DETAILED PROCEDURE FOR

FIRST TIME ENERGIZATION AND INTEGRATION (FTEI) OF NEW OR MODIFIED POWER SYSTEM ELEMENT TO THE STATE GRID

Prepared in compliance to

Clause 8 (4) of CERC (Indian Electricity Grid Code) Regulations, 2023

&

Clause 5.3.4 of AERC (Electricity Grid Code) Regulations, 2024

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PREFACE

This document has been prepared by SLDC in compliance to clause 8.4 of the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulation 2023 & Clause 5.3.4 of Assam Electricity Regulatory Commission (Electricity Grid Code) Regulations, 2024.

The intent of this document is to serve as a guide for the necessary formalities and procedures to be followed while incorporation of a New or Modified Power System Element to the State Grid. The procedure incorporated in this document is to be followed by all the Users of the State Grid for bringing uniformity throughout the state for smooth operation of power system and in the interest of grid security. It is subject to change as per procedures laid down by competent authority from time to time.

Words and expressions used in these procedures and not defined herein but defined in various regulations of AERC/CERC/CEA orders and procedures of CERC, judgments of ATE, rules and policies of MOP and Electricity Act, 2003 shall have the meaning assigned to them under these regulations, orders, procedures, rules, policies & the act.

This detailed procedure has been prepared in line with the prevalent regulations and Central procedures. If any modification is required for removing difficulties, the same shall be done with prior approval of the Commission.

This procedure supersedes all other First Time Charging procedures issued earlier by SLDC

Disclaimer: Any typographical error which may have crept up inadvertently may please be ignored.

CONTENTS

CHAPTER NO	TOPIC	PAGE NO
1	GENERAL REQUIREMENTS	7-12
2	APPLICATION FOR FTEI OF NEW ELEMENT AND REQUEST FOR TRIAL RUN	13-16
3	SPECIFIC REQUIREMENTS FOR CHARGING/ ENERGIZATION AND INTEGRATION OF NEW TRANSMISSION ELEMENT INCLUDING ASSOCIATED TRANSMISSION SYSTEM (ATS) OF GENERATOR	17-23
4	SPECIFIC REQUIREMENTS FOR CHARGING/ ENERGIZATION AND INTEGRATION OF ALTERED (INCLUDING MODIFIED/ REPLACED/ UPGRADED) TRANSMISSION SYSTEM ELEMENTS INCLUDING ASSOCIATED TRANSMISSION SYSTEM (ATS) OF GENERATOR	24-29
5	SPECIFIC REQUIREMENTS FOR CHARGING/ ENERGIZATION AND INTEGRATION OF THERMAL, GAS, HYDRO PLANTS INCLUSING PSP AND CAPTIVE GENERATION COMPLEX CONNECTED TO STATE GRID	30-44
6	SPECIFIC REQUIREMENTS FOR CHARGING/ ENERGIZATION AND INTEGRATION OF SOLAR, WIND, BESS OR HYBRID (WIND/SOLAR/BESS) PLANTS/PARKS	45-64

LIST OF ANNEXURES / FORMATS

ANNEXURE / FORMAT NO	DETAILS
ANNEXURE A / FORMAT-I	USER REGISTRATION WITH SLDC
FORMAT-FL	FORWARDING LETTER TO THE HEAD OF SLDC REQUESTING FTEI PERMISSION
ANNEXURE A1 / FORMAT I A	INTIMATION BY USER REGARDING EXPECTED FIRST TIME ENERGIZATION AND INTEGRATION OF NEW POWER SYSTEM ELEMENT(S)
ANNEXURE A2 (a) / FORMAT I B	LIST OF ELEMENTS TO BE FIRST TIME ENERGIZED AND THEIR DETAILS
ANNEXURE A2 (b) / FORMAT IC	DETAILS OF THE ELEMENTS EXPECTED TO BE FIRST TIME ENERGISED AND INTEGRATED INTO THE GRID IN THE NEXT SIX (06) MONTHS
ANNEXURE A3	SINGLE LINE DIAGRAM OF THE CONCERNED SUBSTATIONS AFTER INCLUSION OF THE NEW ELEMENTS TO BE CHARGED.
FORMAT II	ACKNOWLEDGEMENT OF RECEIPT OF FTEI REQUEST BY SLDC
ANNEXURE A4	LIST OF SCADA POINTS TO BE MADE AVAILABLE TO SLDC & RLDC
ANNEXURE A5	TYPE AND LOCATION OF ENERGY METERS AS PER RELEVANT CEA REGULATIONS
ANNEXURE-B1/ FORMAT III	REQUEST BY THE USER FOR FIRST TIME ENERGIZATION AND INTEGRATION AND NOTICE FOR FRESH/REPEAT TRIAL RUN
ANNEXURE B2/ FORMAT III A	UNDERTAKING BY THE USER IN RESPECT OF PROTECTION SYSTEMS
ANNEXURE B3/ FORMAT IIIB	UNDERTAKING BY THE USER IN RESPECT OF TELEMETRY AND COMMUNICATION
ANNEXURE B4/ FORMAT IIIC	UNDERTAKING BY THE USER IN RESPECT OF ENERGY METERING
ANNEXURE B5/ FORMAT III D	UNDERTAKING BY THE USER IN RESPECT OF STATUTORY CLEARANCES
ANNEXURE B5 (A)	UNDERTAKING IN RESPECT OF CYBER SECURITY REQUIREMENTS
ANNEXURE B6	UNDERTAKING BY THE USER FOR ENERGIZATION AND INTEGRATION OF TRANSMISSION LINE/BAY AFTER ALTERATION (INCLUDING MODIFICATION/ REPLACEMENT/ UPGRADATION)
ANNEXURE B7	UNDERTAKING BY THE USER FOR ENERGIZATION AND INTEGRATION OF TRANSMISSION LINE AFTER ALTERATION (INCLUDING DIVERSION/MODIFICATION/TOWER HEIGHT MODIFICATION/ERS)
ANNEXURE B8	UNDERTAKING BY THE USER FOR ANTI-THEFT CHARGING OF TRANSMISSION LINE
FORMAT IV	PROVISIONAL APPROVAL FOR ENERGIZATION, TESTING AND TRIAL RUN

ANNEXURE C1 / FORMAT-V	SUBMISSION OF INFORMATION FOR COMPLETION OF TRIAL RUN AND REQUEST FOR ISSUANCE OF CERTIFICATE OF SUCCESSFUL TRIAL RUN
FORMAT-VI	OBJECTION BY BENEFICIARY REGARDING TRIAL RUN AS PER CLAUSE 25(1) OF IEGC, 2023
FORMAT-VII	CERTIFICATE OF SUCCESSFUL TRIAL RUN (WITH ELECTRICAL LOAD) AS PER CLAUSE 25 OF CERC (IEGC), 2023 OR CERTIFICATE OF SUCCESSFUL TRIAL RUN (WITHOUT ELECTRICAL LOAD) AS PER REG. 5(2)(B) OF CERC (TERMS & CONDITIONS OF TARIFF) REGULATIONS 2019
FORMAT-VIII	APPROVAL FOR DRAWAL OF START UP POWER
ANNEXURE TTL	TECHNICAL PARAMETERS OF TRANSMISSION LINE & ASSOCIATED BAY
ANNEXURE TT	TECHNICAL PARAMETERS OF TRANSFORMER & ASSOCIATED BAY
ANNEXURE TR	TECHNICAL PARAMETERS OF REACTOR & ASSOCIATED BAY
ANNEXURE-NSS	DETAILS RELATING TO CHARGING OF NEW SUBSTATION
ANNEXURE-UC	UNDERTAKING BY CAPTIVE GENERATION COMPLEX
ANNEXURE GS	APPLICATION FORM FOR SEEKING START UP POWER
ANNEXURE TH	DETAILS OF HYDRO PLANTS
ANNEXURE TPSP	DETAILS OF PUMPED STORAGE PLANTS (PSP)
ANNEXURE TWS	DETAILS OF WIND AND SOLAR PLANTS
ANNEXURE TW	STATIC DATA OF WIND GENERATING STATION
ANNEXURE TS	STATIC DATA OF SOLAR GENERATING STATION
ANNEXURE TB	TECHNICAL PARAMTERS OF BESS
ANNEXURE IB	INDEMNITY BOND
ANNEXURE UG-1	UNDERTAKING BY SPD/ SPDD/ WPD/ WPPD ON GENERAL COMPLIANCE REQUIREMENTS
ANNEXURE UG-2	UNDERTAKING ON COMPLIANCE OF CEA CONNECTIVITY STANDARDS IN CASE OF SOLAR/WIND/ BESS OR HYBRID (WIND/SOLAR/BESS) PLANTS/PARKS CONNECTED TO THE STATE GRID
ANNEXURE UG-3	UNDERTAKING BY GENERATOR BEFORE DRAWAL OF START UP POWER
ANNEXURE UG-4	UNDERTAKING BY SPD/ WPD REGARDING EXEMPTION OF TRANSMISSION CHARGES/ LOSS
ANNEXURE UG-5	UNDERTAKING BY PSP OPERATING IN PUMPING MODE
ANNEXURE UG-6	UNDERTAKING BY ESS OPERATING IN CHARGING MODE
ANNEXURE MT-1	PARAMETERS OF WIND GENERATING PLANTS FOR REAL TIME TELEMETRY
ANNEXURE MT-2	SEGREGATION OF TELEMETERED POINTS FOR WIND TURBINE GENERATING PLANTS
ANNEXURE MT-3	PARAMETERS OF SOLAR GENERATING PLANTS FOR REAL TIME TELEMETRY
ANNEXURE MT-4	SEGREGATION OF TELEMETERED POINTS FOR SOLAR GENERATING PLANTS
ANNEXURE MT-5	PMU SIGNAL LIST
ANNEXURE MT-6	PARAMETERS OF BESS FOR REAL TIME TELEMETRY

ANNEXURE MT-7	AGC SIGNAL LIST TO BE MADE AVAILABLE TO NLDC/ NERLDC/SLDC
ANNEXURE-UC	UNDERTAKING BY CAPTIVE GENERATION COMPLEX
ANNEXURE 3A	GUIDELINES FOR FURNISHING INFORMATION FOR RMS (GENERIC) MODELLING OF COAL FIRED GENERATION
ANNEXURE 3B	GUIDELINE FOR FURNISHING INFORMATION FOR RMS (GENERIC) MODELLING OF GAS-FIRED GENERATION
ANNEXURE 3C	GUIDELINES FOR FURNISHING INFORMATION FOR RMS (GENERIC) MODELLING OF HYDRO GENERATION
ANNEXURE 3D	GUIDELINES FOR MODEL COMPATIBILITY AND SUPPORT FOR CONVENTIONAL GENERATING (THERMAL, GAS & HYDRO) PLANTS, BULK CONSUMERS OR LOAD SERVING ENTITIES AND COMBINED (LOAD AND CAPTIVE) GENERATION COMPLEX
ANNEXURE 3E	GUIDELINE FOR PUMPED STORAGE PLANTS
ANNEXURE I(C)	GUIDELINES FOR EXCHANGE OF DATA FOR RMS MODELLING (GENERIC) OF WIND GENERATING STATIONS
ANNEXURE I(D)	GUIDELINES FOR EXCHANGE OF DATA FOR RMS MODELLING (GENERIC) OF SOLAR GENERATING STATIONS
ANNEXURE I(E)(a)	GUIDELINES FOR MODEL COMPATIBILITY AND SUPPORT, IBR TESTING AND CERTIFICATION, PPC TECHNICAL REQUIREMENT, MODEL BENCHMARKING AND VALIDATION REPORT
ANNEXURE I(E)(b)	DETAILS OF THE IMPLEMENTED CONTROLLER AND PROTECTION SETTINGS (BOTH IBR AND POWER PLANT CONTROLLER)
ANNEXURE I(E) (c)	IBR UNITS - HIGH RESOLUTION DATA SUBMISSION FORMAT
ANNEXURE IF	SINGLE GENERATOR EQUIVALENT MODEL

CHAPTER 1: GENERAL REQUIREMENTS

1.1 INTRODUCTION

The procedure for First Time Energization and Integration (FTEI) of new or modified power system elements specifies the requirements to be fulfilled by the applicant(s) prior to obtaining the charging permission from SLDC. This procedure specifies operational and study requirements for integration of new or modified power system elements with the state grid.

This detailed procedure is applicable to:

a) Intra state Transmission lines/Transformers/Reactors/Flexible Alternating Current Transmission System (FACTS) Devices/ Buses/ Bays/ any other element of upto 132kV voltage level irrespective of ownership.
b) Intra State Generating Units within the state periphery irrespective of ownership including CPPs; seeking to connect or connected to the state grid.
c) Generating Transformers (GTs) /Station Transformers (STs) at Intra State generating stations.

1.2 REGULATORY PROVISION

Clause 5.3.4 of the AERC (Electricity Grid Code) Regulations, 2024 states that "SLDC, after due consultation of stakeholders, shall prepare a detailed procedure covering modalities for processing of application, first time energization and integration of new or modified power system element to intra-State transmission system and submit for approval of the Commission".

In accordance with the above provisions, procedure for first time energization and integration of a new or modified power system element(s) to intra-State transmission system has been formulated in line with that of NLDCs to enable SLDC to ensure secure and reliable integration.

This procedure specifies the requirements to be fulfilled by the applicants prior to obtaining the charging permission of the SLDC for FTEI.

1.3 CONDITIONS UNDER WHICH THIS PROCEDURE NEEDS TO BE FOLLOWED:

a) Commissioning of a new power system element fulfilling criteria specified under 1.1.

b) Charging/Energization of power system elements after continuous outage/shutdown exceeding six (06) months.

c) Charging/Energization of element after alteration (including modification/ replacement/ upgradation) under Planned/Emergency/Forced outage:

   i. Replacement and/or upgradation of substation equipment: CT/PT/CVT/CB /Isolator/LA/ Bushing/Wave trap

ii. Replacement of one phase of a failed Transformer/Reactor with a cold/ hot spare unit

iii. Replacement of failed 3-ph Transformer/Reactor with new 3-ph Transformer/Reactor.

d) Charging/Energization of transmission line after restoration of damaged/collapsed towers at the same location.

e) Restoration and charging /energization of transmission line through Emergency Restoration System towers, Interim bypass arrangement or Restoration and modification of transmission tower.

f) Charging/Energization after re-conductoring, re-bundling or similar other alterations involving change in nature of power flow in the line.

g) Charging/Energization of transmission line after upgradation/increase in voltage level or line rearrangements including Loop-In-Loop-Out.

h) Charging/Energization of transmission line after alterations involving change in course of transmission line i.e. in case of railway line/road/river crossing (with or without the use of ERS) and diversions or interim bypass arrangement or restoration and modification of transmission line/tower involving crossing of another line.

i) Anti-theft charging of already commissioned /new transmission line

(i) Idle charging (for anti-theft) of a section or complete line length of new transmission line which is not terminated at both ends.

(ii) Charging/Energization of already commissioned transmission line (complete line length or a section) which is under breakdown/ outage.

1.4 JURISDICTION FOR ISSUANCE OF APPROVAL FOR FIRST TIME ENERGIZATION, TRIAL RUN, ISSUANCE OF CERTIFICATE OF SUCCESSFUL TRIAL RUN:

- **NLDC-** Trans-national and Inter-Regional AC and HVDC transmission lines irrespective of voltage level and owned by ISTS/Deemed ISTS transmission licensees.

- **NERLDC-** All regional ISTS elements including ISGS generators, Intra State elements of voltage level of 220kV and above irrespective of ownership.

- **SLDC-** Intra State Generating Units within the state periphery and seeking to connect or connected to the State Grid including all Intra State Transmission System elements upto 132kV voltage level.

1.5 PREREQUISITES FOR REQUEST OF FIRST TIME ENERGIZATION AND INTEGRATION OF NEW OR MODIFIED POWER SYSTEM ELEMENT TO SLDC

The following pre-requisite are to be ensured before requesting SLDC for First Time Energization and Integration (FTEI) of Power system elements in the grid:

1.5.1 USER REGISTRATION WITH SLDC

Users intending to integrate elements with the InSTS are required to be registered as a "User" with SLDC as per Regulation 100 of AERC (Terms and Conditions for determination of Multi Year Tariff) Regulations 2024 or as amended from time to time in specified format and an application fee of INR 25000/- or as specified by the Commission.

1.5.2 DATA SUBMISSION FOR CARRYING OUT INTER-CONNECTION STUDIES 6 MONTHS PRIOR.

The User shall submit the necessary technical and modelling data of new power system elements six (6) months before the expected date of first energization for carrying out Inter-connection Studies, as per Clause 10 of IEGC 2023 and 5.6.4 of AERC AEGC Regulations 2024 along with the following information:

i. **Annexure A1**: Intimation by User regarding expected first time energization and integration of the power system element(s) along with the list of the desired documents being submitted.

ii. **Annexure A2(a)**: List of elements to be charged and their details.

iii. **Annexure A2(b):** Details of Elements to be charged in the next Six (6) months: Clause 10 of theIEGC 2023 and 5.6.4 of AERC AEGC Regulations 2024 directs the users to provide technical details of the element to be charged and integrated into the grid to SLDC for carrying out interconnection studies in coordination with RLDC or NLDC as the case may be. Joint studies shall be carried out based on the information provided to identify operational constraints, if any

iv. **Annexure A3**: Single line diagram of the concerned sub stations, along with status of completion of each dia/bus/breakers clearly indicating which elements are proposed to be charged.

v. **Technical Parameters & Protection Data** as per **Annexure – TB, Annexure- TH, Annexure-TR, Annexure-TS, Annexure-TT, Annexure-TTL, Annexure- TW, Annexure- TWS, Annexure- NSS** whichever applicable for specific elements.

1.5.3 CONNECTIVITY AGREEMENT FOR CONNECTION WITH THE STATE GRID.

Users shall enter into Connectivity Agreements for connection with the state Grid/ InSTS as per relevant clauses of AERC (Electricity Grid Code) 2024, AERC (Grant of connectivity to the intra

state transmission system) Reg. 2024 and CEA (Technical Standards for Connectivity to the Grid) Regulations, 2007 etc or as amended from time to time.

The **CONNECTIVITY AGREEMENT along with the SITE RESPONSIBILITY SCHEDULE as per AERC (Grant of Connectivity to the Intra State Transmission System) Regulations, 2025** is to be provided as **ANNEXURE A6.**

1.5.4 REAL TIME SCADA DATA AND TELEMETRY AT SLDC.

As per clause 5.10.1 of AERC (Electricity Grid Code) Regulations, 2024, all Users shall provide Reliable speech and data communication systems to facilitate necessary communication, data exchange, supervision and control of the grid by the NLDC, RLDC and SLDC in accordance with the CERC (Communication System for Inter-State Transmission of Electricity) Regulations, 2017 and the CEA (Technical Standards for Communication System in Power System Operations) Regulations, 2020 or as amended from time to time.

All the Intra State users shall abide by the above regulation by providing Reliable speech and data communication systems to facilitate necessary communication, data exchange, supervision and control of the grid by the NLDC, RLDC and SLDC at their respective power system level.

The list of data points that would be made available to SLDC/RLDC in real time shall be as per Guidelines on "Interface Requirements" under the Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017. However, some other parameters might need to be provided as per Control Centre requirement based on the SLD and site condition.

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).

The interfaces shall be designed to operate under single contingency failure condition. Equipment should support interfaces with multiple ports, cards, gateways etc. and configured in redundant mode so that failure of single hardware element, i.e. communication port, card, gateway etc. of the users shall not lead to failure of data communication. Communication system shall be designed as per planning criterion to be notified by CEA.

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 and its amendments].

Users shall deploy Optical Ground Wire (OPGW) as their primary voice and data link to the State Load Despatch Centre (SLDC). OPGW installation and termination shall comply with the Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022 and its amendments.

The communication system must achieve at least 99.9% annual availability, redundancy and documented fault-restoration procedures as required by the Central Electricity Regulatory Commission (Communication System for Inter-State Transmission of Electricity) Regulation, 2017, and its amendments and meet the fibre-optic technical, environmental resilience and latency requirements set forth in the Central Electricity Authority (Technical Standards for Communication System in Power System Operations) Regulations, 2020 and its amendments.

Where diverse OPGW routing is not practicable, a full-duplex Power Line Carrier

Communication (PLCC) channel shall serve as backup. Terminal equipment shall include a minimum of ten hours of battery backup, automatic switchover between redundant modules or paths within fifty milliseconds, and integration with the SLDC's Network Management System

The real time data shall be made available at SLDC/RLDC and validated prior to charging.

The following timeline shall be followed:

a) SLDC shall be intimated at least 7 working days prior to configuration in local RTU/SAS gateway informing the change and seeking I/O address.
b) SLDC shall be intimated at least 3 working days prior to the proposed date of data validation for conformation on the date of data validation from SLDC.

The details related to real time data and telemetry is to be submitted as per **ANNEXURE A4: List of SCADA points to be made available to SLDC/ RLDC.**

1.5.5 METERING REQUIREMENTS AS PER RELEVANT CEA REGULATION

AEGCL/APDCL shall work out the requirement of meters as per CEA Installation & Operation of Meters)- Regulation-2006 & subsequent amendments after receipt of the Single Line switching Diagram of user, including proposed path for drawal of start-up power in case of Generating station, or Load Serving Entities and Combined (Load & Captive) generation complex. Metering equipments will be installed by the transmission or distribution licensee at the cost of the entities as per Transmission Metering Code of AERC (Electricity Grid Code) Regulations, 2024 and in line with the Technical Specifications Document of APDCL. A copy of meter testing report/installation report is to be shared with SLDC as and when provided by Discom The periodicity of testing, checking, calibration, etc., will be governed by CEA (Installation & Operation of Meters) - Regulation-2006 & subsequent amendments.

The metering scheme of Solar/Wind/BESS/Hybrid power plant/park shall be approved from

SLDC.

The responsibility for providing the monthly generation data to SLDC shall be of the user.

"Information related to meter is to be submitted as per **ANNEXURE A5: TYPE AND LOCATION OF ENERGY METERS AS PER RELEVANT CEA REGULATIONS".**

1.5.6 VARIOUS OTHER COMPLIANCES AND NECESSARY CLEARANCES viz.

a. Power Purchase Agreements (PPA), Power Sale agreements (PSA), connectivity details, sharing agreement between developers sharing common InSTS bay and agreements in case of generators.
b. Connectivity/Access details granted by STU/DISCOM as per the extant CERC/AERC regulations on Connectivity / Access shall be submitted.
c. CEA Registration Certificate for generating units.
d. Copy of Coordination Agreement with the Qualified coordinating Agency (QCA)/Lead/Principal Generator, if any in case of renewable generator.
e. NOC for FTEI from STU or Distribution licensee depending on point of connectivity.
f. Statutory clearances as per CEA or as per respective State government authorities/ STATE INSPECTORIAL ORGANISATION / CHIEF ELECTRICAL INSPECTOR as per Central Electricity Authority (Measures Relating to Safety & Electric Supply) Regulations, 2023 and amendments thereof which ever applicable is to be submitted.
g. PTCC (POWER AND TELECOMMUNICATION COORDINATION COMMITTEE) CLEARANCE for transmission line (Overhead and Underground) for protection against electromagnetic interference as per Central Electricity Authority (Measures Relating to Safety & Electric Supply) Regulations, 2023 and amendments thereof which ever applicable is to be submitted.
h. NERPC approval regarding protection settings, as applicable. Undertaking of implementation of correct and appropriate protection settings as per SPCC/ NERPC approved protection philosophy/guidelines.
i. Compliances of various regulation /standards of CERC, AERC and CEA.
j. Installation of meters as per provisions of CEA/ CERC/ AERC regulations.
k. Dedicated Voice and Data communication from generating stations/substation in redundant and alternate path
l. Details of approval of the project/ element in any forum/ standing committee etc.
m. Compliances related to Cyber Security.

CHAPTER 2: APPLICATION FOR FTEI OF NEW ELEMENT AND REQUEST FOR TRIAL RUN

2.1 REQUEST FOR FIRST TIME ENERGIZATION AND INTEGRATION (FTEI) AND NOTICE OF TRIAL RUN

1. All Users intending to energize a new element falling under the scope of this procedure shall apply to the Head of SLDC through a letter as per ANNEXURE- FL along with all the necessary documents as enlisted below:

   a. All the documents and annexures pertaining to "**Pre-requisites for request of first time energization and integration of new or modified power system element to SLDC"** as listed under 1.5 of Chapter 1 of this document **viz.**

   1) Annexure A4
   2) Annexure A5
   3) Annexure A6
   4) Power Purchase Agreements (PPA), connectivity details and agreements in case of generators.
   5) CEA Registration Certificate for generating units
   6) NOC for FTEI from STU.
   7) Statutory clearances (SIO/ CEI clearance for all elements/ PTCC for transmission lines /UG cables)
   8) NERPC approval regarding protection settings.
   9) Compliances of various regulation /standards of CERC, AERC and CEA.
   10) Installation of meters as per provisions of CEA/ CERC/ AERC regulations.
   11) Dedicated Voice /Data communication from generating stations/substation in redundant and alternate path.
   12) Details of approval of the project/ element in any forum/ standing committee etc.
   13) Compliances related to Cyber Security.
   14) Revised Annexures A1 – A3 and model data (in respective formats) , in case of any changes in the formats submitted at the time of interconnection studies.

   b. The following formats/ undertakings are also to be submitted by the user while applying for FTEI and notice for trial run:

   Annexure B1: Request by the User for first time energization and integration and Notice for Fresh/Repeat Trial Run- as per FORMAT III.
   Annexure B2: Undertaking in respect of Protection systems
   Annexure B3: Undertaking in respect of Telemetry and communication
   Annexure B4: Undertaking in respect of Energy metering
   Annexure B5: Undertaking in respect of Statutory clearances
   Annexure B5 (a): Undertaking in respect of Cyber security requirement

   c. Other documents relating to **specific requirements** as enlisted in the subsequent chapters of this document.

2. The application for FTEI documents along with the above formats is to be submitted at least fifteen (15) working days prior to the expected date of first-time energization. The consideration of Day-1 for submission of application shall be as follows:

   i. Application received till 15:00 hrs of a working day - Same day will be considered as Day-1.
   ii. Application received after 15:00 hrs of a working day - Next working day will be considered as Day-1.
   iii. Application received anytime on Non-Working day - Next working day will be considered as Day-1.

3. Within five (5) working days of submission of above formats and information/documents by the User, SLDC shall acknowledge the receipt of the same, as per Format II, and seek clarifications, if any. The User shall submit the desired information/documents after rectification to the SLDC within next three (3) working days.

   All the documents are to be countersigned by an officer not below the rank of Assistant General Manager or equivalent. User(s) may refer to **"REQUIREMENT LIST"** in specific sections.

2.2 ISSUANCE OF APPROVAL FOR FTEI AND TRIAL RUN

After scrutiny of the submitted documents and fulfillment of all criteria as per relevant regulations, SLDC would issue a provisional approval for FTEI and trial run to the User as per Format IV.

On the designated day, the power system element should be energized. All attempts would be made by the real time operating personnel at SLDC to facilitate first time energization and trial run of the new power system element, subject to availability of real time SCADA data and favourable system conditions, as per Clause 21(3) of IEGC, 2023 and amendments thereof.

2.3 TRIAL RUN

2.3.1 IN CASE OF TRANSMISSION ELEMENT

i. The Transmission Licensee/ User proposing its transmission system or an element thereof for trial run shall give a notice of not less than seven (07) working days to the SLDC, STU, Distribution Licensees of the State and the owner of the inter-connecting system.

ii. The SLDC shall allow commencement of the trial run from the requested date or in the case of any system constraints, not later than seven (07) working 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 SLDC.

Trial run of a transmission system or an element thereof shall mean successful energization of the

transmission system or the element thereof at its nominal system voltage through inter-connection with the grid for a continuous twenty-four (24) hours flow of power and communication signal from the sending end to the receiving end and with the requisite metering system, telemetry and protection system:

Provided that under exceptional circumstances and with the prior approval of STU and SLDC, a transmission element can be energized at lower nominal system voltage level.

Provided further that the STU and SLDC may allow **anti-theft charging** where the transmission line is not carrying any power.

2.3.2 IN CASE OF GENERATING STATION

i. 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 (07) working days to SLDC, STU 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.

ii. A generating station shall be required to undergo a trial run in accordance with clause 6.5 of AERC (Electricity Grid Code) Regulations, 2024 after completion of Renovation and Modernization for extension of the useful life of the project as per the Tariff Regulations.

Trial Run of the Thermal Generating Unit, Hydro Generating Unit, Solar/ Wind/ ESS/ PSP/ Hybrid Generating Station shall be carried out in accordance with relevant clauses 6.5 of the AERC (Electricity Grid Code) Regulations, 2024.

2.4 SUBMISSION OF INFORMATION BY THE USER AFTER COMPLETION OF TRIAL RUN

After completion of trial run, following documents shall be submitted by the User to SLDC and beneficiaries.

1. **Annexure C1:** Submission of information for completion of trial run and Request for issuance of certificate of successful trial run, as per Format V

2. **Annexure C2:** SCADA values of the active and reactive power flows and related voltages during the trial run period.

3. **Annexure C3:** Interface Energy meter readings for the trial run period

4. **Annexure C4:** Outputs of Numerical relay or Disturbance Recorder (DR) and Station Event Logger (EL) during the trial run period, with time synchronized and in the standard format, as per RPC guidelines.

5. **Annexure C5 (for RE only):** Plot along with raw values of weather parameters like ambient Temperature, GHI, Wind speed, wind direction, humidity and other relevant parameters required for corroborating the output from the plant as applicable.

2.5 RAISING OF OBJECTION BY BENEFICIARY

The concerned beneficiary may raise objection "in writing to SLDC with a copy to all concerned regarding the trial run within two (2) working days of completion of such trial run" in Format-VI.

In case any objection is raised by a beneficiary in writing to the SLDC with a copy to all concerned regarding the trial run within two (2) working days of completion of such trial run, the SLDC shall, within five (5) working days of receipt of such objection, in coordination with the concerned entity and the beneficiaries, decide if the trial run was successful or if there is a need for a repeat trial run.

In case any objection by any concerned beneficiary is not received by SLDC, within two (2) working days of completion of trial run, it shall be deemed that there is no objection by any of the concerned beneficiaries.

2.6 ISSUANCE OF CERTIFICATE OF SUCCESSFUL TRIAL RUN

After completion of a successful trial run and receipt of documents and test reports as per Regulation 6.7 of the Grid Code, the SLDC shall issue a certificate as per Format VII to that effect to the concerned generating station, ESS, or Transmission Licensee, as the case may be, with a copy to their respective beneficiary(ies) and the STU and RPC, within three (3) working days.

IN ADDITION TO THE ABOVE GENERAL REQUIREMENTS, AN APPLICANT SHALL ALSO FULFILL THE FOLLOWING SPECIFIC REQUIREMENTS FOR VARIOUS TYPE OF ELEMENTS AS DETAILED IN THE RESPECTIVE CHAPTERS:

CHAPTER 3	SPECIFIC REQUIREMENTS FOR CHARGING/ ENERGIZATION AND INTEGRATION OF NEW TRANSMISSION ELEMENT INCLUDING ASSOCIATED TRANSMISSION SYSTEM (ATS) OF GENERATOR
CHAPTER 4	SPECIFIC REQUIREMENTS FOR CHARGING/ ENERGIZATION AND INTEGRATION OF ALTERED (INCLUDING MODIFIED/ REPLACED/ UPGRADED) TRANSMISSION SYSTEM ELEMENTS INCLUDING ASSOCIATED TRANSMISSION SYSTEM (ATS) OF GENERATOR
CHAPTER 5	SPECIFIC REQUIREMENTS FOR CHARGING/ ENERGIZATION AND INTEGRATION OF THERMAL, GAS, HYDRO PLANTS INCLUDING PSP AND CAPTIVE GENERATION COMPLEX CONNECTED TO STATE GRID
CHAPTER 6	SPECIFIC REQUIREMENTS FOR CHARGING/ ENERGIZATION AND INTEGRATION OF SOLAR, WIND, BESS OR HYBRID (WIND/SOLAR/BESS) PLANTS/PARKS

CHAPTER 3: SPECIFIC REQUIREMENTS FOR CHARGING/ ENERGIZATION AND INTEGRATION OF

NEW TRANSMISSION ELEMENT INCLUDING ASSOCIATED TRANSMISSION SYSTEM (ATS) OF GENERATOR

3.0 APPLICABILITY

This section specifies the requirements for charging/ energization and integration of **new** intra state transmission system element including the Associated Transmission System (ATS) of a generator. Transmission element includes Transmission lines/ Transformers/ Reactors / flexible alternating current transmission system (FACTS) Devices/ Buses/ Bays/ any other element upto 132kV voltage level irrespective of ownership.

All individual elements of the power system proposed to be charged will be treated as separate elements.

For eg. in case of a transmission line connecting two substations, GSS 1 & GSS 2, separate FTEI request has to be placed for all the three (03) elements viz,

1) Bay at GSS 1;
2) Bay at GSS 2;
3) Transmission Line connecting GSS 1& GSS 2.

3.1 APPLICATION FOR FTEI REQUEST

After initial intimation to SLDC regarding intent of charging 6 months prior to expected date of charging via Annexure A1, A2(a), A2(b), A3, Technical Parameters & Protection Data and Models and modelling data via Annexure – TB, Annexure- TH, Annexure-TR, Annexure-TS, Annexure-TT, Annexure-TTL, Annexure- TW, Annexure- TWS, Annexure- NSS, whichever applicable and ensuring the Prerequisites as entailed in Chapter-1 of this procedure, the users will submit the following documents to SLDC as per timeline entailed in **Chapter 2** of this document.

1. Annexure FL
2. Annexure A4
3. Annexure A5
4. Annexure B1
5. Annexure B2
6. Annexure B3
7. Annexure B4
8. Annexure B5
9. Annexure B5 (a)

The detailed requirement list for charging/ energization and integration of new transmission element including associated transmission system of generator is given in section 3.3 of this procedure:

COMMERCIAL OPERATION DATE (COD) OF INTRA-STATE TRANSMISSION SYSTEM OR AN ELEMENT THEREOF.

i. The commercial operation date in the case of an Intra-State Transmission System or an element thereof shall be the date declared by the Transmission Licensee on which the Transmission System or an element thereof is in regular service at 0000 hours after successful trial operation for transmitting electricity and communication signals from the sending end to the receiving end as per Regulation 6.6 of the AERC (Electricity Grid Code) Regulations, 2024 and submission of a declaration as per Regulation 6.9.3 of AERC (Electricity Grid Code) Regulations, 2024.

ii. Provided that the commercial operation date of a transmission element shall be declared only after a successful trial run of the last element of the said transmission system.

iii. Provided further that where only some of the transmission elements of the transmission system have achieved a successful trial run and commercial operation is sought for such elements, the commercial operation date of such transmission elements of the transmission system may be declared by the Transmission Licensee as per provisions of AERC (Electricity Grid Code) Regulations, 2024.

iv. Provided also that where only some of the transmission element(s) of the transmission system have achieved a successful trial run and if the operation of such transmission elements is certified by the STU and concerned Regional Power Committee(s) for improving the performance, safety and security of the grid, the commercial operation date of such transmission element(s) of the transmission system may be declared by the Transmission Licensee as per AERC (Electricity Grid Code) Regulations, 2024.

v. Provided also that in case a transmission system or an element thereof executed under regulated tariff mechanism is prevented from regular service on or after the scheduled COD for reasons not attributable to the Transmission Licensee or its supplier or its contractors but is on account of the delay in commissioning of the concerned generating station or in commissioning of the upstream or downstream transmission system of other Transmission Licensee or downstream distribution system of Distribution Licensee, the Transmission Licensee shall approach the Commission through an appropriate petition along with a certificate from the STU to the effect that the transmission system is complete as per the applicable CEA Standards, for approval of the commercial operation date of such transmission system or an element thereof.

vi. Provided also that in the case of Intra-State Transmission System executed through Tariff Based Competitive Bidding, the Transmission Licensee may declare deemed COD of the Intra-State Transmission System in accordance with the provisions of the Transmission Service Agreement after obtaining (a) a certificate from the STU to the effect that the transmission system is complete as per the specifications of the bidding guidelines and applicable CEA Standards, and (b) no load charging certificate from the respective SLDC, where no load charging is possible.

vii. The COD of a transmission element of the transmission system under Tariff Based Competitive Bidding (TBCB) shall be declared only after the declaration of the COD of all the pre-required transmission elements as per the Transmission Services Agreement (TSA).

viii. Provided that in case any transmission element is required in the interest of the power system as certified by the STU, the COD of the said transmission element may be declared prior to the declaration of the COD of its pre-required transmission elements.

3.2 REQUIREMENT LIST 1: REQUIREMENTS FOR FTEI OF NEW TRANSMISSION SYSTEM ELEMENTS

Annexure	Subject	Description/ Timeline	Line	Trafo	Reactor	Bay	Bus	FACTS
A	Application for registration of entity with SLDC as "User". As per Annexure A/ Format I	At least 15 working days before anticipated date of charging.	If the entity is not a registered user of SLDC.					
A1	Intimation by User regarding expected first time energization and integration of new power system element(s). As per Format IA	To be submitted by USER 6 months ahead of the expected date of charging.	Yes	Yes	Yes	Yes	Yes	Yes
A2 (a)	List of elements to be first time energized and their details. As per Format IB	To be submitted by USER 6 months ahead of the expected date of charging.	Yes	Yes	Yes	Yes	Yes	Yes
A2 (b)	Details of the elements expected to be first time energised and integrated into the grid in the next six (06) months As per Format IC	To be submitted by USER 6 months ahead of the expected date of charging.	Yes	Yes	Yes	Yes	Yes	Yes
A3	Single line diagram of the concerned sub stations clearly indicating the element to be charged	To be submitted by USER 6 months ahead of the expected date of charging.	Updated SLD of Substations at Both ends	Yes	Yes	Yes	Yes	Yes
TTL, TL, TR	TECHNICAL PARAMETER & PROTECTION DATA.	To be submitted by USER 6 months ahead of the expected date of charging.	Annexure-TTL	Annexure-TT	Annexure- TR	Details of bay elements as Per Annexure- TTL		
FL	FORWARDING LETTER TO THE HEAD OF SLDC REQUESTING FTEI PERMISSION	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.						

Annexure	Subject	Description/ Timeline	Line	Trafo	Reactor	Bay	Bus	FACTS
A4	List of SCADA points to be made available to SLDC/RLDC	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes	Yes	Yes
A5	Type and Location of energy meters as per relevant CEA regulations	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes	Yes	Yes
A6	TSA / Connection Agreement/ Site Responsibility Schedule wherever applicable along with all annexures	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes	Yes	Yes
B1	Request by the User for first time energization and integration and Notice for Fresh/Repeat Trial Run. As per Format III	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes	Yes	Yes
B2	Undertaking in respect of Protection systems. As per Format IIIA	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization. The format should be countersigned by the Concerned Testing & Commissioning wing, STU/ other entity.	Yes	Yes	Yes	Yes	Yes	Yes
B3	Undertaking in respect of Telemetry and communication. As per Format III B.	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization. The format should be countersigned by the Concerned Testing & Commissioning wing, STU/ other entity.	Yes	Yes	Yes	Yes	Yes	Yes

Annexure	Subject	Description/Timeline	Line	Trafo	Reactor	Bay	Bus	FACTS
B4	Undertaking in respect of Energy metering. As per Format III C.	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization. The format should be countersigned by the Concerned Testing & Commissioning wing, STU/ APDCL as applicable.	Yes	Yes	Yes	Yes	Yes	Yes
B5	Undertaking in respect of Statutory clearances. As per Format III D.	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	CEI clearance not exceeding 6 Months. PTCC clearance for overhead lines/ UG cables.					
B5 (a)	Undertaking in respect of compliance to Cyber Security requirement.	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization. The undertaking should be countersigned by the Concerned Chief Information Security Officer (CISO)/ alternate CISO of the AEGCL / APGCL /APDCL as the case may be.	Yes	Yes	Yes	Yes	Yes	Yes
II	Acknowledgment of Receipt of request by SLDC. As per Format II	Within five (05) working days of submission of information/documents by the User, SLDC shall acknowledge the receipt of the same.	Yes	Yes	Yes	Yes	Yes	Yes
IV	Provisional Approval for energization, testing and trial run. As per Format IV	After scrutiny of the submitted / resubmitted documents and fulfillment of all criteria as per relevant regulations						
C1	Submission of information for completion of trial run and Request for issuance of certificate of successful trial run. As per Format V	To be submitted by the User post completion of Trial Run of the element.						

Annexure	Subject	Description/ Timeline	Line	Trafo	Reactor	Bay	Bus	FACTS
C2	SCADA values of the active and reactive power flows and related voltages during the trial run period	To be submitted by the User post completion of Trial Run of the element.						
C3	Interface Energy meter readings for the trial run period	To be submitted by the User post completion of Trial Run of the element.						
C4	Outputs of Numerical relay or Disturbance Recorder (DR) and Station Event Logger (EL) during the trial run period, with time synchronized and in the standard format, as per RPC guidelines	To be submitted by the User post completion of Trial Run of the element.						
VI	Objection by beneficiary regarding trial run as per Clause 25(1) of IEGC, 2023. As per Format VI	within two (2) working days of completion of such trial run.						
VII	Certificate of successful Trial Run (with or without electrical load). As per Format VII	After completion of a successful trial run and receipt of documents and test reports within three (3) working days.						

CHAPTER 4: SPECIFIC REQUIREMENTS FOR CHARGING/ ENERGIZATION AND INTEGRATION OF

ALTERED (INCLUDING MODIFIED/ REPLACED/ UPGRADED) TRANSMISSION SYSTEM ELEMENTS INCLUDING ASSOCIATED TRANSMISSION SYSTEM (ATS) OF GENERATOR

4.0 APPLICABILITY:

This procedure is applicable for charging/energization of already commissioned transmission system elements including ATS of a generator whose FTEI was granted by SLDC under following cases:

1. Charging/Energization of transmission system elements after continuous outage/shutdown exceeding six (06) months.

2. Charging/Energization of transmission line/ bay after alteration (including modification/ replacement/ upgradation) under Planned/Emergency/Forced outage:
   a. Replacement and/or upgradation of substation equipment: CT/PT/CVT/CB /Isolator/LA/ Bushing/Wave trap
   b. Replacement of one phase of a failed Transformer/Reactor with a cold spare unit.
   c. Replacement of one phase of a failed Transformer/Reactor with a hot spare unit.
   d. Replacement of failed 3-ph Transformer/Reactor with new 3-ph Transformer/Reactor

3. Charging/Energization of transmission line after restoration of damaged/collapsed towers at the same location.

4. Restoration and charging /energization of transmission line through Emergency Restoration System towers, Interim bypass arrangement or Restoration and modification of transmission tower.

5. Charging/Energization after re-conductoring, re-bundling or similar other alterations involving change in nature of power flow in the line.

6. Charging/Energization of transmission line after upgradation/increase in voltage level or line rearrangements including Loop-In-Loop-Out.

7. Charging/Energization of transmission line after alterations involving change in course of transmission line i.e. in case of railway line/road/river crossing (with or without the use of ERS) and diversions or interim bypass arrangement or restoration and modification of transmission line/tower involving crossing of another line.

8. Anti-theft charging of already commissioned /new transmission line
   a. Idle charging (for anti-theft) of a section or complete line length of new transmission line which is not terminated at both ends.

b. Charging/Energization of already commissioned transmission line (complete line length or a section) which is under breakdown/ outage.

4.1 EMERGENCY NATURE OF WORKS IN RELATION TO ALTERATION OF POWER SYSTEM ELEMENT.

Amongst the above cases, only the following cases will be considered **EMERGENCY NATURE** for approval of First Time Energization & Integration (FTEI) after alteration.

1. Replacement of damaged substation equipment: CT/ PT/ CVT/ CB / Isolator/ LA/ Bushing/ Wave trap.

2. Charging/Energization of transmission line after restoration of damaged/ collapsed towers at the same location.

3. Restoration and charging /energization of transmission line through Emergency Restoration System (ERS) towers, Interim bypass arrangement or Restoration and modification of transmission tower.

4.2 APPLICATION AND APPROVAL FOR CHARGING/ENERGIZATION OF ALTERED (INCLUDING MODIFIED/ REPLACED/ UPGRADED) TRANSMISSION SYSTEM ELEMENTS:

4.2.1 APPLICATION AND APPROVAL IN CASE OF ALTERATIONS OF EMERGENCY NATURE

The user shall submit the FTEI request as per Annexure- FL alongwith requisite documents to SLDC Control Room within 24hrs of occurrence of the emergency. After submission of above documents and statutory clearances, as applicable by the user/asset owner, SLDC will issue the approval of First Time Energization and Integration for altered element, or seek clarifications, if required.

The specific requirements and list of documents for charging/energization of altered (including modified/ replaced/ upgraded) power system elements concerning the nature of work has been tabulated in section 4.3 of this procedure**.**

4.2.2 APPLICATION AND APPROVAL IN CASE OF ALTERATIONS OTHER THAN EMERGENCY NATURE.

The user shall submit the FTEI request as per Annexure- FL alongwith requisite documents to SLDC ten (10) working days before anticipated date of charging. SLDC shall seek clarifications, if any within five (05) working days of submission of above documents and statutory clearances, as applicable by the user/asset owner. The user/asset owner shall submit the clarifications to SLDC along with the supporting documents (as applicable). Upon receipt of satisfactory clarifications/documents, SLDC would issue a provisional approval for charging/energization of

the concerned power system element to the applicant within five (05) working days of receipt of such documents and clarifications.

The specific requirements and list of documents for charging/energization of altered (including modified/ replaced/ upgraded) power system elements concerning the nature of work has been tabulated in 4.3 of this procedure

For either of the above-mentioned alterations, after getting the provisional approval from SLDC, the user/asset owner shall seek real time code from SLDC control room to charge the altered (including modified/replaced/upgraded) power system element(s). In real time, the charging/energization of the concerned power system element(s) shall be facilitated in accordance with the operating procedure, subject to the validity of provisional approval, availability of real time data and favourable system conditions.

4.3 REQUIREMENT LIST 2: REQUIREMENTS FOR CHARGING/ENERGIZATION AND INTEGRATION OF ALTERED (INCLUDING MODIFIED/REPLACED/UPGRADED) POWER SYSTEM ELEMENTS

No	Particulars	CEA, SIO Clearance	PTCC clearance	Undertaking (to be submitted by asset owner)	VOIP, Communication, SCADA & PMU Data Availability	Protection Coordination & approval from NERPC (to be ensured by owner)
1	Charging/Energization of power system elements after continuous outage/shutdown for more than six months.	Yes	Not required	Not required	Yes	Confirmation from Licensee that no changes have been carried out which may affect protection coordination
2	Charging/Energization of transmission line/bay after alteration (including modification/ replacement/ upgradation) under Planned/Emergency/Forced outage					
2.a	Replacement and/or upgradation of substation equipment: CT, PT, CVT, CB, LA, Isolator and Wave trap	Yes	Not required	Yes (as per **Annexure-B6**)	Yes	Yes (If changes in protection coordination are required as mentioned in Annexure-B6)
2.b	Replacement of one phase of a failed Transformer/ Reactor with a cold spare unit	Yes	Not required	Yes (as per **Annexure-B6**)	Yes	Yes (If changes in protection coordination are required as mentioned in Annexure-B6)
2.c	Replacement of one phase of a failed Transformer/ Reactor with a hot spare unit	Not required	Not required	Not required	Yes	Not required
2d	Replacement of failed 3-ph Transformer/ Reactor with new 3-ph Transformer/ Reactor	To be processed as a fresh case for First Time Energization and integration (FTEI), PTCC clearance not required.				

	Particulars	CEA, SIO Clearance	PTCC clearance	Undertaking (to be submitted by asset owner)	VOIP, Communication, SCADA & PMU Data Availability	Protection Coordination & approval from NERPC (to be ensured by owner)
3	Charging/Energization of transmission line after restoration of damaged/ collapsed towers at the same location	Yes	Not required	Yes (as per **Annexure-B6**)	Yes	Yes (If changes in protection coordination are required as mentioned in Annexure-B6)
4	Restoration and charging /energization of transmission line through Emergency Restoration System towers, Interim bypass arrangement or Restoration and modification of transmission Tower	Yes	Not required	Yes (as per **Annexure-B7**)	Yes	Yes (If changes in protection coordination are required as mentioned in Annexure-B7)
5	Charging/Energization after re-conductoring, re-bundling or similar other alterations involving change in nature of power flow in the line	To be processed as a fresh case for First Time Energization. Fresh PTCC Clearance or Suitable Advisory on requirement of fresh PTCC Clearance by CEA to be submitted by transmission licensee.				
6	Charging/Energization of transmission line after upgradation/increase in voltage level or line rearrangements including Loop-In-Loop-Out	To be processed as a fresh case for First Time Energization. Fresh PTCC Clearance or Suitable Advisory on requirement of fresh PTCC Clearance by CEA to be submitted by transmission licensee.				

	Particulars	CEA, SIO Clearance	PTCC clearance	Undertaking (to be submitted by asset owner)	VOIP, Communication, SCADA & PMU Data Availability	Protection Coordination & approval from NERPC (to be ensured by owner)
7	Charging/Energization of transmission line after alterations involving change in course of transmission line i.e. in case of railway line/road/river crossing (with or without the use of ERS) and diversion or restoration and modification of transmission line/tower involving crossing of another line.	Yes	Fresh PTCC Clearance or Suitable Advisory on requirement of fresh PTCC Clearance by CEA to be submitted by transmission licensee. *(Not required for increase in tower height only)*	Yes (as per **Annexure-B7**)	Yes	Yes (If changes in protection coordination are required as mentioned in Annexure-B7)
8	Anti-theft charging/energization of already commissioned /new transmission line					
8 a	Idle charging (for anti-theft) of a section or complete line length of new transmission line which is not terminated at both ends	Not required	Yes	Yes (as per **Annexure-B8**)	Yes	Yes (Relay settings confirmation for safe anti-theft charging)
8b	Charging/Energization of already commissioned transmission line (complete line length or a section) which is under breakdown /outage		Not required			

CHAPTER 5: SPECIFIC REQUIREMENTS FOR CHARGING/ ENERGIZATION AND INTEGRATION OF THERMAL, GAS, HYDRO PLANTS INCLUDING PSP AND CAPTIVE GENERATION COMPLEX CONNECTED TO STATE GRID

5.0 APPLICABILITY

This section is applicable to thermal, gas, hydro plants including PSP and captive generation complex connected to the state grid.

5.1 SUBMISSION OF DOCUMENTS FOR FTEI

1) Alongwith the documents submitted to SLDC regarding intent of charging 6 months prior to expected date of charging via Annexure A1, A2, A3, Technical Parameters & Protection Data and Models and modelling data as per point 1.5.2 of this procedure**,** the users will submit the following additional documents to SLDC.

   Steady-state and Dynamic Simulation Models; both Root Mean Square (RMS) and Electromagnetic Transient (EMT) along with detailed model user guide.

   The models shall include auxiliary models such as excitation system model, turbine governor model, Automatic Voltage Regulator (AVR) and Power system stabilizer (PSS) model etc.

   Annexures 3(A), 3(B), 3(C) and 3(D) may be referred for providing generic RMS modelling data for Thermal, Gas and Hydro Plants respectively. The models shall be submitted as per the model compatibility guidelines specified at **Annexure- 3(D). Annexure 3(E)** may be referred for providing generic RMS Modelling data and model compatibility guidelines for PSP.

   Hydro plants reservoir details such as Full reservoir level (FRL), Minimum Draw down Level (MDDL), monthly design energy/10 daily energy, rated cumecs and rated head, energy content of reservoir and water content details to be provided as per **Annexure-TH.**
   Details of PSP is to be provided as per **Annexure-TPSP**.

   The formats and annexures mentioned in Chapter-2 need to be submitted to k SLDC in accordance with the mentioned timelines.

2) In addition to the documents to be submitted by the user as per timeline and list mentioned in chapter 2.1, the users will also have to submit the following:

   Annexure-UC: Notarized Undertaking: In case of Captive generation complex, system security is to be ensured during the integration of Captive generation complex.

3) Detailed Project Report along with Operating manual(s) (describing Generation Mode and Pump Mode operations for hydro including PSP) shall also be submitted by generating plants.

5.2 ISSUANCE OF APPROVAL FOR FTEI AND TRIAL RUN

Trial run of the thermal, hydro plants and PSP shall be carried out in accordance with relevant clauses 6.5 of the AERC (Electricity Grid Code) Regulations'2024.
After scrutiny of the submitted documents as mentioned above and fulfillment of all criteria as per relevant regulations and as stated in Chapter 2 of this document SLDC would issue a provisional approval for FTEI and trial run of the generator to the User as per Format IV.

5.3 START-UP POWER DRAWAL & INJECTION OF INFIRM POWER

1) As per Clause 6.2 of AERC (Electricity Grid Code) Regulations, 2024, a unit of a generating station including unit of a captive generating plant that has been granted connectivity to the Intra-state transmission system shall be allowed to interchange power with the grid during the commissioning period, including testing and full load testing before the COD after obtaining prior permission of the SLDC.

2) SLDC shall keep grid security in view while granting permission for drawal of start-up power.

3) The period for inter-change of power shall be allowed as per relevant clauses of AERC (Electricity Grid Code) Regulations, 2024 or amendment thereof.

4) Drawal of start-up power shall be subject to payment of transmission charges as per the prevalent AERC (Multi Year Tariff) Regulations'2024 and amendments thereof. The charges for deviation for drawal of startup power or for injection of infirm power shall be as per the AERC (DSM and related matters) Regulations'2024 and amendments thereof.

5) During the period of drawal/injection of infirm power, SLDC Control Room should be intimated in advance, the scheduled pattern of quantum of drawl/infirm injection and tripping and synchronization of the unit.

6) For any switching operation, necessary codes have to be taken from SLDC control room.

7) Generating station has to follow all provisions as enshrined in the AERC (Electricity Grid Code) Regulations, 2024 and its associated Detailed Procedures.

8) Procedure for availing start up power from the grid by the generating stations under commissioning phase will be as per 5.4 of this procedure.

5.4 PROCEDURE FOR AVAILING START UP POWER FROM THE GRID BY THE GENERATING STATIONS UNDER COMMISSIONING PHASE

5.4.1. PRE-CONDITIONS FOR AVAILING START-UP POWER:

The Generating Station intending to avail Start-up power shall fulfill the following conditions:

a) It has signed Connection Agreement with STU/Discom as per AERC (Electricity Grid Code) Regulations, 2024.
b) It has established Connectivity with the InSTS/Discom.
c) It has commissioned requisite switchyard equipments and as per relevant regulations and procedures thereof.
d) It has established Data and Voice communication with the SLDC.
e) It has put in place necessary system protection in place as specified by State Protection and Co-ordination Committee (SPCC).
f) It shall coordinate Generation Transformer (GT) / Station Transformer (ST) tap positions as per the direction of State Load Despatch Centre (SLDC).

5.4.2. PROCEDURE FOR APPLYING FOR START-UP POWER:

1) The Generating Station shall submit a request for availing Start-up power to the SLDC at least one (01) month prior to the expected date of availing Start-up power as per Annexure-GS.

   Drawal of start-up power shall not exceed 15 months prior to the expected date of first synchronization and one year after the date of first synchronization

2) While requesting for start-up power, the Generating Station shall furnish the following details to SLDC:
   a) Submission of reference documents pertaining to COD/ FTEI of Associated Transmission System (ATS) required for availing start-up Power.
   b) Details of arrangement for drawing start up power.
   c) Single line diagram of the Generating Station.
   d) Safety clearance from the Central Electricity Authority; Govt. of India or the Inspectorate of Electricity, Govt. of Assam, whichever applicable of Generating Transformer (GT) and generating unit.
   e) Details of electrical scheme for drawal of construction power clearly establishing the isolation between the schemes for construction power and start up power.
   f) Details of electrical scheme for drawal of start-up power by various phases of the Generating station.
   g) Unit details like Unit size, Maximum Continuous Rating (MCR), Auxiliaries & their rating, etc.
   h) Schedule of activities and their requirement of power in terms of quantity and period of interchange, etc.
   i) The generating station shall open a revolving and irrevocable LC issued by a scheduled bank equivalent to at least 2 months transmission charges prior to the drawal of start-up power. Start-up power shall be granted by SLDC as per the validity of the LC, the requested start-up power timeline by the generator, or as per the timeline mentioned in Regulation 6.2 of AERC (Electricity Grid Code) Regulations, 2024, whichever is earlier. The validity of the said LC shall be verified by the STU.

3) The Generating Station shall submit an undertaking as per Annexure UG-3 that:
   a) Drawal of power is only for the purpose of start-up power and not for construction activities. SLDC shall stop the drawal of start up power in case it is established that the start-up power has been used by the generating station for construction activity.
   b) The onus of proving that the interchange of infirm power from the unit(s) of the generating station is for the purpose of pre-commissioning activities, testing and commissioning, shall rest with the generating station, and the SLDC shall seek such information on each occasion of the interchange of power before COD.
   c) There is no violation of any of the agreements made with the Distribution Licensee or any other agency.
   d) The Generating Station shall indemnify, defend and save the SLDCs from any and all damages, losses, claims and actions including those relating to injury or death of any person or damage to property, demands, suits, recoveries, costs and expenses, court costs, attorney fees, and allother obligations by or to third parties, arising out of or resulting from this drawal.
   e) The Generating Station shall reschedule the startup activities as directed by SLDC due to reasons such as staggering the simultaneous drawal of Start-up power by other Generating Stations.
   f) The Generating Station shall abide by IEGC, AERC (Electricity Grid Code) Regulations, 2024 and its amendments and all prevailing Regulations and the directions of SLDC from time to time.

4) The Generating Station shall pay the charges for Deviation within due date and comply with Deviation Settlement Regulations as amended from time to time or subsequent re- enactment thereof. Failure for payment may compel SLDC to stop the drawal of start-up power as per AERC (Electricity Grid Code) Regulations, 2024 and its amendments.

5) The Generating Station shall pay all incidental charges such as Transmission charges, SLDC Fee & Charges, etc., as applicable. Failure for payment may compel SLDC to stop the drawal of start-up power as per AERC (Electricity Grid Code) Regulations, 2024.

6) The Generating Station shall regularly send the generation data in formats specified by SLDC.

7) The generating station shall submit a tentative plan for the quantum and time of injection of infirm power on day ahead basis to the SLDC.

5.4.3. PROCEDURE TO BE FOLLOWED BY SLDC DURING THE PERIOD OF AVAILING START UP POWER:

1) Upon fulfilling the requirements SLDC will give approval of start up power as per Format VIII.

2) The SLDC shall convey the period, quantum and duration of the Start-up power with a copy to Discom, STU and NERLDC, if required.

3) SLDC may permit drawal of Start-up power for one or more units a a time within a generating station keeping grid security in view.

4) SLDC will issue suitable directions to the Generating Station on Real time basis for limiting/stopping the drawal of start-up power in case of Network constraint on grounds of threat to system security or frequency or Voltage falling below the limits specified in IEGC. Such direction shall be complied by the Generating Station promptly.

5) The generator is entitled to draw the start-up power upto the maximum period of 15 months (Fifteen months prior to expected date of synchronization and twelve months after synchronization) from the date of commencement of drawal of start-up power from the grid. In case startup power is required beyond the specified period, the generator shall approach AERC at least two months in advance of the date up to which permission has been granted as per regulation 6.2.2 of AERC (Electricity Grid Code) Regulations, 2024.

6) In the case of multiple generating units of the same generating station or multiple generating stations owned by different entities connected at a common InSTS interface point, SLDC shall ensure segregation of firm power from generating units that have achieved COD from power injected or drawn by generating units which have not achieved COD through appropriate accounting of energy.

7) SLDC may direct the Generating Station to install under- frequency/undervoltage relays to operate below a threshold value with suitable dead bands. If simultaneous drawal of start-up power by more than one generating station is likely to cause system constraints; SLDC may stagger such drawal among various generators to relieve the constraint.

5.5 SUBMISSION OF FINAL AS-BUILT VALIDATED MODEL TO SLDC AFTER ISSUANCE OF CERTIFICATE OF SUCESSFUL TRIAL RUN.

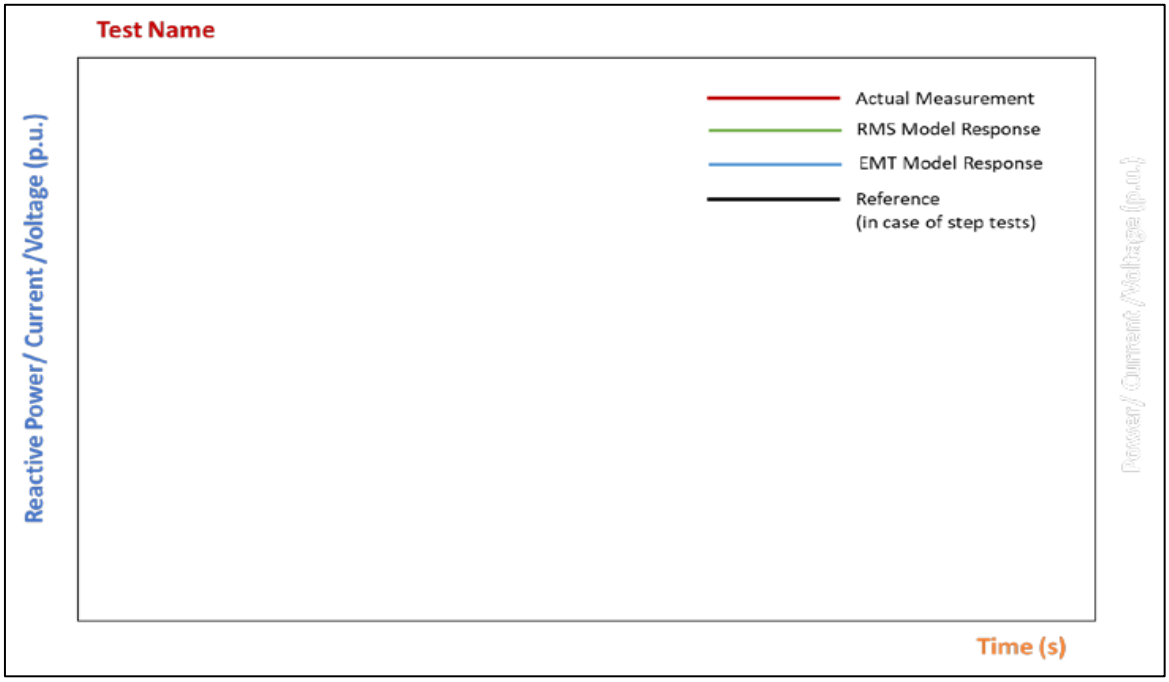
Within 3 months of issuance of successful trial run certificate by SLDC as per **FORMAT-VII,** asset owner shall submit a final as built validated simulation model (both EMT and RMS) along-with model validation report of the Generating Station/Load for both steady state and transient conditions. For steady-state validation, real-time PMU data may be used. For transient condition validation, disturbance recorder data or high-resolution data recorded during test by AVR/PSS or DR system at Generating station.

The validation report shall include the following:

1) Model file names of RMS & EMT model.
2) Final simulation model parameters of Generating units/Load entities.
3) The table demonstrating the similarity between simulation model parameters/settings and

settings implemented at site (in real-time operation) shall be provided.

4) Comparison of on-site test measurement with simulation results shall be provided as per the format shown below:



5) Along with graphical comparison of field test measurement with simulation results, time series measurements/data of field test and simulation response (of same time resolution) shall also be provided in suitable format (preferably .csv file).

6) Model Validation report shall also provide details of the causes of deviation from simulated behavior and suggest corrective actions.

5.6 DECLARATION OF COMMERCIAL OPERATION DATE (COD)

1) The tests as specified in the following clauses shall be scheduled and carried out in coordination with SLDC and the NERLDC (as needed) by the generating company or the transmission licensee, as the case may be, and relevant reports and other documents as specified shall be submitted to SLDC and the NERLDC before a certificate of successful trial run is issued to such a generating company.

2) All thermal generating stations having a capacity of more than 200 MW and hydro generating stations having a capacity of more than 25 MW shall submit documents confirming the enablement of automatic operation of the plant from SLDC by integrating the controls and tele-metering features of their system into the automatic generation control

in accordance with the CEA Technical Standards for Construction and the CEA Technical Standards for Connectivity Regulations and amendments thereof."

5.6.1 Documents and Tests Required for Thermal (coal/lignite) Generating Stations:

a) The generating company shall submit the following OEM documents, namely
   i. Start up curve for boiler and turbine including starting time of unit in cold, warm and hot conditions
   ii. Capability curve of generator
   iii. Design ramp rate of boiler and turbine

b) The following tests shall be performed:
   i. Operation at a load of fifty five (55) percent of MCR as per the CEA Technical Standards for Construction for a sustained period of four (4) hours.
   ii. Ramp-up from fifty five (55) percent of MCR to MCR at a ramp rate of at least one (1) percent of MCR per minute, in one step or two steps (with stabilization period of 30 minutes between two steps), and sustained operation at MCR for one (1)hour.
   iii. Demonstrate overload capability with the valve wide open as per the CEA Technical Standards for Construction and sustained operation at that level for atleast five (5) minutes.
   iv. Ramp-down from MCR to fifty five (55) percent of MCR at a ramp rate of at least one (1) percent of MCR per minute, in one or two steps (with stabilization period of 30minutes between two steps).
   v. Primary response through injecting a frequency test signal with a step change of ±0.1 Hz at 55%, 60%, 75% and 100% load.
   vi. Reactive power capability as per the generator capability curve as provided by OEM considering over-excitation and under-excitation limiter settings and prevailing grid condition.

5.6.2 Documents and Tests Required for Hydro Generating Stations including Pumped Storage Hydro Generating Station:

a) The generating company shall submit OEM documents for the turbine characteristics curve indicating the operating zone(s) and forbidden zone(s). In order to demonstrate the operating flexibility of the generating unit, it shall be operated below and above the forbidden zone(s).

b) The following tests shall be performed considering the water availability and head:
   i. Primary response through injecting a frequency test signal with a step change of ± 0.1 Hz for various loadings within the operating zone. The following checklist may be referred while performing the test:

AEGC Regulation-6.7.4(b)(i)	**Primary response (as per AEGC) through injecting a frequency test signal with a step change of ± 0.1 Hz for various loadings within the operating zone**
Generator Mode Dead Band Test Full Load (100%)	-/+ 0.01 HZ from 50Hz
	-/+ 0.02 HZ from 50Hz
	-/+ 0.03 HZ from 50Hz
	+/- 0.03 HZ from 50Hz
Generator Mode Dead Band Test Between load 60- 70%	-/+ 0.01 HZ from 50Hz
	-/+ 0.02 HZ from 50Hz
	-/+ 0.03 HZ from 50Hz
	+/- 0.03 HZ from 50Hz
Generator Mode Dead Band Test Technical Minimum Load	-/+ 0.01 HZ from 50Hz
	-/+ 0.02 HZ from 50Hz
	-/+ 0.03 HZ from 50Hz
	+/- 0.03 HZ from 50Hz
Pump Mode Dead Band test (for Variable Speed PSP only) Full Load (100%)	-/+ 0.01 HZ from 50Hz
	-/+ 0.02 HZ from 50Hz
	-/+ 0.03 HZ from 50Hz
	+/- 0.03 HZ from 50Hz
Generator Mode Governor Response Test Technical Minimum Load	Step signal from 49.92 Hz to 50.08Hz Ref 50Hz (Optional)
	Step signal from 50.08Hz to 49.92Hz Ref 50Hz (Optional)
	Step signal from 49.9 Hz to 50.1Hz Ref 50Hz
	Step signal from 50.1Hz to 49.9Hz Ref 50Hz
Generator Mode Governor Response Test Full Load (100%)	Step signal from 49.92 Hz to 50.08Hz Ref 50Hz (Optional)
	Step signal from 50.08Hz to 49.92Hz Ref 50Hz (Optional)
	Step signal from 49.9 Hz to 50.1Hz Ref 50Hz
	Step signal from 50.1Hz to 49.9Hz Ref 50Hz
Pump Mode Governor Response Test (for Variable Speed PSP only) Full Load (100%)	Step signal from 49.92 Hz to 50.08Hz Ref 50Hz (Optional)
	Step signal from 50.08Hz to 49.92Hz Ref 50Hz (Optional)
	Step signal from 49.9 Hz to 50.1Hz Ref 50Hz
	Step signal from 50.1Hz to 49.9Hz Ref 50Hz

ii. Reactive power capability as per the generator capability curve considering over-excitation and under-excitation limiter settings. The following checklist has been added for reference while performing the test:

Generator Mode Reactive Power Capability Test Technical Minimum Load	MVAR injection as per capability curve and limiters
	MVAR Absorption as per capability curve and limiters
Generator Mode Reactive Power Capability Test 60 to 70% load	MVAR injection as per capability curve and limiters
	MVAR Absorption as per capability curve and limiters
Generator Mode Reactive Power Capability Test 100% load	MVAR injection as per capability curve and limiters
	MVAR Absorption as per capability curve and limiters
Pump Mode Reactive Power Capability Test 100% load	MVAR injection as per capability curve and limiters
	MVAR Absorption as per capability curve and limiters
Synchronous Condensor mode - Reactive Power Capability Test	MVAR injection as per capability curve and limiters
	MVAR Absorption as per capability curve and limiters

iii. Black start capability, wherever feasible.

iv. Operation in synchronous condenser mode, wherever designed.

v. As per clause 8.3.15 of AERC (Electricity Grid Code) Regulations, 2024 "Optimum Utilization of Hydro Energy: During high inflow and water spillage conditions, for Storage type generating station and Run–of-River Generating Stations with or without Pondage, the declared capacity for the day maybe upto the installed capacity plus overload capability (upto 10% or such other limit as certified by the OEM and approved by CEA) minus auxiliary consumption, corrected for the reservoir level. In case, the overload capability of such a station is more than 10% as approved, such a station shall declare the overload capability in advance." Hydro Generating stations shall demonstrate such overload capacity during trial run operation subject to above mentioned provision.

5.6.3 Documents and Test Required for Gas Turbine based Generating Stations:

(a) The generating company shall submit OEM documents for

i. Starting time of the unit in cold, warm and hot conditions

ii. Design ramp rate.

(b) The following tests shall be performed:

i. Primary response through injecting a frequency test signal with a step change of ± 0.1 Hz for various loadings within the operating zone.

ii. Reactive power capability as per the generator capability curve considering over - excitation and under-excitation limiter settings.

iii. Black start capability up to 100 MW capacity, wherever feasible.

iv. Operation in synchronous condenser mode wherever designed.

COD declaration of units of generating station shall be in line with Chapter 6 of AERC (Electricity Grid Code) Regulations, 2024 and its amendments. Accordingly, after completion of

the trial run, details are to be forwarded to SLDC along with the CoD declaration letter. Relevant clauses/definitions are given under for ready reference.

1) AERC (Electricity Grid Code) Regulations, 2024 6.10.1(a): Thermal Generating Station or a unit there of
   (i) The commercial operation date in the case of a unit of the thermal generation station shall be the date declared by the generating company after a successful trial run at MCR or de-rated capacity as per Regulation 6.5.1(b) of the Grid Code, as the case may be, and submission of a declaration as per Regulation 6.9.1of the Grid Code.
   (ii) In the case of the generating station, the COD of the last unit of the generating station shall be considered as the COD of the generating station.

2) AERC (Electricity Grid Code) Regulations, 2024 6.10.1(b): Hydro Generating Station
   (i) The commercial operation date in the case of a unit of the hydro generating station including a pumped storage hydro generating station shall be the date declared by the generating station after a successful trial run at MCR or de-rated capacity as per Regulation 6.5.2(b) of the Grid Code, as the case may be, and submission of a declaration as per Regulation 6.9.2 of the Grid Code.
   (ii) In the case of the generating station, the COD of the last unit of the generating station shall be considered as the COD of the generating station.

3) AERC (Electricity Grid Code) Regulations, 2024 6.5 (1) & (2): Trial Run in relation to a thermal intra-State Generating Station or a unit thereof shall mean the successful running of the generating station or unit thereof at maximum continuous rating or installed capacity for continuous period of 72 hours in case of unit of a thermal generating station or unit thereof and 12 hours incase of a unit of a hydro generating station or unit thereof.

4) The Generating Company shall issue a certificate in compliance to clause 6.9.1(a) and 6.9.2(b) of AERC (Electricity Grid Code) Regulations, 2024, signed by CMD/CEO/MD of the company to SLDC and Discom.

5) As per 6.4.4 of AERC (Electricity Grid Code) Regulations, 2024 "A generating station shall be required to undergo a trial run in accordance with below mentioned Regulation 6.5 after completion of Renovation and Modernization for extension of the useful life of the project as per the Tariff Regulations." In line with the above provisions a generating station or a unit thereof shall be required to undergo a trial run while uprating or derating of capacity other than existing MCR or installed capacity.

5.7 REQUIREMENT LIST 3: REQUIREMENTS FOR FTEI OF THERMAL, GAS, HYDRO PLANTS INCLUDING PSPs AND CAPTIVE GENERATION COMPLEX CONNECTED TO STATE GRID

Annexure	Subject	DESCRIPTION/ TIMELINE	THERMAL	GAS	HYDRO	PSP	CAPTIVE GENERATION COMPLEX
A	Application for registration of entity with SLDC as "User". As per Annexure A/ Format I	As least 15 working days before anticipated date of charging.	If the entity is not a registered user of SLDC.				
A1	Intimation by User regarding expected first time energization and integration of new power system element(s). As per Format IA	To be submitted by USER 6 months ahead of the expected date of charging.	Yes	Yes	Yes	Yes	Yes
A2 (a)	List of elements to be first time energized and their details. As per Format IB	To be submitted by USER 6 months ahead of the expected date of charging.	Yes	Yes	Yes	Yes	Yes
A2 (b)	Details of the elements expected to be first time energised and integrated into the grid in the next six (06) months As per Format IC	To be submitted by USER 6 months ahead of the expected date of charging.	Yes	Yes	Yes	Yes	Yes
A3	Single line diagram of the concerned sub stations clearly indicating the element to be charged	To be submitted by USER 6 months ahead of the expected date of charging.	Yes	Yes	Yes	Yes	Yes
FL	FORWARDING LETTER TO THE HEAD OF SLDC REQUESTING FTEI PERMISSION	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes	Yes
A4	List of SCADA points to be made available to SLDC/RLDC	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes	Yes
A5	Type and Location of energy meters as per relevant CEA regulations	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes	Yes

Annexure	Subject	DESCRIPTION/ TIMELINE	THERMAL	GAS	HYDRO	PSP	CAPTIVE GENERATION COMPLEX
A6	TSA / Connection Agreement/ Site Responsibility Schedule wherever applicable along with all annexures	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes	Yes
B1	Request by the User for first time energization and integration and Notice for Fresh/Repeat Trial Run. As per Format III	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes	Yes
B2	Undertaking in respect of Protection systems. As per Format IIIA	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization. The format should be countersigned by the Concerned Testing & Commissioning wing, STU/ other entity.	Yes	Yes	Yes	Yes	Yes
B3	Undertaking in respect of Telemetry and communication. As per Format III B.	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization. The format should be countersigned by the Concerned Testing & Commissioning wing, STU/ other entity.	Yes	Yes	Yes	Yes	Yes
B4	Undertaking in respect of Energy metering. As per Format III C.	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization. The format should be countersigned by the Concerned Testing & Commissioning wing, STU/ other entity.	Yes	Yes	Yes	Yes	Yes
B5	Undertaking in respect of Statutory clearances. As per Format III D.	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes	Yes

Annexure	Subject	DESCRIPTION/ TIMELINE	THERMAL	GAS	HYDRO	PSP	CAPTIVE GENERATION COMPLEX
B5 (a)	Undertaking in respect of compliance to Cyber Security requirement.	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization. The undertaking should be countersigned by the Concerned CISO of the organization.)/ alternate CISO of the AEGCL / APGCL /APDCL as the case may be.	Yes	Yes	Yes	Yes	Yes
II	Acknowledgment of Receipt of request by SLDC. As per Format II	Within five (5) working days of submission of information/documents by the User, SLDC shall acknowledge the receipt of the same.	Yes	Yes	Yes	Yes	Yes
IV	Provisional Approval for energization, testing and trial run. As per Format IV	After scrutiny of the submitted/ resubmitted documents and fulfillment of all criteria as per relevant regulations					
C1	Submission of information for completion of trial run and Request for issuance of certificate of successful trial run. As per Format V	To be submitted by the User post completion of Trial Run of the element.	Yes	Yes	Yes	Yes	Yes
C2	SCADA values of the active and reactive power flows and related voltages during the trial run period	To be submitted by the User post completion of Trial Run of the element.	Yes	Yes	Yes	Yes	Yes
C3	Interface Energy meter readings for the trial run period	To be submitted by the User post completion of Trial Run of the element.	Yes	Yes	Yes	Yes	Yes
C4	Outputs of Numerical relay or Disturbance Recorder (DR) and Station Event Logger (EL) during the trial run period, with time synchronized and in the standard format, as per RPC guidelines	To be submitted by the User post completion of Trial Run of the element.	Yes	Yes	Yes	Yes	Yes
C5	Plot along with raw values of weather parameters like ambient Temperature, GHI, Wind speed, wind direction, humidity and other relevant parameters required for corroborating the output	To be submitted by the User post completion of Trial Run of the element.	No	No	Yes	No	No

	from the plant as applicable						

Annexure	Subject	DESCRIPTION/ TIMELINE	THERMAL	GAS	HYDRO	PSP	CAPTIVE GENERATION COMPLEX
VI	Objection by beneficiary regarding trial run as per Clause 25(1) of IEGC, 2023. As per Format VI	Within two (02) working days of completion of such trial run.					
VII	Certificate of successful Trial Run (with or without electrical load). As per Format VII	After completion of successful trial run and receipt of documents and test reports within three (03) working days.					
GS	Request by user for availing Start-up power to the SLDC	At least one (01) month prior to the expected date of availing Start-up power i.e 16 months before the expected date of first synchronisation of the unit	Yes	Yes	Yes	Yes	Yes
UC	Notarized Undertaking by captive generation complex	To be submitted by USER 6 months ahead of the expected date of charging.	No	No	No	No	Yes
UG-3	Undertaking by generator before drawal of start up power		Yes	Yes	Yes	Yes	Yes
UG-5	Undertaking by PSP operating in pumping mode		No	No	No	Yes	No

Annexure	Subject	DESCRIPTION/ TIMELINE	THERMAL	GAS	HYDRO	PSP	CAPTIVE GENERATION COMPLEX
TH	Hydro plants reservoir details	To be submitted by USER 6 months ahead of the expected date of charging.	No	No	Yes	Yes	No
TPSP	PSP technical details	To be submitted by USER 6 months ahead of the expected date of charging.	No	No	No	Yes	No
MT-7	AGC Signal list to be made available to NLDC/NERLDC/SLDC		No	No	No	Yes	No
3(A) to 3(D)	Guidelines for Thermal, Gas and Hydro Plants	May be referred for providing generic RMS modelling data for Thermal, Gas and Hydro Plants respectively. The models shall be submitted as per the model compatibility guidelines specified at **Annexure- 3(D)**					
3 (E)	Guideline for PSP	May be referred for providing generic RMS modelling data for Thermal, Gas and Hydro Plants respectively. The models shall be submitted as per the model compatibility guidelines specified at **Annexure- 3(E)**					
VIII	Approval of start up power by SLDC As per Format VIII						

CHAPTER 6: SPECIFIC REQUIREMENTS FOR CHARGING/ ENERGIZATION AND INTEGRATION OF SOLAR, WIND, BESS OR HYBRID (WIND/SOLAR/BESS) PLANTS/PARKS

6.0 APPLICABILITY

This section is applicable to solar, wind, BESS or hybrid (wind/solar/BESS) plants/parks connected to the state grid

6.1 SUBMISSION OF PRE-COMMISSIONING DATA 12 MONTHS PRIOR TO COMISSIONING

i) The Wind, Solar, *BESS*[1] and Hybrid (Wind/Solar/BESS) plant/park developer shall submit the technical connection data mentioned at points (a) and (b) below to STU at least 12 months prior to the physical interconnection of the RE plant with the Grid. STU shall share the submitted data and models with SLDC. Both STU & SLDC shall, in parallel, examine the submitted data.

The joint observations on the submitted data, if any, shall be conveyed by STU to the *RE developer*[2] within one month of the receipt of complete technical data.

a) Simulation Model Submission: The steady-state and dynamic simulation models (*RMS*[3], 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).

b) Test Reports, Simulation Reports and Certificates Submission: Following report and certificates demonstrating compliance to CEA's "Technical Standards for Connectivity to the Grid, 2007 and subsequent amendments shall be submitted for each make *IBR*[4] in a Generating Station:

For providing certification details of the IBR unit, following documents shall be submitted for each make of IBR in a Generating station.

i. Statement of compliance (SOC) to applicable CEA standards from an Accredited Agency.
ii. *Evaluation report*[5]
iii. *Measurement reports*[6]
iv. Type Certificate
v. Any other relevant report specified in Evaluation report.

The above reports and certificates shall be submitted as per the IBR Unit Testing, Certification and Report Submission Guidelines specified at S. No. 2 of Annexure – I (E)(a). Transferability of the results from another same or different make IBR model shall not be considered and each separate IBR model shall be tested & certified separately.

Certificate of Accreditation of the certifying agency may also be asked for verification, if required.

Technical details of the plant shall be submitted as per the template provided in Part-A of Annexure-I (E).

Single IBR unit Benchmarking Report shall be submitted as per the guidelines specified at S. No. 3 of Annexure – I (E) (a).

Simulation report of the plant demonstrating compliance against CEA's "Technical Standards for Connectivity to the Grid, 2007" and subsequent amendments shall be submitted. The details of tests along with the methodology to be followed in this regard are specified in Part-B of Annexure-I (E).

Technical requirement of Power Plant Controllers (PPC) as specified in S.No. 4 of Annexure-I(E)(a) shall be ensured along with requisite document submission.

BESS[1]: *Battery Energy Storage System-Real time telemetry shall be as per Annexure MT-6 and other technical requirement for BESS shall be submitted as per Annexure-TB. Guidelines for BESS are given in the following section.*

RE developer[2]: *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.*

RMS[3]: *Annexure-I(C) (Guidelines for Exchange of data for modelling wind farms) and Annexure-I(D) (Guidelines for Exchange of data for modelling Solar farms) and shall be referred for RMS modelling (Generic).*

IBR[4]: *Inverter based resource; IBR unit referred here can be the single solar inverter, single WTG (all types) or single BESS inverter.*

Evaluation report[5]: *Report containing the results of conformity evaluations relating to certification, the basis for the decision to issue the Statement of Compliance/Conformity Statement Certificate.*

Measurement reports[6]: *Report indicating the electrical characteristic of IBR unit and referred for the purpose of Certification.*

ii) After submission of the models and reports specified at S. No. (i) above, if there is any change in the plant equipment/layout/firmware/software etc. at a later stage due to some unforeseen/uncontrollable event, the revised models and reports shall be submitted to STU & SLDC at least three months prior to the physical interconnection. The changes w.r.t. the models and reports submitted as per S. No. (i) above shall be clearly highlighted. STU shall share the

revised data and models with SLDC. STU & SLDC shall jointly examine the submitted data and share their observations if any to the RE developer.

If there are no changes, a **"letter of confirmation"** confirming that there are no changes to the models and reports submitted at S. No. (i) and (ii) shall be submitted by the RE developer at least three months prior to the physical interconnection to STU.

At this stage, the details of the implemented controller and protection settings (both IBR and Power Plant Controller) shall be submitted as per the format specified in Annexure - 1 E(b). A letter of confirmation signed by an authorized official certifying that the settings submitted are actual implemented settings and any change in the settings will be carried out in consultation with SLDC.

c) Detailed Project Report along with Operating Manual(s) shall also be submitted by generating plants.

6.2 USER REGISTRATION

In addition to the general requirements regarding user registration as mentioned in Chapter -1, RE Generators or lead generator shall also register as a User of SLDC before getting connected at the InSTS pooling station for the first time and shall pay fees and charges as applicable.

Provided that Co-located Hybrid Power Plants (consisting Wind, Solar & with or without BESS) shall be registered based on their combined actual AC Installed Capacity (in MW) irrespective of the connectivity quantum. The scheduling from Hybrid Plant shall be restricted up to connectivity quantum (in MW). The technical & modelling data as per this procedure shall be submitted for the complete capacity.

Provided that Stand alone BESS shall be registered under the category of "Generating Station" and the registration fee and monthly Fees & Charges shall be based on Installed capacity (MW).

Additional Document submission during registration:

1. Copy of agreement (s) between SPPD/WPPD/HPPD and SPD/WPD/HPD.
2. Technical Details- Below mentioned technical details to be submitted
    a) Static Details: Details of Wind/Solar/Hybrid power plant, Static parameters for wind generating station and Static parameters for solar generating station as per Annexure-TWS, Annexure- TW and Annexure- TS respectively.
    b) Dynamic Details of the generator.
    c) Notarized Indemnity bond to be submitted by generator as per ANNEXURE IB.
    d) Notarized Undertaking on General Compliance Requirements as per ANNEXURE UG-1
    e) Notarized Undertaking on Compliance of CEA Connectivity Standards as per ANNEXURE UG-2

f) Notarized undertaking towards exemption of transmission charge/loss as per ANNEXURE UG-4

g) 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.

3. GEO TAGGING INFORMATION FOR EACH WIND TURBINE: NIWE, Chennai developed geo- tagged database /online registry of wind turbines installed across the country. As per office memorandum of MNRE, all wind turbines in a project should be geo- tagged before Commercial Operation Date (COD). Copy of same to be submitted to SLDCs.

6.3 SUBMISSION OF DOCUMENTS FOR FTEI

Along with the documents submitted to SLDC regarding intent of charging 6 months prior to expected date of charging via Annexure A1, A2, A3, Technical Parameters & Protection Data and Models and modelling data as per point 1.5.2 & documents enlisted under Chapter-2 of this document as per timeline, the users will also have to submit the following:

1. ANNEXURE-UC: Notarized Undertaking by captive generation complex.

2. TELEMETRY & COMMUNICATION: The telemetry and SCADA Integration shall be as per section 1.5.4 of this document. On readiness of metering equipments and establishment of data communications, a field visit by APDCL, AEGCL/SLDC officials is to be carried out for meter and real time data verification prior to issuance of Commissioning/trial run certificates.

   REAL TIME TELEMETRY & PMU DATA TO SLDC:

   i. Entity shall provide real time data for wind and solar plants for all parameters mentioned in ANNEXURE MT-1 *and* ANNEXURE *MT-3* to the SLDC @ resolution of 4-6 sec.
   ii. Telemetered weather parameters like Ambient Temperature (^{0}C), Relative Humidity (%), Wind Speed, and Wind Direction etc. to be provided to respective RLDC. Segregation of telemetered points is as per ANNEXURE MT-2 and ANNEXURE MT-4.
   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:
      a) Single Communication link failure.
      b) Single Port failure.
      c) Single Gateway failure.
      d) Single Master station polling server failure.

iv. 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]

v. Phasor Measurement Units (PMUs) shall be installed at the RE Generating substation(s) of developer. The signal list for PMU data is provided in Annexure-MT-5 (Ref: Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022.

vi. Following details shall also be shared-
   a) Details of PMU (make and model).
   b) Details of gateway/RTU–Make and model.
   c) Details of the Multiplexor owned by RE station.

3. Power Plant Controllers shall be installed with following minimum features:

i. Active Power Control (with ramp rate control functionality).
ii. Reactive power Control (Voltage Control, Constant-Q control and PF Control).
iii. Frequency Controller.
iv. Data logging facility (≤1sec resolution).
v. Sequence of Event Logging Facility (in order to capture switching of IBRs).
vi. Facility to accept remote signals from SLDC for varying active and reactive power set-point.
vii. Facility to control shunt compensation devices like FACTs, etc.

4. 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 SLDC.

Preferable DR trigger criteria and recording period for monitoring purpose is given below:

Setting Value	**Recording Period**
Voltage->=1.1 p.u.&<= 0.9p.u.	Pre-fault–0.5s Post fault– 10 s Sampling–1 kHz or higher
Frequency->=51 Hz&<= 49Hz	

The developer shall be able to provide event logger data from IBR as and when requested by SLDC.

5. As per regulation 24 (6) of IEGC, 2023, and 6.7.6 of AERC AEGC 2024 and its amendments 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 inter connection:
   a) Frequency response of machines as per the extant CEA Technical Standards for Connectivity.
   b) Reactive power capability as per OEM rating at the available irradiance or the wind energy, as the case may be.

Provided that the generating company may submit offline simulation studies for the specified tests, incase 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.

The detailed report covering the results of the above tests shall be submitted to SLDC.

6. As per regulation 6.7.7 of AERC (Electricity Grid Code) Regulations, 2024, following documents/tests shall be performed at the point of inter connection in case of Energy Storage Systems:

   i. Power output capability in MW and energy output capacity in MWh
   ii. Frequency response of ESS
   iii. Ramping capability as per design

   The detailed report covering the results of the above tests shall be submitted to the concerned SLDC.

6.4 ISSUANCE OF APPROVAL FOR FTEI AND TRIAL RUN

After scrutiny of the submitted documents as mentioned above and fulfillment of all criteria as per relevant regulations and as stated in Chapter 2 of this document SLDC would issue a provisional approval for FTEI and trial run of the generator to the User as per Format IV.

6.5 START-UP POWER DRAWAL & INJECTION OF INFIRM POWER

The provisions for drawal of start up power and injection of infirm power will be as per section 5.3, 5.4 of this procedure.

6.6 TRIAL RUN OPERATION OF WIND/ SOLAR/BESS/ HYBRID GENERATING STATION

1) Trial run of the solar inverter unit(s) connected at State Transmission system shall be performed for a minimum capacity of 5 MW.

   Provided that in the case of a project having a capacity of more than 5 MW, the trial run for

the balance capacity shall be performed in a maximum of four instalments with a minimum capacity of 5 MW.

Successful trial run of a solar inverter unit(s) covered under Regulation 6.5.3(a) of AERC (Electricity Grid Code) Regulations, 2024 shall mean the flow of power and communication signal for not less than four hours on a cumulative basis between sunrise and sunset in a single day with the requisite metering system, power plant controller, telemetry and protection system in service.

The Generating Company shall record the output of the unit(s) during the trial run and shall corroborate its performance with the temperature and solar irradiation recorded at site during the day and plant design parameters:

Provided that:

i. the output below the corroborated performance level with the solar irradiation of the day shall call for a repeat of the trial run;
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 Regulation 6.5.3(f) of AERC (Electricity Grid Code) Regulations, 2024.

2) Trial run of a wind turbine(s) connected at State Transmission system shall be performed for a minimum capacity of 5 MW:

Provided that in the case of a project having a capacity of more than 5 MW, the trial run for wind turbine(s) above the capacity of 5 MW shall be performed in batch sizes of not less than 5 MW:

Successful trial run of a wind turbine(s) covered under Regulation 6.5.3(b) of AERC (Electricity Grid Code) Regulations, 2024 shall mean the flow of power and communication signal for a period of not less than four (4) hours on a cumulative basis in a single day during periods of wind availability with the requisite metering system, power plant controller, telemetry, and protection system in service.

The Generating Company shall record the output of the unit(s) during the trial run and corroborate its performance with the wind speed recorded at the site(s) during the day and plant design parameters:

Provided that-

i. the output below the corroborated performance level with the wind speed of the day shall call for a repeat of the trial run;

ii. if it is not possible to demonstrate the rated capacity of the plant due to insufficient wind velocity, COD may be declared subject to the condition that the same shall be demonstrated immediately when sufficient wind velocity 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 wind velocity is available after COD, the Generating Company shall de-rate the capacity in terms of Regulation 6.5.3(f) of AERC (Electricity Grid Code) Regulations, 2024.

3) Successful trial run of a standalone Energy Storage System (ESS) connected at State Transmission system shall mean one (1) complete cycle of charging and discharging of energy as per the design capabilities with the requisite metering, telemetry and protection system being in service.

4) Successful trial run of a hybrid system connected at State Transmission system shall mean successful trial run of each individual source of the hybrid system in accordance with the applicable provisions of this Grid Code.

5) Where, on the basis of the trial run, solar/ wind/ ESS/ hybrid generating station connected at State Transmission system fails to demonstrate its rated capacity, the Generating Company shall have the option to either go for a repeat trial run or de-rate the capacity subject to a minimum aggregated de-rated capacity of 5 MW and above, as the case may be.

6) The developer shall from time to time, ensure compliance to the technical standards & regulations promulgated by CEA & CERC in relation with trial operation & COD of Wind generating stations.

7) During the period of injection of infirm power, the SLDC control room shall be intimated in advance, the forecasted pattern of infirm injection.

8) 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.

9) The developer shall provide high resolution data (preferably ≤ 10ms accuracy) of the commissioned IBR units for at least 10 second period. The data shall be provided as per the format specified in Annexure-I (E)(c).

10) The developer shall submit any other data as sought by the concerned SLDC for the purpose of verification of successful trial run operation.

11) After completion of the successful trial run and receipt of documents and test reports as mentioned in above sections, the concerned SLDC shall issue a certificate as per **FORMAT-VII** to the concerned generating station or ESS, as the case may be, with a copy to their respective beneficiary(ies) as per timeline.

6.7 POST-COMMISSIONING DATA SUBMISSION

1. Within **03 months of the complete RE plant commissioning,** 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 STU & SLDC. The guidelines required to be followed for model validation and validation report are provided at **S. No. 5 of Annexure – I (E)(a)**.

2. Further, in case of any revision w.r.t. earlier submitted details, the updated implemented controller and protection settings (both IBR and Power Plant Controller) shall also be submitted as per the format specified in **Annexure - I E(b).** In case there are no changes, a letter of confirmation signed by an authorized company personnel certifying that there are no changes w.r.t. earlier submitted data shall be submitted.

3. 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.

4. 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 STU & SLDC on annual basis. Failure to carry out the annual power quality assessment shall make the plant liable for disconnection from the grid.

6.8 ADDITIONAL REQUIREMENT FOR FTEI OF BATTERY ENERGY STORAGE SYSTEM (BESS)

BESS shall consist of:

i) A power conversion system (PCS)
ii) An energy storage
iii) Battery Management System (BMS)
iv) Monitoring, information and control system (MIC)

Basic components of BESS are as follows:

i) Batteries as its underlying storage technology to be connected to an electrical network.
ii) Bidirectional inverter is the main device that converts power between the AC line voltage and

the DC battery terminals, and allows for power to flow both ways to charge and discharge the battery

iii) Other components of a BESS may include an isolation transformer, protection devices (e.g. circuit breakers), cooling systems, and a high-level control system to coordinate the operation of all components in the system

6.9 ADDITIONAL DOCUMENTS AND DATA TO BE SUBMITTED FOR FTEI OF BESS

1. UNDERTAKING: The applicant shall furnish the undertaking to comply with CEA Technical Standards as per Annexure UG-2.

2. TECHNICAL PARAMETERS OF THE BESS as per Annexure-TB is to be submitted to SLDC.

3. TELEMETRY: The parameters to be telemetered at SLDC for a BESS is attached as annexure MT-6.

4. TEST CERTIFICATES: The applicant shall furnish the following test certificates prior to trial run:

i. Verification of sensors, metering and alarms
ii. Verification of all control functions including automatic, local and remote control
iii. Verification of the performance criteria as per CEA Technical Standards
iv. Demonstration of all the intended applications including Black start
v. Demonstration of grid interface protection & control system
vi. Verification of power quality parameters

5. PCS DESIGN REQUIREMENTS: Grid-tied energy storage units are predominately DC in nature. To utilize the energy storage capability on the AC electric grid, the energy from batteries must be converted to a standard AC level and regulated through a converter, generally known as the Power Conversion System (PCS).

The PCS serves as the interface between the DC battery system and the AC system, providing bi-directional conversion from DC to AC (for discharging batteries) and AC to DC (for charging batteries). The PCS may consist of one or more parallel units. The PCS shall be bi-directional converter that can be operated in inverting mode for battery discharging and rectifying mode for battery charging.

Power Conversion System Operation conditions:

i. The AC power transformed efficiently from the DC power of the battery arrays shall be bi- directionally transferred to or from the distribution line without causing harmonics higher than as mandated in extant CEA regulations.

ii. The PCS shall contain a remote synchronization feature, as well as the standard synchronization used when starting the PCS online. The remote synchronization feature allows the PCS to synchronize its voltage and frequency to any other remote AC bus or

generator.

iii. Black start capability.

iv. The PCS shall have the ability to perform four-quadrant control.

v. The PCS shall be able to perform load following (for PV smoothing) Voltage shall be maintained at+/-5%nominal under normal operating conditions and +/-10%under emergency conditions.

vi. The PCS shall have the synchro-check function to allow parallel operation with the grid, diesel and PV generators/wind.

vii. PCS shall be able to operate in the following four modes of operation:

a. Active and reactive power control: In this mode of operation, PCS controls the output active and reactive powers supplied to the grid following their reference values which may be set locally or remotely.
b. Voltage and frequency control: In this mode of operation, PCS controls its own voltage and frequency, enabling it to create an islanded grid. Voltage and frequency control is possible when the PCS is in the voltage source operating mode.
c. Virtual synchronous generator: This mode of operation makes the PCS work as a voltage source converter. Under this mode, the BESS shall be able to provide its own voltage and frequency to an islanded grid, or to work in parallel with the utility grid in the grid-connected mode.
d. Voltage and frequency droop for parallel operation: The voltage droop allows reactive power sharing when the BESS is in an islanded mode or paralleled with other voltage sources. The frequency droop allows active power sharing when the BESS is in an islanded mode or paralleled with other voltage sources.

6. FUNCTIONAL REQUIREMENTS OF MIC SYSTEM

i. **Data acquisition:** The MIC system should be able to collect the analog and status quantities of PCCs and interconnection points as well as other data of the BESS.

ii. **Data processing:** The MIC system should be able to conduct calculation and analysis, data backup, out-of limit alarm, rationality check, and processing for collected data (including voltage, current, active power, reactive power, frequency, etc.).

iii. **Data storage:** The MIC system should store operating data, alarm information, and events based on configurations.

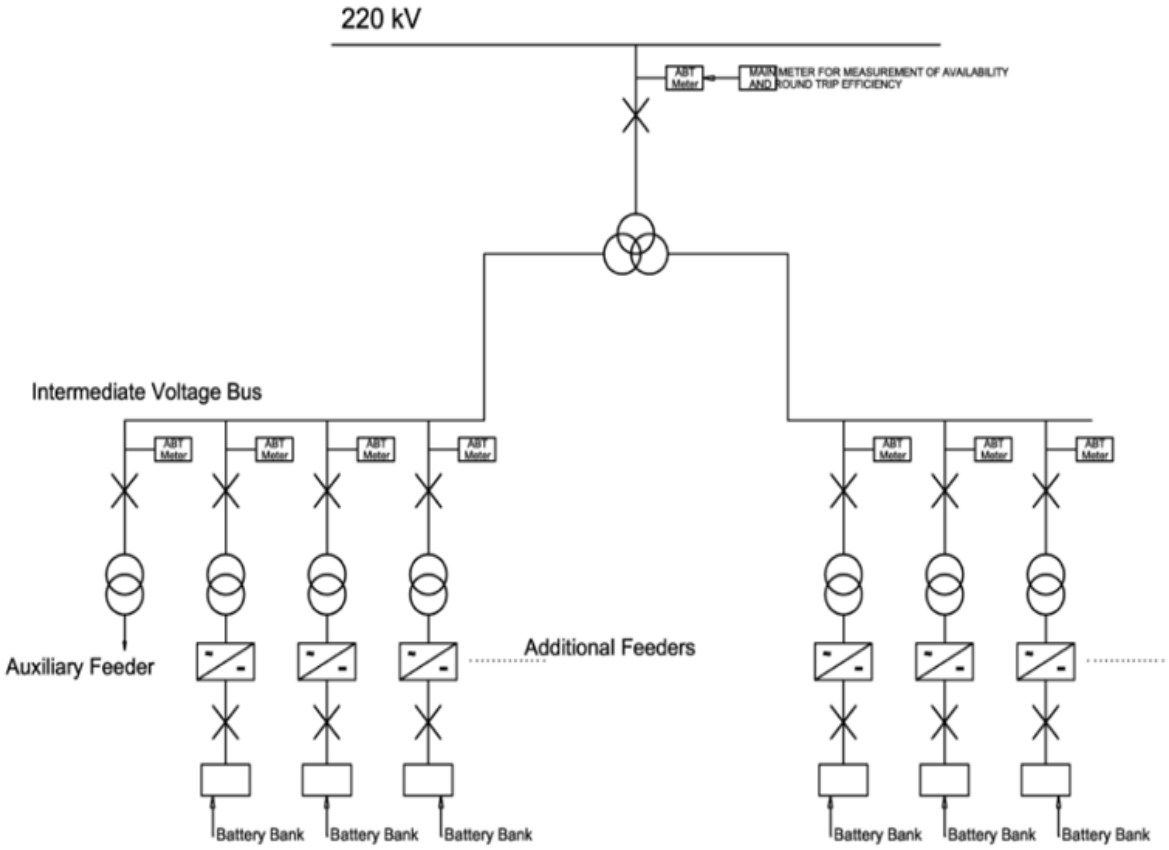
iv. **Event handling:** The MIC system should have functions of event sequence recording and accident recalling.

v. **Interconnection with external systems:** The MIC system shall carry out interconnection with external systems according to application demands. It shall be capable to be

interconnected with the distribution management system, automatic generation control system, etc. and soon to achieve exchange of BESS data and information such as charge and discharge power, energy quantities, operating status, etc. and control of setpoint from appropriate load dispatch centres.

7. LAYOUT DRAWING SUBMISSION:

A sample connectivity of the BESS connected with the system is given below. BESS system is shown to be inter-connected with grid at secondary terminal of power transformer.



8. PMU PLACEMENT

PMU shall be placed at the Point of Interconnection of BESS which shall be reporting the parameters like three phase voltage, three phase current, angles, frequency, active power and reactive power etc.

6.10 COMMERCIAL DATE OF OPERATION (COD) OF SOLAR, WIND, BESS OR HYBRID (WIND/SOLAR/BESS) PLANTS/PARKS CONNECTED TO THE STATE GRID.

1) The commercial operation date in the case of units of a SOLAR/WIND/ESS/PSP/Hybrid

generating station aggregating to 5 MW and above or such other limit as specified in Regulation 6.5.3 of the AERC (Electricity Grid Code) Regulations, 2024 shall mean the date declared by the generating station after undergoing a successful trial run as per Regulation 6.5.3 of AERC (Electricity Grid Code) Regulations, 2024, submission of declaration as per Regulation 6.9.4 of the AERC (Electricity Grid Code) Regulations, 2024, and subject to fulfilment of other conditions, if any, as per PPA.

2) In the case of a generating station as a whole, the commercial operation date of the last unit of the generating station shall be considered as the COD of the generating station.

6.11 REQUIREMENT LIST 4: REQUIREMENTS FOR FTEI OF SOLAR, WIND, BESS OR HYBRID (WIND/SOLAR/BESS) PLANTS/PARKS CONNECTED TO THE STATE GRID.

Annexure	Subject	DESCRIPTION/ TIMELINE	SOLAR	WIND	BESS	HYBRID
A	Application for registration of entity with SLDC as "User". As per ANNEXURE A/ Format I	At least fifteen (15) working days before anticipate date of charging.	If the entity is not a registered user of SLDC.			
A1	Intimation by User regarding expected first time energization and integration of new power system element(s). As per Format IA	To be submitted by USER 6 months ahead of the expected date of charging.	Yes	Yes	Yes	Yes
A2 (a)	List of elements to be first time energized and their details. As per Format IB	To be submitted by USER 6 months ahead of the expected date of charging.	Yes	Yes	Yes	Yes
A2 (b)	Details of the elements expected to be first time energised and integrated into the grid in the next six (06) months As per Format IC	To be submitted by USER 6 months ahead of the expected date of charging.	Yes	Yes	Yes	Yes
A3	Single line diagram of the concerned sub stations clearly indicating the element to be charged	To be submitted by USER 6 months ahead of the expected date of charging.	Yes	Yes	Yes	Yes
FL	Forwarding letter to the head of SLDC requesting FTEI permission	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes
A4	List of SCADA points to be made available to SLDC/RLDC	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes
A5	Type and Location of energy meters as per relevant CEA regulations	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes

Annexure	Subject	DESCRIPTION/ TIMELINE	SOLAR	WIND	BESS	HYBRID
A6	TSA / Connection Agreement/ Site Responsibility Schedule wherever applicable along with all annexures	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes
B1	Request by the User for first time energization and integration and Notice for Fresh/Repeat Trial Run. As per Format III	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes
B2	Undertaking in respect of Protection systems. As per Format IIIA	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization. The format should be countersigned by the Concerned TnC wing, STU/ other entity.	Yes	Yes	Yes	Yes
B3	Undertaking in respect of Telemetry and communication. As per Format III B.	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization. The format should be countersigned by the Concerned TnC wing, STU/ other entity.	Yes	Yes	Yes	Yes
B4	Undertaking in respect of Energy metering. As per Format III C.	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization. The format should be countersigned by the Concerned TnC wing, STU/ other entity.	Yes	Yes	Yes	Yes
B5	Undertaking in respect of Statutory clearances. As per Format III D.	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization.	Yes	Yes	Yes	Yes
B5 (a)	Undertaking in respect of compliance to Cyber Security requirement.	To be submitted at least fifteen (15) working days prior to the anticipated date of first-time energization. The undertaking should be countersigned by the Concerned CISO of the organization.)/ alternate CISO of the AEGCL / APGCL /APDCL as the case may be.	Yes	Yes	Yes	Yes

Annexure	Subject	DESCRIPTION/ TIMELINE	SOLAR	WIND	BESS	HYBRID
II	Acknowledgment of Receipt of request by SLDC. As per Format II	Within Five (05) working days of submission of information/documents by the User, SLDC shall acknowledge the receipt of the same.				
IV	Provisional Approval for energization, testing and trial run. As per Format IV	After scrutiny of the submitted/ resubmitted documents and fulfillment of all criteria as per relevant regulations.				
C1	Submission of information for completion of trial run and Request for issuance of certificate of successful trial run. As per Format V	To be submitted by the User post completion of Trial Run of the element.	Yes	Yes	Yes	Yes
C2	SCADA values of the active and reactive power flows and related voltages during the trial run period	To be submitted by the User post completion of Trial Run of the element.	Yes	Yes	Yes	Yes
C3	Interface Energy meter readings for the trial run period	To be submitted by the User post completion of Trial Run of the element.	Yes	Yes	Yes	Yes
C4	Outputs of Numerical relay or Disturbance Recorder (DR) and Station Event Logger (EL) during the trial run period, with time synchronized and in the standard format, as per RPC guidelines	To be submitted by the User post completion of Trial Run of the element.	Yes	Yes	Yes	Yes
C5	Plot along with raw values of weather parameters like ambient Temperature, GHI, Wind speed, wind direction, humidity and other relevant parameters required for corroborating the output from the plant as applicable	To be submitted by the User post completion of Trial Run of the element.	Yes	Yes	Yes	Yes
VI	Objection by beneficiary regarding trial run as per Clause 25(1) of IEGC, 2023. As per Format VI	Within (02) working days of completion of such trial run.				

Annexure	Subject	DESCRIPTION/ TIMELINE	SOLAR	WIND	BESS	HYBRID
VII	Certificate of successful Trial Run (with or without electrical load). As per Format VII	After completion of successful trial run and receipt of documents and test reports within three (03) working days.				
GS	Request by user for availing Start-up power to the SLDC	At least one (01) month prior to the expected date of availing Start-up power i.e 16 months before the expected date of first synchronization of the unit	Yes	Yes	Yes	Yes
UC	Notarized Undertaking by captive generation complex	To be submitted by USER 6 months ahead of the expected date of charging.	Yes, for all RE captive generation complex.			
UG-3	Undertaking by generator before drawal of start up power		Yes	Yes	Yes	Yes
VIII	Approval of start up power by SLDC As per Format VIII					
(I)E	Technical details of the plant	To be submitted at least 12 months prior to the physical interconnection as per template in part A. To be resubmitted at least three months prior to the physical interconnection to STU in case of any change in the plant equipment / layout /firmware / software etc. at a later stage.	Yes	Yes	Yes	Yes
I(E)	Simulation report of the plant demonstrating compliance against CEA's "Technical Standards for Connectivity to the Grid, 2007" and subsequent amendments	The details of tests along with the methodology to be followed in this regard are specified in Part-B. To be submitted at least 12 months prior to the physical interconnection. To be resubmitted at least three months prior to the physical interconnection to STU in case of any change in the plant equipment / layout /firmware / software etc. at a later stage.	Yes	Yes	Yes	Yes
I(E)(a)	Simulation Model Submission	To be submitted at least 12 months prior to the physical interconnection as per guidelines specified in Sl. No. 1. To be resubmitted at least three months prior to the physical interconnection to STU in case of any change in the plant equipment / layout /firmware / software etc. at a later stage.	Yes	Yes	Yes	Yes

Annexure	Subject	DESCRIPTION/ TIMELINE	SOLAR	WIND	BESS	HYBRID
I(E)(a)	Test Reports, Simulation Reports and Certificates Submission	To be submitted at least 12 months prior to the physical interconnection as per guidelines specified in Sl. No. 2. To be resubmitted at least three months prior to the physical interconnection to STU in case of any change in the plant equipment / layout /firmware / software etc. at a later stage.	Yes	Yes	Yes	Yes
I(E)(a)	Single IBR unit Benchmarking Report	To be submitted at least 12 months prior to the physical interconnection as per guidelines specified in Sl. No. 3. To be resubmitted at least three months prior to the physical interconnection to STU in case of any change in the plant equipment / layout /firmware / software etc. at a later stage.	Yes	Yes	Yes	Yes
(I)E(a)	Validated detailed (only RMS) and equivalent models (RMS and EMT both) of the plant along with the validation report	To be submitted Within 3 months of the complete RE plant commissioning to STU and SLDC as per guidelines in Sl. No. 5	Yes	Yes	Yes	Yes
I(E)(a)	Technical requirement of Power Plant Controllers (PPC)	To be ensured along with requisite document submission as specified in S.No. 4. To be submitted at least 12 months prior to the physical interconnection. To be resubmitted at least three months prior to the physical interconnection to STU in case of any change in the plant equipment / layout /firmware / software etc. at a later stage.	Yes	Yes	Yes	Yes
I(E)(b)	Details of the implemented controller and protection settings (both IBR and Power Plant Controller)	To be submitted at least three months prior to the physical interconnection to STU.	Yes	Yes	Yes	Yes
	Letter of Confirmation	To be submitted at least three months prior to the physical interconnection to STU in case of no changes confirming that there are no changes to the models and reports.	Yes	Yes	Yes	Yes
(I)C-(I)F	Guidelines for Exchange of data for modelling RE farms	To be referred for RMS modelling of respective RE farms	Yes	Yes	Yes	Yes

Annexure	Subject	DESCRIPTION/ TIMELINE	SOLAR	WIND	BESS	HYBRID
	Copy of agreement (s) between SPPD/ WPPD/ HPPD and SPD/ WPD/ HPD	To be submitted during registration with SLDC	Yes	Yes	Yes	Yes
TWS	Details of Wind/Solar/Hybrid power plant	To be submitted during registration with SLDC	Yes	Yes	Yes	Yes
TW	Static parameters for wind generating station	To be submitted during registration with SLDC	No	Yes	No	No
TS	Static parameters for solar generating station	To be submitted during registration with SLDC	Yes	No	No	No
IB	Notarized Indemnity bond	To be submitted during registration by generator with SLDC	Yes	Yes	Yes	Yes
UG-1	Notarized Undertaking on General Compliance Requirements	To be submitted during registration by generator with SLDC	Yes	Yes	Yes	Yes
UG-2	Notarized Undertaking on Compliance of CEA Connectivity Standards	To be submitted during registration by generator with SLDC	Yes	Yes	Yes	Yes
UG-4	Notarized undertaking towards exemption of transmission charge/loss	To be submitted during registration by generator with SLDC	Yes	Yes	Yes	Yes
UG-6	Undertaking by ESS operating in charging mode		No	No	Yes	No
	Undertaking towards compliance to aviation safety norms	To be given by WPD for all the WTGs for the compliance of aviation safety norms viz. installation of LED on turbine blades, etc. during registration with SLDC	No	Yes	No	No
MT-1	Parameters of wind generating plants for real time telemetry	Entity shall provide real time data for wind plants for all parameters as per annexure.	No	Yes	No	No
MT-3	Parameters of solar generating plants for real time telemetry	Entity shall provide real time data for solar plants for all parameters as per annexure.	Yes	No	No	No
MT-2	Segregation of telemetered points for wind generating plants	Entity shall provide as per annexure.	No	Yes	No	No
MT-4	Segregation of telemetered points for solar generating plants	Entity shall provide as per annexure.	Yes	No	No	No

Annexure	Subject	DESCRIPTION/ TIMELINE	SOLAR	WIND	BESS	HYBRID
MT-5	PMU signal list	To be followed while installing PMU.	Yes	Yes	Yes	Yes
MT-6	Parameters of BESS for real time telemetry	To be submitted at least 12 months prior to the physical interconnection as per guidelines.	No	No	Yes	No
TB	Technical requirement for BESS	To be submitted at least 12 months prior to the physical interconnection as per guidelines	No	No	No	Yes
	Type test report for Fault Ride through Test (LVRT and HVRT)		Yes	Yes	No	No
	Test reports for Frequency response of machines		Yes	Yes	No	No
	Test reports for Reactive power capability		Yes	Yes	No	No
	Detailed report covering test reports of Power output capability in MW and energy output capacity in MWh, Frequency response of ESS and ramping capability as per design		No	No	No	Yes

---------- **END OF DOCUMENT** ----------