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भारत सरकार केंद्रीयविद्युत प्राधिकरण **दक्षिण क्षेत्रीय विद्युत समिति** 29, रेसकोर्स क्रास रोड बेंगलूर- 560 009		Government of India Central Electricity Authority **Southern Regional Power Committee** 29, Race Course Cross Road Bengaluru- 560 009	
Email: mssrpc-ka@nic.in	Phone: 080-22287205	Fax: 080-22259343	
सं/No. SRPC/SE-I/SPM/2023/		दिनांक/ Date	**26.09.2023**

सेवा में / To

All Commercial Sub-Committee Members (as per the mailing list)

विषय/ Sub: Minutes of the Special Commercial Meeting on Reactive Energy Accounting held on 25.09.2023 in online mode - reg.

महोदय/ महोदया /Sir/ Madam,

The minutes of the Special Commercial Meeting on Reactive Energy Accounting held on 25.09.2023 in online mode are enclosed herewith for kind reference & necessary compliance by all concerned please.

भवदीय/**Yours faithfully**,

संलग्नक/ **Encl**: **यथोपरि**/ As above

(एन° आर° एल° के° प्रसाद / **N.R.L.K. Prasad**)
अधीक्षक अभियन्ता (वा)/ **Superintending Engineer (C)**

प्रेषिती सूची/Mailing List (Commercial Sub-Committee)

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20. केंद्र निदेशक, केकेएनपीपी, कुडंकुलम/ Station Director, KKNPP, Kudanakulam
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28. श्री एच एल चौधरी, एस वी पी (वाणिज्यिक)/ Shri H L Choudhary, SVP(Comml.), PTC India Limited, New Delhi.
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35. निदेशक, एन पी सी प्रभाग, केविप्रा, नई दिल्ली/Director, NPC Division, CEA, New Delhi.

Special Invitees:

All Regional Entity RE Generating Stations of Southern Region

Contents

SOUTHERN REGIONAL POWER COMMITTEE

BENGALURU

Minutes of the Special Commercial Meeting on Reactive Energy Accounting held on 25.09.2023 in on-line mode

1. Introduction

1.1 A Special meeting to finalize the Methodology & Procedure for carrying out Reacting Energy Accounting as per CERC (IEGC) Regulations, 2023 was held on 25.09.2023 in on-line mode. The list of participants is given at **Annexure-I**.

1.2 Member Secretary (MS), SRPC welcomed all Members & Participants to the Meeting, and informed that Reactive Energy Accounting for all Regional Entities including Generators has to be carried out as per CERC (IEGC) Regulations, 2023. He stated that as new Regional Entities would be included in Reactive Energy Accounting, the requisite Methodology & Procedure to carry out the same covering all nuances is proposed to be finalized in the meeting.

He added that as more and more Renewable Energy Sources are getting added into the system, issues relating to maintaining proper voltage profile would further increase, hence all Regional Entities need to contribute reactive power appropriately to maintain system voltages. He requested all Entities, viz., Conventional Generators, RE Generators, TRANSCOs, and DISCOMs and RE Plants to play their part and support the grid.

1.3 Executive Director (ED), SRLDC endorsed the views of MS, SRPC on the need to main proper voltage profile by all Regional Entities, and hoped that during the course of deliberations, all stakeholders would get a clear understanding of Reactive Energy Accounting as per IEGC, 2023 including de-pooling of Reactive Charges.

1.4 Superintending Engineer (Commercial), SRPC, then took up the Agenda Items for discussion.

2. Deliberations

2.1 The regulatory provisions for Reactive Energy Accounting (RE-Accounting) as per IEGC, 2010 and IEGC, 2023, and existing methodology & procedure for carrying out RE-Accounting were briefed to the forum by SE (Commercial), SRPC.

2.2 The following significant differences were noted:

SN	As per IEGC, 2010	As per IEGC, 2023
1	Applicable to All Regional Entities except Generating Stations	All Regional Entities including Generating Stations
2	Base Rate: 10 Paise/ kVArh from effective date Escalation Rate: 0.5 Paise/ kVArh/ per Year [Ref: Regulation-6.6 (2)]	Base Rate: 5 Paise/ kVArh from effective date Escalation Rate: 0.5 Paise/ kVArh/ per Year [Ref: Clause 1 (b) of Annexure-4]
3	Provision of Bilateral Settlement for state-owned lines (Natural ISTS Lines) [Mechanism as per Annexure-2]	No such Provision
4	Provision of Pro-rata Settlement (in case of 'Receivables to Pool' is less than 'Payments from Pool') [Clause-14 of Annexure-I]	No such Provision

2.3 It was explained that since apart from the regular Regional Entities, all Regional Entity Generators have to be considered, based on the latter's peculiarities, separate methodology & procedure have been proposed under three categories, viz., ISGS including Nuclear Stations, Regional Entity RE Generating Stations directly connected to ISTS, and Regional Entity RE Generating Stations indirectly connected to ISTS through Intermediate Pooling Station.

2.4 Pro-rata Settlement in case of 'Receivables to Pool' is less than 'Payments from Pool':

a) It was noted unlike IEGC, 2010, there is no provision for *pro-rata* settlement in case of "Receivables to Pool" is less than "Payments from Pool", and the respective amounts have to be settled directly with the Pool.

b) In this regard, SRLDC expressed concern regarding the possible deficit in the Pool Account arising on account of "Receivables to Pool" being less than "Payments from Pool".

c) On this, SRPC stated that since the Pool Account is common for DSM, AS and RE (Reactive Energy), actual scenario needs to be seen after RE-Accounting as per IEGC, 2023 is put in place. However, the concern of SRLDC was noted, and it was agreed to review at a later time when things warrant resorting to *pro-rata* settlement and it can be reported to Hon'ble Commission.

2.5 Treatment to Natural ISTS Lines:

a) W.r.t. Natural ISTS lines, it was explained that in line with Clause 2 (e) of Annexure-4 to IEGC, 2023, no bilateral account (for settlement) would be issued since the respective end-Nodes would have been covered in the Reactive Energy Accounting of respective end's Regional Entities.

b) It was clarified, accordingly, that the treatment to the state of Goa would be similar to any Regional Drawee Entity of Southern Region.

2.6 Treatment to PGCIL-HVDC Stations:

a) SRLDC enquired about including PGCIL-HVDC Stations in RE-Accounting. In this connection, it was noted that these stations drawl is as per MoP allocation, and they are part of ISTS system; as such they may not be considered for RE-Accounting.

b) After deliberations, it was agreed not to consider PGCIL-HVDC stations in RE-Accounting.

2.7 Treatment to Non-ISTS (STU) Lines emanating from ISGS including Nuclear Stations:

a) Since RE-Accounting is to be carried out for VAr exchanges with ISTS, it was originally proposed to consider only ISTS lines emanating from ISGS for carrying out its RE-Accounting.

b) SRLDC opined that since for improving voltage profile at a Node (ISGS Bus), all the evacuating (outgoing) lines emanating from ISGS Bus have a role to play; as such, from Grid perspective, all outgoing lines have to be considered in RE-Accounting. Even from ISGS side also, it was noted that an ISGS' performance w.r.t. Reactive Energy can be best measured by considering all its evacuating feeders.

c) W.r.t. above, views of all stakeholders were sought. NTPC, NLCIL and SR-States in general echoed SRLDC's opinion. After thorough deliberations, the following were agreed:

- For an ISGS, all evacuating Lines (at all Voltage levels) will be considered for its RE-Accounting.
- Since all Pay-ins and Pay-outs are w.r.t. the Pool, to balance/ even out the charges by virtue of RE-Accounting of non-ISTS lines from an ISGS as above, the same lines shall also be considered while carrying out RE-Accounting of the connected Regional Entities. That is for non ISTS lines between an ISGS and a Regional Entity, drawl by one end Entity is to be taken as injection by the other end Entity and vice versa (due to same metering point).

d) It was further clarified that this methodology would be applied even for line (s) connected between an ISGS and a State owned Generating Station. In this Case, the connecting line would be accounted for appropriately in the RE-Accounting of both the concerned ISGS and the concerned STU.

e) It was also clarified that RE-Accounting would be done irrespective of Generating Unit's Operating Status.

f) To a query from NPCIL-KKNPP regarding their being non-users of Pool Account, SRLDC was requested to register Nuclear Stations also for Pool Account, and intimate all relevant details to all NPCIL/ Nuclear Stations.

2.8 Based on the above conclusion, it was noted that while carrying out RE-Accounting of a Regional Entity, the line (s) directly connected to its ISGS shall also be considered.

2.9 RE Generating Stations:

a) Wr.t. RE Generating Stations connected either directly to ISTS Pooling Station or through Intermediate Pooling Station to ISTS Pooling Station, SRLDC suggested to consider Commissioned (COD declared) Capacity in place of Connectivity Capacity for de-pooling Reactive charges amongst various RE Generators. The same was discussed, and it was agreed that Commissioned Capacity limited to Connectivity Quantum shall be considered.

b) It was also agreed that all Capacity commissioned up to last day (Sunday) in the immediately preceding Week shall be considered for carrying out RE-Accounting of a Week.

Illustration: For carrying RE-Accounting of Second Week in a Month, the Commissioned Capacities up to the last day (Sunday) of the first Week in that Month shall be considered. And the corresponding Weekly RE-Account will be issued by Second Day (Tuesday) of the fourth Week in that month.

c) W.r.t. RE Generating Station(s) directly connected to ISTS Pooling Station, the appropriateness of de-pooling Reactive charges on the basis of Commissioned Capacities was discussed.

- It was clarified that the stated methodology is to keep things simple, and is also due to non-availability of SEM Data at respective Generators' end.
- However, it was suggested that the concerned RE Generators may enter into a formal Agreement for using a suitable methodology mutually agreed by them for de-pooling Reactive charges. In this connection, it was also suggested that they may use the Methodology proposed for de-pooling reactive charges in case of RE Generators (Installed Capacity > 50 MW) connected to ISTS Pooling Station through an Intermediate Pooling Station.

d) W.r.t RE Generating Station(s) connected to ISTS Pooling Station through Intermediate Pooling Station, the Methodology proposed was explained in detail, and different Illustrative Cases covering various scenarios for de-pooling Reactive Charges were demonstrated. Some of these are given below:

- ISTS Metered Value = Combined Metered Values of RE Generators (all REGs either injecting or drawing; some REGs injecting and the other REGs drawing)
- ISTS Metered Value > Combined Metered Values of RE Generators (all REGs either injecting or drawing; some REGs injecting and the other REGs drawing)
- ISTS Metered Value < Combined Metered Values of RE Generators (all REGs either injecting or drawing; some REGs injecting and the other REGs drawing)

It was explained that the proposed methodology would take care of penalising/ benefiting an REG in proportion to the harm/ benefit it is causing to the ISTS Grid.

2.10 Based on the above deliberations, the finalized Methodology & Procedure for various Regional Entities have been brought out in the ensuing Paras. **It was agreed that these finalized Methodologies & Procedures would be followed for the data that would be received starting from 02.10.2023 (Monday) [i.e., from the Week: 02.10.2023 – 08.10.2023]**.

2.11 In this connection, it was also clarified in case the finalized Methodology & Procedure as outlined are agreed to be changed/ revised at a later date, in line with the standard practice of SRPC and various CERC Regulations such as for DSM & AS, **no retrospective revision & settlement of RE-Accounting** shall be carried out.

3. Finalized Methodology & Procedure for carrying out Reactive Energy Accounting as per IEGC, 2023

In line with the foregoing deliberations & decisions, the Reactive Energy Accounting for all Regional Entities of Southern Region has been agreed & finalized to be carried out as follows:

3.1 Regional Entities except Generating Stations (Regional Entities of SR - AP, TS, KAR, KER, TN, PED & Goa)

Methodology:

- Reactive Energy Accounting shall be done for Regional Entity except Generating Stations (SR States - AP, TS, KA, KL, TN, PED, and Goa) for their reactive power interchange with ISTS.
- Reactive Energy Accounting shall also be done for Natural ISTS lines (state owned) depending on VAr import/ export at either ends of the line.
- VAr drawal/return by a Regional Entity except Generating Stations on its own line emanating directly from an ISGS shall also be considered.

Procedure:

- SRLDC will furnish the verified processed SEM data of each Regional Entity except Generating Station combining all nodes (**one MVARH_H and one MVARH_L per entity**) as per mutually agreed format based on above methodology.
- SRPC Secretariat would issue the weekly Reactive Energy Account based on the data furnished by SRLDC.

3.2 Regional Entity Generating Stations (ISGS including Nuclear Stations)

Methodology:

- VAr drawal/return at ISTS Metering Point of the line connecting Generating Station and ISTS shall be accounted.
- VAr drawal/return at Generating Station end of line connecting Generating station and other Regional Entity shall also be accounted.
- VAr drawal/return on the interconnection between different stages of a GS shall not accounted for generator (Ex: Bus-Coupler between Simhadri St-1 and Simahadri St-2)
- RE/ Floating Solar located in the premises of a Generating Station, and feeding through the Common ICT in the Generation Switchyard, VAr drawal/return of the same shall not be accounted.
- De-pooling for Stages within Generating Station (if applicable) shall be carried out on the basis of Installed Capacity of various Stages.

Procedure:

- SRLDC will furnish the verified processed SEM data of each Regional Entity Generating station/ Stage-wise (**one MVARH_H and one MVARH_L per Generating Station)** as per mutually agreed format based on above methodology.
- SRPC Secretariat would issue the weekly account based on data furnished by SRLDC.

3.3 RE Generating Station (s) directly connected to ISTS Pooling Station

Methodology:

- VAr drawal/return at ISTS Metering Point end of line connecting RE Generating Station and ISTS PS shall be accounted.
- If two or more RE Generators are feeding at same ISTS point, the VAr drawal/ return shall be segregated based on their respective Commissioned Capacities (COD declared capacities) limited to Connectivity Quanta.
- In case, the concerned RE Generators enter into a formal agreement to use a specific Methodology for de-pooling Reactive Charges amongst themselves, the same shall be applied by them, but payments to Pool account would be as per account issued.

Procedure:

- SRLDC will furnish the verified processed SEM data of each RE Generating Station (**one MVARH_H and one MVARH_L per RE Generating Station)** as per mutually agreed format based on above methodology.
- SRPC Secretariat would issue the weekly account based on data furnished by SRLDC.

3.4 RE Generating Station (of Installed Capacity > 50 MW) connected to ISTS Pooling Station (PS) through Intermediate Pooling Station (PS)

Methodology:

- Reactive Energy Accounting shall be done at ISTS Metering Point end of the line connecting Intermediate PS to ISTS PS.
- De-pooling of Reactive Charges shall be done as given below:
  - For each Connecting line between Intermediate PS and ISTS PS, Reactive Energy de-pooling shall be carried out as follows:

Inter-Connecting Line - X between Intermediate PS and ISTS PS			
Name of the RE Generator	**Commissioned Capacity limited to Connectivity Quantum**	**MVARH_H**	**MVARH_L**
Reactive Energy measured at ISTS Metering Point end of the connecting line between Intermediate PS and ISTS PS		**X**	**Y**
Reactive Energy measured at Incomers of RPPD			
REG-1	CCREG1	REG1X	REG1Y
REG-2	CCREG2	REG2X	REG2Y
REG-3	CCREG3	REG3X	REG3Y
REG-4	CCREG4	REG4X	REG4Y
Sum	**CCTotal**	**REGX**	**REGY**

Name of the RE Generator	**Commissioned Capacity limited to Connectivity Quantum**	**MVARH_H**	**MVARH_L**
REG-1	CC-REG1	REG1X+ (X-REGX)*CCREG1/CCTotal	REG1Y+ (Y-REGY)*CCREG1/CCTotal
REG-2	CC-REG2	REG2X+ (X-REGX)*CCREG2/CCTotal	REG2Y+ (Y-REGY)*CCREG2/CCTotal
REG-3	CC-REG3	REG3X+ (X-REGX)*CCREG3/CCTotal	REG3Y+ (Y-REGY)*CCREG3/CCTotal
REG-4	CC-REG4	REG4X+ (X-REGX)*CCREG4/CCTotal	REG4Y+ (Y-REGY)*CCREG4/CCTotal

  - For each RE Generating Station, the aggregated MVAr_H & MVAr-L shall be computed by considering all inter-connecting lines between Intermediate PS and ISTS PS.

Procedure:

- SRLDC will furnish the verified processed SEM data of each RE Generating Station (**one MVARH_H and one MVARH_L per RE Generating Station)** as per mutually agreed format based on above methodology.
- SRPC Secretariat would issue the weekly account based on data furnished by SRLDC.

Note:

- For IBRs of capacity 50 MW and below not coming directly to the point of interconnection but connected through the Intermediate Pooling Station of the Power Park Developer, the Power Park Developer shall act as aggregator for the Reactive Energy Charges for payments to and from the Pool Account at RLDC level. The de-pooling of Reactive Energy charges amongst the individual RE Generators shall be carried out by the Power Park Developer using above methodology or any other suitable methodology.

4. Treatment of Active Power Consumption for providing Reactive Power Support

4.1 Regulatory Provisions as per IEGC, 2023

Clause 1(c) of Annexure-4 of IEGC, 2023 states as follows:

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 ISTS.

4.2 Methodology Proposed

- SRLDC is requested to come up with a suitable methodology for determining Active Power Consumption for providing Reactive Power Support during synchronous condenser/ night mode taking into account the following:
  - During the Time-blocks corresponding to *synchronous condenser/ night-mode of operation, the concerned machine/ unit will be drawing active power to support (i) own auxiliary consumption, and (ii) providing reactive power support*
  - *Active status (in-service) of the machine (s)/ unit(s)*
  - *Learnings from the Pilot project or otherwise of the relation between reactive power support vs active power consumption*
- Once determined, the active power consumption by an SPD/ QCA for providing reactive power support in a time-block shall be deducted from the Actuals recorded by corresponding SEMs.
- Thus Modified Actuals (MWH) and Schedules (MW) for all Time Blocks shall be furnished SPD/ QCA wise by SRLDC.
- SRPC Secretariat would issue the Weekly DSM Account based on data furnished by SRLDC.

- SRLDC informed that they would come up with a suitable Methodology as suggested soon.
- In this regard, the following were also agreed:
  - SRLDC would take care of idle charged lines from one end and faulty reactive values of SEMs.
  - SRLDC would also discuss with NLDC & RLDCs on mandatory reactive support vis-à-vis reactive support for grid requirements and exemption of active power to support reactive power (STATCOMS, etc.).

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Annexure-I

List of Participants in the Special Commercial Meeting on Reactive Energy Accounting held on 25.09.2203 in on-line mode		
SN	**Name**	**Email**
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