



ANDHRA PRADESH ELECTRICITY REGULATORY COMMISSION

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Commission Proceedings No.14/2017, dated: 21-08-2017

Sub:- APERC - Andhra Pradesh Electricity Regulatory Commission Forecasting, Scheduling, Deviation Settlement of Solar and Wind Generation Regulation, 2017 - Reg.

A draft Regulation on the above subject was placed on the web site of the Commission seeking views / objections / suggestions from the stakeholders and a public hearing was conducted on 19-11-2016 in the court hall of Andhra Pradesh Electricity Regulatory Commission, Hyderabad.

The Commission, having regard to the objections/suggestions received and heard from various stakeholders as per the lists annexed, identified the following key issues and arrived at the reasoned conclusions and consequently approved the Andhra Pradesh Electricity Regulatory Commission Forecasting, Scheduling, Deviation Settlement of Solar and Wind Generation Regulation, 2017.

1. Effective date to be fixed after a reasonable period after notification of final Regulation:

Objections/Suggestions:

- a) Effective date of the Regulation may be fixed after one year of commencement of SLDC forecast so as to facilitate both the Wind Energy Generators (WEGs) and SLDC to be conversant with forecasting and scheduling.
- b) In view of the time required for development and installing of tools capable of forecasting to the level of 90% accuracy, it is desirable to implement the regulation after one year or at least 6 months from date of notification of final regulation. Meanwhile, mock exercises can be done on Forecasting, Scheduling and Deviation Settlement.

- c) Any framework must be operationalised after Renewable Energy Management Centres (REMC) are fully functional and generators also should be given considerable time to build the necessary infrastructure for transmission of real time information regarding generation, outage, site information etc.
- d) Initially the framework must run on mock basis for a year with a mandate for compulsory participation of all generators and with huge penalty provisions for non-participation of any generator. The framework must also come out with clear guidelines and procedure for implementation which must specify the timelines with regard to commercial settlement.
- e) New as well as existing plants shall be allowed a minimum period of 1 year post COD / effective date of the regulation for implementation since the generators require one full cycle of all seasons at the specific location to understand the seasonal/daily variations and new plants will be under stabilization / normalization and may not be giving desired results. Commercial impact may be waived during this period for generators to accumulate learning.
- f) Sufficient time may be provided to improve forecasting accuracies before commercial terms are implemented since forecasting accuracies across different regions and sites vary between 60 - 80% with an equivalent revenue impact of 2.5 to 4% depending on the season. One to two years site specific data is necessary to arrive at the accuracy of forecasts.
- g) Existing wind and solar generators should also establish forecasting arrangement immediately in line with the new generators to enable enforcement of regulation with immediate effect from the date of notification.
- h) The framework may be implemented on trial basis first for about a year and fine-tuned on annual basis based on experience.
- i) It would be worthwhile to run the mechanism in trial mode for about a year to know the range of deviation band for already running projects.
- j) Introduction of a new regime always requires preparatory exercise, trial runs and thereafter modifications after gaining some experience. All participants including SLDC, generators, DISCOMs and consumers need to understand and take actions for building the requisite infrastructure first.

- k) Any hasty implementation will cause undue hardship to wind / solar generators, and may be detrimental to the object of development of wind/solar power in the State.
- l) Levy of deviation charges on inter-state sale by STU grid connected generators should be kept in abeyance for at least one year. Introduction of commercial settlement for handling the deviation settlement will not be suitable proposition at this stage in case of inter-state sale.

Commission's View:

As can be seen from the above, the responses mostly suggest to fix the effective date, allowing reasonable time for preparatory exercises viz. establishing forecasting tools by SLDC, development and installation of forecasting tools to get reasonable accuracy, establishment of REMCs, understanding the seasonal variations of forecast etc. Some have suggested mock exercises to be done for a reasonable time before commercial terms are implemented.

Commission recognizes the need for allowing sufficient time for the preparatory exercises and that existing generators do require reasonable time to establish the necessary infrastructure for implementation of the Regulation. Also SLDC has to establish forecasting tools and prepare their systems to meet the requirements of this Regulation. The Commission is also inclined to agree with the proposal for operation of Deviation Settlement without commercial obligations for a reasonable period, to enable the stakeholders to get accustomed to the procedures and thereby ensure smooth implementation of the mechanism.

A preparatory window has to be therefore provided for the Generators to ensure installation of forecasting tools, data measurement and telemetry equipment and also for the SLDC to establish forecasting tools, prepare their systems and teams for receipt of regular data and schedules. Accordingly, the Commission has decided to modify the draft regulation suitably.

2. Qualified Coordinating Agency (QCA):

Objections/Suggestions:

- a) There shall be only one QCA per pooling Station on behalf of all the wind/solar generators represented by the QCA to avoid multiple forecasts at the same pooling station and operational complexity.

- b) An enabling clause may be added to the effect that in the event of lack of consensus in the appointment of QCA, it shall be appointed by those of WEGs who constitute more than 50% of the installed capacity of the Pooling SS.
- c) Power traders may also be considered for QCAs as they undertake scheduling operations for many generators.
- d) The responsibility to form QCA may be fixed to STU/Discom for the group of generators who intended to connect to Transco/Discom substations without pooling station.
- e) The following shall also be added in the Regulation:
 - A QCA shall be registered with the concerned utility and thus appointed by the SLDC based on specified criterion. The QCA shall do the aggregations at State level and submit the same to the SLDC for more accurate State-wise forecasting.
- f) A QCA shall forecast on behalf of solar and wind generators connected to a pooling station, so there can be multiple QCAs in a State. A QCA must be registered and appointed by SLDC who shall do the aggregations at State level and submit the same to the SLDC.
- g) To avoid utilization of information / forecast of the same company for QCA and SLDC and for the sake of accurate forecast, the companies and its subsidiaries shall be debarred from providing the QCA services in case these companies are directly or indirectly involved in providing forecast to SLDC or involved in developing REMCs. An enforcement mechanism with deterrence to the effect may be explicitly added.
- h) The QCA scheduling format may contain entity wise or farm wise scheduling wherein Pooling Station(s) may be mentioned for every farm / project.
- i) Fee payable to SLDC for submission / revision of schedules may be clarified.
- j) Specific format shall be provided to the registered QCA to submit schedule for week-ahead, day-ahead and intra-day revisions of each pooling station, which will help the QCA to submit the schedules and revisions as required/specified by SLDC.
- k) Each Pooling Sub-station will have only one QCA. Accordingly, QCA shall be identified and mapped to every pooling Sub-station for the purpose of co-ordination with STU/SLDC.

- l) Limiting to one QCA is rather restrictive and may result in inefficiencies. Large generators who have different projects in their fold may want to centralize and optimize the scheduling / forecasting.
- m) A minimum capacity threshold of 5 MW may be put to ensure only large and interested generators are allowed to act as multiple QCAs at a pooling station or otherwise the QCA registration may be done entity wise instead of pooling station wise.
- n) A QCA shall have the following qualifying criteria.
 - i) The QCA should be a company incorporated in India under the Companies Act, 1956.
 - ii) The QCA must be experienced in the field of Wind / Solar Power forecasting and scheduling for a minimum period of 3 years.
 - iii) The QCA must have an existing track record of conducting scheduling and forecasting of wind and solar plants in the entire State.
 - iv) The QCA must have capability to handle multiple plant owners connected to a pooling Sub-station.
 - v) The QCA must have experience in working in different terrain & regions.
 - vi) The QCA should have sufficient financial strength.
 - vii) The QCA must have systems in place for seamless flow of information to and from SLDC and RLDCs.
 - viii) QCA should have real time monitoring systems in place.
 - ix) QCA should provide web based tools with multiple user authentication for Geo-visualisation, Graphic/Table visualization, calculation, comparison, analyzing, downloading data & images.
 - x) QCA should be established in credentials on prior experience in successfully running forecasting and scheduling engine built on open source technology and generate its own forecast based on multiple machine learning models.
 - xi) QCA should have an established team of Analysts, Statisticians, Economists, Energy modellers, Wind/ Solar Resource, Software developers and 24 X 7 operation team.

- o) The Criteria for QCA eligibility be set by the Commission and not SLDC as in other States also SLDC were supposed to come up with the eligibility criteria but till date no such criteria has been set although their regulation is in place.
- p) SLDC shall register the QCAs subject to fulfilment of the eligibility conditions to be outlined under the guidelines to be formulated by the SLDC.
- q) QCA eligibility may be granted by APERC subject to fulfilment of eligibility conditions formulated by APERC as in the case of traders.
- r) Definitive criteria for QCA selection (involving past experience in handling such activities, performance certification from clients, technical capability statement, financial capability statement, working experience with SLDC, adequate technical team strength and IT/Hardware capabilities etc.) may be provided.
- s) Instead of formulating separate guidelines for registration of the QCA, the same may be included in the Regulation. Since QCA requires the experience of scheduling / dispatch, commercial settlement etc., eligibility conditions for selecting QCA shall be either one of the generators connected to the pooling Station or any CERC approved trading licensee mutually agreed by all the generators connected to the pooling station.
- t) Guideline for registration of QCA having minimum competency and experience is suggested. The QCA must be such that it should be in a position to handle smooth operations and already involved in similar work.
- u) A Single Option is provided for the QCA to settle the deviation charges based on actual generation. More options may be provided or leave it to the generators to mutually take a decision in this matter.
- v) The following shall be added:

“The guidelines shall specify criterion for technical qualification and also financial strength of the QCA to settle deviation charges on behalf of generators as required in Regulation”.
- w) In case if the QCA was not formed by the power developers within the time frame/ by the time of synchronization, directions to the SLDC are to be provided in the regulation.

x) The following proviso may be incorporated:

‘Provided that a generator connected to a pooling station can opt to independently submit schedule of its generation and act as single point of contact with SLDC for energy account, deviation settlement and co-ordination and issuance of instructions for dispatch / curtailment, irrespective of the appointment of QCA to that pooling station(s).’

y) The QCA shall undertake all commercial settlements on behalf of the generator(s) connected to the respective pooling station(s) and opting for its service.

z) The QCA shall pay the deviation settlement charge to the State pool on behalf of the generators.

aa) Inputs from stake holders shall be taken on the detailed procedure to be formulated by SLDC, before finalization.

bb) State level or individual IPP level forecasting may be considered. Appointment, Communication and Authorization of Aggregator / QCA are to be specified.

cc) Eligibility criteria of the QCA shall be indicated by the Commission & SLDC as the role of QCA is going to be very significant. Approximate QCA charges may be indicated by the Commission to avoid exploitation of the generators.

dd) QCA may be allowed to aggregate all the Pooling Stations being managed by it to enable larger geographical integration which will reduce errors and thus benefit the grid operator as well as the RE generators.

ee) Commission may fix or provide the list of certified QCAs for better analysis and forecasting.

ff) Commission may fix the professional fee for the service provider.

gg) Possible methods of sharing curtailment amongst individual generators connected to the pooling station are to be explored. It can be done in many ways like avoiding the costliest generation based on least cost dispatch principle and some pro-rata manner which is pre-agreed by the generators along with the QCA.

Commission’s View:

As can be seen from the above, there are varied responses relating to - formulation of QCAs, eligibility and selection criteria for QCAs, registration of QCAs, role of QCAs, no. of QCAs, functions of QCAs etc.

Some objectors have sought for including in the Regulation, (i) the provisions to deal with lack of consensus among the generators in appointing QCAs (ii) the guidelines for Registration of QCAs, (iii) directions to SLDC in case QCA is not formed within a time frame, (iii) considering Power Traders to be eligible as QCAs; (iv) fee payable to SLDC for submission / revision of schedules; (v) definitive criteria for QCA selection; (vi) technical qualification and financial strength of the QCAs to be specified in guidelines etc.

As per the Regulation, SLDC shall have to give appropriate directions under Section 33(1) of the Electricity Act, 2003 about the guidelines for registration of QCAs, the data/information to be exchanged between the QCA, SLDC and the generator and the protocol for sharing the same.

The Commission, therefore will forward all the objections / suggestions and views received by it in connection with this regulation to the SLDC for consideration on merits and incorporation in the relevant guidelines to the extent found acceptable.

3. Capacity of the Project for which the Regulation shall be made applicable:

Objections/Suggestions:

- a) It is very difficult to forecast the Wind Power Generated from the small size wind farm as these are very old and have no provision of SCADA system. Hence, forecasting for such old wind turbines is very intricate and complex in the absence of SCADA System. The Regulation should be applicable on Wind Generators having a combined installed capacity of 50 MW and above at the pooling station as CERC has specified that the minimum aggregate generation capacity for providing the Day Ahead forecast is 50 MW vide Indian Electricity Grid Code (Third Amendment) Regulations, 2015.
- b) This regulation may be made applicable to the projects with capacity of 10+ MW for wind and 5+ MW for solar at the pooling station (like in Karnataka).
- c) Applicability of the proposed regulation may be revised such that the same is applicable only to new projects which are getting commissioned subsequent to notification of the regulation.
- d) Applicability criteria may be considered for the projects with capacities equal to and above 50 MW as capacities below 50 MW does not pose any risk to the State Grid.
- e) Clarification is requested in terms of the installed capacities of the wind & solar generators for the applicability of this regulation.

- f) If the basis is no more than CERC Regulations, it is important to notice and consider carefully that the CERC Regulation does not apply to wind energy plants with an aggregate capacity of less than 50 MW.
- g) Distinctions between larger capacity wind plants and smaller capacity wind plants require consideration.

Commission's View:

The Commission recognizes the concerns of the objectors. It may be noted that CERC Regulations are applicable to the regional entities which are normally connected to CTU network to which small capacity wind / solar generators are unlikely to be connected. As such, one-to-one correspondence cannot be made with the provisions of CERC regulations while deciding the applicability of the current regulation as regards to the capacity of wind/solar generators.

As regards the contention that capacities below 50 MW does not pose any risk to the State grid also does not hold water as all the capacities of less than 50 MW are added up, it might result in a substantial capacity affecting the integrity and safety of the Grid.

The objective of the instant regulation is to facilitate large scale grid integration of wind and solar generating stations while maintaining the grid stability. That being the case and in the backdrop of substantial capacity additions already taken place in the State of Andhra Pradesh, both in respect of Wind and Solar generation, applying the Regulation only to the new projects which are getting commissioned subsequent to notification of the Regulation will not fulfill the objective of the Regulation and as such the same cannot be accepted, particularly in the absence of strong reason as to why the said Regulation cannot be made applicable to the existing plants on technical considerations. Further, it was pointed out that as regards very old plants of smaller size have no provision of SCADA system and as such forecasting is very intricate and complex process. However, it was not stated that SCADA system cannot be put in place now. Hence, the Commission being conscious of the fact that putting in place SCADA systems is possible even in respect of old plants, do not see any reason to exempt such generators from the ambit of this regulation.

Classification of wind and solar generators in any of the modes suggested based on capacity or the date of commissioning etc. may not answer the test of reasonable classification on intelligible criteria and inclusion or exclusion of wind or solar generators on such grounds may not stand legal scrutiny.

Accordingly, the Commission is of the view that this Regulation shall be made applicable to all solar and wind generators irrespective of their capacities and vintage.

4. Forecast issues:

Objections/Suggestions:

The complexity of weather related factors and geographical features make it difficult to predict wind velocity and potential for electricity generation at a location. Wind power forecast is totally based on the weather conditions and it makes it very challenging for the accurate forecast.

Commission's View:

The Forum of Regulators (FOR) model Regulation forms the background in designing this Regulation on scientific lines.

5. Pool Account:

Objections/Suggestions:

- a) Even though the pool account is defined as an account for receipts and payments, no provision appears to have been made with regard to payment being made to anyone. The disposition of the funds in the pool, the beneficiaries and the purposes for which they can be used is opaque.
- b) For covering the deficit in the overall pool, grant eligibility and sanction limit may be specified. A specific provision shall be made in the regulation for covering the deficit in the overall pool account if any.

Commission's View:

The deviation charges for excess generation (in the event of the actual generation being more than the scheduled generation as described at Table-II of Appendix to the Regulation) are payable from the Pool Account to the wind / solar generators who are selling power outside the State.

As per the Regulation, SLDC shall have to give appropriate directions under Section 33(1) of the Electricity Act, 2003 about the guidelines for registration of QCAs, the data/information to be exchanged between the QCA, SLDC and the generator etc.

The Commission, therefore will forward the objections / suggestions and views received by it in connection with this regulation to the SLDC for consideration on merits and incorporation in the relevant guidelines to the extent found acceptable.

6. Revision of Schedules:

Objections/Suggestions:

- a) Schedules of solar generation should be allowed to be revised within 2 time blocks since the generation is not in the control of the developer.
- b) The effective revision may be started from 2nd time block as the forecasting capabilities are in nascent stage and the revisions would be rather frequent in the initial period.
- c) The number of revisions in schedules may be increased to 24 as it would give more reliable forecast to the generators as well as SLDC initially. It can be reduced to 16 revisions per day gradually.
- d) It may be clarified whether the revision in schedules should be allowed for both upward and downward changes.
- e) Since the generation is not in the control of the developer and unlike the DSM regulation for non-renewable generating stations there is only penalty provision in the draft regulation, solar developers should be allowed to revise the schedule in two time blocks so that the generators can avail the provision of 16 times revision in a day.
- f) It is necessary to carefully consider that wind and solar plants are distinct and widely different and ought not to be arbitrarily subject to the same conditions.
- g) The process for submission of revision of schedules including the no. of time blocks after which the revised schedule would be implemented and appropriate communication for intimating the generators regarding the final/implemented schedules for the day, may be defined.
- h) Provision for waiver of real-time data submission in the event of communication failure is to be accommodated. Sufficient redundancy is to be provided for accepting revisions in schedules.

Commission's View:

The Commission appreciates that increase in number of allowed revisions to the schedule will make the forecast close to real-time. However, it would be difficult for the SLDC to manage, if more revisions are allowed. In order to strike a balance between the requests of the developers to have more revisions and the complexity of handling increased revisions by the SLDC, the number of revisions shall be retained at 16 per day in

respect of wind generators. However, in respect of Solar generators the number of revisions are suitably modified with due regard to the specific situation obtaining in Solar generation. Similarly, the revisions may be effective from 4th time block as proposed in the draft regulation in respect of both wind and solar generators. Revision shall obviously mean both upward and downward. The process for submission of revision of schedules shall be outlined by SLDC while giving directions in this regard.

7. Gaming

Objections/Suggestions:

- a) Additional clauses may be appended to address the issue of Gaming for curtailing undue commercial gain.
- b) Clarity on ascertaining gaming especially in situations where certain wind turbines become unavailable suddenly is needed.

Commission's View:

The draft is duly modified by incorporating the manner of dealing with alleged gaming.

8. Deviation limits and Charges:

Objections/Suggestions:

- a) The generators are put to the burden of deviation charges even in cases where energy is sold to DISCOMs under long term open access.
- b) The proposed absolute error of 10% as limit of deviation exempted from payment of deviation charges (KERC permitted the deviation of 15% to all wind and solar power generators) is quite low and it is even less than the 12 % deviation limit allowed to the conventional generating stations having complete control on generation.
- c) Segregation of the deviation charges applicable on the generators, on the basis of the date of commissioning i.e. prior to date of effect of regulation and after the date of effect of regulation is discriminatory as the deviation in generation of both will equally endanger the grid security.
- d) The Absolute Error band of intra-state transactions shall be kept in line with that of inter-state Regulation, since different bands will lead to complex implementation issues.

- e) The tolerance band shall be of 15% in line with CERC instead of 10% in case of under or over injection for sale of power within the State to calculate the deviation charges for shortfall or excess generation as the Stake holders have less experience in forecasting and scheduling of wind projects and it is also in the preliminary stage.
- f) Deviation limit should be increased to 30% instead of 10% with subsequent bands of >30% to ≤40%, >40% to ≤ 50% and > 50% as it would be very difficult for wind / solar generators to maintain such tight deviation parameters and associated penalty. Existing as well as new generators do not have prior experience of forecasting and scheduling. The penalties proposed shall make the project unviable and thwart attempts by the State to invest in renewable energy. The limits may be gradually reduced based on the data collected by SLDC during the applicable period.
- g) The allowed deviation up to only 10% on new projects will discourage the developers.
- h) The basis for the proposed bandwidth is not clear or understood. The bandwidth is impracticably low such that as much as 50% of the energy would fall within deviations.
- i) The proposed penalization for over/under injection beyond the allowed band of 10% deviation for solar PV projects (while this band is 15% for inter-State Projects) being insignificant window, is strongly opposed.
- j) Considering the fact that the wind and solar energy generation is variable and intermittent, a modest limit may be applied on the accuracy in the initial years (tolerance band can be kept as that of earlier RRF mechanism i.e. ±30%) till it gets fully implemented and the mechanism is settled. The band may be subsequently reduced based on the results from the experience. Incentive should be given for accurately providing forecast to encourage the generators.
- k) The following Clause shall be added:

SLDC shall also maintain WTG wise generation in order to calculate deviation charges for sale within and outside the State from a wind generator in order to be in a position to calculate the deviation charges for inter-state and intra-state transactions.

Deviation penalties for intra-state transactions based on absolute values need careful attention and regular revision in line with the wind and solar market prices.

Since the penalties are stated as absolute values, they have a higher impact on projects with lower tariffs (PPAs) than on those with higher tariffs.

- l) The CERC devised RRF mechanism in 2011, with penal provisions for deviation beyond +/- 30%, for wind/solar sources through an amendment to Grid Code, which could not take off and had to be abandoned, as being not implementable, leading to a new frame work notified in August 2015. This frame work in effect, is a notional scheme with no real stakeholders, as virtually there is no Wind/Solar generator (Regional entities connected to ISTS).
- m) Over injection of energy from scheduled generation should be incentivized rather than penalized for intra state projects also to avoid negative impact on the net tariff to be paid by the DISCOMs to generator after adjusting the penalty on the basis of actual injection even when the generator has injected excess energy than the schedule.
- n) Cases of zero schedules / zero generation which may lead to infinite / very high percentage deviation are to be appropriately addressed.
- o) Scheduling and forecasting for wind power in off-peak season (October to March) must be given exemption as active energy generation is so low that it becomes inconsequential to the health of the State Grid. Promotion of renewable energy at lowest costs possible should be the target and this suggestion must be given due weightage.
- p) SLDC should furnish forecast and actual generation at pooling substation level to each generator so that generator can assess the commercial impact of deviation on daily / monthly basis.
- q) The introduction of only penalties in the name of deviation charge on solar PV projects for none of their fault is strongly opposed. The actual generation is dependent on availability of plant (which is within the control of developer) and the availability of Sun (entirely nature's phenomenon and totally out of control of the developer) and as such forecast relates to a phenomenon which is dependent on nature's vagaries and may not materialize within the desired accuracy for no fault of the developer. All the risk related to forecasting, scheduling, over injection and/or under injection have been thrust upon RE generator only and neither buyer of RE nor any other agency has been entrusted to share the risk of environment friendly infirm power. It would completely be unfair to penalize RE generator for any inaccurate forecasting.

- r) No incentive/penalty mechanism for nature dependent phenomenon should be applied on solar developers. This is not only against the principles of equity but also that of equality, as conventional generators are subject to such deviation charges because both the plant availability and fuel required for generation are under their control. In case of solar, sunlight is not within generator's control.
- s) Penalizing the generators is not the only way for ensuring secure operation of the grid with RE sources. A suitable mechanism or technical solution, such as centralized forecasting, creation of reserve capacities, for meeting contingencies of variable generation should be enforced before making generators responsible.
- t) As industries are looking forward to invest in wind and captive projects, the proposed charges in deviation in forecasting & scheduling are to be reasonable for the sustainability of wind projects.
- u) Weather forecasting tools are yet to be established at least to reach 80% accuracy. The deviations may be observed at least for a period of one year without levy of any deviation charges after the detailed exercise of which all generators, SLDC and the Commission shall notice the accurate deviations to explore the possible forecasting mechanism.
- v) Deviation charges to be NIL up to 20% deviation and they shall be Rs. 0.15 Ps./kWh for the deviation between 20 to 30% and Rs. 0.50 /kWh for the deviation beyond 30%. Also the charges from second year should be reasonable and in 3rd year they shall be reviewed.
- w) When deviation occurs due to Grid unavailability or back down by APSLDC, such deviation should be excluded from penalty as the Generator has no control over this and it results in penalty as the actual generation becomes Zero, even when the Generator is available to supply Power. Further because such gaps are not predictable it results in very high penalty at both times when back down starts and ends.
- x) The time blocks wherein grid curtailments have been imposed or wherein injection of power on a real time basis has been declined by utility substation for reasons attributable to it, shall not be considered for any kind of deviation charges under any deviation band.
- y) Mandating the entire responsibility of forecasting and scheduling accurately on the generators with a tighter tolerance band of $\pm 10\%$ / $\pm 15\%$ against a much relaxed band proposed in the earlier RRF mechanism is unfair and beyond the principles of

natural justice. Even after diligently following the scheduling and forecasting after bringing on board reputable forecast service providers exercise the generators were not able to maintain generation within the tolerance band of $\pm 30\%$. With the now proposed tolerance band, there will be huge commercial liability on the generators which will create a negative investor sentiment and be a dampener in achieving the 160 GW target for renewables by the Central Government. The tolerance band must be relaxed whereby there must be no commercial impact on RE generators.

- z) There must be a separate band for measurement of deviation in different seasons i.e. different tolerance band for windy and non-windy seasons in case of wind and monsoon and rest of year in case of solar. Alternatively the metrics for measurement of deviation may not be absolute deviations but with respect to the wind/solar firm capacity.
- aa) Commission may chalk out roadmap for wind and solar DSM introduction spanning from 2-3 years with starting band of 30% as was done by Hon'ble CERC. This band may then be tightened as the generators gain experience.
- bb) In absence of any study the band may be fixed as 15%. Any tightening of deviation band may also be gradual based on experience gained. Also, such up/down-ward revision of band may be validated with sufficient reliable data. Considering the fact that unlike conventional sources where man and machine determine the output subject to system and fuel availability, nature plays a key role for RE sources. Therefore, the band may be provided only to bring in some discipline and with no or minimal consequent penalty to RE generator. In case Commission wishes to fix an exempted band it should not be less than 15% to start with.
- cc) A range of $\pm 50\%$ (in which band there will be no penalty) is suggested for the first year of implementation of this new Regulation, so that the new Regulation are not onerous on wind generators and reducing the band thereafter after consulting all the stakeholders.
- dd) If excess power is fed into the grid (i.e. over injection) when the grid is in need of that power (i.e. operating at lower band of frequency), there should be an incentive equal to the penalty envisaged. Similarly if less energy is fed into the grid (i.e. under injection) when the grid is operating at the higher band of frequency, then there should be an incentive equal to the penalty envisaged. At

the least, in such cases where the generator is helping the grid stability there should be no penalty.

- ee) Proper time shall be allowed to settle weekly deviation charges since the process involves long channel engaging technical to finance team of generator to the same that of QCA (if any) and there should not be any hefty charges for any delay.
- ff) Incentives for over injection for intrastate generators to be given on par with inter-state projects.
- gg) Over injection of energy from schedule generation should be incentivized rather than penalized for intra state projects also to avoid negative impact on the net tariff to be paid by the DISCOMs to generator after adjusting the penalty on the basis of actual injection even when the generator has injected excess energy than the schedule.
- hh) It is necessary to carefully consider that wind and solar are distinct and widely different and ought not to be arbitrarily subject to the same conditions. Further, distinctions between larger capacity wind plants and smaller capacity wind plants require consideration.
- ii) Any Commercial impact on account of deviation from schedule based on the forecast shall be borne by the wind and solar generator, either directly or transacted via the representing QCA.
- hh) Neither QCA nor non-defaulting parties connected to the Pooling Station shall be penalized, in case of default by some of the generators in payment of DSM charges. SLDC need to maintain DSM pool account separately for all the generators connected to the Pooling Station and in case of any default occurs, the applicable penalties shall be borne by the identified defaulting generators only.
- ii) In this DSM framework wind/solar generators are liable to be penalized for both shortfall and excess over the band for no fault of them. There is always one way (traffic) flow of money to the coffers of State DSM pool account at the cost of Wind/Solar generators. This is against the object of promotion of RE sources mandated under the EA 2003, and needs to be reviewed.
- jj) The exempted band for solar projects has been proposed to be meagre 10% without giving any reason.
- kk) Whatever range is finalized by APERC needs to be backed by scientific data and forecasting consultants should be willing to guarantee adherence to the same.

- ll) No forecasting agency or consultant is available which can assure of giving the forecasts desired by the proposed framework. Due consideration ought to be placed on these factors before any framework is put in place which shall severely negatively impact RE generators' commercial interest and demote renewable energy sector which is against the provision of section 86(1)(e) of the Electricity Act, 2003.
- mm) Implementation of such onerous mechanism makes the existing and already commissioned wind generators in the State unviable and unsustainable. Pertinently, all along, wind generators embedded in the intra-state grid have been kept outside the purview of scheduling and merit order dispatch principles as the mechanism is unworkable on account of the varying and infirm nature of wind power.
- nn) To achieve the set targets of ambitious plans of the State of AP, the solar generation needs support from all corners therefore any penal provision by way of mandatory scheduling along with penalty of the infirm RE power will discourage RE investment.
- oo) SLDC may be entrusted with the responsibility of such forecasting and may be compensated for additional costs for forecasting instead of RE generator bearing this burden. Any incentive/penalty for errors in such forecasting should be passed on to the beneficiaries as is being done for hydro stations. RE generator may be asked to give declaration of availability of plant for the purpose of forecasting and may be asked to share the deviation charges for incorrect declaration.

Commission's View:

Commission noted the concerns of the objectors. The issues raised are mostly related to (i) the proposed absolute error band of 10% being narrow / restrictive compared to other states, inter-state transactions and to that of conventional generators; (ii) proposed error band being discriminative with regard to the effective date of the regulation; (iii) the penalties based on absolute values impacting the projects with lower tariffs; (iv) the penalties on intra-state generators for both over and under injection leading to negative impact on the net tariff to the generators; (v) weather forecasting tools yet to be established to reach at least 80% accuracy; (vi) the tolerance bands to be fixed differently for windy and non-windy seasons; (vii) the exempted band to be not less than 15%; (viii) incentivizing over injection rather than penalizing; (ix) the need to treat wind and solar generators differently etc.

Some objectors have also questioned the basis for the proposed error bands and suggested different ranges of error bands.

The CERC, while proposing the DSM amendments for solar & wind regional entities, considered simulations and analytical inputs from agencies engaged in wind forecasting. For various sites across India, based on one year actual data, the error normalized to capacity was simulated (pertaining to cases where Available Capacity = Installed Capacity) and observed the following:

- Simulation results with 16 revisions, based on 50 week of actual recorded data, thus including both high wind and low wind seasons, showed the resulting accuracy to be very high.
- One year of forecasting algorithm that was run at a site based on 8 revisions per day, reported a fairly high accuracy, with 87% of output energy within $\pm 10\%$ error, and 94% within $\pm 15\%$.

The Central Commission, in view of the simulation studies such as above, as well as international research reports on observed Mean Absolute Error (MAE), has put forth a framework for computing deviation charges based on error, with a tolerance band of 15% initially, which shall be tightened over time as the ecosystem gains experience.

The Commission adopted as liberal standards as possible without sacrificing the spirit of the need for regulation to justly answer the apprehensions of the objectors.

This is a first step, and regulations shall continue to evolve as more data is gathered, and analytical evidence emerges. The same is also equally applicable for the deviation charges. The regulation should be seen as a proactive intervention seeking to set clear rules thereby creating desired regulatory certainty for investment.

9. Backing-down

Objections/Suggestions:

- a) After the commencement of the forecasting, the wind / solar generators shall not be backed down for any reason except for grid security / safety, which shall only be a very rare event not more than once or twice a year and backing down beyond such stipulation shall be treated as deemed generation hours.
- b) In order to meet contingencies grid security etc. backing down is permitted for 87.6 hours in a year subject to 1% of generation hours during the specific season. Any backing down beyond such time shall be treated as deemed generation hours

and the deemed demand and energy shall be credited to the respective seller's/Open access consumer's account.

- c) Effects of backing down with short time or no advance intimation is compounded in respect of revenue impact due to loss of generation, penalties for deviations to the tune of 100%. A written notification stating the timing / duration of the back down orders is to be arranged.
- d) Possible methods of sharing curtailment amongst individual generators connected to the pooling station are to be explored. It can be done in many ways like avoiding the costliest generation based on least cost dispatch principle and some pro-rata manner which is pre-agreed by the generators along with the QCA.

Commission's View:

Commission noted the concerns of the objectors. It is undisputed that wind and solar sources are to be utilised to the maximum extent possible which will help to preserve the fossil fuels. However, SLDC in discharging its duty of ensuring safe and secure operation of the Grid may need to take decisions depending upon the Grid conditions, which are unpredictable.

10. Compliance Cost shall be allowed to be built-in the PPAs:

Objections/Suggestions:

- a) Since the proposed Regulation wishes to include wind or solar plants in the ambit of the instant Regulation, then a mechanism should also be devised to build-in the Cost of compliance of the proposed framework in the PPAs. Otherwise, the tariff orders and past Regulations to determine tariff for wind and solar generators will be violated, which will lead to tremendous litigation against the proposed Regulation and defeat the purpose of the same. Under 'change in law' provisions, the extra cost of compliance maybe allowed to be incorporated in the PPAs.
- b) The additional costs/capital expenditure incurred for setting up forecasting infrastructure shall be standardized and allowed as a pass through in the Power Purchase Agreements of the generators.
- c) The cost towards necessary tools/techniques for forecasting which may be part of the capital investment as proposed by the Commission has not been captured in the last generic tariff Order for solar PV projects. Commission, if revisiting the norms of the wind /solar tariff order, the generic tariff order for wind/solar may be amended accordingly to capture such cost towards forecasting.

Commission's View:

Review for revision of tariffs or capital expenditure is an issue beyond the scope of the present Regulation.

11. ABT to be implemented first:

Objections/Suggestions:

- a) As the State of AP is yet to fully implement the intra-state ABT, Wind and Solar which are only a small component of the overall power sector of the State cannot be exposed to the untested mechanism. Intrastate ABT should be implemented comprehensively as a precondition to implementation of this Regulation on wind and Solar Power Projects.
- b) Intra-State ABT for conventional generators may be first introduced and once the system stabilizes, it may introduce DSM for wind generators as sizeable capacity of wind is already operating in the State. However, since solar is still in nascent stage in the State, the introduction of DSM should be the last phase.

Commission's View:

As of now the Interim Balancing and Settlement Code issued by the Commission, is taking care of the intrastate open access transactions. The State of Andhra Pradesh is endowed with huge potential of wind and solar power and large scale integration of wind and solar power generation into the Grid is seen in the recent past. Wind and Solar power being intermittent in nature poses challenges to the grid operator in ensuring safe and secure operation of the Grid. In this context, the Commission felt the urgency and need to bring out the current regulation to ensure smooth integration of wind and solar generation into the grid.

12. Issues related to Intra-State Vs. Inter-State:

Objections/Suggestions:

- a) The requirement of a separate feeder for inter-state and intra-state open access appears to be an indirect limitation and discrimination in respect of the freedom to avail open access and the spirit of legislative policy.
- b) The proviso of separate feeder for inter-state transaction is restrictive and discriminatory. If WTG wise generation is used, it shall be easy to calculate DSM data of wind generators whether connected through separate or common feeder.

c) More clarity may be provided in terms of whether the generator will have to establish separate feeder to the substation of distribution company/STU/CTU or will the existing incoming feeder to the Pooling SS be enough for demarcating inter-state and intrastate capacities.

d) An additional clause as hereunder is suggested:

The wind and solar generators connected to the AP State grid and selling power within the State and outside the State shall be paid by the buyer as per actual generation and scheduled generation respectively.

e) The following proviso shall be incorporated:

“Provided that in case where a solar or wind generator is simultaneously supplying power within and outside the State, separate respective schedules for intra state and inter-state sale shall be submitted.”

c) The wind and solar generators, who are opting to supply power to both inter-state and intra-state open access, shall specifically inform SLDC regarding allocated capacities for inter-state and intra-state.

d) Intra-state projects, during under-injection, would suffer with double penalty viz. getting less tariff payment as per actual injection and payment of penalty for deviation from the schedule, which will be very discouraging for the project developers. As such, intra-state projects should also be dealt in the same way inter-state projects are treated.

e) Over injection of energy w.r.t. scheduled generation should be incentivized rather than penalizing for intra-state projects also.

Commission's View:

The Commission noted the concerns of the objectors with regard to requirement of separate feeder for inter-state transactions being discriminative and imposing indirect limitation and accordingly decided to withdraw the proviso.

The draft is suitably modified for energy accounting and payment to the wind and solar generators as per the procedures prescribed and specified in the relevant agreements / regulations / rules. Submission of separate schedules in case of multiple transactions and the issue of allocation of capacities for intra and inter-state transactions is suitably addressed.

Further, it may be noted that commercial settlement of the energy transactions between the generators and consumers in respect of inter-state and intra-state is not the same. The intra-state projects are paid by the buyers for the actual energy generated (actual generation being considered as scheduled generation) whereas the inter-state generators are paid by the buyers as per scheduled generation only. As such, even though it appears to be incentivizing the over-injection of inter-state generators, the mechanism is built such that they are also penalized by way of getting underpaid for the actual energy injected beyond allowed percentage of error band.

13. Legal Issues

Objections/Suggestions:

- a) If the charge is in the nature of a penalty for under-injection or over injection, it can only be done in terms of and limited by the powers specifically conferred upon the Commission in this behalf.
- b) In so far as Inter-state open access is concerned, only CERC which has the power and jurisdiction to frame the Regulation. It appears to be beyond the competence and jurisdiction of the State Commission with regard to inter-state Regulations. In so far as any part of the state grid is used in the course of an inter-state transaction, the same will be an inter-state transaction in view of the provisions of the Act.
- c) The Electricity Act of 2003 under Section 86(1)(e), Section 61 (h) as well as Clause 5.12.1 of the National Electricity Policy and clause 4.3 of the National Electricity Plan issued under Section 3(4) of the said Act have given a clear mandate to the State Commission to take all steps to promote generation of wind energy being a renewable source of energy. Wind energy generators have been given must-run status. A perusal of the statutory provisions would indicate that there is a manifest and avowed legislative policy that electricity generation from renewable sources is to be promoted. In this regard, it ought to be noted that State Commission has been given a mandate under section 86(4) of the Act of 2003 to be guided by the National Electricity Policy as well as the National Electricity Plan in discharge of its functions. It may also be noted that Section 181(3) also stipulates that the Commission may make/issue appropriate Regulations under this Act in a manner that they remain subject to the conditions of previous publications. Accordingly, there is clear mandate on the Commission to follow consistency and uniformity in

these matters including scheduling by wind generators so as to ensure that no undue hardship or disadvantage is caused to the wind generators.

Commission's View:

The Regulation is strictly within the power of delegated / subordinate legislation conferred on the State Commission by the Electricity Act, 2003 and it nowhere and in no way encroaches upon the jurisdiction of the Central Electricity Regulatory Commission (CERC). To the extent the regulation overlaps inter-state matters concerning power, every care is taken to keep it in consonance with the CERC Regulatory framework.

CERC, at para 2.3.3 of the Statement of Reasons on Framework on Forecasting, Scheduling and Imbalance Handling for Variable Renewable Energy Sources (Wind and Solar), inter-alia, stated that

“As regards the RE Projects connected only with the state transmission network but supplying power outside the states, it is clarified that such projects are presently treated as entities under SLDC control area and their scheduling is handled by SLDC....such projects (connected only with the state transmission network but supplying power outside the state) shall, unless decided otherwise through separate regulatory dispensation, continue to operate within the control area of SLDC and their deviation settlement also continue to be governed by the State level deviation settlement mechanism.”

It is sought to be made out that the instant regulation is interfering with the clear mandate given to the Commissions to promote renewables. However, the same is not true in as much as the absolute error bands proposed are based on a study of CERC as pointed elsewhere in these proceedings and furthermore 16 revisions in respect of wind and 9 revisions in respect of solar have been provided to ensure that the forecasts are mostly accurate. That being the case, this endeavor has to be seen only from the point of view of ensuring grid security and not as a measure that would thwart the promotion of renewables unless the generators exceeds the absolute error bands prescribed in the regulation.

14. Centralised forecasting

- a) If SLDC does forecasting for all developers, the overall error would be much less and the burden of deviations needs to be passed on to the beneficiaries.
- b) APERC must consider a centralized approach to scheduling and forecasting for all the Renewable energy being injected into the Grid at any point of time (i.e. at

SLDC level rather than generator/ pooling station level) and socialize the cost of the same, as it is an internationally acceptable practice (for example, Germany and California). A centralized forecasting system should be operationalized by empowering the SLDCs, which are in a much better condition to carry out the intended mission of the proposed Regulation. The costs (as per actuals as calculated by SLDC) can then be socialized across all generators in the State of Andhra Pradesh the effects of which will be minimal to individual RE generators.

- c) Integrated scheduling mechanism shall be adopted, treating an identified area/ cluster as single virtual generator, which will enable system operator to handle transmission congestion in a better way. It will improve the forecasting accuracy and at the same time will reduce the cost of forecasting due to economies of scale.
- c) Forecasting and scheduling should be handled at the State level and not at the sub-station level as the accuracy of the forecast would increase when a larger geographical area is brought under its ambit.
- d) The errors of forecasting tend to reduce due to aggregation. While QCAs may give combined forecast of few developers, the error compensation would be insignificant due to limited number of generators. On the other hand, if SLDC does this forecasting for all developers, the overall error would be much less. But in this case the burden of deviations needs to be passed on to the beneficiaries.
- e) All the pooling stations from both wind and solar categories in the State can be combined in one virtual pool, or there could be one separate virtual pool for wind and another separate virtual pool for solar.
- f) There is also a possibility that a certain group of (like-minded) RE pooling stations may form one Virtual pool, some others may form a second Virtual Pool and the rest may form third Virtual Pool and so on...under such a situation in a particular Virtual pool the advantage of diversity would be available amongst the members of that Virtual Pool only.
- g) Suitable details on the role and responsibility of an entity to deal with virtual pool needs to be clearly defined and incorporated.
- h) As combined forecasting of generating stations (virtual pooling) leads to lower deviations, generators should be allowed to opt for providing schedule on the basis of virtual pooling in line with KERC (Karnataka) regulations wherein it is specified that, 'Wind and Solar generators either by themselves or through the aggregator/QCA may opt for forecasting and scheduling of different pooling

stations to enable larger geographical integration and furnish the scheduling of integrated pools at 15 minutes time block to SLDC, and in all such cases any pooling and de-pooling of the DSM charge shall be done only at their level.”

Commission’s View:

The Commission appreciates the suggestions that centralised forecasting results in improved accuracy, lesser deviations and ease for system operator. Undoubtedly, the centralised forecast benefits all stakeholders. The Commission, duly recognising the benefits of aggregation, provided an option of ‘Virtual Pool’ in which virtual pooling of various pooling stations (and accounting of the deviations of the constituting generators in an aggregated / combined manner through a QCA) is provided for the purpose of availing the benefit of larger geographical area and diversity. The draft is modified accordingly.

15. Definitions

Objections/Suggestions:

- a) Definition of Pooling station may be modified as, “Pooling station means the sub-station where pooling of generation of individual wind generators or solar generators is done for interfacing with the next higher voltage level. Provided that where there is no separate pooling station for a wind / solar generator and the generating station is connected through common/dedicated feeder and terminated at a sub-station of distribution company/STU/CTU, the sub-station of distribution company/STU/CTU shall be considered as the pooling station for such wind/solar generator, as the case may be.”
- b) ‘Captive users’ may be included under the definition of ‘beneficiary’ at 2(g).
- c) Definition of ‘Gaming’ at 2 (l) may be deleted as there is no reference to it in the Regulation.
- d) Clarification may be given in respect of ‘Schedule drawal’ and ‘Collective transactions’.
- e) For the purpose of ample clarity, it is suggested that the definition of interconnection point as below maybe included: “Inter-connection point” means the HV side of the pooling station, which shall be the same level at which forecast and schedule need to be prepared by wind and solar projects for onward submission to SLDC.
- f) A proviso may be added that “AvC would be equal to the installed capacity, unless the QCA informs SLDC that one or more turbines / inverters are under maintenance

or shutdown”. Units shall be defined for Actual Generation, Scheduled generation and AvC.

- g) Definition of power trader may also be incorporated as there would be entities both existing and new who would sell power outside or within the State through Power Traders.

Commission’s View:

Suggestions are noted. Draft is duly modified incorporating the changes in the definitions to the extent the Commission felt it appropriate and necessary. The manner of dealing with alleged gaming being included in the final regulation, the definition of gaming is retained. Inter-connection point is usually defined in the relevant agreements (PPA / OA) and at which the interface meters are located. As, the regulation provides for interpreting the words and expressions not defined in it but defined in the Act or the Andhra Pradesh Electricity Reform Act, 1998 or the rules or the regulations made thereunder or the State Grid Code, the Commission decided to include only the relevant terms under definitions.

16. Metering and Communication

Objections/Suggestions:

- a) Clarification is requested to avoid ambiguity among the parties in respect of the type of meters that are to be provided for energy accounting.
- b) Appropriate meter viz. Main, check, standby, ABT, that will be considered for energy accounting. Further, it may be clarified whether the data communicated through the meter or data based on JMR prevails.
- c) Further, SLDC in its process needs to adequately define the communication system to ensure standardization.
- d) The mode of communication between the QCA/Aggregator/Principal Generator should be software enabled to be developed by the QCA / Aggregator. Technical means used for communication may be any of the following:
 - (i) Installation of modem on existing ABT meters for getting data on 15 min. basis.
 - (ii) Access to API link for getting the data from the meter to the QCA’s central server.
 - (iii) Installation of parallel meter on the existing CT/PT to facilitate acquisition of real time data.

- e) The Software which enables communication should provide, inter-alia, the following information.
- (i) Communicating day ahead, intraday and/or week-ahead schedule along with revisions to SLDC.
 - (ii) Informing real time generation at pooling station and /or at individual generator level as required.
 - (iii) Providing information of grid constraints and curtailments from SLDC side to QCA.
 - (iv) The QCA should provide software login to the State, where live data for all schedules shall be made available and information on the deviations in case real time generation data is provided by SLDC shall be made available to the SLDC. This method will help in online communication without time lag.
 - (v) Providing information from generator side/QCA to SLDC on generator outage with reason for outage.
 - (vi) Intimating to QCA the DSM charges at the pooling station by the SLDC.
 - (vii) It may not be technically feasible to install SCADA for old machines. Hence, transfer of real time weather related data from the WEG may not be possible.
- f) The following procedure may be considered for submission of forecast data:
- First forecast (15 min. block wise Available Capacity and scheduled capacity) for the next day shall be submitted between 23:15 - 23:30 hours of previous day. If the next revision is submitted between 00:45 - 01:00 of next day, the forecast starts from 4th time block (01:30 -01:45) considering the time block when the forecast is being submitted as the 1st time block.
- g) The forecast collection system at SLDC should automatically note the time of receipt of the forecast submission and update its systems accordingly. Each update of the forecast should include forecasts for the next 96 time blocks on a rolling basis for better forecast accuracy.
- h) Details about specific turbine or wind farm parameters for which data is to be communicated to SLDC and the resolution and frequency of this communication for each parameter is to be specified.
- i) Ability of SCADA and file formats differs from manufacturer to manufacturer. Sharing real time availability is a challenge as there are many factors to be

considered before computing the availability. Clarification required on the method of providing the live SCADA data or telemetry data feed to SLDC.

- j) Formats and specifications levels (IPP/Pooling SS/Grid SS) are to be finalized for enabling the training on the relevant software models and a minimum period of 6 months may be allowed before the accuracies are achieved.
- k) Formats for appointing the aggregators, sharing the telemetric live data are to be modified as per existing SCADA capability. Provision may be made for remote collection of data from meters.
- l) E-mails should be established as the sole medium for forecast communication as adopting web based application for communicating forecast information could lead to complexity, IT Security issues, forecast system compatibility / interconnectivity, inconsistency and traceability / reconciliation issues.
- m) A clause mandating placement of Interface Energy Meters (15 min. sampling) at each generator/project should be included to measure the block-wise actual generation data of the QCA member generator/project behind the pooling station.
- n) A reasonable preparatory window shall be provided post finalization of the detailed procedure for data telemetry & communication requirements.
- o) The requirement for the weekly energy accounting is to be waived since Joint Meter Reading, Billing and adjustment is done on monthly basis.
- p) SLDC / REMC fees and charges payable by the wind energy generator specifically for scheduling and forecasting purpose are to be specified.
- q) Machine availability data in real time is essential to SLDC for forecasting and to check whether the generator has done intentional mis-declaration of available capacity. As such, providing of turbine level data is to be mandated in the Regulation for generation forecast.
- r) Feeder wise segregation of the power will not be possible for the existing and upcoming generators.

Commission's View:

The Commission noted the concerns of the stakeholders.

As per the Regulation, SLDC shall have to give appropriate directions under Section 33(1) of the Electricity Act, 2003 about the information required on technical specifications and protocol for sharing information, Forecasting Tools, alternative means

of communication in case of telemetry or other equipment failure, formats of forecast submission and other details.

The Commission, therefore will forward all the objections / suggestions and views received by it in connection with this regulation to the SLDC for consideration on merits and incorporation in the relevant guidelines to the extent found acceptable.

17. De-pooling of deviation charges

Objections/Suggestions:

- a) The de-pooling (apportionment) of the net deviation charges payable amongst the different pooling stations within a 'Virtual Pool' should be done on the basis of the deviation charges which would have been paid by them in case they have been working as an independent pooling station, without having the support of 'Virtual Pool'.
- b) A better methodology of de-pooling the net deviation behind the pooling station would be in proportion to the actual deviations of the generators behind the pooling station which leads to equitable de-pooling of deviation charges among QCA member generators.
- c) If the schedule of the pooling station is based on a forecast (given by SLDC or FSP or QCA) for the aggregate capacity behind the pooling station, then a method will be needed to arrive at the individual schedules of the generators by segregation of pooling station level schedule.
- d) The stipulation that QCA shall de-pool the charges based on actual generation and actual available capacity is quite vague and may be subject to different interpretations as the charges are based on absolute error, which involves three quantities: scheduled generation, actual generation and available capacity. For uniformity of methodology for apportionment and to avoid disputes, a formula may be given for such apportionment along with suitable numerical examples or illustrations.

Commission's View:

Suggestions noted.

As per the Regulation, SLDC shall have to give appropriate directions under Section 33(1) of the Electricity Act, 2003 about the manner of de-pooling of energy deviations and deviation charges.

The Commission, therefore will forward all the objections / suggestions and views received by it in connection with this regulation to the SLDC for consideration on merits and incorporation in the relevant guidelines to the extent found acceptable.

18. Other Issues:

Objections/Suggestions:

- a) It is relevant to forfeit the banking energy facility and inadvertent power with effect from implementation of this regulation.

Commission's View:

The current Regulation deals only with the deviations in terms of the error of the actual generation with respect to the scheduled generation and do not interfere with the prevailing regulations.

- b) Under Commercial and Deviation Settlement it is mentioned that the charges are to be paid by the buyer, whereas the scheduling & forecasting is an activity done from generator end and such deviation charges shall be collected only from the generator, not from the buyer.

Commission's View:

The charges mentioned to be paid by the buyer under the Commercial and Deviation Settlement in the draft Regulation are for the regular energy transactions but not for the deviations.

To remove ambiguity, the relevant clause in the draft is modified as follows:

Energy accounting and payment for the energy generated to the wind and solar generators connected to the Grid shall be in accordance with the procedures prescribed and specified therefor.

- c) Every wind and solar generator, whose scheduling is done by SLDC, shall comply with the technical standards such as for Fault Ride Through etc. as per CERC (Technical standards for connectivity of the distributed generation resources) Regulation 2013.

Commission's View:

SLDC may ensure compliance with the relevant Regulations.

- d) Commission may consider introduction of ancillary market with a surety to generators that their revenue and returns will not be affected.

Commission's View:

Suggestion is noted.

- e) Statement of objects and reasons (SOR) may be published along with the final notification of the Regulation to help all the stake holders understand the Commission's views on various objections/suggestions and the same will act as a reference point in case any clarification not provided under the Regulation but discussed under SOR.

Commission's View:

Proceedings are issued incorporating the views of the Commission on various objections/suggestions received.

Sd/-
P.Rama Mohan
Member

Sd/-
Dr. P. Raghu
Member

Sd/-
Justice G. Bhavani Prasad
Chairman

Annexure-I

List of persons/organizations who submitted objections/suggestions and views

S. No.	Objector	Date
1.	Sri S. Suryaprakasa Rao	25.09.2016
2.	Adani Green Energy Limited	27.09.2016
3.	Energion Power Resources Limited	28.09.2016
4.	Chief Engineer/APSLDC	28.09.2016
5.	Indian Wind Energy Association	28.09.2016
6.	GE India Industrial Private Limited	28.09.2016
7.	Indian Wind Turbine Manufacturers Association Limited	29.09.2016
8.	Orient Green Power Limited	29.09.2016
9.	Manikaran Analytics Limited	30.09.2016
10.	Sembicorp Green Infra Limited	30.09.2016
11.	Tata Power Trading Company Limited	30.09.2016
12.	APSEB Engineers' Association	30.09.2016
13.	Karamchand Tahpar & Bros. (Coal Sales) Ltd.	30.09.2016
14.	Orange Renewables Ltd.	30.09.2016
15.	Hero Future Energies Ltd.	30.09.2016
16.	Mytrah Energy (India) Ltd.	30.09.2016
17.	Mahindra Susten Ltd.	30.09.2016
18.	Acme Cleantech Solutions Private Limited	30.09.2016
19.	ITC Limited	30.09.2016
20.	INOX Renewables Limited	30.09.2016
21.	Renew Power Ventures Pvt. Ltd.	01.10.2016
22.	Reconnect Energy	24.10.2016
23.	Vinod Kumar Agarwal	27.10.2016
24.	Prayas Group	15.11.2016
25.	Tirumala Cotton & Agro Products Pvt. Ltd.	19.11.2016
26.	Sterling Agro Industries Ltd.	19.11.2016
27.	Greenko	19.11.2016

Annexure-II

List of objectors / representatives who presented views
during the public hearing held on 19.11.2016

S. No.	Name of the Objector / representative	Organization
1.	Sri Ravindra Kadam	Indian Wind Energy Association
2.	Sri Pradeep Kumar	Indian Wind Energy Association
3.	Sri Prosenjit Chakaborthy	Energon Power Resources Pvt. Ltd.
4.	Sri Amresh Kosla	Manikaran Analytics Ltd.
5.	Sri Tushar Goel	Mytrah Energy (India) Ltd.
6.	Sri K. Gopal Choudary, Advocate	ITC Limited
7.	Sri N. Alagiri	ITC Limited
8.	Dr. Manish Kanna	ACME Cleantech Solutions Pvt. Ltd.
9.	Sri Avinish Pandey	INOX Renewables Ltd.
10.	Sri Siddartha Priyadarshini	Reconnect Energy Solutions Pvt. Ltd.
11.	Sri Vinod Kumar Agarwal	Ex. Executive Director, NLDC
12.	Sri Ravindranath	----
13.	Sri P. Koti Rao	Tirumala Cotton & Agro Products Ltd.
14.	Sri Sunil Kondu	Greenco