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(भारत सरकार का उद्यम)
GRID CONTROLLER OF INDIA LIMITED
(A Government of India Enterprise)



[formerly Power System Operation Corporation Limited (POSOCO)]

राष्ट्रीय भार प्रेषण केन्द्र / National Load Despatch Centre

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Ref: GRID-INDIA/NLDC/CERC/

Date: 1st October 2024

सेवा में,
सचिव,
केन्द्रीय विद्युत विनियामक आयोग
6th, 7th एवं 8th फ्लोर, टावर बी, वर्ल्ड ट्रेड सेंटर
नौरोजी नगर, नयी दिल्ली, 110029

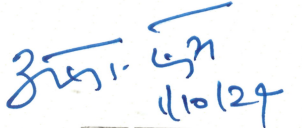
विषय: Suggestions on the Draft Central Electricity Regulatory Commission (Terms and Conditions of Tariff) (First Amendment) Regulations, 2024

महोदय,

The Hon'ble Commission has notified the Draft Central Electricity Regulatory Commission (Terms and Conditions of Tariff) (First Amendment) Regulations, 2024 on dated 02.08.2024.

The suggestions on behalf of Regional Load Despatch Centres (RLDCs) and National Load Despatch Centre (NLDC) on Draft Central Electricity Regulatory Commission (Terms and Conditions of Tariff) (First Amendment) Regulations, 2024 are enclosed herewith for kind perusal and consideration of the Hon'ble Commission.

सधनवाद,


(एस उषा)

मुख्य महाप्रबंधक, (प्रभारी), राभाप्रेके

Copy to:

1. CMD, Grid-India
2. Dir (MO), Dir(SO) Grid-India
3. Heads of RLDCs



Grid Controller of India Limited
(A Govt. of India Enterprise)
(Formerly Power System Operation Corporation Limited)

Date: 30-09-24

The suggestions on behalf of Regional Load Despatch Centres(RLDCs) and National Load Despatch Centre(NLDC) on Draft CERC Terms and Conditions of Tariff (TCT) (First Amendment) Regulations, 2024

Grid-India welcomes the first amendment to Tariff Regulation-2024 especially the addition of clause pertaining to compensation for the operation of generating station below normative plant availability factor. The regulation allows compensation for degradation of station heat rate and auxiliary energy consumption, consumption of additional secondary fuel oil due to loading below the normative plant availability factor up to 40% installed capacity (coal or lignite based generating stations). This has been in alignment with the Central Electricity Authority (Flexible operation of thermal power plants) Regulations, 2022 & IEGC-2023.

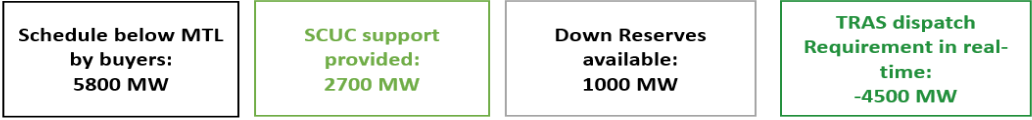
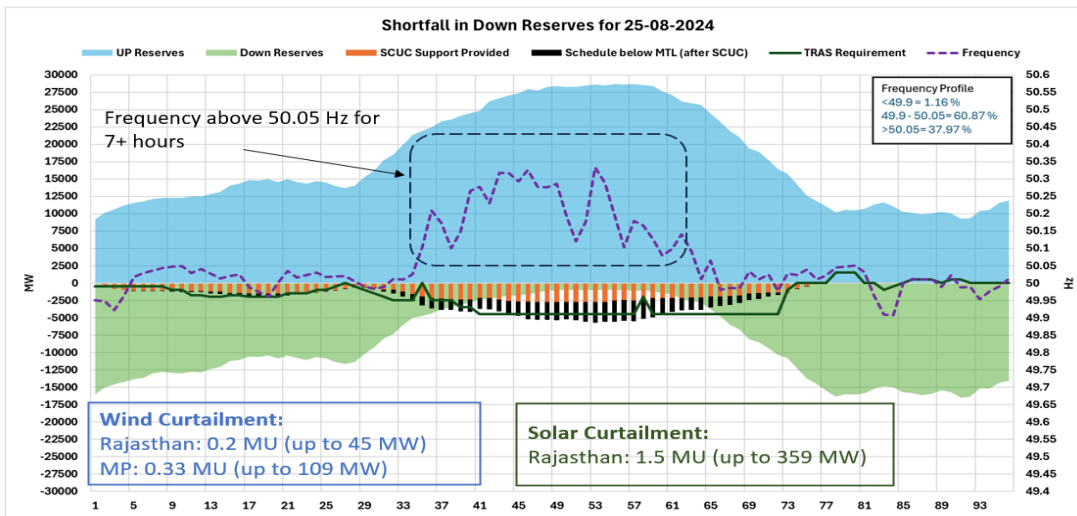
The amendment is both timely & pertinent with respect to pressing resource adequacy challenges being faced by Indian Power System in recent times. With substantial increase in renewable energy sources, ensuring resource adequacy in all time-frames is of utmost importance. Furthermore, the availability of adequate flexible resources in the power system is also imperative to meet the increasing demand ramp and the requirement of backing down of thermal generation during peak RE periods.

The scale of the challenge may be appreciated from the following observations:

1. Around 18% (Maximum: 64 GW (14.06.23)) contribution of RE during solar hours, Increasing non-solar peak limited support from RE (wind) during non-solar hours.
2. Low wind generation during high wind season (Minimum: 358 MW (30.08.22)).
3. Huge impact of Cloud cover, sandstorm (Max affected: 10,000 MW (16.10.23)).
4. RE generation loss due to fault ride through issues (Max affected: 7100 MW (15.05.23)).
5. High RE penetration & low demand scenarios - Since June 2024, **there have been at least 15 days** when all thermal ISGS units were **backed down to MTL**, and the available down reserves were **inadequate to meet dispatch requirements. States were reluctant to curtail intra-state RE generation on account of high frequency.**

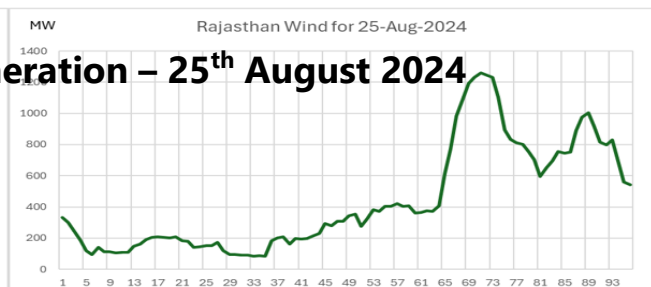
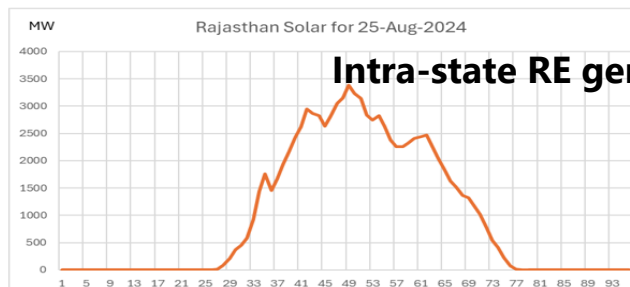
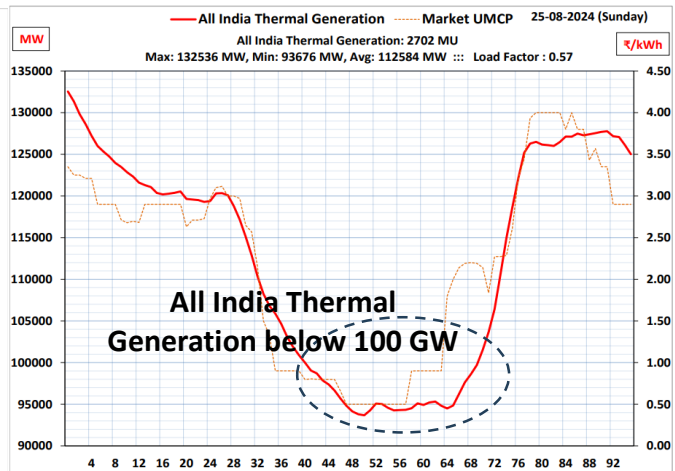
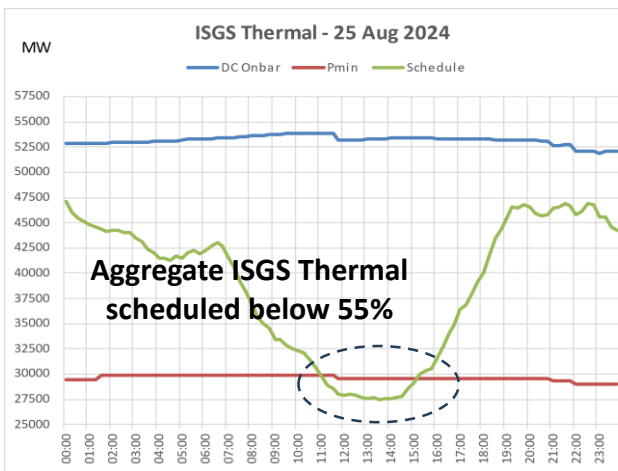
For e.g. on 25-08-24, frequency remained above 50.05Hz for more than 7 hours (**Fig-1**) due to inadequate down reserves to contain persistent high frequency conditions.

Case Study: Shortfall in Reserves – 25th August 2024

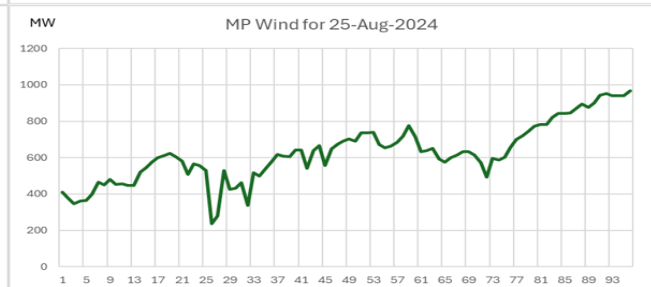
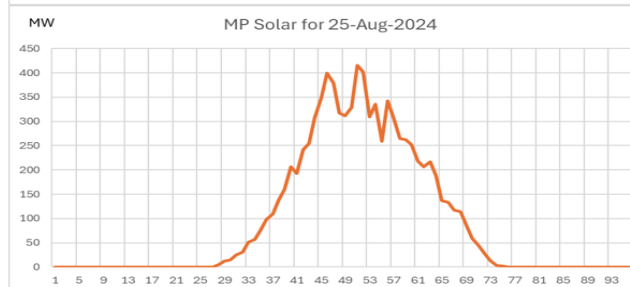


- Coal & gas units being supported through SCUC to maintain adequate reserve during non-solar peaks
- Reduction in down reserves due to backing down of other generators
 - All units being backed down till MTL → no down reserves available resulting in high frequency
 - 15+ days since June 2024 with shortfall in down reserves
- Lower Minimum levels would mitigate this issue

Fig.1



Intra-state RE generation – 25th August 2024



With increased RE penetration, ensuring adequate flexibility resources becomes a key requirement for reliable operation of electricity grid. This amendment will ensure much needed operational flexibility in conventional thermal plants to support national goal of renewable integration.

Additional Suggestions –

1. Start-up time of generators

Generator start-up time is an important attribute of thermal flexibility. The same could be incentivized. It is important for the LDCs that generators quickly respond to the start-up instructions for adequacy of supply in the grid. Considering the large scale renewable integration in India, it is important that the generators coming out of cold reserve must be on bar well within revival time in accordance to CERC Regulations & Approved Procedures. Therefore, benchmark start-up time may be prescribed and suitable provisions may be introduced to nudge the generating stations to adhere to the prescribed time limits. CERC Approved Detailed SCUC Procedure, where Clauses 6.12 and 6.13 provide a guideline for the start-up conditions.

<https://posoco.in/wp-content/uploads/2024/04/Detailed-Procedure-for-Security-Constrained-Unit-CommitmentSCUCUnit-S.pdf>

A lump sum amount of incentive may be provided to such generators which declare faster startup times than benchmark and successfully comply to the instances of start-up instructions given by the LDCs within the declared time in a year.

2. Ramp performance incentive

RoE linked Ramp performance incentive has been a welcome step from Hon'ble Commission in 2019-24 tariff period. It has ensured at least 1% ramp from Sec-62 thermal generators. However, implementation experience has shown that no generators have earned incentive, whereas a few generators such as Singrauli, Barh-I, Khstpp-II have lost RoE, primarily due to non-declaration of 1% ramp rate. The reduction in the step size for earning additional RoE from 1%/min to 0.5%/min has reduced the hurdle for generating stations. This clause has served its purpose well and has contributed to increase in ramping capability from coal-based generators.

IEGC-2023 & Tariff Regulations-2024 have considered CEA (Flexible Operation of Coal-based Thermal Power Generating Units) Regulations, 2023 as the benchmark for higher ramp (>1%). Performance based incentives have been introduced under CERC (Ancillary Services) Regulations,

2022, which take in to consideration both the MWh quantum despatched and the performance (output MWh) of the power plant in adhering to the AGC signals. **Presently, 60 generating units under AGC are providing a higher ramp rate up to 1.5%-2% per minute.** Higher ramp rate would mean that higher reserves are available for despatch under Ancillary Services, in the same 5-minute time frame under consideration. Hence, instead of incentivising ramp through the Tariff Regulation, performance based incentives under Ancillary Services may be suitably enhanced for the plants offering higher regulation MWh in a day. This is also linked with the next suggestion which calls for the same treatment to increase the incentive for plants offering higher regulation quantum.

Further, Proviso (iii) to regulation 30(3) in the Tariff Regulations, 2024, which provides the mechanism for incentivizing ramp performance, does not contain any provision for formulating detailed guidelines/procedure for measurement/assessment of ramping performance by generating stations. Similar provisions were part of the Tariff Regulations, 2019, which also specified that detailed guidelines in this regard were to be issued by NLDC. Accordingly, NLDC had formulated detailed guidelines for assessment of ramping capability of inter-state thermal generating stations, which were issued after stakeholder consultation. NLDC had shared a communication with CERC on 30th July 2024, highlighting the lack of enabling provisions for detailed guidelines/procedure. A copy of the same is enclosed at **Annex-1**.

Therefore, an enabling provision may be added in Proviso (iii) to regulation 30(3) so that detailed guidelines/procedure for assessment of ramping capability may be formulated.

3. Incentive for offering higher regulation quantum under Secondary Reserve Ancillary Services (SRAS) / Automatic Generation Control (AGC)

Presently, around 74 plants with 72 GW installed capacity are operating under AGC. Even then, only +/-1500 MW is obtained from these power plants, which is not enough for frequency control of the large Indian power system with a power number of at least 10000 MW/Hz. One reason for the low reserves extracted by AGC is due to the restriction imposed by the power plants.

- Several thermal power plants express boiler/mill side constraints and offer only up to 5% of the installed capacity for SRAS/AGC.
- Hydro power plants express their disinterest in traversing the forbidden zone of the Francis turbines and restrict their operation between the upper seam of the forbidden zone (P3) and the maximum capacity (P4); thus also typically offering +/-5% regulation.

To overcome these reservations, incentivizing the plants offering higher regulation quantum under SRAS may be done. Higher regulation quantum may be qualified as say providing more than 10%-15% of the scheduled MWh (without AGC) in day.

Slabs may be introduced as deemed fit, for say >15%-20% of the scheduled MWh in day, the performance based incentive will be higher. Linking the same with scheduled MWh will also in turn incentivize the lower scheduled plants to offer higher MWh under AGC to gain more benefits.

Presently, 50 paise/kWh is the incentive provided for SRAS at >95% performance and 40 paise/kWh is given for 75%-95% performance. The incentives can be increased in steps of say 10 paise/kWh for the plants offering higher regulation MWh.

4. Technical Minimum/Minimum Turndown Level(MTL)

Hon'ble Commission through different orders in the petitions had allowed technical minimum of thermal stations more than 55% earlier. Example: RGPPL technical minimum is specified as 65% in the petition number 8/MP/2019 dated 21st January 2020.

Now as per legal maxim Principle of *Lex Posterior Derogat Legi Priori*, the new provision overrides the earlier one on the same subject matter if there is any conflict between the two.

Hon'ble Commission may kindly add necessary provision in Regulation 70(A), whether unit loading of these plants will be up to 40% or as per Hon'ble Commission's order in different petitions issued time to time earlier.

5. Secondary Oil for start and stop:

70(G).6 clause of TCT Regulation amendment states that:

"(6) The additional compensation for secondary fuel oil consumption shall be permissible over and above seven (7) start / stop in a year for the generating station under Unit Shutdown in terms of Regulation 47 of the Grid Code Regulations 2023."

Observation: In practical case shutdown is taken by generation units. Clarification in regulation is required whether the additional compensation for secondary fuel oil consumption shall be permissible over and above seven (7) start / stop in a year for the generating station or generating unit.

Example:

A generating station has 4 units.

So, for secondary fuel oil consumption shall be permissible over and above seven (7) start / stop in a year considering all units or each unit up to 7 (maximum $4 \times 7 = 28$ for station) start / stop as per Regulation 47 of the IEGC.

6. Compensation for Ancillary Services:

70(G).9 clause of TCT Regulation amendment states that:

“(9) The change in the schedule of power under the provisions of Central Electricity Regulatory Commission (Ancillary Services Operations) Regulations, 2022 shall not be considered for compensation.”

For coal or lignite based generating stations Minimum Turndown Level (MTL) upto which compensation is payable has been reduced to 40%, whereas for gas or liquid fuel based generating station same has been reduced to 50%. However, for TRAS DOWN despatch under the shortfall ancillary product (which is regulated), GENCO gets a gain of 10% of VC (which has remained same as previous).

In the light of the revised MTL levels for which part load compensation is payable, the above clause 70(G).9 clause of TCT Regulation amendment may be revisited by Hon'ble Commission.

7. Mandate for devising procedure for part load compensation and its administration thereof

It is noted that, as per the Clause-10.4.(10) of draft regulation NLDC is required to prepare a procedure on the mechanism to work out the compensation for degradation of heat rate, auxiliary consumption and secondary fuel oil consumption due to part load operation and multiple start and stop of units of the generating station.

Accordingly, a draft procedure is uploaded on website (<https://grid-india.in/notices/>) for wider stakeholder consultation. The procedure envisages continued role of RPCs in calculation of compensation and issuance of compensation statement.

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Ref: Grid-India/NLDC/

Date: 30th July 2024

सेवा में,

सचिव

केन्द्रीय विद्युत विनियामक आयोग

छठा, सातवाँ तथा आठवाँ तल, टावर-बी, वर्ल्ड ट्रेड सेंटर

नौरोजी नगर, नई दिल्ली - 110029

विषय : Formulation of detailed guidelines for ramping assessment under Terms and Conditions of Tariff Regulations, 2024

महोदय,

The hon'ble commission has notified the Terms and Conditions of Tariff Regulations, 2024 for the control period from 1.4.2024 to 31.3.2029. Proviso (iii) to regulation 30(3) of the regulations states that:

Quote

iii. in the case of a thermal generating station:

a) rate of return on equity shall be reduced by 0.25% in case of failure to achieve the ramp rate as specified under Regulation 45(9) of IEGC Regulations, 2023.

b) an additional rate of return on equity of 0.125% shall be allowed for every incremental ramp rate of 0.50% per minute achieved over and above the ramp rate specified by Central Electricity Authority, subject to the ceiling of additional rate of return on equity of 1.00%:

Similar provisions for incentivizing higher ramp rates by thermal generating stations were part of the Tariff Regulations, 2019 under proviso (iii) to regulation 30(2). The proviso also specified that detailed guidelines in this regard were to be issued by National Load Despatch Centre (NLDC).

Accordingly, NLDC had formulated detailed guidelines for assessment of ramping capability of inter-state thermal generating stations, which were issued on 28th February 2020 after carrying out stakeholder consultation. The guidelines were amended after feedback from some generating stations regarding practical constraints and the amended guidelines were issued on 30th December 2020, after a round of stakeholder consultation. The guidelines outline the parameters and calculation approach used to assess compliance of generating stations to ramping provisions. The requisite schedule and meter data along with calculations are being shared by RLDCs with Regional Power Committees (RPCs), and the RPCs certify the ramping performance of thermal ISGS on a monthly basis.

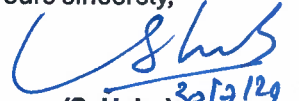


The ramping provisions in the 2024 tariff regulations quoted above do not provide any explicit directions with regards to any detailed procedure/guidelines for assessment of ramping capability by thermal generating stations. For giving effect to these provisions, a framework for ramping assessment through such a procedure would be necessary. Some of the RPCs have also approached Grid-India for amendments in the detailed guidelines in view of the changes in the provisions for additional RoE in the 2024 regulations.

Therefore, to give effect to the provisions contained in proviso (iii) of regulation 30(3) of the Terms and Conditions of Tariff Regulations, 2024, NLDC would formulate detailed guidelines for assessment of ramping capability of inter-state thermal generating stations. These guidelines would be put up for stakeholder consultation and finalized thereafter.

This is for kind information of the Commission and suitable directions (if any) in the matter.

Yours sincerely,



(S. Usha) 30/7/24

CGM (I/C), NLDC

Copy:

- 1) CMD, Grid-India
- 2) Director (SO), Grid-India
- 3) Director (MO), Grid-India