



Views on IEGC – Tata Power

17 July 2019



- Operationalizing “Must Run” of RE generating plants
- Grid integration of 175 GW of RE capacity by FY 22
- Suggestions with respect to conventional generators
- Other Miscellaneous suggestions
- Changes in existing sections of IEGC



OPERATIONALIZING “MUST RUN” OF RE GENERATING PLANTS

Operationalizing “Must Run” for RE power plants



- 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.

- There have been instances of instructions to back down RE projects by SLDCs (most of the RE capacity is under the jurisdiction of SLDCs at present) citing the reason of grid security. 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.*
- 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 at the national/ regional level – this will enable the provision of running the station as per the available natural resources and enhancing the scope of ancillary services. So the development of ancillary services and RT markets should match the development timelines of RE capacity.
- In view of huge focus on solarization of agricultural pumps through grid connected net-metered installations aggregating to around 15-20 GW (which also provides alternate income stream for farmers), due emphasis needs to be accorded to segregation and strengthening of agricultural feeders in the purview of discoms/ SLDCs under the overall supervision of concerned RLDCs to ensure their availability.

Operationalizing “Must Run” for RE power plants



- To add the following as a function of RPC for ISTS RE plants:
 - 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.
- With increasing share of RE in energy mix, RPC shall ensure participation from RE generating companies OCC, PCC etc.
- For RE generators, revision of schedule should be effected 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.
- Certification of grid disturbance is done by RLDC. The declaration of disturbance is done by RLDC and hosted on the web-site. As per Clause no. 6.5 (17), this procedure needs to be implemented under all circumstances, including when RE stations are being asked to back down. This will foster transparency in the working of the system operations.

Operationalizing “Must Run” for RE power plants



- 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:
- *The generating stations with installed capacity of more than 10 MW connected at voltage level of 33 kV and above 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: 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;*
 - The above regulations necessitates installing surplus capacity (spinning reserve) and even that does not guarantee the frequency response mandated. So is there a need for defined a fixed spinning reserve for RE plants?
 - Unlike Thermal Power Plants, RE Power Plants may not be fully capable of delivering frequency response through any governor system – the first set of such governors are being installed by generators and we will have to wait for the outcome on their efficacy
 - Since the generation of RE plants varies throughout the day and the year and depends on natural resources, ramping up of generation by 10% when frequency deviation is in excess of 0.3Hz may not be realistic.
 - In case of a solar plant, the impact of this regulation on the DC installed capacity and consequently on the commercials cannot be undermined.



- CEA Technical Standards for connectivity to the Grid (Second Amendment 2019)
 - *The generating stations with installed capacity of more than 10 MW connected at voltage level of 33 kV and above 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;*
 - 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 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.
- 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. Formula for deemed generation can be as follows:
(Tariff in Rs./ kWh) X (Generation in same period last year in MUs– yearly degradation in MUs)



GRID INTEGRATION OF 175 GW OF RE CAPACITY BY FY 22

Grid integration of 175 GW of RE capacity by FY22



- Bundling of energy from RE with conventional generation offers immediate solution, also from a transmission infrastructure utilization point of view (in case where RE generation happens in the vicinity of a thermal generating station)
- Energy storage solutions when installed in conjunction with RE capacity is another option, both, for ST and LT
- Battery storage offers a solution in the short and immediate term; however at present these do not present a commercially viable solution apart from making the power system hugely dependent on imports
- From an environmental perspective, it is suggested that hydro resources and pumped storage schemes be developed.
- Two/three such large capacity schemes (one each in each of the RE rich regions) need to be developed along Case II TBCB lines
- These schemes should be grid assets rather than generating assets – their benefits and costs socialized over the entire Regional/ national grid; their development may be included in the scope of the recently concluded JV between NTPC and PGCIL – both entities with a Pan India footprint.
- A variant of the pumped storage scheme could be to use hybrid RE resources for pumping up the water – this would help in peak supply shaving as well as shifting of supply to peak hours.
- Energy storage systems need to be recognised as a separate entity in IEGC – they are consumers and producers of power at the same time. Therefore, it needs to be mentioned specifically in the relevant sections of the Code – in Definitions for Connectivity & Spinning Reserve, Scope of Planning (3.3), Planning Philosophy (3.4) etc.



SUGGESTIONS WITH RESPECT TO CONVENTIONAL GENERATION

Suggestions with respect to conventional generation



- 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.
- Synchronous generators should be incentivized to provide reactive power support
- 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.
- 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.
- 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).
- Share by beneficiaries, once surrendered on a day-ahead basis should not be allowed to be recalled within the day
- SCED is beyond the scope of the original PPA and therefore should be compensated at actual costs as per tariff regulations.
- 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.
- Minimum 3 blocks to provided for any case of schedule change and in case of forced outage 3 blocks intimation to be removed.



OTHER MISCELLANEOUS SUGGESTIONS



- IEGC, being regulations, have force of law and hence any change in IEGC regulations should qualify for “Change in Law”
- Waste Heat recovery generators should be allowed to either change the schedule for collective transactions or be exempted from DSM as they have no control over generation other than reducing generation by flaring gases in the atmosphere which in turn has an adverse impact on the environment.
- For generators having partially tied up capacity,
 - RLDC should schedule their power even if their PPAs are on MW basis rather than on % 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
- 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.
- Clause 4.6.5 Cyber Security – This should be in line with the framework finalized by the Central Government from time to time.
- Definition of Generating unit to modify suitably for solar generating plants and wind-solar hybrid systems with/ without storage



CHANGES REQUIRED IN EXISTING GRID CODE



Existing Section	Remarks
2. (1). e) Beneficiary means	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. (1). m) Central Transmission Utility means	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.
2.(1).(hhh) Power System means	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
Part – I 1.1 Introduction	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
Part – I 1.1 Objective	As the sector has grown over the years now, the objective shall 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 2.2 Role of NLDC	Along with other roles, NLDC shall 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.



Existing Section	Remarks
2.3.1 (6)	<p><i>All directions issued by RLDCs to any transmission licensee of the state transmission lines or any other licensee of the state.....shall be issued through the SLDC and the SLDCs shall ensure that such directions are duly complied with by the licensee</i></p> <p>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.</p>
2.7 (2) (a)	<p>The clause may be modified to read as The SLDC shall 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</p>
Part – 3 Planning Code for ISTS 3.1 (i) Introduction	<p>The section shall be appropriately modified to bring out clearly that CTU shall be a different entity than a Transmission Licensee to avoid conflict of Interest</p>
Part – 3 Planning Code for ISTS 3.2 Objective	<p>With the increasing intervention of Roof Top Solar, RESCO model and Distributed generation in the sector, Planning Code shall also take into consideration of such growth.</p>



Existing Section	Remarks
Part – 5 5.1(e) & 5.1(f)	While, the clause of the existing IEGC stipulates for developing and maintaining of detailed procedures for each regional grid/national grid by RLDC/NLDC, we wish to humbly submit 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.
Part – 6 Scheduling and Despatch Code 6.3A	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 define the commission procedure, parameters for COD of a renewable power station (including solar PV (ground mounted and rooftop), Wind (shore/off-shore) etc.).
Part – 6 Scheduling and Despatch Code 6.3B.(7)	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.
Part – 6 Scheduling and Despatch Code 6.5	<p>The sections of capacity declaration and scheduling processes shall 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 shall be ensured that minimum time span to be provided to the generators shall not be less than two 15 min time blocks.</p> <p>Also the procedure should make suitable provisions for Real Time market as envisaged in a CERC Staff Paper.</p>

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