

Comments/Suggestions from Power Foundation of India (PFI) on the Draft Central Electricity Regulatory Commission (Deviation Settlement Mechanism and Related Matters) Regulations, 2024.

- 1) PFI is a Policy Research and Advocacy entity, a registered society under the aegis of the Ministry of Power, Government of India, and supported by twelve leading Central Power Sector Organisations, to undertake evidence-based policy research and facilitate informed decision making by the Regulators, Ministry and stakeholders concerned with the Power Sector. It is led by Director General Shri Sanjiv Nandan Sahai (Former Secretary in Ministry of Power, Government of India).
- 2) Central Electricity Regulatory Commission (CERC) has sought comments / suggestions from various stakeholders on draft *Central Electricity Regulatory Commission (Deviation Settlement Mechanism and Related Matters) Regulations, 2024*.
- 3) PFI has reviewed and analysed the said draft Regulations and welcomes the initiative for introduction of applicability of DSM for Energy Storage Systems (ESS) as such systems will rapidly increase considering the integration and RTC Renewable Energy (RE) required for achieving net zero. Further, grid is becoming highly complex with a greater number of RE generators and Prosumers, stringent grid Control measures becomes essential in this context, the proposed tightening of deviation band is also a welcome step.

A. Regulation 6- “Computation of Deviation”

(1) Deviation in a time block for general sellers shall be computed as follows:

...

Deviation-general seller (D_{GS}) (in %) = $100 \times [(Actual\ injection\ in\ MWh) - (Scheduled\ generation\ in\ MWh)] / [(Scheduled\ generation\ in\ MWh)]$.

(2) Deviation in a time block for WS sellers shall be computed as follows:

...

Deviation-WS seller (D_{WS}) (in %) = $100 \times [(Actual\ Injection\ in\ MWh) - (Scheduled\ generation\ in\ MWh)] / [(Available\ Capacity)]$.

- a) **Calculation of Deviation for WS seller (D_{WS})-** In the draft DSM Regulations, 2024, the computation for deviation D_{WS} (%) is on **Available Capacity** which is defined as the cumulative capacity rating of Wind Turbines or Solar Inverters that are capable of generating power in a given time block whereas for General Sellers computation for deviation D_{GS} (%) is on **Scheduled Generation**. This special provision for Wind/Solar/its

- Hybrid - WS seller(s) provides them undue relaxation at the cost of grid stability and additional ancillary services deployment.
- b) Sections 28 and 32 of the Electricity Act 2003 (“Act”) mandate functions of Load despatch Centres wherein major function enunciated in the said sections are “*monitor grid operations*” and “*be responsible for carrying out real time operations for grid control and despatch of electricity within the region/state through **secure** and economic operation of the regional/state grid in accordance with the Grid Standards and the Grid Code.*”.
- c) Keeping in view the above mandates of the Act, it is noted that under proposed draft DSM Regulations deviation of Wind/Solar seller and RoR generating stations is not linked with frequency i.e., they can over / under inject the power when not required by the Grid. However, deviation charges for General Sellers are linked with prevailing Grid frequency.
- d) Thus, Wind/Solar seller may hamper the grid operations. The impact of the same is also borne in the form of installation of additional ancillary services, whose cost gets loaded to the consumers at large. It has been a long time since Renewable Energy (RE) generators were given such advantages over conventional generators in DSM considering their intermittent nature.
- e) As recognized by CERC, linking deviation settlement with frequency is cornerstone of this mechanism which enables Grid Discipline. Any deviation caused by the seller irrespective of its nature i.e., General seller or a WS seller has the same impact on the Grid.
- f) Renewable Energy capacities are expected to increase at faster pace over next few years, considering the initiatives taken by Gol for Energy Transition, **therefore considering importance and complexities of grid operations it is suggested that deviation of Wind/Solar sellers and RoR generating stations should also be linked with frequency like that of General Sellers. However, considering complexities in forecasting of Wind and Solar generation following relaxations may be provided over and above provisions for General Seller:**

- i) the calculation of Deviation charges for WS seller may be same as those for General Seller except that the 10% deviation band may be increased to 15% for WS seller(s) keeping rest all the provision same as in Regulation 8 (1).

and

- ii) the methodology of calculation (ref. draft Regulation 6(2)) of Deviation (in %) of WS seller should be on Scheduled generation basis instead of Available capacity basis with the relaxation as given below:

$$\text{Deviation-WS seller } (D_{WS}) \text{ (in \%)} = 100 \times \frac{[(\text{Actual injection in MWh}) - (\text{Scheduled generation in MWh})]}{[(\text{Scheduled generation in MWh})]}$$

Provided, if Scheduled generation is less than 10% of Available capacity, then 10% of Available capacity shall be considered as scheduled generation in denominator of the above expression.

B. Regulation 8- “Charges for Deviation- In case of forced outage of a seller”

Draft Regulation 8 (12)

“(12) Notwithstanding anything contained in Clauses (1) to (5) of this Regulation, in case of forced outage of a seller, the charges for deviation shall be @ the reference charge rate for a maximum duration of eight time blocks or until the revision of its schedule, whichever is earlier.”

- a) Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023 stipulate that in the case of tripping, a thermal generator can revise its schedule only from the 7th / 8th time block.
- b) As per draft DSM Regulations 2024, in case of a unit trip, the generator would have to pay penalties for under injection for a maximum duration of eight time blocks, however, buyer has flexibility to manage its schedule, on account of tripping, from Real Time Market where delivery of power takes from 4th time block onwards.
- c) Therefore, it is suggested to CERC to modify Regulation 8 (12), in order to bring unanimous approach between tripped generator & its buyer, as follows:

*“(12) Notwithstanding anything contained in Clauses (1) to (5) of this Regulation, in case of forced outage of a seller, the charges for deviation shall be @ the reference charge rate for a maximum duration of **four** time blocks or until the revision of its schedule, whichever is earlier.”*

C. Regulation 8- “Charges for Deviation- ESS co-located with WS Seller(s) connected at the same interconnection point”

Draft Regulation 8 (12)

“(5) Charges for Deviation, in respect of a Standalone Energy Storage System (ESS), shall be at par with the charges for Deviation for a general seller other than an RoR generating station or a generating station based on municipal solid waste or WS seller as specified in Clause (1) of this Regulation”

“(6) Charges for Deviation, in respect of an ESS co-located with WS Seller(s) connected at the same interconnection point, shall be as follows:

i) Such seller shall provide a separate schedule for WS and ESS components through the Lead generator or QCA at the interconnection point;

ii) Deviation corresponding to WS component shall be charged at the same rates as applicable for WS Seller being a generating station based on solar or hybrid of wind-solar resource in accordance with clause (4) of this regulation; and

iii) Deviation corresponding to the ESS component shall be charged at the same rates as applicable for a standalone ESS in accordance with clause (5) of this regulation.”

- a) It is mentioned in Regulation 8 (6) (iii), as quoted above, that deviation charges for Energy Storage System (ESS) component co-located with WS-Seller will be calculated in line with Regulation 8 (5) and Deviation corresponding to WS component shall be charged at the same rates as applicable for WS Seller being a generating station based on solar or wind or hybrid of wind-solar resources in accordance with clause (4) of this Regulation.
- b) However, a table below clause (6) of this Regulation provides for calculation of deviation, as follows:

Deviation by way of over injection (Receivable by Lead generator)	Deviation by way of under injection (Payable by the lead generator)
(I) Any over injection up to 5% or 50 MW shall be receivable as per RR and for under generation shall be payable zero up to 5% or 50MW.	
(II) For Deviation from 5% to 10% D_{CS} or greater than 50 MW up to 100 MW, whichever is less] and f within f_{band}	
(i) @ RR when $f = 50.00$ Hz	(iv) @ RR when $f = 50.00$ Hz
(ii) When $[50.00 \text{ Hz} < f \leq 50.05 \text{ Hz}]$, for every increase in f by 0.01 Hz, charges for deviation for such seller shall be reduced by 10% of RR so that charges for deviation become 50% of RR when $f = 50.05\text{Hz}$	(v) When $[50.00 \text{ Hz} < f \leq 50.05 \text{ Hz}]$, for every increase in f by 0.01 Hz, charges for deviation for such seller shall be reduced by 3% of RR so that charges for deviation become 85% of RR when $f = 50.05\text{Hz}$
(iii) When $[49.90 \leq f < 50.00 \text{ Hz}]$, for every decrease in f by 0.01 Hz, charges for deviation for such seller shall be increased by 1.5% of RR so	(vi) When $[49.90 \leq f < 50.00 \text{ Hz}]$, for every decrease in f by 0.01 Hz, charges for deviation for such seller shall be increased by 5% of RR so that

Deviation by way of over injection (Receivable by Lead generator)	Deviation by way of under injection (Payable by the lead generator)
that charges for deviation become 115% of RR when $f = 49.90\text{Hz}$	charges for deviation becomes 150% of RR when $f = 49.90\text{Hz}$
(III) For Deviation up to [10% D_{GS} or 100 MW, whichever is less] and f outside f_{band}	
(i) @ zero when [50.05 Hz < f < 50.10 Hz]: Provided that such seller shall pay @ 10% of RR when [$f \geq 50.10$ Hz]	(iii) @ 85 % of RR when [$f > 50.05$ Hz]
(ii) @ 115 % of RR when [$f < 49.90$ Hz]	iv) @ 150 % of RR when [$f < 49.90$ Hz]
(IV) For Deviation beyond [10% D_{GS} or 100 MW, whichever is less] and f within and outside f_{band}	
(i) such seller shall be paid back @ zero when ($f < 50.10$ Hz): Provided that such seller shall pay @ 10% of RR when [$f \geq 50.10$ Hz]	(ii) such seller shall pay @ RR when [$f \geq 50.00$ Hz]; @ 150% of RR when [$49.90\text{Hz} \leq f < 50.00$ Hz]; and @ 200% of RR when [$f < 49.90$ Hz]

Note : (a) Reference rate (RR) of such generators would be the daily weighted average ACP of the Day Ahead Market segments of all the Power Exchange.

(b) The DSM shall be computed based on the Net schedule, i.e., the sum of all generator schedule injecting/drawing power and net actual injection/drawal at the interconnection point

- c) It is not clear from the above table how deviation charges will be calculated for an ESS co-located with WS Seller(s) as it is specified that charges for WS seller component will be calculated as per Clause (4) of these Regulations and for ESS component shall be charged in accordance with the clause (5) of this Regulation. As these two components are charged separately, therefore the need of table is not clear.
- d) It is mentioned that the DSM shall be computed based on the Net schedule, i.e., the sum of all generator schedule injecting/drawing power and net actual injection/drawal at the interconnection point.
- e) Co-location also needs to be defined. Does the co-located mean a common PoC (Point of connection)? Further, if ESS is being used by WS Seller(s) to regulate its schedule/generation, there will not be any separate schedule(injection/drawal) of ESS.
- f) Accordingly, CERC need to bring clarity on the above provisions related to ESS.
