

Central Electricity Regulatory Commission Notification

New Delhi,

No. L-1/18/2016-CERC – In exercise of powers conferred under clause (h) of sub-section (1) of Section 79 read with clause (g) of sub-section (2) of Section 178 of the Electricity Act, 2003 (36 of 2003), and all other powers enabling it in this behalf, the Central Electricity Regulatory Commission hereby makes the following regulations to amend the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010 including the first to fourth amendments thereof (hereinafter referred to as “the Principal Regulations”), namely:-

1. Short title and commencement –

(1) These regulations shall be called the Central Electricity Regulatory Commission (Indian Electricity Grid Code) **(Fifth Amendment)** Regulations, 2016,

(2) These regulations shall come into force with effect from the date of their publication in the Official Gazette.

2. Amendment of Regulation 2 of Principal Regulations

a) Regulation 2. (1) (sss) 'Definition' of Spinning Reserves shall be substituted as under:-

"The Capacity which can be activated on the direction of the system operator and which is provided by devices including generating stations/units, which are synchronized to the grid and able to effect the change in active power."

c) Regulation 2 (2) may be replaced with the following:

"Words and expressions used in these regulations and not defined herein but defined in the Act or other relevant CERC Regulations shall have the meaning as assigned to them under the Act or relevant CERC Regulation."

3. Amendment of Part 1 of Principal Regulations-

Following clause shall be added at the end of Regulation 1.4 (v)

"This section will also cover scheduling and despatch of power of ISGSs for operation of Ancillary Reserve Services, for utilization of Un-requisitioned surplus power and for operation of Spinning Reserves with the process of the flow of information between the Generating Stations, National Load Despatch Centre, Regional Load Despatch Centre, Power Exchanges, the State Load Despatch Centres and other concerned users."

4. Amendment of Part 2 of Principal Regulations-

a) Following shall be added as Regulation 2.2.1 (m)

"Coordination with ISGSs, Regional Load Despatch Centers, State Load Despatch Centers and Regional Power Committees for implementation of Ancillary services, prudent utilization of Un-requisitioned power, and identification and operation of Spinning Reserves at inter-State level as per Detailed Procedure and Regulations specified by the Commission."

b) Regulation 2.2.2 (i) may be replaced as under:

"NLDC shall be the nodal agency for collective transactions and Ancillary Services including Spinning Reserves."

c) Regulation 2.3.2 (g) may be replaced as under:

"Operation of Ancillary Services including Spinning Reserves."

d) Following shall be added as Regulation 2.4.2 (i) & (j)

"2.4.2 (i) – To perform the functions as mandated under the Central Electricity Regulatory Commission (Ancillary Services Operation) Regulations, 2015."

2.4.2 (j) -To maintain the account of energy transacted under Ancillary Services Operation including Spinning Reserves "

e) Following shall be added as clause 2.7.1 (f)-

"be responsible for the functions as mandated in the detailed procedures under Central Electricity Regulatory Commission (Ancillary Services Operation) Regulations, 2015."

5. Amendment of Part 5 of Principal Regulations-

a) Regulation 5.2 (f): "All thermal generating units of 200 MW and above and all hydro units of 10 MW and above" shall be substituted with *"All Coal/lignite based thermal generating units of 200 MW and above, Open Cycle Gas Turbine/Combined Cycle generating stations having gas turbines of capacity more than 50 MW each and all hydro units of 25 MW and above"*.

b) In 5.2 (f) (i) (a) word "Thermal generating units" shall be substituted with words *"Coal/lignite based thermal generating units."*

c) In 5.2 (f) (i) (b), the words and number "10 MW" shall be substituted with the words and number "25 MW".

d) Following shall be added as clause 5.2 (f)(i) (c) –

"Open Cycle Gas Turbine/Combined Cycle generating stations having gas turbines of capacity more than 50 MW each: with effect from 01.04.2017"

e) Regulation 5.2 (f)(ii) (a) may be substituted as follows:

"There should not be any reduction in generation in case of improvement in grid frequency below 50.05 Hz (for example, if grid frequency changes from 49.9 to 49.95 Hz, or from 50.00 to 50.04 Hz there shall not be any reduction in generation). For any fall in grid frequency, generation from the unit should increase as per generator droop upto a maximum of 5% of the generation subject to ceiling limit of 105% of the MCR of the unit having regard to machine capability".

f) In Regulation 5.2 (f) (iii) words "Gas Turbine/combined cycle Power Plants" shall be removed

i) **Amendment of Regulation 5.2 (h):** In Regulation 5.2 (h), the sentence, "All thermal generating units of 200 MW and above and all hydro units of 10 MW and above operating at or up to 100% of their Maximum Continuous Rating (MCR) shall normally be capable of (and shall not in any way be prevented from) instantaneously picking up to 105% and 110% of their MCR, respectively, when the frequency falls suddenly."

shall be substituted with sentence

"All coal/lignite based thermal generating units of 200 MW and above, Open Cycle Gas Turbine/Combined Cycle generating stations having gas turbines of capacity more than 50 MW each and all hydro units of 25 MW and above operating at or up to 100% of their Maximum Continuous Rating (MCR) shall have the capability of (and shall not in any way be prevented from) instantaneously picking up to 105%, 105% and 110% of their MCR, respectively, when the frequency falls suddenly."

ii) Following para may be added at the end of clause 5.2 (h):

"For the purpose of ensuring sustainable primary response, RLDCs/SLDCs shall not schedule the generating units beyond ex-bus generation corresponding to 100% of the Installed capacity. Further, Valve Wide Open (VWO) operation of units is not allowed so that there is margin available in valve opening for providing primary response upto 5% of the generation level. In case of gas/Liquid fuel based units also, adequate margins while scheduling should be kept by RLDCs/SLDCs in due consideration of prevailing ambient conditions of temperature and pressure viz.

a viz. site ambient conditions on which installed capacity of these units have been specified.

Provided that the VWO margin shall not be used by RLDC to schedule in Ancillary Services."

6. Amendment of Part 6 of Principal Regulations:

a) Amendment to Regulation 6.5

i) Clause 3, shall be substituted as follows:

"By 1 PM every day, the ISGS shall advise the concerned RLDC, the station-wise ex-power plant MW and MWh capabilities foreseen for the day after the next day, i.e., from 0000 hrs to 2400 hrs of the day after the next day."

ii) Clause 4 shall be substituted as follows:

"The above information of the foreseen capabilities of the ISGS and the corresponding MW and MWh entitlements of each State, shall be compiled by the RLDC every day for the day after the next day, and advised to all beneficiaries by 3 PM. The SLDCs shall review it vis-à-vis their foreseen load pattern and their own generating capability including bilateral exchanges, if any, and advise the RLDC by 5 PM their tentative drawal schedule for each of the ISGS in which they have Shares, long-term and medium-term bilateral interchanges, approved short-term bilateral interchanges. "

iii) Existing clause no.7 shall be substituted as follows:

"7. By 7 PM each day, the RLDC shall convey:

- (i) The ex-power plant "despatch schedule" to each of the ISGS, in MW for different time block, for the day after the next day. The summation of the ex-power plant drawal*

schedules advised by all the beneficiaries shall constitute the ex-power plant station-wise despatch schedule.

- (ii) The tentative "net drawal schedule" to each regional entity, in MW for different time block, for the day after the next day next day. The summation of the station-wise ex-power plant drawal schedules from all ISGS and drawal from /injection to regional grid consequent to other long term access, medium term and short-term open access transactions, after deducting the transmission losses (estimated), shall constitute the regional entity-wise drawal schedule.*
- (iii) ISGS wise Un-requisitioned surplus (URS) power to ISGS and SLDCs.*

iv) Clause 8 shall be substituted as follows:

8(a) Original Beneficiaries of an ISGS will have first right to give requisition for the URS power of the ISGS. Such original beneficiaries shall advice RLDCs, through their SLDC, regarding quantum of power and time duration of such drawal out of declared URS of the ISGS, by 8 P.M. In case full URS of an ISGS is requisitioned by more than one original beneficiary, RLDC shall allocate URS proportionately based on the share of these original beneficiaries in the ISGS.

8(b) RLDCs to post the ISGS wise data of balance URS on its website by 9 P.M. after modifying the tentative net drawal schedule of the original beneficiaries after taking into account the URS requisitioned and associated transmission losses.

8(c) ISGS may sell the balance URS power left after completion of the process of requisition by other original beneficiaries of the

plant, in the market. The original beneficiary shall communicate by 12PM about the quantum and duration of such URS power to ISGS to enable ISGS sell same in the market. If the original beneficiary fails to communicate to ISGS, then the ISGS shall be entitled to sell the URS power of the beneficiary in the market.

8(d) The URS which has been sold and scheduled by ISGS in the market (power exchange or through STOA) cannot be called back by the original beneficiary.

8 (e) After sale in market as under 8(d) above, if any power still remains under URS, the same may be requisitioned by the beneficiaries of the station .

8(f) By 6 P.M, each day, RLDC shall convey ex-power power plant dispatch to each ISGS for the next day after incorporating sale in market.

8(g) Any change in drawals/foreseen capacities shall be communicated to RLDCs by 10 P.M of the day prior to day of scheduling."

v) Following para shall be added at the end of clause 19.

"Provided that if a generator is not able to restore the unit by the estimated time of restoration, RLDC shall revise the schedule only one more time on the basis of new estimated time of restoration and the revision schedule shall become effective from the 4th time block, counting the time block in which the revision is advised by the generator to be the first one.

7. New Regulation 6.5 (A): New Regulation "6.5 (A)" shall be added after Regulation 6.5 as follows:

"6.5 (A) Scheduling and commercial settlement of energy exchanged under Ancillary services including Spinning Reserves and URS:

- a. The Central Electricity Regulatory Commission (Ancillary Services Operations) Regulations, 2015 provides detailed frame work of scheduling and despatch, withdrawal, energy accounting and commercial settlement of Reserves Regulation Ancillary Services.
- b. In case of spinning reserves, the Scheduling and commercial settlement of energy exchanged shall be as per the framework to be notified separately by the Commission.
- c. In case the un-requisitioned surplus power surrendered by the original beneficiary is requisitioned by the other beneficiaries of the ISGS, it shall be treated as reallocation and the fixed charge and variable charge for such energy exchanged shall be borne by the other beneficiary(ies).
- d. In case of sale of un-requisitioned surplus power in market, the generator and the original beneficiary would share the realized gains in the ratio of 50:50. This gain shall be calculated as the difference between selling price of such power and fuel charge including incidental expenses. Subject to provisions to CERC Tariff Regulations, the liability of fixed charge in such case shall remain with original beneficiary.

Explanatory Memorandum

A comprehensive review of IEGC provisions has been carried out in view of recent developments. The major changes proposed are as under:

1. **Creation of Spinning Reserves:**

CERC constituted "Committee on Spinning Reserve" under the Chairmanship of Shri A.S.Bakshi, Member, CERC for adoption of the Spinning Reserve Services in Indian Power system. Committee submitted its report on 17.09.2015 and has recommended that Spinning Reserve Services shall be in place by 01.04.2017. The report of the Committee was accepted by the Commission vide order dated 13.10.2015 in Suo-moto petition no.11/SM/2015. Committee has observed that the existing definition of Spinning Reserves as provided in IEGC includes primary reserves also as the spinning reserves. Accordingly, to separate out the primary reserves (to be utilized through Governor action) from the secondary reserves (to be utilized through AGC), Committee has suggested that following definition of the Spinning Reserves may be replaced with the existing definition :

"Spinning reserves means the Capacity which can be activated on direction of the system operator and which is provided by devices including generating stations/units, which are synchronized to the grid and able to effect the change in active power."

Accordingly, the definition of spinning reserve has been modified suitably.

2. **Definitions under Ancillary including Spinning Reserves services:**

In view of accommodating new definitions with regard to introduction of Ancillary including Spinning Reserves services in Indian Power System through different CERC Regulations, it is to suggest that instead of amending IEGC every time for inclusion of new definitions under new CERC Regulations, the Regulation 2 (2) may be amended as follows:

"Words and expressions used in these regulations and not defined herein but defined in the Act or other relevant CERC Regulation shall have the meaning assigned to them under the Act or other relevant CERC Regulation."

3. **Inclusion of scheduling and despatch of power of ISGSs for operation of Ancillary Reserve Services, for utilization of Un-requisitioned power and for operation of Spinning Reserves Services:**

Tariff Policy dated 28.1.2016 mandates that the un-requisitioned power not scheduled by the original beneficiaries of ISGSs shall be utilized by way of allowing the generator to sell the same through market. Accordingly, to allow scheduling and despatch of power under these services, it is suggested to include the following para at the end Regulation 1.4 (v) of part-I of IEGC;

"This section would also cover scheduling and despatch of power of ISGSs for operation of Ancillary Reserve Services, for utilization of Un-requisitioned power and for operation of Spinning Reserves with the process of the flow of information

between the ISGS, National Load Despatch Centre (NLDC), Regional Load Despatch Centre (RLDC), Power Exchanges and the State Load Despatch Centres (SLDCs), and other concerned users."

4. Amendment of Part 2 of Principal Regulations:

The amendments of Regulation 2.2.1 (m), 2.2.2 (i), 2.3.2 (g), Regulation 2.4.2 (i) & (j) and introduction of 2.7.1 (f) have been suggested to cover the new roles and responsibilities entrusted to various organisations i.e NLDC, RLDCs, SLDCs and RPCs for operation of Ancillary Reserve Services, for utilization of Un-requisitioned power and for operation of Spinning Reserves Services.

5. Amendment of Part 5 of Principal Regulations

a) Amendment of regulation 5.2 (f), 5.2(f)(i)(b) and addition of 5.2(f)(i)(c) :

A number of state generators through petitions have prayed that governing system of old hydro stations of small capacity are of mechanical ball type and it is very difficult to get the spares for this type of governors as most of the OEMs have stopped the production of the spares. CERC constituted a Committee for 'Implementation of FGMO in generating units'. The Committee consisted of representative from CEA, CERC, POSOCO, ISTS Generating stations, State Generating stations, BHEL, and Alstom. Committee in consideration of vintage of small hydro units, small contribution these units make in terms of the required primary response and the fact that it is difficult to get the spare parts of the governors installed in these old units, has recommended as follows in its report:

"The current lower limit of 10 MW for hydro stations for providing primary response through FGMO/RGMO may be increased to 25 MW."

Further, the Committee has observed that gas stations/combined cycle power stations are capable of providing primary response through governor action, especially, within the narrow operating band under which the Indian grid is operating now.

Accordingly, it has been suggested to amend the Regulation 5.2 (f) and its sub-clauses for excluding the generators below 25 MW from the list of hydro stations which are required to provide the primary response through governor action and for including the Open Cycle Gas Turbine/Combined Cycle generating stations having gas turbines of capacity more than 50 MW each in the list of stations which are required to provide the primary response through governor action.

b) Amendment in Regulation 5.2 (f) (ii):

This amendment has been suggested to bring more clarity with respect to the extent of primary response required from ISGS by way of governor action. Accordingly, it has been suggested to replace the Regulation 5.2 (f) with following:

"There should not be any reduction in generation in case of improvement in grid frequency below 50.05 Hz (for example, if grid frequency changes from 49.9 to 49.95 Hz, there shall not be any reduction in generation). For any fall in grid frequency, generation

from the unit should increase as per generator droop limited to 5% of the generation level before frequency fall, with ceiling limit of 105% of the MCR of the unit subject to machine capability".

c) Amendment in Regulation 5.2 (f) (iii):

Committee on 'Implementation of FGMO in generating units', in its report has observed that gas stations/combined cycle power stations are capable of providing primary response through governor action, especially, within the narrow operating band under which the Indian grid is operating now. As such, this amendment has been suggested to exclude the gas stations/combined cycle power stations from the list of exempted power stations which were not required to provide primary response through governor action.

d) Amendment of Regulation 5.2 (h):

This suggestion is again based on the recommendation of the Committee on 'Implementation of FGMO in generating units'. It was observed by the Committee that desired primary response during frequency excursions is not being observed on sustainable basis as most of the thermal units are running on full capacity, sometimes on overload capacity with VWO and also due to the fact that even partly loaded generation units resort to operation with their valves wide open. Accordingly, Committee has suggested that RLDC/SLDC shall not schedule the units beyond bus generation corresponding to 100% of the installed capacity. Further, it has been opined by the Committee that Valve Wide Open (VWO) operation of units shall not be allowed so that there is margin available in valve opening for providing primary response upto 5% of the generation level. In case of gas/Liquid fuel based units also, adequate margins while despatching should be kept by RLDCs/SLDCs in due consideration of prevailing ambient conditions of temperature and pressure viz. a viz. site ambient conditions on which installed capacity of these units have been specified. Valve Wide Open term has been defined in technical documents like American Society of Mechanical Engineers (ASME) and hence not been specifically defined in this Regulation.

6. Amendment of Part 6 of Principal Regulations:

a) Amendment of Regulation 6.5:

1. Tariff Policy dated 28.1.2016 has introduced certain provisions to utilize the URS of ISGSs as quoted below:

"Power stations are required to be available and ready to dispatch at all times. Notwithstanding any provision contained in the Power Purchase Agreement (PPA), in order to ensure better utilization of un-requisitioned generating capacity of generating stations, based on regulated tariff under Section 62 of the Electricity Act 2003, the procurer shall communicate, at least twentyfour hours before 00.00 hours of the day when the power and quantum thereof is not requisitioned by it enabling the generating stations to sell the same in the market in consonance with laid down policy of Central Government in this regard. The developer and the procurers signing the PPA would share the gains realized from sale, if any, of such un-requisitioned power in market in the ratio of 50:50, if not already provided in the PPA. Such gain will be calculated as the difference between selling price of such power and fuel charge. It should, however, be ensured that such merchant sale does not result in

adverse impact on the original beneficiary(ies) including in the form of higher average energy charge vis-à-vis the energy charge payable without the merchant sale. For the projects under section 63 of the Act, the methodology for such sale may be decided by the Appropriate Commission on mutually agreed terms between procurer and generator or unless already specified in the PPA."

In order to incorporate the above provisions necessary amendments have been proposed in Regulation 6.5

2. To meet the time line of the Tariff Policy i.e ISGS shall have the communication regarding un-requisitioned power from the procurers at least 24 hours before 0.00 hours of the day of scheduling, it is being suggested that day ahead scheduling and despatch procedure shall be replaced with two day ahead scheduling. The time lines for each step of scheduling and despatch procedure are debatable subject to restriction that information of URS, which can be sold in the market, shall be available to ISGS at least 24 hours before 0.00 hours of the day of scheduling. The scheduling is proposed to start at 1 PM on D-2 day if D is the day on which implemented schedules are applicable .
3. After schedules are given by original beneficiaries as per their entitlement in a power station, it has been suggested that the original beneficiaries of an ISGS will have first right to give requisition for the URS power of the ISGS. Other original beneficiaries are proposed to be provided a window to reschedule a power left over by original procurer as per the procedure in vogue as per Order in Petition Nos. 310/mp/2014 dated 5.10.2015 and ROP in Petition No. 16/SM/2015 dated 5.1.2016.
4. After the original beneficiaries of a station has rescheduled the power, the original beneficiary whose power has still been left un-requisitioned may provide a formal communication to ISGS by 12PM on day before the day of implemented schedules. Such communication shall clearly specify the quantum of power and duration for which ISGS may sell the power in the market.
5. In case such power for which original beneficiary has allowed the generator to sell in the market has been sold in the market, beneficiary shall not be allowed to recall the power by rescheduling. In case power left unsold on the market, original beneficiaries may schedule the power from 4th time block as per procedure in vogue.
6. The gains made by the ISGS i.e the difference in selling price and the fuel cost including incidental expenses, shall be shared between the generator and the procurers who have surrendered their share, in the ratio of 50:50.

b) Inclusion of Regulation 6.5 (a)

The new regulation provides the methodology for scheduling and commercial settlement of energy exchanged under Ancillary services including Spinning Reserves and URS.