

**Procedure for
Computation and sharing of Inter-State Transmission System
Losses**

In compliance of

**Central Electricity Regulatory Commission
(Sharing of Inter-State Transmission Charges and Losses)
Regulations, 2020 and First Amendment thereof**

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**The Implementing Agency
(National Load Despatch Centre)**

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1.0 Outline and Scope

- 1.1 This procedure provides the detailed methodology for application of the inter-State transmission system (ISTS) losses on the DICs for the purpose of scheduling power on the ISTS under GNA and T-GNA.
- 1.2 The ISTS losses as arrived as per this procedure shall be applied on all the Regional Entities in line with Regulation (10) of Central Electricity Regulatory Commission (Sharing of inter-State Transmission Charges and Losses) Regulations, 2020 and amendments thereof (hereinafter referred to as “Sharing Regulations 2020 and amendments thereof”). The entities embedded within the State jurisdiction shall have to share additional losses for using intra-State system as applicable in the respective control area.

2.0 Objective:

- 2.1 The procedure aims to provide methodology for computation of the transmission losses and accordingly finalize schedules for various State/ regional entity.
- 2.2 The procedure also aims to ensure that the computed transmission losses to be applied for scheduling of generation and demand under various contracts are as near to the actual transmission losses as possible.

3.0 Computation of Transmission Losses

- 3.1 As per methodology outlined in the Sharing Regulations 2020 and amendments thereof, Transmission losses for ISTS shall be calculated on All India average basis by the Implementing Agency for each week, from Monday to Sunday, as under:

$$\text{All India Average transmission Losses for ISTS} = \frac{\text{In} - \text{Dr}}{\text{Ir}} \times 100$$

Where,

‘In’ denotes sum of injection into the ISTS at regional nodes for the week;

‘Dr’ denotes sum of drawal from the ISTS at regional nodes for the week;

$$\text{Ir} = \text{In} - \text{ISre}$$

'ISre' denotes injection at ISTS by solar, wind, solar-wind hybrid, Hydro PSP and BESS Projects with following conditions:

- a) generation based on solar power resource for the useful life of the projects commissioned during the period from 1.7.2011 to 30.6.2017.
 - b) generation based on solar or wind power resources for a period of 25 years from the date of commercial operation, fulfilling the following conditions:
 - i. Such generation capacity has been awarded through competitive bidding; and
 - ii. Such generation capacity has been declared under commercial operation during the period from 1.7.2017 to 12.2.2018 for solar based resources or during the period from 30.9.2016 to 12.2.2018 for wind based resources; and
 - iii. Power Purchase Agreement(s) have been executed for sale of power from such generation capacity to the Distribution Companies for compliance of their renewable purchase obligation.
 - c) generation based on solar or wind power resources , for a period of 25 years from the date of commercial operation, fulfilling the following conditions:
 - i. Such generation capacity has been awarded through competitive bidding process in accordance with the guidelines issued by the Central Government; and
 - ii. Such generation capacity has been declared under commercial operation during the period from 13.2.2018 to 30.6.2023 or date of operation of the First amendment to these regulations, whichever is earlier; and
 - iii. Power Purchase Agreement(s) have been executed for sale of such generation capacity to all entities including Distribution Companies for compliance of their renewable purchase obligations.
 - d) generation based on solar, wind, solar-wind hybrid, Hydro PSP and BESS Projects whose bidding was completed on or before 15.1.2021 and which are declared under commercial operation within the date specified in their respective PPAs.
- 3.2 In case multiple the injection data of solar or wind generators are connected at a common connection point out of which some qualify under Regulation 13(1) and some doesnot qualify, prorata injection shall be considered for the purpose of Regulation 13(1) under ISre.
- 3.3 Notwithstanding above, where it is not possible to segregate the portion of solar/wind generation as applicable under (a) and (b) as above, ISre shall be considered as zero.
- 3.4 Drawal schedule of DICs shall be prepared as per provisions of the Grid Code taking into account the transmission losses of the week preceding the last week.

- 3.5 Transmission losses for ISTS shall be considered as zero while preparing injection schedule of DICs including that for Collective Transactions in the Power Exchanges.
- 3.6 The injection and withdrawal in the ISTS by the Regional Entities is metered with the help of Special Energy Meters (SEMs) installed at their interface boundary with ISTS. The SEM data is collected and processed weekly for the previous week starting from 0000 hours of Monday to 2400 hours of Sunday.
- 3.7 Each RLDC shall process the last week SEM data and shall send to IA by Thursday of each week for the purpose of computation of all India average transmission loss for ISTS.
- 3.8 The actual losses for All India shall be computed from the data of Injection and withdrawal for each time block by the Regional entities as computed from the SEMs installed at the Regional Entities' boundaries.
- 3.9 IA shall compile SEM data sent by each RLDC and shall prepare and calculate All India average transmission loss for ISTS.

4.0 Application of losses while scheduling of contracts

- 4.1 Based on the actual average weekly loss percentage computed as in Para 3.1 based on data of previous week (w-1), Implementing Agency shall declare average weekly loss to be used for scheduling during the subsequent week (w+1).
- 4.2 IA shall notify the all India average transmission loss for ISTS on its website on each Friday for application of calculated loss from Monday to Sunday of next week.
- 4.3 In case of any unforeseen extreme circumstances, in the absence of significant quantum of SEM data of any region, if it is not possible to compute All India average transmission loss for ISTS, then the notified ISTS loss of previous week shall continue to remain in force for scheduling for subsequent week.
- 4.4 Waiver of transmission losses shall be applicable as per clause 13(1) of Sharing Regulations, 2020 and amendments thereof and/or as per an specific order issued by CERC.
- 4.5 The losses once scheduled shall not be revised subsequently.

4.6 Scheduling of Transactions under GNA and T-GNA:

- 4.6.1 For the purpose of scheduling, transmission losses for ISTS is applicable to Drawee DICs only. Transmission losses for ISTS shall be considered as zero while preparing injection schedule of DICs including that for Collective Transactions in the Power Exchanges.

- 4.6.2 The net drawal schedule of a drawee DIC from an injecting DIC shall be computed by deducting the percentage loss applicable as illustrated below:

Illustration

Say X, Y, Z are the injecting DICs (with Installed Capacity of 100 MW each). Let 'A' be drawee DIC with 'L' being the average all India transmission loss. Let 'A' has 25% share in each injecting DIC 'X', 'Y', 'Z' .

Suppose on a day for a block, 'A' has requisitioned full power from each generator (X,Y,Z). Suppose X,Y,Z has no schedule from any buyer other than A and A has no schedule other than X,Y,Z. Then the ex-bus schedule of X,Y,Z in any 15-minute time block of the day would be 25MW each.

The net drawal schedule of 'A' at its periphery with ISTS in same block would be $25*(1-L/100)+ 25*(1-L/100)+ 25*(1-L/100)$.

- 4.6.3 The total losses attributable to the drawee DIC shall be shown in one separate column along with different ex-bus power plant schedule from each injecting DIC for each 15 minute time block to compute the net drawal schedule of the drawee DIC in that time block.

4.7 Scheduling of Bilateral and Collective transactions under T-GNA

- 4.7.1 For all transactions under this category, ISTS transmission losses shall be applied on drawee DIC only. Accordingly, the drawee DIC shall draw contracted quantum of power after deducting the applicable losses.
- 4.7.2 In case the DIC is embedded within a State Control Area, loss in that State control Area loss shall be in addition to the above ISTS losses for each embedded entity, the schedule of the drawee embedded entity shall be further scaled down by the applicable losses of that State. Further, the schedule of injecting embedded entity shall be scaled up by the applicable losses of that State.

4.8 Computation of Inter-Regional Schedules for Bilateral and Collective transactions under T-GNA

- 4.8.1 The contracted power shall be at the ex-bus of regional control area. All schedules of the injecting and drawee DICs at their respective bus-bars/ State boundaries (in the case of embedded entity) shall be arrived at by applying the transmission losses of drawee DIC. The sample calculation of schedule at the inter-regional boundaries is illustrated below:

Example: Let the Injecting DIC is located in Region-1 and the power is wheeled through Region-2 and the Drawee DIC is located in Region-3.

Let the contracted quantum power be P.
Let All India average loss percentage be 'L'.

Then the injecting DIC must inject 'P'

The schedule at the inter-regional boundary between Region-1 and Region-2 shall be P and that between Region-2 and Region-3 shall also be P.

The schedule of drawee DIC shall be $= P * \left(1 - \frac{L}{100}\right)$
