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संदर्भ संख्या: एनएलडीसी/आरपीसी/2023

दिनांक: 24th मार्च, 2023

सेवा मे,

1. Member Secretary, NRPC, 18/A, SJSS Marg, Katwaria Sarai, New Delhi-110016
2. Member Secretary, WRPC, F-3, MIDC Area, Andheri (East), Mumbai-400093
3. Member Secretary, SRPC, 29, Race Course Cross Road, Bangalore-560009.
4. Member Secretary, ERPC, 14, Golf Club Road, Kolkata-700033
5. Member Secretary, NERPC, Lapalang, Shillong, Meghalaya 793006

- संदर्भ: 1. CERC: Petition No. 359/MP/2022 Date of Order 16th February, 2023
2. CEA: CEA-GO-15-14/1/2022-NPC Division dated: 07th March'2023
3. IEX: Circular No.: IEX/MO/682/2023 Date: 8th March 2023

विषय: Revised Methodology for computation & declaration of Normal Rate for Deviation

महोदय,

CERC vide Petition No. 359/MP/2022 Date of Order 16th February, 2023 approved the introduction of HP-DAM. Subsequently HP-DAM was launched on 09th March'2023 and delivery started from 10th March'2023.

CERC order dated: 06th February, 2023 in Petition No. Petition No. 01/SM/2023 revised the methodology for calculation of Normal Rate of Charges for Deviations for a time block which is applicable from 08th Feb'2023.

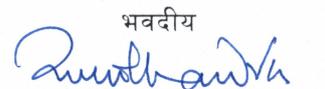
The relevant extract is quoted below:

"shall be equal to the higher of [the weighted average ACP of the Day Ahead Market segments of all the Power Exchanges; and the weighted average ACP of the Real Time Market segments of all the Power Exchanges, for that time block] subject to a ceiling of Rs 12 per kWh, until further orders."

In view of launch of HP-DAM, the details of HP-DAM needs to be incorporated for computing the weighted average ACP of the Day Ahead Market segments.

Accordingly, the methodology has been revised and is enclosed herewith. The same has been uploaded on the Grid-India website.

सादर धन्यवाद,



(S. C. Saxena)
Executive Director

Encl: As above

- Copy to: 1. Secretary CERC, 3 rd & 4 th Floor, Chanderlok Building, 36, Janpath, New Delhi- 110001
2. Executive Director NRLDC/WRLDC/SRLDC/ERLDC/NERLDC



Grid Controller of India limited

(Formerly Power System Operation Corporation Limited)

(A Govt. of India Enterprise)

Methodology for Computation & Declaration of Normal Rate

In accordance with

CERC Deviation Settlement Mechanism Regulations, 2022

Version-5

24th March'2023

National Load Despatch Centre (NLDC)

New Delhi

Methodology for computation & declaration of Normal Rate in line with CERC Deviation Settlement Mechanism and Related Matters Regulations, 2022

1. Background

CERC Deviation Settlement Mechanism Regulations, 2022 (hereinafter referred to as “DSM Regulations”) was notified on 14th March 2022. The date of implementation has been notified as 05.12.2022 by CERC on 31st October 2022.

This regulation provides for declaration of Normal Rate of charges for deviation which, as per the DSM Regulations, is applicable for deviation in a time block.

The methodology to be adopted for computation of normal rate of charges for deviation is summarised below.

| For the period 08.02.2023 to 09.03.2023* | From 10.03.2023 onwards* |
|---|--|
| The normal rate of charges for deviation for a time block shall be equal to the highest of: i. the weighted average ACP of the Day Ahead Market segments of all the Power Exchanges; ii. the weighted average ACP of the Real Time Market segments of all the Power Exchanges, for that time block. | The normal rate of charges for deviation for a time block shall be equal to the highest of: i. the weighted average ACP of the Day Ahead Market segments# of all the Power Exchanges; ii. the weighted average ACP of the Real Time Market segments of all the Power Exchanges, for that time block. # HP-DAM implemented from 10.03.2023 |

*CERC suo-motu Petition No. 16/MP/2022 dated 26.12.2022 introduced price cap of Rs 12 per kWh

The normal rate of charges (paisa /Kwh) for deviation shall be rounded off to the nearest two decimal places.

2. Procedure for calculating the normal rate of charges:

- a. The weighted average ACP of the Day Ahead Market (DAM, G-DAM & HP-DAM) and Real Time Market (RTM) shall be calculated bid area wise considering all Power Exchanges. The list of Bid Areas and States covered under Bid-Areas is enclosed as *Annexure-1*.
- b. Subsequently, as and when any new market segment is introduced in Day Ahead Market, this would be suitably incorporated in the rate computations.
- c. In case of non-availability of ACP in any Power Exchange for a Bid-Area for a time block, if ACP is discovered in other exchanges/exchange, the available discovered ACP shall be considered for computing the weighted average ACP for that time block.
- d. In case of non-availability of ACP for any time block on a given day in all Power Exchanges, the last available ACP for the corresponding time block shall be considered. The non-availability of ACP shall only be considered for those time blocks where the market has not cleared. In case price declared is zero by the Power Exchanges, the same shall be considered.

- e. The **weighted average ACP of the Day Ahead Market** segments of all the Power Exchanges shall be computed as follows.

The weighted average ACP of the Day Ahead Market segments shall be computed by considering the block wise, area wise price and cleared volume for Day Ahead Market (DAM) and GDAM (Green Day Ahead Market) in all the operational Power Exchanges.

For a given time block, the following methodology shall be used for computation of the weighted average ACP in Day Ahead Market for sample bid Area A1.

| DAM | |
|---|-----------------------------------|
| Volume IEX (Buy +Sell) = A1 _{IEX} | Price IEX = P1 _{IEX} |
| Volume PXIL (Buy +Sell) = A1 _{PXIL} | Price IEX = P1 _{PXIL} |
| Volume HPX (Buy +Sell) = A1 _{HPX} | Price HPX = P1 _{HPX} |
| GDAM | |
| Volume IEX (Buy +Sell) = A1 _{G-IEX} | Price IEX = P1 _{G-IEX} |
| Volume PXIL (Buy +Sell) = A1 _{G-PXIL} | Price IEX = P1 _{G-PXIL} |
| Volume HPX (Buy +Sell) = A1 _{G-HPX} | Price HPX = P1 _{G-HPX} |
| HP-DAM | |
| Volume IEX (Buy +Sell) = A1 _{HP-IEX} | Price IEX = P1 _{HP-IEX} |
| Volume PXIL (Buy +Sell) = A1 _{HP-PXIL} | Price IEX = P1 _{HP-PXIL} |
| Volume HPX (Buy +Sell) = A1 _{HP-HPX} | Price HPX = P1 _{HP-HPX} |

Volume in Kwh and Price in paisa/Kwh

Weighted Average ACP of (I-DAM) Day Ahead Market segments (paise/Unit) =

$$\frac{[(A1_{IEX} * P1_{IEX}) + (A1_{PXIL} * P1_{PXIL}) + (A1_{HPX} * P1_{HPX}) + (A1_{G-IEX} * P1_{G-IEX}) + (A1_{G-PXIL} * P1_{G-PXIL}) + (A1_{G-HPX} * P1_{G-HPX}) + (A1_{HP-IEX} * P1_{HP-IEX}) + (A1_{HP-PXIL} * P1_{HP-PXIL}) + (A1_{HP-HPX} * P1_{HP-HPX})]}{[A1_{IEX} + A1_{PXIL} + A1_{HPX} + A1_{G-IEX} + A1_{G-PXIL} + A1_{G-HPX} + A1_{HP-IEX} + A1_{HP-PXIL} + A1_{HP-HPX}]}$$

- f. The **weighted average ACP of the Real Time Market** segment of all the Power Exchanges shall be computed as follows.

The weighted average ACP of the Real Time Market (RTM) segment of all the Power Exchanges shall be computed by considering the block wise, area wise price and volume of RTM in all the operational Power Exchanges.

In case of non-availability of ACP for any time block on a given day in all Power Exchanges, ACP for the corresponding time block of the last available day shall be considered. The non-availability of ACP shall only be considered for those time blocks where the market has not cleared. In case price declared is zero by the Power Exchanges, the same shall be considered.

For a given time block, the following methodology shall be used for computation of the weighted average ACP for Real Time Market for a sample bid Area A1

| RTM | |
|--|---------------------------------|
| Volume IEX (Buy +Sell) = A1 _{IEX} | Price IEX = P2 _{IEX} |
| Volume PXIL (Buy +Sell) = A1 _{PXIL} | Price PXIL = P2 _{PXIL} |
| Volume HPX (Buy +Sell) = A1 _{HPX} | Price HPX = P2 _{HPX} |

Volume in Kwh and Price in paisa/Kwh

Weighted Average ACP of RTM (paise/Unit) =

$$[(A1_{IEX} * P2_{IEX}) + (A1_{PXIL} * P2_{PXIL}) + (A1_{HPX} * P2_{HPX})]$$

$$[A2_{IEX} + A2_{PXIL} + A2_{HPX}]$$

g. **Normal Rate of Charges (paise/Unit) of an area for a time block =**

Maximum of

- weighted average ACP of Day Ahead Market segments of that area
- weighted average ACP of RTM of that area

Subject to a cap rate of Rs 12 per kWh or as specified by CERC from time to time.

3. Normal rate of charges for deviation for inter-regional deviation and cross-border transactions.

- a. Inter-regional corridors are interconnected through different bid areas and neighboring countries are also connected to different bid areas in India. To simplify the settlement of inter-regional and cross-border deviations, the highest of the weighted average price of the unconstrained market clearing price (UMCP) of DAM, RTM of all Power Exchanges shall be considered for computing the normal rate of charges for deviation.
- b. The charges for deviation in respect of cross-border transactions, caused by way of over-drawal/under drawal or under-injection/over-injection shall be payable at the normal rate of charges for deviation.
- c. Charges for Deviation of Inter-regional Exchange between the two regions shall be computed based on normal rate applicable. No additional charges or volume limit shall be applicable for inter-regional deviations. Charges for Deviation shall be applicable for over-drawal or under-injection and under-drawal or over-injection for inter-regional deviations.

Illustration:

| Block No | SR to WR (Schedule) | SR to WR (Actual) | Deviation | Normal rate Paisa/Unit) | Deviation Amount as per SRPC(Rs) | Deviation Amount as per WRPC(Rs) | Payable/Receivable |
|----------|---------------------|-------------------|-----------|-------------------------|----------------------------------|----------------------------------|---------------------|
| 1 | 100 MW | 150 MW | 50MW | 400 | 50000 | -50000 | Payable by WR to SR |
| 2 | 100 MW | 50MW | -50MW | 400 | -50000 | 50000 | Payable by SR to WR |
| 3 | -200 MW | -300 MW | -100 MW | 400 | -100000 | 100000 | Payable by SR to WR |
| 4 | -200 MW | -100 MW | 100 MW | 400 | 100000 | -100000 | Payable by WR to SR |

d. In case of non-availability of UMCP for any time block on a given day in all Power Exchanges, the last available UMCP for the corresponding time block shall be considered.

The following shall be used for computation for weighted average UMCP of DAM for a sample time block:

| DAM | |
|--|-------------------------|
| Volume IEX (Buy +Sell) = V_{IEX} | UMCP IEX = P_{IEX} |
| Volume PXIL (Buy +Sell) = V_{PXIL} | UMCP PXIL= P_{PXIL} |
| Volume HPX (Buy +Sell) = V_{HPX} | UMCP HPX = P_{HPX} |
| GDAM | |
| Volume IEX (Buy +Sell) = V_{G-IEX} | UMCP IEX = P_{G-IEX} |
| Volume PXIL (Buy +Sell) = V_{G-PXIL} | UMCP IEX = P_{G-PXIL} |
| Volume HPX (Buy +Sell) = V_{G-HPX} | UMCP HPX = P_{G-HPX} |

Volume in Kwh and Price in paisa/Kwh

weighted average UMCP of DAM (paise/unit) =

$$\frac{[(V_{IEX} * P_{IEX}) + (V_{PXIL} * P_{PXIL}) + (V_{HPX} * P_{HPX}) + (V_{G-IEX} * P_{G-IEX}) + (V_{G-PXIL} * P_{G-PXIL}) + (V_{G-HPX} * P_{G-HPX})]}{[V_{IEX} + V_{PXIL} + V_{HPX} + V_{G-IEX} + V_{G-PXIL} + V_{G-HPX}]}$$

The following shall be used for computation for weighted average UMCP of RTM for a time block

| RTM | |
|--------------------------------------|-------------------------|
| Volume IEX (Buy +Sell) = V_{IEX} | Price IEX = P_{IEX} |
| Volume PXIL (Buy +Sell) = V_{PXIL} | Price PXIL = P_{PXIL} |
| Volume HPX (Buy +Sell) = V_{HPX} | Price HPX = P_{HPX} |

Volume in Kwh and Price in paisa/Kwh

weighted average UMCP of RTM (paise/unit) =

$$[(V_{IEX} * P_{IEX}) + (V_{PXIL} * P_{PXIL}) + (V_{HPX} * P_{HPX})]$$

$$[V_{IEX} + V_{PXIL} + V_{HPX}]$$

4. Validity of the procedure:

This procedure is valid for one year from 08.02.2022 to 04.12.2023. The procedure shall be reviewed prior to completion of one year or in case of any regulatory changes or based on the experience gained.

5. Time line for publication of normal rate of charges for deviation:

NLDC shall publish the normal rate of charges for deviation on weekly basis by Thursday of the current week for the previous week (Monday to Sunday).

Normal rate of charges shall not be revised after declaration as per the timeline above. No post facto revision in the DSM account would be carried out due to any revision of normal rate of charges for deviation or contract rate or reference charge rate already used for DSM computation.

Annexure-1: Bid Areas and States covered under Bid-Areas

| Sr. No. | Bid Area | Region | States covered under Bid Area |
|---------|----------|--------|--|
| 1 | N1 | NR | Jammu and Kashmir, Himachal Pradesh, Chandigarh, Haryana |
| 2 | N2 | NR | Uttar Pradesh , Uttaranchal, Rajasthan, Delhi |
| 3 | N3 | NR | Punjab |
| 4 | E1 | ER | West Bengal, Sikkim, Bihar, Jharkhand |
| 5 | E2 | ER | Orissa |
| 6 | W1 | WR | Madhya Pradesh |
| 7 | W2 | WR | Maharashtra, Gujarat, Daman and Diu, Dadar and Nagar Haveli, North Goa |
| 8 | W3 | WR | Chhattisgarh |
| 9 | S1 | SR | Andhra Pradesh, Telangana, Karnataka, South Goa |
| 10 | S2 | SR | Tamil Nadu, Puducherry |
| 11 | S3 | SR | Kerala |
| 12 | A1 | NER | Tripura, Manipur, Mizoram, Nagaland |
| 13 | A2 | NER | Assam, Arunachal Pradesh, Meghalaya |

Revision History:

| Ver No | Date of Issue | Original Clause | Revised Clause | Remarks |
|--------|-------------------------|---|---|--|
| 1 | 02 nd Dec'22 | | | Original Methodology |
| 2 | 12 th Dec'22 | <p>h. ASNET>0</p> <p>If ASNET>0 Weighted Average Ancillary Service Charge of All India (paise/Unit) =</p> $\frac{100*AS_{NET}}{[(RRAS_Up\ Volume+ SRAS_Up\ Volume(15min) -RRAS_Down\ Volume- SRAS_Down\ Volume(15min)) *1000]}$ <p>If ASNET<0 Weighted Average Ancillary Service Charge of All India (paise/Unit) =</p> $(-) \left[\frac{100*AS_{NET}}{[(RRAS_Up\ Volume+ SRAS_Up\ Volume(15min) -RRAS_Down\ Volume- SRAS_Down\ Volume(15min)) *1000]} \right]$ | <p>g.ASNET>0</p> <p>If ASNET>0 Weighted Average Ancillary Service Charge of All India (paise/Unit) =</p> $\frac{100*AS_{NET}}{[(RRAS_Up\ Volume+ SRAS_Up\ Volume(15min)) *1000]}$ <p>If ASNET<0 Weighted Average Ancillary Service Charge of All India (paise/Unit) =</p> $\frac{100*AS_{NET}}{(RRAS_Down\ Volume+ SRAS_Down) Volume(15min)) *1000}$ | <p>It was observed that in some situations, netting of the Ancillary despatched quantum leads to high/unrealistic Weighted Average Ancillary Service Charge (Paisa/Unit) and in extreme case, infeasible Weighted Average Ancillary Service Charge (Paisa/Unit).</p> |

| Ver No | Date of Issue | Original Clause | Revised Clause | Remarks |
|--------|-------------------------|---|--|--|
| 3 | 16 th Jan'23 | 2.h.Normal Rate of Charges (paise/Unit) of an area for a time block = Maximum of <ul style="list-style-type: none"> • weighted average ACP of DAM of that area • weighted average ACP of RTM of that area • Weighted Average Ancillary Service Charge of All India | 2.h.Normal Rate of Charges (paise/Unit) of an area for a time block = Maximum of <ul style="list-style-type: none"> • weighted average ACP of DAM of that area • weighted average ACP of RTM of that area • Weighted Average Ancillary Service Charge of All India <p style="text-align: center;">Subject to a cap rate of Rs 12 per kWh or as specified by CERC from time to time.</p> | CERC: Petition No. 16/SM/2022 Order dated 26 th Dec'22 <i>"10....Accordingly, the Commission decides that the Normal Rate of Charges for Deviations for a time block as specified in Regulation 7 of the DSM Regulations, 2022 shall be subject to the cap of Rs 12 per kWh, until further orders. "</i> |
| | | New clause added 3.b & 3.c | <p>b. The charges for deviation in respect of cross-border transactions, caused by way of over-drawal/under drawal or under-injection/over-injection shall be payable at the normal rate of charges for deviation.</p> <p>c. Charges for Deviation of Inter-regional Exchange between the two regions shall be computed based on normal rate applicable. No addition charges or volume limit shall be applicable for inter-regional deviations. Charges for Deviation shall be applicable for over-drawal or under-injection and under-drawal or over-injection for inter-regional deviations.</p> | In order to have uniform approach amongst RPCs for computation off deviation charges. |

| Ver No | Date of Issue | Original Clause | Revised Clause | Remarks |
|--------|-------------------------|--|--|---|
| 4 | 21 st Feb'23 | <p>From 05.12.2023 onwards</p> <p>Weighted Average Ancillary Service Charge (in paise/kWh) computed based on the total quantum of Ancillary Services deployed and the net charges payable to the Ancillary Service Providers for all the Regions for that time block.</p> | <p>From 08.02.2023 onwards</p> <p>The normal rate of charges for deviation for a time block shall be equal to the highest of:</p> <p>i. the weighted average ACP of the Day Ahead Market segments of all the Power Exchanges;</p> <p>ii. the weighted average ACP of the Real Time Market segments of all the Power Exchanges, for that time block.</p> | <p>CERC Petition No. 01/SM/2023 Date of Order: 06th February, 2023 "26. Relaxation of Regulation 7 of the DSM Regulations, 2022: The Commission hereby relaxes Regulation 7 of the DSM Regulations, 2022 to provide that the Normal Rate of Charges for Deviations for a time block as specified in Regulation 7 of the DSM Regulations, 2022 shall be equal to the higher of [the weighted average ACP of the Day Ahead Market segments of all the Power Exchanges; and the weighted average ACP of the Real Time Market segments of all the Power Exchanges, for that time block] subject to a ceiling of Rs 12 per kWh, until further orders"</p> |
| | | <p>g. The weighted average Ancillary Service Charge shall be computed as follows</p> | <p>Removed</p> | |
| | | <p>3.a. Inter-regional corridors are interconnected through different bid areas and neighboring countries are also connected to different bid areas in India. To simplify the settlement of inter-regional and cross-border deviations, the highest of the weighted average price of the unconstrained market clearing price (UMCP) of DAM, RTM of all Power Exchanges & weighted average Ancillary Services charges shall be considered for computing the normal rate of charges for deviation.</p> | <p>3.a. Inter-regional corridors are interconnected through different bid areas and neighboring countries are also connected to different bid areas in India. To simplify the settlement of inter-regional and cross-border deviations, the highest of the weighted average price of the unconstrained market clearing price (UMCP) of DAM, RTM of all Power Exchanges shall be considered for computing the normal rate of charges for deviation.</p> | |
| 5 | 23 rd Mar'23 | <p>For a given time block, the following methodology shall be used for computation of the weighted average ACP in Day Ahead Market for sample bid Area A1.</p> | <p>For a given time block, the following methodology shall be used for computation of the weighted average ACP in Day Ahead Market for sample bid Area A1.</p> | <p>HP-DAM implemented from 10.03.2023</p> |

| DAM | |
|---|----------------------------------|
| Volume IEX (Buy +Sell) = A1 _{IEX} | Price IEX = P1 _{IEX} |
| Volume PXIL (Buy +Sell) = A1 _{PXIL} | Price IEX = P1 _{PXIL} |
| Volume HPX (Buy +Sell) = A1 _{HPX} | Price HPX = P1 _{HPX} |
| GDAM | |
| Volume IEX (Buy +Sell) = A1 _{G-IEX} | Price IEX = P1 _{G-IEX} |
| Volume PXIL (Buy +Sell) = A1 _{G-PXIL} | Price IEX = P1 _{G-PXIL} |
| Volume HPX (Buy +Sell) = A1 _{G-HPX} | Price HPX = P1 _{G-HPX} |

Weighted Average ACP of DAM (paise/Unit) =

$$\frac{[(A1_{IEX} * P1_{IEX}) + (A1_{PXIL} * P1_{PXIL}) + (A1_{HPX} * P1_{HPX}) + (A1_{G-IEX} * P1_{G-IEX}) + (A1_{G-PXIL} * P1_{G-PXIL}) + (A1_{G-HPX} * P1_{G-HPX})]}{[A1_{IEX} + A1_{PXIL} + A1_{HPX} + A1_{G-IEX} + A1_{G-PXIL} + A1_{G-HPX}]}$$

| DAM | |
|--|-----------------------------------|
| Volume IEX (Buy +Sell) = A1 _{IEX} | Price IEX = P1 _{IEX} |
| Volume PXIL (Buy +Sell) = A1 _{PXIL} | Price IEX = P1 _{PXIL} |
| Volume HPX (Buy +Sell) = A1 _{HPX} | Price HPX = P1 _{HPX} |
| GDAM | |
| Volume IEX (Buy +Sell) = A1 _{G-IEX} | Price IEX = P1 _{G-IEX} |
| Volume PXIL (Buy +Sell) = A1 _{G-PXIL} | Price IEX = P1 _{G-PXIL} |
| Volume HPX (Buy +Sell) = A1 _{G-HPX} | Price HPX = P1 _{G-HPX} |
| HP-DAM | |
| Volume IEX (Buy +Sell) = A1 _{HP-IEX} | Price IEX = P1 _{HP-IEX} |
| Volume PXIL (Buy +Sell) = A1 _{HP-PXIL} | Price IEX = P1 _{HP-PXIL} |
| Volume HPX (Buy +Sell) = A1 _{HP-HPX} | Price HPX = P1 _{HP-HPX} |

Weighted Average ACP of I-DAM Day Ahead Market segments (paise/Unit) =

$$\frac{[(A1_{IEX} * P1_{IEX}) + (A1_{PXIL} * P1_{PXIL}) + (A1_{HPX} * P1_{HPX}) + (A1_{G-IEX} * P1_{G-IEX}) + (A1_{G-PXIL} * P1_{G-PXIL}) + (A1_{G-HPX} * P1_{G-HPX}) + (A1_{HP-IEX} * P1_{HP-IEX}) + (A1_{HP-PXIL} * P1_{HP-PXIL}) + (A1_{HP-HPX} * P1_{HP-HPX})]}{[A1_{IEX} + A1_{PXIL} + A1_{HPX} + A1_{G-IEX} + A1_{G-PXIL} + A1_{G-HPX} + A1_{HP-IEX} + A1_{HP-PXIL} + A1_{HP-HPX}]}$$