



11th October 2018

Mr Sanoj Kumar Jha
Secretary, Central Electricity Regulatory Commission
3rd & 4th Floor, Chanderlok Building
36, Janpath
New Delhi- 110001

Sub: Comments/ Suggestions on Discussion Paper on “Re-designing Ancillary Services Mechanism in India”

Dear Sir,

This is with reference to the public notice issued by CERC on ‘Re-designing Ancillary Services Mechanism in India’ having reference no: No.RA-14026(12)/3/2018-CERC dated 6th September 2018, inviting comments/ suggestions on the same.

Tata Power’s comments to the said publication are elaborated under **Annexure I**, enclosed herewith. We further request the Hon’ble Commission to grant an opportunity to all stakeholders to share their views by conducting a public hearing on the above matter.

Yours sincerely,

Ms. Paramita Sahoo
Head - Advocacy
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Annexure I: Observations and Queries on Discussion Paper on Re-designing Ancillary Services Mechanism in India

We appreciate the progressive Discussion Paper prepared and shared by Staff of Hon'ble CERC which primarily aims at initiating discussions on various aspects of increasing the ambit of ancillary services in India through market mechanism. While, we attempted to understand the proposal for redesigning the ancillary market, we have come across certain queries and observations which we feel appropriate to share with Staff of Hon'ble CERC.

S No.	Extracts from Discussion Paper	Views/Observations and Recommendation (if any)
1	<p><u>Para 6.9</u> Currently only the regulated CGS can participate in the Ancillary Services mechanism which has been classified as —slow ancillary. Going forward,</p> <ul style="list-style-type: none"> • All Inter-State / Intra-State generation (Public or Private) resources may be qualified to provide Ancillary Services (subject to maximum/minimum emergency/economic/regulation limits, min-run/down times, max-run times, cold/intermediate/hot start/notification times and start-up costs, and ramp-rate limits). • RE resources, with appropriate retrofit, be qualified to provide energy and Ancillary Services at a later date. 	<p>Currently, the way ancillary mechanism works in India is that all the Generators, that are Regional Entities, and whose tariff for the full capacity is determined or adopted by the CERC have been mandated to provide Ancillary Services as RRAS Providers. In the proposed mechanism, the option is being opened for all Inter-State / Intra-State generation (Public or Private) resources may be qualified to provide Ancillary Services. However, it is to be noted that RE resources have been envisaged to be qualified for ancillary services <i>at a later date</i> with "appropriate retrofit".</p> <p>We submit that, currently, power plants based on renewable sources of energy are being set up on "must run" premise. And hence, these stations must be allowed the "must run" for the duration of their life and must not be forced to participate in this ancillary market or made to undergo a retrofit by subsequent regulations.</p> <p>Further, the ancillary market should provide for incentivizing mechanism for Battery Storage Systems and Small Hydro Projects to offer services as Fast Tertiary Sources.</p> <p>It is suggested that cross border generators selling power in India under Inter State transactions be allowed to participate in Ancillary Market.</p>

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		<p>Trading Licensees should also be permitted to submit bids on behalf of generators as is the case in Day Ahead Market of Power Exchanges</p> <p>Further, it is requested that Hon'ble Commission may kindly clarify that whether SLDC would provide NOC to Generators for simultaneous participating in both Day Ahead Energy and Day Ahead Ancillary Services. For Intra state generation sources, would buyer be SLDCs or RLDCs (POSOCO)?</p>
2	<p>6.13 For the slow tertiary, there shall be a Day Ahead Market where generators would bid simultaneously in Day Ahead Energy and Day Ahead Ancillary Services Market and the two shall be cleared together. While the demand curve in Day Ahead Energy Market is an aggregation of demand bid into the market, the demand curve for each type of ancillary service is put forth by the NLDC/RLDCs.</p>	<p>The proposed section envisages that in the Day Ahead Ancillary Services, the demand curve would be provided by NLDC/RLDCs. In this regards, we wish to submit that it is pertinent to take a note of the factors which would be taken into consideration by NLDC/RLDCs to prepare such demand curve.</p> <p>We further submit that, the proposed scenario for a generator offering certain quantum for Ancillary services, in spite of having potential to sell under Day Ahead Market does not seem convincing until and unless the algorithm (mechanism of price discovery) of co-optimization is provided to stakeholders for a clearer understanding. Ideally, this algorithm should, along with ensuring least cost for ancillary services, should maximize generator's utilization and account for (i) FC recovery; (ii) incentivize participation in Ancillary market and (iii) incentivize the setting of adequate capacity of energy limited resources for ancillary support. This would also reduce the misuse of ancillary services for energy support by discoms.</p> <p>The constraints in the transmission corridor along with increased decentralized generation and technology changes act as catalyst</p>

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		towards locational ancillary requirements. While designing a national Ancillary market, the same needs to be considered.
3	<p>Clause 6.14.3 “The tertiary Reserve Suppliers shall be selected for each block of time for the upcoming day through a co-optimized Day-Ahead Unit Commitment process that minimizes the total cost of Energy and tertiary Reserves, using bids submitted to Power Exchanges in the Day Ahead Market.....”</p>	<p>There are multiple Power Exchanges in India and hence it needs to be clarified whether bids for Ancillary services would be cleared in both Power Exchanges or CERC would designate a particular Power Exchange for clearing bids for Ancillary services.</p> <p>Further, in the said clause, it is said that tertiary reserve supplier shall be selected for each time block. This seems in contradiction with one hour bid availability as mentioned in 6.14.2.</p>
4	<p>6.16.1 Resources selected to provide tertiary support in the day ahead market may advise NLDC no later than ninety minutes prior to the first hour of their Day-Ahead schedule or before the gate closure that they will not be available to provide tertiary reserves in Real-Time under normal conditions. However once committed in real time, the resources shall supply the support of designated quality (for the duration for which the service is defined).</p>	<p>Resources selected to provide tertiary support in the day ahead market may advise NLDC no later than ninety minutes prior to the first hour of their Day-Ahead schedule or before the gate closure that they will not be available to provide tertiary reserves in Real-Time under normal conditions.</p> <p>This is being proposed to ensure gate closure at the stipulated time of 6 time blocks before real time.</p>
5	<p>Clause 6.16.2 In case the requirement changes in real time and the system operator does not require a supplier selected in day ahead market to provide tertiary reserve services, the supplier would be required to buy back the unserved quantum at real time prices</p>	<ul style="list-style-type: none"> • The paper envisages a situation that a generator would be required to buy back unserved quantum. In such case, the generator on one hand would have lost the opportunity to generate and earn in real market and on the other hand, generator would be required to buy back at some cost. This would discourage the generator to offer capacity for reserves market. • It is not clear what is meant by real time price and how is this price determined. Will this price be same as price discovered in Real Time Energy Markets or will it be equal to DSM rate? Or is it the RT Reserve price determined as per the opportunity cost method as demonstrated in the examples?

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		<ul style="list-style-type: none"> • In case real time price is higher than the day ahead price, a peculiar situation may arise wherein a supplier who has not been dispatched by NLDC needs to pay to NLDC. • In the said scenario, the generator is ready to provide AS, but System operator, due to any technical reason, calls the selected generator back and that generator won't be serving in real time Reserve market. However, as proposed, Generator buying back the unserved quantum at real time prices is not justifiable with no default at the end of selected generator. In such scenario, considering the cost of bidding in AS and cost associated in running the unit at low PLF etc., generators here must be given the price whichever is higher between AS and DSM (real time).
6	<p>Clause 6.23 Pricing of Ancillary Services is typically given by the shadow price of the Ancillary Services, i.e. the lost opportunity of the generator forgone in energy market. Therefore, the price would be calculated as the cost of the marginal resource providing the ancillary service. Such opportunity costs are best discovered through the markets</p>	<p>It may be clarified that here the lost opportunity means the day ahead market clearing price for each time block in which generator did forego the energy sale. It is important to mention here that DAM pricing is discovered through demand and supply curve in a closed double side auction, and proposed RTM Intra-day market would also be based on discovery of prices based on closed auction. For AS, it is proposed in the draft that AS pricing would also be discovered (uniform pricing).</p> <p>However, price discovery principle of AS should be on the basis after considering the sequence of bidding (meaning which market closes first) among DAM (Energy), DAM (AS), RTM (Intra Day), Real time (AS) and subsequently timing of discovery of prices and freezing the bid quantum in respect to actual delivery of power. It should not so happen that price discovery results in DAM (Energy) price as lowest one, followed by RTM (Intraday) price and highest for AS. Such price</p>

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		<p>discoveries, if so happen may lead to less declaration under DAM/Day ahead scheduling under long term and generators might indulge in gaming.</p> <p>Products as proposed i.e. during real time operation and close to real time operation; like ACP linked DSM, Real time Intra-Day and AS should not become a platform for sellers/buyers who endeavour maximizing their commercial gains/savings. Hence, proper deterrent and price ceiling may also be imposed on such products and System Operators need to closely monitor the behaviors of sellers/buyers actively participating in such markets.</p>
7	<p>6.25 Under most conditions a generator that is supplying reserve, for example, must reduce output and forgo a profitable energy sale in order to stand ready to respond to a contingency. If that generator's variable fuel and maintenance cost was Rs 4.0/kWh and the energy market was clearing at Rs 5.0/kWh, the market would have to pay at least Rs 1.0/kWh for reserve to make the provision of reserve more attractive than the provision of energy. Providing reserves typically includes an additional cost component to cover the reduction in plant efficiency (e.g. reduction in plant efficiency that thermal generators experience when they position their throttling valves to enable fast and controlled regulation response). It may also include additional maintenance costs from the increased wear and tear of operating in this mode.</p> <p><u>Read with</u> 6.30- Day Ahead Position with Four Generators</p>	<p>Its rightly said that the Generators should be provided incentive to make the option of reserve attractive.</p> <p>In the proposed example, for a Day ahead operation, it has been assumed that the system demand is 590 MW and the demand for reserves is 25 MW. While, the proposed mechanism proposes a reserve price of Rs 1200/MWh (i.e sum of diff of Marginal Price for Reserves and Marginal price of Day ahead market and additional amount of Rs 200/MWh), it would be an important aspect for the resources to watch for the real time scenario.</p> <p>It is to be noted that in a scenario, where the real time requirement does not change much with Day ahead projection for subsequent day and the demand curves more or less remain the same, there would be a substantial loss of Unit 2, which could have generated and earned a revenue of Rs 4500/Kwh, ends up earning only the reserve price of Rs 1200/KWh). In various scenarios, it has been assumed that when reserve generation of any Unit is taken to service during real time, the costs of respective units will increase by cost @ rates offered by such</p>

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		<p>units for generation in day ahead market. This may not be a correct assumption to make as the rates offered by Units/Generator for day ahead market is not a reflection of their costs, but of the minimum expectation of rate of sale in market. So, in such case, wherever Units are having a margin of more than the cut off reserve price (i.e Rs 200/mWh considering example in the discussion paper), would find more benefit in the day ahead market instead of reserve market.</p> <p>Such a perspective may completely discourage the resources to offer their services for Ancillary Services.</p> <p>Further the Paper envisages scenarios for revision of Total Demand in Market as well as Ancillary market. In such case, it would be pertinent to understand the frequency at which such real time ancillary market demand would be determined /assessed and the factors to be considered.</p>
8	<p>Clause 6.26 Spinning and non-spinning reserves are typically very low cost when the power system is at minimum load since there are typically numerous generators operating below full load that have the ability to rapidly increase output. There is no opportunity cost for these generators.</p>	<p>It is not understood why the opportunity cost for spinning and non-spinning reserves should be zero.</p>
9	<p>Clause 6.28 The RLDCs in concert with the SLDCs shall establish tertiary reserve demand curves, one for each type of tertiary reserves requirement. The demand curves shall however be subject to a price cap equivalent to the highest variable cost of the available CERC regulated generation capacities in the country.</p>	<p>When all kind of Inter-State/Intra State generators have been proposed to participate in AS market, considering price cap on basis of highest variable cost of the available CERC regulated capacities may not be appropriate. In fact, demand curve shall be subject to highest cost of generation and not highest variable cost among all generators as many generators are selling power in Short term market where there are no fixed prices realized based on availability of the generation.</p>

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		<p>Further, it will not be practicable to cap the prices of the reserve to ancillary services. When the price discovered at the power exchange is more than highest variable cost of the available CERC regulated generation capacity in the country, during such time the costliest CGS would also be scheduled in the Energy Market itself and there would not be any resource available for the ancillary service, as the market discovered price is higher than the variable cost of the costliest CGS plant and beneficiaries of such plant would schedule the costly CGS generation. In such occasions facilitating ancillary services would be difficult as there would be no un-requisitioned capacity available at the disposal of the system operator. If the Hon'ble Commission decides to cap the price of reserves, then it forms a barrier for other resources e.g. Battery Storage, Plug-in Hybrid Electric vehicles, and demand response to supply energy and participate in the balancing market. As the variable cost of these generators could be higher than capping rate they would not be willing to participate in the AS market if their realization is capped.</p>
10	6.29 The diagram	<p>Ancillary services are defined as support services which are necessary to support the power system in order to maintain the reliability and security of the grid. Hence by virtue of the above definition, the Ancillary services should be price inflexible. However, in the example of the typical tertiary demand curve provided on page no. 26 in the discussion paper shows a step curve where the reserve requirement varies with variation in the price in a given time interval. This variation in the price of ancillary services within a given time block is against the</p>

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		fundamental definition of the Ancillary Services as defined in the Power Market Regulations.
11	<p>6.35 For the secondary and tertiary control services, charges are socialized based either on energy consumption or demand (in UK and Australia). This is in spite of the fact that some customers differ dramatically in their ancillary service consumption. For example, even if a state DISCOM is responsible for half of the ancillary service burden, yet pays for a much lower percentage of the ancillary service cost through the bundled rate. There have been recent research efforts to assess specific ancillary service charges on variable renewable suppliers even though the impact of nonconforming loads is typically significantly higher.</p> <p>6.36 As the power sector in India transitions to include AS markets for tertiary services, it is proposed that initially, the charges be <u>recovered from the Deviation Settlement Mechanism pool</u>. Once the AS markets have stabilized, the charges be recovered as a —price adder to the NLDC/ RLDC service charges and recovered from the grid connected entities on per unit of energy basis or as price adder in UI/DSM charges.</p>	<p>Instead of recovering such costs of Ancillary services from the DSM pool, we propose that a mechanism be developed that such costs shall be strictly recovered (along with penalty) from defaulting Procurers leading to requirement of such ancillary services.</p>
12	<p>Various scenarios</p>	<p>We have the following queries with reference to the various scenarios demonstrated:</p> <ol style="list-style-type: none"> 1. What is the significance of Generation offered at 0? 2. Is the spinning reserve indicated in the examples carved out of the capacity of 200 MW? 3. It appears reserves are scheduled from bottom up - we request that this co-optimization algorithm 4. Can URS be scheduled both for RTM and Ancillary Market?

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		<p>5. In Scenario#2, for U#5, it is observed that the additional costs have been taken only for 125 MW and not for 135 MW (175 + 10- 50). He is operating 10 MW in RT Reserve also. Is it because, the RT reserve remains a demand and is actually not generated and the RT reserve is adjusted against the RT Energy market?</p>
12	<p>Real Time Scenario -4</p>	<p>It appears from the example given in Real Time Scenario-4 that in case a generator which was not scheduled in Day Ahead, participates in Real Time Market, then the schedule given to original generators (already scheduled in Day Ahead) will be revised downwards. This would result in a situation where a generator already scheduled will have to pay back an amount corresponding to quantum which has been revised downwards.</p> <p>It is suggested that generators which have been scheduled in Day Ahead market should not be asked to revise their schedules again.</p>

Suggestions:

1. Ancillary services are meant to provide support for stable grid operations. This would also include balancing support in the case of high RE energy mix scenario. In terms of timelines, since this RE capacity is going to be realized not before another around 5 years' time period, it can safely be assumed that the balancing support required in the high RE scenario is also not going to be needed before that. Currently, the ancillary support services are mostly confined to restore the frequency at desired level and to relieve congestion in transmission networks. Therefore, it is suggested that the market structuring as proposed is taken up in a phased manner. First, let's arrive at the mechanism of DSM operation followed by Real Market restructuring as discussed in another paper by Staff of Hon'ble CERC and only after studying the influence of above two categories of operations on the market, should we take up the proposed idea of Ancillary market restructuring.