

**+Procedure for interconnection of a new transmission element
belonging to any transmission licensee and issue of certificate of
successful trial operation by Regional Load Despatch Centres (RLDCs)**

Indian Electricity Grid Code provides for formulation of operating procedure by RLDC /NLDC. The same is quoted below:

“A set of detailed operating procedures for the National grid shall be developed and maintained by the NLDC in consultation with the RLDCs, for guidance of the staff of the NLDC and it shall be consistent with IEGC to enable compliance with the requirement of this IEGC.

A set of detailed operating procedures for each regional grid shall be developed and maintained by the respective RLDC in consultation with the regional entities for guidance of the staff of RLDC. and shall be consistent with IEGC to enable compliance with the requirement of this IEGC.”

In accordance with the above provisions and as a part of NLDC/RLDC operating procedure, procedure for interconnection of a new transmission element belonging to any transmission licensee has been formulated to enable RLDCs / NLDC for secure and reliable interconnection of new elements. The details of the same are as follows:

1. All the Transmission Licensees intending to commission any transmission element, which is a part of inter-state transmission system, shall intimate the concerned RLDC the details as given below, **generally (10) days** prior to the anticipated date of first test charging.
 - A. **Annexure A1:** Intimation regarding anticipated charging of the line along with the list of the desired documents being submitted as per **Format I**.
 - B. **Annexure A2 :** List of elements to be charged and Element Rating details as per **Format IA**
 - C. **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.
 - D. **Annexure A4 :** List of SCADA points to be made available (as per standard requirement, RLDC would need all MW and MVAR data, voltage and frequency of all the buses, all the breaker and isolator positions, OLTC tap positions, Main-1/Main-2 protection operated signals)
 - E. **Annexure A5 :** Location of Energy meters as per relevant CEA regulations

- F. **Annexure A6** : Connection Agreement, wherever applicable along with all annexures.

In additions to these documents, charging instructions, details of approval of the transmission scheme from the Standing Committee / CTU, availability of line reactors as per approved scheme, approval for changes in the approved scheme, technical parameters of the transmission element required for network modeling shall be made available by CTU/STU, as the case may be, to RLDCs/NLDC.

2. Within 3 days of submission of above information by the Transmission Licensee, concerned RLDC shall acknowledge the receipt of the same, as per Format II, and seek clarifications, if any. The transmission licensee shall submit the desired information/documents to the concerned RLDC within next three days.
3. The request for charging of new transmission element and towards start of the trial operation as per Format III shall be submitted by the Transmission Licensee to the concerned RLDC, **generally three (3) days** prior to the date of first time charging. There could be a separate schedule for test charging and the final schedule for trial operation, which may be mentioned in the Format-I itself. The Transmission Licensee shall also submit the following documents in this regard:
 - A. **Annexure B 1**: Request for charging of the new transmission element along with the summary of the undertakings being submitted as per **Format III**
 - B. **Annexure B2**: Undertaking in respect of Protective systems as per **Format III A**
 - C. **Annexure B3**: Undertaking in respect of Telemetry and communication as per **Format III B**
 - D. **Annexure B4**: Undertaking in respect of Energy metering as per **Format III C**
 - E. **Annexure B5**: Undertaking in respect of Statutory clearances as per **Format III D**
4. On satisfying itself with the submitted information as stated above under Para 3, the RLDC would issue a provisional approval for charging to the Transmission Licensee as per **Format IV** within two days of receipt of above documents. On the designated day, the transmission licensee shall charge the transmission line and do trial operation as per the timeline mentioned in Format III, after obtaining the real time code from RLDC. All attempts would be made by the real time operating personnel at the concerned RLDC to facilitate charging and commissioning of the new element at the earliest, subject to availability of real time data and favourable system conditions.

5. Regulation 5(2) of CERC (Terms and Conditions of Tariff), 2014 provides for certification of successful trial operation of new transmission assets by RLDC. The same is quoted below:

“Trial operation in relation to a transmission system or an element thereof shall mean successful charging of the transmission system or an element thereof for 24 hours at continuous flow of power, and communication signal from sending end to receiving end and with requisite metering system, telemetry and protection system in service enclosing certificate to that effect from concerned Regional Load Dispatch Centre”

Post successful trial operation, following documents shall be submitted by the Transmission Licensee:

- A. **Annexure C1** : Request for issuance of successful trial operation certificate as per **Format V**
 - B. **Annexure C2**: Values of the concerned line flows and related voltages as per local SCADA just before and after charging of the element.
 - C. **Annexure C3** : Special Energy meter (SEM) Reading corresponding to the trial run
 - D. **Annexure C4** : Output of Disturbance Recorders / Event Loggers
6. Within three (3) working days of submission of the information mentioned above, RLDC concerned shall issue the certificate for successful completion of trial run of the transmission element as per **Format VI**.
 7. In case of an inter-regional element, both the respective RLDCs would be involved and a copy of the communications may be forwarded to NLDC also in such cases.

X-----X-----X

Documents to be submitted by Transmission Licensee to RLDCs

Annexure	Subject	Remarks
Annexure A1	Intimation regarding anticipated charging of the line along with other documents	As per Format I
Annexure A2	List of elements to be charged and Element Rating details	As per Format I A
Annexure A3	Single line diagram of the concerned sub stations, along with status of completion of each dia/bus/breakers	
Annexure A4	List of SCADA points to be made available (as per standard requirement, RLDC would need all MW and MVAR data, voltage and frequency of all the buses, all the breaker and isolator positions, OLTC tap positions, Main-1/Main-2 protection operated signals)	
Annexure A5	Type and Location of Energy meters as per relevant CEA regulations	
Annexure A6	Connection Agreement, wherever applicable along with all annexures	
Annexure B1	Request for charging of the new transmission element along with the summary of the undertakings being submitted	As per Format III
Annexure B2	Undertaking in respect of Protective systems	As per Format III A
Annexure B3	Undertaking in respect of Telemetry and communication	As per Format III B
Annexure B4	Undertaking in respect of Energy metering	As per Format III C
Annexure B5	Undertaking in respect of Statutory clearances	As per Format III D
Annexure C1	Request for issuance of successful trial operation certificate	As per Format V
Annexure C2	Values of the concerned line flows and related voltages just before and after charging of the element	
Annexure C3	Special Energy meter (SEM) Reading for the trial	
Annexure C4	Output of Disturbance Recorders / Event Loggers	

Format - I

Intimation by Transmission Licensee regarding anticipated charging of new elements

<Name of Transmission Licensee>

Name of the transmission element :

Type of Transmission Element : Transmission Line / ICT / Bus Reactor / Line Reactor / Bus / Bay / Series Capacitor/ Series Reactor/Station transformer/ Generator transformer/STATCOM/ HVDC Terminal /Converter Transformer/ HVDC Line / MSR / MSC / TCSC / FSC

Voltage Level :

Owner of the Transmission Asset :

Likely Date and time of Charging :

Likely Date and time of start of Trial Operation :

Schedule Date of Commercial Operation:
(As per original scheme)

Project Scheme : TBCB / Other than TBCB

Associated elements of this project :
(In case co-ordinated Transmission/Generation evacuation project)

Place:

Date:

(Name and Designation of the authorized person with official seal)

Encl: Please provide full details.

Annexure A2 : Format I A: List of elements to be charged and Element Rating details

Annexure A3 : Single line diagram of the concerned substations, along with status of completion of each dia / bus / breakers

Annexure A4 : List of SCADA points to be made available

Annexure A5 : Location of installation of Energy meters as per relevant CEA regulations

Annexure A6 : Connection Agreement/Implementation agreement , if applicable along with all annexures

Annexure A7 : Project initiation/approval copy by competent authority

Format - I A

List of elements to be charged and Element Rating details

I. List of Elements to be charged:

II. Element Ratings:

a. Transmission Line -

1	From Substation	
2	To Substation	
3	Voltage Level (kV)	
4	Line Length(km)	
5	Conductor Type	
6	No of sub-conductors	
7	Thermal Capacity	

b. ICT -

1	Voltage(HV kV / LV kV)	
2	Capacity (MVA)	
3	Transformer Vector group	
4	Total no of taps	
5	Nominal Tap Position	
6	Present Tap Position	
9	Tertiary Winding Rating and Ratio	
10	% Impedance	

c. Shunt/Series Reactor -

1	Substation Name/ Line Name	
2	Voltage	
3	MVAR Rating	
4	Switchable / Non Switchable	
5	In case of Bus Reactor, whether it can be taken as line reactor	

(Name and Designation of the authorized person with official seal)

Annexure - A4

<Name of licensee>

List of SCADA points to be made available:

Station	Element to be charged	List of SCADA points to be made available	Remarks

(Name and Designation of the authorized person with official seal)

Annexure - A5

Please make a diagram to describe position of meter in bays.

Format - II

<Name of RLDC>

Not to be filled by Applicant, Please don't include this page.

Acknowledgement of Receipt by RLDC

This is to acknowledge that the intimation of likely charging of (Name of the transmission element) has been received from (Name of the owner of the transmission asset) on (Date).

Kindly complete the technical formalities in connection with energy metering, protection and real time data and communication facilities and inform us of the same three (3) days before charging of the above transmission element as per Formats III, IIIA, IIIB, IIIC and IIID.

Or

The intimation is in complete and the following information may be submitted within three (3) days of issue of this acknowledgment receipt.

1. -

2. _____

3. _____

.....

Date

Signature

Name:

Designation:

RLDC

Format - III

<Name of Transmission Licensee>

**Request by Transmission Licensee for first time charging and
start of Trial Operation**

Past references* :

Name of the transmission element :

Type of Transmission Element : Transmission Line / ICT / Bus Reactor / Line Reactor / Bus / Bay / Series Capacitor/ Series Reactor/Station transformer/ Generator transformer/STATCOM/ HVDC Terminal /Converter Transformer/ HVDC Line / MSR / MSC / TCSC / FSC

Voltage Level :

Owner of the Transmission Asset :

Proposed Date and time of first time charging :

Proposed Date and time of Trial Operation :

Place:

Date:

(Name and Designation of the authorized person with official seal)

Encl:

Annexure B2 : Undertaking in respect of Protective systems as per Format – III A

Annexure B3 : Undertaking in respect of Telemetry and communication as per Format – III B

Annexure B4 : Undertaking in respect of Energy metering as per Format – III C

Annexure B5: Undertaking in respect of statutory clearances as per Format – III

Format IIIA

< Name and Address of Transmission Licensee>

Undertaking by Transmission Licensee in respect of Protective systems

The following transmission element is proposed to be charged on _____<date> tentatively around ___hours.

S no and Name of transmission element

- 1.0 It is certified that all the systems as stipulated in Part-III of the Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 (as amended from time to time) have been tested and commissioned and would be in position when the element is taken into service.
- 2.0 The protective relay settings have been done as per the guidelines of the Regional Power Committee (RPC) as per section 5.2 I of the Indian Electricity Grid Code (IEGC). The necessary changes have also been made/would be made appropriately for the following lines at the following substations:

Sl No:	Name of the substation	Name of the line	Confirmation of suitable Protection Co-ordinations with adjacent connected S/S/ Line
			YES/NO

- 3.0 End to end PLCC testing (Voice & Protection channel) has been completed in co-ordination with other end substation.

Place:

Date:

(Name and Designation of the authorized person with official seal)

Format IIIA

< Name and Address of Transmission Licensee>

Undertaking by Transmission Licensee in respect of Protective systems

The following transmission element is proposed to be charged on _____<date> tentatively around ___hours.

S no and Name of transmission element

1.0 It is certified that all the systems as stipulated in Part-III of the Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 (as amended from time to time) have been tested and commissioned and would be in position when the element is taken into service.

2.0 The protective relay settings have been done as per the guidelines of the Regional Power Committee (RPC) as per section 5.2 I of the Indian Electricity Grid Code (IEGC). The necessary changes have also been made/would be made appropriately for the following lines at the following substations:

Sl No:	Name of the	Name of the line

3. The relay settings modified for anti-theft charging of mentioned element are as follows:

- a) Distance Protection Setting: Time delays for Zone 1, Zone 2 and Zone 3 made instantaneous.
- b) Directional Earth Fault: Pick Up Current settings modified to 120 % of the line charging current of the idle charge length and under definite time with instantaneous trip.(Directional feature retained)
- c) Over Voltage setting : Stage-I overvoltage pick-up made minimum of that of all the lines connected from the charging substation with minimum grading and minimum time delay (say 105 % to 110% within 3 sec delay) corresponding to other lines which are in service

Place:

Date:

(Name and Designation of the authorized person with official seal)

Format IIIB

Annexure B3

< Name and Address of Transmission Licensee >

Undertaking by Transmission Licensee in respect of Telemetry and communication

The following transmission element is proposed to be charged on _____ <date> tentatively around ____ hours.

S no and Name of transmission element:

The list of data points that would be made available to RLDC in real time had been indicated vide communication dated _____. It is certified that the following data points have been mapped and real time data would flow to RLDC immediately as the element is charged and commissioned.

S no	Name of substation	Data point (analog as well as digital) identified in earlier Communication dated	Point to point checking done jointly with RLDC (Y/N)	Data would be available at RLDC (Y/N)	Remarks (path may be specified)
1	Sending end	Analog			
		Digital			
		SoE			
		Main Channel			
		Standby Channel			
		Voice Communication (Specify:)			
2	Receiving end	Analog			
		Digital			
		SoE			
		Main Channel			
		Standby Channel			
		Voice Communication (Specify:)			

It is also certified that the data through main channel is made available to RLDC as well as alternate communication channel is available for data transfer to RLDC to ensure reliable and redundant data as per IEGC (as amended from time to time). Also, Voice communication is established as per IEGC. The arrangements are of permanent nature. In case of any interruption in data in real time, the undersigned undertakes to get the same restored at the earliest.

Place:

Date:

(Name and Designation of the authorized person with official seal)

Format IIIC

< Name and Address of Transmission Licensee >

Undertaking by Transmission Licensee in respect of Energy metering

The following transmission element is proposed to be charged on _____ <date> tentatively around ____ hours.

S no and Name of transmission element:

Special Energy Meters (SEMs) conforming to CEA (Installation and Operation of Meters) Regulations, 2006 have been installed and commissioned. The SEMs are calibrated in compliance of regulation 9 of Part-I of CEA (Technical Standard for Grid Connectivity) Regulations 2007 as per the following details:

S no	Name of substation	Feeder name	Make of meter	Meter no	CT Ratio	PT/CVT Ratio
1	Sending end					
2	Receiving end					

Data Format Conformity: Yes / No

Polarity as per Convention: Yes / No

Time Drift Correction carried out: Yes/No

The data from the above meters would be forwarded on weekly basis to the RLDC as per section 6.4.21 of the Indian Electricity Grid Code (IEGC) (as amended from time to time) and also as and when requested by the RLDC.

(RLDC to indicate the email ids where the data has to be forwarded).

Format - III D

< Name and Address of Transmission Licensee >

Undertaking by transmission licensee in respect of statutory clearances

It is hereby certified that all statutory clearances in accordance with relevant CERC Regulations, CEA standards/regulations and PTCC route clearance for charging of _____ have been obtained from the concerned authorities.

Place:

Date:

(Name and Designation of the authorized person with official seal)

Transmission Licensee request for issuance of successful trial operation certificate
<Name of transmission licensee>

To,

<Name of RLDC>

Sub: Successful trial operation of <Name of Transmission element>---request for issue of certificate.

Ref: i) Our application dated in Format-I
ii) Your acknowledgement dated in Format-II
iii) Our application dated ---- in Format-III along with Format IIIA, IIIB IIIC and IIID
iv) Provisional approval dated ---- issued by your office. v) Real time
codes from RLDC on

Madam/Sir,

Referring to the above correspondence, this is to inform you the successful charging and trial operation of **<Name of Transmission Element>** from ---- to ---- (time & date). Please find enclosed the following:

1. A plot of the MW/MVAr power flow during the 24 hour trial operation based on the substation SCADA is enclosed at Annexure-B1.
2. The Energy Meter readings have already been mailed to your office on _____. The 15-minute time block wise readings for the trial operation period is enclosed at Annexure-B2
3. Event Logger and Numerical Relay or Disturbance Recorder outputs at Annexure-B3 indicating all the switching operations related to the element. It is further to certify that the time synchronization of numerical relay, event logger and disturbance recorder has been established.

It is requested that a certificate of successful trial operation may kindly be issued at the earliest.

Thanking you,

Yours faithfully,

()
<Name and Designation of authorized person with official seal>

Encl: Annexure C2: Plot of MW/MVAr flow during 24 hour trial operation.

Annexure C3: Energy Meter

Annexure-C4: Reading Numerical relay or Disturbance Recorder (DR) output and Event Logger output (SCADA).

