

APP views on changes/modifications required in the existing IEGC Regulations

A. Key suggestions:

The energy sector is in a state of transition with fast increasing penetration of RE sources. The PLF of thermal generating stations has been steadily falling and is likely to decrease even further as per CEA reports. This presents significant challenges for thermal plants in terms of running at very low loads, as well as frequent cycling in order to balance out the variability of the increasing RE energy sources. Therefore, necessary safeguards and compensatory mechanisms need to be put in place to protect investments on the ground. At the same time the Regulations also need to continue promoting RE sources while taking measures for safe and secure integration with the grid. With this background, our key suggestions to the Committee are:

- Compensation in the form of liberal operating parameters for partial loading may be allowed for each time block separately rather than considering on cumulative basis for a year as a whole. This is because any loss in a given time block is already incurred by the Generator and shall not be offset by better operation of the plant in subsequent time blocks.
- For PPAs executed under Section 63 of the Electricity Act, 2003 apart from the present compensation for partial loading in form of liberal operating parameters there is need to offset the permanent damage caused to the metallurgy of the equipment due to frequent thermal variations caused on account of frequent start/stops.
- Reserve Shutdown (RSD) of a unit is done on the instantaneous instructions of concerned SLDC/RLDC and the generator is bound to follow the instructions. Therefore, RSD cannot be considered a planned outage since it is immediate & instantaneous in nature. Therefore, revision in schedule of short term open access transactions should be allowed in case of RSD along with forced outages.
- There is no provision for revision of schedule for collective transactions in case of forced outages, leading to risk of high DSM liability. This should be allowed.
- Additional Capex may be allowed for plant renovation to mitigate impact of frequent start/stops on account of RSD.
- Grid Code should ensure uniform methodology for preparation of Merit Order Dispatch (MOD) and implementation of Availability Based Tariff (ABT) across all States and at regional level.
- Operationalizing 'Must Run' for RE projects:
 - As per Regulations 5.2 (u), the SLDC/RLDC can instruct the solar/wind generator to back down only in cases of grid security or safety of any equipment or personnel is endangered. Many SLDCs are asking wind and solar generators to back down in cases other than event of grid security or safety of any equipment or personnel is endangered, like low demand in the system. Therefore, it is suggested that any backing down in cases other than grid security or safety of any equipment or personnel is endangered, a provision of deemed generation should be provided and its compensation from the State or regional UI Pool by SLDC /RLDC needs to be mandated.

- Further, it is suggested that the term “Grid Security” needs to be specifically defined since low demand in system cannot be considered as a grid security event. SLDCs in the name of low demand are asking high cost wind and solar generators to back down throughout the day, without asking State thermal generator to back down to its technical limit or without reducing central sector share. Definition of “Grid Security “ may be introduced along the following lines...’*Changes in the basic pre-defined power system parameters (such as voltage, frequency, df/dt, dv/dt or thermal loading of equipment) beyond acceptable technical limits.*’
- Pooling at the Regional/ National level for forecasting and scheduling - RE generators connected to different CTU pooling stations should have an option for accounting their deviations in an aggregated/ combined manner through an aggregator/ QCA for the purpose of availing the benefit of larger geographical area and diversity as is being done in AP and Karnataka. Such aggregator/ QCA at Regional/ National level can, going forward, also bundle together generation from different sources to inject into the grid – a measure which is implemented in some European countries for effective grid integration of RE.
- In case of instances of grid security/ constraints, RE should be the last to be backed down.
- Existing provisions of Ancillary Services Regulations may be extended to balancing the market due to large variation in the schedule from actual generation of Wind/ Solar generators.

B. Specific views on the IEGC Regulations:

S.No	Clause no. as per IEGC Regulation	Suggestions and Rationale
1	Definitions – 2 (1) (e)	‘Beneficiary’ - Currently, the definition reads as “a person who has share in an ISGS”. However, it is suggested that a sole procurer from a ISTS connected generating station is also a beneficiary as per the Code.
2	Definitions - 2 (1) (m)	‘Central Transmission Utility’ - It currently defines Central Transmission Utility (“CTU”) as a government company, which the central govt. may notify under sub-section (1) of Section 38 of the Act. However, it is required to introduce a slight change in the definition to ensure that the CTU shall be a different entity than a Transmission Licensee.

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3	Definitions – 2 (1) (ii)	‘Generating Unit’ – May be modified suitably for solar generating plants and wind-solar hybrid systems with/ without storage
4	Definitions – 2 (1) (hhh)	‘Power System’ - Considering the need of Energy Storage Systems as an integral part of Grid Operation or as independent capacities, the definition may be augmented to include systems like Energy Storage System
5	Definitions – 2 (1) (sss)	‘Spinning Reserve’ - The definition of spinning reserve should include the Energy Storage System located at both the transmission line or at the generating stations
6	Introduction - 1.1	Considering the need of Energy Storage Systems as an integral part of Grid Operation or as independent capacities, The section may be augmented to include systems like Energy Storage System, Pump Storage Systems, Integrated Generating systems using more than one sources of energy, etc.
7	Objective – 1.2	As the sector has grown over the years now, the objective may also now include strong measures to support the stability of the Grid by implementing Primary Support, Secondary and Tertiary support, Energy Storage Systems which can be made available with certain suitable service charge for such services.
PART 2 – ROLE OF VARIOUS ORGANIZATIONS AND THEIR LINKAGES		
8	Role of NLDC – 2.2	Along with other roles, NLDC may also provide guidance to CTU/STU for network planning in a manner so as to achieve generation cost optimisation at national level which should not only include the ISGS, but also the State generating stations and IPPs.

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9	Role of RLDC – 2.3.1 (6)	This clause may be suitably modified to reflect the recent MOP order mandating the opening of LCs by procurers. Right now, there are doubts on its enforceability on SLDCs and with respect to single part tariff plants, mostly RE generators, bulk of which are connected to STU and are under jurisdiction of SLDCs. This inclusion will give the order force of law.
10	Role of RPC – 2.4	<p>The following may be added to the role of RPC for ISTS RE plants:</p> <ul style="list-style-type: none"> • To plan for grid augmentation to facilitate RE integration into the grid and to facilitate their timely commissioning and commercial operation. • To build consensus amongst all participants to enable Must Run of RE plants • To develop and maintain MIS on such information like block-wise availability and transmission capability of regional grid, PLFs of conventional generators and backing down of RE plants so that backing down of RE on the pretext of grid security can be reduced and ultimately eliminated subject to grid security and contingency.
11	Role of SLDC – 2.7.1 (2) (a)	<p>The clause may be modified to read as:</p> <p><i>‘The SLDC shall -</i></p> <p><i>(a) Be responsible for optimum scheduling and dispatch of electricity within a State, in accordance with the contracts, including enforcement of such commercial terms as opening of LCs, entered into with the licensees or the generating companies operating in that State.’</i></p>
PART 3 – PLANNING CODE FOR INTERSTATE TRANSMISSION		
12	Planning Code for	The section may be appropriately modified to bring out clearly that CTU shall be a different entity than a Transmission Licensee to avoid conflict of Interest.

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	ISTS – Introduction - 3.1 (i)	
13	Objective – 3.2	With the increasing intervention of Roof Top Solar, RESCO model and Distributed generation in the sector, Planning Code may also take into consideration of such growth.
14	Planning Criterion – 3.5	<p>Transmission system planning and development is undertaken based on prospective requirement, lead time for development of the infrastructure considering area specific issues. Therefore, it is imperative to develop the system anticipating the future demand and the assets put to use only in phased manner. It may happen during early days after commissioning of the assets the loading / utilization of the bays will be lower and which is unavoidable phenomenon, hence Transmission Licensee should not be held responsible for creation of excess assets.</p> <p>CERC / SERC do not allow the CAPEX / O&M till assets are put to use i.e. capitalization is considered post utilization. This will affect the Transmission network development and reliability of the network, therefore it is suggested that above perspective should be covered under the proposed amendment of IEGC such that the Transmission network development is undertaken in holistic manner.</p>
15	Planning Criterion – General Philosophy 3.5 (a)	<p>It is suggested that while planning of transmission network in Megacities, Metro cities, Urban area etc., planning may be based on N-1-1/ N-2 Criteria without load shedding.</p> <p>Rationale - Important METRO cities and Capital cities need reliable Transmission Network and continuity of supply is of very much importance considering economic, Law & Order considerations. Therefore, there is need for differentiation for Transmission planning for METRO cities. It is suggested that at least N-2 criteria should be mandatory for METRO cities.</p>

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16	Planning Data – 3.6	<p>Presently planning data / base case is not shared with all Transmission licensees, hence if any of the Transmission Licensee likes to undertake study of the network related to its Transmission assets or future development it is not possible to study or provide meaningful inputs in view of already planned / proposed network.</p> <p>Therefore, system base case/ network simulation studies may be shared with all Transmission Licensees to facilitate system planning activities on need basis.</p>
PART 5 – OPERATING CODE		
17	Operating Philosophy – 5.1	<p>It is submitted that the CEA through its Technical Standards for connectivity to the Grid (Second Amendment 2019) mandates participation in frequency response as under:</p> <p><i>Clause 4(C)(4) - The generating stations with installed capacity of more than 10 MW connected at voltage level of 33 kV and above –</i></p> <p><i>(ii) shall have governors or frequency controllers of the units at a droop of 3 to 6% and a dead band not exceeding ± 0.03 Hz:</i></p> <p><i>Provided that for frequency deviations in excess of 0.3 Hz, the Generating Station shall have the facility to provide an immediate (within 1 second) real power primary frequency response of at least 10% of the maximum Alternating Current active power capacity;</i></p> <p><i>Clause 4(C)(4) : The generating stations with installed capacity of more than 10 MW connected at voltage level of 33 kV and above –</i></p> <p><i>(iii) shall have the operating range of the frequency response and regulation system from 10% to 100% of the maximum Alternating Current active power capacity, corresponding to solar insolation or wind speed, as the case may be;</i></p>

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		<p>In Renewable Energy (RE) Power plants (Solar/Wind), it is only possible to curtail active power injection in to the grid based on frequency response requirement, as they are powered by natural resource i.e., Solar irradiation and Wind speed. Enhancement of power by installing surplus capacity is not a viable solution. Unlike Thermal Power Plants, RE Power Plants do not have demonstrated capability of delivering frequency response through governor system. Since the generation of RE plants varies throughout the day and depends on natural resources, ramping up of generation by 10% when frequency deviation is in excess of 0.3Hz is unrealistic.</p> <p>It is understood that frequency response from RE Power Plants is expected when plant is generating between 10% to 100% of its capacity depend upon solar insolation or wind speed. However as described above, expectation of frequency response from RE Power Plant is unlikely and impractical. For wind/solar generators, overarching principles on above lines need to be incorporated under the Operating Philosophy as a part of IEGC.</p> <p>Further, expectation of frequency response from RE Power Plant is difficult and goes against principles of “must run” of the installed capacity. Besides, the impact of this on the commercials and the revenue stream of the RE plant based on single part tariff needs to be taken into consideration. For wind/solar generators, overarching principles on above lines need to be incorporated under the Operating Philosophy (5.1) as a part of IEGC.</p>
18	5.1 (e), (f)	<p>These clauses stipulate the development and maintaining of detailed procedures for each regional grid/national grid by RLDC/NLDC. It is suggested that such procedures should be brought out for public consultation before finalising. Further, it is pleaded that even if such procedures are being developed for certain Pilot studies, still the route of public stakeholder consultation process shall be followed.</p>
19	Demand Estimation	<p>At present, demand estimation is not very scientific at all levels and there is need for adopting a robust statistical system for demand estimation which will help operational planning. The provisions related to demand estimation and management measures need to</p>

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	for Operational Purposes – 5.3	be implemented in timely manner and NLDC / central agency may be given a task to review the implementation progress. This is also the need of the hour in line with the operating frequency band tightening being undertaken through DSM Regulations.
20	Demand Management – 5.4	<p>Monitoring of demand and deviations w.r.t schedules of Regional entities and State entities should be based on real time AMI/AMR data based on instantaneous meter parameter of Active power and Reactive power (instead of SCADA data as per current practice). Also in order to ensure redundancy and accuracy of data, meter wise SCADA data should also be used in such a way that in case of non-availability of some of the meter data due to failure of communication or some other issue, specific meter to be replaced with SCADA data as both systems are independently communicating to the Control centre. Monthly report of the SCADA data and Meter data should be published by all control centres.</p> <p>Rationale:</p> <ol style="list-style-type: none"> 1. Under the DSM Regulations the State / Participants are subjected to stringent limits and penalty is applicable if the deviations are higher. It is observed that the real time operations and decision making is done based on the SCADA data whereas the billing is based on the SEM data. There are large variations observed in both data which has financial implications on Pool participants. On many occasions there are operational issues between RLDC and SLDC's as there is difference in the data at the interface. Therefore, there is need for accurate online data with back-up plan. This can be achieved with the implementation of the AMI with real time data refresh. This will not only help to reduce financial burden it will also help in improving the Grid Operations. Hence this should be mandated through IEGC for effective implementation and uniform policy for all stakeholders. 2. Redundancy of data source is also important, if one of the meters is not communicating, the data source can be replaced with SCADA data to avoid major difference in data. This will ensure that the operations and settlement are done on same data and decisions taken by System Operators are based on correct data.

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PART 6 – SCHEDULING AND DESPATCH CODE		
21	Commercial Operation of CGS and ISGS - 6.3 A	This section deals with defining the procedure of declaring COD for thermal generating stations and Hydro generating stations (with or without pondage). However, with growing footprint of renewable generating in the sector, it has become pertinent to also define the commission procedure, parameters for COD of a renewable power station (including solar PV (ground mounted and rooftop), Wind (shore/off-shore) etc.
22	Technical Minimum Schedule - 6.3 B	As per CERC Order No. L-1/219/2017-CERC dtd. 5th May 2017, Clause 4.1 (ii), the Compensation shall be worked out for a month on cumulative basis considering degradation in SHR and AEC based on Average Unit Loading, subject to reconciliation at the end of the year. Our Submission: Compensation for degradation of Heat Rate (SHR) and Auxiliary Energy Consumption (AEC) needs to be considered based on existing time Block of 15 Min basis instead of averaging at the end of month and finally at the end of year since any loss in a given time block is already incurred by the Generator and shall not be offset by better operation of the plant in subsequent time blocks. The Compensation is the consideration which is to be paid to the Generator for something which has been lost, which is required to be measured on time-block basis since the operations at low load will be given on time block basis and not on cumulative basis for entire year, hence, it is imperative that performance shall be measured and compensate on time block basis only.
23	6.3 B	As per CERC Order No. L-1/219/2017-CERC dtd. 5th May 2017 Clause 4.2 (i), no compensation for degradation of Secondary Fuel oil consumption is Payable for the year if total number of start-ups is equal to or less than 7 x no. of units in the generating station or the Actual Secondary Fuel Oil Consumption is less than Normative Fuel Oil Consumption.

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		<p>Our Submission: Thermal power stations running at 55% are vulnerable for tripping of boilers due to improper flame condition in case of poor coal quality or any tripping of coal mills. Due to this additional oil support will be required for flame stabilization to avoid tripping of Unit thereby ensuring reliability of power supply. The oil required for such incidences is not considered for any compensation in this order and compensation is only considered for solely attributable to reserve shut-downs.</p> <p>Also, if loading is not allowed for say more than 100 - 120 hrs of continuous operation at 55% loading, the Unit may be forced to carry out wall soot blowing with oil support.</p> <p>Hence, it is requested that appropriate provision may be incorporated for compensation for both the above cases.</p>
24	6.3 B (7)	<p>This provision envisages for RPCs to work out a mechanism for compensation of SHR and AUX for additional start ups in excess of 7 start ups during a year. However, we understand that the same has not been provided by a few RPCs and thus we request that a suitable standard compensation mechanism may be incorporated in IEGC itself.</p>
25	6.4.2 (c) (iii)	<p>Necessary clarification is required in IEGC whether the Regulation 42(3) of CERC Tariff Regulations 2019 shall also be applicable or not to the generators whose tariff is determined by CERC but falling under the control area of SLDC as per IEGC Regulation 6.4(2)(iii).</p>
26	6.5.19	<p>Reserve shutdown (RSD) of unit is done on the instantaneous instructions of concerned SLDC / RLDC and the generator is bound to follow the instructions. Therefore, reserve shutdown of a unit cannot be considered a planned outage since it is immediate & instantaneous in nature, which construes to be forced outage.</p> <p>Further, there is no provision for revision of schedule for collective transactions, in case of forced outage. Due to this, generators participating in the power exchange have to face huge DSM liability in case of plant outage incidents which are not in their control.</p>

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		Hence, Regulation 6.5.19 may be modified to allow revision in schedule of short term open access transactions and collective transactions in case of forced outage and/or reserve shutdown.
27	6.5.21	If revision of capability below two percent of previous capability is not allowed then this would hinder the ability of the generator to comply with the sign change requirement as per the 5 th Amendment to DSM Regulations and may result in the generator paying additional charges. Therefore, this provision may be removed.
28	6.5	For RE generators, revision of schedule should be made effective from 2nd time block, counting the block in which revision was requested to be the first one; there should not be any cap on the number of revisions allowed per day. Frequent Revisions in schedule will help the generator to cover forecasting errors arising out of the inform nature of RE resources.
29	6.5	The sections of capacity declaration and scheduling processes may be appropriately modified to include the procedures, gate closures in view of RRAS and SCED mechanisms. While integrating SCED and RRAS mechanism with day ahead scheduling processes, it may be ensured that minimum time span to be provided to the generators shall not be less than two 15 min time blocks. Also the procedure should make suitable provisions for Real Time market as envisaged in CERC Staff Paper.

Other General comments:

- (a) For generators having partially tied up capacity, RLDC should schedule their power even if their PPAs are on MW basis instead of % basis (definition of Share may be amended in the Code). Availability under each PPA should be computed by RLDC with contracted capacity as per that PPA in the denominator instead of Installed Capacity.
- (b) Intra-day revision of Interstate Short term Open Access schedule may be allowed in line with the Long / Medium Term contracts (Currently advance notice of 2 days is required). Generally DISCOMs undertake Bilateral Transactions to meet the Daily / monthly / seasonal peaks. This will also help

generators to tide over deviations in schedule arising out of partial outage etc. These decisions are undertaken well in advance hence it is not possible to forecast accurately. These provisions will also enable effective RE integration.

- (c) Reserve Shutdown (RSD) will vary with, amongst other factors, unit size and so will their start-up and shut-down timings. This should be mandated to be as per OEM guidelines.
- (d) The definition of spinning reserve should include the Energy Storage System located at both the transmission line or at the generating stations.
- (e) FGMO should not be mandatory for Sec 63 projects as it is not essential requirement for AGC implementation. Further, feasibility of FGMO installation needs to be checked for each station.
- (f) Synchronous generators should be incentivized to provide reactive power support
- (g) The actual ramp up and ramp down rates are lower than the design rates under practical conditions. Particularly for high capacity generators, the ramp rate is much less than 1% due to high thermal inertia. Hence, it would be appropriate to decide a normative ramp up rate which may be derived based on the capacity, vintage, technology/make of such generating units. Accordingly, an appropriate methodology may be included in IEGC to work out the normative rate.
- (h) SCED payment is received by generating station after getting statement from NLDC (monthly) and the generator has to give payment after getting report from RLDC (weekly). This leads to additional working capital requirements.
- (i) Compensation for degradation of performance should be block-wise rather than on monthly basis. Besides, compensation for adverse impact on life of the generating asset may also be provided to enable recovery of capital costs over such reduced life (at least 10% reduction of useful life may be considered).
- (j) Share by beneficiaries, once surrendered on a day-ahead basis should not be allowed to be recalled within the day
- (k) SCED is beyond the scope of the original PPA and therefore should be compensated at actual costs as per tariff regulations.
- (l) Grid Code may provide clarity for charges on account of usage of the auxiliary power from transformer tertiary terminal.