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NTPC Submission on Draft CERC (Indian Electricity Grid Code) Regulations, 2022





Salient Points

- ✓ *Control Area Jurisdiction*
- ✓ *EX Bus DC Declaration limited to 100 % MCR*
- ✓ *DC Revision by Generators*
- ✓ *Documents and Test Reports Prior to Declaration of CoD*
- ✓ *Security Constrained Unit Commitment (SCUC)*
- ✓ *Incentive for Operation below Normative level*
- ✓ *Drawal of power from Grid with a valid Contract*
- ✓ *Trial Run of Wind / Solar / Storage / Hybrid Generating Station*
- ✓ *Primary Frequency Response by RE Stations*
- ✓ *Role of RPC in issuing various accounts*
- ✓ *Enabling Clause for Flexibility Scheme*

Regulation 43 : Control Area Jurisdiction of System Operator

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As per draft Control Area Jurisdiction shall be based on quantum of Connectivity. Hence if a CGS station suppling power to other states, but connected to state grid with more than 50% of connectivity quantum, shall be under the Control Jurisdiction of SLDC.

- Accordingly some CGS stations shall not be considered as Regional Generating station (*Regional Entity means such entities which are in the RLDC control area and whose metering and energy accounting is done at the regional level)*.
- Various clauses of IEGC and Regulations issued by Hon'ble Commission for regional stations shall not be applicable to them. e.g. Compensation for operation below normative level, Reactive power compensation, DSM etc.
- **As the tariff of CGS is Regulated by Hon'ble Commission, such other components which are part of tariff should also be governed by Hon'ble Commission Regulations.**
- Such stations would also face difficulties in scheduling of Ancillary / SCED due to lack of infrastructure/Communication link thereon with SLDC. Further many SLDC are also not WBES enabled and billing may get delayed as timely issuance of REA accounts by SLDC shall be a concern.
- ***Submission: The existing provision of Grid Code in regards with Controlling Jurisdiction for CGS Stations based on allocation may be retained.***

Regulation 45(8)(a) : EX Bus DC Declaration limited to 100 % MCR

Draft Regulation provides:

- *The regional entity generating station shall declare ex-bus Declared Capacity, limited to 100% MCR, on day ahead basis as per provisions of Regulation 47 of these regulations.*

- Hon'ble Commission vide SoR for IEGC 5th amendment has pleased to mentioned that:

  - *We are of the view that **declaration of capacity including overload margins is the prerogative of the generator.** However, for the purpose of calculation of PAF, DC declared by the generator is not to be reduced. **This would ensure proper incentive for the generator for keeping units in readiness for providing much needed grid support in case of frequency excursion**.*

- Restrictions imposed on scheduling by beneficiaries cannot take away the capability of the machine. It may be noted that schedules shall be finalized considering several factors such as availability of transmission corridors, Reserves for Primary Response, SCED etc. Whereas DC is the capability of the machine which is independent of all such factors and should not capped. Generator is supporting the grid with its capability and in fact such generators should be incentivized.

- ***Submission: The regional entity generating station shall declare ex-bus Declared Capacity, on day ahead basis as per provisions of Regulation 47 of these regulations.***

Regulation 47 (4): Revision of Schedules on Request of Regional Entities

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*The Draft Regulation permits **upwards revision of schedule** after 2 PM onwards on D-1 day only*

- However no enabling provision has been provided for generators to revise their DC on valid reasons.
- The existing Grid Code allows the ISGS to revise their Declared Capability of the D day with advance notice and the revision becomes effective from 7th & 8th block.
- In real time basis the Generating Stations may be required to revise their declared capability due to various technical constraints which can not be anticipated in advance while making declaration on D-1 basis and are beyond the reasonable control of Generator.
- Thermal power plants have multiple auxiliary systems that are essential for operation of the units. Some of these systems do not have in-built redundancy and unit load has to be reduced for carrying out maintenance or repairs in case of breakdowns. Further upward revision of DC is required for restoring the load on machine after carrying out maintenance or repairs in case of breakdowns
- Considering the technical difficulties, The Expert Committee Report has also permitted the DC revisions as follows:

  While making or revising its declaration of capability, *except in case of run-off-river (with up to three-hour pondage) hydro stations and canal fed hydro, the regional entity generating station shall ensure that the declared capability during peak hours is not less than that during other hours. However, exception to this rule shall be allowed in case of tripping/re-synchronization of units as a result of forced outage of units.*

- ***Submission: The existing provision for revision of declared capability of the D day may be retained.***

Regulation 24: Test Reports Prior to Declaration Of CoD

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It is proposed that following tests shall be performed:

*(i) Operation at a **control load of 50 % of MCR** as per the CEA Technical Standards for Construction for a sustained period of 4 hours.*

*(ii) **Ramp-up from 50 % of MCR to MCR** at a ramp rate of at least 1 % of MCR per minute and sustained operation at MCR for 1 hour.*

*(iv) **Ramp-down from MCR to 50 % of MCR** at a ramp rate of at least 1 % of MCR per minute.*

- Based on NTPC experience with the thermal fleet in regards with flame stability and reliability, 55% of MCR needs to be considered as the lowest unit load.
  - ***Accordingly Testing for Operation of Control load at 55% of MCR for a sustained period of 4 hours may be considered.***

- The load variation by varying the mill loading can only be achieved within a certain range only. Beyond this range one or more mills are to be cut in / cut out and during these transient periods, the parameters like temperature and pressure vary and certain stabilization period is required.
  - ***Hence 1% Ramp rate test needs to be carried out in steps with 02 nos. stabilisation periods of 30 min each, from 55% to 100% of MCR and vice versa.***

Regulation 45 (12): Compensation for Operation below Normative level

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The Draft Regulation provides that:

- *The minimum turndown level for operation shall be 55% of MCR of the said unit:*
- *Generating station on its own option may declare a minimum turndown level below 55% of MCR:*
- *Provided that the thermal generating stations shall be compensated for generation below the normative level either as per the mechanism in the Tariff Regulations or in terms of the contract entered, as the case may be.*

- **Submission:** ***Existing grid code provisions for part load compensations to continue to be effective till part load compensations provisions are made applicable in tariff Regulations so that the generators continue to get the compensation.***
- **The existing dispensation is such that the thermal generating station is compensated for the loss on account of degradation in station heat rate and auxiliary power consumption based on actual loss or normative whichever is lower. In many cases, the thermal generating station ends up making losses on account of cycling/flexing as the degradation is beyond normative norms.**
- In order to promote flexibility for integrating large-scale RE and to carry out necessary modification/augmentation to make plants suitable for flexing, ***Enabling provisions are necessary not only to compensate the cost but also to incentivize to take care of the long term impact on machine life due to thermal cycling.***

Regulation 46(4)(h) Security Constrained Unit Commitment (SCUC)

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Draft Regulation provides that:

- *SCUC concept introduced to commit unit on bar for maximization of reserves. For this NLDC shall increase schedule of some units up to their Technical Minimum level.*
- *Units not brought on bar have option to operate on schedule less than Tech. Min. or go under Shutdown. In case unit is taken under shutdown, Genco to fulfil its obligation to supply to the beneficiaries who made requisition prior to unit going under shutdown.*

Submission:

- Running of units below technical minimum can be possible after some technological modifications are done or using the support of secondary fuel. Without addressing these possibilities, units are left with only one option i.e., taking them under shutdown.
- Sometimes unit is forced to go under shutdown due to scheduling pattern of the beneficiaries.
  - While schedule is given during peak hours, Schedule during non peak Hours is either below TM or Zero.
- Further based on the requirement of beneficiaries units are required to bring back on bar.
- Frequent start stop of unit leads to uneconomical operation of the system and RSD of unit reduces the rotating inertia in the system which is required for large scale RE integration.
- This also forces beneficiaries to buy costlier power during peak hours.

Security Constrained Unit Commitment (SCUC): Contd.

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Submission:

- If efforts are made for flattening of load curve and Beneficiaries are mandated to give certain percentage of Schedule during non peak hours of their peak hour requirement, low scheduling during non peak hours can be avoided.
- To ensure maximum units on bar and to cater during peak hours, Schedules of certain units which have received schedule less than TM in day on certain number of blocks only, may be increase in line with SCED or may also be considered in SCUC. This will avoid the start up and shut down cost and shall lead to economic operation of the system.
- System operator may moderate such schedule during such blocks to ensure technical minimum schedule inline with the draft Regulation 47(4)(d). **The Expert Group has also suggested for such provisioning in the interest of reliable operation of the system.**

- In reference to the obligation to supply, the Generator must not be liable to supply power in case of USD which is due to unreasonable requisitions given by beneficiaries not meeting the minimum technical loading/requirements of generating units thus leading to Reserve Shutdown of the units and causing incurring extra operational expenses for no fault of generator.
- Instead generator is required to get compensated for such extra operational expenses incurred owing to USD.

Detailed procedure for USD and then bringing of unit thereof with consideration of start-up time of Units and compensation mechanism need to be formulated in line with existing RSD procedure.

Regulation 45 (15): Drawal of power from Grid permitted with a valid Contract

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The Draft Regulation provides:

- *A generating station including renewable energy generating station shall be allowed to draw power from ISTS during non-generation hours, whether before COD or after COD, only after obtaining schedule for such drawal of power in accordance with a valid contract entered into by it with a seller or distribution licensee or through power exchange.*

  - In case of thermal unit tripping, due to process requirement there would always be requirement to draw power instantaneously from the grid to run certain mandatory auxiliaries like Cooling water System, Turbine Lubricating oil system, Generator Seal Oil System, Air preheater, Station lighting, & Instrument air compressors. Stoppage of above auxiliaries may lead to equipment damage.
  - Unit tripping cannot be anticipated in advance which may be due to outage of unit auxiliary or Tr. Lines.
  - It is not feasible to draw such power by arranging through TGNA as the same shall be available only after 12th time block while the unit shall continue to draw the power from the grid to run mandatory auxiliaries.

Therefore, drawl of power by thermal generator during unit tripping considering as process requirement may continued to be allowed under DSM and under deemed TGNA.

Drawal of power from Grid : Contd.

- Similarly thermal unit may be required to be start up immediately after tripping or may be required due to start up based on beneficiary requirement, the arrangement of power through TGNA will increase the process time.

- Regulation 19 (1) of Draft Grid Code provides interchange of infirm power with the grid for the commissioning of the new thermal units as per existing methodology.

- Hon'ble Commission in DSM Regulation 2022 has pleased to provide *"The charges for deviation for drawal of start-up power before COD of a generating unit or for drawal of power to run the auxiliaries during shut-down of a generating station shall be payable at the normal rate of charges for deviation."*

- ***Submission: Considering the fact that the duration and quantum of drawl of power in each time block for such types of drawl may vary significantly and arranging through TGNA shall not serve the purpose as deviations shall continue to be there therefore drawl of power before CoD or after CoD to run the auxiliaries of a generating station may be permitted under DSM and deemed TGNA.***

Regulation 22 (3): Trial Run of Wind / Solar / Storage / Hybrid Generating Station

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The Draft Regulation provides :

- *Successful trial run of a solar inverter unit(s) aggregating to 50 MW and above shall mean flow of power and communication signal for not less than the period between sunrise to sunset in a single day with the requisite metering system, telemetry and protection system in service. Provided that:*
  - *Output below corroborated performance level with solar irradiation of the day shall call for repeat of the trial run.*
  - *If it is not possible to demonstrate the rated capacity due to insufficient solar irradiation, the same shall be demonstrated immediately when sufficient solar irradiation is available after the date of declaration of COD.*
- RE projects are developed based on TBCB concepts against a RFS defined by DISCOMS or REIA wherein certain conditions such as minimum and maximum CUF, minimum & maximum energy deliverables & the penalties thereof are defined. Further the commissioning of RE stations is done based on the conditions mentioned in the PPA signed with the RE project developer.
- Due to massiveness of area of Solar Plant, variance in number of contributing attributes e.g. insolation, ambient temperature, climatic conditions etc, may lead to dynamic and erratic nature of power output from the SPV generating station, corroboration of performance shall be a contentious issue.
- ***Submission: In view of above Trial Run Conditions of Solar plant may be relaxed as follows:***

Successful trial run of a solar inverter unit(s) aggregating to 50 MW and above shall mean flow of power and communication signal <u>for not less than 4 continuous hours between sunrise to sunset</u> in any single day with the requisite metering system, telemetry and protection system in service

Regulation 30(10) : Primary Frequency Response by RE Stations

Draft Regulation provides RE Generating stations to provide primary response on mandatory basis.

Submission:

- May not be made mandatory for the RE plants which have been commissioned or are under implementation based on tariff discovered through TBCB.
- After comprehensive study CEA/CTU may decide strategic location for installation of such Grid Security System common for whole Park like STATCOM.
- Such separate ancillary services, for which tariff may be determined separately through competitive bidding shall provide optimized overall cost to beneficiaries considering RE plant tariff and PRAS service cost. This shall minimize the underutilization of such high costly BESS system if installed dedicated for the one solar plant.
- However, even if primary frequency response is to be mandated for RE plants then it may be considered for RE plants (having capacity 50MW and above) connected above 220KV level in line with conventional thermal generators and may be made mandatory prospectively.

Annexure- 6 : ACCOUNTING AND POOL SETTLEMENT SYSTEM

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The Annexure provides that:

(1)(a) At the Inter State Transmission System (ISTS) level, the basic principle followed is that all settlements for the energy scheduled are done directly between the sellers and the buyers, with the Regional Power Committee issuing the accounts specifying the quantum of energy scheduled. All deviations from the schedule are settled through a regulatory pool account maintained by RLDCs; a net settlement where only the deviation payments are handled.

Submission:

- The role of RPC in issuing various accounts may be defined as provided in existing Grid Code as follows:

RPC shall prepare monthly Regional Energy Account (REA), weekly unscheduled interchange account, reactive energy account, based on data processed by RLDC. RPC shall endeavour to provide monthly energy accounts at the earliest, in any case not later than 2nd day of succeeding month, to enable generators process energy bills in time.

- Further the following new provision may also be provided:

The Energy accounting system shall be transparent, robust, scalable, and as far as feasible employ modern data processing tools and use standard reporting formats across different RPCs, compatible with standard ERP systems of generating utilities.

Enabling Clause for Flexibility Scheme

- MoP GoI vide dt. 12.4.22 has issued revised “Scheme for Flexibility in Generation and Scheduling of Thermal/ Hydro Power Stations through bundling with Renewable Energy and Storage Power”.

Submission:

- As no separate PPA is being signed for suppling of RE power hence to facilitate scheduling of RE power by thermal station under its existing commitment an enabling provision may be provided:

Any thermal/hydro generating station operating under the flexibility scheme can replace the costlier power with the cheaper RE power against their existing commitments/PPAs and within the GNA quantum granted to thermal/Hydro generator.

THANKS