North Eastern Regional Power Committee

MINUTES OF THE SUB GROUP COMMITTEE MEETING OF NERPC

Date : 13/07/2015 (Monday)
Time : 10:00 hrs
Venue : "Hotel Pragati Manor", Guwahati.

The List of Participants in the Sub Group Meeting is attached at **Annexure – I**

Shri B. Lyngkhoi, Director/SE(O), NERPC welcomed all the participants to the Sub Group Committee meeting. He informed that as decided by the Sub-committee meetings of NERPC the Special Meeting to discuss the long pending and important issues had to be discussed and resolved. In view of above, this meeting has been arranged and requested all the constituents to actively participate for fruitful deliberation so that the same can be intimated to the Sub-committee meetings of NERPC.

A.1 Application to be submitted 10 (ten) days prior to anticipated date of first time charging/synchronization as per procedure:

During the 108th OCC meeting, the Sub-committee requested to intimate the Nodal Officer for above issue so that correspondence can be taken up with them directly. The name of Nodal Officer along with contact number is given below:

Constituent	Name of Nodal Officer	Contact No	Email id:
Ar. Pradesh	N. Perme, EE, SLDC	09436288643	sldcitnagar@gmail.com
Assam	B.C. Borah, DGM, LDC	09435119248	sldcaseb@rediffmail.com
Manipur	L. Haokip, Manager	08575004401	l.haokip@mspdcl.com
Mizoram	Vanlalrema, SE, SLDC	09436140353	sldc_mizoram@rediffmail.com
Meghalaya	F.E. Kharshiing, SE, SLDC	09612170657	sldc.shg@gmail.com
	H.F. Shangpliang, EE, MRT	09863315562	hector_fd@rediffmail.com
Nagaland	Atoho Jakhalu, EE, SLDC	09436002696	atoho.jk@gmail.com
Tripura	Mrinal Pal, Manager	09436137022	mrinalpaulnit@gmail.com

NEEPCO	Bhaskar Goswami, Sr. Mgr	09436163983	pbhaskargoswami@yahoo.com
NHPC	R.C. Singh, Manager	09436894889	rcsloktak@yahoo.com
NERTS	Supriya Paul, Dy. Mgr.	09436302995	nerts_os@yahoo.in
	Deep Bhaumick, Engineer	09436335255	-do-
OTPC	Narendra Gupta, Manager	09774233426	nk.gupta@otpcindia.in
NTPC	J. Bhattacharyya, AGM(EMD)	09435720036	jayanbhattacharjee@ntpc.co.in
	G. K. Kundu, AGM(EEMG)	09401826314	

During 34th PCC & 110th OCC Meetings, the Sub-committee requested NERPC to conduct a Sub-group meeting alongwith all the above Nodal Officers for smooth co-ordination in future.

i) NERLDC informed that in some cases, the applications are being submitted by concerned utilities just prior to the anticipated date of charging.

(Example => The application regarding test charging of 220 kV Mariani (PG) – Mokokchung (PG) I & II lines alongwith associated bays at Mariani and Mokokchung for 31.03.2015 from 1600 Hrs was forwarded vide letter dated. 30.03.2015 and was received at NERLDC on 31.03.2015 itself)

ii) In some cases, original applications along with undertakings are not submitted by concerned utilities and sometimes not signed by nodal officer.

(Example => Original documents of application regarding test charging of LILO of one circuit of 132 kV Khandong – Haflong line at Umrangso 132/33 kV, 16 MVA and 25 MVA transformers at Umrangso and 132 kV Main I and Transfer bus(s) at Umrangso were not sent to NERLDC)

iii)The applications are not being addressed to concerned person of NERLDC in many cases. SOII Deptt of NERLDC is dealing with this matter.

(Example =>The application regarding test charging of 220/132 kV, 200 MVA ICT-II at Bishwanath Chariali (PG) was initially sent to NERLDC with crossed envelope. The same was again forwarded later on vide letter dated. 27.05.15 from DGM (AM), NERTS, but the application was still dated for test charging on 18.05.15 at 1200 Hrs.)

iv) Some of the undertakings submitted by concerned utilities (Transmission licensee as well Generators) for first time synchronization of unit or charging/trial operation of new transmission elements are not satisfying the requirement at the time of synchronization/charging (like telemetering issues, inter-face meters etc.)

v) The list of elements to be Charged and Element Rating details are not marked properly in many applications.

(Example => In the application regarding test charging of 132 kV Bishwanth Chariali (PG) – Biswanath Chariali (AEGCL) I & II lines sent to NERLDC vide letter dtd. 19.03.2015, there was no mention of charging of 132 kV bays at Biswanth Chariali (PG) and Biswanath Chariali (AEGCL) and no information submitted pertaining to these bays.)

vi) The Single Line Diagram is not being furnished alongwith application in many cases. Further, it is required that the SLD furnished should indicate clearly the elements which are to be charged as per the application. But the SLDs furnished in many cases do not have desired clarity or elements to be charged are not marked properly.

(Example => In the Application regarding test charging of 220 kV Mariani (PG) – Mokokchung (PG) I & II lines alongwith associated bays at Mariani and Mokokchung for 31.03.2015 from 1600 Hrs, only the SLD for Mokokchung (PG) substation was enclosed in A4 size. The SLD for Mariani (PG) was sent later vide letter dated 31.03.2015 in A4 size only. Both the SLDs did not have desired clarity, and marking of elements proposed to be test charged were not clearly indicated)

vii) The statuses of completion of each Dia/Bus/Breakers etc., are not being indicated along with the application in most cases.

viii) List of SCADA points needed to be made available at NERLDC is not indicated in many cases, and Regional Entities are furnishing blank or incomplete formats.

ix) Also, in several cases, though the SCADA points are indicated, at the time of synchronization or charging of the element, the data from SCADA is actually not available.

x) Field-RLDC data validation of Analog (MW, MVAR etc) and Digital data (CB, Isolator status, etc.) are to be done prior to the charging of element.

xi) Snapshot of the Analog and Digital status for the said elements are to be furnished alongwith the application.

xii) If the status of Digital and Analog data found suspect / replaced, charging permission may not be issued from NERLDC.

xiii) If any abnormality found post charging of the element, it should be rectified immediately by the respective utility. Otherwise provisional approval may stand cancelled.

xiv) A compliance report indicating that Voice communication is in place should be enclosed alongwith the application.

(Example => In the application regarding test charging of 220/132 kV, 200 MVA ICT-II at Biswanath Chariali (PG) substation submitted to NERLDC vide letter dated. 27.05.2015, a completely blank format regarding SCADA related issues was forwarded alongwith the application.

In case of drawal of start-up power by BgTPP, NTPC, SCADA data was not reported for long period.

In the application regarding test charging of 132 kV Biswanth Chariali (PG) – Biswanath Chariali (AEGCL) I & II lines sent to NERLDC vide letter dated 19.03.2015, it was marked that PLCC / RTU were yet to be installed.)

xv) The type and location of SEMs are to be marked in accordance with CEA regulations.

xvi) In many cases, blank or incomplete formats are being sent.

xvii) Also, in cases where requisite information as per format is furnished, it is seen in real time that meters were actually not in place and not able to record the readings at the time of 1st time charging or synchronisation

xviii) Alongwith the undertaking, the report of testing of Special Energy Meters (SEMs) is to be enclosed.

(Example =>In the application regarding test charging of 220/132 kV, 200 MVA ICT-II at Bishwanath Chariali (PG) substation submitted to NERLDC vide letter dated 27.05.2015, a completely blank format regarding SEM related issues was forwarded alongwith the application.

In the application regarding test charging of 132 kV Bishwanth Chariali (PG) – Bishwanath Chariali (AEGCL) D/C lines sent to NERLDC vide letter dated 19.03.2015, it was marked that SEM meters were yet to be installed.)

In case of 400 kV Bongaigaon – New Siliguri III and IV lines of ENICL, several days after charging of the line, erratic readings were received.

xix) Entities are not furnishing the Connection agreement alongwith all Annexure along with the Application for synchronization

(Example => In the application regarding test charging of LILO of one circuit of 132 kV Khandong – Haflong line at Umrangso 132/33 kV, 16 MVA and 25 MVA transformers at Umrangso and 132 kV Main I and Transfer bus(s) at Umrangso the connection agreement with ISTS was not enclosed alongwith application.)

xx) The undertaking by Transmission licensee in respect of Protective systems is also to be furnished as per format specified in procedure.\

xxi) It has been noted that while utilities may have furnished the said undertaking, in real-time the lines could not hold while charging for the 1st time and tripped immediately after charging. Also, after a second attempt of charging, SOTF relay indication was found indicating that fault was persisting in the line.

xxii) Alongwith the undertaking, a report of testing of protection systems indicating their healthiness is to be enclosed.

xxiii) Annexure A4 is being marked same as Annexure B3 and not being furnished in original in most cases

xxiv) Annexure A5 is being marked same as Annexure B4 and not being furnished in original in most cases

xxv) The undertaking in respect of statutory clearances is not being furnished alongwith applications in some cases.

(Example =>In the application regarding test charging of 220/132 kV, 200 MVA ICT-II at Bishwanath Chariali (PG) substation submitted to NERLDC vide letter dated 27.05.2015, the undertaking regarding Statutory clearances was not provided.)

xxvi) The Charging instructions from CTU are not being furnished in many cases

(Example =>In the application regarding test charging of 220/132 kV, 200 MVA ICT-II at Bishwanath Chariali (PG) substation submitted vide letter dated 27.05.2015, the charging instructions from CTU was not provided.)

xxvii) Technical parameters of the transmission element required for modelling are not being furnished in many cases

(Example => In the application regarding test charging of 220/132 kV, 200 MVA ICT-II at Bishwanath Chariali (PG) substation submitted to NERLDC vide letter dated 27.05.2015, the technical parameters of the line required for modelling were not provided.)

xxviii) The information regarding availability of Line Reactors & Approval for changes in the approved scheme are not being indicated properly in many cases

xxix) In case of new generating units that are to be synchronized to the Grid, the complete set of Technical data as furnished to CTU as part of the connection agreement with CTU is to be submitted for the purpose of modelling. Besides those, it will be required to furnish data required for modelling of Unit, Exciter, Governor, Excitation Limiters, PSS and the Capability curve & V-curves of units.

Deliberation of the Sub-Committee

NERLDC gave a presentation on various formats relating to procedure to be complied by the constituents before first time charging/synchronization of new elements to the grid. As per presentation it is clearly indicated that 10 (ten) days prior to charging they should submit the data to NERLDC / appropriate LDC.

DGM (SO-II), NERLDC stressed upon availability of protection systems in place as per regulations, availability of telemetry (SCADA data) as well as dedicated voice communication at NERLDC/concerned SLDCs prior to 1st time charging of elements. The availability of SEM meters also need to be ensured in order to ensure proper accounting (Active / Reactive). It was also stated that undertakings furnished by utilities in respect of Protective systems, SEM meters, SCADA data should be duly signed by competent authority and sent in Original as per Formats at Annexure – A.1 and to be strictly complied with.

The various formats are attached at **Annexure – A.1.**

NERLDC stated that the formats being sent should be accompanied with Charging Instructions from CTU and Single Line Diagram of associated substations where bays are to be charged; clearly indicating the portion intended to be charged. It was also stated that the SLDs should be furnished in A3 size with good print quality so as to enable the power system operator with requisite information.

The Sub-committee also requested NERPC/NERLDC to prepare the SLDs as per their requirement and converted into Auto CAD for future reference. Once the SLDs are converted to the required size, NERPC/NERLDC will forward to the concerned agency to indicate all the parameters in the SLDs and signed by the competent authority and mail back to NERPC/NERLDC accordingly.

After detailed deliberation, the Sub-committee agreed to follow strictly the procedure prepared by NERLDC by all the constituents, otherwise, no charging/synchronization will be allowed to connect to the grid.

The Sub-committee noted as above.

Action: All Utilities

A.2 Request for successful trial operation certificate:

NERLDC requested that while applying for the Trial Operation certificate after completion of successful trial run, the following are required to be furnished:

1) Values of concerned line flows and local voltages from SCADA just before and after charging of the element.
2) SEM readings viz. outputs corresponding to the trial run
3) Output of Disturbance Recorders / Event Loggers to indicate the trial run operations.

Further, it is seen that in many cases, these data are not being furnished.

Also, outputs of Disturbance Recorders must be in COMTRADE formats only.

Deliberation of the Sub-Committee

NERLDC highlighted the format on this regard and the same is enclosed at **Annexure – 2.**

The Sub-committee suggested that trial run for duration of 24 hours for transmission lines and 72 hours for generators is mandatory and they agreed to submit the application stating successful trial run within 24 hours of their completion**,** along-with outputs of Event Loggers & Disturbance Recorders, SEM meters and Sequence of Events in order to enable NERLDC / appropriate LDC to verify the timings stated by applicant utility. Failing these, there would be unnecessary delay in issuing Trial Operation Certificate by LDCs.

The Sub-committee noted as above.

Action: All Utilities

A.3 Implementation of 3-phase Auto Reclosure Scheme in all lines associated with Khandong and Kopili HEP:

For reliable operation of Power system it is required to implement 3-Phase Auto Reclosure Scheme in all the 132kV lines associated with Kopili and Khandong HEP of NEEPCO. The lists of such lines are:

a) 132kV Khandong – Umrangso - Halflong
b) 132kV Kopili – Khandong #1

During 34th PCC meeting, DGM (AM), NERTS informed that approval for shifting of PLCC Panels has already been given to AEGCL by POWERGRID for establishment of Khandong-Umrangso-Haflong Link necessary implementation of Auto Reclose Scheme but, the same has not yet been done by AEGCL.

AGM, AEGCL informed that he will take up the matter with their site engineer and find out the exact position. Further, he informed that PLCC is not in place on above line. Also he informed that the existing panel will be shifted from Halflong end and put it in Umrangso end. Regarding Kopili end, he mentioned that bays belong to NEEPCO and requested them to intimate the status on this matter.

Sr. Manager, NEEPCO also informed that the scheme at Khandong end of NEEPCO is ready and requested Assam to comply the same at their Umrangso end.

DGM (AM) stated that without PLCC, the AR Scheme cannot be implemented and requested Assam to ensure that all equipments should be made available to implement the scheme at the earliest.

After detailed deliberation, the sub-committee requested NERPC to conduct a special meeting along with other issues so that the matter can be resolved at the earliest. The Sub-committee also suggested that representative from Communication wing of Assam has to attend the above meeting. NERPC agreed to host the above meeting soon and the date will be intimated soon.

Deliberation of the Sub-Committee

After detailed deliberation, it was agreed that joint inspection comprising of POWERGRID, NEEPCO and Assam will be carried out on 03.08.2015 and to complete the implementation of above scheme in 132kV Khandong – Umrangso – Halflong line**.**

The Sub-committee noted as above.

Action: Assam, POWERGRID & NEEPCO

A.4 Major Oscillations in NER:

DGM (SO-II), NERLDC informed that during the month of May, 2015, there were persistent Low Frequency Oscillations (LFOs) in NER Grid which led to tripping of some generators in the Southern part of NER Grid around Khliehriat (Meghalaya) system.

The oscillations occurred from 03:38:56.080 Hrs to 03:41:37.040 Hrs (around 3 minutes) and from around 03:42:33.440 Hrs to around 03:45:24.480 Hrs (around 3 minutes) on 29.05.15, & from around 22:56:30 Hrs to 22:58:15 Hrs on 31st May 2015.

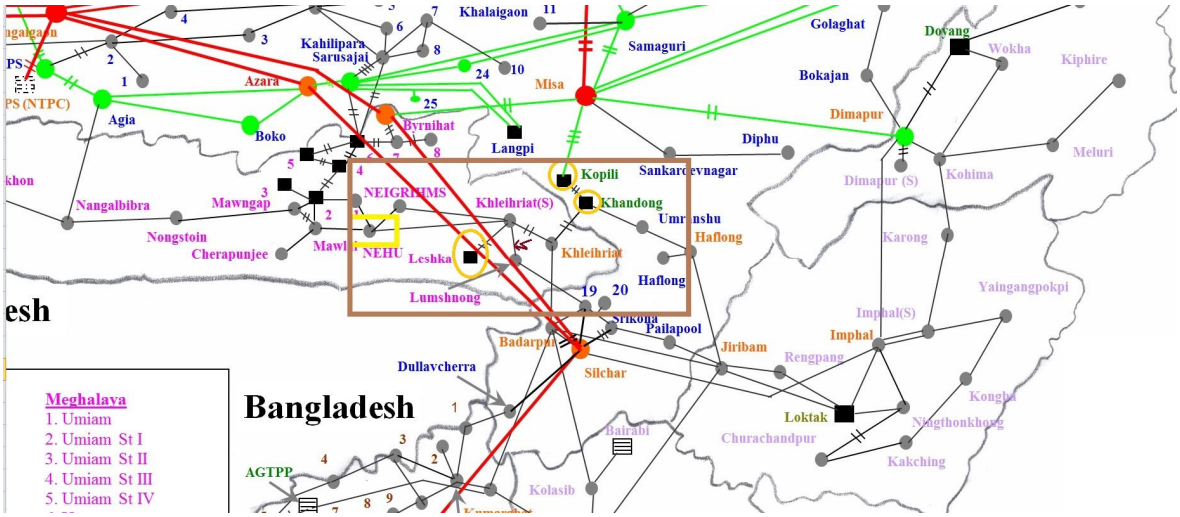
In both the incidents, Low Frequency Modes in the system around 1.2 Hz and it's 2nd Harmonic mode around 2.4 Hz was observed in the system, and the modes have Poor / Negative damping.

In the 29th May incident, the oscillations started after fault in Meghalaya system leading to tripping of 132 kV Khliehriat – Lumshnong line followed by oscillations in Leshka HEP of MePGCL and Khandong HEP of NEEPCO. There was tripping of Leshka units and Khandong units due to jerk in the system. The oscillations later continued between units of Kopili HEP and Kopili St-II HEP.

In the 31st May incident, the oscillations started again after fault in Meghalaya system leading to tripping of 132 kV Khliehriat (PG) – Khliehriat (MePTCL) I & II

lines followed by oscillations in Leshka HPP of MePGCL and Khandong HEP of NEEPCO. There was tripping of Leshka units, Umiam St IV units and Khandong unit due to jerk in the system. The oscillations later continued between units of Kopili HEP and Kopili St-II HEP.

The Zone of oscillations in NER Grid is indicated below:



Oscillations were more prominent in Active power/ Frequency than in Voltage. It thus suggests a lack of system stability as a whole. To address this issue, PSS (Power System Stabilizers) may be installed in Myndtu Leshka Power Station to enhance stability of the system.

During 34th PCC meeting, DGM (SO-II), NERLDC gave presentation on occurrences of Low Frequency Oscillation (LFO) due to tripping of some elements in Southern part of NER Grid. It was shown that LFO was persisted longer duration due to poor/negative damping characteristics and machines of Khandong & Leshka tripped. They expressed the seriousness of these oscillations as longer duration of oscillation may trip larger size machine and as a result wide spread disturbance may occur due to this type of incidence. They requested to the sub-committee to take the matter to the concerned authority.

After detailed deliberation, the sub-committee requested NERPC to conduct a special meeting on above issue and directed that all concerned person from Distribution, Generation & Transmission wings to attend the meeting and to analyze the exact cause of oscillation. NERPC agreed and inform that meeting will be convened soon and the date will be intimated shortly.

Deliberation of the Sub-Committee

DGM (SO-II), NERLDC stated that the instances of oscillations at Leshka and nearby generators are being observed in case of delayed fault clearing in Meghalaya system, and requested MePTCL to look into the matter to ensure fault clearing as per CEA's Grid Standards Regulations. Further, the trigger point of oscillations needs to be ascertained and addressed to prevent undesired trippings in the Grid. Myndtu Leshka (MePGCL) generators and nearby Khandong, Kopili Stg-II, Kopili generators of NEEPCO have been seen to participated most in oscillations and could be on account of issues with governor response of these generators besides others.

After detailed deliberation, the Sub-committee requested NERPC to fix the suitable date at the earliest to discuss and analyzes the root cause of oscillation and also the issue of telemetry and voice communication in respect of Leshka HEP. The Sub-committee suggested that representative from NERPC, NERLDC, POWERGRID, NEEPCO, Meghalaya (Transmission & Leshka HEP) and manufacturers, if required, should attend the above meeting.

NERPC will intimate the date of the above meeting shortly.

The Sub-committee noted as above.

Action: NERPC

A.5 Implementation of the recommendations of the Protection Audit

During 32nd PCC meeting, the sub-committee had also requested NERPC to hold the special meeting to finalize the standard scheduling of O&M comprising of NERLDC, NERTS, NERPC, NEEPCO, Assam & Meghalaya etc., at the earliest so that the best O&M practices can be evolved in the region.

During 34th PCC meeting, SE(O) NERPC informed that since there were other issues to be discussed along with above agenda, the meeting could not be held in May, 2015. The above meeting as suggested by the Sub-committee will be conducted soon by NERPC.

Deliberation of the Sub-Committee

The latest status as furnished by NERLDC during the meeting is given below:

The matter was discussed in detailed during the meeting and it was decided to refer to 35th PCC to request the remaining constituents to furnish the data.

Status of submission of data related to Third Party Protection Audit			
Name of Constituent	***As per format of Task Force***	***As per format of NERPC***	***Remarks***
DoP, Ar. Pradesh	*Not submitted*	*Not submitted*	
AEGCL	*Yes (only checklist submitted)*	*Not submitted*	*Details of Protection not submitted*
MSPCL	*Not submitted*	*Not submitted*	
MePTCL	*Not submitted*	*Yes (Khliehriat, Mawphlang, EPIP I, Mawlai, NEHU, NEIGRIHMS, Ronkhon, Sohra, EPIP II, Lumshnong, Nangalbibra, Nongstoin & Umiam)*	*Leshka, Umiam Stg I, Umiam Stg II, Umiam Stg III, Umiam Stg IV ,Umtru not submitted. Private owned S/S not submitted.*
P&E Dept. Mizoram	*Not submitted*	*Not submitted*	
DoP, Nagaland	*submitted*	*Yes (Kohima,Wokha, Meluri,Kiphire, Dimapur, Mokokchung)*	
TSECL	*Not submitted*	*Not submitted*	
POWERGRID	*submitted*	*submitted*	
NEEPCO	*Not submitted*	*Yes (Khandong & Kopili)*	*Ranganadi, Doyang, AGBPP, AGTPP not submitted*
NTPC	*Not submitted*	*Not submitted*	
NHPC	*Not submitted*	*Not submitted*	
OTPC	*Yes*	*Not submitted*	

After detailed deliberation, the Sub-committee had decided that above information should be sent by all the utilities to NERLDC/NERPDC latest **by 24.07.2015**. All constituents agreed.

The Sub-committee noted as above.

Action: All remaining utilities as above.

The meeting ended with thanks to the Chair.

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Annexure-I

List of Participants in the Sub-Group Committee Meeting held on 13/07/2015

SN	Name & Designation	Organization	Contact No.
	No Representatives	**Ar. Pradesh**	09436288643
1.	Sh. J.K. Baishya, AGM	Assam	09435041494
2.	Sh. S.C. Singh, S.GM, MSPCL	Manipur	09862296029
3.	Sh. H.F. Shangpliang, EE (SP)	Meghalaya	09863315562
4.	Sh. B. Narry, AEE	Meghalaya	09089000911
	No Representatives	**Mizoram**	
	No Representatives	**Nagaland**	
	No Representatives	**Tripura**	
5.	Sh. P. Kanungo, DGM (AM)	PGCIL	09436302823
6.	Sh. S.C. De, CM (SCADA)	NERLDC	09436335369
7.	Sh. R. Chakrabarti, Sr. Engineer (SO-II)	NERLDC	09402507543
8.	Sh. J. Bhattacharyya, AGM (O&M)	NTPC	09435720036
	No Representatives	**ENICL**	
9.	Sh. S. Medhi, Dy. Manager (E)	NHPC	09435534564
	No Representatives	**OTPC**	
10.	Sh. B. Lyngkhoi, Director/S.E (O)	NERPC	09436163419
11.	Sh. S.M. Jha, E.E	NERPC	08731845175
12.	Sh. S. Mukherjee, AEE	NERPC	08794277306
13.	Sh. Shaishav Ranjan, A.E	NERPC	08794276168

ANNEXURE-A.1 (I)

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	Listofelementstobecharged and ElementRating details	As per Format I A
Annexure A3	Singlelinediagramoftheconcernedsubstations,alongwithstatusof completionofeachdia/bus/breakers	
Annexure A4	List of SCADA points to be made available (as per standard requirement, RLDCwouldneed allMW andMVAr data,voltage andfrequencyof all the buses, all thebreaker and isolatorpositions,OLTC tappositions, Main-1/Main-2 protection operatedsignals)	
Annexure A5	Type and LocationofEnergymetersasperrelevantCEAregulations	
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	UndertakinginrespectofEnergymetering	As per FormatIIIC
Annexure B5	Undertaking in respect of Statutory clearances	As per Format III D

Annexure A1

FormatI

IntimationbyTransmissionLicenseeregardinganticipatedchargingofnewelements

<NameofTransmissionLicensee>

Nameofthetransmissionelement :

TypeofTransmissionElement :TransmissionLine/ICT/BusReactor/LineReactor/Bus/ Bay/SeriesCapacitor/SeriesReactor

VoltageLevel : AC/DC kV

OwneroftheTransmissionAsset :

LikelyDateand time ofCharging :LikelyDate

and time of startofTrialOperation :

Place:

Date:

(NameandDesignationoftheauthorizedpersonwithofficialseal)

Encl: Pleaseprovidefulldetails.

☐ **Annexure A2 :**Format IA:Listofelementstobecharged and ElementRating details

☐ **Annexure A3 :**Singlelinediagramoftheconcernedsubstations,alongwithstatusofcompletion of eachdia/bus/breakers

☐ **Annexure A4:** ListofSCADApointstobemadeavailable

☐ **Annexure A5:** LocationofinstallationofEnergymetersasperrelevantCEAregulations

☐ **Annexure A6:** ConnectionAgreement,ifapplicablealong with all annexures

Annexure A2

FormatIA

List of elements to be charged and Element Rating details

I. List of Elements to be charged:

II. Element Ratings

a. Transmission Line

1	FromSubstation	
2	ToSubstation	
3	Voltage Level (kV)	
4	LineLength(km)	
5	ConductorType	
6	Noofsub Conductors	

b. **ICT**

1	Voltage(HVkV/LVkV)	
2	Capacity(MVA)	
3	TransformerVectorgroup	
4	Totalnooftaps	
5	NominalTapPosition	
6	PresentTapPosition	
9	Tertiary Winding Rating and Ratio	
10	% Impedance	

c. **Shunt/SeriesReactor**

1	SubstationName/ LineName	
2	Voltage	
3	MVARRating	
4	Switchable / Non Switchable	
5	In case of Bus Reactor, whether it can be taken as line reactor	

(NameandDesignationoftheauthorizedpersonwithofficialseal)

FormatII

<NameofRLDC>Acknowledgement

ofReceiptbyRLDC

Thisistoacknowledgethattheintimationoflikelychargingof(Nameofthetransmissionelement) hasbeenreceivedfrom(Nameoftheownerofthetransmissionasset)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

Theintimationisincompleteandthefollowinginformationmaybesubmittedwithinthree(3)days ofissueofthisacknowledgmentreceipt.

1. -
2. _____
3. _____

……..

Date

Signature

Name:

Designation:

RLDC

Annexure B1

FormatIII

<NameofTransmissionLicensee>

RequestbyTransmissionLicenseefor first time charging and startofTrialOperation

Pastreferences:

:Nameofthetransmissionelement :

TypeofTransmissionElement :TransmissionLine/ICT/BusReactor/Line Reactor/Bus/ Bay

VoltageLevel :

OwneroftheTransmissionAsset :

ProposedDateandtimeof firsttimeCharging :

ProposedDateandtimeofTrialOperation :

Place:

Date:

(NameandDesignationoftheauthorizedpersonwithofficialseal)

Encl:

Annexure B2:UndertakinginrespectofProtectivesystems as per FormatIIIA

Annexure B3 : UndertakinginrespectofTelemetryandcommunication as per FormatIIIB

Annexure B4: UndertakinginrespectofEnergymetering as per FormatIIIC

Annexure B5: UndertakinginrespectofStatutoryclearances as per FormatIIID

Annexure B2

Format IIIA

< Name and Address of Transmission Licensee>

UndertakingbyTransmissionLicenseeinrespectofProtectivesystems

The followingtransmission element isproposed tobecharged on _____<date>tentatively around ____ hours.
SnoandNameoftransmissionelement

1.0 ItiscertifiedthatAll thesystemsasstipulated inPart-IIIoftheCentralElectricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 (as amended from time to time) have been tested and commissionedandwouldbeinpositionwhentheelementistakenintoservice.

2.0 The protective relay settings have been done as per the guidelines of the Regional Power Committee (RPC)aspersection 5.2loftheIndian Electricity GridCode(IEGC). Thenecessary changeshavealsobeenmade/would be made appropriatelyforthefollowinglinesatthefollowingsubstations:

SlNo:	Nameofthesubstation	Name of the line

Place:
Date:

(NameandDesignationoftheauthorizedpersonwithofficialseal)

Annexure B3

Format IIIB

< Name and Address of Transmission Licensee>

UndertakingbyTransmissionLicenseeinrespectofTelemetryandcommunication

The followingtransmission element isproposed tobecharged on _____<date>tentatively around ____ hours.

SnoandNameoftransmissionelement:

ThelistofdatapointsthatwouldbemadeavailabletoRLDCinrealtimehadbeenindicatedvide communication dated_.Itiscertifiedthatthefollowingdatapointshavebeenmapped andrealtimedatawouldflowtoRLDCimmediatelyastheelementischargedandcommissioned.

S no	**Name of substation**	**Data point (analog as well as digital) identified in earlier Communicationdated**	**Point to point checking done jointly with RLDC (Y/N)**	**Data would be availableat RLDC (Y/N)**	**Remarks (path may be specified)**
1	Sendingend	Analog			
		Digital			
		SoE			
		Main Channel			
		Standby Channel			
		Voice Communication (Specify:)			
2	Receivingend	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. Thearrangementsareofpermanentnature.Incaseofanyinterruptionindatainrealtime, theundersignedundertakestogetthesamerestoredattheearliest.

Place:

Date:

(NameandDesignationoftheauthorizedpersonwithofficialseal)

Annexure B4

Format IIIC

< Name and Address of Transmission Licensee>

UndertakingbyTransmissionLicenseeinrespectofEnergymetering

The followingtransmission element isproposed tobecharged on _____<date>tentatively around ____ hours.

SnoandNameoftransmissionelement:

SpecialEnergyMeters(SEMs)conformingtoCEA(InstallationandOperationofMeters)Regulations, 2006havebeeninstalledandcommissioned. The SEMs are calibrated in compliance of regulation 9 of Part-I of CEA (Technical Standard for Grid Connectivity) Regulations 2007 asperthefollowingdetails:

S no	**Name of substation**	**Feedername**	**Makeofmeter**	**Meter no**	**CT Ratio**	**PT/CVT Ratio**
1	Sendingend					
2	Receiving end					

Data Format Conformity: Yes / No
Polarity as per Convention: Yes / No
Time Drift Correction carried out: Yes/No

ThedatafromtheabovemeterswouldbeforwardedonweeklybasistotheRLDCaspersection 6.4.21oftheIndianElectricity GridCode(IEGC)(as amended from time to time)andalsoasandwhenrequested bytheRLDC.

(RLDCtoindicatetheemailidswherethedatahastobeforwarded).

Place:
Date:

(NameandDesignationoftheauthorizedpersonwithofficialseal)

Annexure B5

Format III D

< Name and Address of Transmission Licensee>

Undertakingbytransmissionlicenseeinrespectofstatutoryclearances

ItisherebycertifiedthatallstatutoryclearancesinaccordancewithrelevantCERCRegulationsand CEAstandards/regulationsforchargingofhavebeenobtainedfrom theconcernedauthorities.

Place:
Date:

(NameandDesignationoftheauthorizedpersonwithofficialseal)

ANNEXURE-A.1 (II)

Format I

IntimationbyUtilityregardinganticipatedsynchronisationofnewunits

<NameofUtility>

NameoftheGenerating Station :

Unit Number :

VoltageLevel : AC/DC kV

OwneroftheGenerating Unit :

LikelyDateand time ofSynchronisation :

LikelyCOD :

Place :

Date :

(NameandDesignationoftheauthorizedpersonwithofficialseal)

Format II

< Name and Address of Utility>

UndertakingbyUtilityinrespectofProtection and Control systems

The followinggenerating elementisproposed tobesynchronisedon _____ <date>tentativelyaround _____ hours.

Sl. NoandNameofGenerating Units

1.0 Itiscertifiedthatall thesystemsasstipulated inPart-IIoftheCentralElectricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 (as amended from time to time) have been tested and commissionedandwouldbeinpositionwhentheelementistakenintoservice.

2.0 The protective relay settings have been done as per the guidelines of the Regional Power Committee (RPC)aspersection 5.2loftheIndian Electricity GridCode(IEGC). Thenecessary changeshavealsobeenmade/would be made appropriatelyforthefollowingunitsatthefollowingpower stations:

SlNo	NameofthePower Station	Unit Number
1		
2		
3		
4		
5		
6		

Place :

Date :

(NameandDesignationoftheauthorizedpersonwithofficialseal)

Format III

< Name and Address of Utility>

UndertakingbyUtilityinrespectofTelemetryandCommunication

The following generating elementisproposed tobesynchronisedon _____ <date>tentativelyaround _____ hours.

Sl.noandNameofGenerating Units:

ThelistofdatapointsthatwouldbemadeavailabletoRLDCinrealtimehadbeenindicatedvide communication
dated.ItiscertifiedthatthefollowingdatapointshavebeenmappedandrealtimedatawouldflowtoRLDCimmediatelyastheelementischargedandcommissioned.

Sl No	Name of Power Station	Data point (analog as well as digital) identified in earlier Communicationdated	Point to point checking done jointly with	Data would be availableat NERLDC (Y/N)	Remarks (path may be specified)
1	Sendingend	Analog			
		Digital			
		SoE			
		Main Channel			
		Standby Channel			
		Voice Communication (Specify:)			
2	Receivingend	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. Thearrangementsareofpermanentnature.Incaseofanyinterruptionindatainrealtime, theundersignedundertakestogetthesamerestoredattheearliest.

Place:
Date:

(NameandDesignationoftheauthorizedpersonwithofficialseal)

Format IV

< Name and Address of Utility>

UndertakingbyUtilityinrespectofEnergymetering

The following generating elementisproposed tobesynchronisedon _____ <date>tentativelyaround _____ hours.

Sl.noandNameofGenerating Units :

SpecialEnergyMeters(SEMs)conformingtoCEA(InstallationandOperationofMeters)Regulations,2006havebeeninstalledandcommissioned. The SEMs are calibrated in compliance of regulation 9 of Part-I of CEA (Technical Standard for Grid Connectivity) Regulations 2007 asperthefollowingdetails:

Sl No	Name of Power Station	Unit Number	Makeofmeter	Meter no	CT Ratio	PT/CVT Ratio
1	Sendingend					
2	Receiving end					

Data Format Conformity : Yes / No

Polarity as per Convention : Yes / No

Time Drift Correction carried out : Yes/No

ThedatafromtheabovemeterswouldbeforwardedonweeklybasistoNERLDCaspersection6.4.21oftheIndianElectricity GridCode(IEGC) (as amended from time to time)andalsoasandwhenrequested byNERLDC.

(NERLDCtoindicatetheemailidswherethedatahastobeforwarded).

Place :

Date :

(NameandDesignationoftheauthorizedpersonwithofficialseal)

Format V

< Name and Address of Utility>

UndertakingbyUtilityinrespectofstatutoryclearances

ItisherebycertifiedthatallstatutoryclearancesinaccordancewithrelevantCERCRegulationsa
nd CEAstandards/regulationsforsynchronisationofhavebeenobtainedfrom
theconcernedauthorities.

Place:

Date:

(NameandDesignationoftheauthorizedpersonwithofficialseal)

Format VI A

Technical Details

A :Rating ofGenerating Units

(Add additional sheets ifnumberof units aremore)

Sl No	Description	Unit – 1	Unit -2	Unit – 3
1	Unit Rating(MVA)			
2	Normal Max. Continuous Generation Capacityat Normal operatingtemperature(MW)			
3	Normal Max. Continuous Export Capacityat Normal operatingtemperature (MW)			
4	Maximum (Peaking) generatingCapacityat min ambient airtemperature(MW)			
5	Maximum (Peaking) Export Capacityat min ambient air temperature(MW)			
6	Minimum Continuous GeneratingCapacity(MW)			
7	Minimum Export GeneratingCapacity(MW)			
8	Normal Maximum LaggingMVAR atrated MW output			
9	Normal Maximum leadingMVAR atrated MW output			

Please attacha capabilityCurve : _____

Drawingno. ofthe Capability Diagram attachment

B : GeneratorData forFault (Short Circuit Studies)

All datato be provided on pu machine MVA base

Sl No	Description	Parameter	Value of Parameter
1	Direct Axis Transient Reactance (Unsaturated)	X_d'	
2	Sub-transient Reactance(Unsaturated)	X_d''	
3	Synchronous Reactance	X_s	
4	Zero PhaseSequenceReactance	X_0	
5	NegativePhaseSequenceReactance	X_2	

C :DynamicSimulation Data

All datato be provided on pu machine MVA base

Sl No	Description	Parameter	Value of Parameter
1	Direct Axis Positive PhaseSequenceSynchronous Reactance	X_d	
2	QuadratureAxis PositivePhaseSequenceSynchronousReactance	X_q	
3	Direct Axis TransientReactance (unsaturated)	X_d'	
4	QuadratureAxis Transient Reactance (unsaturated)	X_q'	
5	Sub-Transient Reactance(unsaturated)	X_d''	
6	ArmatureLeakageReactance	X_l	
7	Direct Axis Transient open circuit TimeConstant (Secs)	T_{do}'	
8	Direct Axis Sub-transient open circuit TimeConstant(Secs)	T_{do}''	
9	QuadratureAxis Transient open circuit TimeConstant(Secs)	T_{qo}'	
10	QuadratureAxis Subtransient open circuitTime Constant(Secs)	T_{qo}''	
11	Inertia ofcomplete turbo-generator (MWs/MVA)	H	
12	Pleaseprovide opencircuit magnetization curve enterdrawing numberhereor mention“assume” *if this not available thenPOWERGRID shall assumemagnetic saturation characteristics as per the**AnnexureI***		

D :Two Winding TransformerData

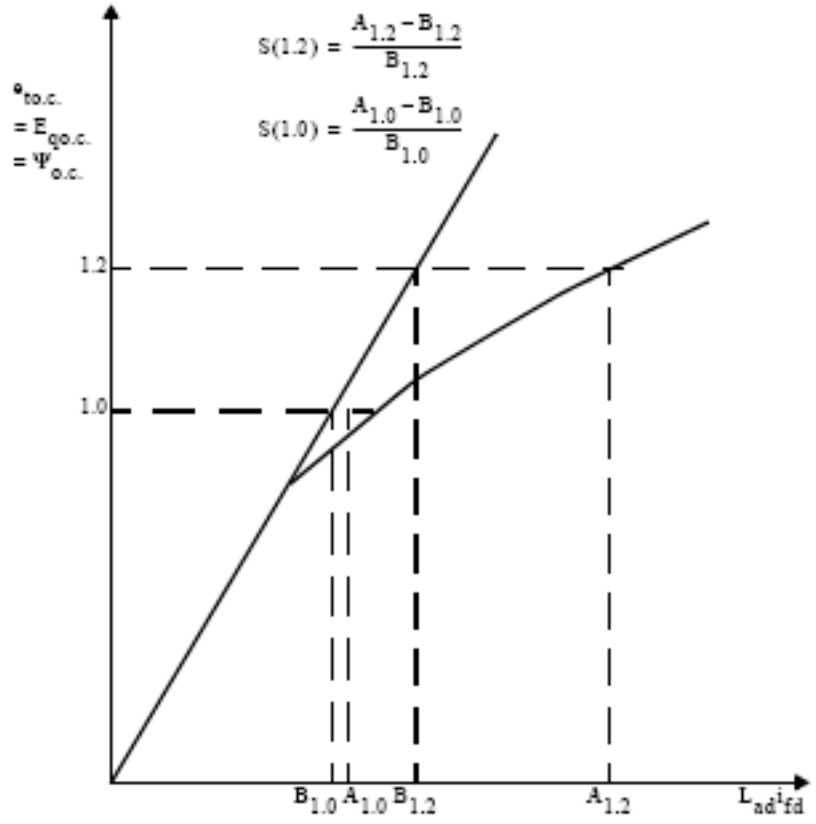
Sl No	Description	Value of Parameter
1	Transformer positivesequenceresistance(R_1%)	
2	Transformer positivesequencereactance (X_1%)	
3	Transformer zero sequence resistance (R_0%)	
4	Transformer zero sequence reactance(X_0%)	
5	Transformer Vectorgroup	
6	Natureof Tap Changer (on load/off load)	
7	Number ofsteps and stepsize	

E : ThreeWinding TransformerData

Sl No	Description	Value of Parameter
1	Transformer Vectorgroup	
2	Positive sequence resistance (R_1HL1%) betweenHV/LV1	
3	Positive sequence reactance (X_1HL1%)betweenHV/LV1	
4	Zero sequence resistance(R_0HL1%)between HV/LV1	
5	Zerosequence reactance(X_0HL1%)between HV/LV1	
6	Positive sequence resistance (R_1HL2%)betweenHV/LV2	
7	Positive sequence reactance (X_1HL2%)betweenHV/LV2	
8	Zero sequence resistance (R_0HL2%)between HV/LV2	
9	Zero sequence reactance(X_0HL2%)between HV/LV2	
10	Positive sequence resistance (R_1L1L2%) betweenLV1/LV2	
11	Positive sequence reactance (X_1L1L2%) betweenLV1/LV2	
12	zero sequence resistance(R_0L1L2%)betweenLV1/LV2	
13	zero sequence reactance(X_0L1L2%)betweenLV1/LV2	
14	Positive sequence resistance (R_1HL1//L2%)between HV/(LV1+LV2)	
15	Positive sequence reactance (X_1HL1//L2%) between HV/(LV1+LV2)	
16	Zero sequence resistance(R_0HL1//L2%)betweenHV/(LV1+LV2)	
17	Zero sequence reactance(X_0HL1//L2%)betweenHV/(LV1+LV2)	

AnnexureI

Open Circuit magnetizationcurve



Magneticsaturation datato be assumed S(1.0)=
S(1.2)=

Format VIB

ExcitationData

PleasesubmitLaplacedomaincontrolblockdiagramthatrepresentsthegeneratorexcitation systeminaccordancewiththeIEEEstandardexcitationmodelorasotherwiseagreedwith POWERGRID.Thiscontrolblockdiagramshouldcompletelyspecifyallthetimeconstantsand gainstofullyexplainthetransferfunctionfromthecompensatororgeneratorterminalvoltage andfieldcurrenttogeneratorvoltage.AlistofacceptableIEEEstandardexcitationmodel available with PSS/E simulation package is shownin**Annexure-II**.

Please fill/tick the appropriateboxbelow: Please assume
OR

Ifthe excitation data is not available at this stagethen POWERGRID shallassume exciter model givenat **Annexure-III** which represents a typicalexcitation model.

Assume themodel givenat**Annexure-III** as ourmodel

Annexure II

AcceptableIEEE standard excitationmodel available with PSS/E simulation packageused by POWERGRID

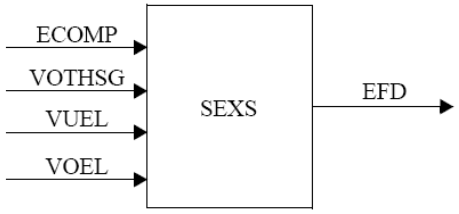
ExcitationSystem Models	
ESAC1A	1992IEEE typeAC1A excitation system model
ESAC2A	1992IEEE typeAC2A excitation system model
ESAC3A	1992IEEE type AC3A excitation system model
ESAC4A	1992IEEE typeAC4A excitation system model
ESAC5A	1992IEEE typeAC5A excitation system model
ESAC6A	1992IEEE typeAC6A excitation system model
ESAC8B	BaslerDECS model
ESDC1A	1992IEEE typeDC1A excitation systemmodel
ESDC2A	1992IEEE typeDC2A excitation system model
ESST1A	1992IEEE typeST1A excitation system model
ESST2A	1992IEEE typeST2A excitation system model
ESST3A	1992IEEE typeST3A excitation system model
EXAC1	1981IEEE typeAC1 excitation system model
EXAC1A	Modified typeAC1 excitation system model
EXAC2	1981IEEE typeAC2 excitation system model
EXAC3	1981IEEE typeAC3 excitation system model
EXAC4	1981IEEE typeAC4 excitation system model
EXBAS	Baslerstaticvoltageregulatorfeeding dcor ac rotatingexciter model
EXDC2	1981IEEE typeDC2 excitation system model
EXELI	Static PItransformer fedexcitation system model
EXPIC1	Proportional/integralexcitation system model
EXST1	1981IEEE typeST1 excitation system model
EXST2	1981IEEE typeST2 excitation system model
EXST2A	Modified 1981IEEEtypeST2 excitation systemmodel
EXST3	1981IEEE typeST3 excitation system model
IEEET1	1968IEEE type1 excitation system model
IEEET2	1968IEEE type2 excitation system model
IEEET3	1968IEEE type3 excitation system model
IEEET4	1968IEEE type4 excitation system model
IEEET5	Modified 1968IEEEtype4 excitation system model

ExcitationSystem Models	
IEEEX1	1979IEEE type1 excitation system model and 1981IEEE typeDC1 model
IEEEX2	1979IEEE type2excitation system model
IEEEX3	1979IEEE type3 excitation system model
IEEEX4	1979IEEE type4 excitation system, 1981IEEEtypeDC3 and 1992IEEE typeDC3A models
IEET1A	Modified 1968IEEEtype1 excitation system model
IEET1B	Modified 1968IEEEtype 1 excitation system model
IEET5A	Modified 1968IEEEtype4 excitation system model
IEEX2A	1979IEEE type2A excitation system model
SCRX	Bus or solid fed SCR bridgeexcitation system model
SEXS	Simplified excitationsystem model

Annexure III

SEXS – Simplified ExcitationSystemModel

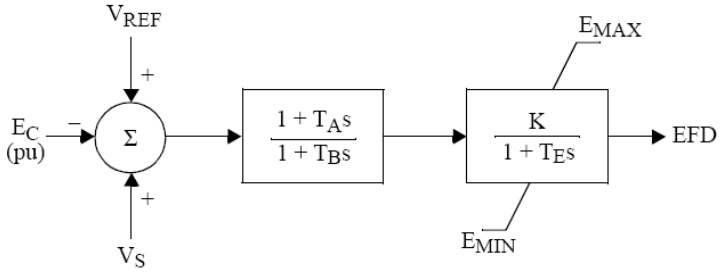
This model is located at system bus #_____ IBUS,
machine #_____ I.
This model uses CONs starting with #_____ J,
and STATEs starting with #_____ K.



CONs	#	Value	Description
J			T_A/T_B
J+1			T_B (>0) (sec)
J+2			K
J+3			T_E (sec)
J+4			E_{MIN} (pu on EFD base)
J+5			E_{MAX} (pu on EFD base)

STATEs	#	Description
K		First integrator
K+1		Second integrator

IBUS, 'SEXS', I, T_A/T_B, T_B, K, T_E, E_{MIN}, E_{MAX}/



V_S = VOTHSG + VUEL + VOEL

Format VII

Equipment to beprovided by applicant in theallocated bay meeting the technical standards as perCentral ElectricityAuthority(Technical StandardsforConnectivity to the Grid) Regulations, 2007

Sl. No.	NameofEquipments	Nos.	Ratings
1	Circuit Breaker		
2	Isolators		
3	Earth Switches		
4	CT		
5	CVT		
6	WaveTrap		
7	Etc.		
8			
9			

Systemrecording & SCADAEquipment to beprovided by theapplicant

Sl. No.	NameofEquipments	Nos.	Ratings
1	EventLogger		
2	Disturbancerecorder/Fault locator		
3	Data Acquisition System		
4	Communicationequipment		
5	Etc.		
6			
7			

ANNEXURE-A.2

Documents to be submitted by Transmission Licensee to RLDCs

Annexure	Subject	Remarks
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	SpecialEnergymeter(SEM)Readingforthetrial	
Annexure C4	OutputofDisturbanceRecorders/EventLoggers	

Annexure C1

Format-V

TransmissionLicenseerequestforissuanceofsuccessfultrialoperationcertificate

<Nameoftransmissionlicensee>

To,

<NameofRLDC>

Sub: Successfultrialoperationof<NameofTransmission element>---request forissue ofcertificate.

Ref: i)Ourapplicationdated inFormat-I
ii) Youracknowledgementdated inFormat-II
iii)Ourapplicationdated ---- inFormat-IIIalong withFormatIIIA,IIIBIIICandIIID
iv) Provisionalapprovaldated ---- issuedbyyouroffice. v) RealtimecodesfromRLDCon

Madam/Sir,

Referringtotheabovecorrespondence,thisistoinformyouthesuccessfulcharging andtrialoperationof<NameofTransmission element>from-----to-----(time&date). Pleasefindenclosedthefollowing:

1. AplotoftheMW/MVArpowerflowduringthe24hourtrialoperationbasedonthe substationSCADAisenclosedatAnnexure-B1.
2. TheEnergyMeterreadingshavealreadybeenmailedtoyourofficeon _____. The 15-minute time block wise readings for the trial operation period is enclosed at Annexure-B2
3. EventLoggerand Numerical Relay or Disturbance Recorder outputsatAnnexure-B3indicatingalltheswitchingoperationsrelatedto theelement.It is further to certify that the time synchronization of numerical relay, eventlogger and disturbance recorder has been established.

Itisrequestedthatacertificateofsuccessfultrialoperationmaykindlybeissuedat theearliest.

Thankingyou,

Yoursfaithfully,

( )

<NameandDesignationofauthorizedpersonwithofficialseal>

Encl:Annexure C2:PlotofMW/MVArflowduring24hourtrialoperation.
Annexure C3: Energy Meter
Annexure-C4: Reading NumericalrelayorDisturbanceRecorder(DR)output and EventLoggeroutput.