

## Grid India remarks on stakeholders comments on section\_1\_4 and\_5 of FTE&I procedure

Sr. No.	Clause no. of draft procedure	Description of the clause	Query	Reply by Grid-India
<b>A</b>	<b>EDF Renewables, Delhi</b>			
1	Section 1 Clause 5	Intimation to RLDC for first time energization and integration of power system elements Other than the documents mentioned above following additional documents, as applicable needs to be submitted to RLDC- 2. CTU/STU charging instructions (It shall clearly mention about the assumptions and connectivity considered in the studies)	Need to clarity on charging instruction approval to be secured from CTUIL/STU. a. At what stage will the CTU issue the charging instruction? b. Will the charging approval from CTU will be issued for each element (Transmission line, substation, Wind Turbine, etc.) of the project?	a. Charging instruction from CTU/STU is required to be submitted to RLDCs before submitting B1-B5A documents for obtaining provisional approval for charging. b. CTU Charging instruction is required for all transmission elements viz. Transmission line, ICT, reactors, FACT devices (except bays)
2	Section 1 Format III A	<i>It is certified that the approval for implementation of new protection system has been obtained from concerned RPC, in compliance to Clause 14(2) of IEGC 2023 and amendments thereof</i>	At present we are sending the details of the Protection System to RPC with copy to RLDC. No formal approval is accorded by RPC. In the revised procedure, has RPC agreed to provide the formal approval and any timelines for giving this approval.	As per Clause. 14(2) and 14(3) of IEGC 2023. RPC shall maintain a database of all protection relay settings and periodically update the same. All users need to furnish protection settings implemented at their end to RPC as per prescribed format. RPC approval is required only when there is a new setting or change/revision in existing protection settings. No time line is specified for RPC to give approval; However, the users are required to intimate any change in the setting to RPC within 15 days.
3	Section 1 Clause 2(i)(c)	i) Document submission during registration c) PPA/PSA details- Copy of signed power purchase agreement (PPA), power sale	Kindly clarify the procedure in respect of proposed sale of power through Power Exchange or in case of sale to Commercial & Industrial customers.	As per Regulation 45(5)(vi) of IEGC 2023, the applicant is required to submit copies of the valid contracts (PPA/PSA etc.) signed by the sellers and the buyers, for

		agreement (PSA) etc. as applicable may be submitted to the respective RLDC as mandated in the Indian Electricity Grid Code		Transactions other than collective transactions. The same is required for facilitating commence of 'scheduling' by RLDCs after successful trial run and COD.
<b>B</b>	<b>GIPCL, Vadodara</b>			
1	Page no. 6	Annexure A4: List of SCADA points to be made available to RLDC (RLDC would need all MW and MVAR data, voltage and frequency of all the buses, all the breaker and isolator positions, OLTC tap positions, Main-1/Main-2 protection operated signals, DC side SCADA data in case of HVDC station, data for FACTS Devices/ESS/Bulk Consumers as per requirement)	<p>1) Differential Protection for dedicated transmission line: There are two possibilities for operation of the protection.</p> <p>a) Main -1 &amp; 2 Differential Protection shall be routed through FOTE (SDH or MPLS)</p> <p>b) direct communication (Single Mode Optical Fiber cable of OPGW) between protection relay at both end Please clarify which methodology is acceptable as per RLDC requirement</p> <p>2) Distance Protection for dedicated transmission line: Distance Protection can be operated as per following methodology.</p> <p>a) Main-1 Distance protection through FOTE (SDH or MPLS).</p> <p>b) Main-2 Distance protection through PLCC.</p> <p>Or any other requirement from RLDC side shall be specified in the procedure only.</p>	<p>This query is not relevant to this Annexure.</p> <p>However, Note(2) clause 1 of schedule V of Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022 may be referred "Transmission lines with distance protection shall, in general, have carrier aided or fibre optic based intercropping or blocking feature".</p>
<b>C</b>	<b>AMPLUS SOLAR</b>			
1	Section 1: Clause 4 - User Registration	Entities/asset owners should get registered with concerned RLDC(s) as a 'User' in RLDC	Entities/asset owners should get registered with concerned RLDC(s) as a 'User' in RLDC Fees & Charges Web Portal, i.e.	Initially a provisional registration of user shall be done by RLDCs upon payment of requisite fees and submission of Appendix-IV as per Fees & Charges Regulations. Subsequently

		Fees & Charges Web Portal, at the time of data submission for carrying out Interconnection Studies.	<a href="https://oms.nrldc.in/">https://oms.nrldc.in/</a> , at the time of data submission for carrying out Inter-connection studies.	Final User Registration is confirmed by RLDC only after submission of connectivity agreement and associated documents.
<b>D</b>	<b>Alfanar Power, Gurugram</b>			
1	Section 1(A), Clause 8	As per Clause 25(1) of IEGC, 2023 and amendments thereof, the concerned beneficiary may raise objection “in writing to the concerned RLDC with a copy to all concerned regarding the trial run within two (2) days of completion of such trial run” in Format-VI	Who are the concerned beneficiaries for raising objection on trial run in case of generation project is developed as merchant generation project i.e. project meant to sell power at power exchange?	Beneficiaries with whom Power purchase Agreement is signed by the Generator. This clause shall not be applicable for purely merchant generators, without having any tied-up firm beneficiaries.
<b>E</b>	<b>Thar Surya 1 Pvt Ltd Delhi</b>			
<b>Sr. No.</b>	<b>Clause no. of draft procedure</b>	<b>Query</b>	<b>Reply by Grid-India</b>	
1	Section 1(B) Applicability	The draft procedure states that the procedure is applicable if case of any change/modification/restoration works in TL and PSS. Please confirm if the same procedure will be applicable in case of any change in PV side.	The procedure is applicable in case of any change/modification/restoration works in Transmission Element and S/S elements for which RLDC issues energization code. However, the CEA (Measures relating to Safety and Electric Supply regulations) 2023 shall be applicable to all electrical installation including electrical plant and electric lines, and the person engaged in the generation or transmission or distribution or trading or supply or use of electricity. Hence, compliance of the same needs to be ensured by all concerned at all times. When user is doing changes in PV side, there may be cases in variation of DC to AC capacity ratio, hence that is required to be submitted to respective RLDC.	

2	Section 1(B) Applicability	In case of replacement of any element with another element of same make and model, does the developer need to apply for CEA energization and subsequent for fresh FTC approval. Or can the developer directly approach control room for required charging codes.	Yes, approval from Electrical Inspector (EI) is required to be taken even in case of replacement with an element of the same make/model as per Clause-1, Chapter-1b FTE&I procedure for Alternative/ Modification of Power system elements
3	Section 1(B) Applicability	In case of change in TL tower location (say within radius of 10 m from initial location) due of some RoW issue, does the developer need to apply for fresh PTCC and FTC approval and subsequently demonstrate trail run operation	Please refer the Chapter-1/Clause-1, of FTE&I procedure for Alternative/ Modification of Power system elements
4	Section 1(B) Applicability	In case of TS1PL, wherein we have already commissioned entire 300 MW, so for installation of Reactive Power compensation device (Capacitor Bank), can we directly approach control room for required charging code or do we need to apply fresh application as per latest procedure.	Need to apply for a fresh FTE &I application since reactive power compensation device is a new grid element.

<b>F</b>	<b>Suzlon</b>		
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Sr. No.	Clause no. of draft procedure	Description of the clause	Query	Reply by Grid-India
1	Section -5 Annexure-I Clause: 1.(ii)(a)	Model Compatibility and Support Guidelines for STATCOM/SVC	UDM - Please remove the requirement of source code submission as this is company intellectual property.	The major issue with the UDM's(.dll files) provided by the majority of the developers are not compatible for the higher versions of the PSS/E. In order to make them compatible, the source code shall be compiled with the Compiler and then shall be used as .dll files for higher versions of the PSS/E. In this regard it is requested to share the source codes & compilation procedure of the UDM's. GRID – INDIA will maintain the confidentiality obligation as mentioned in the FTC procedure

				document & CEA meeting held on 21.07.23.
<b>G</b>	<b>EDF Renewables</b>			
1	<b>Clause 3 Section-5</b>	Trial Run Operation of STATCOM/SVC	Reactive capability of the plant is grid-based event. How the same shall be demonstrated as part of trial run if the Grid situation doesn't permit the same	In line with the IEGC 2023 regulations - 24(9)(b)  Quote " "The following tests shall be performed to validate the full reactive power capability of SVC and STATCOM in both directions i.e., absorption as well as injection mode i. POD performance test ii. Dynamic performance testing: Provided that the transmission licensee may submit offline simulation studies for the specified tests, in case the conduct of tests is not feasible before COD, subject to the condition that tests shall be performed within a period of one year from the date of achieving COD. "Unquote

		General	The Dynamic VAR devices are not modular and to be designed, engineered, and manufactured based on capacity. Considering the lead time many of the inputs are not available to meet the timeline defined by Grid codes. In case of any minor shortfall due to as-built changes in reactive capability of the farm what shall be options and time allowed for capacity enhancement and overcompensation in the event shortfall not in line with the minimum device rating.	Not relevant to FTE&I Procedure
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## Stakeholder comments on section 2 of the FTE&I procedure

1. During the Trail Run of Conventional thermal generating Unit, whether generating companies have to demonstrate the overload capability of 105 % for 1- or 2-time block?

**Ans.** As per IEGC Regulation 24 sub-section (3) (b) (iii),

### *Quote*

*Demonstrate overload capability with the valve wide open as per the CEA Technical Standards for Construction and sustained operation at that level for at least five (5) minutes.*

### *Unquote*

Therefore, thermal generating company must demonstrate the overload capability for at least 5 mins.

2. During the Trail Run of Hydro Generating Unit, what is the duration of demonstration of the overload capability of 10 % and whether generator must demonstrate the output at generator terminal or ex-bus during Trial Run period?

**Ans.** There is no nothing specified in IEGC 2023 regarding demonstration of overload capacity (110 % of MCR) of Hydro Generating Unit.

But there it is mentioned that in case Hydro generating unit fails to demonstrate MCR, they will have the option to de-rate the Unit but in such cases, de-rated MCR will be 90 % of demonstrated capacity.

From the above statement, it is understood that 90 % of demonstrated capacity is declared as MCR, keeping 10 % as overload capacity.

3. Do generators have to intimate to RLDC for Trial Run after cumulative interruption of more than 4 hours?

**Ans.** As per Regulation 22 sub-section (1) (a) (iii)

### *Quote*

*cumulative interruption of more than four (4) hours shall call for a repeat of trial run*

### *Unquote*

Hence, repeat Trial Run is required for cumulative interruption of more than 4 hours.

Also, as per Regulation 21 (1),

### *Quote*

*The generating company proposing its generating station or a unit thereof for trial run or repeat of trial run shall give a notice of not less than seven (7) days to the concerned*

*RLDC, and the beneficiaries of the generating stations, including intermediary procurers, wherever identified:*

*Provided that in case the repeat trial run is to take place within forty-eight (48) hours of the failed trial run, fresh notice shall not be required.*

***Unquote***

Hence, in case of new Trial Run starts within 48 hours of failed Trial Run, no further notice is required.



# Grid India remarks stakeholder comments on section-3 of FTE&I procedure

S.No.	Page No.	Clause No.	Clause	Comment / Suggestion by Stake holder on SECTION-3 of the FTE & I procedure	Reply by GRID-INDIA																											
<b>NTPC Renewable Energy Ltd, NREL</b>																																
1	223	3.h.ii	The following tests shall be performed at the point of interconnection: • Frequency response of machines as per the extant CEA Technical Standards for Connectivity.	As the grid frequency variation is not controlled, then, it may be reviewed how this particular test shall be carried out	As per IEGC 2023 Clause-40, Sub-clause (3) (Page no. 115 in IEGC 2023) Frequency Response Test has been mandated for the Non synchronous Generator (Solar/Wind).  As per the discussion with PPC OEMs, frequency response test can be done as follows; 1. PPC reads the PQ meter, PQ meters takes the real-time (actual) data (As per the PQ meter data (input to PPC) of Frequency (f) and Voltage(V), PPC give the commands to Inverters/WTGs and control the active and reactive power accordingly). 2. In PQ meter simulated frequency and voltage signal can be given by-passing the real-time data. 3. Therefore, frequency reponse test of Solar/Wind plant can be conducted by-passing the real-time data and giving simulated frequency to PQ-meter (Input to PPC).																											
2	227	6	Periodic Testing	What are the tests that will fall under this testing may be mentioned.	As per Clause 40 (PERIODIC TESTING) Table-9 (in pg no. 115 of IEGC 2023) gives the list of test to be carried out in periodic testing.  For PERIODIC TESTING of Non synchronous Generator (Solar/Wind), extract from IEGC 2023 is shown below;																											
			<table border="1"> <tr> <td>Non synchronous Generator (Solar/Wind)</td> <td>(1) Real and Reactive Power Capability for Generator (2) Power Plant Controller Function Test (3) <b>Frequency Response</b> Test (4) Active Power Set Point change test. (5) Reactive Power (Voltage / Power Factor / Q) Set Point change test</td> <td>Applicable as per CEA Technical Standards for Connectivity.</td> </tr> </table>			Non synchronous Generator (Solar/Wind)	(1) Real and Reactive Power Capability for Generator (2) Power Plant Controller Function Test (3) <b>Frequency Response</b> Test (4) Active Power Set Point change test. (5) Reactive Power (Voltage / Power Factor / Q) Set Point change test	Applicable as per CEA Technical Standards for Connectivity.																								
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3	257	4.b of Annexure-I (E) part-B	Detailed v/s Equivalent model response comparison of P, Q, V & I at POI to be demonstrated for different tests like P control, Q control, Voltage control, LVRT, HVRT, frequency response control operation etc.	At page 259, SI no. 7, it is mentioned that FRT tests shall be carried out in <b>both equivalent RMS and EMT Model</b>	S.No. 7 has been modified suitably.  The tests mentioned in SI no. 7 need to be carried out as per the table shown below (already included in the procedure):																											
			<table border="1"> <thead> <tr> <th>S. No.</th> <th>Simulation Test Description</th> <th>Simulation to be carried out on:</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Reactive Power Capability</td> <td>Both - Detailed RMS and Equivalent EMT Model</td> </tr> <tr> <td>2.</td> <td>Power Quality</td> <td>Detailed EMT / Power Quality Assessment Model</td> </tr> <tr> <td>3.</td> <td>Low Voltage Ride Through</td> <td>Detailed and Equivalent RMS and Equivalent EMT Model</td> </tr> <tr> <td>4.</td> <td>High Voltage Ride Through</td> <td>Detailed and Equivalent RMS and Equivalent EMT Model</td> </tr> <tr> <td>5.</td> <td>Operating Frequency Range</td> <td>Both - Equivalent RMS and EMT Model</td> </tr> <tr> <td>6.</td> <td>Frequency Response</td> <td>Both - Equivalent RMS and EMT Model</td> </tr> <tr> <td>7.</td> <td>Dynamic Reactive Power Support</td> <td>Both - Equivalent RMS and EMT Model</td> </tr> <tr> <td>8.</td> <td>Ramping Capability</td> <td>Both - Equivalent RMS and EMT Model</td> </tr> </tbody> </table>			S. No.	Simulation Test Description	Simulation to be carried out on:	1.	Reactive Power Capability	Both - Detailed RMS and Equivalent EMT Model	2.	Power Quality	Detailed EMT / Power Quality Assessment Model	3.	Low Voltage Ride Through	Detailed and Equivalent RMS and Equivalent EMT Model	4.	High Voltage Ride Through	Detailed and Equivalent RMS and Equivalent EMT Model	5.	Operating Frequency Range	Both - Equivalent RMS and EMT Model	6.	Frequency Response	Both - Equivalent RMS and EMT Model	7.	Dynamic Reactive Power Support	Both - Equivalent RMS and EMT Model	8.	Ramping Capability	Both - Equivalent RMS and EMT Model
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4	259	7.b of Annexure-I (E) part-B	Plot of P, Q, Vac, Iac, Id, Iq (IBR output current along with reference in d-q frame) and Vd,Vq (IBR output voltage along with reference in d-q frame) at POI shall be included along with IBR unit response(s) for:	In PSS/c it may not be possible to plot Id, Iq (IBR output current along with reference in d-q frame) and Vd,Vq (IBR output voltage along with reference in d-q frame). May be reviewed	Same shall be plotted in EMT model. Clause suitably modified.																											
5	267	Clause-2 of Annexure-I(E) (a)	<b>IBR Unit Testing, Certification and Report Submission Guidelines:</b>	Many of the projects are already in design and implementation stage where Inverter are already finalized and in manufacturing. These additional requirements might cause additional time and cost escalation for these projects. May be reviewed from this aspect. It should exempt such projects from these requirements in Type Test Report and should be applicable for the projects where Tendering is not done. <b>Please clearly mention at what voltage levels IBR should be tested. Testing of same Inverter can not be possible repeatedly for different projects, therefore uniform guideline for testing should be formed</b>	Inverter OEMs and Accredating agencies should adhere to the FTE & I procedures guidelines, may perform the testing, certification and benchmarking for the specific model once as per the CEA technical standards and FTE & I procedures guidelines, same shall be accepted for same inverter make & model.  As Inverters/WTGs goes in LVRT/HVRT based on its own terminal voltage therefore it should be tested at its own terminal voltage, further voltage difference b/w POI and Inverter terminal and settings need to be kept at Inverter terminal to meet the compliance at POI can be evaluated at the design stage of plant. Hence, plant should opt/procure those Inverters/WTGs which can satisfy plant requirement to meet the compliance at POI for all operating scenarios.  <b>Already in existing procedure.</b>																											

S.No.	Page No.	Clause No.	Clause	Comment / Suggestion by Stake holder on SECTION-3 of the FTE & I procedure	Reply by GRID-INDIA
6	269	4. b of Annexure-I (E) (a)	Simulation models (both EMT & RMS) of PPC shall also be benchmarked, validated & certified by the accredited agency.	Many of the projects are already in design and implementation stage where PPC is already finalized and in manufacturing. <b>These additional requirements for these projects might cause additional time and cost escalation for these projects. It should exempt such projects from these requirements in Type Test Report and should be applicable for the projects where Tendering is not done. May be reviewed from this aspect. Standard guideline for benchmarking process and evaluation for PPC shall be provided</b>	Presently PPC OEMs are providing the PSS & PSCAD model of PPC as per existing FTE & I procedure, PPC of various OEMs are already installed in many plants, further PPC testing are getting mandated vide IEGC 2023 Clause-40 w.e.f 01.10.23. PPC OMEs can benchmarked the PSSE and PSCAD model based on either filed test results or laboratory test results, further 3rd party test report and certificate of PPC by the accredited agency also need to be submitted. Benchmarking process and evaluation for PPC shall be as per the tests specified in IEGC 2023 clause-40 and as per FTE & I procedure guidelines. Plant may take prompt actions and Inform the PPC OEMs as per requirement, <b>extension may be given till 31.12.2023.</b>  Time extension for submission of PPC benchmarking report, 3rd party test report and certificate (SoC) by accredited agency: For the RE plant(s) applying FTE&I from the effective date of this procedure till 31.12.24 need to submit it by 01.01.2024, <b>RE plant(s) applying FTE&amp;I 01.01.2024 onwards need to submit it at the time of FTC.</b>  Clause suitably modified as:  "a) PPC shall be certified by an Accredited agency. b) Simulation models (both EMT & RMS) of PPC shall also be benchmarked."  Accredited agency may be any internationally accepted 3rd party accredited agencies (preferably NABL/NABCB accredited agencies)
<b>Amplus Solar Pvt. Ltd.</b>					
7	5	Section 1: Clause 4 - User Registration	Entities/asset owners should get registered with concerned RLDC(s) as a 'User' in RLDC Fees & Charges Web Portal, at the time of data submission for carrying out Inter-connection Studies.	Entities/asset owners should get registered with concerned RLDC(s) as a 'User' in RLDC Fees & Charges Web Portal, <u>i.e. <a href="https://oms.nrldc.in/">https://oms.nrldc.in/</a></u> , at the time of data submission for carrying out Inter-connection Studies.	Entities/asset owners should get registered with concerned RLDC(s) as a 'User' at respective RLDC(s) web portal, at the time of data submission for carrying out Inter-connection Studies.
8	14	Section 1: Clause 5 - Intimation to RLDC for FTEI of power system elements	All the Users intending to energize new power system elements falling under the scope of this procedure, shall intimate the concerned RLDC about the details as per the formats given below, at least (10) working days prior to the anticipated date of first time <u>charging</u>	All the Users intending to energize new power system elements falling under the scope of this procedure, shall intimate the concerned RLDC about the details as per the formats given below, at least (10) working days prior to the anticipated date of first time <b>energization</b>	All the Users intending to energize new power system elements falling under the scope of this procedure, shall intimate the concerned RLDC about the details as per the formats given below, at least (10) working days prior to the anticipated date of first time <b>energization</b>
9	218	2.1.c)	PPA/PSA details- Copy of signed power purchase agreement (PPA), power sale agreement (PSA) etc. as applicable may be submitted to the respective RLDC as mandated in the Indian Electricity Grid Code.	PPA/PSA details- Copy of signed power purchase agreement (PPA), power sale agreement (PSA), <b>or Undertaking that there is no PPA for the respective unit and power shall be sold in merchant /exchange</b> etc. as applicable may be submitted to the respective RLDC as mandated in the Indian Electricity Grid Code.  For RE Generating units selling power on Exchange / merchant sale, shall be exempted from submitting of PPA/PSA as the same will not be applicable to these RE generating units.	"as applicable" is already mentioned in the statement, in case of Merchant plant PPA/PSA is not applicable hence not required. <b>No changes required.</b>
10	219	2.1.j) iii)	Notarized undertaking towards exemption of transmission charge/loss (as applicable): As per Hon'ble CERC Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020 and its subsequent amendments read with CERC (Connectivity and General Network Access to Inter-state Transmission System) Regulation 2022 and its subsequent amendments, certain wind/solar power generating stations are exempted from sharing the inter-state transmission charges and losses. Notarized undertaking to be submitted, if applicable. Format for undertaking is as per Annexure-IV.	Notarized undertaking towards exemption of transmission charge/loss (as applicable): As per Hon'ble CERC Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020 and <u>its subsequent amendments read with CERC (Connectivity and General Network Access to Inter-state Transmission System) Regulation 2022 and its subsequent amendments</u> , certain wind/solar power generating stations are exempted from sharing the inter-state transmission charges and losses. Notarized undertaking to be submitted, if applicable. Format for undertaking is as per Annexure-IV.  By addition of the following: its subsequent amendments read with CERC (Connectivity and General Network Access to Inter-state Transmission System) Regulation 2022 and its subsequent amendments,  the statement would cover the complete exemption of the transmission charges waiver provide by CERC	Suitably Incorporated asotarized undertaking towards exemption of transmission charge/loss (as applicable): As per Hon'ble CERC Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020 and its subsequent amendments read with CERC (Connectivity and General Network Access to Inter-state Transmission System) Regulation 2022 and its subsequent amendments, certain wind/solar power generating stations are exempted from sharing the inter-state transmission charges and losses. Notarized undertaking to be submitted, if applicable. Format for undertaking is as per Annexure-IV.
11	288	Section 3: Annexure IV Undertaking by SPD	Format	Revised suggested Format has been enclosed  <b>Format shall be revised as transmission charges waiver has been extended to solar / wind project commissioned before 30th June 2025</b>	Comment incorporated suitably.
12	289	Annexure-V: Undertaking on Compliance of CEA Connectivity Standard	2. The MW Wind power plant (Plant Name) situated at Village:....., Taluka:....., District:..... has been awarded via competitive bidding conducted by vide Letter of Intent dated ..... 3. The above Wind Power Plant is scheduled to be commissioned by .....(dd.mm.yyyy) (ref. PPA dated .....). 4. The date of Commercial operation (COD) will be intimated by.....(Name of WPD/SPD) to WRLDC, Mumbai prior to commencement of scheduling of power.	2. The MW Wind / <u>Solar</u> power plant (Plant Name) situated at Village:....., Taluka:....., District:..... has been awarded via competitive bidding conducted by vide Letter of Intent dated ..... or <u>plan to sell power at exchange / bilateral, (strike through which ever is not applicable)</u> 3. The above Wind / <u>Solar</u> Power Plant is scheduled to be commissioned by .....(dd.mm.yyyy) (ref. PPA dated .....). 4. The date of Commercial operation (COD) will be intimated by.....(Name of WPD/SPD) to WRLDC, <del>Mumbai</del> prior to commencement of scheduling of power.  <b>The draft shall consider Wind and solar power plant planned for sale of power at exchange and bilateral sale.</b>	incorporated as follows  2. The MW Wind / <u>Solar</u> power plant (Plant Name) situated at Village:....., Taluka:....., District:..... has been awarded via competitive bidding conducted by vide Letter of Intent dated ..... or <u>plan to sell power at exchange / bilateral, (strike through which ever is not applicable)</u> 3. The above Wind / <u>Solar</u> Power Plant is scheduled to be commissioned by .....(dd.mm.yyyy) (ref. PPA dated .....). 4. The date of Commercial operation (COD) will be intimated by.....(Name of WPD/SPD) to (NRLDC/WRLDC/SRLDC/ERLDC/NERLDC), prior to commencement of scheduling of power. (With trial run certificate, they should intimate COD)
<b>EDF Renewables Comments</b>					

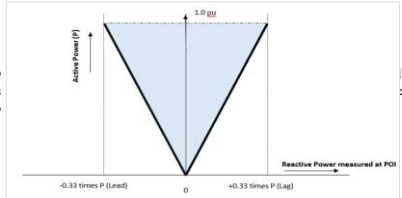
S.No.	Page No.	Clause No.	Clause	Comment / Suggestion by Stake holder on SECTION-3 of the FTE & I procedure	Reply by GRID-INDIA
13	227	Clause 5 (p)	After completion of the successful trial run and receipt of documents and test reports as mentioned in above sections, the concerned RLDC shall issue a certificate to that effect to the concerned generating station or ESS, as the case may be, with a copy to their respective beneficiary(ies) and the respective RPC, within three days	Kindly confirm that the Trail Run will be conducted after issue of FTC. Will WPD be eligible to start scheduling of power after the issue of certificate by the RLDC consequent upon successful trial run.	Yes, trail run will be conducted after FTC, (Before FTC, plant can't be charged, trail run can be conducted once plant will be charged).  <i>As per clause 27(1) (e)(i) "The commercial operation date in the case of units of a renewable generating station aggregating to 50 MW and above or such other limit as specified in clause(3) of Regulation 22 of these regulations, shall mean the date declared by the generating station after undergoing a successful trial run as per clause (3) of Regulation 22 of these regulations, submission of declaration as per clause (4) of Regulation 26 of these regulations, and subject to fulfilment of other conditions, if any, as per PPA".</i>  A per Clause 27 (2) of IEGC 2023, "Scheduling of the generating station or unit thereof shall start from 0000 hours of D+2 (where D is the Commercial Operation Date of the said generating station or unit thereof)".  <b>Yes after successful trail run, plant would be eligible for scheduling the power w.e.f 000hrs of D+2 subject to fulfilment of other conditions, if any, as per PPA.</b>
<b>Gujrat Industries power company Ltd. (GIPCL)</b>					
15	214	1.1. (i)	In case of multiple Solar / Wind / BESS / Hybrid plants in a single power park, the park developer shall be responsible for overall coordination with individual developers for submission of modelling data and other details.	Kindly clarify in case of partial commissioning of the Park, how much capacity modeling data shall be submitted? As an example, if total Park capacity is 600MW (each developer as 100MW within Park) and in first phase if 400MW capacity is being commissioned then as RE Park developer shall we submit individual 100MW capacity or single model for 400MW?	<b>SPD/WPD/HPD and SPPD/WPPD/HPPD need to demonstrate all the compliances at Interconnection point.</b> As connectivity being given to SPPD/WPPD/HPPD, PPD/WPPD/HPPD shall responsible for submission of all the technical data/model for the total capacity which is going to be connected & seeking CON-4 approval. It is the responsibility of SPPD/WPPD/HPPD to take technical data/model for each 100MW from SPD/WPD/HPD involved in the project to develop a single model in order to demonstrate the compliances at POI. SPPD/WPPD/HPPD need to submit the technical data/model for single 400MW.
16				Further, after commissioning of first 400MW capacity another 100MW within park needs to be commissioned then how much capacity model needs to be submitted? for 100MW or total 500MW (400 MW earlier commissioned + 100MW needs to be commissioned)	Yes for total 500MW (400 MW earlier commissioned + 100MW needs to be commissioned), <b>complete 500MW shall be responsibility of SPPD/WPPD/HPPD.</b>
17			The trial run of Wind / Solar / BESS / Hybrid Generating Stations shall be carried out as per the provisions of extant grid code.	In case solar projects are not ready in the solar park and solar park developer needs to backcharge or wanted to do commissioning activities for solar park pooling substation, We request you to allow FTE&I for Pooling Substation alone also.	Antitheft charging may be allowed based on CTU charging instruction. However, for charging of any element RLDCs code is mandatory. Any antitheft charging may be allowed by RLDC(s) on case to case basis based on real-time grid scenario.
18			General	We request you to create one cell / team who can assist us during tendering stage for understanding requirement of WRLDC for smooth integration of the RE Projects and give the training on chargeable basis to developers for timely comply the RLDC requirements	Various workshop on FTE & I procedure is being organized Grid-India time to time.
19			Extension of Time for submission of the comments.	We request you to extend the time limit for submission of the comment atleast by 1 month for submission of fruitful comments for smooth integration of the project during FTC.	Already extended till 22.09.23.
20	6	Section-1 5(a)	Annexure A4: List of SCADA points to be made available to RLDC (RLDC would need all MW and MVAr data, voltage and frequency of all the buses, all the breaker and isolator positions, OLTC tap positions, Main-1/Main-2 protection operated signals, DC side SCADA data in case of HVDC station, data for FACTS Devices/ESS/Bulk Consumers as per requirement)	<b>1) Differential Protection for dedicated transmission line:</b> There are two possibilities for operation of the protection. a) Main -1 & 2 Differential Protection shall be routed through FOTE (SDH or MPLS) b) direct communication (Single Mode Optical Fiber cable of OPGW) between protection relay at both end Please clarify which methodology is acceptable as per RLDC requirement  <b>2) Distance Protection for dedicated transmission line:</b> Distance Protection can be operated as per following methodology. a) Main-1 Distance protection through FOTE (SDH or MPLS). b) Main-2 Distance protection through PLCC. Or any other requirement from RLDC side shall be specified in the procedure only.	As per Note(2) clause 1 of schedule V of Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022 . "Transmission lines with distance protection shall, in general, have carrier aided or fibre optic based intercropping or blocking feature".
21	221	3 (b) (iii)	Gateways/RTUs installed shall report on Redundant communication channel to Main Control centre and backup control centre i.e. 2 channels to Main Control centre 1 and 2 channels to Main Control centre 2 (or to Backup as and when backup is available). The minimum number of ethernet ports on gateway must be 4 (two on each gateway for MCC and two on each gateway for BCC). Redundancy should work for all of the following failures: • Single Communication link failure • Single Port failure • Single Gateway failure • Single Master station polling server failure	We request you to provide block diagram for communication in this clause for understanding and clarity.	Gateways/RTUs installed shall report on Redundant communication channel to Main Control centre (MCC) and backup control centre (BCC) i.e. 2 channels to Main Control centre 1 and 2 channels to Main Control centre 2 (or to Backup as and when backup is available). Redundancy should work for Single Communication/ Single Port/ Single Gateway link/ Single Master station polling server failures"
22	221	3 (b) (vii)	Communication equipment for all the nodes shall be provided with at least ten hours battery backup and extended backup shall be provided depending upon the requirement as per Clause 8.11 of Central Electricity Authority (Technical Standards for Communication System in Power System Operation) Regulations, 2020]	Ten hour battery backup shall be provided for FOTE and PLCC only which are communication equipments. Substation Automation system and other systems may not require ten hour battery backup. Please clarify/confirm.	This is as per Clause 8.11 of Central Electricity Authority (Technical Standards for Communication System in Power System Operation) Regulations, 2020).

S.No.	Page No.	Clause No.	Clause	Comment / Suggestion by Stake holder on SECTION-3 of the FTE & I procedure	Reply by GRID-INDIA																
23	227	5 (n)	The developer shall provide high resolution data ( $\leq 10$ ms accuracy) of the commissioned IBR units for at least 10 seconds period. The data shall be provided as per the format specified in Annexure-I(E)(c).	High resolution data of $\leq 10$ ms is not available with majority of Inverter manufacturers. Being PSU single party approval may result in the problem in the tendering process. Even PQM (Power Quality Meter) of reputed vendor cannot provide such high resolution data. Please consider high resolution data of IBR based on Inverter or PQM available in the market.	<b>Suitably incorporated</b> as "The developer shall provide <b>high resolution data (preferably <math>\leq 10</math>ms accuracy)</b> of the commissioned IBR units for at least 10 seconds period. The data shall be provided as per the format specified in Annexure-I(E)(c).  High resolution data is very important to ascertain the performance of inverters/WTGs during LVRT/HVRT event as inverters/WTGs goes in LVRT/HVRT based on its own terminal voltage, it is important for analyzing performance during oscillation in grid/RE complex																
24	222	3 (e)	Dedicated Voice communication from Solar/Wind/BESS Generating Plant to control centre (RLDC) using VOIP communication,mobile,landline and dedicated email Id of plant shall be ensured.	Generally Solar Parks are located in remote area where landline services are not available. You are requested to remove requirement of landline and communicate with VOIP and mobile only shall be accepted.	Suitably incorporated as Dedicated Voice communication from Solar/Wind/BESS Generating Plant to control centre (RLDC) using VOIP communication/landline,mobile and dedicated email Id of plant shall be ensured.																
25	267	Clause-2 (vii) of Annexure-I (E) (a)	vii) Control Response time4 of the IBR unit during transient condition shall preferably be in the range of 20 – 40 ms.	Response time of majority available IBR is quite higher than the requirement.May be kept the value after survey of majority supplier.	Control Response time of the IBR unit during transient condition shall preferably be in the range of 20 – 40 ms as usually fault occurs and get cleared within 80-100ms or even in less time, delay in control response time may cause direct LVRT to HVRT or may cause the tripping of Inverters/WTGs or undesirable response at POI.																
26	223	3 (g)	In line with the CEA (Technical Standards for Connectivity to the Grid) Regulations 2007, as amended, Disturbance Recorder/Event Logging facility of the generating station shall be ensured. The DR / EL data at the time of first charging shall be submitted to RLDC. Preferable DR trigger criteria and recording period for monitoring purpose is given below: <table border="1" data-bbox="262 581 632 667"> <thead> <tr> <th>Setting Value</th> <th>Recording Period</th> </tr> </thead> <tbody> <tr> <td>Voltage - <math>\geq 1.1</math> p.u. &amp; <math>\leq 0.9</math> p.u.</td> <td>Pre-fault – 0.5 s</td> </tr> <tr> <td>Frequency - <math>\geq 51</math> Hz &amp; <math>\leq 49</math> Hz</td> <td>Post fault – 10 s</td> </tr> <tr> <td></td> <td>Sampling – 1 kHz or higher</td> </tr> </tbody> </table> The developer shall be able to provide event logger data from IBR as and when requested by RLDC.	Setting Value	Recording Period	Voltage - $\geq 1.1$ p.u. & $\leq 0.9$ p.u.	Pre-fault – 0.5 s	Frequency - $\geq 51$ Hz & $\leq 49$ Hz	Post fault – 10 s		Sampling – 1 kHz or higher	Sampling of 1 kHz or higher is not available with majority of Inverter manufacturers. Being PSU single party approval may result in the problem in the tendering process. Please consider sampling of IBR based on Inverter available in the market.	The data is required for proper post-event analysis. <b>Preferable</b> DR trigger and recording criteria may be as under: <table border="1" data-bbox="1444 610 1814 696"> <thead> <tr> <th>Setting Value</th> <th>Recording Period</th> </tr> </thead> <tbody> <tr> <td>Voltage - <math>\geq 1.1</math> p.u. &amp; <math>\leq 0.9</math> p.u.</td> <td>Pre-fault – 0.5 s</td> </tr> <tr> <td>Frequency - <math>\geq 51</math> Hz &amp; <math>\leq 49</math> Hz</td> <td>Post fault – 10 s</td> </tr> <tr> <td></td> <td>Sampling – 1 kHz or higher</td> </tr> </tbody> </table>	Setting Value	Recording Period	Voltage - $\geq 1.1$ p.u. & $\leq 0.9$ p.u.	Pre-fault – 0.5 s	Frequency - $\geq 51$ Hz & $\leq 49$ Hz	Post fault – 10 s		Sampling – 1 kHz or higher
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27	214	1.1 (i)	"Section 3 (1.1. i.e., Pre-Commissioning Data Submission): The Wind, Solar, BESS1 and Hybrid (Wind/Solar/BESS) plant/park developer shall submit the technical connection data mentioned at points (a) and (b) below to <b>CTUIL at least 4 months prior to the physical interconnection of the RE plant with the Grid</b> . CTUIL shall share the submitted data and models with Grid-India. Both CTUIL & Grid-India shall, in parallel, examine the submitted data.;"  "Section 3 (1.1. i.e., Pre-Commissioning Data Submission): The Wind, Solar, BESS1 and Hybrid (Wind/Solar/BESS) plant/park developer shall submit the technical connection data mentioned at points (a) and (b) below to <b>CTUIL at least 12 months prior to the physical interconnection of the RE plant with the Grid</b> . CTUIL shall share the submitted data and models with Grid-India. Both CTUIL & Grid-India shall, in parallel, examine the submitted data.;"	"Section 3 (1.1. i.e., Pre-Commissioning Data Submission): The Wind, Solar, BESS1 and Hybrid (Wind/Solar/BESS) plant/park developer shall submit the technical connection data mentioned at points (a) and (b) below to <b>CTUIL at least 4 months prior to the physical interconnection of the RE plant with the Grid</b> is for the following reasons: 1. It is difficult to provide the data as requested in Annexure-I(C), I(D), I(E) and I(E)(a) of the draft procedure as GRID study shall not be ready before 12 months. GRID study requires PSSE/PSCAD file of inverter, WTG which becomes impossible to arrange without finalisation of OEM/vendors. Finalisation of the latter requires acquisition of project land (takes 7 to 8 months) post which design, and engineering of the project is frozen which entails specifying type and make of inverter, WTG, BOP elements etc. Only post this is PSSE/PSCAD file for grid study reasonably completed. Further, GRID study required system parameters which take time for CTUIL to confirm. Any prediction in initial stage is presumptive and builds inaccuracies in the study results. 2. It is difficult to provide the data as requested in annexure-I(E) as the transformer size and OEM shall not be finalised during initial stage but only post freezing of engineering design after land acquisition. 3. Few inputs can't be provided as requested in annexure of section 6 such as FOTE make/model, No of Fibre in OPGW. Tower configuration as the same are not available or not finalised till design and engineering of plant is completed. Therefore, to shift the submission of Common Technical Data such as Simulation Model, Reports and Certificate Submission to CTUIL around 4 months prior to physical interconnection of the RE plant with the Grid would be practical and reasonable	<b>As per GNA regulation 2022, Clause 10.1</b> "Provided that in case the entity is not in possession of the final technical connection data, it may furnish tentative data to form part of the Connectivity Agreement and furnish the <b>final data at least 1 (one) year prior to the physical connection</b> ".																
<b>Veena Energy Pvt. Ltd.</b>																					
29	216	1.2.(i)	Within <b>03 months of the complete RE plant commissioning</b> , the validated detailed (only RMS) and equivalent models (RMS and EMT both) of the plant along with the validation report shall be submitted to both CTUIL and Grid-India. The guidelines required to be followed for model validation and validation report are provided at S. No. 5 of Annexure – I (E) (a)	It may please be noted that the plant can achieve full load only when the weather is supportive if the developer does not get such window during this period may lead to non-compliance. It is even more complicated in the case of a Hybrid plant wherein wind and solar peak at the same time in the given window may not be possible. It is therefore requested to allow a higher window (maybe 1 year for this clause)	Compliance related to Power Plant Controller Function Test, Frequency Response Test, Active Power Set Point change test and Reactive Power (Voltage / Power Factor / Q) Set Point change test in line with IEGC 2023 Clause-40 does not require the full capacity rather these are the plant response w.r.t any change in the grid scenario and its controller behaviour, models can easily be validated within 3 months for these performances. Further, LVRT/HVRT performance of plant can be validated in case of any fault event in the vicinity of RE complex, in case of any fault or switching event which creates LVRT/HVRT scenario at POI would be intimated by the RLDC to the RE plant(s), same date and time shall be recorded by the RE plants(s) to validate the performance.  <b>Plant can simulate the the real-time scenario and pre-operating conditions in the simulation model and can validate the model any time, it does not requires full load scenario.</b>  For validation of simulation model in line with clause 1.2(i) of FTC, kindly refer S. No. 5 of Annexure – I (E) (a).  Further in case of any unfavourable weather conditions, <b>if plants fails to demonstrate the full capability or fails to corroborate its performance, maximum timeline of one year is allowed as per per IEGC 2023 Clause-3, sub-clause b(ii)</b> . However, <b>it is related with demonstration of full capability in field</b> or else capacity would be de-rated and <b>not related with validation of simulation model</b> , simulation model can be validated any time w.r.t performance of plant and therefore timeline of 3 months would be sufficient.																

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30	216	1.2.(iii)	During the operational phase, if there is any change in the plant due to installation of any additional equipment, changes in controller settings etc., the updated models along with the validation report shall be submitted within 03 month of any such activity. A letter certifying the same shall be submitted along with the final validated models.	It is requested to list specific cases where a revised model needs to be submitted for better clarity.	(i) In case of installation of any additional equipment, replacement of existing equipment with some other make/model equipment (e.g. Additional Inverters/WTGs , SVG, Filter bank, Capacitor bank, STATCOM etc.) (ii) In case of any change in setting or control logic of Inverters/WTGs /WTG, PPC and FACTS devices or re-tuning of parameters which will impact the plant performance at POI. (iii) In case the response of the plant in real-time doesn't match the simulation model response.
31	216 & 217	1.2.(iii)	In compliance to CEA's "Technical Standards for Connectivity to the Grid, 2007" and subsequent amendments, power quality (harmonic content, DC injection, flicker etc.) measurements shall be carried out at least once in a year by NABL accredited labs. First measurement shall be carried out immediately after complete commissioning of plant and subsequently, it shall be repeated on annual basis. The assessment report shall be submitted to CTUIL and Grid-India on annual basis. Failure to carry out the annual power quality assessment shall make the plant liable	A humble request to replace the NABL-accredited lab with a testing agency.	National Accreditation Board for Testing and Calibration Laboratories (NABL) is an accreditation body, with its accreditation system established in accordance with ISO/IEC 17011. "Conformity Assessment-Requirements for Accreditation bodies accrediting conformity assessment bodies". NABL is a Constituent Board of Quality Council of India, Testing by NABL accredited labs provides the sanctity of testing. It is preferred that the certifying agency is accredited by NABL.
32	217 & 218	2. (i)	Document submission during registration a) Connectivity Details: Connection Agreement & Format viz. RCON-IIA Stage-II connectivity grant letter by CTU, CON-3, CON-4, CON-5, CON-6 and any other applicable formats to be submitted to RLDCs specifying the point of connection, bay numbers etc.	We may request to consider the registration once the stage II grant of connectivity is obtained or after the application of con4 filed with CTUIL in the interest of time and competition of parallel activities	<b>Plant can only be registered once final connectivity agreement will be signed.</b>
33	219	2 (j) (v)	Compliance to aviation safety norms: Undertaking to be given by WPD for all the WTGs for the compliance of aviation safety norms viz. installation of LED on turbine blades etc.	We would like to request for deletion of the following words from the clause as mentioned below : v) Compliance to aviation safety norms: Undertaking to be given by WPD for all the WTGs for the compliance of aviation safety norms viz. installation of LED on turbine blades etc. The WTG blades are not installed with LED installation. The Compliance with aviation safety norms is followed as per the provisions of Govt. of India (Ministry of Civil Aviation) order GSR751 (E) dated 30th Sep. 2015 for Safe and Regular Aircraft Operations and in line with Ministry of Defence guidelines.	As per MNRE Order No. 231/7/2018-Wind (Part-1) dated 01.01.2020, (Copy enclosed), one of the mandatory requirements for installing wind turbines in the vicinity of Air Force stations is the provision of standard obstruction markings and lighting. As per the said MNRE order, this complies with IS 5613 notification and International Civil Aviation Organization (ICAO) standards prescribed in ICAO Annex-14.
34	223	3 (h)	As per regulation 24 (6) of IEGC, 2023, following documents/ tests shall be submitted for wind and solar resources: i. Type test report for Fault Ride through Test (LVRT and HVRT) for units commissioned after the specified date as per CEA Technical Standards for Connectivity mandating LVRT and HVRT capability. ii. The following tests shall be performed at the point of interconnection: Frequency response of machines as per the extant CEA Technical Standards for Connectivity. Reactive power capability as per OEM rating at the available irradiance or the wind energy, as the case may be.	Reactive power capability depends upon voltage, frequency and variation in irradiation. A laboratory-like situation is difficult to create in the field and may not be possible to demonstrate such a capability curve in field. Moreover, OEM guarantees values at the machine level wherein it has been asked at POI, may be difficult to demonstrate such a condition. It is requested to review such provision.	Here "unit commissioned" refers the Single inverter/WTG unit, Type test report of unit refers the Single inverter/WTG laboratory type-test report which OEMs prepare before supplying the product, can easily be provided. <i>In case of Single inverter/WTG unit testing, suitable margin may be kept on both higher &amp; lower side such that plant will be able to meet all the compliances at POI as mandated in CEA technical standards.</i>  As per the clause 3(h) of this procedure "Provided that the generating company may submit offline simulation studies for the specified tests, in case testing is not feasible before COD, subject to the condition that tests shall be performed within a period of one year from the date of achieving COD".  <b>If it is not feasible to carry out the test before COD, same shall be demonstrated in simulation model, tests need to be performed at the point of interconnection may be conducted in trail-run.</b> Further in case of any unfavourable weather conditions, if plants fails to demonstrate the full capability or fails to corroborate its performance, as per IEGC 2023 Clause-3, sub-clause b(ii) and covered under 5 (d) (ii) of this procedure, same need to be demonstrated within 1 year.
35	223-224	3 (i)	i) As per regulation 24 (6) of IEGC, 2023, following documents/ tests shall be submitted for Energy Storage Systems: The following tests shall be performed at the point of interconnection: Power output capability in MW and energy output capacity in MWh Frequency response of ESS Ramping capability as per design  The detailed report covering the results of the above tests shall be submitted to the concerned RLDC/NLDC.	Unlike Thermal, Hydro or nuclear plant, it is depended upon wind, solar or combination of both which is varying very fast and in given situation ramping rate for entire plant is difficult to prove immediately post commissioning. It can be proven in very ideal condition like having highest irradiation/wind speed when in ramp up or ramp down of plant is possible. Relaxation in duration may be allowed to demonstrate this test.	<b>This clause is applicable to ESS not for Wind/Solar.</b>
36	224	4 (a)	a) The generating company proposing its generating station or a unit thereof for trial run or repeat of trial run shall give a notice of <b>not less than seven (7) days</b> to the concerned RLDC, and the beneficiaries of the generating stations, including intermediary procurers, wherever identified: Provided that in case the repeat trial run is to take place within forty-eight (48) hours of the failed trial run, fresh notice shall not be required. b) The concerned RLDC shall allow commencement of the trial run from the requested date or in the case of any system constraints, not later than seven (7) days from the proposed date of the trial run. The trial run shall commence from the time and date as decided and informed by the concerned RLDC.	In such cases where ISTS got delayed and charged in the month when there is no wind and Solar irradiation then it would impact the demonstration of trial run. HPPD should get additional time in such a case for re-trial. Any such retrial should not lead to a further delay in the commissioning of the project.	as per IEGC 2023 Clause-3, sub-clause b(ii) and covered under 5 (d) (ii) (successful trail run) of this procedure, "if it is not possible to demonstrate the rated capacity of the plant due to insufficient solar irradiation, COD may be declared subject to the condition that the same shall be demonstrated immediately when sufficient solar irradiation is available after COD, within one year from the date of COD". <b>Timeline of one year from the date of COD covers all the weather scenarios.</b>
37	225	5 (b) (i)	the output below the corroborated performance level with the solar irradiation of the day shall call for a repeat of the trial run;	This clause will not allow developers to commission plants in rainy season or in areas where continuous cloud passing is taking place (like Pavagada/ Rewa, etc.). The same is the case with wind where in a session where wind gusts are coming, it is difficult to predict such gusts and will call for repetitive tests of the plant. Also during a trial run how energy is injected in the grid is getting adjusted. We request to relook into this clause based on the infirm source of generation which totally depends upon weather conditions.	In case of any unfavourable weather conditions, if plants fails to demonstrate the full capability or fails to corroborate its performance, as per IEGC 2023 Clause-3, sub-clause b(ii) and covered under 5 (d) (ii) (successful trail run) of this procedure, "if it is not possible to demonstrate the rated capacity of the plant due to insufficient solar irradiation, COD may be declared subject to the condition that the same shall be demonstrated immediately when sufficient solar irradiation is available after COD, within one year from the date of COD". <b>Timeline of one year from the date of COD covers all the weather scenarios.</b>

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38	225	5(b) (ii)	if it is not possible to demonstrate the rated capacity of the plant due to insufficient solar irradiation, COD may be declared subject to the condition that the same shall be demonstrated immediately when sufficient solar irradiation is available after COD, within one year from the date of COD: Provided that if such a generating station is not able to demonstrate the rated capacity when sufficient solar irradiation is available after COD, the generating company shall de-rate the capacity in terms of sub-clause 5(g) of this procedure.	It is requested to address the below concern in terms of COD: a) If in a year a specific site did not get the required wind / solar resources to demonstrate full load capability, a suitable extension may be permitted under the clause. b) If any serial defect is found in the plant or any major breakdown takes place due to which, the plant is unable to demonstrate full load capacity, suitable extension may be allowed under such circumstances. c) Force major conditions like earthquakes, riots, war, etc.... suitable time extension may be allowed under the clause.	In case of any such special event as mentioned in (a) & (b), <b>plant may produce substantial evidence to the CERC seeking time extension, any further extension can only be granted by CERC as 1 year timeline is already laid down in IEGC 2023 Clause-3</b>
39	226	5 (f)	Successful trial run of a hybrid system shall mean successful trial run of each individual source of the hybrid system in accordance with the applicable provisions of these regulations.	In the case of hybrid generation sources, developers have to demonstrate the capacity separately for Wind and solar. In that case, if the developer were unable to demonstrate the capacity during the initial trial run, then within 12 months during a repeat trial run they need to stop the generation of one source which would be a loss of generation to HPPD and need clarity on such loss of generation and how this will be accounted for meeting the criteria under the provisions.	<b>Trial run of each individual source of the hybrid system shall be validated with meter &amp; telemetry data of individual source.</b> <b>Plant may ensure the suitable metering and telemetry arrangement to demonstrate the successful trial run of individual source.</b> Developers need to demonstrate the <b>successful trial run of individual source in line with IEGC-2023 clause 22, sub-clause 3(g), any generation loss in this case shall be in the responsibility of the plant.</b>
40	227	5 (n)	The developer shall provide high resolution data ( $\leq 10$ ms accuracy) of the commissioned IBR units for at least 10 seconds period. The data shall be provided as per the format specified in Annexure-I(E)(c).	Request this is to be checked wrt inverter capability	<b>Suitably incorporated</b> as "The developer shall provide <b>high resolution data (preferably <math>\leq 10</math>ms accuracy)</b> of the commissioned IBR units for at least 10 seconds period. The data shall be provided as per the format specified in Annexure-I(E)(c).  High resolution data is very important to ascertain the performance of inverters/WTGs during LVRT/HVRT event as inverters/WTGs goes in LVRT/HVRT based on its own terminal voltage, it is important for analyzing performance during oscillation in grid/RE complex
41	227	5 (p)	After completion of the successful trial run and receipt of documents and test reports as mentioned in above sections, the concerned RLDC shall issue a certificate to that effect to the concerned generating station or ESS, as the case may be, with a copy to their respective beneficiary(ies) and the respective RPC, within three days.	Will the developer allowed to generate power during this three-day period? If yes, how energy generated from plant will be billed by the developer to beneficiary?	Once the concerned RLDC shall issue a certificate and COD will be declared, RE plant(s) can schedule the power v.e.f 00:00hrs of D+2 days, subject to fulfilment of other conditions, if any, as per PPA.  A per Clause 27 (2) of IEGC 2023, " <b>Scheduling of the generating station or unit thereof shall start from 0000 hours of D+2 (where D is the Commercial Operation Date of the said generating station or unit thereof)</b> ".  <b>Based on prevailing grid condition to ensure the security of the grid, injection would be reviewed by respective RLDC.</b>  <b>Generation will not be billed, it shall be consider as infirm generation and treatment would be as per DSM regulation. (As per scheduling procedure of Grid-India)</b>
42	227	5 (q)	Forecasting Scheduling & Deviation Settlement: Power plants shall comply with the provision of extant CERC Regulations and CERC approved procedure dated 03.03.2017 for facilitation of Forecasting, Scheduling & Deviation Settlement in respect of its power plants. Annexure-VIII provides the formats for submission of Available Capacity, day ahead forecast & schedule data.	In this case, the developer will not be able to bill another 3 days of revenue. It is requested to allow scheduling from the completion of the trial run. We request that HPPD should not be penalized during this period.	As per <b>Clause 27 (2) of IEGC 2023</b> , " <b>Scheduling of the generating station or unit thereof shall start from 0000 hours of D+2 (where D is the Commercial Operation Date of the said generating station or unit thereof)</b> ". subject to fulfilment of other conditions, if any, as per PPA.
<b>Alfanar Power Pvt. Ltd.</b>					
43	214	1.1 (i) (a)	Simulation Model Submission: The steady-state and dynamic simulation models (RMS3, EMT and Power Quality Assessment model) shall be submitted at least 12 months prior to the physical interconnection of the Wind, Solar, BESS and Hybrid (Wind/Solar/BESS) plant/park with the grid. The models shall be submitted as per the model compatibility guidelines specified at S. No. 1 of Annexure - I (E)(a).	While we can provide some of the technical data aside from the Simulation Model to a certain extent, it's important to note that the submission of the Simulation Model may require additional time. This is because it is contingent upon the final layout of the overall project, which, in turn, depends on various Right of Way (RoW) issues.  Therefore, we kindly request that you consider reducing the Model submission timelinet to six (6) months prior to the physical interconnection of the project.	<b>As per GNA regulation 2022, Clause 10.1</b> "Provided that in case the entity is not in possession of the final technical connection data, it may furnish tentative data to form part of the Connectivity Agreement and <b>furnish the final data at least 1 (one) year prior to the physical connection</b> ".
44	226	5 (m)	The developer shall provide Plant/PPC log of 4 hours after first time charging of the plant. The log shall clearly demonstrate operation of plant in each mode viz. Voltage Control, Fixed Reactive Power Control and Constant Power Factor Control for at least 30 minutes.	The Plant/PPC data should be provided after the plant has successfully demonstrated its operation in various modes. This demonstration is typically carried out upon the project's stabilization, which is generally achieved approximately SIX months after the project's synchronization.	The logs are important to verify the successful trial run of the plant. Therefore, it is desired that the logs are provided as early as possible for trial run verification purpose.


S.No.	Page No.	Clause No.	Clause	Comment / Suggestion by Stake holder on SECTION-3 of the FTE & I procedure	Reply by GRID-INDIA
45				<p>What would be the procedure for charging the DTL and PSS of a Renewable Energy (RE) park developer when their infrastructure is established at a different time than the Renewable Park developer located within the same park?</p> <p>As the RPPS is a separate entity, it is essential for them to achieve synchronization and/ or commissioning of the PSS and DTL infrastructure developed by them. This is necessary, especially when there is a time disparity in commissioning compared to the developer located within the park, in order to comply with the requirements of the financing agreement with their lender.</p> <p>Therefore, we kindly request that the commissioning of the RPPD and the developer within the park be delinked to accommodate these timing differences.</p>	<p>SPD/RPD and SPPD/RPPD should match the time for commissioning of project and evacuating system from RE pooling station to ISTS pooling station.</p> <p>In case SPD/RPD is not ready but SPPD/RPPD is ready, despite charging of pooling station (SPPD station), there would not be any generation to evacuate. Similarly if SPD/RPD is ready but SPPD/RPPD is not ready, generation can't be evacuated because of no evacuating system from RE pooling station to ISTS pooling station, therefore, matching the time for commissioning of project and evacuating system from RE pooling station to ISTS pooling station is important.</p> <p>Further, as asked if SPPD/RPPD is ready but SPD/RPD is not ready, SPPD/RPPD can charge their evacuating line and pooling station on Anti-theft after approval from competent authority, regarding charging of evacuating line and pooling station of SPPD/RPPD, Section-1 of this procedure may be referred for line/bay/ICTs etc. charging.</p> <p>Not related to FTE &amp; I procedure, however queries explained.</p>
<b>Suzlon</b>					
46	222	3 (c) (iv)	Power Plant Controllers shall be installed with following minimum features (iv) Data logging facility ( $\leq 1$ sec resolution)	For how long the data has to be stored	Preferably for 1 year as per IEEE 2800-2022 standard.
47		6 (a)	The tests shall be performed once every five (5) years or whenever major retrofitting is done. If any adverse performance is observed during any grid event, then the tests shall be carried out even earlier, if so advised by SLDC or RLDC or NLDC or RPC, as the case may be.	Delete "every 5 years". Post compliance testing and satisfactory demonstration of GCC after complete commissioning of RE plan capacity will be sufficient. The periodic testing for every 5 years is not required from technical point of view, in case no retrofitting in RE plants	As per <b>Clause 40, sub-clause-2(c) of IEGC 2023</b> "The tests shall be performed <b>once every five (5) years</b> or whenever major retrofitting is done. If any adverse performance is observed during any grid event, then the tests shall be carried out even earlier, if so advised by SLDC or RLDC or NLDC or RPC, as the case may be".
48	258	5(a) of Annexure-I(E) of part-A	What should be the PF when grid voltages beyond 1.05PU & below 0.95PU? Pls specify	What should be the PF when grid voltages beyond 1.05PU & below 0.95PU? Pls specify	It is clear from the <b>QV curve shown in page no. 258 of this procedure</b> . As per QV curve full reactive power support (i.e. 0.95 lagging PF & 0.95 leading PF at POI should come at 1.05pu and 0.95pu VPOI voltage respectively), Power factor above 1.05PU & below 0.95PU VPOI voltage are as follows: <b>1.05pu&lt;VPOI &lt;= 1.1pu (0.95 leading PF at POI)</b> , (VPOI >1.1pu, HVRT as per clause B2(7) of CEA technical standards). <b>0.9pu&lt;=VPOI &lt;0.95pu (0.95 leading PF at POI)</b> , (VPOI <0.9pu, LVRT as per clause B2(3) of CEA technical standards).
49	260	7(E) of Annexure-I(E) of part-A	Frequency Response Test	active power vs grid frequency graph should be provided	<p>Perform frequency response test with dead band of <math>\pm 0.03</math> Hz and droop of both 3% and 6% for the following cases i) Case-1: Step change/increase in grid frequency from 50 Hz to 50.5 Hz ii) Case-2: Step change/decrease in grid frequency from 50 Hz to 49.5 Hz</p> <p>As per CEA (Technical Standards for Connectivity to the Grid ) (Amendment ) <b>Regulations, 2019, clause- B2(4)</b>, "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 <b>at least 10%</b> of the maximum Alternating Current active power capacity"</p> <p><b>Frequency response can be tested as per dead band of <math>\pm 0.03</math> Hz and droop of both 3% and 6% with at least 10% primary frequency response.</b></p> <p><b>As per Clause-30, sub-clause-10(h) of IEGC 2023, The primary response requirement for WS Seller (commissioned after the date as specified in the CEA Technical Standards for Connectivity) has been mandated WS seller means a seller in case of a generating station based on wind or solar or hybrid of wind- solar resources</b></p>
50	260	7(F) of Annexure-I(E) of part-A	Voltage Control Mode - Perform test for dead band & droop of 2%	Q maximum and Q minimum to be specified for the droop	Q maximum and Q minimum shall be as per Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 amendments As per the Actual capability of the Wind Turbine & Inverters/WTGs unit (PQ-Curve),
51	262	1 (ii) (a) of Annexure-I (E) (a)	RMS models shall be compatible with PSS/E version 35 and above.	FTE&I clearance to be issued upon submission of any versions of PSS/E models as per guidelines, NLDC shall not restrict on the model versions.	To ensure the compatibility of the model to be used at CTU/Grid-India level, model of PSS/E version 35 and above is required. Provided that the concerned RLDC may accept the model compatible with version 34 also under special circumstances. The decision in this regard will be at the discretion of the concerned RLDC only.
52	263	1 (ii) (a) of Annexure-I (E) (a)	In case of submission of User Defined Models (UDMs), the submission of the source code and compiling procedure along with the model is mandatory.	Please delete submission of source code as the user defined models are Company intellectual property	It is preferable to submit GENERIC model which does not requires any source code as the system operator must be able to maintain the same without the restrictions of software updates etc. Only in case of significant difference in the actual performance of the plant vis-à-vis the response of the generic model, then user defined model (UDM) shall also be submitted in addition to the generic RMS model. Submission of the source code and compiling procedure is mandatory in this case so that same can be used in future to incorporate with other version of software.
53	263	1 (ii) (b) of Annexure-I (E) (a)	EMT models shall be compatible with PSCAD version 4.6.3 and above with the following	FTE&I clearance to be issued upon submission of any version of PSCAD models as per guidelines, NLDC shall not restrict on the model versions.	To ensure the compatibility of the model to be used at CTU/Grid-India level, model of PSCAD version 4.6.3 and above is required.
54	265	1 (x) (b) of Annexure-I (E) (a)	Any switching controls like OLTCs, FACTs or filter banks etc. used in the plant shall be included in model along with switching logic.	Standard operating procedures (SOP) of dynamic compensation is yet to be finalized by CEA, as per CEA MOM No. 12/X/S.T.D.(CONN)/GM/2023 dt 21st April 2023. Request CEA/CTU/Grid-India/NLDC to specify the switching & Control logics along with Detailed Technical specifications of dynamic compensation equipments to avoid future discrepancies in charging permissions.	Kindly refer the CEA MoM dated 21.04.23, as per <b>14(i)</b> of the MoM "Hybrid reactive compensation to meet requirement at PoI need to be looked instead of only static compensation. However, the hybrid reactive compensation can only be permitted on case to case basis for issuance of connection offer to applicants who made their CON-4 application till 30th April 2023, after which <b>dynamic compensation shall only be permitted</b> ". Further, plant need to meet all the compliances at POI. Design of switching & Control logics along with detailed Technical specifications of dynamic compensation equipments should adhere to the CEA technical standards, and plant shall meet all the compliances at POI.

S.No.	Page No.	Clause No.	Clause	Comment / Suggestion by Stake holder on SECTION-3 of the FTE & I procedure	Reply by GRID-INDIA
55	267	2 (iii)	For e.g. Compliance of continuous operation of the plant at 1.1 p.u. voltage at POI may result in continuous operation of individual IBRs at voltage >1.1 p.u. Therefore, design and testing of IBRs shall be carried out so as to factor in the maximum voltage difference between POI and IBR terminal.	This statement should be removed. IBR unit should be type tested at the voltage levels defined in the CEA regulation.	Kindly refer the <b>Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 and (Amendment ) 2013 &amp; 2019 and clarification on B2(7) issued vide dated 06.01.2023.</b> Regulations states the requirement of <b>all the compliances of RE Plant(s) at interconnection point (POI).</b> In testing and certification, OEM may keep suitable margin. It has been clarified vide CEA MOM No. 12/X/S.T.D.(CONN)/GM/2023/312 dated 25.09.23 in point no. 5(v), The HVRT compliance shall be for the voltages at POI as per clause B2(7) of regulation 2019. <b>RE developer must take suitable action as per the provision.</b>
56	267	2 (vii)	ii) Control Response time of the IBR unit during transient condition shall preferably be in the range of 20 – 40 ms.	subject to technical feasibility in the already RLMM listed WTG models	Control Response time of the IBR unit during transient condition shall preferably be in the range of 20 – 40 ms as usually fault occurs and get cleared within 80-100ms or even in less time, delay in control response time may cause direct LVRT to HVRT or may cause the tripping of Inverters/WTGs or undesirable response at POI.
<b>ArcerolMittal (AM) Green Energy Pvt Ltd (AMGEPL)</b>					
57	214	1.1 (j)	The Wind, Solar, BESS1 and Hybrid (Wind/Solar/BESS) plant/park developer shall submit the technical connection data mentioned at points (a) and (b) below to CTUIL. at least 12 months prior to the physical interconnection of the RE plant with the Grid. CTUIL shall share the submitted data and models with Grid-India.	It is to note that the project development cycle for Renewable Generation Plant is about 12-15 months period and initial period of 4-6 months normally goes into finalization of all major equipment including evacuation arrangement. Hence, considering the practical aspects of renewable project development, the submission of technical data timeline may be changed to 6 months instead of 12 months.	<b>As per GNA regulation 2022, Clause 10.1</b> "Provided that in case the entity is not in possession of the final technical connection data, it may furnish tentative data to form part of the Connectivity Agreement and furnish the <b>final data at least 1 (one) year prior to the physical connection</b> ".
58	214	1.1 (i) (a)	Simulation Model Submission: The steady-state and dynamic simulation models (RMS3, EMT and Power Quality Assessment model) shall be submitted at least 12 months prior to the physical interconnection of the Wind, Solar, BESS and Hybrid (Wind/Solar/BESS) plant/park with the grid. The models shall be submitted as per the model compatibility guidelines specified at S. No. 1 of Annexure – I (E)(a).	Same as above	
59	215	1.1 (i) (b.i)	Statement of compliance (SOC) to applicable CEA standards from an Accredited Agency.	Kindly define the Accredited Agency and provide the list of approved agencies by CTU.	Any internationally accepted 3rd party accredited agencies preferably NABL/NABCB accredited agencies
60	269	4 (b) of Annexure-I (E) (a)	Simulation models (both EMT & RMS) of PPC shall also be benchmarked, validated & certified by the accredited agency.	Kindly define the Accredited Agency and provide the list of approved agencies by CTU.	Any internationally accepted 3rd party accredited agencies preferably NABL/NABCB accredited agencies
61	258	5 (a) of Annexure-I (E) (a)		<p>The following clarification required in the procedure related to co-located Hybrid Power Plant Generating station and connected to same POI.</p> <ol style="list-style-type: none"> <li>1) Definition of rated power specified ambient temperature) for output at POI.</li> <li>2) What is the specified ambient temperature for the hybrid plant.</li> </ol> <p>The PQ capability curve @rated active power output @specified ambient temperature are good to comply for Wind &amp; Solar PV plant connected separately and independently to Grid substation for evacuation of Power. However, project ( Wind &amp; Solar) connected to the same bus with common POI are required, owing to following reason-</p> <ol style="list-style-type: none"> <li>1. Solar plant can be sized &amp; designed for highest temp of site</li> <li>2. Wind turbine outputs are highest at lower temp &amp; negligible at highest temp of site, if it is co-located &amp; evacuated from same POI.</li> <li>3. In such scenario of 1 &amp; 2, how PQ capability curve shall be defined for co- located and having same POI as output varies based on diff. temp from Wind &amp; Solar as against the connectivity approval.</li> </ol>	<ol style="list-style-type: none"> <li>1) Rated power is the contracted capacity of Hybrid plant(s) for which it will be given deemed GNA and can schedule power. Say for a Hybrid plant of 390MW capacity, having Solar installed capacity 360MW, Wind installed capacity of 100MW, with total installed capacity of 460MW plant has been registered for contracted capacity of 390MW for scheduling, then rated power of the Hybrid plant at POI would be 390MW.</li> <li>2) CEA connectivity regulation 2007 design for extreme condition... further clarified in Working group report.</li> </ol> <p>As per IEGC 2023 clause 22, sub-clause 3(g), <b>"Successful trial run of a hybrid system shall mean successful trial run of each individual source of the hybrid system in accordance with the applicable provisions of these regulations"</b>. (pg. no. 52 in IEGC 2023). Therefore, plant shall demonstrate the full capability and corroborate its performance at rated power of individual solar and wind at POI, (i.e. for 360MW (1pu) of Solar and 100MW (1 pu) of Wind).</p>
62	218	2 (i) (a)	Connectivity Details: Connection Agreement & Format viz. RCON-IIA-Stage-II connectivity grant letter by CTU, CON-3, CON-4, CON-5, CON-6 and any other applicable formats to be submitted to RLDCs specifying the point of connection, bay numbers etc.	The reference documents may be replaced in line with CERC (Connectivity and General Network Access to inter-state Transmission System) Regulations, 2022 and its amendments	<b>Suitably incorporated as "Connectivity Agreement(FORMAT-CONN-CA-5) by CTU, FORMAT-CONN-INT-1A,FORMAT-CONN-INT-1B,FORMAT-CONN-INT-1C, FORMAT-CONN-INT2,FORMAT-CONN-TD-1 FORMAT-CONN-TD-4 and any other applicable formats to be submitted to RLDCs specifying the point of connection, bay numbers etc. ."</b>
63	<b>Sembcorp's</b>				



S.No.	Page No.	Clause No.	Clause	Comment / Suggestion by Stake holder on SECTION-3 of the FTE & I procedure	Reply by GRID-INDIA
64	214	1.1 (i)	<p>1. Common Technical Data - Simulation Model, Reports and Certificate Submission to CTUIL and Grid-India</p> <p><b>1.1. Pre-Commissioning Data Submission</b></p> <p>i) The Wind, Solar, BESS1 and Hybrid (Wind/Solar/BESS) plant/park developer shall submit the technical connection data mentioned at points (a) and (b) below to CTUIL at least 12 months prior to the physical interconnection of the RE plant with the Grid.</p> <p>CTUIL shall share the submitted data and models with Grid India. Both CTUIL &amp; Grid-India shall, in parallel, examine the submitted data. The joint observations on the submitted data, if any, shall be conveyed by CTUIL to the RE developer within one month of the receipt of complete technical data</p>	<p>1. Common Technical Data - Simulation Model, Reports and Certificate Submission to CTUIL and Grid-India</p> <p>1.1. Pre-Commissioning Data Submission</p> <p>i) The Wind, Solar, BESS1 and Hybrid (Wind/Solar/BESS) plant/park developer shall submit the technical connection data mentioned at points (a) and (b) below to CTUIL at least 4 months prior to the physical interconnection of the RE plant with the Grid. CTUIL shall share the submitted data and models with Grid-India. Both CTUIL &amp; Grid-India shall, in parallel, examine the submitted data. The joint observations on the submitted data, if any, shall be conveyed by CTUIL to the RE developer within one month of the receipt of complete technical data.</p> <p>Accurately presenting the plant data 12 months ahead of physical interconnection with the grid is practically impossible. Particularly in case of Renewables, where the projects are commissioned in phases. Hence complete visibility is not available with the developer at such an early stage (12 months ahead).</p> <p><b>It is requested to consider reduction in these timeline from proposed 12 months to 4 months ahead of COD.</b></p>	<p>As per <b>GNA regulation 2022, Clause 10.1</b> "Provided that in case the entity is not in possession of the final technical connection data, it may furnish tentative data to form part of the Connectivity Agreement and <b>furnish the final data at least 1 (one) year prior to the physical connection</b>".</p>
<b>Azure Power</b>					
65	214	1.1 (i)	<p>1. Common Technical Data - Simulation Model, Reports and Certificate Submission to CTUIL and Grid-India</p> <p><b>1.1. Pre-Commissioning Data Submission</b></p> <p>i) The Wind, Solar, BESS1 and Hybrid (Wind/Solar/BESS) plant/park developer shall submit the technical connection data mentioned at points (a) and (b) below to CTUIL at least 12 months prior to the physical interconnection of the RE plant with the Grid.</p> <p>CTUIL shall share the submitted data and models with Grid India. Both CTUIL &amp; Grid-India shall, in parallel, examine the submitted data.</p>	<p>Kindly remove the limit of at least 12 months prior to the physical interconnection.</p>	<p>As per <b>GNA regulation 2022, Clause 10.1</b> "Provided that in case the entity is not in possession of the final technical connection data, it may furnish tentative data to form part of the Connectivity Agreement and <b>furnish the final data at least 1 (one) year prior to the physical connection</b>".</p>
66	222	3 (c) (vi)	<p>Facility to accept remote signals from load dispatch centres for varying active and reactive power set-point.</p>	<p>Changes in set point from remote location should be in coordination with the plant owner.</p>	<p>Yes, for any change in set point plant shall be first intimated by respective RLDC(s). Already, 70 thermal and hydro power plants pan-India respond as per the Automatic Generation Control (AGC) set point sent from NLDC under Automatic generation control. The plants under AGC are guided by Ancillary Services Regulations, 2022 and detailed NLDC SRAS operating procedure.</p>
67	227	5 (n)	<p>The developer shall provide high resolution data (<math>\leq 10</math>ms accuracy) of the commissioned IBR units for at least 10 seconds period. The data shall be provided as per the format specified in Annexure-I(E)(c).</p>	<p>Data resolution of <math>&lt;10</math>ms accuracy is not practically possible, due to the response time of various communication devices. PPC response time is approximate 250ms from command given to PPC to publish and record.</p>	<p><b>Suitably incorporated</b> as "The developer shall provide <b>high resolution data (preferably <math>\leq 10</math>ms accuracy)</b> of the commissioned IBR units for at least 10 seconds period. The data shall be provided as per the format specified in Annexure-I(E)(c).</p> <p>High resolution data is very important to ascertain the performance of inverters/WTGs during LVRT/HVRT event as inverters/WTGs goes in LVRT/HVRT based on its own terminal voltage, it is important for analyzing performance during oscillation in grid/RE complex.</p>
68	262	Clause 4 of Annexure-I (E) (a)	<p>a) PPC shall be certified by an Accredited agency.</p> <p>b) Simulation models (both EMT &amp; RMS) of PPC shall also be benchmarked, validated &amp; certified by the accredited agency.</p>	<p>Which agency can be referred for this test.</p>	<p>Clause suitably modified as:</p> <p>"a) PPC shall be certified by an Accredited agency.</p> <p>b) Simulation models (both EMT &amp; RMS) of PPC shall also be benchmarked."</p> <p>Accredited agency may be any internationally accepted 3rd party accredited agencies (preferably NABL/NABCB accredited agencies)</p>
69	224	Clause-5	<p>Trial Run Operation of Wind / Solar / BESS / Hybrid Generating Station</p>	<p>Energy injected to Grid during Trial Run till the certificate issuance.</p> <p>a) In between the trial run and issuance of certificate how the plant operation continues.</p> <p>i. Will it continue to run with the proposed trial run capacity.</p> <p>ii. Or, the plant operation need to be stopped till we get the certificate.</p> <p>b) How the billing and accounting for the generation during this period will be accounted.</p>	<p>In between trial run and issuance of certificate, plant shall operate as per RLDC(s) instruction. Plant shall intimate to respective RLDC(s) and perform the <b>trial run as per Clause-22, sub-clause (3) of IEGC 2023.</b></p> <p><b>Generation will not be billed, it shall be consider as infirm generation and treatment would be as per DSM regulation. (As per scheduling procedure of Grid-India)</b></p>
<b>SIEMENS India</b>					
70	257	Clause-4 of Part-B of Annexure-I (E)	<p>"4) Simulation results showing the comparison of detailed plant model and equivalent model of the Wind/Solar farm/BESS/Hybrid - (Requirement is only for RMS model)</p> <p>a) Steady state comparison of P, Q, V, I to be included at POI</p> <p>b) Detailed v/s Equivalent model response comparison of P, Q, V &amp; I at POI to be demonstrated for different tests like P control, Q control, Voltage control, LVRT, HVRT, frequency response control operation etc.</p> <p>The error between the detailed v/s equivalent model response shall be within a tolerance band as specified by respective RLDC. Suitable measures shall be taken to minimized the error. "</p>	<p>1. Request you define if output plots need to consider/ include at inverter level.</p> <p>2. Detailed v/s Equivalent model response comparison : We understand the advantage for checking on the detailed model, however unable to understand need for repeating all the tasks in Equivalent model. Equivalent model can specified only for specific test cases which important from Grid India point of view and rest of the study on Detail Machine Model.</p> <p>This will help in reducing the complexity and saving on time while achieving the required intent.</p> <p>3. Value of tolerance band to be specified.</p>	<p>1. Already specified in the procedure.</p> <p>2. Response of both detailed and equivalent model need to be shown as per clause. It is important that equivalent model shall give response close to the detailed model which is expected to be close of actual plant response to be charged. It is not practical to integrate multiple plants detailed model, equivalent model of multiple plant model can be integrated to study the dynamics of entire complex.</p> <p>3. The error between the detailed v/s equivalent model response shall be within a tolerance band as specified by respective RLDC.</p>

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71	258	Clause-5 of Part-B of Annexure-I (E)	<p>5) PQ Reactive Capability Curve plot of Wind/Solar Farm/BESS/Hybrid at POI -</p> <p>a) Simulation study results/plots demonstrating PQ capability of the plant at POI for 0.95 pu, 1 pu &amp; 1.05 pu voltage at POI (factoring in specified ambient temperature) shall be included for following cases:</p> <ul style="list-style-type: none"> <li>• Without any additional reactive power compensation?</li> <li>• With additional reactive power compensation (if required for compliance of reactive power capability at POI)</li> </ul> <p>The study shall be carried out on both detailed RMS and equivalent EMT model.</p> <p><input type="checkbox"/> Generating station shall be able to deliver rated output at POI (at specified ambient temperature) for the above-mentioned conditions at least up to the capability shown in the PQ curve below:</p> <p><input type="checkbox"/> The voltage dependence of reactive power capability of RE Generator shall be governed as per the QV curve shown below:</p> <p><input type="checkbox"/> For all cases, the report shall include details of both active and reactive power exchange by generation pooling station with the grid at point of interconnection (POI).</p> <p><b>7 Additional Reactive Power Compensation may include capacitor banks, FACTS devices like STATCOMs or any combination of such devices</b></p>	<p>1. Transformer tap control setting to be specified for each case.</p> <p>2. As per the previous ref document, it was specified that dynamic compensating device is required. Here in the footnote, capacitor bank is mentioned. Please clarify.</p>	<p>1. Nominal Tap position may be considered as suitable.</p> <p>2. Modified suitably. As per <b>CEA MoM dated 21.04.23, as per 14(i)</b> of the MoM "Hybrid reactive compensation to meet requirement at POI need to be looked instead of only static compensation. However, the hybrid reactive compensation can only be permitted on case to case basis for issuance of connection offer to applicants who made their CON-4 application till 30th April 2023, after which <b>dynamic compensation shall only be permitted</b>".</p>
72	259	Clause-7 of Part-B of Annexure-I (E)	<p>7) Below mentioned tests shall be performed on both equivalent RMS &amp; EMT models of the plant</p>	<p>Please clarify the model on which power quality study should be considered. As per clause 10, power quality is to be performed on detailed EMT/ Power Quality Assessment model</p>	<p>Suggestion suitably incorporated. Power quality study shall be carried out either in Detailed EMT or Power Quality Assessment model.</p>
73	259	Clause-7 (b) of Part-B of Annexure-I (E)	<p>b) LVRT Test - Plot of P, Q, Vac, Iac, Id, Iq (IBR output current along with reference in d-q frame) and Vd,Vq (IBR output voltage along with reference in d-q frame) at POI shall be included along with IBR unit response(s) for:</p> <p>i) Case-1: 3-ph impedance fault at POI for 3 sec for voltage of 0.85 pu during fault</p> <p>ii) Case-2: 3-ph impedance fault at POI for 1.65 sec for voltage of 0.5 pu during fault</p> <p>iii) Case-3: 3-ph impedance fault at POI for 300 msec for voltage of 0.15 pu during fault</p> <p>iv) Case-4: 1-ph fault at POI for 3 sec for voltage of 0.85 pu during fault</p> <p>v) Case-5: 1-ph fault at POI for 1.65 sec for voltage of 0.5 pu during fault</p> <p>vi) Case-6: 1-ph fault at POI for 300 msec for voltage of 0.15 pu during fault</p> <p>Above cases shall be simulated for both full (100%) and partial (25% and 50%) active power dispatch</p> <ul style="list-style-type: none"> <li>• LVRT settings (including "K" factor), Response Time (ms) shall be mentioned in the study results.</li> <li>• Suitable margin shall be incorporated in inverter level settings (through line drop compensation studies) to enable LVRT operation at specified voltage at POI.</li> </ul>	<p>In case of more than 1 inverter make, what k factor shall be defined for plant level study? Is there any specific guideline to the inverter OEM for K factor to follow?</p>	<p>K-factors and other parameters of inverters/WTGs may be tuned/kept suitably in plant simulation model (RMS &amp; EMT i.e PSSE &amp; PSCAD models) based on the system strength at POI and other considerations. Any change in default parameters of <b>Inverters/WTGs shall be</b> the responsibility of the RE plant(s) in consultation with respective OEMs.</p>
74	259	Clause-7 (c) of Part-B of Annexure-I (E)	<p>c) HVRT Test - Plot of P, Q, Vac, Iac, Id, Iq (IBR output current along with reference in d-q frame) and Vd,Vq (IBR output voltage along with reference in d-q frame) at POI shall be included along with IBR unit response(s) for:</p> <p>i) Case-1: 3-Phase voltage rise at POI is up to 1.2 pu for 2 sec</p> <p>ii) Case-2: 3-Phase voltage rise at POI is up to 1.3 pu for 200 msec</p> <p>iii) Case-3: 1-ph voltage rise at POI is up to 1.2 pu for 2 sec</p> <p>iv) Case-4: 1-ph voltage rise at POI is up to 1.3 pu for 200 msec</p> <p>Above cases shall be simulated for both full (100%) and partial (25% and 50%) active power dispatch</p> <ul style="list-style-type: none"> <li>• HVRT settings (including "K" factor), Response Time (ms) shall be mentioned in the study results.</li> <li>• Suitable margin shall be incorporated in inverter level settings (through line drop compensation studies) to enable HVRT operation at specified voltage at POI.</li> <li>• The Protection settings of 33 kV feeders, Generator PS &amp; Dedicated Trans. Line shall be coordinated to enable HVRT compliance at POI. Same shall also be specified in the study results.</li> </ul>	<p>1. In case of more than 1 inverter make, what k factor shall be defined for plant level study? Is there any specific guideline to the inverter OEM for K factor to follow?</p>	<p>K-factors and other parameters of inverters/WTGs may be tuned/kept suitably in plant simulation model (RMS &amp; EMT i.e PSSE &amp; PSCAD models) based on the system strength at POI and other considerations. Any change in default parameters of <b>Inverters/WTGs shall be</b> the responsibility of the RE plant(s) in consultation with respective OEMs.</p>

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75	259	Clause-7 (d) of Part-B of Annexure-I (E)	<p>d) Operating Frequency Range [Frequency control flag (Fflag) set 0 in PPC model]</p> <p>i) Case -1: Rated Active Power Generation in the frequency range of 49.5 – 50.5 Hz.</p> <p>Plots of P, Q, V, f at POI demonstrating the ability of the plant to deliver rated active power in the frequency range of 49.5 – 50.5 Hz shall be included.</p> <p>ii) Case -2: Capability to operate (stable operation) in the frequency range of 47.5 – 52 Hz.</p> <p>Plot of P, Q, V, f at POI demonstrating the ability of the plant to operate in the frequency range of 47.5 to 52 Hz shall be included.</p> <p>PPC control parameter setting shall also be specified for the above cases.</p>	1. clarify the PPC control parameter setting to be specified for these cases	Default parameters of PPC may be tuned suitably in plant simulation model (RMS & EMT i.e. PSS/E & PSCAD models) to meet all the compliances as per CEA technical standards at POI and test need to be performed as specified in Clause-7 (d, e, f, g) of Part-B of Annexure-I of this procedure. Any change in default parameters of Inverters/WTGs shall be the responsibility of the RE plant(s) in consultation with respective OEMs.																											
76	261	Clause-10 of Part-B of Annexure-I (E)	<p>Guidelines for Simulation Studies – The specified simulation tests shall be carried out on the simulation models mentioned below:</p> <table border="1"> <thead> <tr> <th>S. No.</th> <th>Simulation Test Description</th> <th>Simulation to be carried out on:</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Reactive Power Capability</td> <td>Both - Detailed RMS and Equivalent EMT Model</td> </tr> <tr> <td>2.</td> <td>Power Quality</td> <td>Detailed EMT / Power Quality Assessment Model</td> </tr> <tr> <td>3.</td> <td>Low Voltage Ride Through</td> <td>Detailed and Equivalent RMS and Equivalent EMT Model</td> </tr> <tr> <td>4.</td> <td>High Voltage Ride Through</td> <td>Detailed and Equivalent RMS and Equivalent EMT Model</td> </tr> <tr> <td>5.</td> <td>Operating Frequency Range</td> <td>Both - Equivalent RMS and EMT Model</td> </tr> <tr> <td>6.</td> <td>Frequency Response</td> <td>Both - Equivalent RMS and EMT Model</td> </tr> <tr> <td>7.</td> <td>Dynamic Reactive Power Support</td> <td>Both - Equivalent RMS and EMT Model</td> </tr> <tr> <td>8.</td> <td>Ramping Capability</td> <td>Both - Equivalent RMS and EMT Model</td> </tr> </tbody> </table>	S. No.	Simulation Test Description	Simulation to be carried out on:	1.	Reactive Power Capability	Both - Detailed RMS and Equivalent EMT Model	2.	Power Quality	Detailed EMT / Power Quality Assessment Model	3.	Low Voltage Ride Through	Detailed and Equivalent RMS and Equivalent EMT Model	4.	High Voltage Ride Through	Detailed and Equivalent RMS and Equivalent EMT Model	5.	Operating Frequency Range	Both - Equivalent RMS and EMT Model	6.	Frequency Response	Both - Equivalent RMS and EMT Model	7.	Dynamic Reactive Power Support	Both - Equivalent RMS and EMT Model	8.	Ramping Capability	Both - Equivalent RMS and EMT Model	Please clarify the model on which power quality study should be considered. As per clause 7, power quality is to be performed on both equivalent RMS & EMT models of the plant	Suggestion suitably incorporated. Power quality study shall be carried out either in Detailed EMT or Power Quality Assessment model.
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77	262	Clause 1 (i) of Annexure-I (E) (a)	<p>Following RMS and EMT models along with detailed model user guide shall be submitted for the Wind/Solar/BESS/Hybrid Plant:</p> <table border="1"> <thead> <tr> <th>Type of Model</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td rowspan="3">RMS (Root Mean Square)</td> <td>IBR Unit Model</td> </tr> <tr> <td>Detailed Plant Model (including PPC model)</td> </tr> <tr> <td>Equivalent Plant Model (including PPC model)</td> </tr> <tr> <td rowspan="3">EMT (Electro Magnetic Transient)</td> <td>IBR Unit Model</td> </tr> <tr> <td>Equivalent Plant Model (including PPC model)</td> </tr> <tr> <td>Power Quality Assessment Model</td> </tr> </tbody> </table>	Type of Model	Description	RMS (Root Mean Square)	IBR Unit Model	Detailed Plant Model (including PPC model)	Equivalent Plant Model (including PPC model)	EMT (Electro Magnetic Transient)	IBR Unit Model	Equivalent Plant Model (including PPC model)	Power Quality Assessment Model	Initialization time shall be uniform for all PSCAD models, preferably under 3 seconds	Its better to have less and uniform initialization time, but for different models and integrated models it may be different, PSCAD & PSSE model shall be validated as per the guideline of this procedure.																	
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78	262	Clause 1 (ii) (a) of Annexure-I (E) (a)	RMS models shall be compatible with PSS/E version 35 and above.	We would highly recommend the models in latest PSS/E version 35 because of various advantages; it will have for NLDC. However understanding current scenario; NLDC also provide sufficient timelines for OEM to convert their models to newer version, so the comments " <b>Provided that the concerned RLDC may accept the model compatible with version 34 also under special circumstances. The decision in this regard will be at the discretion of the concerned RLDC only.</b> " should also have deadline to accept this.	To ensure the compatibility of the model to be used at CTU/Grid-India level, model of PSS/E version 35 and above is required.																											
79	263	Clause 1 (ii) (a) of Annexure-I (E) (a)	EMT models shall be compatible with PSCAD version 4.6.3 and above with the following	1. As per the recent communication from SRLDC, PSCAD v5 was mentioned. Here it is not clearly specified. As it is mentioned for 4.6.3 and above, there might be version conflicts among the models in one plant. To bring all stakeholders on the same level, version needs to be uniform. 2. All models shall work for a timestep of 10-20 usec	Plant should submit all the PSCAD model preferably in ver-5 and above. PSCAD version of 4.6.3 and above shall be accepted.  Model should work in timestep of 5-20 usec but not limited to same.																											
80	263	Clause 1 (iii) of Annexure-I (E) (a)	<p>iii) The plant simulation models (applicable for generic and UDMS) shall: Be numerically stable for the full operating range including a wide range of grid SCR.</p>  <p>From Short circuit study (SCS), following formulae can be used:</p> $I_{sc} = \frac{V_{pre-fault}}{Z_{th} + jX_{sc}}$ <p>Where,  <math>I_{sc}</math> = Short circuit current (SCC)  <math>V_{pre-fault}</math> = Pre-fault voltage (V)  <math>Z_{th}</math> = Thevenin Impedance (Z)  <math>X_{sc}</math> = Short circuit reactance (X)</p>	What range of SCR is to be considered for study?	<b>Plant may take the SCR value from CTU/RLDC(s) before carrying out the study.</b>																											
81	265	Clause 1 (iii) of Annexure-I (E) (a)	EMT model shall not contain any dependant libraries. The submitted workspace file (.pswx) must not load any PSCAD library (.pslx) files apart from the PSCAD master library. The model shall be capable of running with no extra steps aside from clicking "Run" option in PSCAD. EMT model shall have snapshot capability.	Creating local library for Individual OEM stake holder provides lot many advantage start from modeling and quick evaluation/resolution point of view. sometime project specific changes needs to be done, which will restrict if we use central lib. We request you to recommend the standard procedure/ guideline for submission of PSCAD library (.pslx) files. Also we would request you to check with PSCAD Software Development Team on additional aspects.	PSCAD shall be validated during technical approval by RLDC(s)/CTUIL as per the the procedure. Any thing additional requirement shall be checked with PSCAD development team.																											
82	266	Clause 1 (x) (e) of Annexure-I (E) (a)	Station transformer taps and static switched shunts should be initialized to a nominal position appropriate for the initial POI voltage and real power dispatch.	As mentioned in point 3a, POI is already defined and controllable infinite bus is defined, which in conflict with this point from a modelling point of view	Vschedule=1 pu shall be defined for Infinite bus. For POI, initialization need to be done with initial state VPOI=1pu, further simulation need to be run for sometime for flat run. Here, only Vschedule=1 (for Infinite bus) is fixed rest all will set after initialization with initial state VPOI=1pu. Therefore, there would not be any conflict from modeling point of view. Further in case of any modeling issue, same shall be resolved during technical approval by RLDC(s)/CTUIL as per the the procedure.																											

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83	224	Clause:5	The trial run of Wind / Solar / BESS / Hybrid Generating Stations shall be carried out as per the provisions of extant grid code.	In case of fresh application for capacitor bank as per draft procedure, do we need to demonstrate trail run operation..?	No need to demonstrate the trial run of individual new element.