



KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Indian Companies Act, 1956)

TARIFF AND REGULATORY AFFAIRS CELL

Vydyuthi Bhavanam, Pattom, Thiruvananthapuram 695 004 India

Phone (O) +91 471 2514317

E-mail: trac@ksebn.in www.kseb.in

KSEBL/TRAC/AE1/ IEGC 2022/2022-23/ 451

30 .09.2022

To,

Shri. HARPREET SINGH PRUTHI

Secretary - CERC

3 rd & 4th Floor

Chanderlok Building

36, Janpath, New Delhi-110001

Email: secy@cercind.gov.in, shilpa@cercind.gov.in

Sir,

Sub: Draft CERC (Indian Electricity Grid Code) Regulations,2022 - KSEBL Remarks- Reg

Ref: (1) CERC Notification No. L-1/265/2022/CERC dated 7th June 2022

Kindly refer above.

KSEBL remarks on draft CERC (Indian Electricity Grid Code) Regulations,2022 is furnished as follows.

Chapter -1. Regulation 3	
Definition – following additions are required	1. Manual Voltage Regulator 2. Start – Up Power 3. Charging /Discharging cycle of ESS
32. Demand – definition shall be modified as	Demand of active power in MW and Reactive power in MVAR of electricity, unless specified.

Chapter -2. Clause 5.3.(f)	
(f) After considering the demand forecasting and the generation resource procurement planning carried out based on the principles specified under this Regulation, each distribution licensee shall ensure demonstrable generation resource adequacy as specified by the respective SERC for the next five (5) years starting 1st April of the next year. Failure of a distribution licensee to meet the generation resource adequacy target approved by the SERC shall render the concerned distribution licensee liable for payment of resource adequacy noncompliance charge as may be specified by the respective SERC.	The generation resource planning is being done by taking planned outages of machines and 10% contingency outages of all the sources. But in actual scenario, the main reason for the non-compliance of resource adequacy planning may be due to unexpected forced outages of units or shortage in tied up power due to some other contingencies which is beyond the control of licensees. Hence the liability for not achieving the Resource adequacy target should be done away.

CHAPTER 5 – COMMISSIONING AND COMMERCIAL OPERATION	
20. DATA TO BE FURNISHED PRIOR TO NOTICE OF TRIAL RUN	MCR also to be included.
22. TRIAL RUN OF GENERATING UNIT	
2 (a) A hydro generating unit shall be in continuous operation at MCR for twelve (12) hours	For the trail run operation, hydro generating station operation also to be in continuous at MCR for seventy – two (72) hours for getting better understanding of bearing temperature rise, generator/field wing/transformer temperature rise, machine vibration.
24.DOCUMENTS AND TEST REPORTS PRIOR TO DECLARATION OF COMMERCIAL OPERATION – SUB REGULATION 2,3,4	PSS (Power System Stabiliser) tuning also to be included for hydro station with capacity greater than 50 MW. Protection testing report also to be included.

<p>CHAPTER 6 – OPERATING CODE 28. OPERATING PHILOSOPHY – clause (7)</p>	
<p>Every generating station and transmission substation of 132 kV and above shall have a control room manned by qualified operating personnel round the clock</p>	<p>Shall be replaced as: Every generating station and transmission substation of 110/132 kV and above shall have a control room manned by qualified operating personnel round the clock</p>
<p>29. SYSTEM SECURITY</p>	
<p>(6) All generating units shall have their automatic voltage regulators (AVRs), Power System Stabilizers (PSSs), voltage (reactive power) controllers and any other requirement in operation, as per CEA Technical Standards for Connectivity. If a generating unit with capacity higher than 50 (fifty) MW is required to be operated without its AVR in service, the generating station shall immediately intimate to the concerned RLDC along with the reasons thereof and the likely duration of such operation and obtain its permission.</p>	<p>As a part of ensuring voltage stability the generating units shall be provided with AVR and MVR (Manual Voltage Regulator). Generating unit with capacity greater than 25 MW shall have redundant AVR and MVR (with cross control i.e AVR1 to MVR1,2 and AVR2 to MVR1,2) PSS shall be made applicable to generating station with capacity higher than 50 MW.</p>
<p>3. Maintenance of grid elements shall be carried out by the respective users, transmission licensees, STU's and CTU in accordance with the provisions of THE CEA (Grid Standards) Regulations, 2010. Outage of any element which is causing or likely to cause danger to the grid or sub-optimal operation of the grid shall be monitored by the concerned RLDC. RLDC shall report such outages to RPC and RPC shall issue suitable instructions to restore such elements in a specified time period.</p>	<p>Maintenance of grid elements shall be carried out giving due importance the availability of the concerned element in the grid. The Maintenance schedule shall be done giving weightage to weekdays and holidays. In case the non-availability of the element impacts the evacuation of generation/ scheduling of generation, then such elements should be invariably given maintenance during low demand period ie either during off peak hours or during holidays/ Sundays when the demand is low and cheaper power is available in the market.</p>
<p>(4) Except under an emergency, or when it becomes necessary to prevent an imminent damage to a costly equipment, no user shall suddenly reduce its generating unit output by more than 100 (one hundred) MW [20 (twenty) MW in case of NER] without</p>	<p>The point here is that the change in schedule of the generator should not impact the reliability of the grid and the grid parameters, hence the change in generation should not be limited to figures like 100MW, but specified with respect to the percentage change in the output of the generation with</p>

<p>prior permission of the respective RLDC.</p>	<p>respect to the duration the variation persists in the grid.</p> <p>At present the RE penetration is more. Sudden variation in RE power demands more than 100MW generation variation.</p> <p>Also, with the introduction of real time market, the fluctuation in schedule needs more than 100MW variation in generation/demand. Hence, limiting the variation to 100MW cannot be acceptable.</p>
<p>(5) Except under an emergency, or when it becomes necessary to prevent an imminent damage to a costly equipment, no user shall cause a sudden variation in its load by more than 100 (one hundred) MW without prior permission of the respective RLDC.</p>	<p>Same is also in the case of demand profile. Sudden variation in load may be defined in terms of how much time it persists. Usually, it is seen that at times of very low frequency there are hanging loads in the grid. And at times of high frequency low load conditions is seen to occur. Hence the duration of change in load with time is also to be emphasized here.</p>
<p>30. FREQUENCY CONTROL AND RESERVES</p> <p>(2) The NLDC, RLDC and SLDC shall ensure that the grid frequency remains close to 50 Hz. and ensure that the frequency is restored within the allowable band of 49.95- 50.05 Hz at the earliest.</p>	<p>Even during low frequencies, even if the entity is under drawing for the last 6 time blocks, as a part of sign change a drawal has to be done. During such an operation while enforcing the DSM regulation, this action causes the frequency to deteriorate further. Also same is the case while exporting when frequency is above 50Hz, Unless and until there is a change in the DSM regulation, this clause w. r. t SLDC cannot be implemented ,even if SLDC wants to .</p>
<p>(3) All users shall adhere to their schedule of injection or drawl, as the case may be, and take such action as required under these regulations and as directed by NLDC or respective RLDCs or respective SLDCs so that</p>	<p>There are instances in the grid while the entity is still in the under drawal mode and the frequency of the grid is lower . In this case to improve the frequency, the entity will be asked by RLDC to put in more reserves (hydro reserves w r t kerala), but this might</p>

<p>the grid frequency is maintained and remains within the allowable band.</p>	<p>exceed the 12% of schedule and will have commercial impact on the entity. Hence while taking steps to improve frequency, the ACE will be showing a high deviation. hence the present regulation should foresee this.</p>
<p>30(10)(i) The normal governor action shall not be suppressed in any manner through load limiter, Automatic Turbine Run-up System (ATRS), turbine supervisory control or coordinated control system and no time delays shall be deliberately introduced. In case of renewable energy generating unit, reactive power limiter or power factor controller or voltage limiter shall not suppress the primary frequency response within its capability. The inherent dead band of a generating unit/frequency controller shall not exceed +/- 0.03 Hz.</p>	<p>In the case of primary response, it is not clearly mentioned about FGMO or RGMO. For FGMO, the inherent dead band of a generating unit/frequency controller shall be kept not exceeding +/- 0.01 Hz especially in the scenario of high RE penetration. For RGMO response the dead band may be set at +/- 0.03 Hz. As in the scenario of RE penetration, it will be better to keep FGMO until SARS is implemented fully for balancing the grid.</p>
<p>30.(11) Secondary Reserves</p>	<p>The SLDC are required to maintain secondary and Tertiary reserves after assessing its frequency response characteristics and share assessment of the control area with RLDC. The secondary control aims at regulating the generation or load in the control area to restore frequency within the allowable band.</p> <p>In this context the DISCOMS as a part of resource adequacy and reliability has entered into various PPAs with the intention of giving 24X 7 supply to the consumers. In the present IEGC by 16:30 hrs of the (D-1)day the schedules of the D day has to be finalised hence the flexibility available with SLDC is now curtailed. The regulation mandates that adequate reserves in the form of secondary and tertiary reserves to be maintained in the control area to address any contingency that may result in deviation of frequency. Maintaining reserves implies commercial obligations on the part of</p>

	<p>DISCOM. Moreover, these reserves may not be required in real time and remain idle. Hence as the already available reserves are now no longer available with the SLDC, remuneration from pool account must be made available to the DISCOMs for maintaining such reserves.</p> <p>The surplus available in different control area may be made available as regional/ national reserve and a methodology should be arrived for pooling these reserves among the control areas.</p> <p>Otherwise maintaining reserves will be a burden to the DISCOMs and the intention of maintaining a healthy grid will be lost.</p> <p>Hence a suitable mechanism to incentivise the DISCOMS for maintaining reserves is to be implemented in the regional as well as national level.</p>
30.(11)(t) Secondary Reserves	Considering the cost of investment AGC shall be made applicable for hydro station with capacity greater than 25 MW.
34(4) -System Restoration	<p>Line charging capability of generator (including the working of algorithm) during system restoration also be reviewed.</p> <p>For the large hydro generator SCADA controller should be capable to execute line charging restoration during black outs by gradually building generator voltage.</p>
35 (1)(C) - Real Time Operation	Governor action also to be considered as part of bringing back power system to normal state by regulating frequency fluctuation. (Especially for Hydro generators)
SCHEDULING AND DESPATCH CODE	It is clear that the regulation has taken all steps to insulate the

45

(12) Minimum turndown level for thermal generating stations The minimum turndown level for operation in respect of a unit of a regional entity thermal generating station shall be 55% of MCR of the said unit: Provided that the Commission may fix through an order a different minimum turndown level of operation in respect of specific unit(s) of a regional entity thermal generating station: Provided further that such generating station on its own option may declare a minimum turndown level below 55% of MCR.: Provided also that the regional entity thermal generating stations shall be compensated for generation below the normative level either as per the mechanism in the Tariff Regulations or in terms of the contract entered into by such generating station with the beneficiaries or buyers, as the case may be.

generators from incurring any kind of loss due to load schedule. However, in this context the regulation may also look into the financial liability of all the beneficiaries. As per this Clause a minimum turndown level for thermal generating stations is to be analysed with respect to forceful schedule levied on the beneficiaries in the context of giving schedule to the generators by all means, ie by removing the right to downward revision of schedule of the generator within th e day.

46. SECURITY CONSTRAINED UNIT COMMITMENT (SCUC)

4.(b) *Beneficiaries of such stations, whose units are likely to be scheduled below minimum turndown level for some or all time blocks of the D day, shall be permitted to revise their requisitions from such stations by 1630 Hrs of D-1 day, in order to enable such units to be on bar. The revised requisition from the said generating stations, once confirmed by the beneficiaries by 1630 Hrs of D-1 day, shall be final and binding after 1630 Hrs of D-1 day and further reduction in drawal schedule shall not be allowed from such stations for such time blocks.*

With this regulation, the general trend will be that SLDC will give full schedule to all the CGS stations which are down the merit order stack and low schedules to costlier stations. Only these stations will be left for SCUC.

Also chances of full schedule to costlier stations can also be given anticipating high demand. This can have reverse effect on the economy of the DISCOM as merit order violation is prone to take place in real time if there is variation in demand as only upward revision possible during the day.

This has some serious consequence on economic scheduling and dispatch by SLDC. Currently the weather is

<p><i>5(b) The request for revision of scheduled transaction for 'D' day, shall be allowed to be made in any time block starting 2 PM on 'D-1' day subject to the following: (i) In respect of a generating stations whose tariff is determined under Section 62 of the Act, upward revision of schedule shall be allowed starting 2 PM on 'D-1' day, only in respect of the remaining available quantum of unrequisioned surplus after finalization of schedules under day ahead market.</i></p>	<p>changing dynamically and even the demand forecasted for the next 15 minutes in some instance is varying by 300MW to 400MW due to sudden change in the cloud movement, weather conditions etc. Hence with this regulation, the mechanisms available to SLDC to schedule power to the consumers economically and without interruption will be at stake as there is no room for flexibility. As the states are bound to maintain the balance 24X7 between supply and demand, the DISCOMs have entered into PPA's with CGS/IPP. The upward scheduling for the D Day is allowed only from 14hrs, of D-1 day. The main intent here is to get a higher schedule for the generator. In this context the revival of a unit under forced shutdown or after annual overhauling is not mentioned. As there should be provision for the beneficiaries to revise the schedule i.e downward revision, otherwise the full schedule from the unit will be allotted to the beneficiary who will not be prepared to take it. Here multiple options for enhancing the schedule of the generator is allowed. Hence option should be made available to the SLDC to give downward revision also as the dynamicity in demand and resources are varying in real time.</p>
<p><i>(8) Discrepancy in schedule (a) All regional entities, open access customers, injecting entities and drawee consumers may closely check their transaction Schedule and point</i></p>	<p>This is very important as it seen that very often WBES of RLDCs are sluggish and issuing revisions after the gate closure.</p>

<p><i>out errors, if any, to the concerned LDC. (b) The final schedules issued by RLDC shall be open to all regional entities and other regional open access entities for any checking and verification, for a period of 5 days. In case any mistake or omission is detected, the RLDC shall make a complete check and rectify the same.</i></p>	<p>RLDCs may be advised to update the WBES as the realtime schedules have commercial impact on the DISCOMs. Many a times revisions are issued in a day for the previous hours as SLDCs are navigating towards the rest of the day there is less room for examination for the lapsed hours. Hence issuing of post facto revision by RLDCs within a day has to be limited. Though in many instances only the post facto revision of the final schedule get captured. Also steps may be taken to include IPPs in WBES.</p>
<p>46.4.h UNIT SHUT DOWN (USD)</p> <p><i>i. The generating stations or units thereof, identified by NLDC in co-ordination with RLDCs, as per Clause (4) (c) of Regulation 46 of these regulations, but not brought on bar under SCUC, shall have the option to operate at a level below the minimum turn down level or to go under Unit Shut Down (USD).</i></p> <p><i>ii. In case a generating station, or unit thereof, opts to go under unit shut down (USD), the generating company owning such generating station or unit thereof shall fulfil its obligation to supply electricity to its beneficiaries who had made requisition from the said generating station prior to it going under USD, by entering into a contract(s) covered under the Power Market Regulation or by arranging supply from any other generating station or unit thereof owned by such generating company subject to honouring of rights of the original beneficiaries of the</i></p>	<p>Here the already in place RSD procedure can be invoked. Hence other mechanism with commercial implication is not needed.</p> <p>In this case if any unit/ generator goes under shutdown the beneficiary may be given an option to whether it requires power through the alternate source before the generator finalises procurement through alternate source, If cheaper power is available with SLDC in real time, opportunity to schedule the same may be given to SLDC's.</p>

<p><i>said generating station or unit thereof from which supply is arranged.</i></p>	
<p><i>30 (11) (r) If a State falls short of maintaining secondary reserve capacity as allocated to it in terms of clause (o) of this Regulation, the NLDC through RLDC shall procure such Secondary reserve capacity on behalf of the State and allocate the cost of procurement of such capacity on that State based on the methodology specified in the Ancillary Service Regulations.</i></p> <p><i>12 (e) If a State falls short of maintaining tertiary reserve capacity as allocated to it in terms of sub-clause (d) of clause (12) of this Regulation, the NLDC through RLDCs shall procure such tertiary reserve capacity on behalf of this State and allocate the cost of procurement of such capacity to that State based on the methodology specified in the Ancillary Services Regulations.</i></p>	<p>NLDC through RLDC shall issue a warning message to SLDC before procuring any reserve capacity on behalf of the state to patch up the deficit in the secondary reserve. So that some opportunity is left with SLDC for acting.</p>
<p>Chapter-8 Cyber Security</p>	
<p><i>New cluse to be added</i></p>	<p>All VPN connections from OT network to external communication are presently disconnected/disabled as per the direction received from MoP. Hence suitable provisions are to be included in the grid code regarding” VPN connectivity -Do’s and Don’ts” for remote monitoring of OT system under exigency</p>

ANNEXURE – 1 - The following also to be included	
4. C Busbar Protection Relay -	i. Check Zone is provided or not j. LBB is connected with Busbar trip k. Status of PT switching relay in the case of high impedance relay, if applicable.
4. e) DC auxiliary system	h. Daily monitoring of pilot cell voltage i. Daily monitoring of Specific Gravity j. Monthly monitoring of Cell Voltages
4.f) Circuit Breaker Details	g. Type of operating Mechanism h. Device for monitoring& controlling operating mechanism

Yours faithfully,


 Chief Engineer
 Commercial & Tariff
