

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

No. L-1/261/2021/CERC

CORAM:

**Shri Jishnu Barua, Chairperson
Shri I. S. Jha, Member
Shri Arun Goyal, Member
Shri P. K. Singh, Member**

Date of Order: 29.09.2023

In the matter of:

Approval of 'Detailed Procedure for Allocation of Transmission Corridor for Scheduling of General Network Access and Temporary General Network Access under Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State Transmission System) Regulations, 2022

Order

Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State Transmission System) Regulations, 2022 (hereinafter called 'GNA Regulations') were published on 19.07.2022 in Part III, Section 4 of the Gazette of India (Extraordinary) No 364.

2. In accordance with Regulation 39.2 of the GNA Regulations, NLDC was required to submit a Detailed Procedure in respect of Regulation 36 of the GNA Regulations for approval of the Commission.



3. Accordingly, NLDC vide its letter dated 14.07.2023 submitted the 'Detailed Procedure for Allocation of Transmission Corridor for Scheduling of General Network Access and Temporary General Network Access'.
4. The Commission has examined the Detailed Procedure submitted by NLDC and after incorporating suitable changes hereby approves the "Detailed Procedure for Allocation of Transmission Corridor for Scheduling under General Network Access and Temporary General Network Access" in terms of proviso to Regulation 39.2 of the GNA Regulations. The approved Detailed Procedure is enclosed as Annexure to this order.

Sd/
(P. K. Singh)
Member

Sd/
(Arun Goyal)
Member

Sd/
(I. S. Jha)
Member

Sd/
(Jishnu Barua)
Chairperson

Allocation of Transmission Corridor under General Network Access (GNA) and Temporary General Network Access (T-GNA) to the Inter-State Transmission System

1. Background

- 1.1. This procedure is in accordance with Regulation 39.2 of the Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State Transmission System) Regulations, 2022 (hereinafter called 'GNA Regulations').
- 1.2. The procedure lays down the guidelines for allocation of the transmission corridor for scheduling of GNA and T-GNA transactions as per the provisions stipulated in GNA Regulations and the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023 (hereinafter called 'Grid Code, 2023').

The procedure will supplement NLDC's Procedure for granting Temporary General Network Access (T-GNA) to the inter-State Transmission system through the National Open Access Registry (NOAR) prepared in accordance with the aforementioned regulations.

- 1.3 All the provisions of this Procedure as applicable to GNA Applicants are also applicable to GNA_{RE} and all the provisions of this Procedure as applicable to T-GNA Applicants are also applicable to T-GNA_{RE}. Accordingly, GNA_{RE} and T-GNA_{RE} have not been repeated everywhere in the Procedure as the same provisions are applicable.

2. Definitions

- 2.1. 'Applicant' means Distribution licensee directly connected to ISTS / Bulk consumer directly connected to ISTS, drawee entity connected to intrastate transmission system or to distribution system, all generating stations, including based on a renewable source of energy with or without Energy Storage System including Renewable Hybrid Generating Station for meeting its auxiliary consumption or start-up power or for meeting its supply obligations in terms of clause (3) of Regulation 6 of the Power Market Regulations, Captive generating

plant, Standalone Energy Storage System, Generating station based on a renewable source of energy with or without Energy Storage System including Renewable Hybrid Generating Station for drawal during non-generation hours as buyers. Trading Licensee on behalf of above buyers or engaged in cross border trade of electricity for injection into or drawal from the Indian grid. Power Exchange for collective or bilateral transactions on behalf of the above buyers or on behalf of trading licensees engaged in cross border trade of electricity for injection into or drawal from the Indian grid., or any other entity as per GNA Regulations

- 2.2. 'Bid Area' is defined as the largest geographical area within which market participants are able to exchange energy without capacity allocation.
- 2.3. 'Control Area' means an electrical system bound by interconnections (tie lines), metering and telemetry which controls its generation and/or load to maintain its interchange schedule with other control areas and contributes to the regulation of frequency as specified in Grid Code, 2023.
- 2.4. 'Cross Border Transaction' means transactions involving the import or export of electricity between India and any of the neighbouring countries and shall also include transactions across India involving neighbouring countries.
- 2.5. 'Day' means a day starting at 00:00 hours and ending at 24:00 hours.
- 2.6. Grid Controller of India Ltd. (hereinafter called 'Grid-India') (erstwhile Power System Operation Corporation Ltd. (POSOCO)) means the wholly Government owned independent Company notified by Central Government under Section 26 and subsection (2) of Section 27 of the Electricity Act vide notification dated 19th December 2016. Grid-India is operating all five RLDCs and the NLDC w.e.f. 1st October, 2010;
3. Words and expressions used in this procedure that are not defined herein but defined in the Act or any other regulations of the Central Commission shall, unless the context otherwise requires, have the meanings assigned to them under the Act or the said regulations specified by the Central Commission.

4. Declaration of Total Transfer Capability (TTC), Available Transfer Capability (ATC) and Transmission Reliability Margin (TRM)

4.1 Declaration of Transfer Capability

- a) The procedure for calculation of TTC, ATC and TRM is attached as Appendix -I of this Procedure.
- b) The Central Transmission Utility of India Limited (CTUIL) shall furnish to NLDC on a rolling basis, the import and export ATC of the inter-regional links/corridors as considered by it while granting General Network Access (GNA) to entities.
- c) The National Load Despatch Centre (NLDC), Regional Load Despatch Centres (RLDCs) and State Load Despatch Centres (SLDCs) shall consider the quantum declared by CTUIL while assessing the import and export TTC, TRM and ATC for the purpose of grant of Temporary General Network Address (T-GNA), scheduling of GNA and T-GNA transactions.
- d) The declaration of the import and export TTC, ATC and TRM shall be carried out by RLDCs and NLDC in accordance with Regulation 44 (1) and Regulation 44(2) of the Grid Code 2023. The TTC, ATC, and TRM figures for the month along with the details of the basis of calculations, including assumptions, if any, shall be published on the website of NLDC and concerned RLDCs at least eleven (11) months in advance. The specific constraints indicated in the system study shall also be published on the website.
- e) SLDCs in consultation with RLDCs shall declare the import and export TTC, ATC, and TRM of the individual control/bid areas within the region in accordance with Regulation 44 (3) of the Grid Code 2023. RLDCs shall assess the import and export TTC, TRM and ATC for the group of control/bid areas within the region (if required). The computed TTC, TRM and ATC figures shall be published on the website of respective SLDCs and RLDCs, along with the details of the basis of calculations, including assumptions, if any, at least eleven (11) months in advance. The specific constraints indicated in the system study shall also be published on the website.

- f) The consolidated bid area/control area/combination of control areas wise import and export TTC, TRM and ATC shall also be published on the NLDC/Grid-India website.
- g) NLDC, RLDCs and SLDCs shall perform the TTC computation studies such that all anticipated operating conditions are covered. In the studies, the worst credible contingency shall be considered to ensure equipment loadings, voltage stability, and transient stability limits.

Provided further that NLDC and/or concerned RLDCs and SLDCs in consultation with each other may revise the TTC, ATC and TRM of respective control areas due to changes in system conditions, which includes changes in network topology or changes in anticipated active or reactive generation or load, on account of outage of one or more generators or transmission lines at any of the nodes in the study. Revised TTC, TRM and, ATC figures along with the reasons for revision shall be published on the websites of NLDC/GRID-INDIA, concerned RLDCs and SLDCs.

- a) The TTC, ATC and TRM may also be revised near the operating horizon depending on the anticipated system conditions at that time.

5. Allocation of Transmission Corridor

- a) In order to determine whether the drawl schedules as requisitioned by the GNA and T-GNA grantees can be allowed, RLDCs shall check the availability of the margin for each and every time block against the available inter-regional import/export transfer capability as well as intra-regional and bid/control area import/export transfer capability. This process shall be carried out for all the bid area (s) / control area (s) / group of control or bid areas.
- b) For the purpose of transmission corridor allocation, all states and Union Territories shall be configured as bid areas. Further, additional bid areas/groups of bid areas may also be configured as and when the need arises.
- c) NLDC shall be responsible for the configuration/reconfiguration of these bid area(s) based on the anticipated congestion and prevailing grid conditions. Power Exchanges shall keep the provision in their respective systems for the configuration of bid areas as and when intimated by NLDC with due advance notice.

- d) First, the GNA grantees shall be eligible to schedule power within the GNA granted to them subject to the available import and export transfer capability of the concerned bid area (s)/control area (s)/group of control or bid area (s). After the allocation of the corridors to the GNA grantees, the concerned RLDC shall allow the drawl schedules as requisitioned by the T-GNA/ grantees based on the available margin. The detailed procedure for the same is provided in a subsequent section.
- e) Responsibilities of CTUIL:
 - i) The CTUIL shall be responsible for electronically intimating details of any new grant of GNA to all the stakeholders (including NLDC) within 15 days of such grant.
 - ii) In case of a change in the original quantum or date of effectiveness of GNA, the same shall be intimated by CTUIL to all the stakeholders (including NLDC) at least 15 days in advance from the original date of effectiveness of GNA.
 - iii) CTUIL shall also provide an interface (Application Programming Interface – API based) for communicating approved GNA quantum to NLDC.
 - iv) CTUIL shall also inform the details of authorisation of use of GNA by other GNA grantees under Regulation 23 of the GNA Regulations to the RLDCs and NLDC at least 15 days before the effective date of such authorization.

5.1. Allocation of Transmission Corridor and Scheduling of Transactions under GNA and T-GNA

- a) Respective SLDCs on behalf of the intra-state entities which are drawee GNA grantees or other drawee GNA grantees which are regional entities, shall furnish the details of the contracts(which may include power purchase agreements (PPAs) or Letters of Award (LOA)or any other type of contract) already entered into by such entities two days before the day when scheduling request is to made (i.e. for scheduling for ‘S’ day, scheduling request is placed on ‘S-1’ day, copy of the contract may be submitted by 11:00 hrs of ‘S-3’ day) so as to configure these details in the scheduling system. In case contracts have not been entered into by S-3 day, contracts are required to be submitted at least one time block before the time block when the scheduling request is made.

As per Regulation 45(5) of the Grid Code 2023, the copy of contracts once submitted by sellers and buyers need not be submitted again before every scheduling request and the copy of the contract can be linked with a unique ID by RLDC for reference before scheduling request.

- b) The requisite information shall be provided in the Web based Energy Scheduling Software (WBES) for scheduling requests under GNA or NOAR for scheduling requests under T-GNA. The said details of the contract shall be provided for Intra Day, Day Ahead Contingency (DAC), Term Ahead, Green Intra Day, Green Day Ahead Contingency (DAC) and Green Term Ahead contracts as per above.
- c) SLDCs or drawee GNA grantees shall place a request for schedule in accordance with Regulation 49 of the Grid Code 2023.
- d) RLDCs shall check if drawl schedules as requisitioned by the drawee GNA grantees can be allowed based on the available transmission capability.
- e) RLDCs shall check the availability of the margin for each and every time block against the available inter-regional import/export transfer capability as well as the intra-regional and bid/control area import/export transfer capability. This process shall be carried out for all the bid area (s) / control area / group of control areas.
- f) Once such entity has placed a scheduling request with RLDC and there is a constraint in the transmission system due to which a full schedule as requested by all drawee DICs in the region cannot be accommodated, RLDC shall allocate the transmission corridor as follows:
 - i. In case of constraint in the transmission system “from outside the region”, the transmission corridor shall be allocated in proportion to the “outside the region” bifurcation of all such drawee DICs.
 - ii. In case of constraint in the transmission system “within the region”, the transmission corridor shall be allocated in proportion to the total GNA quantum for such drawee DICs (sum of “within the region” and “from outside the region” bifurcation)

- g) Drawee GNA grantees shall revise their requisition for drawl schedule based on the availability of transmission corridors for such grantees. In case of no revision is furnished by drawee GNA grantees, within their allotted corridor, RLDC shall consider revised schedules where, the generation from wind, solar, wind-solar hybrid and run of the river hydro plants with up to three hours pondage (in case of excess water leading to spillage) shall be scheduled first followed by scheduling of generation from other sources.

5.2. Allocation of Transmission Corridor and Scheduling of Transactions under Advance T-GNA Application Category

- a) After the day-ahead schedule is finalised for the GNA grantees, the schedule for T-GNA grantees under the Advance category shall be finalised over the balance transmission margin, in accordance with clause (j) of Regulation 49(1) of the Grid Code, 2023.
- b) Respective SLDC on behalf of intra-State entities which are T-GNA grantees or other drawee T-GNA grantees who are regional entities shall furnish the details of the contracts already entered into by such entities two days before the day when scheduling request is to be made (i.e. for scheduling for 'S' day, scheduling request is placed on 'S-1' day, copy of contract may be submitted by 11:00 hrs of 'S-3' day) so as to configure these details in the scheduling system. In case contracts have not been entered into by such an entity before S-3 day, and the entity enters into a contract after 'S-3' day, such contracts are required to be submitted at least one time block before a scheduling request is made.

As per Regulation 45(5) of the Grid Code 2023, the copy of contracts once submitted by sellers and buyers need not be submitted again before every scheduling request and the copy of the contract can be linked with a unique ID by RLDC for reference before scheduling request.

The requisite information shall be provided in the Web based Energy Scheduling Software (WBES for scheduling requests under GNA or NOAR for scheduling requests under T-GNA.). The said details of the contract shall be provided for for Intra Day, Day Ahead Contingency (DAC), Term Ahead, Green Intra Day, Green Day Ahead Contingency (DAC) and Green Term Ahead contracts as per above.

- c) Standing clearance, as applicable, shall be furnished in accordance with Regulation 28 of the GNA Regulations.
- d) The available margin for transactions under the advance bilateral category shall be determined for each bid area /control area /group of control areas as:

Margin for scheduling of advance bilateral category of T-GNA transactions:

- Import T-GNA margin = import ATC – import schedule (GNA) + 'A'% export schedule (GNA)
- Export T-GNA margin = export ATC – export schedule (GNA) + 'B'% import schedule (GNA)

Where 'A' and 'B' are the percentage export/import in the opposite direction which shall be determined by NLDC from time to time based on RE variability and other system exigencies.

- e) RLDCs shall check if the drawl schedules as requisitioned by the drawee T-GNA grantees can be allowed based on the available import/export transfer capability and the standing clearance issued by the NLDC/RLDC/SLDC.
- f) For this, the RLDCs shall check the availability of corridor for each and every time block of the next day against the available inter-regional import/export transfer capability as well as the intra-regional and bid area import/export transfer capability and the standing clearance issued by the NLDC/RLDC/SLDC for injecting and drawee entities. This process shall be carried out for all the bid area (s) / control area / group of control areas.
- g) In case the day-ahead scheduling request of T-GNA grantees for a full quantum of T-GNA/T-GNA_{RE} cannot be accommodated due to the non-availability of sufficient transmission corridor, then the available transmission corridor shall be allocated for scheduling on a pro-rata basis to the T-GNA grantees in proportion to their granted T-GNA quantum.

Within such proportionate T-GNA allocated, the curtailment of requested schedule shall be done first from generation sources other than wind, solar, wind-solar hybrid and run of the river hydro plants with up to three hours pondage (in case of excess water leading to spillage) in proportion to the requested schedule from such sources .

- h) .
- i) There shall be no refund in transmission charges in case the advance T-GNA applications were applied more than the standing clearances issued by the SLDC/RLDC for the injecting entity. However, if SLDC/RLDC has revised the standing clearances due to transmission constraints or in view of grid security, transmission charges for the quantum not scheduled shall be refunded to the T-GNA grantee.
- j) A T-GNA grantee who has been granted Advance T-GNA, but does not request a schedule for the full quantum of T-GNA by 9.15 AM on 'D-1' day as per Regulation 49(1)(j)(i) of the Grid Code 2023, it may request for scheduling up to T-GNA granted after 2.00 PM on 'D-1' day which shall be processed as per exigency applications. In case, a scheduling request cannot be accommodated due to transmission constraints, no refund of transmission charges for such quantum shall be made.
- k) After Scheduling of Advance applications of T-GNA the balance corridor including the unutilised quantum of T-GNA shall be released in the following sequence:
- i. Collective transactions under day ahead market.
 - ii. Bilateral transactions under exigency T-GNA applications received till 13:00 hours of 'D-1' day
 - iii. Schedule revision by GNA grantees OR Bilateral transactions under exigency T-GNA applications received after 13:00 hours of 'D-1' day OR upward scheduling request by Advance T-GNA grantee on first cum first serve basis.
 - iv. Collective transactions under real time market

Inter-se, the exigency applications after 13:00 hrs of 'D-1' day and revisions requests under GNA received after 14:00 hrs of 'D-1' day shall be scheduled on first cum first serve basis as per available transmission margin.

5.3. Allocation of Transmission Corridor and Scheduling of Collective Transactions

- a) After allocation of the transmission corridor to the GNA grantees and T-GNA grantees under the Advance category, the balance transmission margin shall be released for collective transactions under the Integrated Day Ahead Market (IDAM). The available margin for IDAM transactions shall be determined for each bid area /control area /group of control areas as:

Margin for IDAM category of transactions:

- Import IDAM margin = import ATC – scheduled import (GNA + advance T-GNA) + 'M'% scheduled export (GNA +T-GNA)
- Export IDAM margin = export ATC – scheduled export (GNA + advance T-GNA) + 'N'% scheduled import (GNA + T-GNA)

Where 'M' and 'N' are the percentage export/import in the opposite direction which shall be determined by NLDC from time to time based on RE variability and other system exigencies.

- b) In case of congestion in any of the bid area/ control area / group of control areas, the allocation of available corridor margin among the power exchanges shall be in the ratio of initial unconstrained market clearing volume in the respective Power Exchange(s) submitted by the respective power exchanges for the particular time block in the congested corridors, as per Grid Code 2023.

Provided that within an integrated day ahead market, high price day ahead market transactions shall be curtailed first, followed by day ahead market transactions and then green day ahead market transactions.

- c) For uncongested corridors, the margin shall be the requisition in MW plus residual quantum (in that particular uncongested corridor left over after the total requisition from all power exchanges in that time block) in proportion to the IDAM provisional volume for the respective exchanges.

- d) The Power Exchange(s) shall ensure that the scheduling request for IDAM transaction is within the limits for each bid area/ control area / group of control areas and for each time block as intimated by NLDC through NOAR.

5.4. Allocation of Transmission Corridor and Scheduling of Exigency Bilateral Transactions

- a) After the finalisation of the collective transactions under IDAM, Exigency applications for the grant of T-GNA shall be processed in accordance with clause (o) of Regulation 49(1) of the Grid Code, 2023 and Regulation 29.4 of the GNA Regulations.

- b) The available margin for transactions under the exigency category shall be determined for each bid area /control area /group of control areas as:

Margin for Scheduling of Exigency Bilateral Transactions:

➤ Import T-GNA margin = import ATC – net scheduled (GNA + T-GNA)

➤ Export T-GNA margin = export ATC – net scheduled (GNA + T-GNA)

- c) An application for a grant of exigency T-GNA/T-GNA_{RE} for a bilateral transaction through NOAR may be submitted in accordance with clause (b) of Regulation 28.4 of the GNA Regulations. For each and every time block of a particular day, the requests shall initially be checked against the available inter-regional import/export transfer capability followed by intra-regional and bid area import/export transfer capability. This process shall be carried out for all the bid area (s) / control area / group of control areas.
- d) Based on the above, nodal RLDC shall therefore approve / reject / partially approve the transactions as the case may be.
- e) In the event T-GNA as applied for, cannot be granted for full quantum and full period as sought in the application, in view of constraints in the transmission system, the entire application shall be rejected.

Provided that, in case the applicant has given consent in its application through NOAR that T-GNA for part quantum or part period or both may be granted to it, T-GNA for such part quantum and part period or both shall be granted as per available transmission margin.

- f) T-GNA granted under the exigency application category shall be considered as schedule, which cannot be revised, except in case of forced outage of a unit of a generating station or ESS, transmission constraint and in view of grid security.
- g) RLDC shall update the availability of balance transmission corridors, if any, for utilization by GNA grantees by way of revision of schedule, under any contract within its GNA or for exigency applications or in real time market on first cum first serve basis, in accordance with clause (p) of Regulation 49(1) of the Grid Code, 2023.

5.5. Allocation of Transmission Corridor and Scheduling of Real Time Collective Transaction

- a) All the entities participating in the real-time market (RTM) may place their bids and offers on the Power Exchange(s) in accordance with clause (q) of Regulation 49.1 of the Grid Code 2023.
- b) NLDC shall finalize schedules under RTM in accordance with clause (r) of Regulation 49.1 of the Grid Code 2023.
- c) The available margin for real time market collective category of transactions shall be determined for each bid area /control area /group of control areas as:

For real time market collective category of transactions:

- Import RTM margin = import ATC – net scheduled import (GNA + T-GNA)
 - Export RTM margin = export ATC – net scheduled export (GNA + T-GNA)
- d) In case the combined trade volume submitted by the power exchange(s) exceeds the available transmission margin limit for any of the bid area/ control area / group of control areas, the allocation of available corridor margin for a particular time block among the power exchanges shall be in the ratio of initial unconstrained market clearing volume in

the respective Power Exchange(s) submitted by the respective power exchanges for the particular time block in the congested corridors, as per Grid Code 2023

5.6. Scheduling of Cross Border transactions

Scheduling of cross border GNA and T-GNA transactions shall be done in accordance with the Procedure for approval and facilitating Import/Export (Cross Border) of Electricity by the Designated Authority (DA), Cross Border Trade of Electricity Regulations, 2019 and amendments thereof and Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State transmission System) Regulations, 2022 and amendments thereof.

5.7 Revision of Schedules under GNA and T-GNA in Case of Real time congestion

- a) When to maintain the grid security in the opinion of NLDC/RLDC/SLDC because of interstate/intrastate transmission constraints other than outage of dedicated transmission lines owned and operated by the generating station itself, it becomes necessary to curtail the power flow on a transmission corridor, the transactions already scheduled shall be curtailed in accordance with provisions of Grid Code 2023 and in the manner which in the opinion of NLDC/RLDC/SLDC as the case may be, would relieve transmission constraints and/ or enhance grid security.
- b) NLDC/RLDC/SLDC shall initiate the process of curtailment of transactions for all such bid area/ control area/ group of control areas and the same shall become effective from the 7th or 8th time block for any revision in schedule made in odd or even time blocks respectively, counting the time block in which the schedule revision made by the RLDC as the first-time block.
- c) The actual generation of sellers shall be treated as scheduled generation from the 1st till the 6th or 7th time block as the case may be. The schedule of buyers will be revised, in proportion, based on the actual generation of the seller.

Provided that the transmission charges for the quantum not scheduled or curtailed shall be refunded to the T-GNA grantee.

- d) When because of transmission constraints in the neighbouring countries, it becomes necessary to curtail power flow on a bid area/ control area/ block of control areas/ transmission corridor, the concerned NLDC of the country shall intimate the transactions to be curtailed to NLDC, India. Subsequently, curtailment shall become effective from the 7th or 8th time block for any revision in the schedule made in odd or even time blocks respectively, counting the time block in which the schedule revision made by the NLDC/RLDC as the first-time block.
- e) The transactions already scheduled may be curtailed by the Regional Load Despatch Centre as per Regulation 49 (3) of Grid Code 2023.
 - i. Provided that within an integrated day ahead market, high price day ahead market transactions shall be curtailed first followed by day ahead market transactions and then green day ahead market transactions.
- f) The priority of restoration of transactions shall be in the reverse order of that of curtailment as specified in points (e) above.

6. Revision of Procedure

As and when required, the procedure shall be reviewed and revised by NLDC with the approval of the Commission.

Procedure for Assessment of Transfer Capability

1. Background

- 1.1. Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State Transmission System) Regulations 2022(hereinafter ‘GNA Regulations’), provides at Regulation 28.1 that T-GNA may be applied for any period from 1 (one) time block and up to 11 (eleven) months. Regulation 29.1 provides that T-GNA shall be granted within the Available Transfer Capability (ATC) on the ISTS after accounting for the GNA of the GNA grantees.
- 1.2. As per Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023 (hereinafter ‘Grid Code 2023) provides at Regulation 33 (5) that RLDC shall assess intra-regional and inter-state level TTC and ATC and submit them to NLDC. Further NLDC shall declare TTC and ATC for import or export of electricity between regions including simultaneous import or export capability for a region, and cross border interconnections 11 (Eleven) months in advance for each month on a rolling basis. The study inputs from SLDCs would serve as the foundation for the assessment of transfer capabilities at the interstate, intra-regional levels, interregional and cross-border levels.
 - 1.1. Regulation 33 (3)(a) of the Grid Code 2023 provides that SLDCs shall assess and declare the Total import/export Transfer Capability (TTC) and Available Transfer Capability (ATC) of the state. Further Grid Code 2023 at Regulation 44(1)(e)(iii), 44(2)(e), 44(3)(f) provides that SLDCs, RLDCs and NLDC shall assess TTC/ATC at least three months in advance for their respective control areas.
 - 1.2. A harmonious reading of all the provisions in GNA regulations and Grid Code 2023 indicates that transfer capability by SLDCs, RLDCs and NLDC shall be assessed and declared 11 (Eleven) months in advance for each month on a rolling basis.
 - 1.3. The procedure lays down the guidelines for the assessment of TTC and ATC for the import or export of different states/union territories, intra-regional/inter-state level, inter-regional system & cross- border interconnections.

2. Scope:

The procedure shall apply to all Users, State Load Despatch Centres (SLDCs), Regional Load Despatch Centres (RLDCs), National Load Despatch Centre (NLDC), Central Transmission Utility (CTU), State Transmission Utilities (STUs), Licensees, and Settlement

Nodal Agencies, to the extent applicable.

3. **Definitions:**

- 3.1. 'Available Transfer Capability (ATC)' means available power transfer capability across control areas or across regions or between ISTS and state network or between cross-border interconnections declared by the concerned load despatch centre for scheduling transactions in a specific direction with due consideration for the network security. Mathematically, ATC is the Total Transfer Capability Less Transmission Reliability Margin. [Grid Code 2023, Regulation 3(1) (10)]
- 3.2. 'Bid Area' is defined as the largest geographical area within which market participants are able to exchange energy without capacity allocation.
- 3.3. 'Congestion' means a situation where the demand for transmission capacity or power flow on any transmission corridor exceeds its Available Transfer Capability [Grid Code 2023, Regulation 3(1) (32)]
- 3.4. 'Control Area' means an electrical system bounded by interconnections (tie lines), metering and telemetry which controls its generation and/or load to maintain its interchange schedule with other control areas and contributes to the regulation of frequency. [Grid Code 2023, Regulation 3(1) (32)]
- 3.5. 'Credible contingency' means the likely to happen contingency, which would affect the Total Transfer Capability of the inter-control area transmission system [CERC Measures to relieve congestion in realtime operation Regulations, 2009 – Definition: 2(1)(f)]
- 3.6. 'Interconnection Study' means a joint system study to be carried out by LDCs for assessment of the impact of energization of new elements in the grid six months in advance as per Regulation 10 (3) of Grid Code 2023 .
- 3.7. 'Limiting Constraint' is the limitation on one or more transmission elements that may be reached during normal operation or contingency beyond which the security criteria would be violated.
- 3.8. 'Prolonged outage' means planned or forced shutdown of a transmission element or generator for more than 7 days.
- 3.9. 'System constraint' is a situation in which there is a need to prepare and activate a remedial action in order to respect operational security limits. [Grid Code 2023, Regulation 3(1) (121)]

3.10. 'Swing bus' means the bus designated in the load-flow study to balance the active power (P) and reactive power (Q) of the system by absorbing/supplying the same.

3.11. "Total Transfer Capability (TTC)" means the amount of electric power that can be transferred reliably over the inter-control area transmission system under a given set of operating conditions considering the effect of the occurrence of the worst credible contingency. [Grid Code 2023, Regulation 3(1) (128)]. The characteristics of Total Transfer Capability are as follows:

- a) TTC is dependent upon the network topology, point and quantum of injection /drawl and power flows in other paths of the interconnected network as well as the prevailing voltage profile in the network during the assessment period.
- b) TTC is directional in nature and the transfer capability for the import of power in a region or control area from another region or control area may be different from the transfer capability for the export of power from that region or control area to the other region or control area.
- c) Total Transfer Capability is time variant and there could be different figures for different times of the day/month/season/year.
- d) Transfer Capability is mentioned in MW.

3.12. "Transmission Reliability Margin (TRM)" means the amount of margin earmarked in the total transfer capability to ensure that the interconnected transmission network is secure under a reasonable range of uncertainties in system conditions. [Grid Code 2023, Regulation 3(1) (130)]

3.13. 'Unit commitment' means committing generating units while respecting unit operating characteristics as specified in Grid Code 2023 or standards issued by CEA

Any words mentioned in this procedure and not explicitly defined shall have the meaning assigned to them under the Act or other regulations specified by the Central Commission, or Central Electricity Authority as the case may be.

4. Roles and responsibility and Timeline for Data sharing & TTC/ATC calculation:

4.1. For calculation of the T-GNA margin eleven months in advance, declaration of TTC needs to be done keeping a clear gap of eleven months. Hence TTC assessment and declaration for month 'M' month shall be done before the end of month 'M-12'.

4.2. NLDC shall declare the time of the day corresponding to cardinal points of the

anticipated aggregate All India demand for any particular month, “M” (for which the transfer capability is to be assessed). The time of the day shall be declared by NLDC by the 3rd day of month “M-12”. These time instants shall be used for simulation base case preparation and subsequent transfer capability assessment & inter-connection studies.

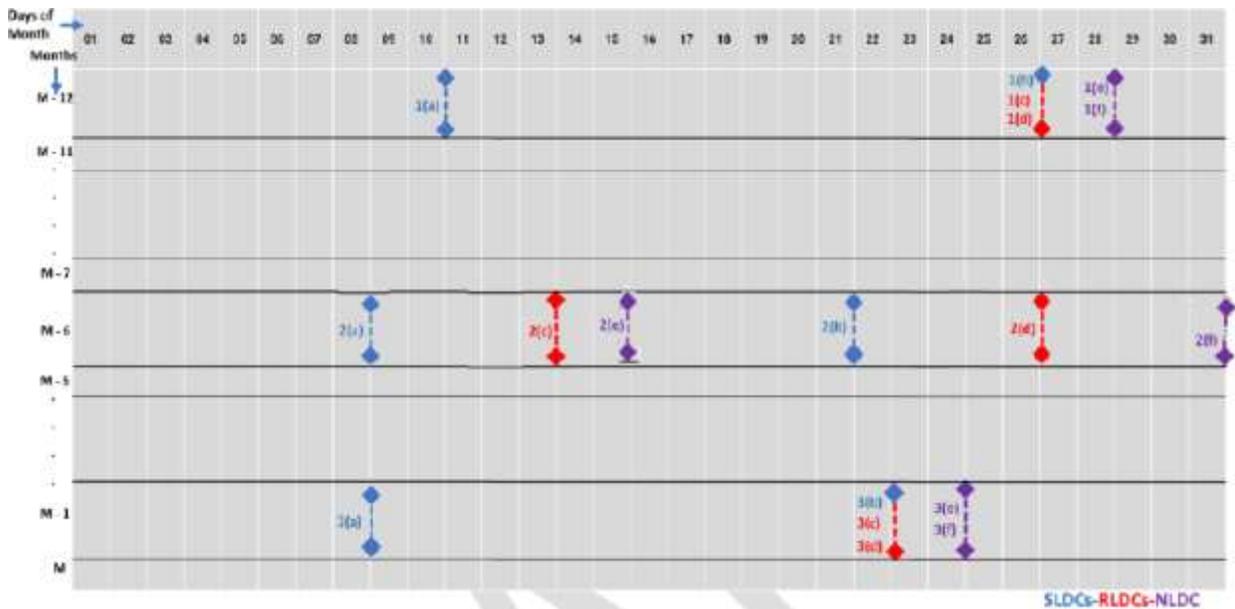
4.3. Detailed roles and responsibilities for Load Dispatch Centers in various timelines are provided in the table below.

| Purpose | SI No | Action of Stakeholder | Responsibility | Submission to | Data/Information Submission Time line |
|--|-------|--|----------------|---------------|---------------------------------------|
| 1. Revision 0 TTC/ATC Declaration for Month ‘M’ | 1(a) | Submission of node wise Load and generation data along with envisaged scenarios for assessment of transfer capability | SLDC | RLDC | 10 th Day of ‘M-12’ month |
| | | Assessment of TTC/ATC of the import/export capability of the state and intra-state system and sharing of updated network simulation models | | | |
| | 1(b) | Declaration of TTC/ATC of the intra-state system by SLDC in consultation with RLDC | | | 26 th Day of ‘M-12’ month |
| | 1 (c) | Updating state and regional load & generation & modelling of inter-state & intra-state elements in the regional system base case | RLDCs | NLDC | 26 th Day of ‘M-12’ month |
| | 1 (d) | Assessment and declaration of TTC/ATC by RLDC for the intra-regional and interstate system & sharing of network simulation models | | | |
| | 1 (e) | Update the All-India network model with inputs from RLDCs/SNA | NLDC | RLDCs | 28 th Day of ‘M-12’ month |
| | 1(f) | Assessment and declaration of inter-regional, bid area and cross-border TTC/ATC on the website | | | |

| Purpose | SI No | Action of Stakeholder | Responsibility | Submission to | Data/Information Submission Time line |
|---|---|--|----------------|---------------|---------------------------------------|
| 2. Interconnection Studies for elements to be integrated in the month 'M' | 2(a) | Submission of node-wise load and generation data & sharing of network simulation models for intra-state elements coming in the next six months | SLDC | RLDC | 8 th Day of 'M-6' month |
| | 2(b) | Sharing of inter-connection study results | | | 21 st Day of 'M-6' month |
| | 2(c) | Updating state and regional load & generation & modelling of inter-state & intra-state elements coming in the next six months in the regional system base case | RLDCs | NLDC | 13 th Day of 'M-6' month |
| | 2(d) | Sharing of inter-connection study results | | | 26 th Day of 'M-6' month |
| | 2(e) | Update the All-India network model for interconnection studies | NLDC | RLDCs | 15 th Day of 'M-6' month |
| | 2(f) | Completion of inter-connection study for elements coming in the next six months | | | Last Day of 'M-6' month |
| 3. Month Ahead TTC/ATC Declaration & Base case for Operational Studies for Month 'M' | 3(a) | Submission of node wise Load and generation data along with envisaged scenarios for assessment of transfer capability | SLDC | RLDC | 8 th Day of 'M-1' month |
| | | Assessment of TTC/ATC of the intra-state system and sharing of updated network simulation models | | | |
| | 3(b) | Declaration of TTC/ATC of the intra-state system in consultation with RLDC | SLDC | RLDC | 22 nd Day of 'M-1' month |
| | 3(c) | Updating state and regional load & generation and modelling of inter-state & intra-state elements in the regional system base case | RLDCs | NLDC | 22 nd Day of 'M-1' month |
| 3(d) | Assessment and declaration of TTC/ATC for the intra-regional and interstate system & sharing of network simulation models | | | | |

| | | | | | |
|--|------|--|------|-------|-------------------------------------|
| | 3(e) | Update the All-India network model with inputs from RLDCs/SNA | NLDC | RLDCs | 24 th Day of 'M-1' month |
| | 3(f) | Assessment and declaration of inter-regional and cross-border TTC/ATC on the website | | | |

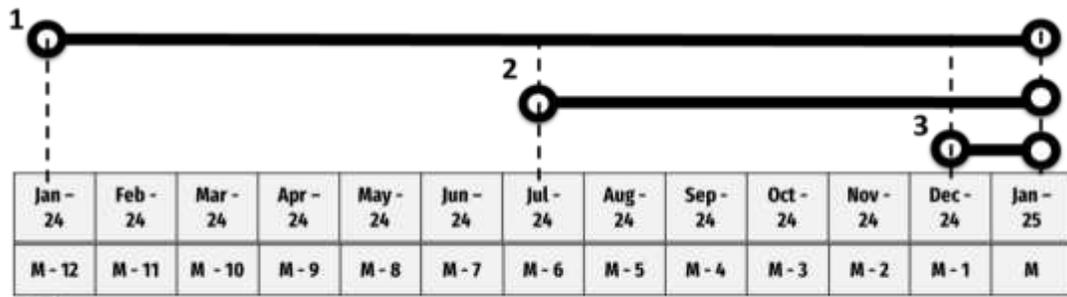
4.4. Timelines for data collection, Base Case Preparation, declaration of TTC/ATC and its review for a typical month 'M' is depicted below. The serial numbers marked for each month in the figure below correspond to the those given against responsibilities of Table in clause 4.2 of this procedure.



4.5. Every month, three sets of different base cases shall be prepared by all the concerned LDCs.

- a) Base cases for Revision - 0 TTC/ATC Declaration
- b) Base cases for Interconnection Studies for new elements to be integrated.
- c) Base cases for Month Ahead TTC/ATC Declaration & Operational Studies

The limiting cases used for the assessment of Transfer Capability shall also be shared along with the base cases. The yearly timeline for base case sharing for TTC/Inter-connection study is given below:



Preparation of 3 Sets of Simulation Base-Cases

1. Base cases to be prepared in **Jan 2024** for Revision – 0 TTC/ATC Declaration for **Jan 2025**
(For TTC Declaration)
2. Base cases to be prepared in **July 2024** for 6 Month Ahead Interconnection Studies for elements to be integrated in **January 2025**
(For Interconnection Studies)
3. Base cases to be prepared in **December 2024** for 1 Month Ahead TTC/ATC Declaration & Operational Studies for **January 2025**
(For TTC Declaration and Operational Planning Studies)

5. Methodology for assessment of TTC, TRM and ATC

- 5.1. The Total Transfer Capability (TTC), Available Transfer Capability (ATC) and Transmission Reliability Margin (TRM) for both import & export shall be computed for all the States/Union Territories (UT), Intra-regional/Inter-state level, Inter-regional system, Cross-border interconnections and bid areas. The bid area can also be a part of the Region/State/UT or any combination of the same. The bid area shall be separately defined from time to time as per operational/commercial requirements.
- 5.2. The TTC, ATC and TRM shall be assessed with the help of simulation studies such that all anticipated operating conditions in a particular month are covered. For this, the TTC computation studies may be carried out for at least following four time periods (i.e. considering the load-generation balance of four cardinal points on the monthly load curve or the sum of the absolute value of interregional/regional flow or both depending on the bid area in consideration for TTC assessment) of a typical day of the month.
 - a) Solar Peak
 - b) Non-Solar Peak
 - c) Non-Solar Off-peak
 - d) Morning Peak Demand

If required, further granular resolution i.e. hourly, sub-hourly (15 min.) may also be considered for TTC

assessment and declaration. This shall be in line with Grid Code 2023, Regulation 31(2)(d) under Operational planning.

- 5.3. Separate limiting cases for computing the export and import capability corresponding to preferably four load-generation scenarios (as specified in point 5.2 above) for the time frame for which transfer capability is to be assessed shall be used in the simulation studies. If additional study cases, apart from the ones prepared for 04 time periods are prepared, then the same shall also be shared by the concerned SLDC with concerned RLDCs and vice-versa.
- 5.4. **Modelling of Power System:** The TTC assessment simulation studies will require setting up of a power system model and obtaining a power flow solution. The construction of an accurate base case simulation model is of utmost importance for the accurate assessment of TTC. The modelling and input data guidelines to be followed for TTC assessment are as under:
 - 5.4.1 EHV transmission network shall be normally modelled down to at least 110 kV level with exceptions for generating units connected at lower voltage levels.
 - 5.4.2 Normally, all the conventional generating units greater than 50 MW and connected at 110 kV and above shall be modelled. Smaller generating units (particularly hydro) may be lumped for study purposes.
 - 5.4.3 For Renewable Energy (solar, wind, solar-wind hybrid) and Battery Energy Storage plants, equivalent modelling shall be done at 33 kV or higher voltage level. Attempts shall be made to model individual plants in the simulation cases to the extent possible. However, in the case of very small plants, the capacity can be lumped together at the nearest 33 kV or higher voltage level bus.
 - 5.4.4 Modelling data shall be shared by CTU, ISTS licensees, ISGS/IPPs, STUs/SLDCs and all other Users for carrying out interconnection studies. The models need to be submitted as per the formats prescribed in GRID-INDIA/NLDC's procedure for "*First Time Charging/Energization (FTC) and Integration of New or Modified Power System Element*".
 - 5.4.5 New transmission elements shall be considered only after the date of commissioning of that asset and duly considering their reliability during the initial operation period.

- 5.4.6 Whenever a new element is commissioned, depending on the jurisdiction of SLDC/RLDC/NLDC, the concerned LDC may add it to the network and a file for the same may be created and maintained. The automation file (such as Python scripts) will be shared with all other concerned LDCs.
- 5.4.7 The equipment ratings and models submitted by the users at the time of first-time charging/inter-connection study (or revised models submitted later) shall be considered in the assessment of transfer capability. In case any clarification is required regarding the model/rating of any equipment during transfer capability studies, the same shall be sought from the asset owner/user. The ratings of equipment will also be reviewed based on operational permissible loading and dynamic rating of the equipment from time to time.
- 5.4.8 Load shall be generally lumped at 110/132 kV, as the case may be. Actual system data wherever available shall be used for power system modelling. In cases, where data is not available, standard data as given in the CEA Manual on Transmission Planning Criteria shall be considered. The different components of load as constant power, constant current and constant impedance should be modelled as per the information available from users. In the absence of the above information load should be modelled as constant power load.

5.5 **Load Set – Point**

- 5.5.1 For the 1st time to build the All-India Base case in this format SLDC/RLDC may submit node-wise data as per *format-2* given at the end of this procedure. For the subsequent base-case preparation and simulation studies, the data shall be provided in the base-case itself or as per requirement.
- 5.5.2 Nodal MW demand shall be considered as per the node-wise load forecast provided by SLDCs. Independent load forecasts by RLDCs/NLDC shall be considered in case of the absence of SLDC data. For all four scenarios as mentioned above, node-wise demand must be updated. For overall demand estimation, LGBR finalized by RPC and the latest EPS data may be taken into consideration.
- 5.5.3 Nodal MVAR demand shall be as per the anticipated power factor provided by SLDCs or power factors as observed from the historical data for each node. This, however, shall be verified, post facto, with actual data, and if different, shall be revised for accurate assessment in the future. For all the four scenarios mentioned above node-wise reactive power demand must be updated.

5.5.4 Bulk consumer connected to ISTS/ having dual connectivity shall explicitly submit their net active and reactive power consumption/injection for all four scenarios to the respective RLDC.

5.6 Network Topology to be Considered for Base Case Preparation:

5.6.1 Outage plan for grid elements as finalized by RPC shall be considered during base case preparation for assessment of Transfer Capability. In case the same is not available, information available from respective utilities shall be considered.

5.6.2 Updated network topology shall be prepared by SLDCs/RLDCs/NLDC as per prevailing network configuration. If the updated network topology is not received from respective agencies, network details as available previously shall be used for TTC computation studies.

5.6.3 The transmission elements/generators under prolonged outage shall be considered in the simulation cases for assessment of Transfer Capability based on their expected date of revival in consultation with the concerned asset owner/utility.

5.7 Unit Commitment and Active Power Generation Dispatch:

5.7.1 The unit commitment (on-bar units) and source-wise dispatch in the base case shall be considered as per the output of Short-Term Resource Adequacy/Production Cost Modelling Studies carried out by states/ RLDCs/NLDC. In the absence of such information, LGBR and the annual generation outage plan published by RPCs in line with Grid Code 2023, Regulation 32(3)(b) may be considered along with the following source-wise dispatch methodology.

a) **Nuclear dispatch** shall be considered as per the past trend of Plant Load Factor available with Central Electricity Authority (CEA) or SLDCs/RLDCs/NLDC while suitably factoring in the maintenance schedule finalized by Regional Power Committees (RPCs).

b) **Solar and wind dispatch** shall be considered based on the historical dispatch factors available with SLDCs/RLDCs/NLDC corresponding to each study scenario. For newer plants, either the profile data available as specified in CEA's Manual on Transmission Planning Criteria or the historical dispatch of nearby existing plants may be considered.

c) **Hydro dispatch** shall be considered as per the past trend available at SLDCs/ RLDCs/NLDC. The current inflow pattern shall also be suitably considered in the studies.

- d) **Gas Dispatch** shall be considered as per the past trend of Plant Load Factor available with Central Electricity Authority (CEA) or SLDCs/RLDCs/NLDC while suitably factoring in the maintenance schedule finalized by Regional Power Committees (RPCs).
- e) **Coal-fired thermal dispatch** for the state/regional/control area/bid area may be arrived at after deducting the anticipated generation of other sources from the total anticipated generation requirement. While deciding the distribution of thermal generation, the merit order dispatch of thermal generators shall be considered.

Further, the generation shall be considered as per the anticipated ex-bus generation of the thermal generating units arrived after deducting a normative auxiliary consumption as per the norms specified by the Central Commission and suitably factoring in the maintenance schedule finalized by Regional Power Committees (RPCs). Distribution of thermal dispatch between state sector generators and ISGS shall be decided in consultation with states/past trends over and above merit order dispatch.

- f) Injection/Drawl value of cross-border connection will be set as per historical pattern. Apart from the historic pattern, data received from SNA/DA for additional contracts for all four scenarios shall also be considered.
- g) In case, the data from any of the sources mentioned above is unavailable or in case of additional data requirement, reasonable assumptions shall be made.

5.8 **Reactive power dispatch:**

- 5.8.1 For generating units, reactive power dispatch shall be considered as per the declared generator capability curve or demonstrated generator capability curve from the historical data. In the absence of such data, assumptions recommended in the extant CEA's Manual on Transmission Planning Criteria may be taken. The MVAR absorption of the Generator transformer (GT) shall be considered for implicitly modelled GTs.
- 5.8.2 The reactive power reserves of FACTS devices in the base case under steady-state shall be preserved to the extent possible so as to provide maximum dynamic support.
- 5.8.3 In the case of LCC HVDC links, the switching of HVDC Filter banks shall be done in the base case as per the filter switching sequence of the converter station depending on the HVDC power order.

5.9 For arriving at the Total Transfer Capability value of a control area/bid area, load and generation shall be changed for both importing and exporting areas in the base cases (incremental dispatch) as per the following methodology.

5.9.1 **Import Transfer Capability:** While calculating the import transfer capability of a control/bid area, the load of the control/bid-area shall be kept considering the peak demand scenario. Then the load of the importing area(s) may be increased and/or generation of the importing area(s) may be backed down as per reverse merit order for conventional generators & commensurate generation outside the area shall be increased. This process shall be continued till a credible N-1 contingency causes some limiting constraint in the importing/exporting area or joining both areas.

5.9.2 **Export Transfer Capability:** While calculating the export transfer capability of a control/bid area, the load of the control/bid-area shall be kept considering the off-peak demand scenario. Then the load of the exporting area may be decreased or generation of the exporting area(s) may be increased as per merit order and a commensurate decrease in generation will be done outside the area. This process shall be continued till a credible N-1 contingency causes some limiting constraint in the importing/exporting area or joining both areas.

5.10 Following points shall be considered while assessing the import & export transfer capability

5.10.1 Reserve requirements/technical minimum should be honored during scaling up/down of generation

5.10.2 The dispatch of swing bus generators in the load flow solution results shall be within their technical maximum/minimum limits.

5.10.3 The swing bus in the load flow studies shall be located outside the importing/exporting area in the transfer capability assessment.

5.11 The credible N-1 contingencies considered in the TTC/ATC studies shall be as specified in the latest CEA Manual on Transmission Planning Criteria.

5.12 In the studies, the worst credible contingency shall be considered to ensure the following limits:

a) Equipment Loading (Thermal or any other operational Limit)

b) Voltage Stability

c) Transient Stability

5.13 During the assessment of Total Transfer Capability, it shall be ensured that the Reliability Criteria specified for N-1 and N-1-1 contingencies in the latest CEA Manual on Transmission Planning Criteria are satisfied.

5.14 Power Order and direction of the HVDC links shall be based on the envisaged scenarios and capability of the HVDC link. The same may also be modulated in the base-case for the particular scenario based on the power flow in AC lines/ICTs & bus voltages.

5.15 The Transmission Reliability Margin (TRM) shall be kept within the total transfer capability to ensure that the interconnected transmission network is secure under a reasonable range of uncertainties in the system conditions. Computation of TRM for a region, control area or group of control areas may be based on the consideration of the following:

5.15.1 Size of largest generating unit in the importing control or bid area/group of control or bid areas

5.15.2 Two per cent (2%) of the total anticipated peak demand met in MW of the control/bid area/group of control or bid areas (to account for forecasting uncertainties).

Provided that either of the above TRM values may be decided by the concerned LDC to ensure the reliability of the system under prevailing system conditions.

5.16 For base case preparation and simulation studies for transfer capability assessment of intra-state system, the realistic set points for HVDC and any other ISTS points may be varied by respective NLDC/RLDCs/SLDC after mutual consultation.

6. **Declaration of TTC, TRM, ATC and Anticipated Constraints**

6.1. The State Load Despatch Centres (SLDCs), in consultation with Regional Load Despatch Centres (RLDCs) shall assess & declare the Transfer Capability for the import or export of electricity by the State.

6.2. The Regional Load Despatch Centres (RLDCs), in consultation with State Load Despatch Centres

(SLDCs) & National Load Despatch Centre (NLDC) shall assess & declare the Transfer Capability for intra-regional and inter-state level.

- 6.3. The National Load Despatch Centre (NLDC) shall assess & declare the Transfer Capability for inter-regional systems and cross-border interconnections.
- 6.4. SLDCs/RLDCs/NLDC shall declare the assessed Transfer Capability for both export and import scenarios on their website with the following information
 - a) Total Transfer Capability (TTC)
 - b) Available Transfer Capability (ATC),
 - c) Transmission Reliability Margin (TRM),
 - d) Limiting constraints and limiting elements
 - e) Assumptions in the base case for assessment of Transfer Capability,
 - f) Details of the reason for the revision of the Transfer Capability
- 6.5. The National Load Despatch Centre (NLDC), Regional Load Despatch Centres (RLDCs) and State Load Despatch Centre (SLDCs) shall refer to the quantum declared by CTUIL while assessing the TTC, TRM and ATC for the purpose of grant of GNA.

Sample format for declaration of TTC/TRM/ATC is enclosed as **Format-I**.

- 6.6. NLDC and/or concerned RLDCs/SLDCs in consultation with each other may revise the TTC, ATC and TRM of respective areas due to changes in system conditions, which includes changes in network topology or changes in anticipated active or reactive generation or load, on account of outage or otherwise, of one or more generators or transmission elements, at any of the nodes in the study. Revised TTC, TRM and, ATC shall be published on the website of NLDC, concerned RLDCs and SLDCs and shall clearly state the reasons for revision thereof.
- 6.7. The TTC, ATC and TRM may also be revised near the operating horizon depending on the anticipated system conditions at that time.
- 6.8. SLDCs / RLDCs / and NLDC shall designate Main and Alternate officers as *“Reliability co-coordinator(s) for TTC Computation and Declaration”*.

7. Study of the impact of new elements on TTC Transfer Capability

- 7.1. Each LDC shall study the impact of new elements on the Transfer Capability as per the relevant regulations of Grid Code 2023, (Operating Code: Regulation 33(9) to 33(13)) for interconnection study for new power system elements.
 - 7.1.1. Each SLDC shall undertake a study on the impact of new elements to be commissioned in the intra-state system in the next six (6) months on the TTC and ATC for the State and share the results of the studies with RLDC.
 - 7.1.2. Each RLDC shall undertake a study on the impact of new elements to be commissioned in the next six (6) months in (a) the ISTS of the region and (b) the intrastate system on the inter-state system and share the results of the studies with NLDC.
 - 7.1.3. NLDC shall undertake study on the impact of new elements to be commissioned in the next six (6) months in (a) inter-regional system, (b) cross-border link and (c) intraregional system on the inter-regional system.
- 7.2. Timelines and methodology of the interconnection studies are to be followed as per “Procedure for Carrying Out Interconnection Studies of New Power System Elements” notified by NLDC.
- 7.3. Any major impact on TTC figure by the commissioning of a new element needs to be notified to the concerned utilities

Format-I

National / _____ Regional/ State Load Dispatch Centre **TOTAL TRANSFER**
CAPABILITY FOR MMM, YYYY _____

Issue Date:

Issue Time:

Revision No.

| Corridor/ Control Area | Date | Time Period | Time Blocks | Total Transfer Capability (TTC) (MW) | Reliability Margin (RM) (MW) | Available Transfer Capability (ATC) (MW) | Appr oved GNA (MW) | Margin for T- GNA (MW) | Change sin TTC w.r.t last revisio n | Remar ks |
|------------------------------|------|----------------|----------------|--|------------------------------------|--|-----------------------------|---------------------------------|---|-------------|
| | | Period-1 | | | | | | | | |
| | | Period-2 | | | | | | | | |
| | | Period-3 | | | | | | | | |
| | | Period-4 | | | | | | | | |
| | | | | | | | | | | |
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Assumptions:

A. Aggregate Load and Generation (MW)

| Region/State/Bid-Area | | Scenarios | | | |
|-----------------------|------------|-----------|----------|----------|----------|
| | | Period 1 | Period 2 | Period 3 | Period 4 |
| | Load | | | | |
| | Generation | | | | |

B. HVDC Settings

| Name of the HVDC Link | Direction of Operation | Power Order (MW) |
|-----------------------|------------------------|------------------|
| | | |
| | | |
| | | |

C. Constraints

| Corridor / Control Area | Limiting Constraints for TTC |
|-------------------------|------------------------------|
| | |
| | |
| | |

D. Revision History

| Revision Number | Date of Revision | Reason for Revision | Corridors Involved |
|-----------------|------------------|---------------------|--------------------|
| | | | |
| | | | |
| | | | |

E. Miscellaneous

Format-II (Node Wise Load Details)

| Bus Number | Bus Name | S/s name | In Service | Morning Peak | | Solar Peak | | Evening Peak | | Off-Peak | |
|------------|----------|----------|------------|--------------|--------------|------------|--------------|--------------|--------------|------------|--------------|
| | | | | Pload (MW) | Qload (Mvar) | Pload (MW) | Qload (Mvar) | Pload (MW) | Qload (Mvar) | Pload (MW) | Qload (Mvar) |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Note: The formats are not exhaustive and may be changed suitably based on the requirement.