
Sharing of Inter-State Transmission Charges and Losses – Regulations 2010

**National Load Despatch Centre
Power System Operation Corporation**

Introduction

- **Notification of Regulations : 15th June 2010**

- **Applicable to:**
 - Designated ISTS Customers
 - Inter State Transmission Licensees
 - NLDC, RLDC, SLDCs, and RPCs **Regulation 1(2)**

- **Regulations shall come into force from 1.1.2011**
 - For a period of 5 years unless reviewed or extended by the Commission **Regulation 1(3)**

Application Period

“ Application Period means the period of application of the charges determined as per these regulations and shall ordinarily be 12 (twelve) months coinciding with the Financial Year, which shall be further divided into **multiple blocks of months** representing the **seasonal conditions and peak and other than peak conditions**; “

Approved Injection

“Approved Injection means the injection in MW vetted by Implementing Agency (IA) for the Designated ISTS Customer for each representative block of months, peak and other than peak scenarios at the ex-bus of the generator or any other injection point of the Designated ISTS Customer into the ISTS, and determined based on the generation data submitted by the Designated ISTS Customers incorporating total injection into the grid, considering the long term and medium term contracts.”

Approved Withdrawal

“Approved withdrawal means the simultaneous withdrawal in MW **vetted by Implementing Agency** for any Designated ISTS Customer in a control area aggregated from all nodes of ISTS to which Designated ISTS Customer is connected, for each representative block of months, peak and other than peak scenarios at the interface point with ISTS, and where the Approved Withdrawal shall be determined based on the demand data submitted by the Designated ISTS Customers. incorporating long term and medium term transactions.”

Designated ISTS Customers

“Designated ISTS Customers (‘DIC’s) means the **users of any segments/elements of the ISTS** and shall include all generators, state transmission utilities, SEBs or load serving entities directly connected to the ISTS including Bulk Consumer and any other entity/person.”

Implementing Agency (IA)

“**Implementing Agency** shall mean the agency designated by the Commission to undertake the estimation of allocation of transmission charges and transmission losses at various nodes/zones for the Application Period along with other functions as per [Chapter-4, Chapter-5, Chapter-6, Chapter-7 and Chapter-8] of these regulations.”

Point of Connection (PoC) Charging Method

“Point of connection Charging Method shall mean the methodology of computation of sharing of ISTS charges and losses amongst Designated ISTS Customers, which depends on the location of the node in the grid and is calculated in accordance with Regulation 7(1(q)) and 7(1(s)) of chapter 4 of these regulations.”

Point of Connection (PoC) Transmission Charges

“Point of connection transmission charges are the nodal / zonal charges determined using the Point of Connection charging method.”

Participation Factor

“Participation Factor of a node in any transmission line means the percentage usage of that line by a node, whether a generator node or a demand node as explained in Annexure - 1 of these regulations.”

Transmission Service Agreement

“Transmission Service Agreement (TSA) shall mean the agreement to be entered into between the Designated ISTS Customer(s) and ISTS Licensee(s) in terms of Chapter 6 of these regulations.”

Uniform Charge

“Uniform charge means the charge determined by dividing the Yearly Transmission Charge of the ISTS Licensees by the sum of the Approved Injection and Approved Withdrawal from the grid alternatively referred to as the postage stamp charge.”

Yearly Transmission Charges

“Yearly Transmission Charge (YTC) means the Annual Transmission Charges for existing lines determined by the Commission in accordance with the Terms and Conditions of Tariff Regulations or adopted in the case of tariff based competitive bidding in accordance with the Transmission License Regulations as specified by the Commission and as in force from time to time and for new lines based on benchmarked capital costs.”

Regulation 3

YTC and losses shall be shared amongst following categories of DICs :

- **Power Stations / Generating Stations that are regional entities as defined in the Indian Electricity Grid Code (IEGC)**
- **State Electricity Boards / State Transmission Utilities connected with ISTS (on behalf of distribution companies, generators and other bulk customers connected to the transmission system owned by the SEB/STU/intrastate transmission licensee)**
- **Any bulk consumer directly connected with the ISTS**
- **Any designated entity representing a physically connected entity as per above clauses**

Principle of Sharing of ISTS Charges and Losses Chapter 3

Regulation 4

The Point of Connection charges and Loss Allocation Factors for all DICs shall be computed :

- ❑ Using Load Flow Based Method
- ❑ Based on Point of Connection Charging philosophy

- ❑ The sharing of the transmission charges and losses amongst the Designated ISTS Customers shall be carried out on the principles of Hybrid methodology detailed at Annexure 1 of these regulations.

Principle of Sharing of ISTS Charges and Losses Chapter 3

Regulation 5

Mechanism to Share ISTS Transmission Charges

- ❑ Computed Based on Technical and Commercial Information provided by DICs, ISTS Transmission Licensees, NLDC, RLDCs and SLDCs
- ❑ YTC of ISTS licensees are fully and exactly recovered
- ❑ Shall be computed for an application period in advance and subjected to periodic truing-up
- ❑ Charges for LT & MTOA Transaction : Rs/MW/Month
- ❑ Charges for STOA Transaction : Rs/MW/Hour

Principle of Sharing of ISTS Charges and Losses Chapter 3

Regulation 6

Mechanism to Share ISTS Transmission Losses

- ❑ Based on Technical and Commercial Information provided by DICs, ISTS Transmission Licensees, NLDC, RLDCs and SLDCs
- ❑ Schedules for DICs shall be adjusted by RLDCs/SLDCs to account for energy losses in Transmission
- ❑ To be apportioned based on loss allocation factors determined using hybrid methodology
- ❑ Shall be declared in advance and shall not be revised retrospectively

Process to Determine PoC Charges & Losses Chapter 4

■ Data Collection

Regulation 7(1)(a)

- ❑ DICs, Transmission Licensees to submit Basic Network Data

■ Network Data for Load Flow Analysis

Regulation 7(1)(b)

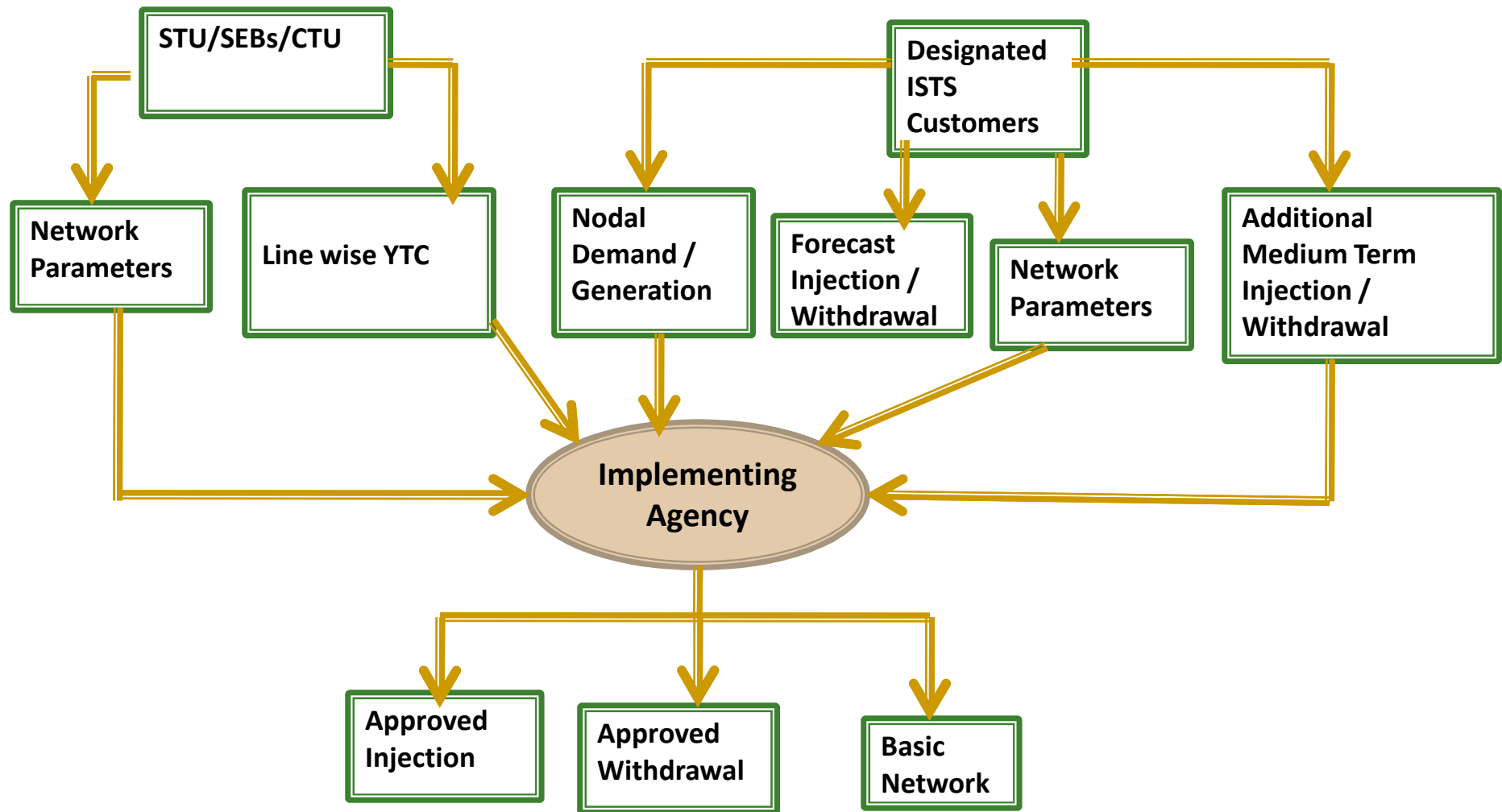
- ❑ Electrical Plant or line upto 132 kV
- ❑ Generators connected at 110 kV

■ Dedicated Transmission Lines

Regulation 7(1)(c)

- ❑ Owned and Operated by ISTS..... **Included in Basic Network**
- ❑ Owned and Operated by Generator....**Excluded**

Process to Determine PoC Charges & Losses Chapter 4



Flow Chart for Data Acquisition

Process to Determine PoC Charges & Losses Chapter 4

- **Nodal Generation / Demand** **Regulation 7(1)(d) / (e)**
 - Based on Forecast provided by DICs
 - Forecast Generation to be vetted by IA based on Historic Generation / Demand.
 - Changes in Generation /Demand to be Communicated to DICs

- **IA to perform AC Load flow** **Regulation 7(1)(h)**

- **Converged Load Flow results to be verified by Validation Committee** **Regulation 7(1)(i)**

Validation Committee

Regulation 7(1)(g)

- **Validation Committee Comprises two officials each from:**
 - ❑ Implementing Agency
 - ❑ National Load Despatch Centre
 - ❑ Regional Power Committee
 - ❑ Central Transmission Utility
 - ❑ Central Electricity Authority
 - ❑ Central Electricity Regulatory Commission

- **Nominee from Commission to Chair the Committee**

Process to Determine PoC Charges & Losses Chapter 4

Network Truncation by IA

Regulation 7(1)(k)

- Upto 400 kV except NER, where it shall be reduced to 132 kV
Annexure I, Clause 2.3
- Power inflow from Lower voltage Level : Generation Node
Annexure I, Clause 2.3
- Power outflow from Lower voltage Level : Demand Node
Annexure I, Clause 2.3
- AC Load Flow on Truncated Network
Annexure I, Clause 2.3

Treatment of HVDC

Annexure 1 Clause 2.7

- **Zero Marginal Participation for HVDC Line**
 - HVDC line flow regulated by power order.

- **MP Method can not recover its cost directly.**

- **HVDC line can be modeled as:**
 - Load at sending end
 - Generator at receiving end

Indirect Method for HVDC Cost Allocation

Annexure 1 Clause 2.7

- Compute Transmission Charges for all load and generators with all HVDC lines in service.
- Disconnect HVDC line and again compute new transmission charges for all loads and generators
- Compute difference between nodal charges with or without HVDC.
- Identify nodes which benefits with the presence of HVDC
- Allocate HVDC line cost to the identified nodes.

Process to Determine PoC Charges & Losses Chapter 4

- **Average YTC per circuit km shall be used for computation of charges** **Regulation 7(1)(l)**
- **YTC of substations to be apportioned in line** **Regulation 7(1)(m)**
 - ❑ 2/3 to higher voltage lines
 - ❑ 1/3 to lower voltage lines
 - ❑ Apportionment among lines on the basis of length.
- **PoC Charges to be computed for 5 blocks of month and peak and other the peak conditions** **Regulation 7(1)(o)**

Process to Determine PoC Charges & Losses Chapter 4

■ Representative Blocks of Months

Regulation 7(1)(o)

- April to June
- July to September
- October to November
- December to February
- March

■ Peak Hours : 8hrs

Regulation 7(1)(o)

Other the Peak Hours :16 Hrs

■ Average YTC to be apportioned to peak and other than peak based on the number of hours constituting these periods

Regulation 7(1)(p)

■ 50% recovery of transmission charges through Hybrid Methodology and 50% through Uniform Charge Sharing Mechanism

Regulation 7(1)(q)

Determination of losses

- Loss Allocation Factor to be computed for each season using Hybrid Methodology

Regulation 7(1)(r)

- 50% losses through Hybrid Method and 50% through Uniform Loss Allocation Mechanism

Regulation 7(1)(s)

- Weighted average of LAF for peak and other than peak conditions shall be used

Regulation 7(1)(s)

- Loss Application as per the Procedure prepared by NLDC

Regulation 7(1)(s)

Process to Determine PoC Charges & Losses Chapter 4

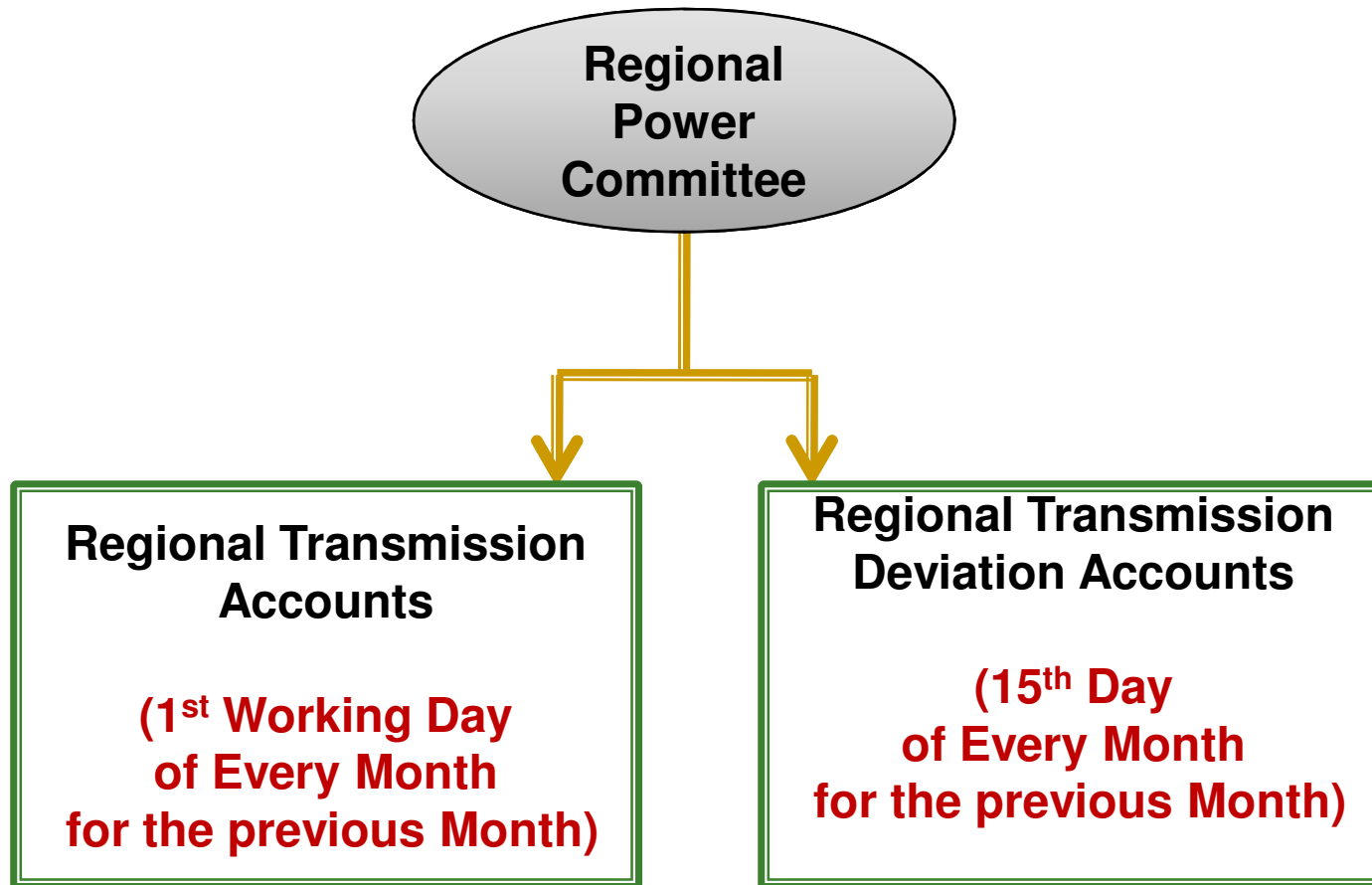
- **Criteria for Zoning of nodes:** **Regulations 7(1)(t)**
 - ❑ Zones shall contain relevant nodes with Costs in the same range
 - ❑ Nodes within zones shall be combined in a manner that they are Geographically and electrically proximate
 - ❑ Nodes with connectivity to Thermal Generators > 1500 MW or Hydro Generators > 500 MW to be taken as separate zones
 - ❑ Demand zones : State Control Area
 - Except NER states which are to be taken as one zone.

 - **Zonal Charges : Weighted Average of Nodal Charges**
Annexure I, Clause 2.2

 - **Revision of Zones in a financial year**
 - ❑ Significant Changes in Power System
 - ❑ Prior approval from commission by IA **Regulations 7(1)(t)(vi)**
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Accounting Billing and Collection of Charges Chapter 5

Accounting of Charges : Monthly accounts in each region shall be prepared by respective RPC **Regulation 10(1)**



Accounting Billing and Collection of Charges Chapter 5

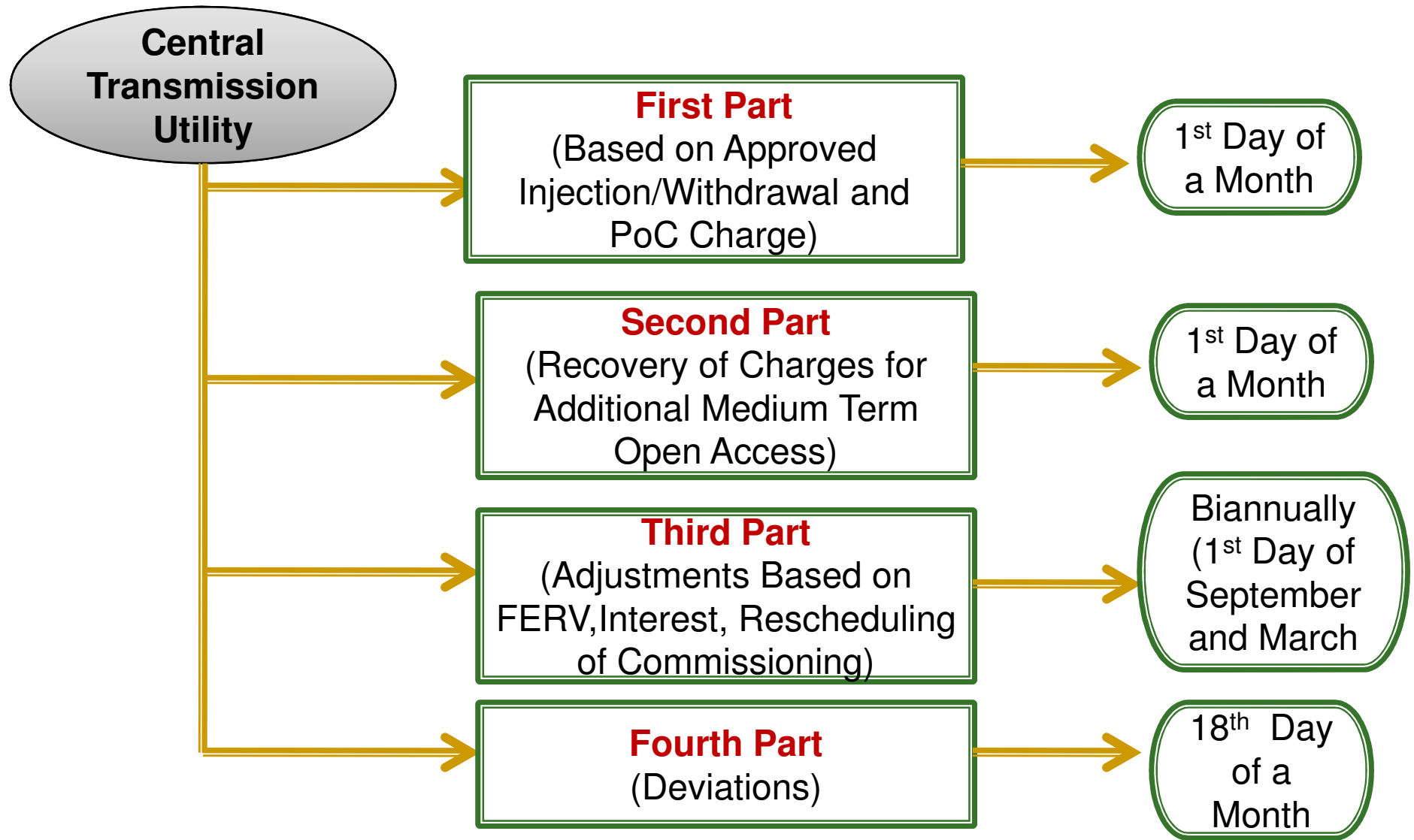
Billing :

- **Central Transmission Utility (CTU) shall be responsible for**
 - Raising the bills, collection and disbursement to ISTS licensees based on Accounts issued by RPC **Regulation 11(1)**

- **Bill to be raised only on DIC's**
 - SEB/STU may recover such charges from DISCOMs, Generators and Bulk Consumers connected to the intra-state system. **Regulation 11(2)**

- **The billing from CTU for ISTS charges for all DICs shall be :**
 - In 3 parts on the basis of Rs/MW/Month and;
 - the fourth part for deviations would be on the basis of Rs/MW/Block **Regulation 11(3)(7)**

Accounting Billing and Collection of Charges Chapter 5



Treatment of Deviations

Regulation 11(7)

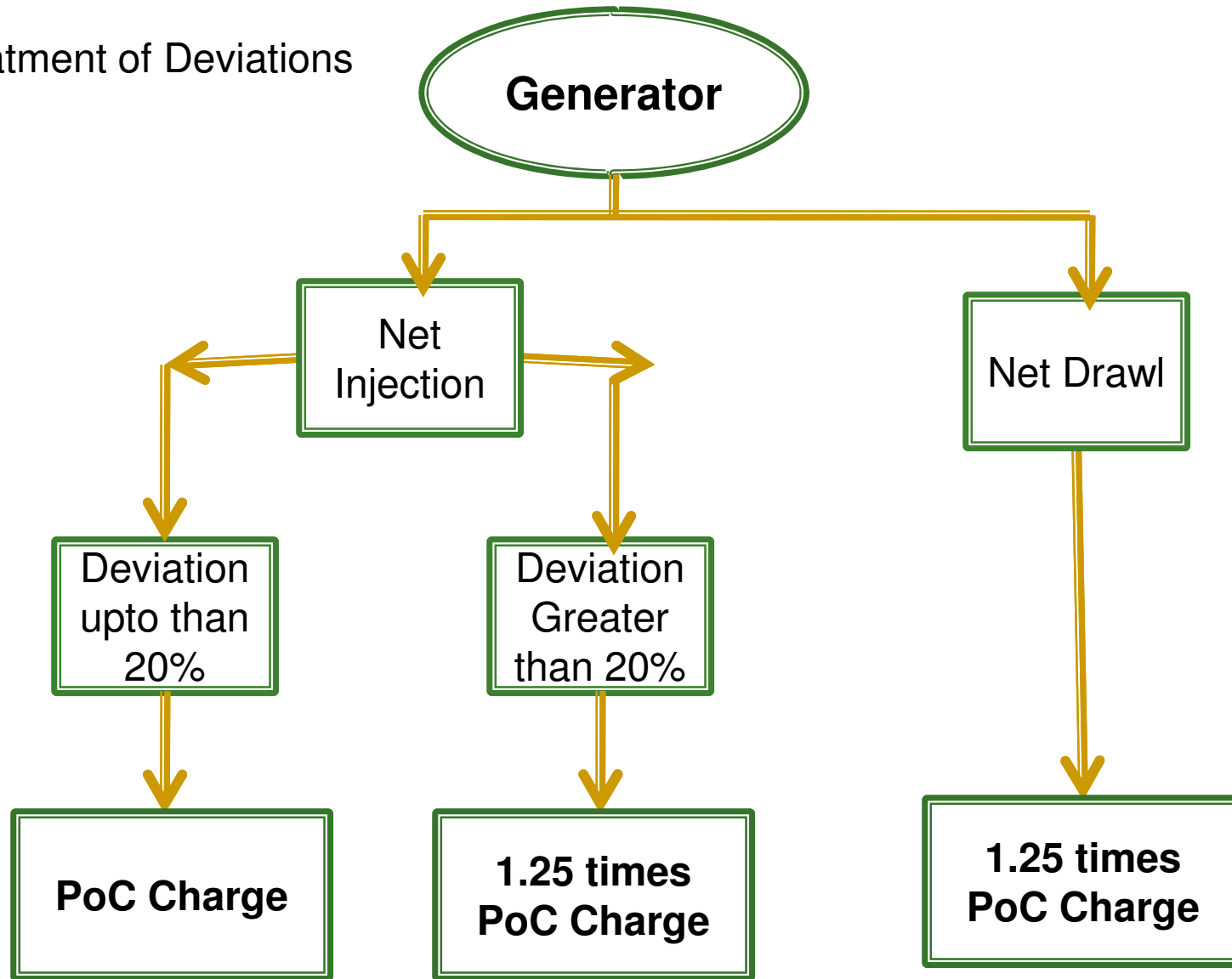
- Deviation Calculation shall be carried out after considering Short Term Open Access.

$$\text{Deviation} = \text{Metered MW} - (\text{Approved Injection/Withdrawal}) + (\text{Approved Additional Injection/Withdrawal}) + \text{Approved Short Term Open Access}$$

- Charge to be Calculated on Block wise Deviation
- Deviations by Generator shall not be charged to Long Term Customers
- No additional Charge for Deviations in case :
 - Rescheduling of Maintenance Schedule and Certified by RPC

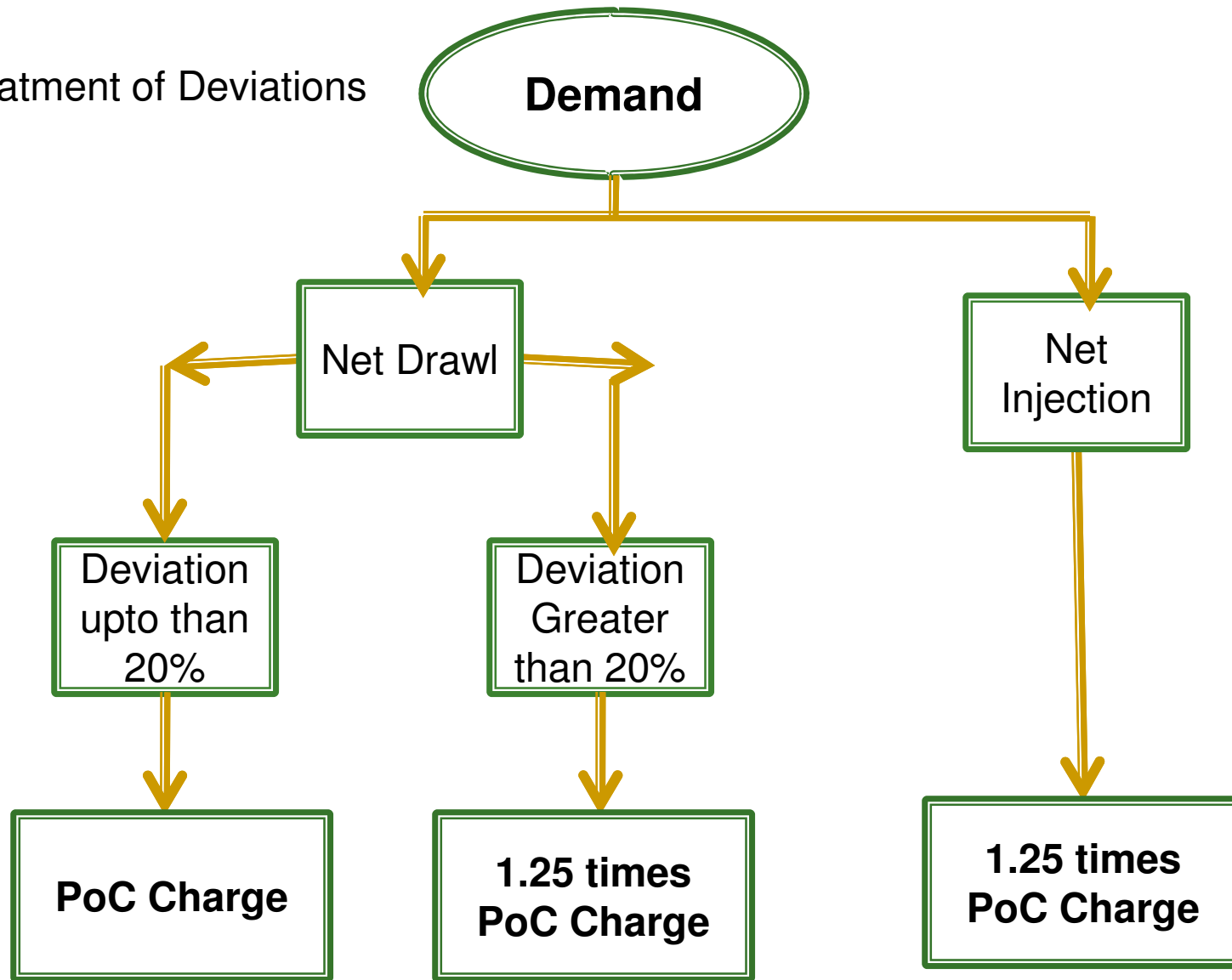
Accounting Billing and Collection of Charges Chapter 5

Treatment of Deviations



Accounting Billing and Collection of Charges Chapter 5

Treatment of Deviations



Accounting Billing and Collection of Charges Chapter 5

Collection and Disbursement

Regulation 14

- CTU to collect charges on behalf of ISTS service providers.
- CTU to disburse in proportion to Monthly Transmission Charges.
- Payment and Disbursement shall be executed through RTGS.
- Delayed Payments shall result in pro-rata reduction in all payouts
- Payment Security as per detailed procedure prepared by CTU

Transmission Service Agreement :

- Governs the provision of transmission services and charging for the same. **Regulation 13(1)**
- CTU shall publish the draft Model Transmission Service Agreement on its website and invite public comments on the same. **Regulation 13(2)**
- Signing of the Transmission Service agreement shall not be a pre-condition for construction of new network elements by the CTU and Transmission Licensees. **Regulation 13(7)**

■ Revenue Sharing Agreement

Regulation 13(9)

- CTU shall enter into a separate RSA with other ISTS Transmission Licensees for disbursing monthly transmission charges among various transmission licensees.

■ Amendments of Contracts

Regulation 14

- Realignment of all existing contracts within 60 days of notification of TSA

Information by DICs and other constituents

Regulation 16(1)

■ Data to be submitted by DICs

- ❑ YTC, Basic Network Details of ISTS, Deemed ISTS, Certified ISTS Lines
- ❑ Demand or Injection Forecast for each season
- ❑ On or Before the end of fourth week of November

■ Data to be submitted by CTU, Owners of Deemed ISTS and DICs

- ❑ Entire Network Data for first year of Implementation
- ❑ Dates and data of commissioning of any new transmission asset for subsequent years

Details of data submitted by DICs **Regulation 16(4)**

■ Injection and Withdrawal forecast for different blocks of months (Peak and Other than Peak):

- April to June..... (for May 15)
- July to September..... (for August 31)
- October to November..... (for October 30)
- December to February..... (for January 15)
- March..... (for March 15)

Regulation 16(4)(a)

■ In case the dates appearing in brackets fall on a weekend/public holiday, the data shall be submitted for working days immediately after the dates indicated.

Regulation 16(4)(b)

Information on Public Domain by IA **Regulation 17**

- **Approved Basic Network Data and Assumptions, if any**
- **Zonal or nodal transmission charges for each block of month**
- **Zonal or Nodal Transmission losses data**
- **Schedule of Charges payable by each constituent after undertaking necessary true up costs**

■ For First Two Years

Regulation 18(1)

- NLDC shall be Implementing Agency

■ Procedures to be prepared by IA

- Procedure for Data Collection
- Procedure for Loss Sharing
- Procedure for Transmission Charge Computation

Regulation 18(2)(3)

■ Expenses of IA to be included in YTC and approved by Commission

Regulation 18(4)

THANK YOU