

**STATE LOAD DESPATCH CENTRE
TAMIL NADU TRANSMISSION CORPORATION LTD**

Procedure for implementation of Reactive Energy Accounting and Settlement as per "Tamil Nadu Electricity Grid Code -2026" issued by the Tamil Nadu Regulatory Commission vide notification dt 13.02.2026.

1.0 Title

This procedure is issued in compliance with clause 12.7 Appendix K.3 of TNERC's Tamil Nadu Electricity Grid Code-2026 and hereafter called "procedure for Reactive Energy Accounting and settlement for intra state Entities."

This Procedure shall be subject to modifications, amendments, or orders as may be notified by the Commission from time to time

2.0 Objective: -

The objective of this Reactive Energy Accounting Procedure is to implement a transparent, commercially sound, and technically accurate mechanism for measuring, accounting, and settling reactive energy (kVArh) exchanges between intra-state entities and the Intra-State Transmission System (InSTS) at interface points in Tamil Nadu.

This mechanism is intended to incentivise State Entities for Reactive Power drawal at high voltage & Reactive Power injection at low voltage and disincentives State Entities for Reactive Power drawal at low voltage & Reactive Power injection at high voltage, thereby for facilitating effective voltage management in the grid and enhancing grid security and reliability.

3.0 Applicability

This Procedure shall be applicable to all intra state entities including drawal entities (Distribution licensees and full Open Access Consumers) and Generating entities including Wind and Solar Generators.

4.0 Definitions

In addition to the definitions provided in TNEGC 2026, the following definitions apply to this Procedure:

'Interface Point' means the boundary metering point between the InSTS and the User's system

'Reactive Energy Exchange' means the net kVArh (lead or lag) flow measured at an Interface Point

'Low Voltage (LV) Condition' means the condition where the measured voltage at the Interface Point is less than 97% of the nominal voltage at that point

'High Voltage (HV) Condition' means the condition where the measured voltage at the Interface Point exceeds 103% of the nominal voltage at that point

'State Reactive Energy Pool Account' means the dedicated account maintained by TNSLDC for collection and disbursement of reactive energy charges and credits among intra-state entities.

'Monthly Reactive Energy Account' means the monthly statement issued by Secretariat of SPC to each State Entity detailing its reactive energy charges payables and receivables for the month.

'QCA' means the Qualified Coordinating Agency as defined in TNERC (Forecasting, Scheduling and Deviation Settlement and related matters for Wind and Solar Generation) Regulations, 2024.

'kVArh' means kilo Volt Ampere reactive hour — the unit of reactive energy.

5.0 General Principle

- (a) All Users shall endeavour to maintain the voltage at the inter-connection point in the range specified in the TN Electricity Grid Code-2026.
- (b) All generating stations shall be capable of supplying reactive power support so as to maintain power factor at the point of inter-connection within the limits of 0.95 lagging to 0.95 leading as per the CEA Technical Standards for Connectivity Regulations and amendments thereof.
- (c) The distribution licensees, OA and bulk consumers shall ensure the following:
 - i. They shall maintain neutral grounding of their installation and shall isolate the installation whose neutral grounding is imperfect; and
 - ii. They shall switch off capacitor banks if voltage exceed 105% of nominal system voltage and shall switch off shunt reactors if voltage goes below 95% of nominal voltage
- (d) All generating stations connected to the grid shall generate or absorb reactive power as per instructions of SLDC, within the capability limits of the respective generating units, where capability limits shall be as specified by the OEM.
- (e) The reactive interchange of Users shall be measured and monitored by SLDC/SRLDC.

- (f) SLDC/SRLDC may direct the Users about reactive power set-points, voltage set-points and power factor control to maintain the voltage at inter-connection points.
- (g) SLDC shall assess the dynamic reactive power reserve available at various sub-stations or generating stations under any credible contingency on a regular basis based on technical details and data provided by Users, as per the procedure specified by SLDC/ NLDC.
- (h) SLDC shall take appropriate measures to maintain the voltage within limits, inter-alia, using the available facilities, but not limited to and the facility owner shall abide by the instructions of NLDC, RLDCs and SLDCs:
- (i) Reactive power facility shall be in operation at all times and shall not be taken out without the permission of SLDC.
- (j) Periodic or seasonal tap changing of inter-connecting transformers and generator transformers shall be carried out to optimize the voltages, subject to technical feasibility, and wherever necessary, other options such as tap staggering may be carried out in the network.
- (k) Hydro and gas generating units having this capability shall operate in synchronous condenser mode operation as per instructions of the SLDC or SRLDC. Standalone synchronous condenser units shall operate as per the instructions of SLDC or SRLDC.
- (l) Users using the State Transmission System shall make all possible efforts to ensure that the grid voltage always remains within the limits specified in TNEGC/IEGC and amended thereof. The specified limits of voltage specified are reproduced below:

Voltage (kV rms)		
Nominal	Maximum	Minimum
765	800	728
400	420	380
230*	245*	207*
110	121	99
33	36	30

*As per CEA Manual on Transmission Planning criteria and updated thereof.

- (m) If voltage is outside the limit as specified above and the means of voltage control set out in point (h) above are exhausted, SLDC shall take all necessary actions to restore the voltages so as to be within the permissible limits including switching ON or OFF of lines considering the security of the system.
- (n) Notwithstanding the above, SLDC shall direct the State entities to curtail VAr drawal / injection in case the security of grid or safety of any equipment is endangered.
- (o) In general, the State entities shall endeavour to minimize the VAr drawal at an interchange point when the voltage at that point is below 95% of rated voltage, and shall not inject VAr when the voltage is above 105%. Transformer taps at the respective drawal points may be changed to control the VAr interchange only as per the instructions of SLDC.
- (p) Switching in/out of 400 kV bus and line reactors in the intra-state transmission grid shall be carried out as per instructions of SLDC/SRLDC. Tap changing of all identified transformers shall be carried out as per SLDC instructions.
- (q) All the Inverter Based Resources (IBRs) covering wind, solar and energy storage shall ensure that they have the necessary capability, as per CEA Connectivity Standards, all the time including non-operating hours and night hours for solar. The active power consumed by these devices for purpose of providing reactive power support, when operating under synchronous condenser/night-mode, shall not be charged under deviations and shall be treated as transmission losses in the transmission system. For IBRs of capacity 10 MW and below not coming directly to the point of interconnection but through the pooling station at the Power Park Developer end, the Power Park Developer or the QCA shall act as aggregator for the Reactive Energy Charges payments to and from the Pool Account at SLDC level. The de-pooling of Reactive Energy charges amongst the individual wind and solar shall be done by the Power Park Developer or QCA or aggregator.
- (r) Any commercial settlement for reactive power shall be governed as per the procedure given in clause 6.0 of this procedure.

6.0 REACTIVE POWER COMPENSATION

Reactive power compensation should ideally be provided locally, by generating reactive power as close to the reactive power consumption as possible. The state entities are therefore expected to provide local VAr compensation or generation such that they do not draw VAr from the EHV grid, particularly under

low-voltage condition. To discourage VAR drawal by state entities, VAR exchanges with Intra State Transmission System shall be priced as follows:

- (i) The State entity pays for VAR drawal when voltage is below 97%
- (ii) The State entity gets paid for VAR injection when voltage is below 97%.
- (iii) The State entity gets paid for VAR drawal when voltage is above 103%.
- (iv) The State entity pays for VAR injection when voltage is above 103%.

Where all voltage measurements are at the interface point with ISTS / InSTS.

7.0 Reactive Energy Charge Rate

- (a) The Reactive Energy Charges shall be fixed by the Commission vide separate order / notification from time to time.
- (b) As per the Para 6.1.17 of TANTRANSCO's Tariff Order No.8 of 2022 dt.09.09.2022 of Hon'ble TNERC, the Reactive Energy Charges to be levied from 01-07-2025 is 17.50 paise /kVARh for FY 2025-26 which will be escalated by 0.5 paise/kVARh annually in subsequent years unless otherwise revised by the Hon'ble Commission.

8.0 Methodology for Reactive Energy Accounting

In line with Appendix -J of the TNEGC-2026, any commercial settlement for reactive power shall be governed as per the regulatory framework given below.

- (a) Measurement of Reactive Energy shall be from the Special Energy Meter installed for the State Entities for energy measurement as per the metering regulation.
- (b) As per Chapter 19 – "Transmission Metering Code and Distribution Metering Code" of TN Grid Code 2026, the meters shall be capable of recording, storing and displaying various parameters which includes the following with respect to reactive energy.
 - (i) VAR hour - Lead/Lag while Watt hour - Import
 - (ii) VAR hour - Lead/Lag while Watt hour - Export
 - (iii) VA hour – Import/Export
 - (vi) VAR hour during low voltage ($V < 97\%$)
 - (v) VAR hour during high voltage ($V > 103\%$)

- (c) The metered reactive energy data (Daily/Monthly Cumulative) shall be arranged to be acquired through the AMR system. In addition to that the same data downloaded using CMRI shall be provided by the Distribution/Transmission/Generating Licensees.
- (d) The acquired data shall be processed through the metering module of SAMAST software under following heads.
 - (i) kVAR Hour during low voltage ($V < 97\%$)
 - (ii) kVAR Hour during high voltage ($V > 103\%$)
- (e) The verified processed meter data of each state entity (kVARh_H and kVARh_L) shall be made available for Reactive Energy Charges Accounting in the SAMAST Software.
- (f) In case of non-availability of AMR data, the CMRI data shall be utilized for accounting of reactive energy.

9.0 State Reactive Energy Account Statement:-

- (i) Based on the verified meter data of reactive energy (kVARh_H and kVARh_L), the Monthly State Reactive Energy Account will be prepared to all intra-state entities using SAMAST software and published in the TN SLDC web portal.
- (ii) The working of State Reactive Energy Account will be as follows.

kVARh_H	kVARh_L	Net kVARh	Amount in Rs.	Payable/Receivable
+A	+B	$C = A - B$	C X VAR Rate per kVARh	" +ve " Receivable from Pool Account " -ve " Payable to Pool Account
+A	-B	$C = A - (-B)$	C X VAR Rate per kVARh	" +ve " Receivable from Pool Account
-A	+B	$C = (-A - B)$	C X VAR Rate per kVARh	" -ve " Payable to Pool Account
-A	-B	$C = (-A - (-B))$	C X VAR Rate per kVARh	" +ve " Receivable from Pool Account " -ve " Payable to Pool Account

kVARh_H, " +ve " implies VAR drawal at High Voltage (incentive)

kVARh_H, " -ve " implies VAR injection at High Voltage (disincentive)

kVARh_L, " +ve " implies VAR drawal at Low Voltage (disincentive)

kVARh_L, " -ve " implies VAR injection at Low Voltage (incentive)

- (iii) The State entity pays at the applicable rate for VAr drawal when voltage is below 97% and VAr injection when voltage is above 103%.

The State entity gets paid at the applicable rate for VAr drawal when voltage is above 103% and VAr injection when voltage is below 97%.

- (iv) State Reactive Energy Account Statement shall contain the following details.
 - a. Details of monthly Reactive Energy Injection/Drawal during low Voltage (<97%) and high Voltage (>103%) for each entity
 - b. Details of Monthly total net Reactive Energy Injection/Drawal during low Voltage (<97%) and high Voltage (>103%) for each entity;
 - c. Details of Reactive Energy Charges payable/receivable by the State Entity
 - d. Any other details which State Load Despatch Centre feels necessary to complete the State Reactive Account.
- (v) The measurement unit for State Reactive Energy Account Volume preparation shall be kiloVAr hours (kVArh). Measurement unit for State Reactive Energy Pool Account Value (Payable and Receivable) preparation shall be Indian Rupees (INR). The decimal component of the energy unit (kVArh) and amount (INR) shall be rounded off to nearest integer value.

10.0 Reactive Energy Pool Account Maintenance

All payments on account of Reactive Energy Charges levied and interest, if any received for late payment shall be credited to the "State Reactive Energy Pool Account" (SREPA), which shall be maintained and operated by the State Load Despatch Centre.

Provided that

- i. The Commission may by Order direct any other entity to operate and maintain respective "State Reactive Energy Pool Account".
- ii. Separate books of accounts shall be maintained for the Principal component of Reactive Energy Charges of conventional Generators, Wind, Solar Generators, Drawal entities and Interest component of Reactive Energy Charges

iii. The State entities shall facilitate SLDC in meeting with the reporting requirements of Statutory Authorities, as necessary.

11.0 Payment Settlement Mechanism

- (i) The payment of Reactive Energy charges shall have a high priority and the concerned state entities shall pay the indicated amounts within 10 (ten) days of the issue of Statement of Charges for Reactive Energy by Secretariat of SPC into the "State Reactive Energy Pool Account".
- (ii) If payments against the Charges for Reactive Energy are delayed by more than two days, i.e., beyond twelve (12) days from the date of issue of the statement by the Secretariat of SPC, the defaulting constituent shall have to pay reactive energy charges along with simple interest @ 0.06% for each day of delay and the same may be added in the energy bill, if such facility is available, of such defaulting constituent by the Distribution Licensee on receipt of information of such default from the SLDC. This is without prejudice to any action that may be taken under Section 142 of the Act in addition to any action under Section 56 of the Act and other relevant Regulations.
- (iii) All payments to the entities entitled to receive any amount on account of Reactive Energy shall be made within 10 working days from the date of receipt of 100% payments from the payable entity in the "State Reactive Energy Pool Account"

Provided that in case of total amount required to pay for the receivable entities is lesser than the total amount payable by the payable entities, the receivable entities will be paid from the pool account (amount paid by the payable entities) on Pro-Rata basis.

- (iv) The surplus fund available if any after settlement, will be utilised for TANTRANSCO/SLDC system improvement.

12.0 Dispute Resolution

- 12.1 Any State Entity disputing the reactive energy charges in the monthly reactive Energy Statement shall submit a written representation to Member Secretary/SPC along with proper evidence/proof within 5 days of publishing of the Monthly reactive energy account in SLDC website with all supporting details.
- 12.2 On receiving the written representation, the secretariat of SPC, shall endeavour to resolve the dispute within 7 days.
- 12.3 If the dispute is not resolved by the Secretariat of SPC, the matter will be taken up with the commercial sub-committee.

13.0 Exceptions in Reactive Energy Accounting

With respect to Distribution licensee (TNPDC), this Reactive Energy Accounting and Settlement shall be implemented after installation and commissioning of AMR system at all drawal boundary points.

14.0 Implementation Time frame :-

The Mock Exercise of Reactive Energy Accounting and settlement will be carried for a period of three months after completion of development, testing and deployment of Reactive Energy Accounting Module in SAMAST software. The commercial implementation will be commenced from the date as notified by the Hon'ble TNERC

15.0 Grievance Redressal

All complaints unfair practices, delays, discrimination, lack of information, supply of wrong information or any other matter related to implementation of this procedure in the first instance, shall be mutually resolved by the state entities and TNSLDC only and in the event of irrecoverable differences / disputes the matter shall be referred to the Commission for clarification or adjudication.

16.0 Removal of Difficulties

- (i) This procedure aims at easy and flawless accounting of Reactive Energy to intrastate entities. However, some teething problems may still be experienced. The various implications would be known only after practical experience is gained by way of implementing these procedures. In case of any difficulty in implementation of this procedure, SLDC may approach the Commission for review or revision of the procedure.
- (ii) In case any dispute between these procedures and provision in TNEGC 2026, the latter shall prevail over these procedures.
- (iii) Notwithstanding anything contained in this Procedure, SLDC may take appropriate decisions in the interest of System Operation and such decisions shall be taken under intimation to TNERC and these procedures shall be modified / amended, to give effect to such decisions taken by TNSLDC not later from 6 months from the date of such decision.

Annexure-I: Glossary of Abbreviations

AMR	– Automated Meter Reading
CERC	– Central Electricity Regulatory Commission
CEA	- Central Electricity Authority
DSM	– Deviation Settlement Mechanism
EHV	– Extra High Voltage
HV	– High Voltage ($V > 103\%$ in this Procedure)
IBR	– Inverter-Based Resource
IEGC	– Indian Electricity Grid Code
ISTS	- Inter State Transmission System
InSTS	– Intra-State Transmission System
KV	- Kilo Volt
kVArh	– Kilo Volt Ampere Reactive Hour
LV	– Low Voltage ($V < 97\%$ in this Procedure)
NLDC	– National Load Despatch Centre
OA	- Open Access
OEM	- Original Equipment manufacturer
PoC	– Point of Connection
QCA	– Qualified Coordinating Agency
RMS	- Root Mean Square
SAMAST	– Scheduling, Accounting, Metering and Settlement of Transactions of Electricity
SLDC	– State Load Despatch Centre
SRLDC	– Southern Regional Load Despatch Centre
SRPC	- Southern Regional Power Committee
SREPA	- State Reactive Energy Pool Account
STU	– State Transmission Utility
SPC	- State Power Committee
TANTRANSCO	– Tamil Nadu Transmission Corporation Limited
TNPDCL	- Tamil Nadu Power Distribution Corporation Limited
TNERC	– Tamil Nadu Electricity Regulatory Commission
TNEG	– Tamil Nadu Electricity Grid Code
VA	- Volt Ampere

Annexure-II: Key Regulatory References

1. Tamil Nadu Electricity Grid Code (TNEGC), 2026
2. Indian Electricity Grid Code (IEGC), 2023
3. TNERC (Forecasting, Scheduling and Deviation Settlement and related matters for Wind and Solar Generation) Regulations, 2024.
4. TNERC (Deviation Settlement Mechanism and related matters) Regulations, 2019 and its amendments
5. TANTRANSCO's Tariff Order No.8 of 2022 dt.09.09.2022 of Hon'ble TNERC