

From,

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To,

The Secretary,
Central Electricity Regulatory Commission,
3rd & 4th Floor, Chanderlok Building,
36, Janpath, New Delhi-110001 Tel: 23353503.

Dear sir,

The CERC has issued public notice vide No.L-1/260/2021/CERC dated 7th sept., 2021 inviting comments / suggestions on the Draft CERC (deviation settlement mechanism and related Matters) Regulations 2021 ('draft CERC DSM reg') by 8th Oct., 2021. I am submitting my comments / suggestions for the considerations of the commission.. I will not be participating in hearing.

2. **Agency to notify rate of charges for deviation:** Reg. 7 specifies principles of determination of normal rate of charges for deviation as applicable for a time block. It does not specify agency which will determine and notify the these rates. **The Commission may kindly specify a agency (say NLDC as per note ix under reg. 5(1) of CERC DSM reg. (4th amendment) 2018)) which will determine using software the normal rates of charges of deviation on real time basis for say for previous time block applicable to next / current time block and notify on real-time basis to RLDCs and SLDCs and also display on its website.**

3. **Entity for RoR, Municipal solid waste, wind or solar generating station:** Reg. 8(1) specifies through table the rate of charges for deviation as applicable to seller. However, reg 9(2) specifies preparation of statement of charges for deviation for previous week by RPC based on data from RLDC and its issue to all regional entities. From these it is implied that seller mentioned in reg 8 , will not be the each RoR, Municipal solid waste, wind or solar generating station but out of them such stations which are the regional entity. This will be in order, as Jurisdiction of CERC does not extend to generating station, distribution licensees embedded in regional entity. **The Commission may kindly clarify / mention that "entity' for the purpose of this reg. 8(1) is regional entity and term RoR generating station, Municipal solid waste generating station and WS-seller' will apply only if each of them is regional otherwise it shall be the general-seller"**

4. **Wind-solar hybrid and energy storage stations:** Term WS seller covers only wind or solar energy power stations. Wind -solar hybrid projects are already in offering and during the tenure of the regulations, battery operated energy storage

stations may materialise. Additional pumped storage power stations too may also be established and utilised for Renewable Energy (RE) storage. **The commission may kindly define WS seller as “seller in case of a power project based on wind or solar or wind-solar hybrid or battery operated Renewable energy storage station or pumped storage station based on renewable energy”**

categories of buyers.:

5. Table below reg 8(2) specifies , categories of buyers as under:-

Sr. no	Buyer	Applicability of normal rate of charges for deviation. by way of over-drawl
1	Buyer (other than the buyer with schedule less than 400 MW and RE rich state)	up to 12% Deviation-buyer (in %) or 150 MW Deviation -buyer (in MWh) for a time block, whichever is lower.
2	Buyer with schedule up to 400 MW	up to 12% Deviation-buyer (in %)
3	Buyer being RE rich state	(i) up to 12% Deviation-buyer (in %) or 250 MW Deviation -buyer (in MWh) for a time block, whichever is lower.

6. In existing regulations vide CERC (DSM and related matters) (third amendment) reg 2016 categorisation of RE rich states was (i) installed capacity of wind and solar of 1000-3000MW and (ii) above 3000 MW for which limits applicable was 200 MW and 250 MW respectively. From the limits ('L')specified in reg. 8(2) (reproduced above in bold text), it is evident that sr.no.1 and 3 are for RE rich states. Further, in this table, limit of 200 MW as specified in existing regulations is reduced to 150 MW without indicating basis in explanatory memorandum (vide para 3,13. Further, existing categorisation by way of installed capacity in MW is replaced by schedule up to 400 MW and other than Buyer with schedule less than 400 MW. From these, it is implied that sr.no. 3 is for schedule up to 400 MW and sr.no. 1 for schedule exceeding 400 MW . However limit is interchanged (as higher schedule limit should have been more and vice-versa). Further , Buyer (sr.no. 2) being not a RE rich state should not either have limits of scheduling in MW or buyers having schedule exceeding 400 MW are to be specified as a category.. Further, ,sr.no.1 can be misinterpreted by considering term “other than” applicable to RE rich state. From these appears that there is mix up in specifying schedules and limits. Further, the schedule as mentioned in this table requires to be clarified. It can not be schedule for a time block, as for schedule of up to 400MW, 12% deviation will be 48 MW only and Limit of 150 MW or 250 MW is immaterial being higher than deviation. From same reason it can nor be peak schedule. It can not be the minimum schedule as for solar power plant during non sun shine hours schedule will be zero and for wind power plant it can be zero if there is no wind or very low speed wind.. **Considering all these, it appears appropriate to have categorisation a under:-**

1. Buyer being RE rich state with installed capacity of wind and solar power plants from 1000MW to 3000 MW
2. Buyer being not a RE rich state
3. Buyer being RE rich state with installed capacity of wind and solar power plants exceeding 3000 MW

7. **Applicability of normal rate to RE rich state Buyers:** Table below reg 8(2) (reproduced above) specifies applicability of normal rate of charges for deviation. by way of over-drawl as “up to 12% Deviation-buyer (in %) or **150 MW** Deviation -buyer (in MWh) for a time block, whichever is lower” for sr.no. 1, and “up to 12% Deviation-buyer (in %) or **250 MW** Deviation -buyer (in MWh) for a time block, whichever is lower”. It is submitted that for various schedules, the applicability of normal rate of charges for deviation will be as under:-

Particulars	Schedule in a time block, ,				
	200 MW	300 MW	1250 MW	2083 MW	2500 MW
A. Category 1					
(i)12% of schedule	24 MW	36 MW	150 MW	250 MW	300 MW
(ii) Limit	150 MW	150 MW	150 MW	150 MW	150 MW
(iii) Eligibility of normal rate, lower of (i) or (ii)	24 MW	36 MW	150 MW	150 MW	150 MW
B. Category 3					
(i)12% of schedule	24 MW	36 MW	150 MW	250 MW	300 MW
(ii) Limit	250 MW	250 MW	250 MW	250 MW	250 MW
(iii) Eligibility of normal rate, lower of (i) or (ii)	24 MW	36 MW	150 MW	250 MW	250 MW
C. Category 2					
(i)12% of schedule	24 MW	36 MW	150 MW	250 MW	300 MW
(ii)Eligibility of normal rate,=(i)	24 MW	36 MW	150 MW	250 MW	300 MW

8. from the above table, it will be observed that (vide values in bold) for applicability of normal rate of charges is for higher MW deviation for non RE rich state compared to RE rich state. Thus no benefit is passed on to RE rich state having substantial RE generation capacity but provision is disadvantageous to them. **Thus specified formula has error and it would be appropriate to define these to be “(i) schedule or (ii) 12% of schedule+150MW whichever is lower” for category .1 and “(i) schedule or (ii) 12% of schedule+250MW whichever is lower” for category 3.** In that case, eligibility for normal rate will be as under and thus passes the benefit up to limits (of 150 MW or 250 MW) to RE rich state.

Particulars	Schedule in a time block, ,				
	200 MW	300 MW	1250 MW	2083 MW	2500 MW
A.Category 1	174 MW	186MW	300MW	400 MW	450 MW
B. category 3	200 MW	286 MW	400 MW	500 MW	550 MW
Ccategory 2	24 MW	36 MW	150 MW	250 MW	300 MW

9. **Run of River (RoR) power plant:** Wind and Solar generation is nature dependent. Their generation can not be predicted with certainty so zero deviation charges is considered up to 10% of deviation. However, Run of River plant is defined

as having no upstream storage. RoR power plant on perennial river too will have certainty of prediction. RoR power plant, not on perennial river or not with upstream storage, will be like wind generating plants having nature dependency but as its generation will depend on water flow which in turn will depend on the part of catchment area where rain fall can occur and quantum of rainfall in that area, both of which can not be predicted with certainty and as such RoR power plant will have more uncertainty in prediction of likely generation. **Therefore such RoR plants needs to be treated at par with wind generators. i.e. up to 12% deviation, zero rate of charges of deviation should be considered instead of normal rate of charges for deviation.**

Availability of capacity for secondary reserve ancillary services (SRAS) and tertiary reserve ancillary service (TRAS):

10. Explanatory memo vide para 3.16 states as under:-

“responsibility of managing frequency would hence forth primarily lie with system operator in terms of the new draft auxiliary services regulations and buyers can continue to play the same role (of helping restore frequency) but at the instruction of the system operator by participating in the auxiliary services mechanism rather than acting at their own driven by price signals linked to frequency. As such proposed regulations provide that buyers will neither pay nor be paid for under-drawl.”

11. It is submitted that ancillary services scheme is in infant stage and its effectiveness is yet to be established so time tested mechanisms of varying injection and drawls based on frequency signal and levying penal rate of deviation charges to curb under-drawl and over-drawl should not be dispensed with. Further, draft CERC ancillary service regulations specifies payment for SRAS-UP from DASPA and for SRAS-DOWN to DASPA And similar provision for TRAS-UP and TRAS-DOWN vide reg.11 and 19 respectively of draft ancillary services reg.21. However, commitment charges for these services has to be paid ultimately by beneficiary and beneficiary's commercial considerations will govern whether to avail ancillary services or effect load shedding in case of over-drawl or to effect increase in internal generation in case of under-drawl. State LDC / Discoms can not be forced to avail or rely on ancillary services only.

12. As per reg. 12(2) and 13 of draft CERC ancillary services regulations 2021 performance of SRAS provider shall be measured against secondary control signal sent every 4 seconds and performance below 20% may result in disqualification of SRAS provider. In other words, SRAS provider is to increase generation or back down generation up to 20% of signalled MW in 4 seconds. Ramp rates of various generation as per CEA's "Report of the Technical Committee On Study Of Optimal Location Of Various Types of Balancing Energy Sources/Energy Storage Devices to Facilitate Grid Integration of Renewable Energy Sources And Associated Issues (dec., 17)" **is as under:-**

“The ramp rates of existing Coal Based Plants, as ascertained from NTPC for their Plants, is 1 % in the operating load range of 55% to 80% and 1.5% per minute in the operating load range of 80% to 100% for Sub-Critical Plants and 3% per minute in the operating load range of 55% to 100%, for super-critical

Plants, whereas the ramp rates for combined cycle Gas Based Plants is up to 10% per minute. As determined from NHPC, SJVNL and THDC, the ramp rate of pondage /storage Hydro Based Power Plants is about 50% per minute.”

13. As per information available on web site, Ramp rates from spinning mode of most industrial frame gas turbine is around 20% per minute and for aeroderivative gas turbines is around 50% per minute. It is reported that Wärtsilä internal combustion engines can ramp at over 100% per minute, Thus within 4 seconds, Supercritical thermal plant can provide 0.02% ($=3\% \times 4/60$) of its capacity, Combined cycle power plant 0.066% of its capacity, Hydro-plant and open cycle aerodynamic gas turbine up to 3.3% of its capacity and Wartsila generator up to 6.6% of its capacity. Thus conventional thermal and combined cycle gas turbines are ruled out for SRAS and Hydro turbine or aero-derivate gas turbine can provide their capacity up to 16.5% only for SRAS and Wartsila engine up to 33% of its capacity only for SRAS to meet requirement of achieving performance level of 20%. This will be the part load on the generating unit/ With almost entire capacity of hydro and gas turbines having already been tied by long term PPA and Available capacity of Warstsila or any other diesel engine genset is limited. Only battery operated energy storage system have very fast response and can commit full capacity for SRAS but there is no such installation in India. Thus capacity to meet SRAS is non – existent or is very small.

14. As per reg. 14, TRAS is to provide its capacity within 15 minutes. Considering the ramp rates only hydro, gas turbine (open cycle) and diesel engines can provide TRAS capacity upto their rated capacity. Reg 20(1) of CERC ancillary services regulations 21 provides that in case the generating stations ,whose tariff is fixed by the regulatory commission under sec 62 of the Electricity Act, have unscheduled requisitioned surplus (URS) power after gate closure, they shall be deemed to be available for use by the nodal agency for SRAS-up or SRAS-Down or TRAS-Up or TRAS-Down subject to technical constraints of such generating stations. Under this regulations all long term PPA generating stations , not scheduled to full capacity, can be utilised for the ancillary services. This provision will cover NTPC thermal power stations which with RE penetration are not scheduled to their capacity. NHPC (and its subsidiaries) hydro stations except for rainy season and peak demand period, are not scheduled to full capacity and except for rainy season and peak demand hours, their unscheduled capacity will be available for TRAS-UP and for limited capacity for SRAS-UP.. Thus very limited capacity will be available for SRAS-UP will not be available from them (vide para 19 above) and substantial capacity availability for TRAS-UP only. However, TRAS-DOWN or SRAS-DoWN can be to the extent of TRANS-UP or SRAS-UP already effected.

15. As per reg. 15 and 18 of draft CERC ancillary service reg., TRAS shall be activated in order to replenish secondary reserve, if secondary reserve has been deployed continuously in one direction for 15 minutes for more than 100 MW and .the schedule for TRAS shall become effective from the time block starting 15 minutes after issue of dispatch authority by the nodal agency. Thus TRAS will be

effective at least 30 minutes after initiation of SRAS after gate closure (which is 12.00 hours for day ahead bidding and every 30 minutes starting 00.15 hours for real-time bidding). **Thus SRAS capacity is limited and Time taken for initiation of TRAS (i.e. at least 30 minutes) is quite long and power system under distress can not wait for such a long period and generation / drawl based on frequency signal should continue. To prevent generator from damage or tripping under low frequency, generators will resort to over-injection and under high frequency will resort to under injection. This should be permitted at extreme end of frequency band of normal operation and should be deemed TRANS -UP / TRANS-DOWN till its instructions are issued by RLDC and for TRAS-UP / TRANS-DOWN instructions, RLDC to consider URS only irrespective of over-injection / under-injection resorted by the generators.**

Frequency linked rates for deviation:

16. In the proposed draft regulations, linkage of normal rate of charges for deviation with system frequency is not considered. Explanatory memorandum, vide para 2.2 to 2.6, advances following reasons:-

- (i) in absence of large frequency excursions at present, there hardly remains any scope of frequency linked price arbitrage
- (ii) system frequency is no longer a correct indicator of generation being short or surplus.
- (iii) Existence of both centralised mode of frequency control regulation through Ancillary Services and decentralised mode of controlling frequency through frequency linked DSM could lead to avoidable conflict in system operation.
- (iv) perverse tendency of the discoms to deviate from the schedule specially during high frequency conditions.
- (v) there is no link between the system marginal price and frequency

17. As regards sr.no. (i) that in absence of large frequency excursions at present, there hardly remains any scope of frequency linked price arbitrage, it is submitted that with present conditions there should not be complacency. In coming years, RE generation will grow and proportion of synchronous generation capacity of thermal and hydro generation in total generation will reduce and this will lead to steeper fall in frequency in case of generation outage and steeper rise in frequency in case of load throw off. Thus system operating conditions may differ and time tested mechanism should not be dispensed.

18. The statement at sr.no. (ii) is against the physics of power generation and supply and incorrect. Power system has large motive loads e.g. industrial drives, agricultural pumps, pumps for water supply and pumps and fans in domestic and commercial premises. Output of motive load is frequency dependent. Load throw off results in generation surplus and with generator's prime mover power not adjusting immediately to load reduction, electricity generator accelerates thereby system frequency rises. With this rise, Load also increases with rise in frequency and a load-generation balance is established at higher frequency. Converse happens when a generator trips which causes increase in load on other generators and causing them to slow down and thereby lowering system frequency which in turn reduces load and

a load – generation balance is established at lower frequency. This is the established fact. Frequency dependence of the Indian grid system has been observed on 5th April 2020, when on prime minister's call lights were switched off for 9 minutes at 9.0 p.m. This effected load reduction of 31089 MW load on all India grid operating at 117300 Megawatts and frequency rise from 49.71 HZ to 50.26 Hz. Thus system frequency is the indicator of shortages or surplus of power generation capacity in the system.

19. The argument that co-existence of frequency control through ancillary services and rate of charges of deviation linked to frequency will have conflict is not correct. To save the system from collapse (i.e. Grid failure), all possible mechanism has to work. For example to avoid grid failure due to low frequency, manual load shedding and boosting of generation is effected on the instructions of state LDC. On further fall in frequency, load shedding is effected by number of under-frequency and Df/dt relays installed in the system under under-frequency load shedding scheme. On further fall, healthy system from faulty system takes place under system islanding scheme. All these, have common objective to save the system and does not have technical conflicts so these can not be dispensed with on the ground of ancillary services scheme will take care of these as ancillary service scheme is in infant stage and its effectiveness is yet to be established. Further as per regulation 10(1)(8) of the draft CERC (ancillary services) regulations 2021, SRAS-UP and SRAS-DOWN will be effected every 4 seconds, so if mechanism of manual load shedding on RLDC instructions, under-frequency load shedding and Manual load shedding due to commercial impact of UI rate / rate of charges for deviation has resulted in rise in frequency, SRAS -DOWN will be effected after 4 seconds. Further, secondary reserve ancillary service(SRAS) capacity is limited (as brought out above) and further, raising / lowering of generation through Tertiary Reserve Ancillary Service (TRAS) will be on the instructions of RLDC and will take time. Thus there will be no technical conflict. Indian Electrical Grid System has withstood number of Load collapses and generators tripping and had survived or has been restored in short time. All is due to multiple mechanism (as above and islanding scheme) operating together. This aspect should not be ignored even if there is commercial conflict.

20. The statement that Frequency linked UI rate / deviation charges has lead to perverse tendency of discoms to over-draw during high frequency conditions is true but it should not be ignored that such over-drawl have saved the system by not having generator tripping under high frequency conditions. This beneficial aspect can be retained by avoiding UI rate/ deviation charge rate changing with small change in frequency and to have frequency linked deviation charge rate at the extreme end of normal operating frequency range. Normal operating frequency band envisaged is 49.85 Hz to 50.05 Hz (i.e. 0.20 HZ) vide table below reg 5(1) as per CERC (DSM)(fourth amendment 2018). **It is suggested that a major part of it say, 49.88 to 50.02HZ (i.e. 0.14 HZ band) can be with normal deviation charge rate while frequency below 49.88 may have higher deviation charge rate (to signal over-injection / under-drawl) and that above 50.02 may have low deviation charge**

rate (to signal over-drawl and under-injection). This as illustrated in table below. This will avoid tendency of over-drawl for major part of system operation but will have advantage of load-generation management during high / low frequency control by commercial mechanism also. Aspect of linkage with the system marginal price will not be relevant at extreme frequencies.

System frequency, Hz	Deviation charge rate
> 50.05	Zero
>50.02 and <=50.05	50% of normal rate of charges for deviation
>49.88 to <=50.02	normal rate of charges for deviation
>49.85 to <=49.88	150% of normal rate of charges for deviation
<=49.85	200% of normal rate of charges for deviation

Review of zero rate of charges for deviation:

21. Column 2 of table below Reg. 8(1) specifies zero deviation charges for over-injection by Seller – general other than ROR, municipal solid waste, solar or wind power generation The column 2 of table below Reg 8(2) specifies zero deviation Charges for under injection by buyers. It is submitted that zero deviation charges for deviation for over-injection and under-drawl will not be conducive to grid management as on day-ahead basis such seller may under schedule the injection and buyer may over schedule the drawl so that they are not subject to deviation charges. This tendency will result in under-frequency conditions in the Grid, which is not desirable. Further such tendency will make it difficult for SLDC and RLDC to effect load-generation balance and to schedule generation accordingly. To curb this malpractice/ gaming, Commercial mechanism of deviation charges, intended to have proper scheduling will be lost. **It is therefore necessary that there should not be zero rate of charges for deviation for over-injection and under-drawl.**

22. Column 3 of table below reg 8(2) specifies charges for buyer for over-drawl payable to Deviation and ancillary services pool account(‘DASPA’) as under:-

- (i) at normal rate of charge for under -injection up to 12% deviation; and
- (ii) at 110% of normal rate of charges for deviation beyond 12% deviation.

23. The specified rate of deviation , as above, can be considered as of two parts , (i) deviation chargeable at normal rate of charges for deviation up to specified limit beyond 12% and (ii) penal rate of 10% of normal rate of charge for deviation for the deviation exceeding 12%. This penal rate is matching with sr.no.1 col.2 of table under reg. 8(1). On account of limited capacity available for SRAS, much reliance at this stage can not be placed on ancillary services and time tested mechanism of deviation charges for excessive under-drawl and over-drawl payable to DSAPA in both cases should continue. This will require levying it on absolute deviation, which can be defined as follows:“ Absolute deviation means absolute value of deviation.” And deviation charge for Buyers can be considered as 10% of normal rate x absolute deviation in kwh exceeding 12% of schedule. **Further, under-drawl may cause over-frequency conditions so it should not be permitted beyond a limit and penal rate of 10% of normal rate of**

charges of deviation should apply except at the frequency of 49.88 Hz and below (based on table at para 20 above) and on the same ground over-drawl at frequency of 50.02 Hz and above.

24. On the same ground, Deviation charges for sellers for over-injection (up to system frequency $\leq 50.02\text{HZ}$) or under-injection (up to system frequency ≥ 49.988) can be also be considered at 10% of normal rate of charges for deviation for absolute deviation exceeding following % of schedule. (for working out this, deviation charges @110% at normal rate of deviation charges for first and second category is split to that @ normal rate of deviation charges for under-injection exceeding 2% plus @10% normal rate of deviation charges for under-injection for absolute deviation exceeding 2%)

(i)	For general seller (other than ROR or MSW generating station)	2%
(ii)	For ROR generating station	12%
(iii)	For MSW generating station	20%
(iv)	For WS seller	10%

25. **Charges of deviation – under-drawl by Buyer** :- If scheduled generation is unaltered, then any under-drawl by an entity shall normally be over drawl by another entity for which that entity shall pay to DASPA @normal rate of deviation charges (for entire deviation) and additional 10% towards penal deviation charges if deviation limit of 12% for drawl) is exceeded (with 110% of normal rate of deviation charge split into 100% towards under over-drawl and 10% towards penal deviation charges). **Overdrawing entity utilises the overdrawn energy for its commercial gains. Under-drawl by an entity (i.e. discom) is not welcome by discom as it affects its revenue. Further, under-drawls can be due to various reasons beyond its control.** For example :-

- (i) automatic load shedding by under-frequency relays under under-frequency load shedding,
- (ii) transmission constraint not permitting it to utilise scheduled power,
- (iii) weather phenomenon like agricultural load crash down due to unanticipated rains,
- (iv) sudden in ambient temperature causing switching off of coolers and A.Cs. by consumers,
- (v) disruption in supply due to storms,
- (vi) wind generation picking up due to high winds or early onset of wind,
- (vii) increase in solar generation with cloud cover over solar plants swept by wind,
- (viii) lock down by civil authorities,
- (ix) variation in load due to system frequency as brought out at para 18 above.

26. All these are beyond the control of an entity (i.e. discom). And **for reasons beyond discom's control, it should not suffer specially when other entity has gained. Regional Load Despatch centre is system operator and not the trader vide provisions of section 27 of the electricity Act, so it can realise revenue at the cost of an entity, as such receipts by way of deviation charges of over-drawl should be paid to under-drawing entity.**

27. If an entity has underdrawn and other entities has not over-drawn, then scheduled generation will be affected by under-drawl. and will causes under-injection to the extent of under-drawl, RoR generating station, Municipal solid waste based generating stations, Solar or wind generating stations are RE power stations having must run status or zero energy cost so their generation will not be reduced for under-drawl by an entity and generation reduction will be effected only for the seller (i.e. conventional thermal generating station). As per CERC tariff reg 2019, tariff for generating stations consists of capacity charges of generation as per plant availability and energy charges as per schedule (vide reg.42, 43 & 44 of CERC tariff reg 2019. Thus generator is not the sufferer as it has been paid by under-drawing entity. Under-drawl has resulted in reduction in savings in the cost of fuel and conservation of water for which energy charges will be payable . On account of capacity and energy charges paid for by the under-drawing, and utility receiving less than scheduled energy, they should be paid back amount for under-drawl

28. Over-injection by RoR generating stations, wind or solar generating stations shall be on account of natural phenomenon Municipal solid waste power stations too have must run status, as they will have to utilise daily intake of waste so as to avoid its accumulation and consequent pollution. Over injection by thermal generating plants may be due to low frequency conditions requiring maximisation of generation or due to load demand. It can not be at their own as in that case frequency will rise and RLDC will certainly intervene under provisions of grid code or the electricity Act. Denial of payment of deviation charges at normal rate of charges of deviation on the ground (vide para 3.7 of explanatory memo) that generators should help the system within operating band but at the instructions of system operator by participating in the ancillary services mechanism rather than their own driven by price signal linked to frequency is not proper since all conventional generators , as brought out above, can not participate in SRAS and TRAS will come into play with timelag of 30 minutes. , On this account existing CERC (DSM and related matters) regulation 2014 has following provisions/:-

“5. Charges for Deviations:

(1) **The charges for the Deviations for all the time-blocks shall be payable for over drawal by the buyer and under-injection by the seller and receivable for under-drawal by the buyer and over-injection by the seller** and shall be worked out on the average frequency of a time-block at the rates specified in the table below as per the methodology specified in clause (2) of this regulation:...

29. **In considerations to above, under-drawal by the buyer and over-injection by the seller should be paid at normal rate of charges for deviation from DASPA.**

Pay back for shortfall by seller:

30. Sr.no. 4 under Column 3 of table below reg 8(1) have a provision as under:-

“.....seller shall pay back to deviation And Ancillary service pool account for the shortfall in energy against its schedule in any time block due to under-injection (a) at the contract rate at which it been paid based on schedule or (b) in the absence of contract rate at the rate of area clearing price of the day ahead market for respective time block (ACP).”

31.. It is submitted that inter-state contracts are of two categories:

(i) contract requiring payment by Buyer as per schedule and deficit in generation of seller is met from State Grid or surplus absorbed by State Grid. (like collective transactions)

(ii) contract requiring initial payment by Buyer as per schedule to be adjusted finally as per actuals. and supply of energy to seller is as per actual generation. (like CESI's contracts for solar energy projects)

32. The above provision (vide para 30) is applicable for contract at sr.no.(i) only, Since Grid has effected the supply so deficit in generation should be paid by the seller. In respect of contract as per sr.no. (ii) , payment as per actual supply should be the transaction between buyer and seller and this should not be through DASPA. This needs to be specified in tables.

33.. Inter-state solar Projects:- Rajasthan has 7738MW of solar energy power plants. SLDC Jaipur effects scheduling to NRLDC based on 3000 MW operational solar generating stations for intra-state supply and 500 MW for inter-state supply transmiited through STU's transmission system. Besides this, number of solar power stations ,directly connected to Power Grid / CTU's transmission system, are scheduling their generation directly to NRLDC. Variation of solar generation reflects as variation in drawl by Rajasthan state (as regional entity). A variation of say 10% from scheduled generation considered by SLDC Jaipur , will transform to 350 MW at state periphery and this deviation will not attract DSM charges from solar plant but it will attract payment at normal rate of charges for deviation of Rajasthan state as regional entity-Buyer Out of these, 50 MW variation will be due to inter-state solar power stations which will ultimately gets reflected on Rajasthan's consumer with no benefit to them. This is logically not correct and is also against the Electricity Act as being not in consumers' interest and protection of consumers interest is the main objective of the Act vide its preamble (“an act. to consolidate.....incidental thereto”). This burden on consumers of Rajasthan will increase in coming years with more and more solar power stations likely to be installed in Rajasthan for inter-state sale as Rajasthan have maximum annual solar insolation in sparsely populated barren land of thar desert (due to clear sky days almost throughout the year). **Being against the consumers interest, the burden of charges of deviation due to inter-state solar, Wind or solar-wind hybrid projects in Rajasthan should not be passed on to the Rajasthan as regional entity and in turn on State's consumers. It is therefore appropriate that all inter-state solar. wind and solar-wind hybrid) generating stations are considered as deemed regional entity and**

their energy account and deviation settlement is effected based on real time schedule and actual generation data supplied by SLDC Rajasthan to NRPC.

DSM for Energy storage Plants:

34. Energy storage plants will be suitable for:-

- (i)balancing variations in solar or wind generation;
- (ii)peak hour energy generation and
- (iii) TRAS.
- (iv) SRAS (Battery operated energy storage plant)

35 Where wind or solar or solar-wind hybrid generating station and storage plant are within the same state, injection / drawl of these projects for functions at sr.no. (i) and (ii) above will be accounted in the schedule/ actual drawl of the regional entity. However, where, solar or wind or solar-wind hybrid power plant and energy storage plant are in different states and there is contract between, Wind/solar/solar-wind hybrid generating plant or regional entity embedding them and Energy storage power plant, for functions at sr.no.(i) and(ii), supply of power for energy storage and utilisation of power generation from energy storage plant will be inter-state transaction. Under existing draft DSM reg, balancing of variation in solar or wind or solar wind hybrid power plant and Energy storage power plant will be considered separately and this will not enable function at sr.no.(i) to be feasible as may be required as per actual generation.. Further, utilisation of battery operated energy storage plant for SRAS and any energy storage plant for TRAS will not be feasible by nodal agency under reg. 21(1) of draft CERC ancillary services reg.21 , as their tariff may not be determined under sec 62 of the Electricity Act. **It will be appropriate that DSM regulations provide mechanism to facilitate the function of balancing of variation of solar or wind or solar-wind hybrid power plant with energy storage power station indifferent states and utilisation of their URS , as it may not be bid, as its availability for SRAS /TRAS will depend on real-time generation. For this, it is suggested that Energy storage power generation plant may be considered as deemed regional entity and where any regional entity (or embedded wind or solar generation plant in a regional entity) has contracted for (i) and (ii) then, their actual drawl and actual injection (not the scheduled injection) is adjusted time block wise against the state's injection and drawl and any capacity bid by them for SRAS /TRAS or Un requisitioned surplus (i.e. URS) is utilised under reg. 21(2) by nodal agency for SRAS and TRAS**

36. Must run RE RoR, solar or wind generating stations are nature dependent and - over-injection or under injection is not within their control. Deviation charges are levied on them for over-injection or under-injection beyond absolute deviation of 12% (in draft regulation 10%). This levy is to force them to have accurate forecasting and scheduling in the interest of grid management, States have specified agency of Qualified Coordinating Agency (QCA) to forecast and schedule wind or solar generation separately for each pooling station. The agency of QCA has enabled scheduling but accuracy of forecast and scheduling and transmission of requisite SCADA data has not been improved to the extent desired. **The charges @10% of**

normal rate of charges for deviation beyond specified limit of 12% should therefore be deposited in a separate pool account. This is to be partly (say 50%) utilised to effect improvement in scheduling by

- (i) installation of weather stations,
- (ii) parallel forecasting and scheduling by REMC with the objective to have software development and improvement
- (iii) data transmission facility from pooling station (specially SCADA of individual supplier at pooling station) at pooling station to REMC.
- (iv) incentivising QCA and REMC for software improvement with respect to that of previous year.

37. Further, RLDC to publish on its web site statistics of deviation by state entity, regional entity, with respect to scheduling by QCA and by REMC and their performance improvement.

38. In considerations to above, table under reg 8(2) will be required to be revised. Such revision as suggested by me are at annexure -1A and 1B .(additions are in bold and deletions are ~~within[]~~)

(shanti Prasad)
Ex-chairman,
Rajasthan Electricity Regulatory Commission,

Annexure -1A

Sr. no	Regional Entity	Charges for deviation payable to / receivable from Deviation and Ancillary Service pool account (DASPA) subject to provision as per note 1 below.	
	Seller	For over-injection.	For under injection.
1	For general seller other than RoR generating stations or generating station based on municipal solid waste or WS generating station	[Zero] (i)* @ normal rate of charges of deviation x deviation in kwh -general seller up to 2% deviation for system frequency higher than 49.88 Hz and deviation in kwh at system frequency of 49.88 hz and lower (receivable from DASPA)	[(i) normal rate of charges for deviation up to 2% deviation - seller (in %)] (i) @ normal rate of charges of deviation x deviation in kwh - general seller deviation (payable to DASPA)
		[(ii) @ 110% of normal rate of charges of deviation beyond 2% deviation - general seller (in %)] (ii) 10% of normal rate of charges of deviation x absolute deviation-general seller in kwh exceeding 2% for frequency exceeding 49.88 HZ (payable to DASPA)	[(ii) @ 110% of normal rate of charges of deviation beyond 2% deviation - general seller (in %)] (ii) 10% of normal rate of charges of deviation x absolute deviation-general seller in kwh exceeding 2% for frequency up to 50.02 HZ (payable to DASPA)
2	For a general seller being an RoR generating station on perennial river or upstream reservoir	[ZERO] (i)* @ normal rate of charges of deviation x deviation in kwh -general seller (receivable from DASPA)	[(i) normal rate of charges for deviation up to 12% deviation - seller (in %)] (i) @ normal rate of charges of deviation x deviation in kwh - general seller (payable to DASPA)
		[zero] (ii) 10% of normal rate of charges of deviation x absolute deviation- general seller in kwh exceeding 12% for frequency exceeding 49.88 HZ (payable to DASPA)	[(ii) @ 110% of normal rate of charges of deviation beyond 12% deviation - general seller (in %)] (ii) 10% of normal rate of charges of deviation x absolute deviation-general seller in kwh exceeding 12% for frequency up to 50.02 HZ (payable to DASPA)

3	For general seller being a generating station based on Municipal solid waste.	[ZERO]-(i)* @ normal rate of charges of deviation x deviation in kwh -general seller (receivable from DASPA)	[[i] normal rate of charges for deviation up to 20% deviation - seller (in %)] (i) @ normal rate of charges of deviation x deviation in kwh - general seller (payable to DASPA)
		[zero] (ii) 10% of normal rate of charges of deviation x absolute deviation- general seller in kwh exceeding 20% for frequency exceeding 49.88 HZ (payable to DASPA)	[[ii] @ 110% of normal rate of charges of deviation beyond 20% deviation -general seller (in %)] (ii) 10% of normal rate of charges of deviation x absolute deviation- general seller in kwh exceeding 20% for frequency up to 50.02 HZ (payable to DASPA)
4	A. For WS seller (including wind – solar hybrid, or RoR generating station on non perennial river and no upstream reservoir) B. Battery operated RE storage station or RE power pumped storage hydro power generating station#	[ZERO]-(i)* @ normal rate of charges of deviation x deviation in kwh -general seller (receivable from DASPA)	[[i] normal rate of charges for deviation up to 10% deviation - seller (in %)] (i) @ normal rate of charges of deviation x deviation in kwh - general seller (payable to DASPA)
		[zero] (ii) 10% of normal rate of charges of deviation x absolute deviation- general seller in kwh exceeding 10% for frequency exceeding 49.88 HZ (payable to DASPA)	[[ii] @ 110% of normal rate of charges of deviation beyond 10% deviation -general seller (in %)] (ii) 10% of normal rate of charges of deviation x absolute deviation- general seller in kwh exceeding 12% for frequency up to 50.02 HZ (payable to DASPA)
		Provided that where buyer is supplied energy as per schedule and seller is paid as per schedule, such seller shall receive from deviation And Ancillary service pool account for the excess	Provided that where buyer is supplied energy as per schedule and seller is paid as per schedule, such seller shall ,in addition, pay back to deviation And Ancillary service

		energy against its schedule in any time block due to over-injection (a) at the contract rate at which it been paid based on schedule or (b) in the absence of contract rate at the rate of area clearing price of the day ahead market for respective time block of the Day Ahead Market for the respective time block.	pool account for the shortfall in energy against its schedule in any time block due to under-injection (a) at the contract rate at which it been paid based on schedule or (b) in the absence of contract rate at the rate of area clearing price of the day ahead market for respective time block of the Day Ahead Market for the respective time block
		# Battery operated storage station or pumped storage hydro power station operating on RE sources shall be deemed regional entity. Where such plants have contracted for balancing variations of RE generation and meeting peak load, then Schedule and actual transactions of such RE station and Storage station (for contracted capacity) shall be integrated for the purpose of deviation settlement regulations at common bus bar or periphery of regional entities, as the case may be. Provision of DSM regulations will apply on only on uncontracted capacity of battery operated storage station / pumped storage hydro power station	

Note-1: For the time blocks during which SRAS-UP , SRAS-DOWN, PRAS-UP & PRAS-DOWN is availed by RLDC, above provisions will be superceded by CERC Ancillary service regulations for capacity so availed and amount payable to DASPA or receivable from DASPA, shall be as per CERC Ancillary service regulations and for those time blocks.

2.*calculations will yield negative value of charges for deviation, indicating it to be receivable from DASPA.

3. Where inter-state agreement provides for supply of energy based on actual generation but initial payment is as per schedule to be adjusted finally as per actual generation, payment for deficit / surplus supply of energy shall be settled between buyer and seller.

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Annexure 1B

Sr. no	Regional Entity	Charges for deviation payable to / receivable from for Deviation and Ancillary Service pool account (DASPA)	
	Buyer	Deviation by way of under-	Deviation by way of

		drawl	overdrawl
1	Buyer (other than the buyer with schedule less than 400 MW and Re rich state) being RE rich state and having aggregated installed capacity of solar and wind power stations $\geq 1000\text{MW}$ and $\leq 3000\text{MW}$	(i)* [Zero] @ normal rate of charges of deviation x energy corresponding to deviation (.receivable from DASPA)	[(i) @normal rate of charges for deviation up to 12% deviation buyer or 150 MW deviation buyer in atime block, whichever is lower] (i) @ normal rate of charges of deviation x energy corresponding to deviation.(payable to DASPA)
		ii)[ZERO]@ 10% of normal rate of charges of deviation x energy corresponding to absolute deviation beyond specified limit 'L1' up to system frequency of $\geq 50.02\text{HZ}$ (receivable from DASPA)	[(ii) @110% of normal rate of charges for deviation beyond above limit] @10% of normal rate of charges of deviation x energy corresponding to absolute deviation exceeding the Limit specified (L1) (payable to DASPA) for system frequency above 49.88 Hz
		Limit L1 for each time block shall be the schedule or 12% of schedule +200 MW, whichever is lower.	
2	Buyer [with schedule up to 400 MW] being non RE rich state	(i)* [Zero] @ normal rate of charges of deviation x energy corresponding to deviation (.receivable from DASPA)	[(i) @normal rate of charges for deviation up to 12% deviation buyer(in %)] (i) @ normal rate of charges of deviation x energy corresponding to deviation.(payable to DASPA)
		ii)[ZERO]@ 10% of normal rate of charges of deviation x energy corresponding to absolute deviation beyond 12% up to system frequency of 50.02 HZ (receivable from DASPA)	(ii) @10% of normal rate of charges of deviation x energy corresponding to absolute deviation beyond 12% (payable to DASPA) for system frequency above 49.88 HZ
3	Buyer being RE rich state and having aggregated installed capacity of solar and wind	(i)* [Zero] @ normal rate of charges of deviation x energy corresponding to deviation (.receivable from DASPA)	[(i) @normal rate of charges for deviation up to 12% deviation buyer or 150 MW deviation buyer in atime block, whichever

	power stations > 3000MW		is lower] (i) @ normal rate of charges of deviation x energy corresponding to deviation.(payable to DASPA)
		ii)[ZERO]@ 10% of normal rate of charges of deviation x energy corresponding to absolute deviation beyond specified limit 'L2' up to system frequency of >=50.02HZ (receivable from DASPA)	[(ii) @110% of normal rate of charges for deviation beyond above limit] @10% of normal rate of charges of deviation x energy corresponding to absolute deviation exceeding the Limit specified (L2) (payable to DASPA) for system frequency above 49.88 Hz
		Limit L2 for each time block shall be the schedule or 12% of schedule +250 MW, whichever is lower.	

Note- 1. *calculations will yield negative value of charges for deviation, indicating it to be receivable from DASPA.

2. Where inter-state agreement provides for supply of energy based on actual generation but initial payment is as per schedule to be adjusted finally as per actual generation, payment for deficit / surplus supply of energy shall be settled between buyer and seller.