

CENTRAL ELECTRICITY REGULATORY COMMISSION

New Delhi

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File No. L-1/250/2019/CERC

Date: 30.10.2023

Statement of Reasons

In the matter of

Central Electricity Regulatory Commission (Sharing of inter-State Transmission Charges and Losses) (Third Amendment) Regulations, 2023

1. Introduction:

1.1. The Commission, vide notification dated 12.06.2023 issued the Draft CERC (Sharing of Inter-State Transmission Charges and Losses) (Third Amendment) Regulations, 2023 (hereinafter referred to as the “Draft Third Amendment”) along with an Explanatory Memorandum proposing to amend the CERC (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020 (hereinafter referred to as the “Principal Regulations” or the “2020 Sharing Regulations”), seeking comments/ suggestions/ observations from the stakeholders/public.

1.2. Written Comments have been received from 10 stakeholders, including Discoms, Statutory bodies, and Associations. A list of stakeholders who submitted written comments is given in **Appendix-I**. The Public Hearing on the Draft Third Amendment was conducted on 05.09.2023 wherein 10 stakeholders made their submissions. A list of stakeholders who made their presentations/ oral submissions during the public hearing is given in **Appendix II**. The detailed comments and presentations made during the Public hearing are available on the website of the Commission at www.cercind.gov.in.

1.3. After due consideration of the comments/ suggestions/ objections received, the

Commission has finalized the Third Amendment to 2020 Sharing Regulations.

1.4. The proposed amendments and the reasons for the decisions of the Commission are given in the succeeding paragraphs. While an attempt has been made to consider all the comments/suggestions received, the names of all the stakeholders may not appear in the deliberations.

2. Amendment to Regulation 5 and 6:

2.1. The following Proviso was proposed to be inserted in sub-clause (d) of Clause (3) of Regulation 5 of the 2020 *vided that % of Yearly Transmission Charges shall be 30% or more in accordance with subclause (a) of clause (1) of Regulation 6 of these regulations.*"

2.2. The following Proviso was proposed to be inserted in sub-clause (a) of Clause (1) of Regulation 6 of the Principal Regulations:

"Provided that where an interregional HVDC transmission system planned to supply power to a particular region is operated to carry power in reverse direction due to system requirements, the percentage Yearly Transmission Charges of such transmission system to be considered in the regional component and the National component shall be calculated as follows:

HVDCr (in %)

$$= \frac{\sum_{k=1}^n \text{Maximum power flow in reverse direction (in MW) in any time block on } k\text{th day} \times 100}{\text{Capacity of HVDC transmission system in forward direction (MW) X number of days in a month}}$$

Where k, is a day of a month with total 'n' days

where HVDCr >30%, the Yearly Transmission charges corresponding to HVDCr shall be considered in the National component and the balance in the regional component.

where HVDCr is ≤ 30%, 30% of Yearly Transmission Charges shall be considered in the National component and 70% in the Regional component."

2.3. **Comments have been received from IWPA, PCKL, KPTCL, TANGEDCO, KSEBL, APPCC, Sembcorp Energy, TNEB retired officers' association, GRIDCO, BYPL, MSEDCL and MPPMCL.**

2.3.1 IWPA has suggested that the Transmission lines are designed for maximum capacity, and are not designed considering the loads on different days of the year or the average load. Hence, in as much as there is a reverse power flow in an HVDC line, the "maximum capacity of reverse power flow" has to be considered as the sharing criteria for the "National component or Regional Component". Apart from taking care of 50% of reverse power flow, such HVDC lines also provide more flexibility and stability to the overall Grid. Hence, once an HVDC line exceeds 50% of reverse power flow, there is a strong case to account for the entire charges and losses of the line into the National component.

2.3.2 PCKL has submitted that, considering the fact that the said line is serving a bi-directional flow of power, the HVDC lines, which are bidirectional, should be treated as National component even though they are planned for regional requirements.

2.3.3 KPTCL has submitted that transmission assets are created to cater to the power (MW) flow, irrespective of peak/off peak in the element. With the introduction of this amendment, a dual stand of the Commission is being observed for declaring charges of transmission assets. On one side, transmission charges are collected based on declared assets based on their standard capacity, while on the other hand, as quoted in the above draft amendment, transmission charges are being collected on the basis of usage of capacity. This is unfair, and the formula introduced in the amendment is unjust with respect to Southern states in particular. The National component enables the charges to be borne by all the entities, thereby socializing the network in the interest of all entities in the country. The flow in the reverse direction from SR-WR is predominantly high in the RE season, and it is marginally more than 30%. This does not provide equitable justice to the southern states, while the Commission has adopted different yardsticks for similar HVDC projects and considered them as National Component. Therefore, based on the bi-directional flow of power, the Commission may declare the HVDC elements as Regional or National component and not on the methodology introduced in this draft amendment.

2.3.4 TANGEDCO has submitted that the RPT HVDC system is a System Strengthening scheme planned by the Central Transmission Utility of India and implemented by the Power Grid Corporation of India without any specific generator or beneficiary tie-up and totally based on anticipated surplus generation in the Western Region and

projected deficit in the Southern Region. The scenario has now completely changed as the said HVDC system is now being used to facilitate the transfer of RE from RE-rich Southern States to benefit the entire country. Further, the Southern Regional States are imposed with a huge tariff burden on account of the sharing charges of the BNC-Agra HVDC system planned for the evacuation of Hydro power, and a dedicated transmission system planned and built by Adani Power Limited for the sale of power from their generating station. The RPT HVDC system should have been put under the National Component from COD, and any new amendment will have a prospective effect from the date of implementation. Once the RPT HVDC system is included under the National component from COD on par with BNC-Agra, any contrary provisions/amendment will not apply to this system. TANGEDCO during the public hearing submitted that in the proposed methodology, reveals that there is absolutely nothing beneficial to the SR States. Further, the Commission has not clarified why the usage-based methodology has been diluted, and uniform charges methodology has been introduced in the case of AC systems (contributing a major part of YTC), and a specific usage-based methodology is proposed for this specific HVDC system, which is benefitting the entire nation. In addition to this, the Mundra-Mohindergarh HVDC dedicated transmission system and the Biswanath Chariali- Agra HVDC System built for the evacuation of power from Hydro Power Plants from NER to NR have not been brought into the ambit of the proposed Third amendment.

2.3.5 KSEBL has suggested that instead of monitoring the reverse flow of power and determining the percentage sharing of transmission charges, the entire transmission charges of the Raigarh-Pugalur-Thrissur HVDC system may be shared under the 'National Component'.

2.3.6 APPCC during the public hearing suggested that the HVDCr (%) factor in the Raigarh-Pugalur case will never reach more than 50% with a peak capacity of 3000 MW (since restricted by the downstream network), the maximum forward flow is 6000 MW. This condition is not tested for other Inter regional HVDC Transmission Systems, already placed in the National Component including HVDC Back to Back Stations which are in the normal course operating in Uni-direction.

2.3.7 Sembcorp Energy submitted during the public hearing that the Mundra-Mohindergarh Transmission System, to date, has operated with only unidirectional flow

and the Biswanath-Chariali Transmission system is under-utilized. The SR is not benefitted by either of these two assets, but they still form part of the National Component. The Transmission Asset will be used for the benefit of other regions given the bi-directional flow of power, from the Transmission Asset. CERC ought to withdraw the draft 3rd Amendment to Sharing Regulation 2020, which was published on 12.06.2023 in view of the APTEL Judgement dated 18.07.2023.

2.3.8 TNEB retired officers' association during the public hearing suggested that pushing an amendment at this stage, instead of considering the issue afresh as advised by the Hon'ble Appellate Tribunal for Electricity and passing orders before 31.10.23 as directed by the Supreme Court of India, is inappropriate.

2.3.9 SRPC has suggested that the draft amendment, appears to be at variance with declaring 100% of Yearly Transmission Charges (YTC) for the Biswanath-Chariali/ Alipurduar to Agra HVDC transmission system and of Mundra-Mohindergarh 2500 MW HVDC transmission system corresponding to 1005 MW capacity under the National component, and SR beneficiaries are sharing the charges. In this regard, the following is suggested:

Priority Suggestion I: Case for considering 100% HVDC System Charges under National Component:

Considering the fact that an inter-regional HVDC system, apart from effecting bulk-transfer of power, also plays a significant role in providing flexibility & stability to the grid, ideally its full design capacity should be included in the "National Component", which can also be gauged from the role it plays in ensuring the required import/export ATC/ TTC between the connecting regions (i.e., in case of any critical contingencies, including tripping of other existing inter-regional links, flows on this HVDC system can go up to the designed capacity on any day). Pugalur-Trichur HVDC is a VSC based technology that has some distinct advantages, and in view of the RE evacuation from TN and promoting new Technology, Raigarh- Pugalur-Trichur may be considered a National component.

Priority Suggestion-2: Case for apportioning the HVDC System Charges under National Component & Regional Component (without resorting to Usage based Computations):

Apart from the already allowed 30% Charges under the National Component, an additional proportion commensurate with the maximum Common Capacity available in

both directions may be considered for inclusion under the National Component. In the case of the Raigarh-Pugalur-Trissur HVDC link, this additional proportion works out to 35% [= (3000/6000)x70]. This may be reviewed as and when capacity is increased to 6000 MW from SR to WR.

Suggestion-3: Case for apportioning the HVDC System Charges under National Component & Regional Component (using the Methodology outlined In the Draft Regulations):

a) Apart from the proposed Usage-based Component (in the Draft Regulations), appropriate Capacity based component also need to be considered for inclusion under the "National Component". Accordingly, the monthly transmission charges (MTC) for inter-regional HVDC systems may be determined as follows:

Total Transmission Charges = Capacity based Charges (fully under National Component) + Usage based charges (under National Component & Regional Components as per the methodology outlined in the Draft Regulations)

Here, the proportion of the Capacity based charges to be included under the National Component shall be determined as (maximum common capacity available in both directions)/ maximum design capacity) x 100.

The balance charges (MTC Capacity- based charges) shall be used to determine the proportion of the Usage based charges to be included under the National Component and Regional Component.

- Further if the methodology outlined in the Draft Regulations is to be applied as it is, then the Grid-India NLDC may come under severe pressure from the DICs of the concerned region to change the DC Set Points of the HVDC System to their advantage, contrary to Grid requirements that may be needed to handle the prevailing grid conditions, which may lead to unnecessary litigation. System Operator decisions should not lead to different sharing of charges for critical assets under the National component and Regional component.

2.3.10 GRIDCO has submitted that the cost of additional reverse flow beneficial to one region cannot be transferred to other regions in the form of a National component. Instead, the **formula** should be to add additional reverse flow, i.e. HVDCr > 30 % to the regional component of the supplying region instead of adding it to the National Component, as under:

“where HVDCr >30%, the Yearly Transmission charges (YTC) corresponding to additional HVDCr in excess of 30 % shall be added to the Regional Component of the drawee region (region receiving the reverse flow), 30% to be considered in the National component and the balance in the regional component.”

2.3.11 BYPL has suggested that the HVDC lines are planned/ constructed based on the commitment from the generators/ states to enable the evacuation of contracted power from one region to the targeted region. The usage of lines for reverse direction is mainly attributed to the demand of that region. Therefore, the sharing of such HVDC elements in reverse direction should not be under the National component but under the regional component of the drawing region.

2.3.12 MSEDCL has suggested that, as per the power flow pattern on the Raigarh-Pugalur HVDC line, it is observed that there are only a few hours of the day wherein power flows in the reverse direction with a higher quantum. It would be not be justifiable to apply the proposed formula in such a scenario and would unnecessary result in a higher quantum of ‘National Component’ of the transmission charges, thereby increasing the burden on DICs of another region. Therefore, the Average Power flow for the day should be considered in the given formulae.

2.3.13 MPPMCL has **suggested** that average power flow for the day should be considered in the given formulae.

2.3.14 Dr. Sudarshan Kumar Babu Professor, DTU, suggested during the public hearing the following methodology:

HVDCf - Regional Component

HVDCr - National Component

$$HVDC_f = \frac{\sum_{k=1}^n \text{Maximum power flow in forward direction (MW) in any time block on } k^{\text{th}} \text{ day}}{\text{Capacity of HVDC transmission system in forward direction (MW)} \times \text{number of days in a month}}$$

$$HVDC_r = \frac{\sum_{k=1}^n \text{Maximum power flow in reverse direction (MW) in any time block on } k^{\text{th}} \text{ day}}{\text{Capacity of HVDC transmission system in forward direction (MW)} \times \text{number of days in a month}}$$

$$\text{Regional Component (\%)} = 100 \times \frac{HVDC_f}{HVDC_f + HVDC_r}$$

$$\text{National Component (\%)} = 100 \times \frac{HVDC_r}{HVDC_f + HVDC_r}$$

2.4. Analysis and decision:

2.4.1 We have considered the submissions of all the stakeholders. The detailed reasoning for the proposed formula for consideration of transmission charges of interregional HVDC transmission systems under the National Component based on the bi-directional flow of power has been provided in the Explanatory Memorandum dated 12.06.2023.

2.4.2 We have given careful consideration to the suggestions of the MOP received vide letter dated 30.5.2022 whereby it was suggested to consider inter-regional HVDC under the National component based on bidirectional flow to be finalized in consultation with CEA, CTU, and POSOCO. The relevant extract of the MoP letter dated 30.05.2022 is as under:

“4. Accordingly, CERC is requested to consider transmission charges of all HVDC interregional links under National Component [100% transmission charges to be borne by all Designated Inter State Transmission Customers], provided that

i) There is certain quantum of bi-directional power flow through the concerned HVDC inter-regional link

ii) The quantum of bi-direction power flow [for considering 100% of transmission charges of the link under National Component] may be decided by CERC in consultation with stakeholders including POSOCO, CEA and CTU.”

2.4.3 We have further considered suggestions from IWPA, KPTCL, TANGEDCO, and SRPC to consider capacity-based principles in place of flow-based principles for the inclusion of HVDC under the National component. Whereas some States have suggested using average reverse power flow in a day as the principle to share % of charges in the National component.

- 2.4.4 SRPC has submitted that keeping flow-based formula for sharing charges of inter-regional HVDC may lead to pressure from the DICs of the concerned region to change the DC Set Points of the HVDC System to their advantage contrary to Grid requirements which may be needed to handle the prevailing grid conditions.
- 2.4.5 Some stakeholders have suggested considering the entire transmission charges of the HVDC system under the 'National Component' considering there is a bi-directional flow of power, without linking it to the capacity of reverse flow of power. In this regard, we feel that if the reason for inclusion of a particular HVDC under the National component is bi-directional flow, considering the percentage of charges in the national component beyond the capability of reverse flow may not be appropriate.
- 2.4.6 We have also taken note of CEA suggestions whereby CEA vide its letter dated 20.10.2023 while making suggestions under Petition No. 685/TT/2020 in a related matter, while referring to Draft Third Amendment, has suggested to include % of Yearly transmission charges of an inter-regional HVDC with substantial reverse flow equal to reverse capacity vs forward capacity.
- 2.4.7 Some stakeholders have referred to the Biswanath-Chariali/ Alipurdwara to Agra HVDC transmission system and the Mundra-Mohindergarh 2500 MW HVDC transmission system, corresponding to 1005 MW capacity under the National component. In this regard, the following is clarified:
- (a) Any amendment was not proposed for these two HVDCs and is beyond the scope of present regulatory process of the third amendment to the 2020 Sharing Regulations. The treatment for these two HVDCs was proposed in the Draft Sharing Regulations, 2019 and finalized in the 2020 Sharing Regulations on 4.5.2020 based on the sharing mechanism already in vogue for these two HVDCs, subsequent to the Commission's orders dated 31.8.2017 in Petition No. 67/TT/2015 (for Biswanath-Chariali/ Alipurdwara to Agra HVDC transmission system) and Order dated 8.6.2013 in Petition No. 44/TL/2012 and third amendment to CERC (Sharing of Inter State Transmission Charges and Losses) Regulations, 2010 (for Mundra-Mohindergarh 2500 MW HVDC transmission system corresponding to 1005 MW capacity). No representation has been received post notification of 2020 Sharing Regulations seeking change in treatment of these HVDCs as provided for in the 2020 Sharing Regulations. Accordingly, the treatment of said HVDCs was not proposed to be modified under

the Draft Third Amendment.

- (b) High capacity Biswanath-Chariali/ Alipurdwār to Agra HVDC transmission system was mainly created to facilitate evacuation of power from hydro potential in the North East, Sikkim, and Bhutan for the entire country and in view of the fact that the lines have to traverse through the “Chicken Neck” area which has limited space available for laying the transmission lines. It necessitated the need to lay high capacity transmission lines so that hydro potential in NER is not bottled up due to limited space in the Chicken Neck area, which is a narrow patch of land measuring 22 km in width and 18 km in length near Siliguri having borders with Nepal on one side and Bangladesh on the other side and the area is densely populated. As such, Biswanath-Chariali/ Alipurdwār to Agra HVDC transmission system was not created for a particular region, but for the utilisation of hydro potential in NER, Bhutan, and Sikkim for the entire country. Therefore, it was included in the National Component in the 2020 Sharing Regulations, similar to its treatment in the CERC (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2010 (hereinafter referred to as the ‘2010 Sharing Regulations’)
- (c) Mundra-Mohindergarh HVDC which was created as a dedicated transmission line to supply power to Haryana, was granted license vide Order dated 8.6.2013 in Petition No. 44/TL/2012 pursuant to suggestions of CEA and POSOCO to utilize the spare capacity (1005 MW out of 2500 MW capacity) for inter-regional transfer of power. The said HVDC was not planned to cater drawal by a specific region unlike other HVDCs such as Talcher-Kolar, and Raigarh-Pugular have been planned for drawal requirements of Southern Region, Rihand-Dadri, Barh-Balia, Champa-Kurukshetra have been planned for drawal by Northern Region. Accordingly, the transmission charges corresponding to 1005 MW spare capacity (40% of total charges) were scaled up on all India DICs as per third amendment to 2010 Sharing Regulations and the similar treatment was continued by way of including such 40% charges under National Component in the 2020 Sharing Regulations.
- (d) Although the treatment of abovesaid HVDCs have been included in the 2020 Sharing Regulations, the suggestions of stakeholders have been noted in this regard and the percentage of charges to be considered under Regional

component and National component for the said HVDCs may be reviewed through process of amendment based on suggestions received from CEA, CTUIL, Grid-India and other stakeholders.

2.4.8 With regard to the comments on withdrawing the Draft Third Amendment in view of the APTEL Judgement dated 18.07.2023, it is clarified that the Draft Third Amendment to the Sharing Regulations 2020 was issued by the Commission on 12.6.2023, exercising its powers conferred under the Electricity Act. Moreover, APTEL in its order dated 18.07.2023 has not issued any such directions to withdraw the Draft Third Amendment to the 2020 Sharing Regulations.

2.4.9 With regard to comments that the HVDC lines were planned/ constructed based on the commitment from the states to enable evacuation of contracted power from one region to the targeted region and that the usage of lines in reverse direction is mainly attributed to the demand of that region, it is observed that if an inter-regional HVDC line is used in reverse direction, the power flowing in reverse direction may not only get absorbed in the connecting region but also to other regions, as all regions are interconnected, based on the load-generation balance of regions. Accordingly, it may not be appropriate to levy charges on connecting regions only in cases of reverse flow.

2.4.10 Further, considering the suggestions of SRPC, IWPA, Southern region states and the fact that flow in an inter-regional HVDC would depend on prevailing grid conditions, we agree that principle for sharing in National component should not be linked to real time flows to avoid any pressures on Grid-India to keep set point of HVDC for commercial issues, rather it may be linked to the capacity of HVDC to transmit power. Once the reverse flow capacity is established, System operator can utilize the HVDC in the reverse direction, depending on load generation balance and overall optimized operation of integrated mesh of AC and HVDC transmission system.

2.4.11 Therefore, in view of the above discussions, we are of the considered view that the Yearly Transmission charges of inter-regional HVDC Transmission Systems having a bi-directional flow of power can be considered in the National Component based on its capacity for power flow in the reverse direction. i.e. if the reverse flow capacity

vis-a-vis forward capacity is 50%, then 50% of YTC shall be considered in National component and balance in regional component. If such reverse capacity increases to 100% at any point in time, 100% YTC shall be considered under National Component. However, it is necessary that such reverse capacity needs to be established through actual flow. There may be some constraints in reverse flow such as testing not carried out for such reverse capacity or some other constraint may be there. For example, in the case of Raigarh-Pugular HVDC due to constraints on ICTs at Raigarh end, the full reverse capacity flow (equal to 3000 MW) was not possible when the HVDC was declared COD and the actual reverse flow equal to 3000 MW happened only in May 2022. Similarly, Talchar-Kolar HVDC, although having a reverse capacity of 1900 MW, has never been tested. Unless an HVDC is capable of carrying reverse power flow for a quantum claimed as reverse capacity, other regions cannot be charged for such a quantum. We also note that the quantum of reverse capacity must be discussed while planning by CTU so that all stakeholders are aware of such capacity, and while declaring the COD of an HVDC, such capacity must be tested since the transmission charges are getting shared based on such capacity.

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Member

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(Arun Goyal)
Member

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(I.S. Jha)
Member

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Chairperson

Appendix-I

List of Stakeholders who submitted written Comments/Suggestions

| SI. No. | Name of the Stakeholder | Short term used in this document |
|---------|--|----------------------------------|
| 1 | BSES Yamuna Power Limited | BYPL |
| 2 | Grid Corporation of Orissa | GRIDCO |
| 3 | Indian Wind Power Association (IWPA) | IWPA |
| 4 | Karnataka Power Transmission Corporation Ltd. | KPTCL |
| 5 | Kerala State Electricity Board Limited | KSEBL |
| 6 | M.P. Power Management Co. Ltd. | MPPMCL |
| 7 | Maharashtra State Electricity Distribution Co. Ltd. | MSEDCL |
| 8 | Power Company of Karnataka Limited | PCKL |
| 9 | Southern Region Power Committee | SRPC |
| 10 | Tamilnadu Generation and Distribution Corporation Ltd. | TANGEDCO |

Appendix-II

List of Stakeholders who made submissions during the Public Hearing

| Sl. No. | Name of the Stakeholder | Short Form used in this Document Presentation /Oral Submission |
|----------------|--|---|
| 1 | Andhra Pradesh Power Coordination Committee | APPCC |
| 2 | Tamilnadu Generation and Distribution Corporation Ltd. | TANGEDCO |
| 3 | Grid Corporation of Orissa | GRIDCO |
| 4 | Dr. Sudarshan Kumar Babu, DTU | Dr. Sudarshan Kumar Babu, DTU |
| 5 | TNEB Retired officials association | TNEB Retired officials association |
| 6 | Sembcorp Energy India Limited | Sembcorp Energy |
| 7 | Kerala State Electricity Board Limited | KSEBL |
| 8 | Power Company of Karnataka Limited | PCKL |
| 9 | Maharashtra State Electricity Distribution Co. Ltd. | MSEDCL |
| 10 | Indian Wind Power Association (IWPA) | IWPA |