

पावर सिस्टम ऑपरेशन कॉरपोरेशन लिमिटेड

(पावरग्रिड की पूर्ण स्वामित्व प्राप्त सहायक कंपनी)

POWER SYSTEM OPERATION CORPORATION LIMITED

(A wholly owned subsidiary of POWERGRID)



पंजीकृत एवं केन्द्रीय कार्यालय: बी-9, प्रथम तल, कुतुब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली-110 016
Registered & Corporate Office : B - 9, 1st Floor, Qutub Institutional Area, Katwaria Sarai, New Delhi - 110 016
Website : www.posoco.in, www.nldc.in, Tel: 011-26536832, 26524522, Fax: 011-26524525, 26536901

To,

Dated: 26th May 2014

- 1) All Regional Load Despatch Centres (RLDCs)
- 2) All the inter-state transmission licensees (as per list attached)

Sub: Procedure for integration of a new network element of a transmission licensee into the grid and issuance of certificate by Regional Load Despatch Centre (RLDC) for successful trial operation of a transmission element

Sir,

As per section 5.2 of the grid related to System Security Aspects, each Regional Load Despatch Centre (RLDC) is required to maintain a list of important grid elements. Generally, the following categories of elements fall in the category of important grid elements (please refer to the RLDC documents for the exact listing):

- All transmission lines of 400 kV and above
- All inter-state and inter-regional transmission lines irrespective of the voltage level.
- Generating units over and above a particular capacity.

The above process would start with the first time charging of a new transmission element and its integration in to the grid. A new transmission asset by any transmission licensee needs to be carefully integrated, observing all provisions of the CERC Regulations and CEA Standards. Regulation 5(2) of CERC (Terms and Conditions of Tariff) Regulations, 2014 further provides for certification of successful trial operation of new transmission assets by RLDC. In line with the above provisions, a procedure has been formulated to enable RLDCs to facilitate integration of a new transmission element. On the basis of this procedure, a successful trial operation certificate would also be issued to all ISTS Licensees covered under the CERC (Terms and Conditions of Tariff) Regulations, 2014. This procedure would also be followed for all dedicated transmission lines also. For new generators under the jurisdiction of RLDCs, additional requirements would be specified separately.

All concerned are requested to follow these procedures for the smooth operation of the All India electricity grid. RLDCs may circulate the procedure to all the State Transmission Utilities (STUs) and State Load Despatch Centres (SLDCs) in their region.

Thanking you,

Encl: as above

Yours faithfully,

(K V S Baba)
General Manager

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 MVA_r 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 B1**: 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

Voltage Level : AC/DC kV

Owner of the Transmission Asset :

Likely Date and time of Charging :

Likely Date and time of start of Trial Operation :

Place:

Date:

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

Encl: Please provide full details.

- Annexure A2** : Format IA: List of elements to be charged and Element Rating details
- 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
- Annexure A5**: Location of installation of Energy meters as per relevant CEA regulations
- Annexure A6**: Connection Agreement, if applicable along with all annexures

| Sr. No. | Scheme / approval details | Remarks |
|---------|--|---------|
| 1 | Details of approval of the transmission scheme from the standing committee/CTU | |
| 2 | Availability of the line reactor as per approved scheme | |
| 3 | Approval for the changes in the approved scheme, if/any | |

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 | |

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 | |
| 11 | No. of Phases/Make/Serial No. | |

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 | |
| 6 | No. of Phases/Make/Serial No. | |

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

Annexure A3

<Name of Transmission Licensee>

Name of the transmission element:

Copy of SLD to be provided

List of SCADA points to be made available as per standard requirement, RLDC would need all as mentioned below

<Name of Transmission Licensee>

Name of the transmission element:

- 1. MW and MVAr data.
- 2. voltage and frequency of all the buses.
- 3. all the breaker and isolator positions.
- 4. OLTC tap positions.
- 5. Main-1/Main-2 protection operated signals.

Place

Date :

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

Type and Location of Energy meters as per relevant CEA regulations

<Name of Transmission Licensee>

Name of the transmission element:

Location Details:

| Sr. No. | Name of Substation | Feeder Name | Make of Meter | Meter No. | CT Ratio | PT/CVT Ratio | Time in Meter | Time in GPS | Time Difference |
|---------|--------------------|-------------|---------------|-----------|----------|--------------|---------------|-------------|-----------------|
| 1 | Sending End | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 2 | Receiving End | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Place

Date :

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

Format II

<Name of RLDC>

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 incomplete 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

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 IIIA

Annexure B3 : Undertaking in respect of Telemetry and communication as per Format IIIB

Annexure B4: Undertaking in respect of Energy metering as per Format IIIC

Annexure B5: Undertaking in respect of Statutory clearances as per Format IIID

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 |
|--------|------------------------|------------------|
| | | |
| | | |
| | | |

Place:
Date:

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

Format IIIB

< 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)

Annexure B4

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).

Place:

Date:

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

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 and CEA standards/regulations including PTCC route approval for charging of
.....
have been obtained from the concerned authorities.

Place:

Date:

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

Format IV

Approval for charging and trial run

<Name of RLDC>

Approval no:

To,

The Transmission Licensee,

Sub: Charging and trial run of <Name of Transmission element>----Provisional approval

**Ref: 1) Your application dated in Format-I
2) RLDC response dated in Format-II
3) Your request and details forwarded on dated in Format III, IIIA, IIIB IIIC and IIID**

Madam/Sir,

- 1) The above documents have been examined by RLDC and permission for charging of <Name of Transmission element> on or after _____ is hereby accorded. This approval is provisional and in the intervening period, if any of the conditions given in the undertakings submitted by you are found to be violated, the approval stands cancelled. Kindly obtain a real time code from the appropriate RLDC for each element switching as well as commencement of trial operation.
- 2) The following shortcomings have been observed in the documents at S no 3) above.
 - a.
 - b.
 - c.

Please rectify the above shortcomings at the earliest to enable RLDC to issue the provisional approval for test charging, commissioning and trial operation of <Name of transmission element>.

Thanking you,

Yours faithfully,

(Name and designation of authorized personnel with seal)

Format-V

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.

<Name and Address of the Load Despatch Centre>**Certificate Number:****Date:****Certificate of completion of Trial Operation of Transmission Element**

Reference:

- i. Communication dated _____ from Transmission Licensee to RLDC in Format-I and IA.
- ii. Communication from RLDC dated _____ to Transmission Licensee in Format-II.
- iii. Communication from Transmission Licensee to RLDC dated _____ in Format III, IIIA, IIIB, IIIC and IIID.
- iv. Provisional approval dated _____ from RLDC to Transmission Licensee for charging in real time in Format-IV.
- v. Real time code issued by RLDC on _____
- vi. Communication dated _____ from Transmission Licensee in Format-V after trial operation.

Based on the above reference, it is hereby certified that the following Transmission element has successfully completed the trial operation:

| | |
|--|--|
| Name of the Transmission Asset: | |
| Owner of the Transmission Asset : | |
| Date and Time of Energization for commencement of successful trial run operation | |
| Date/time of completion of successful trial run operation | |

This certificate is being issued in accordance with Regulation 5 of CERC (Terms and Condition of Tariff) Regulations, 2014 to certify successful completion of trial operation of transmission element. Usage of this certificate for any other purpose is prohibited.

Signature

**Name and Designation of the
issuing Officer with official seal**

Place**Copy to:**

- I. Transmission System Owner
- II. Member Secretary, RPC
- III. Head, NLDC
- IV. Any other agency, if required