



“Draft Procedure for Mechanism of Compensation for Degradation of Heat Rate, Auxiliary Consumption, and Secondary Fuel Oil Consumption Due to Part Load Operation and Multiple Start/Stop of Units”

The GRID- INDIA notified “**Draft Regulation on (Mechanism of Compensation for Degradation of Heat Rate, Auxiliary Consumption, and Secondary Fuel Oil Consumption Due to Part Load Operation and Multiple Start/Stop of Units) Regulations, 2024.**”

Objective:

- **Fair Compensation:** Provide a structured method to compensate generators for losses in heat rate, auxiliary energy consumption, and secondary fuel oil usage.
- **Promote Efficiency:** Encourage generators to maintain operational efficiency and minimize degradation impacts.
- **Transparent Mechanism:** Establish a clear methodology for calculating, billing and reconciling compensation based on actual and normative parameters.
- **Accountability:** Allocate compensation costs fairly among beneficiaries based on energy requisition and un-requisitioned entitlements.
- **Operational Incentives:** Encourage power plants to maintain efficiency and reliability under varying grid demands.
- **Data-Driven Decision:** Mandate accurate data submission by generators to Regional Power Committees (RPCs) for validation and periodic review.

The draft document can be accessed [here](#):

CER Opinion

- 1) The Role of Mechanism of Compensation in Power Generation Operation:** The mechanism of compensation for degradation in power generation is essential for enhancing efficiency and reliability. It involves continuous performance monitoring to assess the impact of part load operation and frequent cycling on key metrics like heat rate and fuel consumption.

Additionally, this mechanism promotes operational optimization and stakeholder transparency, fostering a culture of continuous improvement. Ultimately, it supports the economic viability and sustainability of power generation, contribution to a more efficient energy landscape.

As highlighted in CER opinion on ‘Central Electricity Regulatory Commission (CERC) (Terms and Conditions of Tariff) (First Amendment) Regulations, 2024 - Part Load Compensation for



Auxiliary Energy Consumption and Station Heat’.¹ Design of part load compensation mechanism largely on the basis of data submitted by the regulated entities and it suffers from information asymmetry as well as sample selection bias. The regulatory principles, in contrast, should utilise efficient operating benchmarks with appropriate adjustment for the local conditions. The amendment’s proposal should thus be examined in light of wider operational data leading to recalibration of the compensation. Grid India should mandate submission of operational data by the regulated entities so that an in depth analysis can be conducted under a research study, thus assisting CERC to set efficient norms.

- 2) **Draft clause no. 1(vii)** states that “Effective Capacity in MWhr means the maximum possible generation from a station during the calculation period.

Total Installed Capacity of the designated generating station (in MWhr) is minus Installed Capacity (MW) of the Unit(s) of the said station under outage (planned or forced outage) and under reserve shut down during the calculation period X outage time....” (emphasis added)

The above clause may be modified, for clarity, as “Total Installed Capacity of the designated generating station (in MWhr) **excludes** Installed Capacity (MW) of the Unit(s) of the said station under outage (planned or forced outage) and under reserve shut down during the calculation period X outage time....”

- 3) **Draft clause no. 1(viii)** states that “For ECR (Comp)” means an **increase in the normative Energy Charge Rate in Rs/kWh for the calculation period considering degraded SHR and AEC based on average unit loading...**” (emphasis added)

ECR (Comp) is incremental charge, and thus may be suffixed with roman delta for clarity.

- 4) **No Compensation based on 85% of Declared Capacity (DC): Draft clause no. 2.1(ix)** states that “No compensation shall be payable by beneficiaries if it has requisitioned at least **85% of its entitlement** during the calculation period.” (emphasis added)

This may be modified, for clarify, as “No compensation shall be payable by **a beneficiary** if it has requisitioned at least 85% of its entitlement during the calculation period.” (emphasis added)

- 5) **Compensation only for cost incidence Effective Generation must include Bilateral and Collective Sales: Draft clause no. 1(xi)** that “Effective Generation in MWhr means the actual generation ex- bus of the designated station or the Schedule generation excluding the schedule under TRAS, SRAS and bilateral sale/ collective sale under open access during the calculation period...”

The spirit of the CERC regulation is to provide compensation for the cost incurred in due to part load operation (before 85% of DC). Apart from utilisation of the URS, utilised DC of a generating unit can be scheduled for TRAS, SRAS as well as under bilateral/collective

¹Singh, A. (ed.) (2024), Opinion on CERC (Terms and Conditions of Tariff) Regulations [Draft], *Regulatory Insights* V6 No. 4, Centre for Energy Regulation (CER), Indian Institute of Technology Kanpur. (cer.iitk.ac.in/regulatory_insights)

transaction. This would enhance the overall schedule for the available DC, and **would thus avoid any additional cost due to part-load operation. Compensation for a cost not incurred should not be burdened on the beneficiaries and hence the final consumers. Any part load compensation on account of TRAS/SRAS down should be recoverable from the Deviation and Ancillary Service Pool Account.**

Figure 2 shows TRAS Up/Down (MU) from June, 2023 to October, 2024. It is analysed that TRAS Up/Down increases, with frequent dispatch adjustment that results in +84 MU in case of TRAS Up and -124 MU for TRAS Down to meet fluctuating demand. EAL observed that significant increases in quantum/instruction for TRAS Up/Down during peak demand month from April to June 2024 when energy met reaches around 5466 MU. During non-peak months, average of TRAS Down is higher as compared to average TRAS Up.

Figure 3 shows that the average TRAS Up and Down (MW) from June 2023 to October 2024. It is observed that the average TRAS (Up) vary between 0 to 3.5 GW and TRAS (Down) vary between 0 to -5.1 GW with notable peak during April to July 2024. During non-peak months the average TRAS (Down) value variation between -1 to -3.5 GW. Whereas average TRAS (Up) is 0.5 to 1.5 GW during non-peak months. **Given the significant impact TRAS/SRAS up schedule can have on the DC utilisation, its role in ‘avoidance’ of part load operation of thermal generating units should not be undermined.**

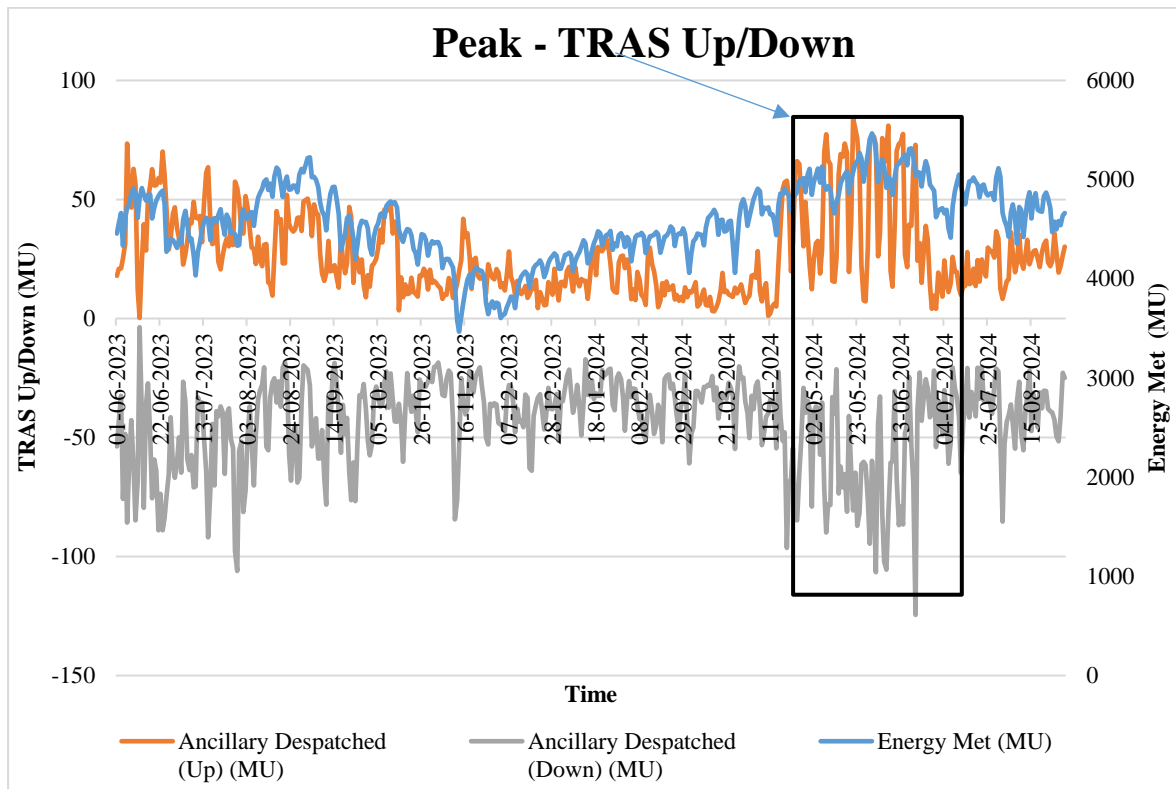


Figure 2: TRAS Up and Down in MU (Source: EAL analysis)

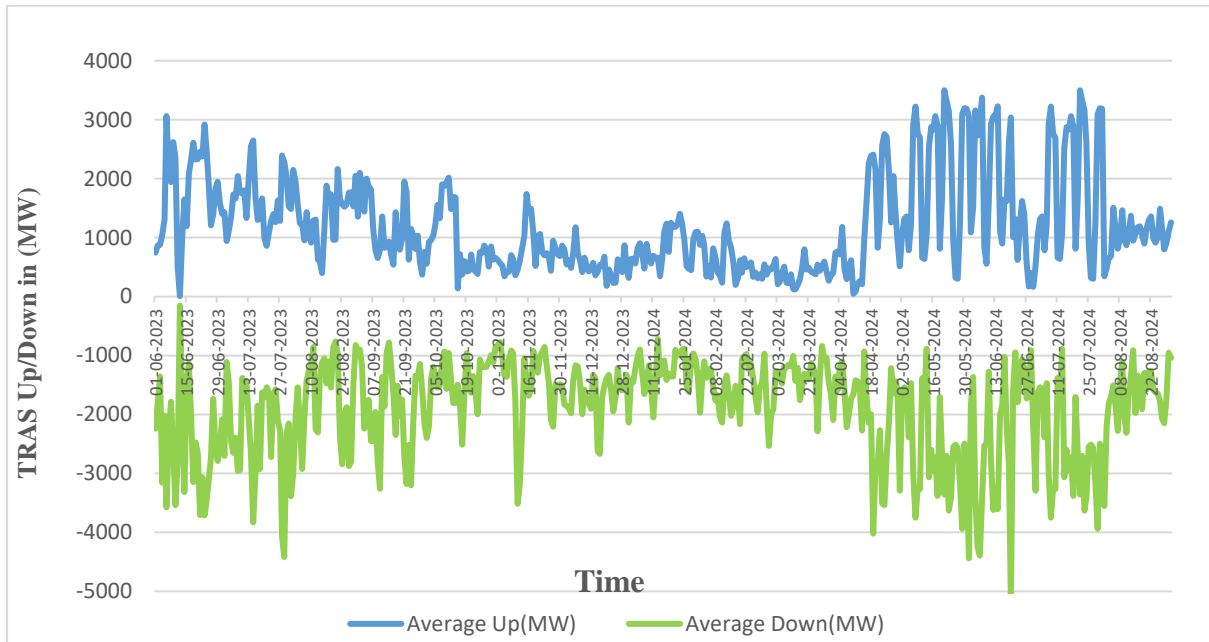


Figure 3: Average TRAS Up and Down in MW (Source: EAL analysis)

- 6) **Data Transparency:** Draft clause no. 2(v) states that “ The compensation to be paid to designated stations for the calculation period ending the *n*th month shall be the difference in the **ECR (SE) and ECR (DC) for that period ECR (Comp)** for the calculation period ending *n*th month shall be calculated .”

Data related to all calculations including ECR (SE) and ECR (DC) should be reported in detail and be archived on the respective RLDC website. Uniform format for reporting detailed and disaggregated data with block wise schedule, and uniform reporting protocol should be adopted across all RLDCs. Apart from pdf reports, data including calculations should be available in Excel format on the respective website.

- 7) **Significant impact of secondary fuel oil consumption :** Draft clause no. 2.1(vi) states that “The summation of energy forecast (MWh) for various consumer categories upon adjusting for The compensation *Compn (P)* payable to CGS/ISGS for the calculation period ending *n*th month calculated $Compn (P) = (Total\ Generation\ Schedule\ (Energy)\ to\ its\ original\ beneficiaries\ excluding\ schedule\ under\ TRAS,\ SRAS\ \&\ bilateral\ sale/\ collective\ sale\ under\ open\ access) * ECRn (Comp)$ *ECRn (A)* for the calculation period shall be calculated using actual values of SHR and Aux Consumption furnished by CGS/ISGS at the end of the calculation period and **normative secondary fuel oil consumption** as per CERC Tariff Regulation for.”(emphasis added.)
- The calculation of ECR (A) should use actual rather than normative secondary fuel oil consumption otherwise it would be a misnomer to its very spirit.