

Andhra Pradesh Electricity Regulatory Commission
11-4-660, 4th Floor, Singareni Bhavan,
Red Hills Road, Khairatabad,
Hyderabad 500004

Kind Attention : Hon Secretary

Dear Sir,

Subject: Comments on Draft Amendments proposed by APTRANSCO, towards the Regulation 4 of APERC Forecasting, Scheduling and Deviation Settlement of Solar and Wind Generation Regulation, 2017

We have a Wind power project aggregating to 7.5 MW in Ramagiri, Dist Anathapur. We are pleased to submit our views and suggestions on the proposed amendment by APTRANSCO, as referred above.

In the meantime it is observed that the hearing for the above matter is scheduled on 10th March - which is a public holiday due to Holi festival. We therefore request you to kindly schedule another date for the hearing. We look forward to hearing from you on this issue.

At the outset, the changes proposed by APTRANSCO will make our investment in AP completely unviable.

The proposed changes appear arbitrary and one-sided. The "detailed report" cited does not provide adequate data on the basis of which APTRANSCO has made such recommendations. In our opinion, it is necessary for the Honourable APERC to ask APTRANSCO to provide justification backed by evidence from forecasting & scheduling data to arrive at such changes.

Since forecasting & scheduling activity has started in AP from July 2018, the Honourable APERC should ask APTRANSCO to provide this data. An analysis of such data will allow assessment of changes needed in the regulation based on real evidence.

Regarding Para 3 of the "Detailed report" by APTRANSCO we feel a utility has several existing tools like drawing on ancillary reserves and the URS power. Further, from April 1, 2020 the "real-time" markets will become operational. APTRANSCO has not considered these aspects when proposing changes to the DSM regulations.

Further, the Honourable APERC may also assess the existing practice and accuracy of demand forecasting by DISCOMS and APTRANSCO. Only a full analysis of the accuracy of demand and supply forecasting will enable making an informed decision regarding the cost of deviation from VRE, and changes, if any that need to be made in the regulation.

The larger impact of changes proposed by APTRANSCO will only lead to make the projects unviable. All the changes proposed - a change in the error calculation formula, reducing the permitted deviation to 5%, disallowing any intra-day revisions, and charging Rs 2/ unit of deviation will result in a significant cost increase, potentially making the projects unviable.

The Honourable APERC should assess the cost impact of such changes on a per unit basis, and assess viability of RE projects before making any changes.

Our detailed comments on each recommendation are as follows:

S. No	Original Regulation	Suggested Amendments																								
1	Clause 2.1 (a): "Absolute Error" means the absolute value of the error in the actual injection of wind or solar generators with reference to the scheduled generation and the Available Capacity (AVC), as calculated using the following formula for each 15-minute time block.	<p>The formula for error calculation is suggested to be changed as:</p> <ul style="list-style-type: none">• $\text{Forecast Error (\%)} = 100 \times (\text{Schedule Generation} - \text{actual Injection}) / \text{Schedule Generation}$.• The term 'absolute error' substituted with 'forecast error'.• The term 'Available Capacity' substituted with 'Scheduled Generation'.																								
	<p>Comments:</p> <ul style="list-style-type: none">- It may be recalled that the RRF Regulations of 2013 computed error in a similar way as being proposed by APTRANSCO.- The Honourable CERC observed the following on the error formula in the RRF regulation (which computed error on the basis of schedule as the denominator)<ul style="list-style-type: none">- <i>"The present error definition has been pointed out to be insufficient to handle varying seasons, especially very low or zero schedules, and not aligned with direct grid impact (MW deviations)" (Para 6.2.1 of SOR)</i>- The current method has also been stated as the scientific method in the Model Regulation by FoR. The SoR given by CERC for the Framework on Forecasting, Scheduling and Imbalance Handling of Variable RE Sources, states the following with regards to the MAE based on Available Capacity:<ul style="list-style-type: none">- <i>"The Commission has noted that with the current definition, instances such as low/no generation cases cannot be covered. With due regard to these constraints and with a view to ensuring optimum and genuine forecasting, the Commission has decided to define the error percentage normalized to available capacity, instead of schedule. This will ensure that the error quantity corresponds to the physical MW impact on the grid, the forecasting models are aligned to minimize the actual MW deviations, and the error definition holds valid in all seasons." (Para 6.2.2 of SOR)</i>- This is explained below, using the example of wind energy deviation, during the seasons. If error is based on Scheduled Generation, it would be highly unfair to the Generators but at the same time have minimal or no impact on the overall grid. <table><tr><th>Season</th><th>Capacity (AvC)</th><th>Sch. (MW)</th><th>Act (MW)</th><th>Absolute Deviation (MW)</th><th>Error based on AvC</th><th>Error based on Sch.</th><th>Impact on Grid</th></tr><tr><td>High Wind</td><td>100</td><td>60</td><td>80</td><td>20</td><td>20%</td><td>33.33%</td><td>High</td></tr><tr><td>Low Wind</td><td>100</td><td>10</td><td>13</td><td>3</td><td>3%</td><td>30%</td><td>Low</td></tr></table> <p>A similar analysis for solar, especially during the dawn and dusk periods everyday will show skewed results if the error is calculated based on scheduled generation.</p>		Season	Capacity (AvC)	Sch. (MW)	Act (MW)	Absolute Deviation (MW)	Error based on AvC	Error based on Sch.	Impact on Grid	High Wind	100	60	80	20	20%	33.33%	High	Low Wind	100	10	13	3	3%	30%	Low
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2	<p>Clause 2.1 (j): "deviation in a time block for a seller means its total actual injection minus its total/ scheduled generation."</p> <p>15% error is allowed without any DSM charges.</p>	<ul style="list-style-type: none"> • Inclusion of 'Allowable forecasted error' in calculating the deviation wherein 'Allowable forecasted error' will be calculated as: 'Allowable forecast error' = $100 \times (\text{diversity factor } 0.7 \text{ in control area at the beginning of the financial year}) \times (\text{quantum of deviation limit permitted under CERC's DSM Regulation amended from time to time}) / (\text{quantum of VRE installed capacity})$. • This would be $\pm 5\%$ allowed error, beyond which, DSM charges will be applicable on the generators.
	<p>Comments:</p> <ul style="list-style-type: none"> - The justification provided by APTRANSCO in this proposed change is arbitrary is illogical. - The APTRANSCO proposes to use a multiplier of 0.7 as "diversity factor" in calculation of "allowable forecast error". However, nowhere in the "detailed report" or any other place is such a "diversity factor" either defined, explained or any basis of the "0.7" multiplier elaborated upon. - Similarly, the APTRANSCO cites that 15% error will result in a deviation of 1125 MW in AP. This is an illogical argument as it assumes that all sites will have equal or similar deviation in the same direction (ie. either all will over-inject or all will under-inject). Infact, projects spread out over a large and geographically diverse area will result in low overall error, as often errors of individual projects cancel each other out. - Since APTRANSCO will have data from July 2018 of the entire state, Honourable APERC should ask for a detailed, factual analysis to determine if deviation from VRE sources at any time was equal to or more than 1125 MW at the state level. 	

S. No	Original Regulation	Suggested Amendments
3	<p>Regulation 4, clause 4.1: "The Methodology for day-ahead scheduling of wind and solar energy generating stations which are connected to the Grid and rescheduling them on one and half-hourly basis and the methodology of handling deviations of such wind and solar energy generating stations shall be as stated hereunder and accordingly forecasting tools shall be</p>	<ul style="list-style-type: none"> • It is suggested to remove the option of rescheduling of forecast on one and half-hourly basis during the day of operation and strictly adhere to schedule on a day-ahead basis over violation notices to the Discoms.

	provided by the generator concerned."	
	<p>Comments:</p> <ul style="list-style-type: none"> - The suggestion for removal of one and half hourly revision on the basis that the DISCOMS have to plan on a day ahead basis is not in the right spirit due the following reasons: <ul style="list-style-type: none"> - Variability of generation from VREs, can only be bridged if revisions are allowed close to real time, so that the variations can be kept at a lower level. Allowing only Day Ahead schedule for VREs may significantly escalate the deficit/surplus scenario for the DISCOMs, due to much higher variations in the Day Ahead forecast, and this has been discussed and documented in several meetings of SLDC with the stakeholders involved. - The same has also been recognized by forecasting agencies worldwide, and also quoted in the SoR by CERC: <ul style="list-style-type: none"> - "The Commission recognizes that accuracy of forecasting improves as one gets closer to time of dispatch. This is borne out by plenty of research that is available on how forecasting accuracy improves as more updates are done aligned with shorter scheduling intervals." - Further, Real Time Electricity Market in India will become a reality soon, and the utilities will then have access to real time electricity trading market options so that the deficits/surplus can be better managed on a real time basis. 	

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4	<p>Regulation 4, Clause 6.3: error calculation table for under or over - injection for sale/supply of power within the state.</p> <table border="1"> <thead> <tr> <th>S. No</th><th>Forecast Error</th><th>Deviation Charges in Rs per Unit</th></tr> </thead> <tbody> <tr> <td>1</td><td><15%</td><td>Zero</td></tr> <tr> <td>2</td><td>15-25%</td><td>Rs. 0.5</td></tr> <tr> <td>3</td><td>25-35%</td><td>Rs. 1.0</td></tr> <tr> <td>4</td><td>>35%</td><td>Rs. 1.5</td></tr> </tbody> </table>	S. No	Forecast Error	Deviation Charges in Rs per Unit	1	<15%	Zero	2	15-25%	Rs. 0.5	3	25-35%	Rs. 1.0	4	>35%	Rs. 1.5	<ul style="list-style-type: none"> • Suggestion for removal of error bands and shifting to a single allowable forecast error as discussed above in the following manner: <table border="1"> <thead> <tr> <th>Sr.No.</th><th>Forecast Error in the 15 min. time block</th><th>Deviation charges payable to State Pool Account</th></tr> </thead> <tbody> <tr> <td>1.</td><td><Allowable Forecast Error</td><td>None</td></tr> <tr> <td>2.</td><td>Allowable Forecast Error</td><td>At Rs.2.00 per unit for the shortfall or excess injection</td></tr> </tbody> </table>	Sr.No.	Forecast Error in the 15 min. time block	Deviation charges payable to State Pool Account	1.	<Allowable Forecast Error	None	2.	Allowable Forecast Error	At Rs.2.00 per unit for the shortfall or excess injection
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	<p>Comments:</p> <ul style="list-style-type: none"> - The APTRANSCO has proposed a price of Rs 2/ unit above the "allowable forecast error". This is derived on the basis of - "adequacy costs of Rs 1.6/unit" and "Balancing cost of Rs 0.4/ unit". However, detailed calculations of how these costs have been 																									

arrived at are not available. Before considering these changes, the Honourable APERC should require APTRANSCO to provide justification backed by evidence.

- Infact other states have taken an opposite approach - that of reducing per unit DSM charges. In Gujarat, DSM charges are Rs 0.25/ Rs 0.5 and Rs 0.75 per unit. This is done in conjunction with marginal reduction in accuracy thresholds. The reduction in per unit DSM charge is in line with the recent PPA tariffs, which have been significantly lower than the Rs 5/unit benchmark used by FoR when determining the current DSM charges. Similarly, the Honourable APERC should consider reducing per unit DSM charges.

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5	Regulation 4, Clause 2.1 (aa): Virtual Pool means the virtual/ grouping of various pooling stations wherein the generators in such pooling stations have an option for accounting their deviational in an aggregated/combined manner through a QCA for the purpose of availing the benefit of larger geographical / area and diversity. "	<ul style="list-style-type: none"> • Suggestion for removal of virtual pooling from clause 2.1 (aa) and clause 6.9 accordingly
	Comments: <ul style="list-style-type: none"> - The document shared by APTRANSCO wrongly claims that no other state allows aggregation. This is factually incorrect. - The concept of Aggregation had been proposed in the FoR Model Regulation, and in the most recently it has been proposed at the Inter-State RE DSM in the draft IEGC 2020 code. - Further, Karnataka has successfully implemented Aggregation along with Andhra Pradesh, and the result of Aggregate level schedules and revisions have resulted in much lower overall deviation at the state levels. 	

Submitted for your kind consideration in the final version.

Regards
Onkar Singh
Sr.Vice President
Weizmann Ltd.