

EXPLANATORY MEMORANDUM

Subject: Draft Central Electricity Regulatory Commission (Indian Electricity Grid Code)(Second Amendment) Regulations, 2013.

The Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010 was amended through the Central Electricity Regulatory Commission (Indian Electricity Grid Code) (First Amendment) Regulations, 2012 (hereinafter "Grid Code") vide Notification dated 5.3.2012. The amendments were challenged before the High Court of Madras by Tamil Nadu Generation and Distribution Company Limited in Writ Petition Nos. 8509 and 8510 of 2012. The Hon'ble High Court granted stay on the operation of the First Amendment limited to the State of Tamil Nadu during the pendency of the Writ Petitions. The writ petitions were dismissed vide order dated 14.8.2012. Consequently, the First Amendment to the Grid Code was implemented from the 0000 hrs of 17.9.2012.

2. Meanwhile, there were two major grid failures in the country on consecutive days- one on 30th July, 2012 and another on 31st July, 2012. In the wake of these grid disturbances, the Government of India, Ministry of Power had appointed an Enquiry Committee under Chairmanship of Chairman, Central Electricity Authority. The Enquiry Committee in its report submitted to the Government on 16.8.2012 has identified over-drawals as one of the causes of grid disturbance. The Enquiry Committee has inter-alia recommended as under:

"9.2.2 Frequency band needs to be further tightened and brought closer to 50 Hz. POSOCO may file an urgency application in Supreme Court for early resolution of the issue in view of the recent grid disturbances."

3. Consequently, National Load Despatch Centre (NLDC) filed a Petition on 10.9.2012 seeking amendment of Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010 for change in frequency band and for incorporation of certain provisions regarding ancillary services. The Commission, vide order dated 29.11.2012 in No.210/MP/2012 directed that the petition be treated as a proposal of POSOCO for amendment of the Grid Code and further directed the staff to examine the proposal and submit to the Commission for consideration. Relevant extracts from Commission's aforementioned order are given below:

"6. The representative of the petitioner submitted that a self-contained proposal has been made out in the petition for amendment of the Grid Code and for making necessary provisions of the Ancillary Services Regulations. Noting the submission of the petitioner, we direct that the present petition be treated as a proposal of POSOCO for amendment of the Grid Code and further direct the staff to examine the proposal and submit to the Commission for consideration in a time-bound manner. Staff is further directed to examine the proposal of POSOCO for incorporation of appropriate provisions in the draft regulations on Ancillary Services. POSOCO is permitted to submit further information as may be considered necessary in furtherance of the proposal."

4. The staff paper on Introduction of Ancillary Services in Indian Electricity Market inviting comments of stakeholders has been posted on the web site of the Commission 10th April, 2013.

5. The major amendments sought by POSOCO relate to tightening of frequency band. As simultaneously other requests of POSOCO for amendment in UI Regulations are also being considered, certain consequential changes are proposed in the Grid Code as well. These basically relate to treatment of UI mechanism (now proposed to be called Deviation Settlement Mechanism) as last mile imbalance settlement mechanism with the object of improving operational discipline on the part of generators as well as drawee utilities, and not as a mere market mechanism. In the draft Deviation Settlement Mechanism Regulation, it has been proposed that volume limits shall be imposed on all deviations.

6. The rationale for tightening of frequency band has been discussed in another draft Regulations, namely draft Central Electricity Regulatory Commission (Deviation Settlement Mechanism and related matters) Regulations, 2013, which seeks to repeal UI Regulations. The same is, therefore, not discussed here for sake of brevity. The proposed amendments are mostly in line with suggestions made by POSOCO in its Petition No. 210/MP/2012.

7. Additional amendments in the Grid Code are necessitated due to:

(a) Commission's order in Petition no. 209/MP/2011 and 2/MP/2012 for Renewable Regulatory Funds (RRF) mechanism.

(b) Third Amendment to Central Electricity Regulatory Commission (Grant of Connectivity and Long- Term and Medium Term Open Access in Inter-State Transmission System) Regulations, 2010, notified on 26.3.2013.

Narrowing down frequency band further to 49.9 Hz to 50.1 Hz so that system operates close to 50 Hz:

8. POSOCO (NLDC) has submitted that there is an urgent need for tightening the frequency band and to restrict over-drawals / under-drawals for secure operation of the grid and accordingly has proposed that the grid frequency should be narrowed down to 49.9 Hz to 50.1 Hz.

9. The Commission had in the past narrowed down the permissible frequency range for deviation from 49.2-50.3 Hz to 49.5-50.2 Hz with effect from 3.5.2010 and thereafter, reduced it further to 49.7-50.2 Hz which was implemented with effect from 17.9.2012. The Commission is committed to further narrowing of grid frequency range for improved efficiency of industrial equipment and appliances and its effect on consequential industrial output and country's economy.

10. A record capacity of 54,963.9 MW has been added during the 11th Plan period. The Installed Capacity at the end of the 11th Plan was 1, 99, 877 MW as on

31.3.2012. The 12th Plan envisages a capacity addition of another 88,537 MW. The Installed capacity as on 31.3.2013 is **2,23,344** MW and a capacity of 23, 467 MW was added in the year 2012-13, which includes a capacity of 20,687 MW from conventional sources of energy against the target of 17,956 MW. Such rate of capacity additions annually would take care of the concerns of the beneficiaries regarding their inability in meeting the demand or increase in load shedding due to narrowing down of grid frequency range. Further, the average grid frequency, post grid disturbances, is around 50 Hz. The grid frequency profile from April 2012 to January 2013 for the NEW Grid and the SR Grid is annexed as **Appendix-I**.

11. In this backdrop, the Commission has proposed in the draft amendment to further narrow down the operating grid frequency range close to 50 Hz i.e. from 49.7-50.2 Hz to 49.95 Hz-50.05 Hz. However, with the narrowing down of grid frequency range to 49.95-50.05 Hz, it would be necessary to have step sizes of 0.01 Hz and this would require changing of existing SEMs by the CTU. As POSOCO had informed that Master Meters for reference frequency have already been installed in each region, no problem is visualized on account of the proposed narrowing down of frequency range.

12. The proposed amendments to the Grid Code are discussed in the succeeding paragraphs.

13. Amendment in Regulation 2 of Principal Regulations: In order to implement the Commission's order dated 16.1.2013 in Petition No.209/2011 on Renewable Regulatory Funds, following definitions are proposed to be added under Regulation 2.1 of the Grid Code:

"(hhhh) : Coordinating Agency:

The agency appointed by Wind/Solar Generators connected on the pooling station commissioned on or after 3.5.2010, which may be one of the generators or any other mutually agreed agency for the following purpose:

- i. Provide schedules with periodic revisions as per Grid Code on behalf of all the wind/solar generators connected to the pooling station.
- ii. Responsible for metering, data collection/ transmission, communication, co-ordination with DISCOMS, RLDC, SLDC, RPC and other agencies.
- iii. Undertake commercial settlement of all charges on behalf of the generators, including payments to the Regional/ State UI pool accounts through the concerned SLDC.
- iv. Undertake de-pooling of payments received on behalf of the generators from the Regional/ State UI Pool accounts and settling them with the individual generators.

- v. Undertake commercial settlement of any other charges on behalf of the generators as may be mandated from time to time.

(iii) Pooling Station: The substation where pooling of generation of individual wind generators or solar generators is done for interfacing with the next higher voltage level substation. This shall be the first interface point with DISCOM/STU/CTU network, as the case may be.

(jii) Reference Rate: Rate which shall be used for computing financial implications for the variability of Wind Generators under Renewable Regulatory Fund (RRF) Procedure issued with the approval of the Commission."

14. Amendment in Regulation 5.2(i) of Grid Code:

(a) **Existing Provision:**

"(i) The recommended rate for changing the governor setting, i.e. supplementary control for increasing or decreasing the output (generation level) for all generating units, irrespective of their type and size, would be one (1.0) per cent per minute or as per manufacturer's limits. However, if frequency falls below 49.8Hz, all partly loaded generating units shall pick up additional load at a faster rate, according to their capability."

(b) **Proposed Amendment:**

"In sub-regulation (i) of Regulation 5.2 of the Principal Regulations, the words and figures "However, if frequency falls below 49.8 Hz, all partly loaded generating units shall pick up additional load at a faster rate, according to their capability" shall stand deleted."

(c) **Rationale:** With introduction of tight frequency control and deviation proposed to be delinked with frequency, support may not be required. In case such generation support is required, the same may have to be sought under Ancillary Services or any other mechanism.

15. Amendment in Regulation 5.2(j) of Grid Code:

(a) **Existing Provision:**

"(j) Except under an emergency, or to prevent an imminent damage to a costly equipment, no User shall suddenly reduce his generating unit output by more than one hundred (100) MW (20 MW in case of NER) without prior intimation to and consent of the RLDC, **particularly when frequency is falling or is below 49.7 Hz.** Similarly, no User / SEB shall cause a sudden variation in its load by more than one

hundred (100 MW) without prior intimation to and consent of the RLDC.”

(b) Proposed Amendment:

“In sub-regulation (j) of Regulation 5.2 of Principal Regulations, the words *“particularly when frequency is falling or is below 49.7 Hz”* shall stand deleted.”

(c) Rationale: This is a grid security measure which needs to be followed by every entity irrespective of frequency. Information to RLDC and consent by RLDC is required because while individual an entity may not be fully aware about the grid condition and may be taking frequency as the only parameter of grid healthiness, RLDC, which is monitoring other parameters like voltage, phase angle and line flows etc., will be in a better position to take a decision.

16. Amendment in Regulation 5.2(m) of the Grid Code:

(a) Existing Provision:

“All Users, SEB, SLDCs, RLDCs, and NLDC shall take all possible measures to ensure that the grid frequency always remains within the 49.7-50.2 Hz band.”

(b) Proposed Amendment:

“In sub-regulation (m) of Regulation 5.2 of the Principal Regulations, the words and figures “49.7-50.2 Hz” shall be substituted with the words and figures “49.95-50.05 Hz.”

(c) Rationale: The need for tightening the frequency range has already been explained. The narrowing of the frequency band would result in safe, secure and reliable grid operation and supply of quality power to the consumers, smooth integration of Southern Regional Grid with the NEW Grid, and will enhance the service life of the generating units.

17. Amendment in Regulation 5.4.2 (a) of the Grid Code:

(a) Existing Provision:

“SLDC/SEB/distribution licensee and bulk consumer shall initiate action to restrict the drawal of its control area, from the grid, within the net drawal schedule whenever the system frequency falls to 49.8 Hz.”

(b) Proposed Amendment:

“In sub-regulation (a) of Regulation 5.4.2 of the Principal Regulations, the following phrase “whenever the system frequency falls to 49.8 Hz” shall stand deleted.”

(c) Rationale: Drawal has to be maintained as per the schedule irrespective of frequency and deviation from schedule has to be inadvertent only. Large volume of

deviation increases uncertainty in power flows, consequently making it difficult for ensuring (N-1) security of the system all the time, congestion forecast and its management, transmission outage coordination, assessment of transfer capability and available margins for facilitating Short-Terms Open Access (STOA).

The freedom to inject / withdraw in unscheduled interchange appears to be one of the reasons for inadequate attention towards load forecasting, adequacy planning and load management by the Utilities. The existing market design hardly has any incentive for portfolio management and risk management by the buyers and sellers in the organized market. In the long- term, UI is distorting the signals for investment in generation (including peaking generation) and transmission. Therefore, SLDC /SEB/distribution licensee and bulk consumer shall initiate action to restrict the drawal of its control area, from the grid, within the net drawal schedule irrespective of frequency.

18. Amendment in Regulation 5.4.2 (b) of Grid Code:

(a) **Existing Provision:**

“The SLDC/ SEB/distribution licensee and bulk consumer shall ensure that requisite load shedding is carried out in its control area so that there is no overdrawl when frequency is 49.7 Hz. or below.”

(b) **Proposed Amendment:**

In sub-regulation (b) of Regulation 5.4.2 of Principal Regulations, the following phrase *“when frequency is 49.7 Hz. or below”* shall stand deleted.

(c) **Rationale:** UI mechanism does offer a settlement mechanism for inadvertent power, at rates determined by the system conditions. However, when some States overdraw power from the Grid at the expense of the other States and/or some of the Utilities inject large quantum of unscheduled power into the Grid, the security of the integrated grid is jeopardized and transmission corridors are also overloaded. Therefore, SLDCs/ SEBs / distribution licensees and bulk consumers shall ensure that requisite load shedding is carried out in their control area so that there is no overdrawal irrespective of frequency.

19. Amendment in Regulation 5.4.2 (g) of the Grid Code:

(a) **Existing Provision:**

“RLDCs shall devise standard, instantaneous, message formats in order to give directions in case of contingencies and /or threat to the system security to reduce **overdrawal** by the bulk consumer, SLDC/ State at different **overdrawal** conditions depending upon the severity **of the overdrawal**. The concerned SLDC shall ensure immediate compliance with these directions of RLDC and send a compliance report to the concerned RLDC.”

(b) Proposed Amendment:

The sub-regulation (g) of Regulation 5.4.2 of the Principal Regulations shall be substituted with the following:

"(g) RLDCs shall devise standard instantaneous message formats in order to give directions in case of contingencies and/or threat to the system security to reduce deviation from schedule by the bulk consumer, SLDC/State/Injecting Utilities at different overdrawal/under-drawal/over-injection/under-injection conditions depending upon the severity. The concerned SLDC/other regional entity shall ensure immediate compliance with these directions of RLDC and send a compliance report to the concerned RLDC."

(c) Rationale: Contingency and / or threat to system security can happen at different overdrawal / under-drawal / over-injection/ under-injection conditions and deviation from schedule should be discouraged strongly. Also, concerned regional entity alongwith SLDC responsible for deviation from their schedule will have to comply with the instructions of RLDCs and send compliance reports to the concerned RLDC

20. Amendment in Regulation 6.4.6 of the Grid Code:

(a) Existing Provision:

"(6) The system of each regional entity shall be treated and operated as notional control area. The algebraic summation of scheduled drawal from ISGS and from contracts through long-term access, medium-term and short-term open access arrangements shall provide the drawal schedule of each regional entity, and this shall be determined in advance on day-ahead basis. The regional entities shall regulate their generation and/or consumers' load so as to maintain their actual drawal from the regional grid close to the above schedule. Deviation, **if any, from the drawal schedule, shall be within the limits specified by the Central Commission in UI Regulations and it shall not cause system parameters to deteriorate beyond permissible limits and shall not lead to unacceptable line loading.** Such deviation from net drawal schedule shall be priced through the Unscheduled Interchange (UI) mechanism as specified by the Central Commission from time to time."

(b) Proposed Amendment: Regulation 6.4.6 of Principal Regulations shall be substituted as under:

"The system of each regional entity shall be treated and operated as notional control area. The algebraic summation of scheduled drawal from ISGS and from contracts through long-term access, medium-term and short-term open access arrangements shall provide the drawal schedule of each regional entity, and this shall be determined in advance on day-ahead basis. The regional entities shall regulate their generation and/or consumers' load so as to maintain their actual drawal from the regional grid close to the above schedule.

Maximum inadvertent deviation allowed during a time block shall not exceed the limits specified in the Deviation Settlement Mechanism Regulations. Such deviations should not cause system parameters to deteriorate beyond permissible limits and should not lead to unacceptable line loadings. Deviations, if any, from net drawal schedule shall be priced through the Deviation Settlement mechanism as specified by the Central Commission from time to time.

Every regional entity shall ensure reversal of sign of deviation from schedule within every six time blocks."

(c) **Rationale:** The specification of maximum inadvertent deviation allowed during a time block as per the limits specified in the draft Deviation Settlement Mechanism Regulations will help the regional entities to more accurately regulate their generation and/or consumers' load so as to maintain their actual drawal from the regional grid close to the schedule. Deviation from schedule is to be discouraged irrespective of system frequency.

21. Amendment in Regulation 6.4.7 of the Grid Code:

(a) **Existing provision:**

"(7) The SLDC/SEB /distribution licensee shall always endeavour to restrict the net drawal of the State from the grid to within the drawal schedules, whenever the system frequency is below 49.8 Hz. The concerned SEB/distribution licensee/User, SLDC shall ensure that their automatic demand management scheme mentioned in clause 5.4.2 acts to ensure that there is no over-drawal when frequency is 49.7 Hz or below. If the automatic demand management scheme has not yet been commissioned, then action has to be taken as per manual demand management scheme to ensure zero overdrawal when frequency is 49.7 Hz. or below."

(b) **Proposed Amendment:** The Regulation 6.4.7 of Principal Regulations shall be substituted as under:

"7. The SLDC, SEB / distribution licensee shall always restrict the net drawal of the state from the grid to within the drawal schedules. The concerned SEB/distribution licensee User, SLDC shall ensure that their automatic demand management scheme mentioned in clause 5.4.2 acts to ensure that there is no over drawl. If the automatic demand management scheme has not yet been commissioned, then action has to be taken as per manual demand management scheme to restrict the net drawal from grid to within schedules and all actions for early commissioning of automatic demand management scheme would be initiated."

(c) **Rationale:** UI mechanism does offer a settlement mechanism for inadvertent power, at rates determined by the system conditions. However, when some entities overdraw power from the grid at the expense of the other entities and/or some of the utilities inject large quantum of unscheduled power into the grid, the security of the

integrated grid is jeopardized and transmission corridors also get overloaded. Therefore, automatic demand management schemes need to be functional irrespective of frequency so as to ensure net drawal of the entity from the grid within schedule.

22. Amendment in Regulation 6.4.10 of the Grid Code:

(a) Existing Provision:

“(10) The ISGS would normally be expected to generate power according to the daily schedules advised to them. The ISGS may also deviate from the given schedules within the limits specified in the CERC UI Regulations of CERC, depending on the plant and system conditions. In particular, they may be allowed to generate beyond the given schedule under deficit conditions as long as such deviations do not cause system parameters to deteriorate beyond permissible limits and/or do not lead to unacceptable line loading. Deviations, if any, from the ex-power plant generation schedules shall be appropriately priced in accordance with Deviation Settlement Mechanism Regulations. In addition, deviations, from schedules causing congestion, shall also be priced in accordance with the Congestion Charge Regulations of CERC.”

(b) Proposed Amendment: The Regulation 6.4.10 of Principal Regulations shall be substituted as under:

"10. The ISGS would normally be expected to generate power according to the daily schedules advised to them barring any inadvertent deviations. Maximum deviation allowed during a time block shall not exceed the limits specified in the Deviation Settlement Mechanism Regulations. Such deviations should not cause system parameters to deteriorate beyond permissible limits and should not lead to unacceptable line loadings. Inadvertent deviations, if any, from the ex-power plant generation schedules shall be appropriately priced in accordance with UI Regulations. In addition, deviations, from schedules causing congestion, shall also be priced in accordance with the Congestion Charge Regulations of CERC."

(c) Rationale: The specification of maximum inadvertent deviation allowed during a time block as per the limits specified in the UI Regulations (Deviation Settlement Mechanism Regulations) will help the ISGS to more accurately regulate their generation so as to maintain their actual generation close to the given schedule irrespective of frequency.

23. Amendment in Regulation 6.4.11 of the Grid Code:

(a) Existing Provision: Regulation 6.4.11 reads as under:

“Provided that when the frequency is higher than 50.2 Hz, the actual net injection shall not exceed the scheduled despatch for that time block. Also, while the frequency is above 50.2 Hz, the ISGS may (at their discretion) back down without waiting for an advice from RLDC to restrict the frequency rise. When the frequency falls below 49.8 Hz, the generation at all ISGS (except those on peaking duty) shall be maximized, at least upto the level to which can be sustained, without waiting for an advice from RLDC subject to the condition that such increase does not lead to unacceptable line loading or system parameters to deteriorate beyond permissible limit.”

(b) **Proposed Amendment:** The Regulation 6.4.11 of Principal Regulations shall stand deleted.

(c) **Rationale:** The prevailing clause provides freedom to deviate from schedule based on frequency. The prevailing clause is proposed to be deleted as generation has to be maintained close to schedule irrespective of frequency.

24. **Amendment in Regulation 6.4.12 of Principal Regulations:**

(a) **Exiting Provision:**

“12. However, notwithstanding the above, the RLDC may direct the SLDCs/ISGS/other regional entities to increase/decrease their drawal/generation in case of contingencies e.g. overloading of lines/transformers, abnormal voltages, threat to system security. Such directions shall immediately be acted upon. In case the situation does not call for very urgent action, and RLDC has some time for analysis, it shall be checked whether the situation has arisen due to deviations from schedules, pursuant to short-term open access. These shall be got terminated first, before an action, which would affect the scheduled supplies to the long term and medium term customers is initiated in accordance with Central Electricity Regulatory Commission (Grant of Connectivity, Long-term Access and Medium-term Open Access in inter-State Transmission and Related matters) Regulations, 2009.”

(b) **Proposed amendment:** The Regulation 6.4.12 of Principal Regulations shall be substituted as under:

"12. However, notwithstanding the above, the RLDC may direct the SLDCs /ISGS /other regional entities to increase/decrease their drawal/generation in case of contingencies e.g. overloading of lines/transformers, abnormal voltages, threat to system security. Such directions shall immediately be acted upon. In case the situation does not call for very urgent action, and RLDC has some time for analysis, it shall be checked whether the situation has arisen due to deviations from schedules. These shall be got terminated first, through appropriate measure like opening of feeders , if necessary by SLDC/RLDC, before an action, which would affect the scheduled supplies to the long term, medium term customers or short term customers is initiated in accordance with Central Electricity Regulatory Commission (Grant of Connectivity, Long-term Access and Medium-term Open

Access in Inter-State Transmission and Related matters) Regulations, 2009 and CERC (Open Access in Inter-State Transmission) Regulations, 2008.

In case short term /Medium term or Long Term open access are curtailed, RLDC(s) shall submit a report regarding the reasons due to which it was not able to curtail deviations from Schedule and agencies which had not taken necessary actions."

(c) **Rationale:** This clause created ambiguity during the incident of grid disturbance. System Operator was trying to reduce UI (trying to bring down it to zero) and STOA transactions were not curtailed. POSOCO has also opined that UI cannot be pursuant to STOA and there appears to be inadvertent error in the IEGC which may be corrected. The amendment is proposed with deletion of words "pursuant to short term open access".

25. **Amendment in Regulation 6.4.15 of Grid Code:**

(a) **Existing Provision:**

"15. All other regional entities should abide by the concept of frequency-linked load despatch and pricing of deviations from schedule, i.e., unscheduled interchanges. All regional entities should normally be operated according to the standing frequency-linked load despatch guidelines issued by the RLDC, to the extent possible, unless otherwise advised by the RLDC/SLDC."

(b) **Proposed Amendment:** Sub-regulation 15 of Regulation 6.4 shall stand deleted.

(c) **Rationale:** Schedule is to be maintained irrespective of frequency.

26. **Amendment in Regulation 6.4.24 of the Grid Code:**

(a) **Existing Provision:**

"24. Hydro generating stations are expected to respond to grid frequency changes and inflow fluctuations. The hydro generating stations shall be free to deviate from the given schedule without causing grid constraint and a compensation for difference between the actual net energy supply by the hydro generating station and the scheduled energy (ex-bus) over day shall be made by the concerned Regional Load Despatch Centre in the day ahead schedule for the 4th day (day plus 3)."

(b) **Proposed Amendment:** Regulation 6.4.24 of Principal Regulations shall be substituted as under:

"24. Hydro generating stations are expected to respond to grid frequency changes and inflow fluctuations. Maximum deviation allowed during a time block shall be as per the CERC Deviation Settlement Mechanism Regulations."

(c) Rationale: The specification of maximum inadvertent deviation allowed during a time block as per the limits specified in the Deviation Settlement Mechanism Regulations will help hydro generating stations to regulate their generation more accurately so as to maintain their actual schedule close to the given schedule. Further, after imposition of volume limit in regard to deviation from schedule, revision of schedule on 4th day is not necessary so as to provide level playing field to Hydro generators.

27. Amendment in Regulation 6.5.9 of Grid Code:

(a) Existing Provision:

"9. The hydro electric generation stations are expected to respond to grid frequency changes and inflow fluctuations. They would, therefore, be free to deviate from the given schedule as long as they do not cause a grid constraint. As a result, the actual net energy supply by a hydro generating station over a day may differ from schedule energy (ex-bus) for that day. A compensation shall then be made by the concerned load despatch centre in the day ahead schedule for the 4th day (day plus 3)."

(b) Proposed Amendment: Regulation 6.5.9 of Principal Regulations shall stand deleted.

(c) Rationale: In view of proposed amendment in Regulation 6.4.24 of Grid Code, this sub-regulation shall not be required in Scheduling and Despatch procedure.

28. Amendment in Regulation 6.5.13 of Principal Regulations:

(a) Existing Provision:

"13. The schedule finalized by the concerned load despatch centre for hydro generating station, shall normally be such that the scheduled energy for a day equals the total energy (ex-bus) expected to be available on that day, as declared by the generating station, based on foreseen/planned water availability/release. It is also expected that the total net energy actually supplied by the generating station on that day would equal the declared total energy, in order that the water release requirement is met. While the 15-minute wise, deviations from schedule would be accounted for as Unscheduled Interchange (UI), the net energy deviation for the whole day, if any, shall be additionally accounted for as shown in the illustration.

Illustration

Suppose the foreseen/ expected total energy (ex-bus) for Day-1 is E1, the scheduled energy is S1, actual net energy (metered) is A1, all in ex-bus MWh.

Suppose the expected energy availability for Day 4, as declared by the generator, is E4. Then, the schedule for day4 shall be drawn up such that the scheduled energy for Day 4, shall be

$S4=E4+(A1-(E1))$, Similarly,
 $S5= E5+(A2-(E2))$,
 $S6=E6+(A3-(E3))$, $S7=E7+(A4-(E4))$, and so on.”

(b) **Proposed Amendment:** The Regulation 6.5.13 of the Grid Code shall be substituted as under:

"13.The schedule finalized by the concerned load despatch centre for hydro generating station, shall normally be such that the scheduled energy for a day equals the total energy (ex-bus) expected to be available on that day, as declared by the generating station, based on foreseen/planned water availability/release. It is also expected that the total net energy actually supplied by the generating station on that day would equal the declared total energy, in order that the water release requirement is met."

(c) **Rationale:** In view of proposed amendment in Regulation 6.4.24 of the Grid Code, this modification in schedule for hydro generating station on D+3 would not be required.

29. Amendment in Regulation 6.5.17 of Grid Code:

(a) Existing Provision:

"17. In case of any grid disturbance, scheduled generation of all the ISGS and scheduled drawal of all the beneficiaries shall be deemed to have been revised to be equal to their actual generation / drawal for all the time blocks affected by the grid disturbance. Certification of grid disturbance and its duration shall be done by the RLDC."

(b) **Proposed Amendment:** The Regulation 6.5.17 of Grid Code is proposed to be substituted as under:

"17. In case of any grid disturbance, scheduled generation of all the ISGS supplying power under long term / medium term/short term shall be deemed to have been revised to be equal to their actual generation and the scheduled drawals of the beneficiaries/buyers shall be deemed to have been revised accordingly for all the time blocks affected by the grid disturbance. Certification of grid disturbance and its duration shall be done by the RLDC.

Provided further that in case of grid disturbance, for above revision of generation schedule, Long term, medium term and short term schedule shall be deemed to be revised in proportion of original Schedule in each category of transaction and corresponding drawals schedule shall be deemed to be revised accordingly.

Provided that the above shall be applicable till any of the aforementioned transactions was not terminated by the RLDC by giving a notice.

Provided further that in case where Grid Disturbance affects only the Region either where Generator is located or Drawal entity is located, for the short term transactions, following methodology shall be applied:

- (a) for quantum of Deviation, for the periods, till information of Grid Disturbance communicated to the affected entities by concerned RLDC , which was due to difference in Original schedule and revised deemed schedule , payment to /from Deviation settlement account shall be done at contracted energy price of the particular transaction.
- (b) If Generation is affected and drawl is not affected, drawee entity shall pay in its regional deviation account, for deviation at Contracted energy rate. Generator which had received payment shall reimburse drawee entity for this payment.
- (c) If drawal is affected and Generation is not affected, Deviation settlement account of the Region where generator is located, shall pay to drawee entity at the contracted energy rate.”

(c) **Rationale:** This clause has been there in the IEGC since the year 2000 when major regions were not interconnected and various market products like long term, medium term, short term bilateral, short term collective were not there. With gradual interconnection of the regional grids as well as introduction of various market products, the above clause is difficult to implement. For example, on the days of recent grid disturbance, power to affected regions was extended by neighboring regions. If schedule of all utilities is made equal to actual, then there would be no UI in the affected region and power supplied by neighboring regions cannot be accounted for.

While POSOCO suggested this for Long Term and medium term transactions only, the Commission is of the view that there should not be any financial implication on any entity due to Grid Disturbance. Hence it is proposed that Regulation 6.5.17 may be modified in line with Regulation 6.5.16 (transmission bottleneck), wherein schedule of ISGS is made equal to actual and schedule of beneficiaries is revised accordingly (based on entitlement).

30. Amendment in Regulation 6.5.23 of the Grid Code:

(a) Existing Provision:

“23. Special dispensation for scheduling of wind and solar generation

(i) With effect from 1.1.2011, Scheduling of wind power generation plants would have to be done for the purpose of UI where the sum of generation capacity of such plants connected at the connection points (called Pooling stations) to the transmission or distribution system is 10 MW and above and connection point is 33 KV and above, for pooling stations which had commissioned after 3.10.2010 and where PPA has not yet been signed. These connection points shall be called pooling stations. For capacity and voltage level below this, as well as for old wind farms (A wind farm is collection of wind turbine generators that are connected to a common connection point) it could be mutually decided between the Wind Generator and the transmission or distribution utility, as the case may be, if there is no existing contractual agreement to the contrary. The schedule by wind power generating stations (excluding collective transactions) may be revised by giving advance notice to SLDC/RLDC, as the case may be. Such revisions by wind power generating stations shall be effective from 6th time block, the first being the time-block in which notice was given. There may be one revision for each time slot of 3 hours starting from 00:00 hours of a particular day subject to maximum of 8 revisions during the day.

(b) Proposed Amendment: Regulation 6.5.23 of the Grid Code has been proposed to be substituted as under:

“(23) With effect from 15.7.2013, Scheduling of wind power generation plants would have to be done for the purpose of deviation settlement where the sum of generation capacity of such plants connected at the connection points (called Pooling stations) to the transmission or distribution system is 10 MW and above and connection point is 33 kV and above, for pooling stations commissioned after 3.05.2010. For capacity and voltage level below this, as well as for old wind farms (A wind farm is collection of wind turbine generators that are connected to a common connection point), it could be mutually decided between the Wind Generator and the transmission or distribution utility, as the case may be, if there is no existing contractual agreement to the contrary. The schedule by wind power generating stations (excluding collective transactions) may be revised by giving advance notice to SLDC/RLDC, as the case may be. Such revisions by wind power generating stations shall be effective from 6th time block, the first being the time-block in which notice was given. There may be one revision for each time slot of 3 hours starting from 00:00 hours of a particular day subject to maximum of 8 revisions during the day.”

(c) Rationale: In accordance with Commission's order dated 16.1.2013 in Petition No. 209/2011 wherein based on report of Task Force, it was decided that pooling station commissioned after 3.5.2010 shall be considered as criteria. If there is no separate pooling stations for wind generators, then for wind generating station connected through common feeder and terminating at a sub-station, the bay shall be considered as pooling point and all provisions of this Regulations shall apply.

In case State agency comes to conclusion that most of the capacity of wind generator is connected at a voltage level lower than 33 kV and due to this is being excluded from this mechanism, it may approach the respective State commission and seek its approval for bringing these generators also under this mechanism subject to the condition that pooling station must be commissioned/ augmented after 3.5.2010. The objective is to bring maximum capacity under RRF mechanism so that variation due to this can be measured and monitored through proper forecasting.

31. Amendment in Regulation 6.5.34 of Grid Code:

(a) Existing Provision:

"34. While availability declaration by ISGS shall have a resolution of one decimal (0.1) MW and one decimal (0.1) MWh, all entitlements, requisitions and schedules shall be rounded off to the nearest two decimal at each control area boundary for each of the transaction, to have a resolution of 0.01 MW and 0.01 MWh."

(b) Proposed Amendment: Regulation 6.5.34 of the Grid Code has been proposed to be substituted as under:

"34. While availability declaration by ISGS shall have a resolution of one decimal (0.1) MW and one decimal (0.1) MWh, all entitlements, requisitions and schedules shall be rounded off to the nearest two decimals at each control area boundary for each of the transaction, to have a resolution of 0.01 MW and 0.01 MWh."

(c) Rationale: The amendment for scheduling and despatch of renewable energy generation has been proposed consequent to third amendment in Connectivity Regulations issued on 26.3.2013.

Amendments to Annexure 1 to the Grid Code (Complementary Commercial Mechanism)

32. Amendment of para 3 of annexure 1:

(a) Existing Provision: Para 3 of Annexure 1 provides as under:

“(c) Wind energy being of variable nature, needs to be predicted with reasonable accuracy for proper scheduling and dispatching of power from these sources in the interconnected system. Hence wind generation forecasting is necessary for increased penetration. Wind generation forecasting can be done on an individual developer basis or joint basis for an aggregated generation capacity of 10 MW and above connected at a connection point of 33 kV and above. If done jointly, the wind forecasting facility shall be built and operated by wind developers in the area and sharing of the cost shall be mutually discussed and agreed.”

(b) **Proposed Amendment:** It has been proposed to substitute para 3 as under:

“3. Wind energy being of variable nature, needs to be predicted with reasonable accuracy for proper scheduling and dispatching of power from these sources in the interconnected system. Hence wind generation forecasting is necessary for increased penetration. Wind generation forecasting can be done on an individual developer basis or joint basis for an aggregated generation capacity of 10 MW and above connected at a connection point of 33 kV and above. If done jointly, the wind forecasting facility shall be built and operated by wind developers in the area and sharing of the cost shall be mutually discussed and agreed. For the purpose of this Regulation, the agency which would be assigned the work of forecasting, scheduling, metering and energy accounting, etc., shall be designated as coordinating agency.

This coordinating agency shall submit to SLDC an authorization on behalf of all generators that it is coordinating with copy endorsed to respective RLDC.

The RLDCs/SLDCs shall interact with coordinating agency only for forecasting, scheduling, metering and energy accounting, deviation and RRF settlement. SLDCs/RLDCs shall not be a party or respondent for any dispute between coordinating agency and its Generators.”

(c) **Rationale:** The amendment is in accordance with the decision taken by the Commission in petition No. 209/2011.

33. Amendment of para 5 of Annexure 1

(a) **Existing provision:**

“5. The wind generators shall be responsible for forecasting their generation upto an accuracy of 70%. Therefore, if the actual generation is beyond +/- 30% of the schedule, wind generator would have to bear the UI charges. For actual generation within +/- 30% of the schedule, no UI would be payable/receivable by the generator. The host State shall bear the UI charges for this variation, i.e. within +/- 30%. However, the UI charges borne by the host State due to the wind generation, shall be shared among all the States of the country in the ratio of their peak demands in the previous month based on the data published by the CEA, in the form of a regulatory charge operated through the Renewable Regulatory fund(RRF). This provision shall be applicable with effect from 1.1.2011, for the new wind farms with

collective capacity of 10 MW and above connected at connection point of 33 kV level and above, and who have not signed any PPA with States or others as on the date of coming into force of the IEGC.”

(b) **Proposed Amendment:** the words "who have not signed any PPA with the States or others as on date of coming into force of this IEGC" shall be substituted with the words "where pooling station was commissioned on or after 3.5.2010 and total connected generating capacity is 10 MW or above".

(c) **Rationale:** The amendment has been proposed is in accordance with the decision taken by the Commission in petition No. 209/2011.

34. Insertion of a new para in Annexure 1:

(a) **Proposed amendment:** A new para shall be added after para 5 of Annexure 1 to the Principal Regulations as under:

“5A. If the capacity of the pooling station for Wind Generator at present is less than 10 MW, as and when its connected capacity becomes 10 MW or above, it shall participate in forecasting and scheduling. The ABT metering at pooling station shall be provided by the concerned DISCOM/STU or CTU as applicable. The cost of this shall be borne by all generators connected at that pooling station in proportion to their connected capacity and shall be paid by coordinating agency working on behalf of generators connected at the pooling station. Forecasting, scheduling and energy accounting shall be done at pooling station level.

In cases where pooling station capacity was augmented to 10 MW or above after 3.5.2010, both old and new generators connected at the pooling point shall participate in forecasting and scheduling.

Necessary arrangement of transferring real-time data from pooling station to SLDC/RLDC shall be made by coordinating agency and concerned DISCOM/STU shall facilitate this. The integration of this data with SCADA system of SLDC and onward transfer of the same to RLDC shall be the responsibility of SLDC. If required, this real time data may be accessed by coordinating agency for improving real time forecasting.”

(b) **Rationale:** The amendment has been proposed is in accordance with the decision taken by the Commission in petition No. 209/2011.

35. **Amendment of para 7 of Annexure 1:**

(a) **Existing Provisions:**

“7. In case of solar generation no UI shall be payable/receivable by Generator. The host State, shall bear the UI charges for any deviation in actual generation from the schedule. However, the net UI charges borne by the host State due to the solar

generation, shall be shared among all the States of the country in the ratio of their peak demands in the previous month based on the data published by CEA, in the form of regulatory charge known as the Renewable Regulatory Charge operated through the Renewable Regulatory Fund as referred to in clause 5 above. This provision shall be applicable, with effect from 1.1.2011, for new solar generating plants with capacity of 5 MW and above connected at connection point of 33 KV level and above and, who have not signed any PPA with States or others as on the date of coming into force of this IEGC.”

(b) Proposed Amendment: In para 7 of Annexure 1 to the Principal Regulations, the words "who have not signed any PPA with the States or others as on date of coming into force of this IEGC" shall be substituted with the words "where the solar generation was commissioned on or after 3.5.2010 and total connected generating capacity is more than 5 MW".

(c) Rationale: The amendment has been proposed is in accordance with the decision taken by the Commission in petition No. 209/2011.

36. Insertion of a new para in Annexure 1:

(a) Proposed provision: A new para has been proposed to be added after para 7 of Annexure 1 to the Grid Code as under:

“7A. For computation of financial implication on account of deviation in generation of renewable energy under Renewable Regulatory Fund in accordance with paras 5 and 7 above, Reference Rate shall be the Deviation Settlement Rate of average frequency of last year for the respective synchronized Grid i.e. NEW Grid and Southern Grid.”

(b) Rationale: The amendment has been proposed is in accordance with the decision taken by the Commission in petition No. 209/2011.

Appendix-I

FREQUENCY PROFILE NEW GRID								
(% Time frequency was)								
FREQUENCY PROFILE	< 48.5	48.5 - 49.5	< 49.5	49.5 - 50.2	>50.2	Max. Freq (Hz)	Min. Freq (Hz)	Avg. Freq (Hz)
Apr-12	0.00	2.38	2.38	93.68	3.94	50.66	49.08	49.90
May-12	0.00	10.82	10.82	87.82	1.36	50.75	48.82	49.80
Jun-12	0.00	19.95	19.95	78.66	1.39	50.68	48.75	49.70
Jul-12	0.00	24.38	24.38	73.59	2.03	51.21	49.79	49.68
Aug-12	0.00	1.57	1.57	89.72	8.71	50.65	48.82	49.95
Sep-12*	0.00	0.60	0.60	83.73	15.67	50.65	48.96	50.02
FREQUENCY PROFILE	<49.0	49.0-49.7	<49.7	49.7-50.2	>50.2	Max. Freq (Hz)	Min. Freq (Hz)	Avg. Freq (Hz)
Sep-12#	0.00	3.22	3.22	84.09	12.69	50.65	48.96	50.03
Oct-12	0.00	3.33	3.33	90.39	6.28	50.61	49.37	49.98
Nov-12	0.00	0.05	1.79	85.83	12.38	50.63	49.33	50.02
Dec-12	0.00	4.39	4.39	84.1	11.51	50.63	49.25	50.00
Jan-13	0.00	4.63	4.63	80.95	14.42	50.78	49.3	50.01
FREQUENCY PROFILE SR GRID								
(% Time frequency was)								
FREQUENCY PROFILE	< 48.5	48.5 - 49.5	< 49.5	49.5 - 50.2	>50.2	Max. Freq (Hz)	Min. Freq (Hz)	Avg. Freq (Hz)
Apr-12	0.00	7.79	7.79	91.28	0.93	50.66	48.66	49.69
May-12	0.00	5.61	5.61	94.01	0.38	50.63	48.81	49.7
Jun-12	0.00	7.83	7.83	91.03	1.14	50.79	48.86	49.68
Jul-12	0.00	0.00	6.95	92.18	0.87	50.61	48.81	49.69
Aug-12	0.00	3.17	3.17	95.57	1.26	50.55	48.86	49.75
Sep-12*	0.00	1.68	1.68	95.88	2.44	50.58	49.12	49.81
FREQUENCY PROFILE	<49.0	49.0-49.7	<49.7	49.7-50.2	>50.2	Max. Freq (Hz)	Min. Freq (Hz)	Avg. Freq (Hz)
Sep-12#	0.00	0.00	18.37	81.43	0.2	50.51	49.12	49.79
Oct-12	0.00	8.26	8.26	89.38	2.36	50.73	49.19	49.86
Nov-12	0.00	0.00	4.16	91.85	3.99	50.69	49.15	49.91
Dec-12	0.00	3.68	3.68	93.4	2.92	50.87	49.28	49.90
Jan-13	0.00	0.00	3.78	91.41	4.81	50.87	49.24	49.94

* (till 16 sep) # (17 Sep onwards)