loads like arc furnaces, rolling mills etc., Real and Reactive Power values of the load with time and harmonic level.

2.4.2 The generating stations, applying for connectivity to InSTS, shall also submit the following information in addition to information under Sr.No. 2.4.1 above:-

- (a) The RE/ NRSE generators, while submitting the application for connectivity shall submit the copy of registration certificate/ clearance from PEDDA along with a report confirming the captive status of RE/ NRSE generators at the time of registration of the project with PEDDA. The copy of report shall also be supplied to PSPCL for ascertaining captive status by PSPCL.
- (b) In order to assess preparedness of applicant making application for the connectivity to the InSTS, the generator shall be required to submit along with its application, documents in support of having initiated specific actions for project preparatory activities in respect of matters mentioned in (i) to (vi) below.
 - i) **Site identification and land acquisition:** The applicant shall inform land required for the generation project along with extent to which the same have been acquired and taken possession of. The "Requirement" of land would be considered as indicated in the proposal filed with the competent authority for seeking environmental clearances. In case of land to be acquired under the **Land Acquisition Act 1894, the applicant shall submit copy of notification issued for such land under Section - 4 of the Land Acquisition Act 1894.** In all other cases, the applicant shall furnish documentary evidence in the form of certificate by concerned and competent revenue / registration authority for the acquisition / ownership / vesting of the land.
 - ii) **Environmental clearance for the power station:** The applicant shall have to inform status on submission of requisite proposal, for the environmental clearance, to the concerned administrative authority (first level submission).
 - iii) **Forest Clearance (if applicable) of the land for the power station:** The applicant shall have to inform status on submission of requisite proposal, for the forest clearance, to the concerned administrative authority (first level submission).
 - iv) **Fuel Arrangements:** Details on fuel arrangements shall have to be informed for the quantity of fuel required to generate power from the power station for the total installed capacity intended for connectivity.

- v) **Water linkage:** The applicant shall inform the status of approval from the concerned irrigation department or any other relevant authority for the quantity of water required for the power station.
- vi) The status of order placed for plant and machinery or EPS contract awarded.
- vii) Details of dedicated transmission line associated with the generating station.
- viii) Useful life of generating station:
- ix) Commissioning schedule:
 - (a) Original date of commercial operation;
 - (b) Revised date of commercial operation, if any.
- x) Commercial arrangement(s) made by the applicant:
Details of agreement(s) for purchase of electricity for start up power or backup power from any other source including distribution licensee.
- xi) Information specific to captive generating plant:
 - (1) Scheme of captive generating plant –
 - (a) Entity which owns, operates and maintains the plant;
 - (b) Generating unit(s) identified for captive use;
 - (c) Generating unit(s) not identified for captive use.
 - (2) Scheme of captive use/details of captive user(s) –
 - (a) Details of captive user(s) of the plant;
 - (b) Share holding of each captive user(s) in equity, if any;
 - (c) Percentage share of consumption assigned to each captive user(s) in the aggregated electricity generated;
 - (d) Quantum of power to be transferred to each captive user(s) and the point(s) of drawl, intra-State or transmission system of any other state or inter-State;
 - (e) Details of existing or proposed connectivity of each captive user(s) to InSTS or transmission system of any other state or Inter-STS (i.e. capacity (MW), voltage level (kV), name of 400/220/132 substation and name of licensee where such captive user(s) is embedded) or the point of state periphery at which power shall be delivered if captive user(s) is located outside the State.
- xii) Information specific to plant generating Non-firm Power:
 - (a) Details of pooling station;
 - (b) Entity which owns, operates and maintains the pooling station;
 - (c) Geographical location of pooling station (nearest village/town, district, State, latitude and longitude);
 - (d) Useful life of pooling station.
- xiii) Other clearances:

The Applicant shall also provide the necessary any other approval(s)/ permission(s)/ no objection certificate(s) required from any competent authorities (concerned Deptt./local authorities, as applicable) under the law e.g.

- Forest clearance form Forest Deptt.
- TEC clearances from Energy Directorate
- CEA clearance
- NOC from local authorities /Panchyat/IPH/B&R Deptt.
- Govt. Clearance for muck disposal
- Aviation clearance
- Others , if any as applicable or as decided by the STU

xiv) Any other relevant information required by STU or to be provided by the applicant.

2.4.3 The Open Access Consumer (Non-Captive), applying for connectivity to InSTS, shall also submit the following information in addition to information under Sr.No. 2.4.1:-

- (i) Details of industrial or commercial establishment.
- (ii) Extent of use of transmission system:
 - (a) Existing demand;
 - (b) Additional demand;
 - (c) Total demand to be met through transmission system;
 - (d) Expected growth in demand in subsequent five years.
- (iii) Details of standby supply from distribution licensee:
 - (a) Contracted load;
 - (b) Date of contract.
- (iv) Commercial arrangement(s):
 - (a) Details of agreement(s) for purchase of electricity from any source other than distribution licensee;
 - (b) Details of such source of power connected with InSTS or ISTS and the point of state periphery at which power shall be delivered if the source is located outside the State.
- (v) Any other relevant information required by STU or to be provided by the applicant.

2.4.4 The Captive User, applying for connectivity to InSTS, shall also submit the following information in addition to information under Sr.No. 2.4.1:-

- (i) Details of industrial establishment.
- (ii) Extent of use of transmission system by the applicant:
 - (a) Existing demand;

- (b) Additional demand;
 - (c) Total demand to be met through transmission system; (d) Expected growth in demand in subsequent five years.
- (iii) Details of back up supply from distribution licensee:
- (a) Contracted load;
 - (b) Date of contract.
- (iv) Commercial arrangement(s) made by the applicant:
Details of agreement(s) for purchase of electricity from any source other than distribution licensee.
- (v) Scheme of captive generation and supply to captive user(s):
- (1) Scheme of captive generating plant and inclusion of its requirement in transmission planning of STU –
 - (a) Name of captive generating plant;
 - (b) Entity which owns, operates and maintains the plant;
 - (c) Geographical location of captive generating plant (i.e. nearest village/town, district, state, latitude and longitude);
 - (d) Details of captive generating plant including type of prime mover (fuel base), generation voltage (kV) and step-up voltage (kV);
 - (e) Generating unit(s) identified for captive use;
 - (f) Generating unit(s) not identified for captive use;
 - (g) Details of dedicated transmission line;
 - (h) Details of existing or proposed connectivity of captive generating plant to InSTS or transmission system of any other state or ISTS (i.e. capacity (MW), voltage level (kV), name of 400/220/ 132 sub-station and name of licensee where such captive plant is embedded) or the point of state periphery at which power shall be delivered if the plant is located outside the State.
 - (2) Scheme of captive use and information in respect to captive user(s) –
 - (a) Details of captive user(s);
 - (b) Share holding of each captive user(s) (including the applicant) in equity;
 - (c) Percentage share in consumption assigned to each captive user(s) (including the applicant) in the aggregated electricity generated in the plant;
 - (d) Maximum quantum (MW) of power to be transferred to each captive user(s) (including the applicant) and the details of

point(s) of drawl (Intra-State or transmission system of any other state or Inter-State) and injection;

- (e) Details of existing or proposed connectivity of each captive user(s) to InSTS or transmission system of any other state or ISTS (i.e. capacity (MW), voltage level (kV), name of 400/220/132 sub-station and name of licensee where such captive user(s) is embedded) or the point of state periphery at which power shall be delivered if captive user(s) is located outside the State.

- (vi) Any other relevant information required by STU or to be provided by the applicant.

2.4.6 Beside above, the applicant shall submit following documents:-

- Copy of Registrar of Companies (ROC) letter/ Memorandum & Articles of Association certifying name & address of the applicant.
- Copy of Board Resolution/ Power of Attorney of the applicant certifying Name & Signatures of the Authorized Signatory, duly certified by Company Secretary/ CA.

2.5 The above evidences (at Sr.No. 2.4) shall be supported by a sworn in affidavit by the applicant as per the format given at **FORMAT-2** : "Undertaking".

2.6 All applications received during the month shall be treated to have been made concurrently.

2.7. An incomplete Application, and/or an Application not found to be in conformity with these Procedures and Regulations, shall be rejected.

3. CHANGES TO THE APPLICATION ALREADY MADE

3.1. Any material change in the location of the applicant (generation project/drawl point) or change by more than 10% quantum of power to be interchanged with the Intra-State transmission system shall require filing of fresh application by the applicant alongwith applicable fees and the already filed application shall be considered disposed and application fee shall be forfeited.

3.2. If any applicant has already been granted connectivity and subsequently applies afresh with material changes as provided above in para – 3.1, then the already granted connectivity shall stand cancelled.

4. GRANT OF CONNECTIVITY

4.1. On receipt of application, PSTCL shall scrutinize the application and intimate the

deficiencies in the application, if any, to the applicant. The application shall be considered incomplete until the deficiencies are rectified by the applicant. Rectification shall not include submission of any new material facts in addition to already submitted documents.

- 4.2. A "Transmission Feasibility Committee" shall be constituted by PSTCL for processing the application and carry out the necessary inter-connection/ feasibility study as specified in the Central Electricity (Technical Standards for Connectivity to the Grid) Regulations, 2007 and State Grid Code, in consultation and through coordination with other agencies involved in State Transmission System to be used. The "Feasibility Committee" shall consist of following members:-
- Chief Engineer/ P&M, PSTCL
 - Chief Engineer/ TS, PSTCL
 - Concerned Superintending Engineer/ P&M, PSTCL, in whose area the applicant (generator/ consumer) is embedded
 - Superintending Engineer/ Planning, PSTCL – Convener
- 4.3. The application, complete in all aspects along with supporting data, shall be forwarded by the office of SE/ Open Access, PSTCL to SE/ Planning, PSTCL, for putting the same before transmission feasibility committee.
- 4.4. The Transmission Feasibility Committee shall process the application after carrying out the necessary interconnection/ feasibility study as specified in the Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 and State Grid Code, and considering comments received from other agencies involved in the intra-State transmission including State Load Despatch Centre. The Committee shall:
- (a) Accept the application with such modification or such conditions as may be specified by it;
 - (b) Reject the application for reasons to be recorded in writing
 - If such application is not in accordance with the provisions of the Regulations/ Procedures,
 - If such proposed connection is likely to cause breach of any provision of STU's Licence or any provision of the State Grid Code or any provision of IEGC or any criteria or covenants or deeds or regulations by which STU is bound
 - If the applicant does not undertake to be bound, in so far as applicable, by the terms of the Regulations/ State Grid Code
 - If the applicant fails to give confirmation and undertakings according to this procedure
 - If grant of connectivity is not technically feasible.
- 4.5 The outcome of processing of application for grant of connectivity shall be communicated by SE/ Planning, PSTCL to the applicant through the office of SE/ Open Access, PSTCL as per **FORMAT-3**, within 60 days from the receipt of

application from the applicant. The Connectivity letter issued by the STU shall be valid for a period of one year from the date of issue.

Provided that STU shall forward a copy of the offer to the appropriate intra-State transmission licensee in case connectivity is granted to the intra-State transmission system of an intra-State transmission licensee other than the State Transmission Utility.

- 4.6. While granting connectivity, the STU shall specify the name of the sub-station or pooling station or switchyard where connectivity is to be granted. In case connectivity is to be granted by looping-in and looping-out of an existing or proposed line, the STU shall specify the point of connection and name of the line at which connectivity is to be granted. The STU shall indicate the broad design features of the dedicated transmission line and the timeframe for completion of the dedicated transmission line.
- 4.7. Applicant granted "Connectivity" with the grid at the point specified by PSTCL shall have to apply for "Connection Offer" to PSTCL by furnishing additional details (including detailed planning data as per State Grid Code) as per format given at **FORMAT-4**. Such application for Connection Offer shall be made at least more than 2 (two) years prior to physical interconnection. Here it may be mentioned that it is advisable that the applicants to apply above connection offer as early as possible for enabling them having lead time for any type of access.
- 4.8. The additional details (including detailed planning data) submitted by the applicant for grant of "Connection Offer" shall be sent by SE/ Open Access, PSTCL to the SE/ Planning, PSTCL for scrutinizing the same. After processing the Connection Offer application, the Connection Offer shall be intimated by SE/ Planning, PSTCL to the applicant through the office of SE/ Open Access, PSTCL, as per the format given at **FORMAT-5** which clearly indicates the responsibility, requirements for establishing physical interconnection. Pursuant to the Connection Offer, the applicant shall have to sign "Connection Agreement" with STU (PSTCL) prior to the physical interconnection, within 30 days from the receipt of Connection Offer, as per format given at **FORMAT-6**.
- 4.9 In case the connectivity is granted to the transmission system of a transmission licensee other than STU, a tripartite agreement shall be signed between the applicant, the State Transmission Utility and such transmission licensee, in line with the provisions of Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007. After signing of the Agreement, Nodal Agency will provide a copy of the same to SLDC.

5. INTERCHANGE OF POWER WITH THE InSTS

- 5.1. The grant of connectivity shall not entitle an applicant to interchange any power with the grid unless it obtains Long Term Access (LTA), Medium Term Open Access

(MTOA) or Short Term Open Access (STOA).

- 5.2. The Applicant shall ensure that its unscheduled interchange/ deviation with the grid is only limited to inadvertent changes only and does not cause any transmission constraint. In case of repeated instances of unscheduled interchange/ deviation with grid leading to transmission constraints or grid violations and continued violation of instruction of SLDC to reduce such interchange, the SLDC may report such matter to the commission (PSERC).
- 5.3. However, generating station, including captive generating plant, which has been granted connectivity to the grid shall be allowed to undertake testing including full load testing by injecting its infirm power into the grid before being put into commercial operation, even before availing any type of open access, after obtaining permission of the SLDC, which shall keep grid security in view while granting such permission. Such infirm power injected into the grid by a generating station or a unit thereof, other than those based on non-conventional energy sources, the tariff of which is determined by the Commission, shall be charged at the rates for imbalance/ deviation determined by the Commission.

The power injected into the grid from other generating stations as a result of this testing shall also be charged at imbalance/ deviation rates.

- 5.4. The Generating Station including Captive Generating Station will submit likely date of synchronization, likely quantum and period of injection of infirm power to the SLDC at least one month in advance.

6. CONSTRUCTION OF DEDICATED TRANSMISSION SYSTEM

- 6.1. Unless exempted by the Commission for reasons to be recorded in writing, an applicant may be required by PSTCL to construct a dedicated system to the point of connection to enable connectivity to the grid. The cost of such line and bay shall be borne by the applicant, and the same shall be owned, operated and maintained by the STU (PSTCL). The prevailing O&M charges as approved by the Commission shall be charged for the dedicated transmission lines and associated Bays and equipments. The amount shall be paid by the applicant in advance to the STU for the term of Long Term Agreement. In case augmentation of substation or transmission line feeding the substation is required, the applicant shall also bear the cost of such line and bay, breaker in the substation and equipment for interconnection of real time data to SLDC.

7. GENERAL

- 7.1. The applicant shall keep the nodal agency indemnified at all times and shall

undertake to indemnify, defend and keep the nodal agency, harmless from any and all damages, losses, claims and actions including those relating to injury to or death of any person or damage to property, demands, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting from such grant of connectivity.

- 7.2. All costs/expenses/charges associated with the application, including bank draft, bank guarantee etc. shall be borne by the applicant.
- 7.3. The applicant shall abide by the provisions of the Electricity Act, 2003, Indian Electricity Grid Code and PSERC Regulations, as amended from time to time.
- 7.4. This procedure aims at easy and pragmatic disposal of applications made for Connectivity to InSTS. However, some teething problems may still be experienced. In order to resolve the same, this procedure may be reviewed or revised by the Nodal agency with prior approval of PSERC.
- 7.5. All complaints regarding unfair practices, delays, discrimination, lack of information, supply of wrong information or any other matter related to grant of connectivity to InSTS shall be directed to PSERC for redressal.

FORMAT- 1

(APPLICABLE IN CASE OF GRANT OF CONNECTIVITY TO GENERATING STATION)

APPLICATION FOR GRANT OF CONNECTIVITY (to be submitted by the applicant to STU)

Application no. and date	< self generated by the applicant >
--------------------------	-------------------------------------

A. Details of the applicant

1	Name of the applicant	< name of generating company >			
2	Address of registered office (if any)				
3	Address for correspondence				
4	Contact detail(s)				
	(a) Prime contact person				
	Designation				
	Phone no. (with STD code)	Landline		Fax	
	Mobile				
	E-mail				
	(b) Alternate contact person				
	Designation				
	Phone no. (with STD code)	Landline		Fax	
	Mobile				
	E-mail				
5	Status of the applicant	< generator (other than captive)/captive generator >			

B. Details of connectivity requirement

1	Connectivity sought				
	Capacity (MW) for which connectivity is required				
	Voltage Level (kV) at which connectivity is required				
	Date from which connectivity is required				

Procedure for Grant of Connectivity in Intra State Transmission System

2	Nearest 400/220/132 kV sub-station(s)	
	(a) Sub-station-1	
	Name of sub-station	
	Voltage level(s) available (kV)	
	Name of licensee (Owner)	
	Distance (Km)	
	(b) Sub-station-2	
	Name of sub-station	
	Voltage level(s) available (kV)	
	Name of licensee (Owner)	
	Distance (Km)	

C. Details of existing connectivity

1	Existing connectivity, if any	
	Date of connectivity	
	Capacity (MW)	
	Name of 400/220/132 sub-station	
	Voltage level (kV)	
	Name of licensee (Owner)	
	Distance (Km)	

D. Details of project (for which connectivity is sought)
(enclose duly signed supporting documents as considered appropriate)

1	Name of generating station	
2	Whether new or existing generating station	
3	Entity which owns, operates and maintains	
4	Is it an identified project of CEA	< yes/no >
5	Geographical location of generating station	
	Nearest village/town	
	District	
	State	
	Latitude	
	Longitude	
6	Existing unit(s) (if any)	
	Details of units	< unit-wise breakup of installed capacity (MW) >
	Details of re-rated units	< unit-wise breakup of re-rated capacity (MW) >

Procedure for Grant of Connectivity in Intra State Transmission System

7	Additional unit(s)	
	Details of units	< unit-wise breakup of installed capacity (MW) >
	Original date of commercial operation	< unit-wise breakup >
	Revise date of commercial operation, if any	< unit-wise breakup >
8	Type of prime mover (fuel base)	< hydro turbine/steam turbine(coal/lignite/multifuel)/gas turbine/diesel engine/wind turbine/specify, if any other>
9	Generation voltage (kV)	
10	Step-up voltage (kV)	
11	Existing dedicated transmission line (if any)	
	Single circuit or double circuit	
	Voltage level (kV)	
	Length (km)	
	Conductor	
12	Information specific to captive generating plant	
	Generating unit(s) identified for captive use	
	Generating unit(s) not identified for captive use	
13	Information specific to plant generating infirm power	
	Name of pooling station, if any	
	Whether new or existing pooling station	
	Voltage level(s) available (kV)	

E. Status of project related activities

(enclose duly signed supporting documents as per clause 3.1 of procedure)

1. Site identification and land acquisition
2. Environmental clearance
3. Forest clearance
4. Fuel arrangements
5. Water linkage
6. Order for supply of plant and machinery or award of EPS contract
7. Dedicated transmission line
8. Useful life of generating station
9. Commissioning schedule
10. Commercial arrangement(s) for purchase of electricity
11. Information specific to captive generating plant
12. Information specific to plant generating non-firm power
13. Other clearances
14. Any other relevant information required by STU or to be provided by the applicant

In addition to above, the applicant shall also submit concise description of each completed activities with regard to project planning, designing and pre-construction activities (including all licenses, authorizations, permissions and clearances as required from time to time under the law).

F. Details of application fees

1	Non-refundable application fees				
	Name of Bank & branch	Details of instrument (DD/RTGS/NEFT)			Amount (Rs.)
Type of instrument		Instrument no.	Date		

G. Undertaking(s)

< refer clause 2.4 of procedure >

I undertake that all the activities of project planning, designing and pre-construction activities (including all licenses, authorizations, permissions and clearances as required from time to time under the law) are completed. All the details given in support of specific actions taken for project preparatory activities (as given under "E") above) are true and correct and nothing material has been concealed thereof.

I further undertake that the technical standards for connectivity specified by CEA in Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 have been complied with.

In case of requirement of making an application for grant of long term access

I declare the following conditions:

- (i) existence of an agreement for sale or purchase of electricity/for carrying electricity from captive generating plant to its captive user(s);
- (ii) use of transmission system to its full capacity or in phases (give details), as sought in the application for grant of connectivity; and
- (iii) (give name) shall submit the application for grant of open access in accordance with the regulations specified by the Appropriate Commission and subsequently will sign BPTA/LTA Agreement with STU under clause 12.

Or

In case application for open access not required

I declare the following conditions:

- (i) intention for staying connected or synchronized with the InSTS only;
- (ii) that no exchange of active power intended with the grid except for reactive power exchange chargeable at applicable rates; and
- (iii) application for open access shall not be required under the regulations specified by the Appropriate Commission.

Place:

(Signature)

Date:
Authorized signatory of the applicant
Name:
Designation:
Seal:

Enclosures:

1. Non-refundable application fees (demand draft or payment slip in case of payment through RTGS/NEFT)
2. Documents in support of information (including project related preparatory activities) submitted under clause 2.4 of this procedure read with this format (mention details)
3. Documents in support of existing connectivity with InSTS (including detailed description of 'electricity systems') along with single line diagrams (if existing user of InSTS)
4. If any other

Copy to others as considered necessary:

FORMAT- 1

(APPLICABLE IN CASE OF GRANT OF CONNECTIVITY TO PREMISES OF A CAPTIVE USER OR AN OPEN ACCESS CONSUMER)

APPLICATION FOR GRANT OF CONNECTIVITY (to be submitted by the applicant to STU)

Application no. and date	< self generated by the applicant >
--------------------------	-------------------------------------

A. Details of the applicant

1	Name of the applicant				
2	Address of registered office (if any)				
3	Address for correspondence				
4	Contact detail(s)				
	(a) Prime contact person				
	Designation				
	Phone no. (with STD code)	Landline		Fax	
	Mobile				
	E-mail				
	(b) Alternate contact person				
	Designation				
	Phone no. (with STD code)	Landline		Fax	
	Mobile				
	E-mail				
5	Status of the applicant	< captive user/open access consumer >			

B. Details of connectivity requirement

1	Connectivity sought				
	Capacity (MW) for which connectivity is required				
	Voltage level (kV) at which connectivity is required				
	Date from which connectivity is required				
2	Nearest 400/220/132 kV sub-station(s)				
	(a) Sub-station-1				
	Name of sub-station				
	Voltage level(s) available (kV)				
	Name of licensee (Owner)				
	Distance (Km)				

Procedure for Grant of Connectivity in Intra State Transmission System

	(b) Sub-station-2	
	Name of sub-station	
	Voltage level(s) available (kV)	
	Name of licensee (Owner)	
	Distance (Km)	

C. Details of existing connectivity

1	Existing connectivity, if any	
	Date of connectivity	
	Capacity (MW)	
	Name of 400/220/132 sub-station	
	Voltage level (kV)	
	Name of licensee (Owner)	
	Distance (Km)	

D. Details of project (for which connectivity is sought)

(enclose duly signed supporting documents as considered appropriate)

	In case applicant is a captive user <i>(in case if applicable)</i>	
1	Extent of use of transmission system	
	Existing demand	
	Additional demand	
	Total demand to be met	
2	Expected growth in demand in subsequent five years	< year wise >
3	Maximum quantum (MW) of power assigned from its captive generating plant	
4	Back up supply from distribution licensee	
	Contracted load	
	Date of contract	
5	Commercial arrangement(s) for purchase of electricity from any source other than local discom	
	Name of supplier	
	Contracted load	
	Duration of contract	
6	Geographical location of premises (i.e. industrial establishment)	
	Nearest village/town	
	District	
	Latitude	
	Longitude	

Or

Procedure for Grant of Connectivity in Intra State Transmission System

	In case applicant is an open access consumer <i>(in case if applicable)</i>	
1	Extent of use of transmission system	
	Existing demand	
	Additional demand	
	Total demand to be met	
2	Expected growth in demand in subsequent five years	< year wise >
3	Maximum quantum (MW) of power assigned from its captive generating plant	
4	Back up supply from distribution licensee	
	Contracted load	
	Date of contract	
5	Commercial arrangement(s) for purchase of electricity from any source other than local discom	
	Name of supplier	
	Contracted load	
	Duration of contract	
6	Geographical location of premises (i.e. industrial or commercial establishment)	
	Nearest village/town	
	District	
	Latitude	
	Longitude	

E. Status of project related activities

(enclose duly signed supporting documents as per clause 3.2 of procedure)

1. Site identification and land acquisition
2. Environmental clearance
3. Forest clearance
4. Order for supply of plant and machinery or award of EPS contract
5. Useful life of premises (i.e. commercial or industrial establishment) of captive user or open access consumer
6. Commissioning schedule
7. Other clearances
8. Any other relevant information required by STU or to be provided by the applicant

In addition to above, the applicant shall also submit concise description of each completed activities with regard to project planning, designing and pre-construction activities (including all licenses, authorizations, permissions and clearances as required from time to time under the law).

F. Details of application fees

1	Non-refundable application fees				
	Name of Bank & branch	Details of instrument (DD/RTGS/NEFT)			Amount (Rs.)
		Type of instrument	Instrument no.	Date	

G. Undertaking(s)

< refer clause 2.4 of procedure >

I undertake that all the activities of project planning, designing and pre-construction activities (including all licenses, authorizations, permissions and clearances as required from time to time under the law) are completed. All the details given in support of specific actions taken for project preparatory activities (as given under "E") above) are true and correct and nothing material has been concealed thereof.

I further undertake that the technical standards for connectivity specified by CEA in Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 have been complied with.

In case of requirement of making an application for grant of long term access

I declare the following conditions:

- (i) existence of an agreement for sale or purchase of electricity/for carrying electricity from captive generating plant to its captive user(s);
- (ii) use of transmission system to its full capacity or in phases (give details), as sought in the application for grant of connectivity; and
- (iii) (give name) shall submit the application for grant of open access in accordance with the regulations specified by the Appropriate Commission and subsequently will sign BPTA/LTA agreement with STU under clause 12.

Or

In case application for open access not required

I declare the following conditions:

- (i) intention for staying connected or synchronized with the InSTS only;
- (ii) that no exchange of active power intended with the grid except for reactive power exchange chargeable at applicable rates; and
- (iii) application for open access shall not be required under the regulations specified by the Appropriate Commission.

Place:
(Signature)

Date:
Authorized signatory of the applicant
Name:
Designation:
Seal:

Enclosures:

1. Non-refundable application fees (demand draft or payment slip in case of payment through RTGS/NEFT)
2. Documents in support of information (including project related preparatory activities) submitted under clause 2.4 of this procedure read with this format (mention details)
3. Documents in support of existing connectivity with InSTS (including detailed description of 'electricity systems') along with single line diagrams (if existing user of InSTS)
4. If any other

Copy to others as considered necessary:

FORMAT- 2

On Non Judicial Stamp paper Rs.50

AFFIDAVIT

In the matter of filing application to Punjab State Transmission Corporation Limited, for grant of Connectivity under PSERC (Terms & Conditions for Intra-State Open Access) Regulations, 2011.

I.....(Name).....S/o Shri(Father's name)... working as (Post)..... in(name of the Company).....,having its registered office at (address of the company)....., do solemnly affirm and say as follows:

1. I am the (Post)..... of(Name of the Company)....., the representative in the above matter and am duly authorized by the Board Resolution dated of the above referred Company attached herewith to file the above application and to make this affidavit.
2. I submit that M/s.....(name of the company)..... is a registered company.....(Public Ltd/Pvt. Ltd.)..... registered under Companies Act/..... Under the Article of Association of the Company and in accordance with the provisions of Electricity Act, 2003/ relevant Regulation(s) of PSERC and Procedures notified thereunder, the company can file the enclosed application.
3. I submit that all the details given in the enclosed application for grant of Connectivity alongwith necessary documents are true and correct and nothing material has been concealed thereof.
4. I shall abide by the provisions of Punjab State Grid Code, Indian Electricity Grid Code, Indian Electricity Rules and various standards including Grid Connectivity Standards made by the Central Electricity Authority pursuant to the Act for installation and operation of the apparatus.
5. I also submit that the documents enclosed are original or true copies of their respective originals.

(Signature)
Name of the Applicant
Company Stamp (mandatory)

(To be duly attested by Notary)

(Copy of Board Resolution/ Power of Attorney to be attached)

FORMAT- 3

Intimation for grant of Connectivity/ Connectivity Letter

1 Intimation No.

Date :

2 Ref. Application No.

Date :

3 Name of the Applicant

4 Address for Correspondence

5 Nature of the Applicant

Normal Generator
Captive Generator
Consumer

6 Details for Connectivity

- 6a Capacity (MW) for which connectivity is granted
- 6b Point at which Connectivity is granted
- 6c Date from which connectivity is granted
- 6d Transmission System Required for Connectivity
- 6e Implementing Agency for transmission system required for connectivity
- 6f Agencies between which agreement is to be signed for implementation of transmission system required for connectivity

7 Transmission Charges Applicable for the dedicated line

8 Estimated Amount (in Rupees) to be deposited by the applicant in advance

9 Location of the Generating Station / Consumer

Nearest Village / Town
District
State
Latitude
Longitude

10 Installed Capacity of the Generating Station

Unit-1
Unit-2
Unit-3
Unit-4
Unit-5
Unit-6

11 Commissioning Schedule of the Generating Station

Unit-1
Unit-2
Unit-3
Unit-4
Unit-5
Unit-6

Note :-

1. Applicant given intimation for Connectivity to the grid shall have to furnish additional details to STU (PSTCL) for signing of "Connection Agreement" as per format given at FORMAT- 4. These details are to be furnished to STU at least two years prior to physical interconnection, unless otherwise indicated by STU. The Applicants are, however advised to furnish such details as early as possible for enabling them have lead time for any type of access.
2. The STU will process the above information and will intimate the Connection details as per format given at FORMAT- 5. Pursuant to such Connection details, the applicant shall have to sign "Connection Agreement" with STU prior to the physical interconnection as per format given at FORMAT- 6. In case the connectivity is granted to the InSTS of an intra-State transmission licensee other than the STU, a tripartite agreement shall be signed between the applicant, the STU and such intra-State transmission licensee, in line with the provisions of the Regulations.

This Connectivity Letter shall be valid for a period of one year from the date of issue.

SE/ Planning,
PSTCL, Patiala.

FORMAT- 4

APPLICATION FORM FOR SEEKING CONNECTION TO INTRA-STATE TRANSMISSION SYSTEM

General Information to the Applicants

1. This application form outlines the information that PSTCL requires to process an application for connection to Intra-State Transmission System (InSTS).
3. Based on the information provided through this application, PSTCL shall issue "Connection Offer" to the applicant. The connection offer shall include allocation of "Bay" in the substation where connection has been sought.
4. The "Connection Offer" shall also outline broad technical requirements in line with the applicable CEA Regulations (Technical Guidelines for Connectivity to grid) Regulations 2007, State Grid Code and other best industry practices to ensure safe operation, integrity and reliability in the grid.
5. Pursuant to getting "Connection Offer" the applicant shall be required to sign "Connection Agreement" as per the provisions of CEA Regulations (Technical Guidelines for Connectivity to Grid) Regulations 2007, Grid Code.

**APPLICATION FORM
FOR SEEKING CONNECTION TO INTRA-STATE TRANSMISSION SYSTEM**

A. DETAILS OF APPLICANT

1.	Name of the Applicant Company	:	
2.	Details of Grant of Connectivity (a) Connectivity Intimation No. (b) Date	:	
2.	Address for Correspondence	:	
3.	Contact Person 3.1 Prime Contact Person (a) Name (b) Designation (c) Phone No. (d) FAX (e) E-mail 3.2 Alternate Contact Person (a) Name (b) Designation (c) Phone No. (d) FAX (e) E-mail	:	
4.	Status of Applicant Company (Please tick the appropriate box)	:	<input type="checkbox"/> Generating Station including Captive generating plant <input type="checkbox"/> Consumer
5.	Estimated time of completion of project (Please enclose PERT chart)	:	

B. MAPS AND DIAGRAMS

1. Provide necessary survey of India topo sheet clearly marking the location of the proposed site. **Schedule - I**
2. Provide site plan (both hard and soft copy in AutoCAD 2000 & above version) in appropriate scale. **Schedule – II.** The site plan should indicate following details
 - a. The proposed location of the connection point
 - b. Generators
 - c. Transformer
 - d. Site building
3. Provide an electrical Single Line Diagram (SLD) of the proposed facility detailing all significant items of plant. The plan is to be submitted in both hard copy and soft copy in AutoCAD 2000 & above version **Schedule - III**

C. DETAILS OF CONNECTION - GENERATION PLANT

1.	Type of Generation Plant (Hydro, Thermal, Gas etc	:	
2.	Rating of Generator Units	:	Schedule – IV
3.	Maximum Export Capacity Required	:	
4.	In case of hydro generator, the expected		
4.	Maximum Import Capacity required This is the amount of import capacity that the site will require during startup (MVA)	:	
5.	Station house load during normal operating conditions (MW/MVAR)	:	
6.	Expected running regime e.g. base load, peaking etc	:	
7.	Detailed Planning data for Generation Plant (including Generator Data for Fault / Short Circuit Studies and Dynamic Simulation)		
	(a) For Thermal Generating Stations		Schedule – V
	(b) For Hydro Generating Stations		Schedule – VI
	(c) Other Generating Stations		Schedule – VII

D. DETAILS OF CONNECTION –CONSUMER

1.	Type of Load (Industrial/Commercial) including type of industry, i.e. electric furnace, rolling mills, manufacturing, assembly line, etc.	:	
2.	Peak requirement of load in MVA, MW and MVAR	:	
3.	Peak import required in MVA, MW and MVAR	:	
4.	Month-wise Peak import required in MVA, MW and MVAR	:	
5.	Month-wise Energy requirement in MUs.	:	
6.	Data for Fault (Short Circuit Studies)		Single phase and three phase Fault level

E. DETAILS OF CONNECTION – DATA AND VOICE COMMUNICATION

1.	Type Data Gateway (Remote Terminal Unit/ Substation Automation System Gateway)	:	(Whether RTU/ Substation Automation System Gateway ; and Number of data ports)
2.	Data Communication connectivity Standard followed (As per interface requirement and other guideline made available by the SLDC)	:	(Type of Communication Protocol, i.e. 101(serial port) or 104(Ethernet), etc.)
3.	Write here the communication media, interface and capacity being targeted for connection for Data and voice Communication	:	(Communication media: For example fibre optics, PLCC, etc. Interface : Example RS 232C, G.703) or as per mutual agreement Capacity : Example 1200 baud, 64 Kbps, 9.6 Kbps, etc or as per mutual agreement)

This is to certify that the above data submitted with the application are pertaining to connection sought for the InSTS. Further, any additional data sought for processing the application shall be furnished.

**Authorized Signatory
Of Applicant**

Name :

Designation:

Seal :

Place :

Date :

Schedule – I : Survey of India topo sheet clearly marking the location of the proposed site

Schedule – II : Site plan in appropriate scale.

Schedule – III : Electrical Single Line Diagram (SLD) of the proposed facility detailing all significant items of plant.

Schedule – IV : Rating of Generating Units

(Add additional sheets if number of units are more)

		Unit – 1	Unit - 2	Unit – 3
1.	Unit Rating (MVA)			
2.	Normal Max. Continuous Generation Capacity at Normal operating temperature (MW)			
3	Normal Max. Continuous Export Capacity at Normal operating temperature (MW)			
4	Maximum (Peaking) generating Capacity at min ambient air temperature (MW)			
5	Maximum (Peaking) Export Capacity at min ambient air temperature (MW)			
6	Minimum Continuous Generating Capacity (MW)			
7	Minimum Export Generating Capacity (MW)			
8	Normal Maximum Lagging MVAR at rated MW output			
9.	Normal Maximum leading MVAR at rated MW output			

Please attach a capability Curve (MW & MVAR) : _____

Drawing no. of the Capability
Diagram attachment

Schedule – V : DETAILED PLANNING DATA FOR THERMAL GENERATING STATION

DATA FOR THERMAL POWER STATIONS

1 GENERAL

- i. Name of Power Station.
- ii. Number and capacity of Generating Units (MVA/MW).
- iii. Ratings of all major equipment (Boilers and major accessories, Turbines, Alternators, Generator Unit Transformers etc).
- iv. Single line Diagram of Power Station and switchyard.
- v. Relaying and metering diagram.
- vi. Neutral Grounding of Generating Units.
- vii. Excitation control- (What type is used? e.g. Thyristor, Fast Brushless Exciters)
- viii. Earthing arrangements with earth resistance values.

2 PROTECTION AND METERING

- i Full description including settings for all relays and protection systems installed on the Generating Unit, Generator unit Transformer, Auxiliary Transformer and electrical motor of major equipment listed, but not limited to, under Sec. 3 (General).
- ii Full description including settings for all relays installed on all outgoing feeders from Power Station switchyard, tie circuit breakers, and incoming circuit breakers.
- iii Full description of inter-tripping of circuit breakers at the point or points of Connection with the Transmission System.
- iv Most probable fault clearance time for electrical faults on the User's System (with main and back up protection).
- v Full description of operational and commercial metering schemes.

3 SWITCHYARD

- (i) In relation to interconnecting transformers:
 - Rated MVA.
 - Voltage Ratio.
 - Vector Group.
 - Positive sequence reactance for max., min., normal Tap. (% on MVA).
 - Positive sequence resistance for max., min., normal Tap. (% on MVA).
 - Zero sequence reactance (% on MVA).
 - Tap changer Range (+% to -%) and steps.
 - Type of Tap changer. (off/on load).

Two Winding Transformer Data

1.	Transformer positive sequence resistance (R1%)	
2.	Transformer positive sequence reactance (X1%)	
3.	Transformer zero sequence resistance (R0%)	
4.	Transformer zero sequence reactance (X0%)	
5.	Transformer Vector group	
5.	Nature of Tap Changer (on load/off load)	
6.	Number of steps and step size	

Three Winding Transformer Data

1.	Transformer Vector group	
2.	Positive sequence resistance (R1HL1%) between HV/LV1	
3.	Positive sequence reactance (X1HL1%) between HV/LV1	
4.	zero sequence resistance (R0HL1%) between HV/LV1	
5.	zero sequence reactance (X0HL1%) between HV/LV1	
6.	Positive sequence resistance (R1HL2%) between HV/LV2	
7.	Positive sequence reactance (X1HL2%) between HV/LV2	
8.	Transformer zero sequence resistance (R0HL2%) between HV/LV2	
9.	zero sequence reactance (X0HL2%) between HV/LV2	
10.	Positive sequence resistance (R1L1L2%) between LV1/LV2	
11.	Positive sequence reactance (X1L1L2%) between LV1/LV2	
12.	zero sequence resistance (R0L1L2%) between LV1/LV2	
13.	zero sequence reactance (X0L1L2%) between LV1/LV2	
14.	Positive sequence resistance (R1HL1//L2%) between HV/(LV1+LV2)	
15.	Positive sequence reactance (X1HL1//L2%) between HV/(LV1+LV2)	
16.	zero sequence resistance (R0HL1//L2%) between HV/(LV1+LV2)	
17.	zero sequence reactance (X0HL1//L2%) between HV/(LV1+LV2)	

- (ii) In relation to switchgear including circuit breakers, isolators on all circuits connected to the points of Connection:
- Rated voltage (kV).
 - Type of circuit breaker (MOCB/ABCB/SF6).
 - Rated short circuit breaking current (kA) 3 phase.
 - Rated short circuit breaking current (kA) 1 phase.
 - Rated short circuit making current (kA) 3 phase.
 - Rated short circuit making current (kA) 1-phase.
 - Provisions of auto reclosing with details.
- (iii) In relation to the Lightning Arresters -number and location(line / transformer)-
Technical data

- (iv) In relation to the Communication - Details of communication equipment installed at points of connections.
- (v) In relation to the Basic Insulation Level (kV) -
 - Bus bar.
 - Switchgear.
 - Transformer bushings.
 - Transformer windings.

4 Parameters of Generating Units

- (i) Rated terminal voltage (kV).
- (ii) Rated MVA.
- (iii) Rated MW.
- (iv) Speed (rpm) or number of poles.
- (v) Inertia constant H (MW Sec./MVA).
- (vi) Short circuit ratio.
- (vii) Synchronous Reactance (% on MVA) X_s .
- (viii) Direct Axis Positive Phase Sequence Synchronous Reactance (% on MVA) X_d .
- (ix) Direct axis (saturated) transient reactance (% on MVA) X_d' .
- (i) Direct axis (saturated) sub-transient reactance (% on MVA) X_d'' .
- (ii) Direct Axis Transient Reactance (Unsaturated) (% on MVA) X_{d1}'
- (iii) Direct Axis Sub-transient Reactance (Unsaturated) (% on MVA) X_{d1}''
- (iv) Quadrature axis Positive Phase Sequence synchronous reactance (% on MVA) X_q .
- (v) Quadrature axis (saturated) transient reactance (% on MVA) X_q' .
- (vi) Quadrature axis (saturated) sub-transient reactance (% on MVA) X_q'' .
- (vii) Quadrature Axis Transient Reactance (Unsaturated) (% on MVA) X_{q1}'
- (viii) Quadrature Axis Sub-transient Reactance (Unsaturated) (% on MVA) X_{q1}''
- (ix) Zero Phase Sequence Reactance (% on MVA) X_0
- (x) Negative Phase Sequence Reactance (% on MVA) X_2
- (xi) Direct axis transient open circuit time constant (sec) $T'd_0$.
- (xii) Direct axis sub-transient open circuit time constant (sec) $T''d_0$.
- (xiii) Quadrature axis transient open circuit time constant (sec) $T''q_0$.
- (xiv) Quadrature axis sub-transient open circuit time constant (sec) $T'''q_0$.
- (xv) Stator Resistance (Ohm) R_a .
- (xvi) Neutral grounding details.
- (xvii) Stator leakage reactance (Ohm) X_1 .
- (xviii) Stator time constant (sec).
- (xix) Rated Field current (A).
- (xx) Open Circuit saturation characteristic for various terminal Voltages giving the compounding current to achieve the same.
- (xxi) Please provide open circuit magnetization curve.
*If this is not available then please mention "assume" and PSTCL shall assume magnetic saturation characteristics as per the **Annexure-I***

5 Parameters of excitation control system:

- (i) Type of Excitation.
- (ii) Maximum Field Voltage.
- (iii) Minimum Field Voltage.
- (iv) Rated Field Voltage.
- (v) Details of excitation loop in block diagrams showing transfer functions of individual elements using I.E.E.E. symbols.

- (vi) Dynamic characteristics of over - excitation limiter.
- (vii) Dynamic characteristics of under - excitation limiter.
- (viii) Please submit Laplace domain control block diagram that represents the generator excitation system in accordance with the IEEE standard excitation model or as otherwise agreed with PSTCL. This control block diagram should completely specify all the time constants and gains to fully explain the transfer function from the compensator or generator terminal voltage and field current to generator voltage. A list of acceptable IEEE standard excitation model available with PSS/E simulation package used by PSTCL is shown in **Annexure-II**.

Please fill/tick the appropriate box below:

Please assume

OR

If the excitation data is not available at this stage then PSTCL shall assume exciter model given at **Annexure-III** which represents a typical excitation model.

Assume the model given at **Annexure-III** as our model

6 Parameters of governor:

- (i) Governor average gain (MW/Hz).
- (ii) Speeder motor setting range.
- (iii) Time constant of steam or fuel Governor valve.
- (iv) Governor valve opening limits.
- (v) Governor valve rate limits.
- (vi) Time constant of Turbine.
- (vii) Governor block diagram showing transfer functions of individual elements using I.E.E.E. symbols.

7 Operational parameters:

- (i) Minimum notice required to synchronize a Generating Unit from de-synchronization.
- (ii) Minimum time between synchronizing different Generating Units in a Power Station.
- (iii) The minimum block load requirements on synchronizing.
- (iv) Time required for synchronizing a Generating Unit for the following conditions:
 - Hot
 - Warm
 - Cold
- (v) Maximum Generating Unit loading rating for the following conditions:
 - Hot
 - Warm
 - Cold
- (vi) Minimum load without oil support (MW).

8 GENERAL STATUS

- (i) Detailed Project report.
- (ii) Status Report
 - Land
 - Coal
 - Water
 - Environmental clearance
 - Rehabilitation of displaced persons
- (iii) Techno-economic approval by Central Electricity Authority (CEA)
- (iv) Approval of State Government/Government of India.
- (v) Financial Tie-up.

9 CONNECTION

- (i) Reports of Studies for parallel operation with the State Transmission System.
- (ii) Short Circuit studies
- (iii) Stability Studies.
- (iv) Load Flow Studies.
- (v) Proposed Connection with the State Transmission System.
 - Voltage
 - No. of circuits
 - Point of Connection.

Schedule – VI : DETAILED PLANNING DATA FOR HYDRO GENERATING STATION

DATA FOR HYDRO ELECTRIC POWER STATIONS

1 GENERAL

- (i) Name of Power Station.
- (ii) No. and capacity of units. (MW/MVA)
- (iii) Ratings of all major equipment.
 - a. Turbines (HP)
 - b. Generators (MVA)
 - c. Generator Transformers (MVA)
 - d. Auxiliary Transformers (MVA)
- (iv) Single line diagram of Power Station and switchyard.
- (v) Relaying and metering diagram.
- (vi) Neutral grounding of Generator.
- (vii) Excitation control.
- (viii) Earthing arrangements with earth resistance values.
- (ix) Reservoir Data.
 - a. Salient features
 - b. Type of Reservoir
 - Multipurpose
 - For Power
 - c. Operating Table with
 - Area capacity curves and
 - Unit capability at different net heads

2 PROTECTION

- (i) Full description including settings for all relays and protection systems installed on the Generating Unit, Generator transformer, auxiliary transformer and electrical motor of major equipment included, but not limited to those listed, under Sec. 3 (General).
- (ii) Full description including settings for all relays installed on all outgoing feeders from Power Station switchyard, tiebreakers, and incoming breakers.
- (iii) Full description of inter-tripping of breakers at the point or points of Connection with the Transmission System.
- (iv) Most Probable fault clearance time for electrical faults on the User's System.

3 SWITCHYARD

- (i) Interconnecting transformers:
 - Rated MVA
 - Voltage Ratio
 - Vector Group
 - Positive sequence reactance for max., min. and normal Tap.(% on MVA).
 - Positive sequence resistance for max., min. and normal Tap.(% on MVA).
 - Zero sequence reactance (% on MVA)
 - Tap changer range (+% to -%) and steps.
 - Type of Tap changer (off/on load).
 - Neutral grounding details.

Two Winding Transformer Data

1.	Transformer positive sequence resistance (R1%)	
2.	Transformer positive sequence reactance (X1%)	
3.	Transformer zero sequence resistance (R0%)	
4.	Transformer zero sequence reactance (X0%)	
5.	Transformer Vector group	
5.	Nature of Tap Changer (on load/off load)	
6.	Number of steps and step size	

Three Winding Transformer Data

1.	Transformer Vector group	
2.	Positive sequence resistance (R1HL1%) between HV/LV1	
3.	Positive sequence reactance (X1HL1%) between HV/LV1	
4.	zero sequence resistance (R0HL1%) between HV/LV1	
5.	zero sequence reactance (X0HL1%) between HV/LV1	
6.	Positive sequence resistance (R1HL2%) between HV/LV2	
7.	Positive sequence reactance (X1HL2%) between HV/LV2	
8.	Transformer zero sequence resistance (R0HL2%) between HV/LV2	
9.	zero sequence reactance (X0HL2%) between HV/LV2	
10.	Positive sequence resistance (R1L1L2%) between LV1/LV2	
11.	Positive sequence reactance (X1L1L2%) between LV1/LV2	
12.	zero sequence resistance (R0L1L2%) between LV1/LV2	
13.	zero sequence reactance (X0L1L2%) between LV1/LV2	
14.	Positive sequence resistance (R1HL1//L2%) between HV/(LV1+LV2)	
15.	Positive sequence reactance (X1HL1//L2%) between HV/(LV1+LV2)	
16.	zero sequence resistance (R0HL1//L2%) between HV/(LV1+LV2)	
17.	zero sequence reactance (X0HL1//L2%) between HV/(LV1+LV2)	

(ii) Switchgear (including circuit breakers, Isolators on all circuits connected to the points of Connection).

- Rated voltage (kV).
- Type of Breaker (MOCB/ABCB/SF6).
- Rated short circuit breaking current (kA) 3 phase.
- Rated short circuit breaking current (kA) 1 phase.
- Rated short circuit making current (kA) 3 phase.
- Rated short circuit making current (kA) 1 phase.
- Provisions of auto reclosing with details.

(iii) Lightning Arresters-number and location(line / transformer)-Technical data

(iv) Communications

Details of Communications equipment installed at points of connections.

(v) Basic Insulation Level (kV)

- Bus bar.
- Switchgear.
- Transformer Bushings
- Transformer windings

4 GENERATING UNITS

(i) Parameters of Generator

- Rated terminal voltage (kV).
- Rated MVA.
- Rated MW
- Speed (rpm) or number of poles.
- Inertia constant H (MW sec./MVA).
- Short circuit ratio.
- Synchronous Reactance (% on MVA) X_s
- Direct axis Positive Phase Sequence synchronous reactance X_d (% on MVA).
- Direct axis (saturated) transient reactance (% on MVA) X'_d .
- Direct axis (saturated) sub-transient reactance (% on MVA) X''_d .
- Direct Axis Transient Reactance (Unsaturated) (% on MVA) X_{d1}'
- Direct Axis Sub-transient Reactance (Unsaturated) (% on MVA) X_{d1}''
- Quadrature axis synchronous reactance (% on MVA) X_q .
- Quadrature axis (saturated) transient reactance (% on MVA) X'_q .
- Quadrature axis (saturated) sub-transient reactance (% on MVA) X''_q .
- Quadrature Axis Transient Reactance (Unsaturated) (% on MVA) X_{q1}'
- Quadrature Axis Sub-transient Reactance (Unsaturated) (% on MVA) X_{q1}''
- Zero Phase Sequence Reactance (% on MVA) X_0
- Negative Phase Sequence Reactance (% on MVA) X_2
- Direct axis transient open circuit time constant (sec) T'_{do} .
- Direct axis sub-transient open circuit time constant (sec) T''_{do} .
- Quadrature axis transient open circuit time constant (sec) T'_{qo} .
- Quadrature axis transient open circuit time content (sec) T''_{qo} .
- Stator Resistance (Ohm) R_a .
- Stator leakage reactance (Ohm) X_1 .
- Stator time constant (sec).
- Rated Field current (A).
- Neutral grounding details.
- Open Circuit saturation characteristics of the Generator for various terminal voltages giving the compounding current to achieve this.
- Type of Turbine.
- Operating Head (Metres)
- Discharge with full gate opening (cumecs)
- Speed Rise on total Load throw off(%).
- Please provide open circuit magnetization curve.
*If this is not available then please mention "assume" and PSTCL shall assume magnetic saturation characteristics as per the **Annexure-I***

(ii) Parameters of excitation control system:

Please submit Laplace domain control block diagram that represents the generator excitation system in accordance with the IEEE standard excitation model or as otherwise agreed with PSTCL. This control block diagram should completely specify all the time constants and gains to fully explain the transfer function from the compensator or generator terminal voltage and field current to generator voltage. A

list of acceptable IEEE standard excitation model available with PSS/E simulation package used by PSTCL is shown in **Annexure-II**.

Please fill/tick the appropriate box below:

Please assume

OR

If the excitation data is not available at this stage then PSTCL shall assume exciter model given at **Annexure-III** which represents a typical excitation model.

Assume the model given at **Annexure-III** as our model

(iii) Parameters of governor:

(iv) Operational parameter:

- Minimum notice required to Synchronise a Generating Unit from de-synchronisation.
- Minimum time between Synchronising different Generating Units in a Power Station.
- Minimum block load requirements on Synchronising.

5 GENERAL STATUS

(i) Detailed Project Report.

(ii) Status Report.

- Topographical survey
- Geological survey
- Land
- Environmental Clearance
- Rehabilitation of displaced persons.

(iii) Techno-economic approval by Central Electricity Authority.

(iv) Approval of State Government/Government of India.

(v) Financial Tie-up.

6 CONNECTION

(i) Reports of Studies for parallel operation with the State Transmission System.

- Short Circuit studies
- Stability Studies.
- Load Flow Studies.

(ii) Proposed Connection with the State Transmission System.

- Voltage
- No. of circuits
- Point of Connection.

7 RESERVOIR DATA

(i) Dead Capacity

(ii) Live Capacity

Schedule – VII : Data for Generators (other than Thermal & Hydro)

Generator Data for Fault (Short Circuit Studies)

All data to be provided on pu machine MVA base

1.	Direct Axis Transient Reactance (Unsaturated)	X_d'	
2.	Sub-transient Reactance (Unsaturated)	X_d''	
3.	Synchronous Reactance	X_s	
4.	Zero Phase Sequence Reactance	X_0	
4.	Negative Phase Sequence Reactance	X_2	

Generator Data

All data to be provided on pu machine MVA base

1.	Direct Axis Positive Phase Sequence Synchronous Reactance	X_d	
2.	Quadrature Axis Positive Phase Sequence Synchronous Reactance	X_q	
3.	Direct Axis Transient Reactance (unsaturated)	X_d'	
4.	Quadrature Axis Transient Reactance (unsaturated)	X_q'	
5.	Sub-Transient Reactance (unsaturated)	X_d''	
5.	Armature Leakage Reactance	X_l	
6.	Direct Axis Transient open circuit Time Constant (Secs)	T_{do}'	
7.	Direct Axis Subtransient open circuit Time Constant(Secs)	T_{do}''	
8.	Quadrature Axis Transient open circuit Time Constant(Secs)	T_{qo}'	
9.	Quadrature Axis Subtransient open circuit Time Constant(Secs)	T_{qo}''	
10.	Inertia of complete turbo generator (MWs/MVA)	H	
11.	Please provide open circuit magnetization curve enter drawing number here or mention "assume" <i>if this not available then PSTCL shall assume magnetic saturation characteristics as per the Annexure-I</i>		

Excitation Data

Please submit Laplace domain control block diagram that represents the generator excitation system in accordance with the IEEE standard excitation model or as otherwise agreed with PSTCL. This control block diagram should completely specify all the time constants and gains to fully explain the transfer function from the compensator or generator terminal voltage and field current to generator voltage. A list of acceptable IEEE standard excitation model available with PSS/E simulation package used by PSTCL is shown in **Annexure-II**.

Please fill/tick the appropriate box

below: Please assume

OR

If the excitation data is not available at this stage then PSTCL shall assume exciter model given at **Annexure-III** which represents a typical excitation model.

Assume the model given at **Annexure-III** as our model

Two Winding Transformer Data

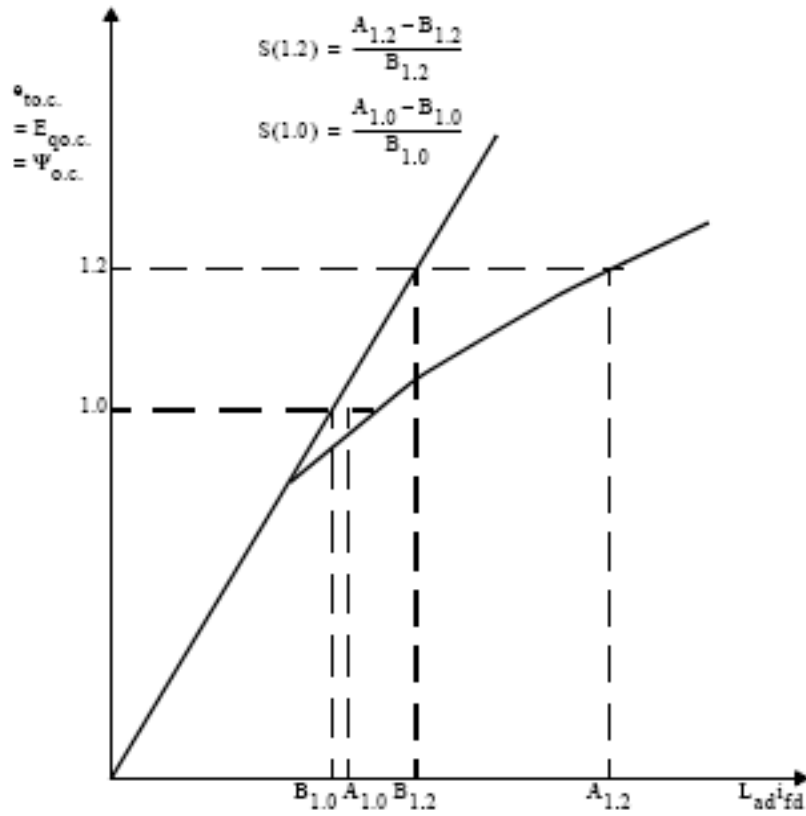
1.	Transformer positive sequence resistance (R1%)	
2.	Transformer positive sequence reactance (X1%)	
3.	Transformer zero sequence resistance (R0%)	
4.	Transformer zero sequence reactance (X0%)	
5.	Transformer Vector group	
5.	Nature of Tap Changer (on load/off load)	
6.	Number of steps and step size	

Three Winding Transformer Data

1.	Transformer Vector group	
2.	Positive sequence resistance (R1HL1%) between HV/LV1	
3.	Positive sequence reactance (X1HL1%) between HV/LV1	
4.	zero sequence resistance (R0HL1%) between HV/LV1	
5.	zero sequence reactance (X0HL1%) between HV/LV1	
6.	Positive sequence resistance (R1HL2%) between HV/LV2	
7.	Positive sequence reactance (X1HL2%) between HV/LV2	
8.	Transformer zero sequence resistance (R0HL2%) between HV/LV2	
9.	zero sequence reactance (X0HL2%) between HV/LV2	
10.	Positive sequence resistance (R1L1L2%) between LV1/LV2	
11.	Positive sequence reactance (X1L1L2%) between LV1/LV2	
12.	zero sequence resistance (R0L1L2%) between LV1/LV2	
13.	zero sequence reactance (X0L1L2%) between LV1/LV2	
14.	Positive sequence resistance (R1HL1//L2%) between HV/(LV1+LV2)	
15.	Positive sequence reactance (X1HL1//L2%) between HV/(LV1+LV2)	
16.	zero sequence resistance (R0HL1//L2%) between HV/(LV1+LV2)	
17.	zero sequence reactance (X0HL1//L2%) between HV/(LV1+LV2)	

Annexure-I

Open Circuit magnetization curve



Magnetic saturation data to be assumed

$S(1.0) =$

$S(1.2) =$

Annexure-II

Acceptable IEEE standard excitation model available with PSS/E simulation package used by PSTCL

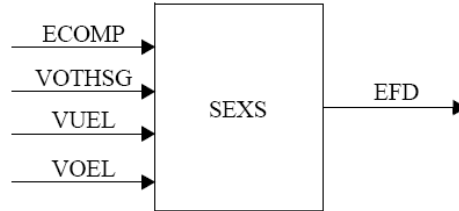
Excitation System Models	
ESAC1A	1992 IEEE type AC1A excitation system model
ESAC2A	1992 IEEE type AC2A excitation system model
ESAC3A	1992 IEEE type AC3A excitation system model
ESAC4A	1992 IEEE type AC4A excitation system model
ESAC5A	1992 IEEE type AC5A excitation system model
ESAC6A	1992 IEEE type AC6A excitation system model
ESAC8B	Basler DECS model
ESDC1A	1992 IEEE type DC1A excitation system model
ESDC2A	1992 IEEE type DC2A excitation system model
ESST1A	1992 IEEE type ST1A excitation system model
ESST2A	1992 IEEE type ST2A excitation system model
ESST3A	1992 IEEE type ST3A excitation system model
EXAC1	1981 IEEE type AC1 excitation system model
EXAC1A	Modified type AC1 excitation system model
EXAC2	1981 IEEE type AC2 excitation system model
EXAC3	1981 IEEE type AC3 excitation system model
EXAC4	1981 IEEE type AC4 excitation system model
EXBAS	Basler static voltage regulator feeding dc or ac rotating exciter model
EXDC2	1981 IEEE type DC2 excitation system model
EXELI	Static PI transformer fed excitation system model
EXPIC1	Proportional/integral excitation system model
EXST1	1981 IEEE type ST1 excitation system model
EXST2	1981 IEEE type ST2 excitation system model
EXST2A	Modified 1981 IEEE type ST2 excitation system model
EXST3	1981 IEEE type ST3 excitation system model
IEEET1	1968 IEEE type 1 excitation system model
IEEET2	1968 IEEE type 2 excitation system model
IEEET3	1968 IEEE type 3 excitation system model
IEEET4	1968 IEEE type 4 excitation system model
IEEET5	Modified 1968 IEEE type 4 excitation system model
IEEEX1	1979 IEEE type 1 excitation system model and 1981 IEEE type DC1 model
IEEEX2	1979 IEEE type 2 excitation system model

Procedure for Grant of Connectivity in Intra State Transmission System

IEEEX3	1979 IEEE type 3 excitation system model
IEEEX4	1979 IEEE type 4 excitation system, 1981 IEEE type DC3 and 1992 IEEE type DC3A models
IEET1A	Modified 1968 IEEE type 1 excitation system model
IEET1B	Modified 1968 IEEE type 1 excitation system model
IEET5A	Modified 1968 IEEE type 4 excitation system model
IEEX2A	1979 IEEE type 2A excitation system model
SCRX	Bus or solid fed SCR bridge excitation system model
SEXS	Simplified excitation system model

SEXS – Simplified Excitation System Model

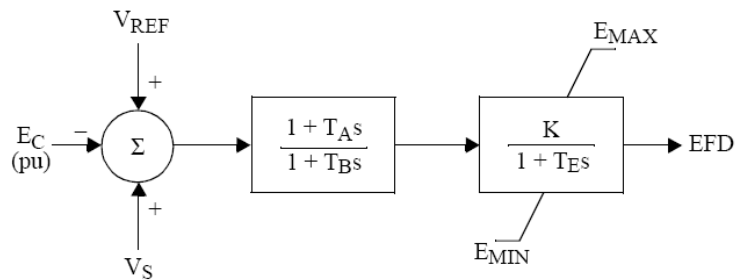
This model is located at system bus # _____ IBUS,
 machine # _____ I.
 This model uses CONs starting with # _____ J,
 and STATEs starting with # _____ K.



CONs	#	Value	Description
J			T_A/T_B
J+1			$T_B (>0)$ (sec)
J+2			K
J+3			T_E (sec)
J+4			E_{MIN} (pu on EFD base)
J+5			E_{MAX} (pu on EFD base)

STATEs	#	Description
K		First integrator
K+1		Second integrator

IBUS, 'SEXS', I, T_A/T_B , T_B , K, T_E , E_{MIN} , E_{MAX} /



$$V_S = VOTHSG + VUEL + VOEL$$

Draft Connection Offer Letter for Connection to the State Transmission Grid

[Name]
[Address of the party]

Subject : Connection Offer letter for connection to the State Transmission Grid.

Dear Sir,

We write with reference to the application No. _____ dated _____ seeking connectivity to the State Transmission System. We have examined the your proposal and it is hereby permitted to connect to the grid as per the details given below:

1. Name of the Link : from [Name of switchyard/substation] – to [Name of switchyard/substation]
2. Voltage level : 400/220/132 kV
3. Type of Link : Double Circuit / Single Circuit
4. Reactive compensation to be provided : [Specify rating of Line Reactor/Bus Reactor/Series compensation if any]
5. Maximum Import Capacity through the Link :
6. Maximum Export Capacity through the Link :
7. Date of commissioning :
8. Bay allocated in the switchyard of connectivity : Bay No. [refer enclosed single line diagram at **Annexure-I**]
9. Equipment to be provided by applicant in the allocated bay meeting the technical standards as per Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 and shall be compatible with the equipment installed at other end. : [refer **Annexure-II**]
- 10 Protection Equipment to be provided by : [refer **Annexure-II**]

applicant shall be meeting the technical standards as per Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 and shall be compatible & matching with the equipment installed at other end.

- 11 System recording & SCADA Equipment : [refer **Annexure-III**]
shall be meeting the technical standards as per Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 and shall be compatible to exchange data with the existing system installed in the InSTS network.
- 12 Details of the modification/alteration to existing facilities for accommodating proposed connection and its estimated cost. : [refer **Annexure-IV**]
- 13 Name of Communication Link for Data and Voice Communication : from [Name of switchyard/substation] – to [Name of switchyard/substation]
- 14 Communication equipment details upto PSTCL Data Collection Point : [refer **Annexure-V**]
- 15 Site responsibility schedule at : [as marked in the attached GA diagram **Annexure-VI**]

It should be noted by the applicant that all the equipments and systems to be provided by applicant shall have to conform with the technical standards as specified in the Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 and Grid Code.

The applicant will establish, test, commission and demonstrate the voice and data communication facilities with SLDC before test charging.

he applicant will forward meter data in the format appropriate and at a periodicity as specified by the appropriate regulatory authority from time to time. This shall be established & demonstrated by the applicant prior to test charging of interconnecting line.

At the connection point to the InSTS, all works associated with bay extension shall be taken- up by PSTCL on deposit of cost for the same. However, these equipment shall be owned and maintained by the PSTCL at the cost of applicant.

Thanking You

Yours faithfully,

SE/ Planning,
PSTCL, Patiala.

Annexure - II

Equipment to be provided by applicant in the allocated bay meeting the technical standards as per Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007

Sl. No.	Name of Equipments	Nos.	Ratings
1.	Circuit Breaker		
2.	Isolators		
3.	Earth Switches		
4.	CT		
5.	CVT		
6.	Wave Trap		
7.	Etc.		
8.			
9.			

System recording & SCADA Equipment to be provided by the applicant

Sl. No.	Name of Equipments	Nos.	Ratings
1.	Event Logger		
2.	Disturbance recorder		
3.	Fault locator		
4.	Data Acquisition System		
5.	Communication equipment		
6.	Etc.		
7.			
8.			

Details of the modification/alteration to existing facilities for accommodating proposed connection and its estimated cost

Communication equipment details upto PSTCL Data Collection Point

Annexure-VI

Site responsibility schedule

A. Principle & Procedure :

The responsibility of control, operation, maintenance & all matters pertaining to safety of equipments and apparatus at the connection point shall lie with the owner. For ease of day-to-day operation as a general practice O&M is carried out by the owner of the substation in whose premises the proposed bay is located for which a separate O&M contract is entered into, based on mutually agreed terms and conditions.

B. List of equipment and their ownership at the connection point :

Name of Power Station/Sub-Station:
 Site Owner:
 Site Manager:
 Tel. Number:
 Fax Number:

Sl. No.	Name of Equipment/ Apparatus	Plant Owner	Safety Responsibility	Control Responsibility	Operation Responsibility	Maintenance Responsibility
	____ kV Switchyard					
1.	All equipment including bus bars					
2.	Feeders					
3.						
	Generating Units					
1.						
2.						

C. Site common Drawings :

- a. Site layout
- b. Electrical layout (SLD)
- c. General Arrangement Drawings (GA)
- d. Details of protection
- e. Common services drawing

FORMAT- 6

DRAFT Connection Agreement

THIS AGREEMENT is made the [] day of [] 20[]

BETWEEN:

- (1) **[Name and registered address of the STU]** (hereinafter called the "PSTCL") which expression shall unless repugnant to the context or meaning thereof be deemed to mean and include its successors or permitted assigns and for the purposes of this Connection Agreement the STU shall act through its _____ **[address of the regional head quarter where connection shall be located]** Unit

as the first party
; and

- (2) **[Name and registered address of the applicant Company]** (herein after called "the Applicant" or "the Customer") which expression shall unless repugnant to the context or meaning thereof be deemed to mean and include its successors or permitted assigns and each of the parties hereto being a "Party" and the term "Parties" shall be construed accordingly.

As the second party

WHEREAS:

- (A) The Applicant has applied to the STU for connection of the **[mention generating station including a captive generating plant or consumer as appropriate]** facility to the STU's Transmission System and use of the STU's Transmission System to transmit electricity to and or from the Facility through the Intra-State Transmission System.
- (B) The STU has agreed to the connection of the **[mention generating station including a captive generating plant or consumer as appropriate]** Facility to the STU's Transmission and Communication System (via the customer's Site-Related Connection Equipment) at the Connection Point (..... Mention details of the connection point, the name of sub-station, name of line which is to be made LILO, etc.....) and to the applicant using the Owner's Transmission and Communication System to transmit electricity as well as real time data to and or from the Facility through the STU's Transmission and Communication System.

- (D) The Parties shall enter into this connection agreement to record the terms and conditions upon which the Parties will carry out their respective Connection Works in accordance with the Connection Agreement. In the case of a generating plant seeking connection to the State Transmission System not owned by the STU, a tripartite Connection Agreement would be signed between the STU, the State transmission licensee and the applicant, since the planning of the Intra-State Transmission System, insulation coordination, system studies, etc. are the responsibility of the STU. The responsibilities of the three parties would be defined accordingly in the tripartite Agreement.
- (E) Further, the parties shall separately take up modalities for implementation of the works on mutually agreed terms and conditions. The scope of works, time schedule for completion of works, including the timelines for the various milestones to be reached for completion of works (PERT chart), shall form an appendix to this agreement, and shall form the basis for evaluating if the works by the parties is being executed in time. Penalties for non-completion of works in time by one party resulting in financial losses to the other party may be appropriately priced, as per mutual agreement, for indemnification of each other against losses incurred in this regard, and form a part of this Agreement. Similarly, for the regular O&M of the connection equipments owned by the applicants and located in the STU's premises/switchyard, the parties shall separately take up the O&M agreement on mutually agreed terms and conditions.
- (F) Further, a signed copy of the agreement along with all the Annexures, and amendments when ever made, shall be submitted to SLDC.

IT IS HEREBY AGREED as follows:

1. General Conditions for Connectivity

1.1 The Parties agree to the following General Conditions that are incorporated into this Agreement.

- (a) The parties shall abide by the Punjab State Electricity Regulatory Commission Terms & Conditions for Intra-State Open Access) Regulations, 2011, as amended from time to time (hereinafter referred to as "Open Access Regulations") and other regulations/grid codes issued by PSERC/ CERC in respect of procedure of grant of connectivity and other matters.
- (b) The applicant shall be responsible for planning, design, construction, and safe and reliable operation of its own equipment in accordance with the PSERC Open Access Regulations, State Grid Code, IEGC, Central Electricity Authority (Technical Standards for Construction of electrical plants and electric lines) Regulations, Central Electricity Authority (Grid Standards) Regulations and other statutory provisions.

- (c) The responsibility of data transfer shall be that of the applicant. The applicant shall provide necessary facilities for voice & data communication for transfer of real time operational data such as voltage, frequency, real and reactive power flow, energy, status of circuit breaker & isolators positions, transformer taps and other parameters from their station to SLDC as per State Grid Code. The Real Time data shall be transmitted upto SLDC through IEC: 101/104 protocol by providing a redundant (main & backup) communication link/ connectivity using any mode of communication e.g. Optical Fibre/PLCC/MPLS/RF/GPRS or any other latest technology available, which shall be provided and maintained by the applicant. Further, main and backup communication links shall preferably be either through different communication modes or from different service providers (if same communication mode is used). The applicant shall follow the provisions of CERC (Communication Systems for Inter-State Transmission of Electricity) Regulations, 2017, as amended from time to time and technical standards, protocols for communication system etc. notified by CEA under aforesaid CERC Regulations for Communication Infrastructure to be used for data communication and tele-protection of power system and shall ensure the correctness of the real-time data.

STU may provide access to Customer's data transfer through its communication network in case spare channels are available on mutually agreed terms, in which case the nearest connected sub-station of STU where communication capacity (PLCC/ Optical Fibre) is available, may be considered as Data Collection Point (DCP) for onward telemetry of data to SLDC.

- (d) Where an open access customer falls under the category of "Designated Consumer" defined under Electricity Supply Code, 2014, as amended from time to time, the customer shall
- Install power quality meter and share the recorded data thereof with the transmission/ distribution licensee in line with the provisions of Electricity Supply Code.
 - Control the harmonics level at the Point of Common Coupling (PCC) in line with the provisions of Electricity Supply Code. The limits of voltage harmonics and current harmonics, Point of measurement i.e. PCC and other related matters shall be as per the IEEE 519-2014 namely "IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems", as modified from time to time read along with Standards issued by Central Electricity Authority (CEA) from time to time.
 - Provide adequate harmonic suppression units/ harmonic filters to avoid dumping of harmonics into transmission system, complying with the standards issued by CEA from time to time.

The measurements undertaken to determine compliance shall be carried out in accordance with the requirements as specified in IEC 61000-4-7 and IEC 61000-4-30. There shall be continuous measurement of harmonics with permanent Power Quality meters complying with the IEC 61000-4-30 Class-A meters for all new installations.

Where the open access customer fails to install power quality meter within stipulated time or the injection of harmonics exceeds the prescribed limits, such consumer shall be liable to pay a penalty to the STU at the rate and in the manner as may be approved by the Commission from time to time. The penalty shall be without prejudice to the right of the STU to take other punitive action as may be approved by the Commission.

1.2 The following documents and their schedules which have been initialed by the parties and annexed herewith shall be deemed to form part of this Agreement in the order of precedence listed below :-

- (a) Application for seeking connection to the Intra-State Transmission System along with undertaking and documents submitted with the application.
- (b) Intimation for grant of connectivity by STU
- (c) Application for Connection Offer and additional details submitted by the applicant.
- (d) Connection Offer issued by the STU attached hereto;
- (e) This Agreement

1.3 Availability of Statutory/Regulatory Approval

Notwithstanding anything in the Agreement to the contrary, the applicant shall be responsible for obtaining the statutory clearances/approval (if required) for carrying out the works requiring connection to the InSTS. Accordingly, the provisions of the Agreement dealing with the carrying out of the Works by either the applicant or the STU (unless otherwise agreed mutually) in all respects would be conditional on and subject to the STU being satisfied that the necessary approvals/clearances are available with the applicant.

2 Agreement to Pay Charges and Costs

2.1 Agreement to Monthly Transmission Tariff

The Customer agrees to pay or make arrangements for payment of the Monthly Transmission Tariff including SLDC charges, FERV, income tax or other taxes, cess, duties etc., for use of State Transmission System, as and when Long term access , Medium-term open access or short-term open access is availed by the applicant, in accordance with the relevant regulations of PSERC in this regard.

2.2 Agreement to additional costs

The Customer agrees to pay cost towards modification/alterations to Owner's infrastructure for accommodating the proposed connection as specified in the offer letter.

2.3 Agreement to pay for damages

The customer agrees to pay/ make good damages, if any, caused to the property of the Owner, which has been notified by the Owner within reasonable time of its occurrence, during the course of control, operation and maintenance of the equipment.

2.4 Agreement to pay Charges for construction of Bays:

The applicant will execute an agreement with STU for the Erection of equipment of applicant in the substation premises of the STU for construction of bays, if required. For this purpose the applicant shall pay charges to the STU on mutually agreed term.

2.5 Agreement to pay O&M Charges:

The applicant shall agree to pay O&M charges to the STU on mutually agreed terms for the bay equipment of applicant being operated & maintained by the STU in their substation. These O&M charges will be governed time to time as per the mutually agreed term.

3. Conditions Precedent to the implementation of the Commissioning Instructions

The applicant shall have to get appropriate "Commissioning Instruction" prior to actually first charging of the equipment through the grid. The charging instruction shall be issued only when the STU is satisfied (acting reasonably) that:

- (a) the Connection Works have been completed;
- (b) the applicant has complied with its all obligations as set out in the Offer Letter;
- (c) the applicant has demonstrated the voice & data communication facilities to SLDC;
- (d) the applicant has obtained necessary approvals like PTCC, Electrical Inspectorate of CEA etc. from competent authority;
- (e) the Customer has complied with its obligations under the PSERC Open Access Regulations, State Grid Code and Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007;

4. Metering

The customer shall provide and maintain the Metering equipment, in accordance with the PSERC Open Access Regulations, State Grid Code and Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006, as amended from time to time read along with the approved LTA/ MTOA and STOA Procedures. The metering infrastructure/ system shall also satisfy all the requirements laid in CEA "Functional Requirements for Advanced Metering Infrastructure" and provisions in SAMAST (Scheduling, Accounting, Metering & Settlement of Transaction in electricity) report issued by FOR technical committee (as & when implemented) and other Regulations/ guidelines issued by PSERC/ CERC from time to time

5.1 Site Access

Being restricted area the STU may give permission or allow access to Customer's employees and/or agents and/or subcontractors and/or invitees in the Owner's premises to carry out preliminary site investigation works, the Connection Works, modification works, inspections, etc , based on a written request by the applicant, as deemed fit. All such actions are to be carried out under the strict supervision of the STU's authorized representative to safeguard the safety and security requirements of STU's installations and safety of the representatives of the applicant.

Similarly the applicant may also allow, on prior permission, site access to the STU's employees and/or agents and/or invitees to carry out preliminary site investigation works, inspections, etc in the connection site of the applicant, as deemed fit.

5.2 Conditions of access

Site access for the STU/applicant shall include the right to bring such vehicles, plant, machinery and construction materials as shall be reasonably necessary to carry out the functions in respect of which the permission of access is granted. Being a restricted area, any individual to whom access is given under the Agreement shall comply with all reasonable directions given by the applicant or STU and its appropriately authorized employees and agents to safe guard the interest of safety and security requirements of personnel and equipment. All such access shall be exercisable without payment of any kind.

6. Transfer Assignment and Pledge

The applicant shall not transfer, assign or pledge its rights and obligations under this connection agreement to any other person.

7. Notice

All notices required or referred to under this Agreement shall be in writing and signed by the respective authorized signatories of the parties mentioned herein, unless otherwise notified. Each such notice shall be deemed to have been duly given if delivered or served by registered mail/speed post of the department of post with an acknowledgment due to other party (ies) as per

authorization by parties.

The authorities of the parties who shall issue/receive notices etc. in connection with this agreement shall be informed in advance.

8. Settlement of Disputes And Arbitration

All differences and/or disputes between the parties arising out of or in connection with these presents shall at first instance be settled through amicable settlement at the level of Transmission Planning Committee (TPC) formulated under State Grid Code or at Director level.

In the event of unresolved disputes or differences as covered under the statutory arbitration provided under The Electricity Act, 2003, the same shall be resolved accordingly.

Notwithstanding the existence of any disputes and differences referred to arbitration, the parties herein shall continue to perform their respective obligations under this Agreement.

9. Force Majeure

Force Majeure herein is defined as any clause which is beyond the control of the Owner or the Customer as the case may be, which they could not be foreseen or with a reasonable amount of diligence could not have been foreseen and which substantially affects the performance of the agreement such as:

- Natural phenomenon including but not limited to floods, droughts, earthquake and epidemics;
- Acts of any Government, domestic or foreign, including but not limited to war, declared or undeclared, priorities, guarantees, embargoes.

Provided either party shall within fifteen (15) days from the occurrence of such a cause notify the other in writing of such causes.

Neither of the parties shall not be liable for delays in performing obligations on account of any force majeure causes as referred to and/or defined above.

10 Confidentiality

The parties shall keep in confidence any information obtained under this Connection Agreement and shall not divulge the same to any third party without the prior written consent of the other party, unless such information is

- a) In the public domain.
- b) Already in the possession of the receiving party.
- c) Required by the Govt. Ministries/Agencies/Court of Law.

The information exchanged herein between the parties shall be used only for the purpose of, and in accordance with, this Agreement and for the purpose stated herein. This clause shall remain in force even after termination of Connection

Agreement.

11 Governing Laws and Jurisdiction

The agreement shall be governed by Indian Laws and Rules framed there under. The courts in Punjab shall have exclusive jurisdiction.

12 Amendment to the Connection Agreement

In case of Modification to point of connection like re-allocation of bays, upgradation of voltage level etc. by either of the parties, if mutually agreed, an amendment to the Connection Agreement shall be executed between the parties within 30 days of implementing such modification.

IN WITNESS WHEREOF the STU and the applicant have caused this Agreement to be executed by duly authorized representative on date above first herein written.

Signed for and on behalf of STU (PSTCL):-

CE/ P&M,
PSTCL, Ludhiana

Signed for and on behalf of Applicant:-

Signature
(Name & designation of Applicant)

Annexure-1

List of Gen Projects and their beneficiaries

Details of Generation Projects

Sl. No.	Applicant	Gen. Project Capacity (MW)	LTA Applied for (MW)	Location	Time Frame (Unit wise)	Long Term Access granted				
						MG	DG	UG	PG	TOR
1.										
2.										
3.										

Annexure-2

Transmission system to be implemented by Generation project developers and its schedule of commissioning

Sl. Name of Scheme & Elements

No.

- 1.
- 2.
- 3.
- 4.

Note:

1. The termination of the line as well as location of pooling station is subject to minor changes depending upon final survey and physical constraint, if any.
2. In case of any major development, if there is any change in the transmission system to achieve overall optimization of the system, then, above details would be modified on mutual consent.
3. In case, in future, any other long-term transmission customer(s) is/are granted open access through the transmission system detailed at Annexure-3 (subject to technical feasibility), he/they would also share the applicable transmission charges.

Annexure-3

Transmission System under the Scope of PSTCL

Sl. No.

- 1.
- 2.
- 3.

Name of Scheme & Elements

Note:

1. The termination of the line as well as location of pooling station is subject to minor changes depending upon final survey and physical constraint, if any.
2. In case of any major development, if there is any change in the transmission system to achieve overall optimization of the system, then, above details would be modified on mutual consent.
3. In case, in future, any other long-term transmission customer(s) is/are granted open access through the transmission system detailed at Annexure-3 (subject to technical feasibility), he/they would also share the applicable transmission charges.

Annexure-4

Transmission Charges for the transmission system of respective Generation Projects

The transmission charges for different stages of the transmission system would be borne by the generation developers / beneficiaries as given below:

- The dedicated transmission system indicated at Annexure-2 i.e. from the generation switchyard up to various pooling points/substations shall be built by the generation project developer and maintained by PSTCL at the cost of the developer.
- However, some of the dedicated transmission system indicated at Annexure-3 i.e. from the generation switchyard up to various pooling points/substations shall be built, owned and operated by PSTCL. The Transmission charges for these dedicated transmission system shall be paid by the concerned generation developers.
- The charges for the transmission system (other than the dedicated system) indicated at Annexure-3 would be borne by the generation developers in proportion to capacity for which long term access has been sought. The transmission charges will be corresponding to phased development of transmission system and in each time frame, charges should be shared by all the generation developer whose generation projects are scheduled to come up in that time frame or earlier.
- The long term access Applicants would also have to share the applicable Regional transmission charges in proportion to the Long term capacity sought by them as per PSERC norm.

- As the transmission system has been evolved considering target beneficiaries and tentative allocation indicated by the developer(s) in their application, some transmission strengthening may be required in the receiving end/region once the beneficiaries/quantum of allocation is finalized. The cost/tariff of such system strengthening would also have to be borne by the developer(s) as and when identified.

The composite transmission scheme would be developed in phases keeping in view the commissioning schedule of generation project. Depending upon the status of various generation projects as informed by different generation developers, the details of phasing of development of transmission system has been evolved. Details of staging are described as follows –

1.0 Stage-I

1.1 Generation project and its schedule

.....
.....

1.2 Transmission System

1.2.1 Transmission system to be developed by the generation developer and its schedule

.....
.....

1.2.2 Transmission system to be developed by PSTCL and its schedule

.....
.....

Sharing of transmission charges by above developers.

2.0 Stage-II

2.1 Generation project and its schedule

.....
.....

2.2 Transmission System

2.2.1 Transmission system to be developed by the generation developer and its schedule

.....
.....

2.2.2 Transmission system to be developed by PSTCL and its schedule

.....
.....

Sharing of transmission charges by above developers.

Note: In case, in future, any other long-term transmission customer(s) is/are granted open access through the transmission system detailed at Annexure-3 (subject to technical feasibility), he/they would also share the applicable transmission charges.