

**Staff Paper  
on  
Stakeholder's suggestions for necessary  
modifications in the GNA Regulations**



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## 1 **Background**

- 1.1 The Commission issued the Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State Transmission System) Regulations, 2022 (Principal Regulations) on 7<sup>th</sup> June 2022. Subsequently, the First amendment to the Principal Regulations was issued on 1st April 2023, and the Second amendment on 19th June 2024 ('GNA Regulations').
- 1.2 The provisions of the GNA Regulations were made effective from 5<sup>th</sup> April 2023 partly and balance from 1<sup>st</sup> October 2023. Further, the provisions of the Second amendment to the Principal Regulations were made effective from 15<sup>th</sup> July 2024.
- 1.3 Stakeholders, including statutory bodies, provide their suggestions on the GNA Regulations from time to time, which are considered under the amendments to the GNA Regulations. Some of the proposals require wider stakeholder consultation before a draft can be finalised. In this light, this Staff paper gives suggestions from stakeholders and attempts to frame new provisions of the GNA Regulations. Alternate proposals are made in the staff paper so as to receive appropriate feedback from the Stakeholders.

2 **Issue No. 1: Substitution of GNA quantum under Regulation 17.1(i) to Regulation 17.1(iii) to the GNA Regulations**

2.1 Suggestions made by Torrent Power Limited:

*“Regulation 25.2 clarifies the aspect of substitution of GNA from Regulation 17.1(i) with Regulations 17.1(ii) without any relinquishment charges considering continuation of usage of ISTS network for the same quantum. However, it is silent on the aspect of substitution of GNA from Regulations 17.1(i) with Regulation 17.1(iii). In such case as well, usage of ISTS network is continued for the same quantum.*

*For instance, Distribution Licensee “A” has 100 MW GNA under Regulation 17.1(i). Now, Distribution Licensee “A” intends to substitute this 100 MW GNA under Regulation 17.1(i) to GNA under Regulation 17.1(iii) through existing / potential direct connectivity with ISTS. As in such instances, as GNA quantum would remain same, there should not be any requirement of applicability of relinquishment charges as there is no reduction in GNA quantum. In such scenario, if there is any liability of payment of relinquishment charges due to surrendering the GNA quantum from Intra-state network, same shall be governed based on prevailing SERC Regulations.*

*In view of the above, the Commission may suitably clarify or guide in respect of substitution of GNA from Regulations 17.1(i) with Regulations 17.1(iii) by way of suo motu order or amendment of GNA Regulations so as to avoid any ambiguity amongst the Stakeholders.”*

As per the above, clarification has been sought in respect of the substitution of GNA from Regulations 17.1(i) with Regulations 17.1(iii).

2.2 Regulation 17.1 of the GNA Regulations provides as under:

*“17.1. The following entities shall be eligible as Applicants to apply for grant of GNA or for enhancement of the quantum of GNA:*

- (i) State Transmission Utility on behalf of intra-State entities including distribution licensees;*
- (ii) A drawee entity connected to intra-State transmission system;*
- (iii) A distribution licensee or a Bulk consumer, seeking to connect to ISTS, directly, with a load of 50 MW and above;*  
*.....”*

As per the above, STU on behalf of intra-State entities, a drawee entity connected to the intra-State transmission system, a distribution licensee, or a Bulk consumer having a load of more than 50 MW and seeking to connect to ISTS directly are inter-alia eligible to seek GNA.

2.3 Regulation 25.2 of the GNA Regulations provides as under:

*“25.2. In case an intra-State entity including a distribution licensee having GNA covered under clause (i) of Regulation 17.1, substitutes GNA with GNA under clause (ii) of Regulation 17.1, GNA for such intra-State entity shall be reduced from the total GNA of STU as held under clause (c) of Regulation 22.1, for the quantum so substituted and for such substituted period.”*

As per the above, an intra-State entity, including a distribution licensee having GNA covered under Clause (i) of Regulation 17.1 can substitute its GNA with GNA under Clause (ii) of Regulation 17.1, subsequent to that such substituted quantum of GNA shall be reduced from the total GNA of STU as provided under clause (c) of Regulation 22.1, for such substituted period.

2.4 Under the above provision, an intra-State entity remains connected with the intra-State network/ distribution system, and only ownership of GNA is considered from through STU to such intra-State entity.

2.5 The suggestion to shift GNA from an intra-State entity to an entity directly connected to ISTS, i.e., to substitute its GNA quantum under Regulation 17.1(i) to GNA under Regulation 17.1(iii) through direct connectivity with ISTS, is not covered under Regulations and is suggested by stakeholders considering the following:

- i. It may facilitate such entities to optimize their transmission charges with easy access to competitive power and to facilitate meeting RE power requirements.
- i. It may lead to non-utilisation of the intra-State system by such an entity. Thus, the question may arise as to whether any relinquishment charges should be considered for relinquishing access to the intra-State network.

2.6 Considering the above, Comments and suggestions are sought from stakeholders on the following issues:

- i. Whether such substitution of GNA quantum under Regulation 17.1(i) to GNA/under Regulation 17.1(iii) should be allowed?
- ii. If such substitution is allowed, should it be coupled with the following conditions:
  - a. the entity shall submit the NOC from the STU.
  - b. the entity shall be liable for payment of the charges of the intra-State network or relinquishment charges, as applicable.
  - c. the entity shall be radially connected with the ISTS as 17.1(iii) entity

3 **Issue No. 2: Use of GNA of a Connectivity grantee by an entity connected with an intra-State network that is not a GNA grantee**

3.1 RIL have suggested allowing the use of the GNA granted to an entity ('A') covered under Regulation 17.1(iii) of the GNA Regulations by entities ('B') which may be connected to an intra-state system of the same State where 'A' is located or some other State. This implies that 'B' may be connected to the intra-State transmission system /distribution system of any State within the same Region in which 'A' is located. Entity 'B,' in this case, is not a GNA grantee.

3.2 Regulation 23.1 of the GNA Regulations provides as under:

*“23.1 An entity covered under Clauses (i) to (v) of Regulation 17.1 which is a GNA grantee, may authorise other entities covered under Clauses (i) to (v) of Regulation 17.1 which are GNA grantee(s), to use its GNA, in full or in part, with prior approval of the Nodal Agency, for a period not exceeding 3 (three) year at a time on mutually agreed terms and conditions:*

*.....”*

As per the above, an entity covered under Clauses (i) to (v) of Regulation 17.1, which is a GNA grantee, may utilise the GNA of another GNA grantee for up to a period of three years.

3.3 At present the GNA Regulations do not permit the 'Use of GNA' by an entity who is not a GNA grantee. The following issues need consideration in this regard:

- i. It will facilitate the drawing entity, which has multiple units consuming power at different locations, to access the power at competitive rates to draw RE power to meet its RPO obligation.
- ii. This may optimise the utilisation of ISTS.
- iii. Such an Entity connected with an intra-State network would need to take NOC of STU and pay intra-state transmission charges as applicable
- iv. Liability of payment of transmission charges against the GNA shall be on the original GNA grantee.

3.4 Considering the above, Comments and suggestions are sought from stakeholders on the following issues:

- i. Whether such utilisation of GNA of a GNA grantee can be allowed by an entity that is not a GNA grantee?

- ii. If such use is allowed, should it be coupled with the following conditions:
  - a. Such request to be made along with the NOC from the STU towards availability of space in the intra-State network for such quantum of GNA and period
  - b. Such request for utilisation of GNA shall be from an entity located in the same State or same region as that of the GNA grantee. The additional conditionalities that need to be imposed for considering the GNA utilisation beyond the state.
  - c. Such request should only be allowed based on the margin available in ISTS, and no augmentation in the ISTS is to be made to facilitate such use of GNA.
  - d. Such utilisation shall be restricted to GNA only and not GNA<sub>RE</sub>.
- iii. Issue of Waiver of transmission charges: If entity 'B' draws power from RE resources, should the GNA grantee 'A' be allowed waiver in respect of such RE power drawl.

#### 4 **Issue No. 3: Dual Connectivity to the Bulk Consumer for the same load capacity**

4.1 CTUIL vide letter dated 24.01.2024 has submitted as under:

***"1. Dual Connectivity for Bulk Consumers:***

*In our earlier letter dated 12.07.23, it was pointed out that unlike generators, Dual Connectivity for Bulk Consumers i.e. connection to both ISTS and Intra-state systems is not provided in GNA Regulations. Dual Connectivity is provided to generators, however, not for the same capacity (i.e. part to ISTS and part to Intra-state). Representations have been received from various Bulk Consumers regarding the requirement of Dual Connectivity for same load capacity to both ISTS and Intra-state transmission system. One of the primary reasons for this requirement is to enable the Bulk Consumers to avail RTC green power, i.e. from ISTS during availability of RE power and banked power from intra-state entities such as DISCOMs through STU network during non/low RE hours."*

As per the above, CTUIL has received representations from various Bulk Consumers regarding the requirement of Dual Connectivity for the same load capacity to both ISTS and Intra-state transmission system to enable the Bulk Consumers to avail of RTC green power, i.e., from ISTS during the availability of RE

power and banked power from intra-state entities such as DISCOMs through STU network during non/low RE hours.

4.2 Regulation 17.1 of the GNA Regulations provides as under:

*“17.1. The following entities shall be eligible as Applicants to apply for grant of GNA or for enhancement of the quantum of GNA:*

*.....*

*(iii) A distribution licensee or a Bulk consumer, seeking to connect to ISTS, directly, with a load of 50 MW and above;*

*.....”*

As per the above, a distribution licensee or a Bulk consumer having a load of more than 50 MW and seeking to connect to ISTS directly is also eligible to seek GNA.

4.3 Thus, at present, GNA Regulations do not have any provision to grant GNA to bulk consumers through dual connectivity, i.e., the entity is connected with the intra-State network as well as ISTS for the same load capacity or for enhanced capacity.

4.4 The following issues need consideration:

- i. Such provision of dual connectivity may facilitate the bulk consumer to avail of RTC green power.
- ii. There may be a question of redundant capacity in the intra-State network and ISTS due to such dual connectivity for the same load capacity and on whom should such liability fall to pay the transmission charges for such stranded capacity.
- iii. There may be the possibility that such Bulk Consumers may seek GNA<sub>RE</sub> from ISTS and avail of full ISTS transmission charges waiver; however, on the other side, they draw non-RE Power from the intra-State network. In such a situation, redundant capacity may be developed in the system for an entity that is not actually paying the transmission charges for such a transmission system.
- iv. The inter-se flows between ISTS and intra-State transmission network would need coordinated planning between CTU and STU.

4.5 Considering the above, Comments and suggestions are sought from stakeholders on the following issues:



- i. Whether such grant of GNA to Bulk Consumer through dual connectivity, i.e., for the same load capacity should be allowed or not?
- ii. If such a grant of GNA to Bulk Consumer through dual connectivity is allowed, can it be coupled with the following conditions:
  - a. NOC of the STU based on the commitment of bulk consumers to pay the applicable charges of the intra-State network if the applicant is already connected with the intra-State network and seeking GNA through direct connectivity with ISTS?
  - b. Commitment of bulk consumer to pay the applicable charges of ISTS if the applicant is already connected with the ISTS and seeking connectivity to the intra-State network.
  - c. Should only those Bulk Consumers be granted GNA<sub>RE</sub> from ISTS, which is drawing only RE power through the intra-State network also. Further, after the granting of GNA<sub>RE</sub>, if the user starts drawing non-RE power through the intra-State network, its GNA<sub>RE</sub> may be converted into GNA with a waiver of the ISTS charges as applicable for GNA in terms of the Sharing Regulations, 2020.

## 5 **Issue No. 4: Provision of Conn BG-2 for Bulk Consumer**

5.1 CTUIL vide Letter dated 14.06.2024 has submitted the following:

*“Regulations 12.5 of GNA Regulation provides that ‘In case of an entity covered under Regulation 17.1(iii), the line to connect such an entity to the ISTS and necessary augmentation for providing connection to the ISTS, shall be constructed and maintained by a licensee at the cost of such entity’.*

*Under such provision, in case, augmentation of ISTS system is required (say 765 or 400 kV line & ICTs) for grant of GNA to bulk consumer, then required augmentation is to be implemented and maintained in ISTS (765kV or 400 kV transmission line(s) / ICT(s)) at the cost of bulk consumer. However, it may be noted that transmission system under ISTS can be implemented through TBCB route or RTM route.*

.....

*In view of above, it is proposed that like generators, Bulk Consumer may be also granted GNA along with / without ATS system. Where augmentation of transmission system is required, bulk consumer shall submit applicable Conn-BG2 towards cost of ATS, as submitted by the generators under Regulation 8 of GNA Regulations 2022.*

*Accordingly, it is proposed to replace the Regulations 12.5 with below:*

*“In case of an entity covered under Regulation 17.1(iii), the line along with its bay at ISTS end to connect such an entity to the ISTS shall be constructed and maintained by entity at its own cost and necessary augmentation required in ISTS for providing connection to the ISTS, shall be taken up for implementation under ISTS. GNA to bulk consumer shall be issued in line with the Regulation 7. Further, Bulk consumer is required to submit applicable BGs (Conn-BG1, Conn-BG2 towards cost of ATS and Conn-BG3) in line with Regulations 8.2 and 8.3.”*

*It may be clarified that Conn-BG2 towards bay cost would not be applicable for entity covered under Regulation 17.1(iii) as the same would be constructed and maintained by the entity.”*

As per the above, CTUIL, citing the reason that the transmission system under ISTS can be implemented through the TBCB route or RTM route, has proposed to make provision for submission of Conn-BG2 towards the cost of ATS where augmentation of the transmission system is required for the grant of GNA to entities covered under Regulation 17.1(iii).

5.2 Regulation 12.5 of the GNA Regulations provides as under:

*“12.5. In case of an entity covered under Regulation 17.1(iii), the line to connect such an entity to the ISTS and necessary augmentation for providing connection to the ISTS, shall be constructed and maintained by a licensee at the cost of such entity.”*

As per the above, the line to connect the entity covered under Regulation 17.1(iii) to ISTS and necessary augmentation for providing such connection shall be constructed and maintained by a licensee at the cost of such entity.

5.3 Clause (b-i) of Regulation 22.2 of the GNA Regulations provides as under:

*“(b-i) Entities covered under clause (iii) of Regulation 17.1 shall furnish ConnBG1 for Rs 50 lakhs per application and Conn-BG3 for Rs 2 lakh/MW.”*

As per the above, the entity covered under clause (iii) of Regulation 17.1 shall furnish ConnBG1 for Rs 50 lakhs per application and Conn-BG3 for Rs 2 lakh/MW. The said BGs serve as security in case such an entity abandons the project.

5.4 To grant GNA to an entity under Regulation 17.1(iii), there may be a requirement of augmentation *for providing connection to the ISTS*, which may be an ICT or LILO of a transmission line and augmentation of ISTS system (under system strengthening). It is understood that the terminal bay connecting the dedicated line shall be constructed by the entity itself. The issue at hand is whether such ICT/LILO or any other system, which is an immediate drawl system, should be constructed under ISTS with Conn-BG2 paid by such entity for security and later such entity pays

charges for GNA Or such entity should only construct the immediate system/pay for it.

5.5 Considering the above, Comments and suggestions are sought from stakeholders on the following issues:

- i. Whether the implementation of the system *for providing connection to the ISTS* for the grant of such GNA to the entity covered under Regulation 17.1(iii) should be implemented as ISTS under TBCB/RTM, for which the concerned entity shall submit Conn-BG2?
- ii. Whether post construction under ISTS, transmission charges for such ATS or dedicated elements like ICT, etc, should be bilaterally billed to such Bulk Consumer or should be considered under the transmission charges pool?
- iii. Should charges of such system *for providing connection to the ISTS*, to be constructed under ISTS, be paid by the entities under GNA/GNA<sub>RE</sub> where more than 50% of the transmission charges are waived off ?

**6 Issue No. 5: Utilisation of the Connectivity granted to a subsidiary by another subsidiary of the same Parent company.**

6.1 NSEFI has proposed to allow the utilisation of Connectivity granted to one subsidiary to another subsidiary of the same Parent Company.

6.2 Regulation 15.1 and Regulation 15.3 of the GNA Regulations provide as under:

*“15.1. A Connectivity grantee shall not transfer, assign or pledge its Connectivity and the associated rights and obligations, either in full or in parts, to any person except as provided under Regulations 15.2 and 15.3 of these regulations.*

*Provided that Connectivity granted to a parent company may be utilised by its subsidiary companies and Connectivity granted to a subsidiary may be utilised by its parent company:*

.....

*15.3 Any person which acquires 51% or more shareholding of the company or its subsidiary or affiliate company owning REGS or part thereof in terms of Regulation 15.2, may after COD of such split part, apply to the Nodal Agency for transfer of Connectivity. The Nodal Agency shall issue revised grant of Connectivity on submission of applicable Conn-BG2 and Conn-BG3 by such person. The original grantee may substitute its Conn-BG2 and Conn-BG3 with revised Conn-BG2 and Conn-BG3, to be intimated by CTU. On issue of revised grant of Connectivity, such person shall enter into a fresh Connectivity Agreement and be responsible for compliance with all applicable regulations.*

.....”

As per the above and the subsequent clarification issued vide Order dated 22.9.2023 in Suo Motu 11/SM/2023, Connectivity granted to a parent company may be utilised by its subsidiary companies, and Connectivity granted to a subsidiary may be utilised by its parent company. Further, any person who owns REGS or part thereof, after COD of such part, may get transferred the corresponding connectivity on his name by applying to the Nodal Agency.

6.3 At present, there is no provision under the GNA Regulations that provides the utilisation of Connectivity among the subsidiaries of the same Parent company. The transfer of connectivity is possible after COD to the owner of REGS, which can be a subsidiary of the same parent or any third party.

6.4 Whether such utilisation of Connectivity among the different subsidiaries of the same Parent company should be allowed or not?

7 **Issue No. 6: Platform for providing NOC by the STU in a time-bound and a transparent manner**

7.1 Serentica have raised concerns regarding the issuance of NoC from STU while they wish to seek GNA to ISTS. It has been submitted that they face challenges in getting the timely consent of the STU for the intra-State network. Stakeholders have suggested that the NoC / Deemed NOC should be provided for existing consumers in a time-bound manner. Some stakeholders have also suggested developing a centralised platform where an entity can apply for NOC from the STU, and the concerned STU will issue or reject the NOC with a valid reason in a time-bound and in a transparent manner.

7.2 Regulation 20.1 and Regulation 20.4 of the GNA Regulations provide as under:

*“20.1. Entities covered under clauses (ii) and (iii) of Regulation 17.1 of these regulations, may apply for GNA indicating bifurcation of GNA within the region and outside the region, from a specified date, for a specified quantum, and for a specified period of more than eleven months.*

*Provided that the entities covered under clause (ii) of Regulation 17.1 of these regulations shall furnish consent of the concerned STU in terms of availability of transmission capacity in intra-State transmission system for such quantum and period of GNA.*

.....

*20.4 Entities covered under clauses (ii) and (iii) of Regulation 17.1 of these regulations may apply for GNARE indicating bifurcation of GNARE within the region and from outside the region, from a specified date, for a specified quantum, and for a specified period of more than eleven months.*

*Provided that the entities covered under clause (ii) of Regulation 17.1 of these regulations shall furnish consent of the concerned STU in terms of availability of transmission capacity in intra-State transmission system for such quantum and period of GNA<sub>RE</sub>.*

.....”

As per the above, entities covered under Regulation 17.1(ii), i.e., intra-State entities, including distribution licensee, seeking GNA or GNA<sub>RE</sub>, as the case may be, shall be required to furnish consent of the concerned STU in terms of availability of transmission capacity in the intra-State network for such quantum and period of GNA/GNA<sub>RE</sub>.

7.3 Clause (d) of subsection (2) of Section 39 of the Electricity Act, 2003 provides as under:

**“Section 39. (State Transmission Utility and functions):**

.....

*(2) The functions of the State Transmission Utility shall be –*

.....

*(c) to provide non-discriminatory open access to its transmission system for use by-*

*(i) any licensee or generating company on payment of the transmission charges; or*

*(ii) any consumer as and when such open access is provided by the State Commission under sub-section (2) of section 42, on payment of the transmission charges and a surcharge thereon, as may be specified by the State Commission:*

.....

**Section 42. (Duties of distribution licensee and open access): ---**

.....

*(2) The State Commission shall introduce open access in such phases and subject to such conditions, (including the cross subsidies, and other operational constraints) as may be specified within one year of the appointed date by it and in specifying the extent of open access in successive phases and in determining the charges for wheeling, it shall have due regard to all relevant factors including such cross subsidies, and other operational constraints:*

.....

*(3) Where any person, whose premises are situated within the area of supply of a distribution licensee, (not being a local authority engaged in the business of distribution of electricity before the appointed date) requires a supply of electricity from a generating company or any licensee other than such distribution licensee, such person may, by notice, require the distribution licensee for wheeling such electricity in accordance with regulations made by the State Commission and the duties of the distribution licensee with respect to such supply shall be of a common carrier providing non-discriminatory open access .*

.....”

As per the above, the STUs and distribution licensees are required to provide non-discriminatory open access to its transmission system for use by any licensee or

generating company any consumer on payment of the transmission charges and a surcharge thereon, as specified by the State Commission. Further, it is the duty of the distribution licensee to provide non-discriminatory open access to a person seeking supply of electricity from a generating company or any licensee other than such distribution licensee in accordance with the regulations made by the State Commission.

- 7.4 To address the stakeholders' concerns regarding the delay in providing the NOC by the STU in terms of the availability of transmission capacity in the intra-State network for the quantum and period, a centralised online portal may be developed. Applicant can apply online along with the necessary details for providing the STU's consent /NOC, and STU shall process the same in a time-bound manner. STU may allow or reject such applications with valid reasons in accordance with the regulations made by the State Commission. This portal will provide a transparent platform for processing the NOC application and ease the grant of GNA to the intra-State entities.
- 7.5 This platform may be implemented and maintained by the CTU as per the direction of the Commission. Access to the same shall be provided to CTU, RLDC, STUs, SLDC, and the applicant seeking State NOC.
- 7.6 Considering the above, Comments and suggestions are sought from stakeholders, whether such a centralized online platform is required to be implemented for processing the application for grant of NOC by the STU in terms of availability of transmission capacity in the intra-State network?

## **8 Issue No. 7: Provision for grant of Solar hours Connectivity and Non-Solar hours Connectivity through the same Transmission system**

- 8.1 India has set an ambitious target of achieving 500 GW of non-fossil fuel power by 2030. This necessitates substantial investment in Renewable Energy (RE) generation and its vital enabling infrastructure – transmission system. However, integrating this growing share of renewables into the power grid poses significant challenges. While high power demand exists during non-solar peak hours, RE transmission capacity connected to solar projects remains unutilised. Additionally, the grid faces instability issues due to the variable nature of RE generation. To address these challenges and ensure successful RE integration, optimising existing

RE transmission infrastructure and deploying Energy Storage Systems (ESS) in the Grid are crucial requirements.

## 8.2 Challenges in expanding ISTS and integrating RE

### **(a) Suboptimal Utilization of Transmission Grids.**

VRE projects, such as solar and wind farms, typically have lower Capacity Utilization Factors (CUF) as compared to conventional generation. Solar installations have a CUF ranging from 18% to 23%, while onshore wind CUF ranges from 20% to 35%. This means VRE projects utilize the transmission system for only a portion of 24 hours.

### **(b) Non Utilisation of ISTS during non-solar hours.**

There is a mismatch between peak power demand and solar generation. While demand is high during non-solar peak hours, the transmission capacity built for solar projects sits idle.

**(c) Challenges in Expanding Transmission Infrastructure.** Expanding transmission infrastructure to integrate more VRE sources like solar and wind farms faces several challenges. Building new transmission lines and substations requires significant time, financial resources, and coordination with States and other entities. Obtaining Right-of-Way for new transmission lines can be a slow and challenging process due to land procurement and forest clearance requirements. Construction timelines can also be impacted due to reliance on imports for critical equipment like Cold Rolled Grain Oriented (CRGO) steel and high-voltage direct current (HVDC) substation equipment.

**(d) Rising Costs for Evacuating Renewable Energy from states like Rajasthan and Gujarat.** The increasing cost of building new ISTS lines is posing a challenge for evacuating RE generated in Rajasthan and Gujarat. This cost increase is partly due to the saturation of evacuation to nearby load centers like Delhi and Punjab. To reach more distant load centers in Uttar Pradesh, Maharashtra, Orissa, etc., power needs to be transmitted over longer distances, requiring longer transmission lines and potentially more expensive HVDC systems. This can have an inflationary impact on transmission costs and consumer tariffs.

### 8.3 Proposal

The increasing penetration of VRE sources like solar and wind presents a growing challenge: grid balancing during periods of low VRE generation. Without mandatory ESS for VRE projects, managing this variability could become significantly more complex. In the absence of sufficient storage, states may be forced to rely on additional coal-fired power plants to meet peak demand during non-solar hours. However, strategically deployed ESS can minimize the need for new coal capacity by supplying power during these critical periods. Co-located Energy Storage Systems (ESS) can also significantly improve the utilization of these valuable transmission assets.

- a) At present, the Connectivity granted to a REGS is available with it for a full day, i.e. for 24 hours, irrespective of the technology/resource of the generating plant and irrespective of the fact that the applicant is able to utilise this connectivity and inject the power during the entire day or not.
- b) Particularly in the case of the Connectivity granted on a Solar generating station without any storage, the Connectivity and transmission system for the same will be utilised only during the Solar hours, and for the remaining period of the day, the transmission system is not likely to be utilised, unless another generating station or storage with complementary injection pattern is added behind the meter.
- c) It is proposed that to ensure the optimum utilisation of the transmission system, the applicant who is seeking Connectivity for the Solar source only, the Connectivity will be granted 'Solar-hour Connectivity.' These plants will have full rights to inject power up to their connectivity quantum into the grid during solar hours. Solar plants that are already connected to the ISTS or have already been granted connectivity will retain the GNA during solar hours. Grid India shall declare solar hours well in advance.
- d) Regulation 5.1 to Regulation 5.5 of the GNA Regulations provide as under:

*"5.1 An Applicant, which is a generating station including REGS, shall apply for grant of Connectivity to the Nodal Agency for the quantum equal to the installed capacity of the generating station:*

*Provided that if such an Applicant already has Connectivity to intra-State transmission system for part of its installed capacity, it may apply for Connectivity to the ISTS for a quantum not exceeding the balance of the installed capacity;*



*Provided further that if such an Applicant is a Renewable Hybrid Generating Station or REGS with storage, it may apply for grant of Connectivity for a quantum less than or equal to the installed capacity.*

*5.2. Notwithstanding anything contained in Regulation 5.1, a generating station or ESS, with prior approval of CTU, shall be eligible to add, within the quantum of Connectivity granted to it, additional generation capacity or ESS, including the capacity owned by any other entity:*

*Provided that the generating station or the ESS being the existing Connectivity Grantee shall be responsible for compliance with the Grid Code and other regulations of the Central Commission for such additional generation capacity including ESS as 'Lead generator' or 'Lead ESS' in terms of Regulation 2.1 (y)(ii) or Regulation 2.1 (x)(ii), as the case may be:*

*Provided further that net injection at any point of time shall not exceed the quantum of total Connectivity granted to the existing Connectivity grantee.*

.....

*5.5. An Applicant, which is a Renewable Power Park Developer, shall apply for grant of Connectivity for the quantum for which it has been authorised by the Central Government or a State Government as a Renewable Power Park developer."*

As per the above, an applicant may add, within the quantum of Connectivity granted to it, additional generation capacity or ESS. However, net injection at any point in time shall not exceed the quantum of total Connectivity granted to the existing Connectivity grantee. However, under the aforementioned clause, it is up to the existing Connectivity grantee to agree or disagree with such an addition of capacity on the same Connectivity.

- e) It is proposed that the existing connectivity grantee, which was solar-based REGS, shall be mandated to share the dedicated grid infrastructure (terminal bay and the dedicated transmission line) with payment of charges for the dedicated transmission infrastructure (as mutually agreed or as determined by CERC in case of disagreement). For solar hours, the new grantee shall be allowed to schedule power if the transmission system is available after scheduling power of existing solar REGS. The hours other than solar hours shall be treated as non-solar hours. It is clarified that the existing solar REGS can also seek GNA (non-solar)/connectivity at par with the new entity.
- f) The applicant who has been granted non-solar hour connectivity will have the right for injection of power during the non-solar hours. Further, for solar hours, the new Connectivity grantee may be allowed to schedule power if the transmission system is available after scheduling power of existing solar REGS.
- g) An REGS, which is a REGS with storage or an RHGS where the Connectivity for Solar components is much larger than storage or wind, may also be considered under the

aforementioned proposal of the utilisation of Connectivity during non-hours by the existing Connectivity Grantee. The following two examples may be considered:

- (i) Suppose an REGS with storage has a Connectivity of 1000 MW with an Installed capacity of 1000 MW Solar and 100 MW storage. Such REGS can utilise a maximum of 100 MW during non-solar hours, which can be considered under the aforementioned proposal.
  - (ii) Suppose an RHGS with storage has a Connectivity of 1000 MW with the Installed capacity of 700 MW Solar, 300 MW Wind, and 100 MW storage. Such REGS can utilise a maximum of 400 MW during non-solar hours, which can be considered under the aforementioned proposal.
- h) Considering the above, Comments and suggestions are sought from stakeholders on the abovementioned proposed model of “Solar-hour Connectivity” and “non-Solar hour Connectivity”.
- i) Should existing solar generators (without storage) also be given the option to install storage for utilisation of connectivity/GNA during non-solar hours by submitting an application to CTUIL within three months and installing within a period of 24 months, failing which connectivity/GNA during non-solar hours shall be utilised to grant another connectivity through the same transmission system as ‘non-solar hour connectivity’ to another applicant, based on the other RE resources or Storage plant, for injection of power during non-solar hours?.

#### **Issue No. 8: Provision for Minimum Transmission Capacity Utilisation for Hybrid ISTS Connectivity**

8.4 Regulation 5.1 of the GNA Regulations provides that in the case of RHGS, the applicant may seek connectivity for a quantum less or equal to the installed capacity. Suppose an RHGS has the configuration of 500 MW Solar and 300 MW Wind; such an applicant may seek Connectivity for 800 MW or less.

8.5 If the entity has Connectivity for the full capacity of the RHGS (i.e., for 800 MW in the present example) but subsequent to the Commissioning of the RHGS, the Connectivity grantee is not able to utilise the full quantum of the Connectivity, it may lead to under-utilization of the transmission system and may lead to a situation where other connectivity applicants are deprived of such connectivity.

8.6 An applicant should take Connectivity for a quantum that it wishes to utilise. It is proposed that to ensure the optimal utilization of the transmission system, a minimum annual capacity utilization, i.e., 50%, for RHGS may be mandated, failing which the underutilized capacity of the Connectivity may be reduced, effective 1st October 2026. Alternatively, the quantum of Connectivity equal to the average of maximum injection in any time block of a day over the year (first year after the declaration of COD) may be allowed to be retained by the Connectivity grantee, and the balance quantum of the part of the Connectivity may be revoked (with corresponding Conn-BGs to be returned). Connectivity on such vacated capacity may be granted to other entities.

8.7 Considering the above, Comments and suggestions are sought from stakeholders on the above proposal whether the minimum annual capacity utilization of the Connectivity by the RHGS should be mandated or not.

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