PXIL
Transforming Power Markets

Ref: PXIL/SPD&L&S/3172018/30 Date: July 31, 2018

The Secretary,
Central Electricity Regulatory Commission,
3rd and 4th floor, Chanderlok Building,
36 Janpath,
New Delhi - 110001.

Sub: Draft Amendment to CERC (Deviation Settlement Mechanism and related matters) (Fourth Amendment) Regulations, 2018 – Observations, comments and suggestions from Power Exchange India Limited.

Ref: Public Notice No. L-1/132/2013-CERC dated 29th June 2018.

Dear Sir,

With reference to the subject cited above, we hereby submit our observations, comments and suggestions, in response to the public notice.

In the core of the proposed amendment lies the linkage between the DSM price vector to the prices discovered in the organised power market i.e. power exchanges, to address the critical issues identified in the current DSM Price Vector.

The principle of developing a reference for determining the DSM price vector is a step in the right direction and is thus welcome and encouraging. Nonetheless, the DSM mechanism needs to retain its attributes towards maintaining grid discipline and simultaneously should not serve as a proxy for organized markets. Therefore, a more thorough evaluation of possible alternative solutions needs to be undertaken to ensure a robust DSM mechanism.

We hereby submit our suggestions on the proposed draft, especially considering the following broad areas:

- Inculcating prudent behaviour in the participants by way of incentives and penalties.
- Nature of proposed linkage and its relevance to system operation in light of DSM being a disciplinary tool.
- Nature of proposed linkage based on past amendments to the DSM Regulations, their causes and the outcome.
- Difference in the market segments and ability of proposed linkage to alter the nature of market segments.
- Alternate ways to address the gaps.

It has been mentioned in the report of the Expert Group, the proposed Amendment and its explanatory memorandum, that the proposed linkage may be carried out initially for a period of six months and based on the experience, CERC may consider refining of the mechanism. It has

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also been mentioned that regulatory processes have their own timelines, the changes more often than not are behind the curve.

We submit that a far more detailed study of the proposed linkage may be carried out on sufficiently larger period, as compared to the sample study in the report, considering past periods and also in parallel to the existing methodology, to capture the likely outcome, which are then evaluated prior to any implementation. There are several aspects as have been detailed out in our submissions that would have an adverse impact on the DSM mechanism remaining true to its purpose of ensuring grid stability and balance.

We further submit that linking the DSM price vector to prices emanating from a small part of the overall power market may potentially push the DSM mechanism to act as a proxy for real time market. The DSM mechanism as it stands today itself can be made more robust by enhancing the price vector to curb mis-utilization by drawing utilities and by tightening the volume caps on the injecting utilities to ensure that the DSM mechanism is not used as a proxy.

We request you to place our observations on record and grant us an opportunity to present them during the public hearing. Also, we would be grateful in case the Commission desires and allows us to present our views to the Staff of the Commission, at any time in the week starting Aug 20, 2018.

Thanking You,

Yours faithfully,
For **Power Exchange India Limited**

POWER EXCHANGE INDIA LTD. MUMBAI

Prabhajit Kumar Sarkar
Managing Director & CEO

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OBSERVATIONS ON THE DRAFT AMENDMENT TO THE CERC (DEVIATION SETTLEMENT AND RELATED MATTERS) (FOURTH AMENDMENT) REGULATIONS 2018

In the core of the proposed amendment lies the linkage between the DSM price vector to the prices discovered in the organised power market i.e. power exchanges, to address the critical issues identified in the current DSM Price Vector.

Accordingly, we, at PXIL, have evaluated the proposed draft on its ability to address the identified core issues. The evaluation has been considering the following broad areas:

- Nature of proposed linkage based on past amendments to the DSM Regulations, their causes and the outcome.
- Nature of proposed linkage and its relevance to system operation in light of DSM being a disciplinary tool.
- Inculcating prudent behaviour in the participants by way of incentives and penalties.
- Difference in the market segments and ability of proposed linkage to alter the nature of market segments.
- Alternate ways to address the gaps.

EXTRACTS FROM PAST AMENDMENTS TO THE DEVIATION SETTLEMENT MECHANISM REGULATIONS, THEIR CAUSES AND OUTCOME

Central Electricity Regulatory Commission had notified the CERC (Deviation Settlement Mechanism and related matters) Regulations, in January 2014, replacing the Unscheduled Interchange Regulations 2009. This replacement of regulations was in the backdrop of two blackouts in the grid and as per the explanatory memorandum to the DSM regulations, the key changes in the regulations are enumerated below.

- *"...4. The NLDC has sought in its proposal the following three major changes:*

(a) Narrowing down frequency band further to 49.9 Hz to 50.1 Hz, so that system operates close to 50 Hz;

(b) Imposing limits on UI injection/withdrawal and making its ***truly inadvertent interchange;*** *and*

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(c) Introduction of locational bias in UI settlement rate." (page 2 & emphasis added)

- *"...16. The Central Commission has stated from time to time that Unscheduled Interchange (UI) should not be used as a route for trading of electricity..."*
- *"....Since the **UI mechanism shall no longer to act as a market mechanism it is also proposed to adopt a new Regulation in place of UI Regulation** namely CERC (Deviation Settlement Mechanism and related matters) Regulations, 2013..." (page 5, emphasis added)*
- *"...UI Commercial mechanism is **no longer a market and strict volume limits are being imposed**..." (page 9 & emphasis added)*
- *"...The UI rate is same throughout the synchronous system. **This issue can be addressed to some extent,** by introducing locational bias in UI price, based on area clearing prices in the Power Exchanges...." (page 10 and emphasis added)*
- *"....The UI prices were higher than the PXs prices prior to grid disturbances and UI Volume was higher than the PXs volume. UI prices are lower than the PXs prices post grid disturbance and UI volume has also come down...."*
- *"....Contrary to the PXs, **UI market ignores willingness of entities, capacity to pay, value of lost load for entities**....." (page 11and emphasis added)*
- *".....There is merit in the NLDC suggestion of linking UI with area clearing prices in the Power Exchanges. However, **the real time grid operation scenario may be significantly different than the day ahead scenario in the PXs** due to load crash or major generation outage or any other unforeseen circumstances. Further, **the UI mechanism is not to act as real time balancing mechanism. It is now proposed to convert the UI mechanism as a purely grid discipline mechanism as intended ab initio**, with strict limits on deviation from the schedules...." (page 11 and emphasis added)*
- *"....However, **the UI charges or the charges for the deviation should be sufficiently high to persuade the entities to go for scheduled transactions rather than unscheduled deviations**...". (page 12 and emphasis added)*

EXCERPTS FROM THE REPORT OF THE EXPERT GROUP ON THE REVIEW OF THE PRINCIPLES OF DSM

The explanatory memorandum relies on the report of the Expert Group on the Review of the Principles of DSM. The areas highlighted in the report are:

SNIPPETS FROM LITERATURE REVIEW

- *"**Inadvertent market or inadvertent interchange or inadvertent exchange**"*
- *"...Unscheduled power occupies the interface between markets and reliability; **real-time is the proper domain for management of honest scheduling error, not for markets for energy..**".*
- *"...Moreover, allowing suppliers to increase real-time risk by taking real-time energy delivery risks in an energy-only spot market winds up unfairly penalizing customers if there are no resources available..."*
- *"...The California market meltdown may be attributed in significant part to improper pricing of unscheduled power..."*
- *"....In a competitive market **the real time prices are true marginal cost prices**, and the forward prices are just estimates...."*
- *".....There must be some pricing rules for imbalances...These **pricing rules become central to the character of the whole electricity market**...The main tool available to the **Market Operator to encourage efficiency is the price charged or paid for imbalances** between contracts and actual flows.....*

SNIPPETS FROM FEATURES OF DSM

"The DSM price vector has been designed to bring in economy and efficiency during real time operations in a decentralized manner.

(a) Some of the unique features and the strengths of the present mechanism are:

- *Real Time Imbalance Pricing*
- *Promotes Efficiency and Merit Order Despatch*
- *Perfect Information, known ex ante to everyone*
- *Diffusion of market power and choice to buyers & sellers*
- *Discourages advertent deviations*
- *Highest priority in payment*

(b) The features lacking in the present mechanism are as follows:

- *Market linked Price Vector*
- *Factoring Value of Lost Load (VOLL)*
- *Interplay of Prices in various market segments*
- *Time value of Electricity*
- *Geographical Location and Transmission Congestion*

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Some of the other key aspects which are related to the larger electricity market design inhibiting the market are non-availability of adequate Market Opportunities for Balancing and implementation of Gate Closure.

The desired features of a good imbalance handling mechanism design in future should incorporate the strengths of the present mechanism as well as address those features which are lacking in the present mechanism.

OUR OBSERVATIONS

NATURE OF PROPOSED LINKAGE BASED ON PAST AMENDMENTS TO THE DSM REGULATIONS AND ITS RELEVANCE TO SYSTEM OPERATION IN LIGHT OF DSM BEING A DISCIPLINARY TOOL

DSM as a Regulated Vector

1. The Price Vector needs to remain a regulated vector, as it is not a market instrument but a disciplinary tool for efficient and reliability in grid operations.
2. The vector is stated to be static in terms of it firm definition based on highest cost of dispatch, which itself changes and also, on temporal scale due to the time taken for regulatory process resulting into significant periods between successive revisions. While the vector has always been static, it has produced dynamic results due to its linkage with frequency, distributed and diminished market power of the individual constituent to control the frequency etc.

   By changing the referencing of the DSM Vector to market clearing prices and the other contours (slope, additional surcharge, volume caps etc.) remaining the same, the vector would still remain static. **It is only on the temporal scale that the vector will be revised from current few years to daily basis.**

   This daily revision may lead to high volatility in volume with the absence of predictability in vector. The DSM segment would appear to be designed as a real time balancing market and with a direct correlation being established with day-ahead spot, the constituents may be incentivized to adopt this as a chosen route.

   Nevertheless, the inadvertent nature of the DSM transactions would definitely be affected, as predictability aids planning and any change in predictability is likely to promote ambiguity.
3. The need for frequent revisions in the base rate for the vector can also be addressed by defining a periodicity for revision in the base rate by POSOCO on semi-annual basis or with any other suitable periodicity as is being followed in case of loss calculations.

Interplay between segments

4. The interplay between the market segments does not exist in first place, as the DSM mechanism is neither a market segment not it is intended to be one. As a disciplinary tool, it has devised a commercial mechanism for incentivizing market participants to sufficiently induce them for lower and lower deviations from schedule. **As a matter of correlation between segments, the prices at which deviations are settled should be considerably higher than the prices at which markets are transacting to create a deterrent and a commercial barrier towards deviations.**
5. DSM is a mechanism to account for the **inadvertent exchange** between market participants and not a real time balancing mechanism. **It is post facto mandatory settlement of deviations without taking into account the willingness of entities, ability to pay etc. and not transactions in electricity on very short notices.**

   The real time market (called real time colloquially) is a market for transactions as close as allowed before delivery. Currently, in our grid code, the least count for downward revision in schedules on the request of a seller is 6 time blocks or 1.5 hours whereas on the exchanges the contracts can be scheduled 3 hours ahead of delivery.

   For a more efficient real time market to take root, the gate closure period need to be brought down significantly and the propensity to change schedules to account for deviations, needs to be curbed. Both of these concepts have been outlined in the recent Staff Paper issued by the Hon'ble Commission on "***Re-Designing Real Time Electricity Market in India***". These real time transactions would therefore be voluntarily entered by participants to avoid the penalties arising out of the deviations under DSM and would help reduce the dependence on DSM to handle real time deviations.

Pricing of the DSM Vector

6. The DSM prices, as a deterrent, will always have a bearing on the other markets. The design requirement will therefore be to avoid interplay between segments. Referencing of the prices to the market discovered prices may lead to promoting interplay as it might compromise on the disciplinary nature of the prices coupled with a larger frequency band.
7. The prices of the DSM vector are supposed to sufficiently encourage the market participants to refrain from dis-balancing the grid and also to help them gravitate towards organized markets. The proposed linkage fails to address as to how it will encourage the market participants towards organized markets.

We would like to submit that the DSM is not meant to provide a price signal but has to be a price deterrent towards large deviations.

8. It must also be noted that the pricing in the Day-ahead spot market is determined by the behavior of both buyers and sellers. During periods of high demand during the year, some large participants influence the price pattern significantly through their purchases on the exchanges. Restrained sale bids or buy bids in the day ahead spot can lead to higher or lower prices respectively, the impact of which can be subsequently mis-utilized in the DSM mechanism by such participants for commercial gains.

Operational aspects of DSM

9. The DSM vector operates on frequency and therefore, the true operation is due to a combined effect of the frequency, its rate of change, variation etc. The success of DSM can be evaluated by how it has contributed to reduce the variations by flattening the frequency curve or reducing the variations around the mean.
10. As part of system operation, the grid frequency has to necessarily remain within the allowed band at all times. In case there is a perceived risk on security of the operation during few particular hours or to bring in time concept in operations, the volume caps can be tweaked for those hours and relaxed for other hours.
11. Secondly the prices discovered in the exchanges during peak hours may not be the true reflection of demand in the system, as wholesale participants have adopted Time of Day (ToD) tariff to flatten the demand curve during peak hours and reduce their need to procure in day ahead spot market, on a regular basis.

Coverage of the DSM Vector

12. The DSM Vector captures the energy charges of the **regulated** generating stations, both on the lower side and the higher side. This not only results into a range which captures the entire spectrum of generating plants but also has an implicit consent from all the utilities. Regulated entities on the generation side do not participate in the day ahead spot market. Two, the day ahead prices, even though are energy only prices, do not define a range to cover the entire spectrum of generating stations.
13. **Referencing of the day ahead prices, as proposed in the amendment, accepts this anomaly and proposes a regulatory cap on the higher side. As a principle of design, the range of the vector should have same underlying across the range. Two, the applicability and range, as has been implicit in the current design, may be continued in the proposed referencing.**

14. The proposed pricing of the vector to have a linkage with day ahead prices at 50.00 – 50.01 Hz, assumes that the pricing is discovered for a balanced grid which accounts for congestion. But, as has been mentioned earlier, the actual operations and assessment/anticipation of congestion, may differ significantly, leaving no incentive for the buyer to plan in advance as whatever was discovered in day ahead is available in DSM at 50Hz. This also needs to be examined in light of the higher operative band. On the seller side, they have incentive to inject higher in DSM as the realization is at least equal to prices in organized market.

Applicability of DSM Vector

15. The DSM Vector is applied uniformly to all the regional entities in the grid as a disciplinary tool.
16. The system operation, in real time, was oblivious to the type of contracting (long term, medium term and short term), nature of transaction (voluntary or regulated).
17. The procedure for relieving congestion in real time also re-dispatches open access transactions first before any other.
18. The DSM vector was also defined based on energy charges of regulated (long term) entities.
19. As design and operational framework were therefore intertwined and based on same principles (long term, followed by open access in operations and long term defining the range of the vector).
20. **The proposed linkage disturbs this linkage and creates a confusing/mixed alignment between applicability, range and operations.** The price is based on open access transactions (lowest priority even in short term transactions) whereas the applicability is on all transactions (long term) and range is constructed through a regulatory cap.

Price Discovery in Energy Exchanges

21. The Power Exchanges are regulated to follow the principle of social welfare maximization for their price discovery, which augurs well with the voluntary nature of participation.
22. The DSM is a disciplinary tool and therefore, mandatory in nature. The price has to work as a deterrent.
23. As per the Market Monitoring Report, a significant contribution in cleared volumes, and therefore, in price discovery is by entities which are not regional entities.

24. The price discovery is designed to capture the residual transactions and is currently driven by open access transactions.

Concluding Observation

The proposed linkage of the DSM vector, to the prices in day-ahead market as have been proposed in the draft regulations are therefore likely to create ambiguity, implicitly push higher volumes in DSM and assure higher realization to the regulated generating stations. This may lead to compromise on the principles of secure and reliable grid operations, as have been built by the System operators over the last few years.

We submit that the DSM mechanism can be made more robust by enhancing the price vector to curb mis-utilization by drawing utilities and by tightening the volume caps on the injecting utilities to ensure that the DSM mechanism is not used as a proxy for a real time market.

Furthermore, the price caps can be adjusted with a pre-defined periodicity based on relevant data related to the overall cost of generation in the system.