North Eastern Regional Power Committee

MINUTES OF THE 31st PROTECTION COORDINATION SUB-COMMITTEE MEETING OF NERPC

Date : 20/03/2015 (Friday)
Time : 10:00 hrs
Venue : "State Guest House", Agartala.

The List of Participants in the 31st PCC Meeting is attached at **Annexure – I**

Shri P.K. Mishra, Member Secretary, NERPC welcomed all the participants to the 31st PCC meeting. He thanked the team of NLDC for attending the Sub-committee meetings of NERPC and stated that their presence will guide the forum in many important issues to be discussed during the meeting especially the major rid incidence occurred on 23.02.2015. He requested the forum to discuss the incidence and formulate the recommendation so that such grid disturbance should not be repeated. He thanked Shri Debabrata Pal, Sr. Manager, TSECL, Shri Aroop Sarma, DGM, OTPC and their teams for making a comfortable stay in Tripura. He requested all the constituents to actively participate in this meeting for fruitful deliberation.

Thereafter, Member Secretary I/C requested Sh. B. Lyngkhoi, Director/SE(O) to take up the agenda items for discussion.

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 30th MEETING OF PROTECTION SUB-COMMITTEE OF NERPC.

The minutes of 30th meeting of Protection Sub-committee held on 23rd February, 2015 at Guwahati were circulated vide letter No. NERPC/SE (O)/PCC/2015/4520-4555 dated 5th March, 2015.

The Sub-Committee confirmed the minutes of 30th PCCM of NERPC as No observations or comments were received from the constituents

I T E M S F O R D I S C U S S I O N

A.1 <u>Implementation of 3-phase Auto Reclosure Scheme in all lines connected to Khandong and Kopili HEP</u>:

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

a) 132kV Khliehriat – Khandong # 1
b) 132kV Khliehriat – Khandong # 2
c) 132kV Haflong – Khandong
d) 132kV Kopili – Khandong # 1
e) 132kV Kopili – Khandong # 2

During 30th PCC meeting, Sr. Manager, NEEPCO informed that 3-phase auto-reclosure scheme in 132 kV Khiehriat – Khandong #1 has already implemented in February, 2015. However, the following lines are yet to be implemented:

a) 132kV Khandong – Haflong

b) 132kV Kopili – Khandong # 1

Further, he informed that many times they have requested Alsthom engineers to carry out the remaining lines but to no avail. He requested NERTS to extend possible assistance for successful implementation of the scheme.

DGM, NERTS stated that he will look into the matter and intimate to NEEPCO accordingly.

<u>Deliberation of the sub-Committee</u>

DGM, NERTS stated that due to Financial Year target the issue could not be taken up by them and stated that the matter can be taken up in April, 2015.

The sub-committee requested NERPC to convene the meeting in Shillong along with NERTS, NEEPCO & NERLDC to resolve the issue at the earliest.

A.2 Implementation of 3-Phase Auto Reclosure scheme of Radially fed 132kV Lines connected to Ranganadi HEP:

At present, the power flows to Nirjuli, Gohpur and Ziro radially from Ranganadi HEP and any transient fault in line causes undesirable outages. Hence, to avoid outages during transient fault it is essential to implement 3- Phase Dead Line charging of following 132kV Lines.

a) 132kV Ranganadi – Nirjuli Line (Dead Line Charging at RHEP)
b) 132kV Nirjuli – Gohpur Line (Dead Line Charging at Nirjuli)
c) 132kV Ranganadi – Ziro Line (Dead Line Charging at RHEP)

During 29th PCC meeting, DGM, NERTS informed that the work at 132 kV Nirjuli-Gohpur has already been completed.

Regarding 132 kV Ranganadi-Nirjuli & 132 kV Ranganadi- Ziro, NEEPCO informed that relay testing will be carried out by 15.02.2015 and the work is likely to be completed by February, 2015.

Sr. Manager, NEEPCO informed that AREVA engineers have visited the site but since Ar. Pradesh has not given permission for shutdown of above lines, the work could not be completed. Further, he stated that Ar. Pradesh should inform NEEPCO in advance so that they can tie up with AREVA to complete the remaining lines.

Deliberation of the sub-Committee

EE, SLDC, Ar. Pradesh informed that due to many VIP visit during the month of February, 2015, the shutdown could not be given by them. He requested NEEPCO to avail the shutdown any date after 10.04.2015

The sub-committee requested NEEPCO to take up the matter with Ar. Pradesh after 10.04.2015 so that SPAR on above lines can be completed.

A.3 Implementation of the recommendations of the Protection Audit:

As per Sl. no 9.1.1 & 9.1.4 of Report on Enquiry Committee on Grid Disturbance in Northern Region on 30th July 2012 and in Northern, Eastern & North-Eastern Region on 31st July 2012, thorough Third Party protection audit needs to be carried out periodically along with independent audit of Fault Recording Instruments.

Last Protection audit of NER was carried out w.e.f. November, 2012 to March, 2013. It is now required to carry out Third party protection audit along with independent audit of Fault Recording Instruments.

During 30th PCC meeting, SE(O), NERPC informed that check list for above protection has been prepared by NERPC & NERLDC separately. The same is enclosed at **Annexure – A.3 (I&II)** respectively.

DGM, NERTS stated that since both the format are prepared based on the suggestions given by Task Force, constituents can compare both the formats and see that only one format can be combined by taking due care as per task force suggestions.

GM, NERLDC stated that since the format has been given by the Task Force, it would not be prudent to deviate from it.

DGM, NERTS reiterated that there was no deviation from the format given by Task Force but it was rather an improvement of it as many parameters given in the format are not reflected/in-completed information.

SE(O) requested the constituents to give their opinion on the issue.

OTPC informed that the format given by Task Force is very simple and they have already filled up in all respect.

Assam, Ar. Pradesh, Meghalaya, Manipur felt that the format given by NERPC is containing more details and will help in the long run.

After detailed deliberation, the sub-committee requested NERPC to forward the format prepared by NERPC to Task Force/CEA to give their comments if the format prepared by NERPC is acceptable to them. In the meantime constituents should furnish the data in both the formats within 15 days time so that once the consent is received from Task Force/CEA the audit can be started at the earliest.

Deliberation of the sub-Committee

SE(O) informed that as decided in the 30th PCC meeting, NERPC has forwarded the **Annexure A.3 (I)** to Task Force, CEA and Member Secretary, Task Force vide mail dated 13.03.2015 has intimated as below:

"Your request has been examined by undersigned and the work towards preparing new format is appreciated. However, in order to maintain the uniform practice of the auditing by various audit groups, the audit format and the fault clearance check list provided by Ramakrishna Task Force may please be followed. The same is available at Section 8 and Section 9 of the report of the sub-committee under Task Force and the above report is available on CEA website (GM Div. under GO&D wing)

Further, in case it is felt by audit group that more information is required to be collected for sake of completeness of audit, the same may be collected as supplementary tables".

Deliberation of the sub-Committee

After detailed deliberation, the sub-committee requested all constituents to furnish the data as per check list of Task Force in Annexure – A.3 (II) within 15 (fifteen) days so that audit report can be sent to Task Force. Further, the data as per Annexure A-3 (I) may also be furnished as supplementary so that detail information can be kept ready for future reference.

The Sub-committee requested NERPC to forward the Annexure-A.3 (II) to constituents once again so that data should be furnished within 15 days.

A.4 Standardization of Disturbance Recorder Channels:

Disturbance Recorders on Transmission elements are necessary for post disturbance analysis, and identification & rectification of any protection mal-operation. As per CBIP's manual on Protection of Generators, GT, Transformers and Networks, it is recommended to have minimum 8(eight) analog signals and 16(sixteen) binary signals per bay or circuit. Also, it should have a minimum of 5 sec of total recording time, minimum pre-fault recording time of 100 msec and minimum post-fault recording time of 1000 msec.

As per sl no A7 of MOM of 28th PCCM of NERPC, the forum requested NERTS to help NERLDC to finalize the DR Channels and NERLDC will present the same in next PCC Meeting

During 30th PCC meeting, DGM, NERTS informed that standardization of channels will be done jointly with NERLDC in line with POWERGRID's practice at the earliest.

The Sub-committee requested NERTS, NERLDC & NERPC to have a joint meeting on 04.03.2015 and finalize the standards.

Deliberation of the sub-Committee

SE(O) informed that as decided in the 30th PCC meeting, the meeting between NERTS, NERLDC & NERPC was held in Shillong on 04.03.2015 and the standard procedure has been finalized and the same is attached at **Annexure A-4 (I & II).**

The Sub-committee requested NERTS, NERLDC & NERPC to have a joint meeting once again to finalize the standardization pertaining to Transformers, Reactors etc.

A.5 Submission of formats for charging/first time synchronization of new elements:

Information related to charging/first time synchronization of new elements/units is to be furnished to NERLDC (two month in advance). All the activities related to charging/first time synchronization of new elements are to be completed before charging/first time synchronization of new elements. The technical data of the elements are also necessary for preparation of Base Case for system study for NER system.

NEEPCO is requested to furnish the information/data of **Monarchak Unit I & II** at the earliest as per the formats formulated by NERLDC.

It has been observed that 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.).

During 30th PCC meeting, the sub-committee requested all the constituents to furnish the name of Nodal Officers to NERLDC with a copy to NERPC within March, 2015. Further, all the concerned utilities are requested to furnish all the information as per formats & requirements to NERLDC at least one week in advance before charging of new elements and to resolve all the issues like telemetering, protection, interface meter, statutory clearance etc., before charging of new elements.

Deliberation in the 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 is given below:

Ar. Pradesh: Shri N. Perme, EE, SDLC.
Assam: Shri B.C. Baruah, DGM, LDC.
Manipur: Shri Haokip
Mizoram: Shri Lalrema, SE, SLDC
Meghalaya: Shri F.E. Kharshing, SE, SLDC/Shri H.F. Shangpliang, EE (MRT)
Nagaland: Shri A. Jakhalu, EE, SLDC
Tripura: Shri Mrinal Sen, Manager
NEEPCO: Shri Bhaskar Goswami, Sr. Manager
NHPC: Shri R.C. Singh, Manager
POWERGRID: Shri Supriyo Paul, Dy. Manager/D. Bhaumick, Engineer
OTPC: Shri N. Gupta, Manager
NTPC: They will intimate soon.

The Sub-committee directed all the constituents to intimate NERLDC/NERPC at least 10 (ten) days before charging/first time synchronization of any new elements.

A.6 Furnishing of Event Logger (EL) & Disturbance Recorder (DR) output of event:

As per section 5.2.r of IEGC, information/data including Disturbance Recorder & Event Logger output is to be sent to NERLDC **within 24 hrs** of occurrence of any event.

The DR files (Comtrade format), EL files, Sequential Event Recorder outputs and any other protection related information may be sent to nerldcprotection@gmail.com

DR & EL outputs of events as per **Annexure –A.6** have not been received after the joint meeting of NERPC, NERLDC and all constituents of NER held on 29.12.14.

During 30th PCC meeting, the Sub-committee once again stated that those elements which have the facilities (including Disturbance Recorder & Event Logger output if

activated/available) should be sent to NERLDC within 24 hrs of occurrence of any event. NERLDC may kindly intimate NERPC in case of non-compliance so that necessary action can be taken up with Competent Authority.

Deliberation in the Meeting:

SE(O) stated that once the R&M of sub-stations is over, all those facilities will be in place. Further, he informed the house about the Hon'ble CERC Order and the direction given by Commission to NER constituents regarding the hearing on 26.02.2015 is reproduced as below:

a. Take proactive actions like taking Board's approval, floating of NITs, selection of bidders etc., and place the award of work as and when fund from PSDF is released.

b. In case of constraints of funds, the States of NER (who have not got funds from PSDF) may explore the possibility of arranging funds from PSDF; and

c. Complete the implementation of the recommendations of third party Protection Audit within 12 months from the date of placement of award for purchase of equipments.

NERPC is directed to monitor the progress of each constituent and file the report to the Commission for every quarter.

He requested all the constituents to start the process of tendering etc., at the earliest so that as soon as the fund is released tendering can be initiated.

NLDC informed that DPR from all the constituents of NER have been received except Manipur. NLDC requested NERPC to take up the matter with Manipur so that funding for Manipur can also be taken up by them.

The Sub-committee expressed its gratitude towards NLDC and CEA for taking great efforts for getting the funding from PSDF. They requested them to keep in contact with NERPC from time to time so that the funding can be released at the earliest and implementation of R&M of sub-stations in NER can be completed at the earliest for the benefit of the system in the region.

A.7 Reporting of failure of equipment/towers of transmission lines to Standing Committee of Experts:

CEA vide letter dated 04.02.2015 has intimated that as per Section 73 of Electricity Act 2003, CEA is to carry out investigation of failure of substations/generating stations and failure of transmission line towers. Accordingly two Standing Committees have been constituted taking representation from academic institutes, Research Institutes like CPRI and utility to investigate the cause of failures:

(a) Standing Committee of Experts to investigate the failure of Transmission line towers of 220 kV and above voltage level of Power utilities.

(b) Standing Committee of Experts to investigate the failure of Equipments of 220 kV and above substations/Generating stations of power utilities.

In view of above, it is requested that all utilities may please report the incidences of failure immediately after occurrence of such failure to Chief Engineer (SE&TD), CEA with copy to NERPC.

The format for reporting the first hand information about the failure of equipment in substations/generating stations and failure of transmission line towers are attached at **Annexure – A.7**

During 30th PCC meeting, SE(O) stated that recent failure of one 63 MVAR reactor at 400 kV S/S Byrnihat of Me.ECL should be sent to CEA for investigation as directed above. Meghalaya agreed.

Deliberation in the Meeting:

Since no representative from Meghalaya was present, the status could not be updated.

The Sub-committee suggested that the equipment failure of CB at Bongaigoan of POWERGRID which causes major grid disturbance on 23.02.2015 has to be sent to above Standing Committee of CEA for further investigation. POWERGRID agreed.

The Sub-committee noted as above.

A.8 Implementation of activities as decided in joint meeting amongst NERLDC, NERPC & constituents of NER on 29.12.2014:

A meeting was held at NERLDC between NERPC, NERLDC and constituents of NER as per directive of Hon'ble CERC in response to Petition No. 113/MP/2014 on 29.12.14:

The constituents of NER agreed upon the following:

a. Testing of all existing relays and schemes within 2 months by all constituents to assess the healthiness of existing protective relays.

b. Review of relay settings based on history of tripping.

c. Availability of Distance Protection scheme.

d. Attempts would be made to avoid any tripping on account of vegetation growth, which is frequent in NER.

e. Single Phase / Three phase Auto Reclose Scheme of transmission lines of voltage level 132 kV and above under List of Important Grid Elements of NER are to be adopted, wherever available. The status of implementation will be monitored in monthly OCC/PCC meetings.

During 29th PCC meeting, the Sub-committee requested all the constituents to furnish latest status of the above activities by 15.02.2015 so that report on latest status of the above activities can be submitted on 26.02.2015 before Hon'ble CERC.

During 30th PCC meeting, DGM (SO-II), NERLDC requested all the constituents to submit the status after the meeting so that a joint report will be prepared for onward submission during the hearing at CERC which is scheduled to be held on 26.02.2015. All constituents agreed.

Deliberation in the Meeting:

SE(O) informed that the joint report was prepared after the PCC meeting and information was received from Assam, Manipur, Meghalaya, Nagaland & Tripura and the same has been appraised during the CERC hearing on 26.02.2015. The CERC Order is highlighted in **Item A.8**. He requested Ar. Pradesh & Mizoram to furnish the actions taken by them as decided on 29.12.2014.

DGM (AM), NERTS suggested to club the procurement of various equipments for R&M so that each tender have maximum equipments and number of tendering can be reduced. The same will be also cost effective. Moreover, he stated that the vendors can be called form imparting training on important equipments especially Numerical Relays for the better know how of the product prior to procurement.

NLDC requested the constituents to go through their website under (**psdf.india.in**) where details of PSDF funding are clearly mentioned for their kind information.

The Sub-committee noted as above.

A. 9 Training on Numerical Relay:

During 30th PCC meeting, GM, NERLDC informed that many of the engineers in NER do not have experience in operating of numerical relays, it would be helpful if POWERGRID can arrange a workshop where Numerical Relay facilities are available so that impart training to handle the relay can be made for the benefit of the region.

DGM, NERTS informed that such facilities are available in Misa sub-station and at the same time some accommodation of around 20-25 participants can be arranged there. He requested NERPC to write to their Management so that at least two days workshop can be arranged by them.

All constituents appreciated the idea and requested NERPC to write to NERTS, POWERGRID for the workshop.

NERPC vide letter dated 13.03.2015 has written to NERTS, POWERGRID for facilitating impart training on NR at Misa and the reply is awaited. NERPC will inform to all the constituents accordingly.

Deliberation in the Meeting:

DGM (AM) informed that the likely dates for impart training at Misa is 27th & 28th April, 2015. Further, he requested NERPC to furnish the names of participants so that training at Misa can be firmed up at the earliest.

DGM, NERLDC also informed that on the request from NERLDC, NPTI has agreed to conduct training for basic level certification in NPTI/Guwahati if number of participants is at least 10 or more and they have also agreed to provide boarding

and lodging facility. He also requested NERPC to collect nominations from utilities so that a consolidated proposal and modus operandi can be finalised.

NLDC informed that provision is available in PSDF for capacity building and requested NERPC/NERLDC to give a proposal to them including the TA/DA and cost of training etc., so that they can examine the matter.

The Sub-committee requested NERPC/NERLDC to prepare the module which should cover more hands on than classroom and the expert faculties should be selected from Original Equipments Manufacturers (OEM) for better understanding of operation and maintenance. The complete proposal including the tentative cost of modules, TA/DA etc., should be made and send to NLDC so that funding can be arranged from PSDF.

A.10 Furnishing Protection Details of Transmission Lines, Transformers, Reactors and Bus Bars:

a. Transmission Line

As per section 43.4.c (Schedule V) of Technical Standards for construction of Electrical Plants and Electric Lines Regulation, 2010, Protection system of **400 kV lines** consists of Main I, Main II, DEF, Two Stage Over Voltage, Auto Reclosing and Carrier Aided Inter Tripping. Protection system of **220 kV lines** consists of Main I, Main II/Over Current & DEF, Auto Reclosing and Carrier Aided Inter Tripping. Protection system of **132 kV lines** consists of Main I, Over Current & DEF, Auto Reclosing and Carrier Aided Inter Tripping.

AEGCL, MSPCL, MePTCL, P&E, Mizoram, POWERGRID, NEEPCO (only AGBPP, Ranganadi HEP, Doyang HEP & AGTPP), NHPC *has furnished the information.*

DoP, Arunachal Pradesh, DoP, Nagaland, TSECL, NEEPCO (except AGBPP, Ranganadi HEP, Doyang HEP & AGTPP), OTPC *are requested to furnish* ***Protection Details of Transmission Lines*** *as per enclosed format in* ***Annexure - A.11 (I&II)****.*

b. Transformer

As per section 43.4.c (Schedule V) of Technical Standards for construction of Electrical Plants and Electric Lines Regulation, 2010, Protection system of **Transformer** consists of Differential Protection, Over Flux Protection, REF Protection, Backup Directional Over Current and Earth Fault Protection (HV & LV side)/Impedance Protection, Buchholz, WTI, OTI, MOG, OSR for OLTC, PRD, SA, Tertiary Winding Protection, Over Load Alarm.

AEGCL, MSPCL, MePTCL, P&E, Mizoram, POWERGRID, NEEPCO (only AGBPP, Ranganadi HEP & AGTPP), NHPC *has furnished the information.*

DoP, Arunachal Pradesh, DoP, Nagaland, Tripura, NEEPCO (except AGBPP, Ranganadi HEP & AGTPP), OTPC *are requested to furnish* ***Protection Details of Transformer*** *as per format in* ***Annexure–A.11.***

c. Reactor

As per section 43.4.c (Schedule V) of Technical Standards for construction of Electrical Plants and Electric Lines Regulation, 2010, Protection system of **Reactor** consists of Differential Protection, REF Protection, Backup Definite Time Over Current and Earth Fault Protection/Impedance Protection, Buchholz, WTI, OTI, MOG, SA.

AEGCL, MePTCL, NEEPCO (Rangaandi HEP) and POWERGRID *have furnished the information.*

TSECL and OTPC *are requested to furnish* ***Protection Details of Reactor*** *as per enclosed format in* ***Annexure-A.11****.*

d. Bus Bar & LBB

As per section 43.4.c (Schedule V) of Technical Standards for construction of Electrical Plants and Electric Lines Regulation, 2010, Bus Bar Protection and Local Breaker Backup Protection are to be provided in **220 kV and above voltage** interconnecting sub-station and all generating station switchyards.

MePTCL, POWERGRID, NEEPCO (AGTPP, AGBPP & Ranganadi HEP) & NHPC *have furnished the information.*

DoP, Arunachal Pradesh (Deomali), AEGCL (BTPS, Agia, Boko, Sarusajai, Langpi, Samaguri, Jawaharnagar, Mariani, Tinsukia), NEEPCO (Kopili) &

***OTPC** are requested to furnish **Bus Bar Protection and Local Breaker Backup Protection** as per enclosed format in **Annexure-A.11**.*

e. Bus Coupler

MSPCL, MePTCL, P&E, Mizoram, NEEPCO (only AGBPP, Ranganadi HEP & AGTPP) & NHPC have furnished the information.

DoP, Arunachal Pradesh, AEGCL, DoP, Nagaland, TSECL, POWERGRID, NEEPCO (except AGBPP, Ranganadi HEP & AGTPP) & OTPC are requested to furnish Bus Coupler Protection as per enclosed format in **Annexure –A.11**.

Protection System Database prepared based on information furnished by power utilities of NER, which is attached at Annexure- A.11(II). Power utilities of NER are requested to check & validate the same.

Deliberation in the Meeting:

After detailed deliberation, the Sub-committee requested all the constituents to furnish the above information to NERLDC latest by 10.04.2015.

A.11 Grid Incidences during February, 2015:

The following numbers of Grid Disturbances (GD) occurred during the period **w.e.f 1st February to 28th February, 2015**:

Sl No	Control Area	Grid Disturbance in nos.	
		1st February, 2015 to 28th February, 2015	Jan'15 to Feb'15(till 28th)
1	Palatana	1	1
2	AGBPP	1	1
3	AGTPP	1	1
4	Ranganadi	1	1
5	Kopili	1	1
6	Khandong	1	1
7	Doyang	2	2
8	Loktak	2	4
9	Arunachal Pradesh	2	8
10	Assam	3	9
11	Manipur	7	12
12	Meghalaya	1	1
13	Mizoram	1	2
14	Nagaland	5	7
15	Tripura	1	1

Sl No	Category of GD	Grid Disturbance in nos.	
		1st February, 2015 to 28th February,15	Jan'15 to Feb'15(till 28th)
1	GD 1	9	22
2	GD 2	1	1
3	GD 3	0	0
4	GD 4	0	0
5	GD 5	1	1
	Total	**11**	**24**

Deliberation in the Meeting:

This is for information to the members. Remedial actions are to taken by the concerned power utilities of NER.

A.12 Root Cause analysis of tripping of multiple elements:

i. Disturbance in Nagaland System:

a. At **2122 Hrs on 16.02.15**, 132 kV Dimapur (PG) - Bokajan line tripped (**Dimapur (PG)- No tripping & Bokajan- Over-current)**.

At 2124 Hrs, 132 kV Dimapur(PG)- Kohima (**Dimapur(PG)- No tripping & Kohima- Over-current) &** 132 kV Dimapur (PG) - Imphal (**Dimapur (PG)- No tripping & Imphal- Over-current)** line tripped.

220 kV Misa- Dimapur II was under planned shutdown w.e.f 0812 Hrs of 16.02.15 and 220 kV Misa - Dimapur I tripped at 1736 Hrs.

Load loss: 66 MW in Nagaland.

Category as per CEA Standards: GD-I

Analysis of events:

As SOE of 132 kV Dimapur – Bokajan & 132 kV Dimapur – Kohima lines are not recorded in NERLDC, exact location of fault is difficult to identify. Line patrolling report is to be furnished.

It is requested to furnish DR outputs at both ends for all the lines for further analysis.

b. At **1413 Hrs on 27.02.15**, 132 kV Dimapur (PG) - Kohima (**data not furnished for both ends)** and 132 kV Dimapur(PG) & Doyang II **(Dimapur (PG)- DP,Z1,R-Y-E & Doyang- DP,Z1, R-Y-E)** line tripped.
Load loss: 24 MW in Nagaland & Manipur.
Category as per CEA Standards: GD-I

Analysis of events:

These two lines are radially connected. It is to be checked whether these lines tripped subsequently. Line patrolling report is to be furnished.

It is requested to furnish DR outputs of 132 kV Dimapur(PG) - Kohima for further analysis.

Deliberation in the Meeting:

Since no representative from Nagaland was present, the status could not be updated.

DGM (AM) informed that the DR related to them will be sent to NERLDC soon.

Sr. Manager, NEEPCO requested NERLDC to take up the matter with Corporate, Shillong for getting the DR data regarding Doyang.

Further, DGM (AM) stated that during PCC all grid disturbances should be placed for corrective measures and action taken to be monitored during PCC. Hence, analysis of any disturbance is to be carried out immediately after the occurrence not during PCC meeting.

The Sub-committee noted as above.

ii. Disturbance in Capital & Ziro area of Arunachal Pradesh and Gohpur area of Assam:

a. At **0656 Hrs on 13.02.15**, 400 kV Balipara-Ranganadi I **(Balipara- Direct Trip received & Ranganadi-Over Voltage)** tripped.
400 kV Balipara- Ranganadi II was under shutdown w.e.f 0809 Hrs of 07.02.15.
Rise in Ranganadi Bus voltage: 422 kV to 434 kV (as per NERLDC SCADA data)
Load loss: 24 MW in Arunachal Pradesh & 29 MW in Assam.
Category as per CEA Standards: GD-I

Analysis of events:

It is suspected that there may be mal-operation of relay at Ranganadi /problem of carrier inter tripping. It is requested to furnish DR outputs at Balipara ends for above events for further analysis. As informed by Rangandi DR is not available. It is requested to Ranganadi HEP, NEEPCO to install DR & EL at the earliest.

Deliberation in the Meeting:

SE(O) informed that the issue was discussed in 30th PCC meeting where Sr. Manager, NEEPCO informed that the problem for above was due to initiation of relay on over voltage at Ranganadi end and the problem has now been rectified.

The Sub-committee noted as above.

iii. System Isolation

a. At **1736 Hrs on 16.02.15**, 220 kV Misa- Dimapur(PG) I (**Misa- No Tripping & Dimapur(PG)- DP, Z1, R-E),** 132 kV Loktak **-** Ningthoukhong **(Loktak- DP, ZI, R-Y-B & Ningthoukhong- No tripping)** & 132 kV Dimapur(PG) – Bokajan **(Dimapur(PG) - No tripping & Bokajan- Over-current)** lines tripped.

   220 kV Misa- Dimapur(PG) II line & 132 kV Loktak- Imphal lines were under shutdown w.e.f 0812 Hrs on 16.02.15 & w.e.f 0923 Hrs of 16.02.15 respectively.

   Load loss: 81 MW in Manipur & 80 MW in Nagaland.
   Generation loss: 45 MW in Doyang HEP.

   Category as per CEA Standards: GD-I

Analysis of events:

At around 1736 Hrs, power flow of 220 kV Misa- Dimapur (PG) I was around 90 MW as per NERLDC SCADA data. Due to tripping of 220 kV Misa- Dimapur-I, 132 kV Dimapur- Bokajan line overloaded at tripped. Due to tripping of 220 kV Misa- Dimapur-I & 132 kV Dimapur- Bokajan line, 132 kV Loktak- Ningthoukhong line got overloaded and tripped. These tripping resulted in isolation of Manipur & Nagaland system from the rest of NER Grid.

Deliberation in the Meeting:

POWERGRID, Manipur & NHPC informed that they will look into the matter and furnish the data to NERLDC at the earliest.

The Sub-committee noted as above.

b. At **1809 Hrs on 23.02.15,** 400 kV Bongaigaon- New Siliguri I, II & IV **(Bongaigaon- No tripping & New Siliguri- DP, ZII, B-E),** 400 kV Balipara-Bongaigaon I, II & III **(Balipara- DP, ZII, B-E & Bongaigaon- No tripping),** 400 kV Bongaigaon- Azara **(Bongaigaon- No tripping & Azara- DP, ZII, B-E),** 400 kV Bongaigaon- Byrnihat **(Bongaigaon- No tripping & Byrnihat- DP, ZII, B-E)** lines and 400/220kV, 315 MVA ICT at Bongaigaon **(Earth Fault)** tripped. Due to tripping of these above elements 220 kV Salakati-BTPS D/C lines got overloaded and tripped resulting in isolation of NER Grid from rest of the grid.

400 kV Bongaigaon- New Siliguri III & 400 kV Balipara- Bongaiagon IV was kept open since 2216 Hrs of 20.02.15 & 0722 Hrs of 22.02.15 respectively to contain O/V.

AGBPP, NTPS and LTPS stations survived with generation of 165MW, 55 MW and 88 MW respectively totaling 308MW with corresponding upper Assam load on successful operation of Islanding scheme (as per design).

AGTPP machines were running in FSNL after tripping of Generator breaker & Field breaker on low frequency and brought into service immediately.

Power failure occurred in the rest part of the NER network due to mis-match of Load and Generation.

NER was importing around 600 MW from ER before grid disturbance.

Load loss: 1842 MW.
Generation loss: 1045 MW
Category as per CEA Standards: GD-V

Analysis of events:

As per decision taken in 106th OCC Meeting an enquiry committee will be set up by NERPC so that the issue can be discussed. However detailed report of NERLDC furnished to all concerned.

Deliberation in the Meeting:

The issue on major grid disturbance on 23.02.2015 is discussed in thread bear and the members felt that recommendation should be firmed up so that such incidence does not repeat again.

Members opined that status of UFRs should be furnished by the constituents to NERLDC/NERPC to find out if the UFRs operated during the above incidence.

DGM, NERLDC informed that DR form Bongaigoan has not been received by them and requested POWERGRID to furnish immediately.

After detailed deliberation, the sub-committee recommended as below:

a. The testing of Siliguri – Bongagigoan – III Main & Tie breaker which are out of service was carried out without the knowledge of NERLDC. Hence it is recommended that all utilities should inform NERLDC prior to testing/maintenance of any equipments which is not in service.

b. The EL data should be submitted by POWERGRID along with main –II DR for analysis of protection system operation and cause of non-clearance of fault. The entity should submit the data to NERLDC/NLDC within one week time.

c. Time synchronization of Bongaigoan station needs to be checked and POWERGRID is to inform the status within one week.

d. The data outage of Bongaigoan during the event needs to be examined. All the utilities should ensure that all peripherals of the telemetry system is to be powered up by Uninterrupted Power Supply in form of DC or UPS to avoid loss of data during disturbance of station auxiliary power supply.

e. The Isolator was being closed manually. The entity should ensure that motorized operator is made for line isolator.

f. The STUB protection did not operate because the two phases of isolators were opened. The engineering may be reviewed to ensure that two separate sets of contacts of isolator is considered to prevent mal-operation.

g. During restoration system, no constituent should over draw from the grid and all should strictly abide to the instruction of NERLDC.

The Sub-committee noted as above.

iv. Power Station Blackout

a. At **1738 Hrs on 28.02.15**, 220 kV AGBPP- Tinsukia I & II, 220 kV AGBPP-Mariani (PG), 220 kV AGBPP- Mariani (S) and 220 kV AGBPP- Deomali lines tripped.

AGBPP Unit- 1,3,4,5,6,7,8 & 9 also tripped.
Generation loss: 204 MW.

Category as per CEA Standards: GD-II

Analysis of events:

Due to tripping of all the outgoing feeders from AGBPP, all the running generating units of AGBPP tripped. As a result there was a complete power station blackout.

Event Report not yet furnished as per clause no. 5.9.6 (a) of IEGC.

Deliberation in the Meeting:

POWERGRID, NEEPCO, Assam & AR. Pradesh informed that they will look into the matter and furnish the data to NERLDC at the earliest.

The Sub-committee noted as above.

Date and Venue of next PCC

It is proposed to hold the 32nd PCC meeting of NERPC in the third week of April, 2015. The exact venue will be intimated in due course.

****

Annexure-I

List of Participants in the 31st PCC Meetings held on 20/03/2015

SN	Name & Designation	Organization	Contact No.
1.	Sh. N. Perme, EE	Ar. Pradesh	09436288643
2.	Sh. G.K. Bhuyan, AGM	Assam	09854015601
3.	Sh. N. Chakraborty, Asstt. Manager	NETC	07896022335
4.	Sh. Utpal Saha, Engineer	NETC	08794704040
5.	Sh. N. Jasobanta Singh, Manager	Manipur	08413945327
6.	Sh. G Tapankumar Sharma, Mgr, MSPCL	Manipur	08974138850
7.	Sh. Themcham Woleng, Manager, MSPCL	Manipur	08731000143
	No Representatives	**Meghalaya**	
	No Representatives	**Mizoram**	
	No Representatives	**Nagaland**	
8.	Sh. D. Pal, Sr. Manager	Tripura	09436500244
9.	Sh. U. Debbarma, DGM	Tripura	09436462842
10	Sh. Mrinal Paul, Manager	Tripura	09436137022
11.	Sh. Sankar Choudhuri, Sr. Manager	Tripura	09436503239
12.	Sh. Nirupam Guha, Sr. Manager	Tripura	09436502631
13.	Sh. B. Medhi, Dy. Manager	NERLDC	0943635776
14.	Sh. N.R. Paul, DGM	NERLDC	09436302723
15.	Sh. P. Kanungo, DGM	PGCIL	09436302823
16.	Sh. S. Sarkar, Sr. Manager (E/M)	NEEPCO	08974009294
17.	Sh. Prasenjit Sen, Sr. Manager (E/M)	NEEPCO	09436167999
	No Representatives	**ENICL**	
	No Representatives	**NTPC**	09435325996
18.	Sh. R.K. Tenzing, Engineer (E)	NHPC	09436894885
19.	Sh. N.L. Jain, AGM	NLDC	09999143112
20.	Sh. Brijendra B. Singh, Sr. Engineer	NLDC	07042954333
21.	Sh. Rahul Shukla, Engineer	NLDC	09650555388
22.	Sh. T. Karmakar, Asst. Mgr (Electrical)	OTPC	09435239314
23.	Sh. P.K. Mishra, MS	NERPC	09968380242
24.	Sh. B. Lyngkhoi, S.E (O)	NERPC	09436163419
25.	Sh. S.M. Jha, E.E	NERPC	08731845175

GENERAL INFORMATION

01. Name of Sub Station :
02. Owner of The Sub Station :
03. Date of first commissioning :
04. Type of Bus Switching Scheme :
05. Whether SLD collected or Not : Refer Annexure – I

AUDIT TEAM

SN	Name	Organisation	Date of Audit	Signature
1.				
2.				
3.				

LIST OF AUXILIARIES

SN	Code	Name / Description	DOC
1	DC-1	220/110V Battery Bank - 1	
2	DC-2	220/110V Battery Bank - 2	
3	DC-3	48V Battery Bank - 1	
4	DC-3	48V Battery Bank - 1	
5	AC-1	---KVA, ***/****KV Transformer	
6	AC-2	---KVA, ***/****KV Transformer	
7	DG-1	____KVA DG Set	
8	DG-2	____KVA DG Set	

LIST OF ELEMENTS

SN	Name / Description	DOC
1	Bay 1: _____	
2	Bay 2: _____	
3	Transformer 1 : _____	
4	Transformer 1 : _____	
5	Reactor 1: _____	
6	Reactor 2: _____	
7	Line 1: _____	
8	Line 2: _____	
9	Etc	

1.0 AUXILIARIES

1.1 DC Sources

SN	Description	DC – 1	DC – 2	DC – 3	DC – 4
1	Checking Cleanliness Battery cell terminals and application of petroleum jelly, if required				
2	No. of Cells Per Bank				
3	Capacity				
4	Electrolyte Level				
5	Sample Checking of Sp. Gravity				
6	Healthiness of Charger				
7	Measurement of Voltage with				
	(a) Charger ON				
	(b) Charger OFF				
8	Positive to Earth			NA	NA
9	Negative to Earth			NA	NA
10	Healthiness EF Relay			NA	NA
11	Discharge Test Capacity				
12	Checking of tightness of VRLA Battery and dusting/ cleaning.				
13	Servicing of Air Conditioners for VRLA Batteries.				

1.2 AC Supply

SN	Description	AC – 1	AC – 2
1	Source of supply		
2	Reliability of Supply		
3	Average trippings per month		

1.3 DG Set

SN	Description	DG – 1	DG – 2

1	Make		
2	Rating		
3	Weather on Auto or Manual		
4	Fuel Level		
5	Average Hrs. Run / Month		

2.0 COMMON EQUIPMENTS / ITEMS

SN	Description	Status
1	**Bus Bar Protection**	
(a)	Bus Voltage	
(b)	Make & Model of Bus Bar relay	
(c)	Status of Healthiness	
(d)	Date of Stability Test	
(e)	Remarks (if any)	
2	**Event Logger**	
(a)	Make & Model	
(b)	Status of Healthiness	
(c)	Remarks (if any)	
3	**Time Synchroniser**	
(a)	Make & Model	
(b)	Status of Healthiness	
(c)	Remarks (if any)	
4	**Annunciation Scheme**	
(a)	Healthiness Annunciation	
(b)	Healthiness Hooter	
(c)	Remarks (if any)	
5	**Fire Alarm System**	
(a)	Availability	
(b)	Healthiness	
(c)	Remarks (if any)	
6	**Fire Fighting System**	
(a)	Availability	

SN	Description	Status
(b)	Healthiness	
(c)	Remarks (if any)	
7	**Earthing System**	
(a)	Earth Resistivity Value	
(b)	No. of Pits	Available / Required
(c)	Remarks (if any)	
8	**Switchyard Gravelling**	
(a)	Availability	
(b)	Remarks (if any)	

3.0 BAY

3.1 Bay 1: _____

(a) Lightning Arrestor

SN	Description	Status		
		R-Φ	Y-Φ	B-Φ
1	Make			
2	Rating			
3	Type			
4	Year Commissioning			
5	Last THRC Test & Values			

(b) Capacitive Voltage Transformer

SN	Description	Core	Status		
			R-Φ	Y-Φ	B-Φ
1	Make	All			
2	Rating	All			
3	Type	All			
4	Year of Comm	All			
5	Adopted Ratio	Core 1			
		Core 2			
		Core 3			

6	Ratio Measured	Core 1			
		Core 2			
		Core 3			
7	Error Calculated	Core 1			
		Core 2			
		Core 3			
8	Date of Testing	All			

(c) Current Transformer

SN	Description	Core	Status		
			R-Φ	R-Φ	R-Φ
1	Make	All			
2	Rating	All			
3	Type	All			
4	Year of Comm.	All			
5	Adopted Ratio	Core 1			
		Core 2			
		Core 3			
		Core 4			
		Core 5			
6	Ratio Measured	Core 1			
		Core 2			
		Core 3			
		Core 4			
		Core 5			
7	Error Calculated	Core 1			
		Core 2			
		Core 3			
		Core 4			
		Core 5			
8	Date of Testing	All			

(d) Circuit Breaker

SN	Description	Status
1	Make	

2	Rating				
3	Type				
4	Duty Cycle				
5	No. of Trip & Close Coils	Trip Coil =		Close Coil =	
6	Timing Date & Value	Date:	C =	O =	CO =
7	Healthiness of CB				
8	**LBB Protection**				
(a)	Type				
(b)	Make & Model				
(c)	Healthiness				
(d)	Date of Last Testing				
(e)	Setting				

4.0 TRANSFORMERS

4.1 Transformer – 1

SN	Description	Status
1	Make	
2	Rating	
3	Year of Manufacture	
4	Year of Commissioning	
5	Type of Cooling	
6	Type of Earthing	
7	Date of last DGA	
8	Date of last Oil Parameter	
9	Date of last Tan∂ & C	
10	Oil Level	
11	Oil Leakage	
12	Rusting / Painting	
13	**Differential Protection**	
(a)	Type	

SN	Description	Status
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Stability Test	
(e)	Setting	
14	**REF Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Stability Test	
(e)	Setting	
15	**Over Flux Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Test	
(e)	Setting	
16	**Back Up O/C Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Test	
(e)	Setting	
17	**Back Up E/F Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Test	
(e)	Setting	
18	**Healthiness Status**	
(a)	Buchholz Relay	
(b)	PRV	
(c)	OTI	

SN	Description	Status
(d)	WTI	
(e)	MOG	
(f)	Oil Surge Protection	

5.0 REACTORS

5.1 Reactor – 1:

SN	Description	Status
1	Make	
2	Rating	
3	Year of Manufacture	
4	Year of Commissioning	
5	Type of Cooling	
6	Type of Earthing	
7	Date of last DGA	
8	Date of last Oil Parameter	
9	Date of last Tan∂ & C	
10	Oil Level	
11	Oil Leakage	
12	Rusting / Painting	
13	**Differential Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Stability Test	
(e)	Setting	
14	**REF Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	

SN	Description	Status
(d)	Date of Stability Test	
(e)	Setting	
15	**Back Up Impedance**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Test	
(e)	Setting	
18	**Healthiness Status**	
(a)	Buchholz Relay	
(b)	PRV	
(c)	OTI	
(d)	WTI	
(e)	MOG	

6.0 TRANSMISSION LINE

6.1 Line – 1:

SN	Description	Status
1	Line Name	
2	Voltage	
3	Length	
4	Type of Conductor	
5	Line Configuration	
6	R1 (Ω/Km/Ph.)	
7	X1(Ω/Km/Ph.)	
8	R0 (Ω/Km/Ph.)	
9	X0 (Ω/Km/Ph.)	
10	R0M (Ω/Km/Ph.)	
11	X0M (Ω/Km/Ph.)	
12	No. of Tripping / Year	

SN	Description	Status
13	Infringement Clearance	
14	**Main – 1 Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Testing	
(e)	Zone 1 Setting	
(f)	Zone 2 Setting	
(g)	Zone 3 Setting	
(h)	Zone 3 Reverse Setting	
(i)	DEF Setting	
15	**Main – 2 Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Testing	
(e)	Zone 1 Setting	
(f)	Zone 2 Setting	
(g)	Zone 3 Setting	
(h)	Zone 3 Reverse Setting	
(i)	DEF Setting	
16	**Back Up O/C Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Testing	
(e)	Setting	PS/TS:
17	**Back Up E/F Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Testing	

SN	Description	Status
(e)	Setting	PS/TS:
18	**Over Voltage Stage 1**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Testing	
(e)	Setting	
19	**Over Voltage Stage 2**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Testing	
(e)	Setting	
20	**PLCC & Prot. Coupler**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness of Carrier	
(d)	Date of Last Testing	
21	**Auto Reclosure Scheme**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Selected Mode	
(e)	Setting	
(f)	Date of Last Testing	
22	**Disturbance Recorder**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	

CONFIGURATION OF DR FOR TRANSMISSION LINES

DR CONFIGURATION FOR TRANSMISSION LINES

Annexure-A.4

A. ANALOG CHANNELS

SN	Channel Description	Standardized Channel Name
1	R Phase Current	I-R PH.
2	Y Phase Current	I-Y PH.
3	B Phase Current	I-B PH.
4	Neutral Current	I-N PH.
5	R Phase Voltage	V-R PH.
6	Y Phase Voltage	V-Y PH.
7	B Phase Voltage	V-B PH.
8	Open Delta Voltage	V-N (Open Delta)

B. DIGITAL CHANNEL - 32 CHANNEL DR

SN	Channel Description	(Limited to 16 Characters)	7 characters	Triggers
1	MAIN CB R-PHASE OPEN	MAIN_CB_R_OPEN	M CB_RO	Y
2	MAIN CB Y-PHASE OPEN	MAIN_CB_Y_OPEN	M CB_YO	Y
3	MAIN CB B-PHASE OPEN	MAIN_CB_B_OPEN	M CB_BO	Y
4	TIE / TBC CB R-PHASE OPEN	TIE/TBC_CB_R_OPEN	T CB_RO	Y
5	TIE / TBC CB Y-PHASE OPEN	TIE/TBC_CB_Y_OPEN	T CB_YO	Y
6	TIE / TBC CB B-PHASE OPEN	TIE/TBC_CB_B_OPEN	T CB_BO	Y
7	MAIN1 TRIP	MAIN1_TRIP	M1_TRIP	Y
8	MAIN2 TRIP	MAIN2_TRIP	M2_TRIP	Y
9	AUTO RECLOSE OPTD MAIN / TIE / TBC CB	MAIN/TIE/TBC_CB_A/R_OPTD	MT_AR	Y
10	MAIN / TIE / TBC CB AR LOCKOUT	MAIN_TIE/TBC CB AR LO	M/T_AR LO	Y
11	MAIN 1/2 CARRIER RECEIVE	MAIN1/2_CARR_REC	M12CR_RC	Y
12	DT RECEIVE CHANNEL - 1/2	DT_REC_CH1/2	DTRC1/2	Y
13	3 PH. GROUP A / B OPERATED	3PH_GR_A/B_OPTD	GRABOPD	Y
14	OVER VOLTAGE STAGE-1/2 OPERATED	O/V_STG1/2_OPTD	O/V_ST1/2	Y
15	POWER SWING DET.	PS_DETECTED	PS_DET	Y
16	POWER SWING BLOCK OPERATED	PS BLK OPTD	PSB_OP	N
17	STUB OPERATED	STUB_OPTD	SB_OPD	Y
18	BUSBAR OPERATED (M1/M2)	BUSBAR_OPTD	BB_OPD	Y
19	MAIN / TIE / TBC LBB OPERATED	MAIN/TIE/TBC_LBB_OPTD	M_T_LBB	Y
20	MAIN/TIE / TBC CB POLE DISCREPANCY	M/T_CB_POLE_DISC	M/T_PLDSC	N
21	MAIN 1 ZONE-1 OPTD.	MAIN1_Z1_OPTD	M1Z1_OP	Y
22	MAIN 1 ZONE-2 START	MAIN1_Z2_START	M1Z2_ST	N
23	MAIN 1 ZONE-2 OPTD.	MAIN1_Z2_OPTD	M1Z2_OP	Y
24	MAIN 1 ZONE-3 START	MAIN1_Z3_START	M1Z3_ST	N
25	MAIN 1 ZONE-3 OPTD.	MAIN1_Z3_OPTD	M1Z3_OP	Y
26	MAIN 1 REVERSE ZONE START	MAIN1_ZR_START	M1ZR_ST	N
27	DIRECT TRIP SEND	DIR_TR SEND	DT_SEND	Y
28	VT FUSE FAIL	VT_FUSE_FAIL	VT_FAIL	Y
29	MAIN 1/2 SOTF OPTD	M1/2_SOTF_OPD	M12SOTF	Y
30	MAIN 1/2 DEF OPTD	DEF_OPD	DEF_OPD	Y
31	MAIN1/2 CARR. SEND	M1/2 CARR. SEND	M12CRSD	Y
32	MAIN1/2 CARRIER AIDED TRIP	CARR_AID_TRIP	CAR_AID	Y
Note: Digital Signals in S/N 21 - 28 shall be defined as below in case DR is configured in Main 2 relay				
21	MAIN 2 ZONE-1 OPTD.	MAIN2_Z1_OPTD	M2Z1_OP	Y
22	MAIN 2 ZONE-2 START	MAIN2_Z2_START	M2Z2_ST	N
23	MAIN 2 ZONE-2 OPTD.	MAIN2_Z2_OPTD	M2Z2_OP	Y
24	MAIN 2 ZONE-3 START	MAIN2_Z3_START	M2Z3_ST	N
25	MAIN 2 ZONE-3 OPTD.	MAIN2_Z3_OPTD	M2Z3_OP	Y
26	MAIN 2 REVERSE ZONE START	MAIN2_ZR_START	M2ZR_ST	Y
27	DIRECT TRIP SEND	DIR_TR SEND	DT_SEND	Y
28	VT FUSE FAIL	VT_FUSE_FAIL	VT_FAIL	Y

C. DIGITAL CHANNEL - 16 CHANNEL DR

SN	Channel Description	(Limited to 16 Characters)	7 characters	Triggers
1	MAIN CB R-PHASE OPEN	MAIN_CB_R_OPEN	M CB_RO	Y
2	MAIN CB Y-PHASE OPEN	MAIN_CB_Y_OPEN	M CB_YO	Y
3	MAIN CB B-PHASE OPEN	MAIN_CB_B_OPEN	M CB_BO	Y
4	TIE / TBC CB R-PHASE OPEN	TIE/TBC_CB_R_OPEN	T CB_RO	Y
5	TIE / TBC CB Y-PHASE OPEN	TIE/TBC_CB_Y_OPEN	T CB_YO	Y
6	TIE / TBC CB B-PHASE OPEN	TIE/TBC_CB_B_OPEN	T CB_BO	Y
7	MAIN1 TRIP	MAIN1_TRIP	M1_TRIP	Y
8	MAIN2 TRIP	MAIN2_TRIP	M2_TRIP	Y
9	AUTO RECLOSE OPTD M/T CB	M/T_CB_A/R_OPTD	M/TCBAR	Y
10	MAIN1 CARRIER RECEIVE	MAIN1_CARR_REC	M1CR_RC	Y
11	MAIN2 CARRIER RECEIVE	MAIN2_CARR_REC	M2CR_RC	Y
12	DT RECEIVE CHANNEL-1/2	DT_REC_CH-1/2	DTRC1/2	Y
13	OVER VOLTAGE STAGE-1/2 OPERATED	O/V_STG1/2_OPTD	OVST1/2	Y
14	STUB/UF/TEE OPERATED	STUB/UF/TEE_OPTD	SB_OPD	Y
15	BUSBAR OPERATED (M1/M2)	BUSBAR_OPTD	BB_OPD	Y
16	MAIN/TIE/TBC CB LBB OPERATED	M/T_LBB_OPTD	M/T_LBB	Y

Note:

1. TIE CB - ONE & HALF BREAKER SCHEME

2. TBC CB - DOUBLE MAIN TRANSFER SCHEME

CONFIGURATION OF DR FOR TRANSMISSION LINES

ANNEXURE-A.4 (II)

DR CONFIGURATION: TRANSMISSION LINE
BUS BAR SCHEME: DOUBLE / SINGLE MAIN TRANSFER SCHEME
PROTECTION: MAIN & BACK UP

A. ANALOG CHANNELS

SN	Channel Description	Standardized Channel Name
1	R Phase Current	I-R PH.
2	Y Phase Current	I-Y PH.
3	B Phase Current	I-B PH.
4	Neutral Current	I-N PH
5	R Phase Voltage	V-R PH.
6	Y Phase Voltage	V-Y PH.
7	B Phase Voltage	V-B PH.
8	Open Delta Voltage	V-N-Open Delta

B. DIGITAL CHANNEL - 32 CHANNEL DR

SN	Channel Description	(Limited to 16 Characters)	7 characters	Triggers
1	MAIN CB R-PHASE OPEN	MAIN_CB_R_OPEN	M CB_RO	Y
2	MAIN CB Y-PHASE OPEN	MAIN_CB_Y_OPEN	M CB_YO	Y
3	MAIN CB B-PHASE OPEN	MAIN_CB_B_OPEN	M CB_BO	Y
4	TBC CB R-PHASE OPEN	TBC_CB_R_OPEN	T CB_RO	Y
5	TBC CB Y-PHASE OPEN	TBC_CB_Y_OPEN	T CB_YO	Y
6	TBC CB B-PHASE OPEN	TBC_CB_B_OPEN	T CB_BO	Y
7	MAIN TRIP	MAIN_TRIP	M_TRIP	Y
8	BACK OC/EF TRIP	BU_TRIP	BU_TRIP	Y
9	AUTO RECLOSE OPTD MAIN CB	MAIN_CB_A/R_OPTD	M CB_AR	Y
10	AUTO RECLOSE OPTD TBC CB	TIE_CB_A/R_OPTD	T CB_AR	Y
11	A/R LOCKOUT OPERATED	A/R_LOCKOUT	AR_L/O	Y
12	MAIN CARRIER RECEIVE	MAIN_CARR_REC	M_CR_RC	Y
13	DT RECEIVE CHANNEL - 1/2	DT_REC_CH1/2	DTRC1/2	Y
14	3 PH. GROUP A OPERATED	3PH_GR_A_OPTD	GRA_OPD	Y
15	3 PH. GROUP B OPERATED	3PH_GR_B_OPTD	GRB_OPD	Y
16	OVER VOLTAGE STAGE-1/2 OPERATED	O/V_STG1/2_OPTD	O/V_ST1/2	Y
17	POWER SWING DET.	PS_DETECTED	PS_DET	Y
18	BUSBAR OPERATED	BUSBAR_OPTD	BB_OPD	Y
19	MAIN / TBC LBB OPERATED	MAIN/TBC_LBB_OPTD	MT_LBB	Y
20	MAIN/TBC CB POLE DISCREPANCY	M/T_CB_POLE_DISC	M/T_PLDSC	N
21	ZONE-1 OPTD.	Z1_OPTD	Z1_OP	Y
22	ZONE-2 START	Z2_START	Z2_ST	N
23	ZONE-2 OPTD.	Z2_OPTD	Z2_OP	Y
24	ZONE-3 START	Z3_START	Z3_ST	N
25	ZONE-3 OPTD.	Z3_OPTD	Z3_OP	Y
26	REVERSE ZONE START	ZR_START	ZR_ST	N
27	DIRECT TRIP SEND	DIR_TR SEND	DT_SEND	Y
28	VT FUSE FAIL	VT_FUSE_FAIL	VT_FAIL	Y
29	SOTF OPTD	SOTF_OPD	SOTF	Y
30	MAIN DEF OPTD	M_DEF_OPD	DEF_OPD	Y
31	CARR. SEND	CARR. SEND	CRSD	Y
32	CARRIER AIDED TRIP	CARR_AID_TRIP	CAR_AID	Y

C. DIGITAL CHANNEL - 16 CHANNEL DR

SN	Channel Description	(Limited to 16 Characters)	7 characters	Triggers
1	MAIN CB R-PHASE OPEN	MAIN_CB_R_OPEN	M CB_RO	Y
2	MAIN CB Y-PHASE OPEN	MAIN_CB_Y_OPEN	M CB_YO	Y
3	MAIN CB B-PHASE OPEN	MAIN_CB_B_OPEN	M CB_BO	Y
4	TBC CB R-PHASE OPEN	TBC_CB_R_OPEN	T CB_RO	Y
5	TBC CB Y-PHASE OPEN	TBC_CB_Y_OPEN	T CB_YO	Y
6	TBC CB B-PHASE OPEN	TBC_CB_B_OPEN	T CB_BO	Y
7	MAIN TRIP	MAIN_TRIP	M_TRIP	Y
8	BACK OC/EF TRIP	BU_TRIP	BU_TRIP	Y
9	AUTO RECLOSE OPTD M/T CB	M/T_CB_A/R_OPTD	M/TCBAR	Y
10	MAIN CARRIER RECEIVE	MAIN_CARR_REC	M_CR_RC	Y
11	DT RECEIVE CHANNEL - 1/2	DT_REC_CH1/2	DTRC1/2	Y
12	OVER VOLTAGE STAGE-1/2 OPERATED	O/V_STG1/2_OPTD	OVST1/2	Y
13	BUSBAR OPERATED	BUSBAR_OPTD	BB_OPD	Y
14	MAIN/TBC CB LBB OPERATED	M/T_LBB_OPTD	M/T_LBB	Y
15	POWER SWING DET.	PS_DETECTED	PS_DET	Y
16	DIRECT TRIP SEND	DIR_TR SEND	DT_SEND	Y

Annexure -A.7

DR of the following list of events not received

Sl. No.	Name of tripping element/ Description	Owner	DR to be furnished by	Date & Time of Event
1	400 kV Balipara - Ranganadi II	POWERGRID	**POWERGRID**	2202 Hrs on 01.01.15
2	400 kV Balipara - Ranganadi II	POWERGRID	**POWERGRID**	1311 Hrs on 02.01.15
3	132 kV Dimapur (PG) - Kohima	DoP, Nagaland	**POWERGRID & DoP, Nagaland**	1330 Hrs on 02.01.15
4	400 kV Balipara - Ranganadi II	POWERGRID	**POWERGRID**	2311 Hrs on 03.01.15
5	132 kV Loktak - Ningthoukhong	MSPCL	**NHPC**	0228 Hrs on 05.01.15
6	400 kV Balipara - Ranganadi II	POWERGRID	**POWERGRID**	1235 Hrs on 09.01.15
7	132 kV Imphal (PG) - Imphal (Manipur) I	POWERGRID	**POWERGRID**	2020 Hrs on 15.01.15
8	132 kV Dimapur (PG) - Kohima	DoP, Nagaland	**POWERGRID & DoP, Nagaland**	1545 Hrs on 17.01.15
9	132 kV Loktak - Imphal (PG)	POWERGRID	**POWERGRID, NPHC**	1302 Hrs on 19.01.15
	132 kV Loktak - Ningthoukhong	MSPCL		
	132 kV Ningthoukong - Imphal(PG)	POWERGRID / MSPCL		
10	132 kV Aizwal - Kumarghat	POWERGRID	**POWERGRID**	1128 Hrs on 22.01.15
				1142 Hrs on 22.01.15
11	132 kV Loktak - Ningthoukhong	POWERGRID / MSPCL	**POWERGRID & NHPC**	1832 Hrs on 24.01.15
12	400 kV Balipara - Ranganadi II	POWERGRID	**POWERGRID**	1119 Hrs on 27.01.15
13	400 kV Balipara - Ranganadi II	POWERGRID	**POWERGRID**	1221 Hrs on 27.01.15
14	400 kV Bongaigaon - New Siliguri IV	POWERGRID	**POWERGRID**	1330 Hrs on 02.02.15
15	132 kV Loktak - Rengpang	MSPCL	**NHPC**	1610 Hrs on 03.02.15
16	220 kV AGBPP - Tinsukia I	AEGCL	**NEEPCO & AEGCL**	1158 Hrs on 05.02.15
	220 kV AGBPP - Tinsukia II			
17	132 kV Dimapur (PG) - Kohima	DoP, Nagaland	POWERGRID & DoP, Nagaland	1130 Hrs on 06.02.15
18	132 kV Imphal (PG) - Imphal (Manipur) I	POWERGRID	POWERGRID	0554 Hrs on 08.02.15

Annexure -A.7

DR of the following list of events not received

Sl. No.	Name of tripping element/ Description	Owner	DR to be furnished by	Date & Time of Event
19	400 kV Balipara - Ranganadi I	POWERGRID	**POWERGRID**	0656 Hrs on 13.02.15
20	220 kV Misa - Dimapur I	POWERGRID	**POWERGRID**	1736 Hrs on 16.02.15
	132 kV Loktak - Ningthoukhong	MSPCL	**NHPC**	
	132 kV Dimapur - Bokajan	AEGCL	**POWERGRID & AEGCL**	
21	132 kV Dimapur - Bokajan	AEGCL	**POWERGRID & AEGCL**	2122 Hrs on 16.02.15
	132 kV Dimapur - Imphal	POWERGRID	**POWERGRID**	2124 Hrs on 16.02.15
	132 kV Dimapur (PG) - Kohima	DoP, Nagaland	**POWERGRID & DoP, Nagaland**	
22	132 kV Bokajan - Golaghat	AEGCL	**AEGCL**	0530 Hrs on 17.02.15
23	132 kV Imphal (PG) - Imphal (Manipur) I	MSPCL	**POWERGRID**	1344 Hrs on 17.02.15
24	220 kV AGBPP - Tinsukia II	AEGCL	**AEGCL & NEEPCO**	1334 Hrs on 18.02.15
25	132 kV Loktak - Jiribam	POWERGRID	**POWERGRID & NHPC**	0620 Hrs on 19.02.15
26	400 kV Balipara - Ranganadi II	POWERGRID	**POWERGRID**	0958 Hrs on 19.02.15
27	132 kV Loktak - Imphal (PG)	POWERGRID	**POWERGRID & NHPC**	0621 Hrs on 20.02.15
28	132 kV Imphal (PG) - Imphal (Manipur) I	MSPCL	**POWERGRID**	0111 Hrs on 22.02.15
29	132 kV Loktak - Imphal (PG)	POWERGRID	**POWERGRID & NHPC**	0356Hrs on 22.02.15
30	132 kV Loktak - Ningthoukhong	MSPCL	**NHPC**	1408 Hrs on 22.02.15

Annexure -A.7

DR of the following list of events not received

Sl. No.	Name of tripping element/ Description	Owner	DR to be furnished by	Date & Time of Event
31	400 kV Bongaigaon - New Siliguri I	POWERGRID	**All the constituents of NER**	1809 Hrs on 23.02.15
	400 kV Bongaigaon - New Siliguri II	POWERGRID		
	400 kV Bongaigaon - New Siliguri IV	ENICL		
	400 kV Balipara - Bongaigaon II	POWERGRID		
	400 kV Bongaigaon-Azara	NETC		
	400 kV Bongaigaon- Byrnihat	NETC		
	400/220 kV, 315 MVA ICT at Bongaigaon	POWERGRID		
	220 kV BTPS - Salakati I	POWERGRID		
	220 kV BTPS - Salakati II	POWERGRID		
32	132 kV Dimapur (PG) - Imphal (PG)	POWERGRID	**POWERGRID**	1013 Hrs on 25.02.15
33	400/220 kV, 315 MVA ICT at Balipara	POWERGRID	**POWERGRID**	1452 Hrs on 26.02.15
34	132 kV Dimapur (PG) - Kohima	DoP, Nagaland	**POWERGRID & DoP, Nagaland**	1413 Hrs on 27.02.15
35	400 kV Bongaigaon - New Siliguri IV	ENICL	**POWERGRID**	1206 Hrs on 27.02.15
36	132 kV Balipara - Depota	AEGCL	**POWERGRID & AEGCL**	1425 Hrs on 27.02.15
37	220 kV AGBPP - Mariani(PG)	POWERGRID	**NEEPCO, POWERGRID, AEGCL & DoP, Arunachal Pradesh**	1738 Hrs on 28.02.15
	220 kV AGBPP - Mariani(S)	POWERGRID		
	220 kV AGBPP - Tinsukia I	AEGCL		
	220 kV AGBPP - Tinsukia II	AEGCL		
	220 kV AGBPP - Deomali	DoP, Arunachal Pradesh		

Annexure – A.8

Format for intimating the failure of Transmission line Towers

1. Name of Transmission line with voltage level:
2. Length of line (km):
3. Type of configuration:
   [(S/C, D/C, S/C strung on D/C towers,
   narrow base etc.)]
4. Number of Towers and Type of Towers failed:
   [suspension/ tension/ dead end/ special tower/
   river crossing tower/ Powerline crossing/ Railway crossing etc.,
   with/ without extension
   (indicate the type & length of extension)]
5. Tower location no. with reference to nearest substation (indicate name):
6. Name and size of conductor:
7. No. of sub-conductors per bundle and bundle spacing:
8. Number and size of Ground wire/ OPGW (if provided):
9. Type of insulators in use (Porcelain/ Glass/ Polymer):
10. Configuration of insulators (I/ V/ Y/ tension):
11. No. of insulators per string and No. of strings per phase:
12. Year of construction/ commissioning:
13. Executing Agency:
14. Weather condition on the date of failure:
15. Terrain Category
16. Wind Zone (1/2/3/4/5/6) and velocity of wind:
17. Details of earthing of tower (pipe type/ Counter poise):
18. Line designed as per IS: 802 (1977/1995/ any other code):
19. The agency who designed the line:
20. Any special consideration in design:
21. Date and time of occurrence/ discovery of failure:
22. Power flow in the line prior to failure:
23. Any missing member found before/ after failure of towers:
24. Condition of foundation after failure:
25. Brief description of failure:
    [alongwith photographs(if available), other
    related information like tower schedule,
    newspaper clipping for cyclone/ wind storm etc.]
26. Probable cause of failure:
27. Details of previous failure of the line/ tower:
28. Whether line will be restored on ERS or Space tower will be used:
29. Likely date of restoration:
30. Present Status:
31. Details of any Test carried out after failure:
32. Any other relevant information:

Profoma for details of equipment failure

(Information should be in detail and test reports should be furnished)

1. Name of Substation :
2. Utility/ Owner of substation :
3. Faulty Equipment :
4. Rating :
5. Make :
6. Sr. No. :
7. Year of manufacturing :
8. Year of commissioning :
9. Date and time of occurrence/ discovery of fault :
10. Fault discovered during (Operation/ maintenance) :
11. Present condition of equipment :
12. Details of previous maintenance :
13. Details of previous failure :
14. Sequence of events/ Description of fault :
15. Details of Tests done after failure :
16. Conclusion/ recommendation :

Annexure – A.9

Status on the activities finalized during the Joint Meeting of NERPC, NERLDC & constituents of NER held on 29-Dec-2014.

Furnished by AEGCL on 23.02.15:

a. All the numerical relays were intensively tested by us before commissioning. The efficacy of the relays is expected to be as per the desire. Wherever we have suspected problem, we have thoroughly tested these relays.
b. Relay settings have been changed whenever necessary.
c. DPR schemes are already in place at all substations.
d. Routine maintenance of transmission line is being taken vigorously to avoid tripping of lines on account of growth of vegetation.
e. AR scheme will be implemented for 132 kV (important) lines once the requisite fund from PSDF is obtained for replacement some breakers.

Furnished by OTPC on 23.02.15:

a. All the numerical relays were intensively tested by during the month of August, 2014. The efficiency of the relays is expected to be as per the desire. Whenever we have suspected any problem, we test the relays.
b. Auto Reclose scheme is active in all the relays installed in lines.
c. Auto Reclose scheme is implemented in all line relay i.e. 400 kV and 132 kV.

Furnished by MSPCL on 23.02.15:

a. All numerical relays and E/M type at 33 kV level and 132 kV have been checked for healthiness and found OK.
b. Relay settings are periodically reviewed as per necessity.
c. Distance protection scheme are available in all 132 kV line feeders.
d. Periodic cutting of vegetation growth to avoid unwanted trippings have already started.
e. Single phase / 3 phase auto reclose scheme of 132 kV transmission lines are available.

Furnished by Me. PTCL on 23.02.15:

a. Testing of relays was done before and after commissioning. Testing of existing relays of Me. PTCL is in progress as per Agenda item No. A.9, discussed in the 29th PCC Meetings. Progressed report of testing was sent to NERLDC. The substations completed are:

1. Khliehriat
2. NEHU
3. NEIGRIHMS
4. Umtru
5. Lumshnong

Testing of relays at Mawlai substation is also completed. Now testing of relays at 132 kV Mawphlang is going ON (Report to be sent after completion).

b. Relay setting (Distance & Backup relays) at Khliehriat substation were reset to reduce wanted trippings.

c. Distance Protection Scheme is available for all 132 kV & 220 kV lines of MePTCL except the following listed lines where distance protection is not installed,

1. Khliehriat(M)-Khliehriat (PG) II
2. NEHU – Mawlai
3. Umiam – NEHU
4. Umtru – EPIP I
5. Umtru – EPIP II
6. EPIP II – Umtru I
7. EPIP II – Umtru II
8. Nongstoin – Mawngap
9. Nangalbibra – Agia
10. Lumshong – Khliehriat
11. EPIP II – EPIP I line I
12. EPIP II – EPIP I line II
13. Cherra – Mawlai

d. Jungle clearing is being carried out by TLMSD personnel from time to time

e. Auto Reclose has not been implemented in any of the substations.

Furnished by Nagaland:

a. To avoid unwanted trippings, Periodic cutting of vegetation growth have already started in all important Lines.

b. Scheduled for testing of relays in all 132 kV Sub-stations have been formulated and will commence from first week of March, 2015.

c. Distance Protection and Auto-Reclosure Schemes are presently not available in Nagaland.

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
1. Owner of Line/End: Assam, AEGCL													
1	Balipara-Depota	132	Balipara	Yes (7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Depota	Yes (7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
2	Balipara-Ghoramari	132	Balipara	Yes (7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Ghoramari	Yes (7SA61 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
3	Depota-Ghoramari	132	Depota	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Ghoramari	Yes (7SA61 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
4	Balipara- Gohpur	132	Balipara	Yes (7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Gohpur	Yes (REL670 ABB)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
5	Barnagar-Dhaligaon	132	Barnagar	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Dhaligaon	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
6	Barnagar-Rangia	132	Barnagar	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Rangia	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
7	B.Chariali-Depota	132	B.Chariali	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Depota	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
8	B.Chariali-Gohpur	132	B.Chariali	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Gohpur	Yes(SEL321)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
9	Depota-Rowta I	132	Depota	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Rowta I	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
10	Depota-Rowta II	132	Depota	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Rowta II	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
11	Dhaligaon-APM	132	Dhaligaon	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			APM	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
12	Dhaligaon-BRPL	132	Dhaligaon	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			BRPL	NoT KNoWN									
13	Dhaligaon-Gosaigaon	132	Dhaligaon	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Gossaigaon	Yes (7SA61 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
14	Dhaligaon-Nailbari	132	Dhaligaon	Yes (7SA61 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Nalbari	Yes (REL 670 ABB)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
15	BTPS (Salakati)-Dhaligaon I	132	BTPS (Salakati)	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Dhaligaon I	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
16	BTPS (Salakati)-Dhaligaon II	132	BTPS (Salakati)	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Dhaligaon II	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
17	Dhaligaon-Salakati I	132	Dhaligaon										
			Salakati I										

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
18	Dhaligaon-Salakati II	132	Dhaligaon										
			Salakati II										
19	Dibrugarh-Moran	132	Dibrugarh										
			Moran										
20	Dibrugarh-Behiating	132	Dibrugarh	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Behiating	Yes (7SA61 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
21	Moran-Behiating	132	Moran	Yes (GRZ-100 TOSHIBA)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Behiating	Yes (7SA61 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
22	Dibrugarh-Tinsukia	132	Dibrugarh	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Tinsukia	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
23	Garmur-Bokakhat	132	Garmur	Yes (7SA61 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Bokakhat	Yes (GRZ-100 TOSHIBA)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
24	Gohpur-North Lakhimpur I	132	Gohpur	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			North Lakhimpur I	Yes (D60 GE)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
25	Gohpur-North Lakhimpur II	132	Gohpur	Yes (D60 GE)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			North Lakhimpur II	Yes (D60 GE)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
26	Dimapur (PG) - Bokajan	132	Dimapur (PG)	PGCIL	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Bokajan	Yes (P442 MICOM)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
27	Golaghat-Mariani	132	Golaghat	Yes (GRZ-100 TOSHIBA)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Mariani	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
28	Golaghat-Bokajan	132	Golaghat	Yes (GRZ-100 TOSHIBA)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
		132	Bokajan	Yes (7SA52 SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
29	Gossaingaon-Gauripur	132	Gossaigaon	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Gauripur	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
30	Haflong - Lower Haflong	132	Haflong		Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Lower Haflong		Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
31	Kahilipara-Chandrapur	132	Kahilipara										
			Chandrapur										
32	CTPS - Jagiroad (Bagjhap)	132	CTPS	Yes(D60 GE)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Jagiroad (Bagjhap)	Yes (7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
33	Jagiroad (Bagjhap) - HPC, Jagiroad	132	Jagiroad (Bagjhap)	Yes (7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			HPC, Jagiroad	NoT KNoWN									
34	Nazira - Jorhat	132	Nazira	Yes (7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Jorhat	Yes(D60 GE)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
35	Kahilipara-Narengi	132	Kahilipara	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Narengi	Yes(REL670 ABB)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
36	Kahilipara-Rangia	132	Kahilipara	Yes (7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Rangia	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
37	Kahilipara-Sarusajai I	132	Kahilipara	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Sarusajai I	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
38	Kahilipara-Sarusajai II	132	Kahilipara	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Sarusajai II	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
39	Kahilipara-Sarusajai III	132	Kahilipara	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Sarusajai III	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
40	Kahilipara-Sarusajai IV	132	Kahilipara	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Sarusajai IV	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
41	Kahilipara-Sisugram	132	Kahilipara	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Sisugram	Yes(RAZOA ABB)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
42	Dullavcherra - Dharmanagar	132	Dullavcherra	Yes (7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Dharmanagar	NoT KNoWN	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
43	Lakwa-Mariani	132	Lakwa	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Mariani	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
44	Lakwa-Moran	132	Lakwa	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Moran	Yes(GRZ-100 TOSHIBA)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
45	Srikona - Panchgram(Old)	132	Srikona	Yes(REL670 ABB)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Panchgram(Old)	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
46	Panchgram - Panchgram(Old)	132	Panchgram	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Panchgram(Old)	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
47	NTPS - LTPS (Maidela)	132	NTPS	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			LTPS (Maidela)	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
48	NTPS - Sonari	132	NTPS	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Sonari	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
49	Sonari- LTPS (Maidela)	132	Sonari	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			LTPS (Maidela)	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
50	Lakwa-Namrup I	132	Lakwa	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Namrup I	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
51	Lakwa-Namrup II	132	Lakwa	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Namrup II	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
52	Lakwa-Nazira	132	Lakwa	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Nazira	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
53	Mariani-Garmur I	132	Mariani	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Garmur I	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
54	Mariani-Garmur II	132	Mariani	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Garmur II	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
55	Nalbari-Rangia	132	Nalbari	Yes(REL670 ABB)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Rangia	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
56	Namrup-Tinsukia	132	Namrup	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Tinsukia	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
57	Nazira-Betbari	132	Nazira	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Betbari	Yes(GRZ-100 TOSHIBA)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
58	North Lakhimpur-Dhemaji	132	North Lakhimpur	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Dhemaji	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
59	North Lakhimpur- Majuli	132	North Lakhimpur	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Majuli	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
60	Narengi- Chandrapur	132	Narengi	Yes(REL670 ABB)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Chandrapur	Yes(D60 GE)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
61	Pailapool-Srikona	132	Pailapool	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Srikona	Yes(REL670 ABB)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
62	Panchgram-Dullavchera	132	Panchgram	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Dullavcherra	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
63	Panchgram-HPL	132	Panchgram	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			HPL	NoT KNoWN									
64	Panchgram-Srikona	132	Panchgram	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Srikona	Yes(REL670 ABB)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
65	Rangia (Chirakhundi) - Nalbari (Sariahatali)	132	Rangia (Chirakhundi)	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Nalbari (Sariahatali)	Yes(REL670 ABB)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
66	Rangia-Rowta	132	Rangia	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Rowta	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
67	Rangia-Sipajhar	132	Rangia	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Sipajhar	Yes(REL670 ABB)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
68	Rangia-Sisugram	132	Rangia	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Sisugram	Yes(RAZOA ABB)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
69	Samaguri- B.Chariali	132	Samaguri	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			B.Chariali	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
70	Samaguri- Khalaigaon	132	Samaguri	Yes(P442 MICOM)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Khalaigaon	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
71	Samaguri-S.Dev Nagar I	132	Samaguri	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			S.Dev Nagar I	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
72	Diphu-S.DevNagar	132	Diphu	Yes(GRZ-100 TOSHIBA)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			S.Dev Nagar	Yes(P442 MICOM)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
73	Sipajhar-Rowta	132	Sipajahar	Yes(REL670 ABB)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Rowta	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
74	Tinsukia-Margherita I	132	Tinsukia	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Margherita I	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
75	Tinsukia-Margherita II	132	Tinsukia	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Margherita II	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
76	Nalkata-Gohpur I	132	Nalkata										
			Gohpur I										
77	Nalkata-Gohpur II	132	Nalkata										
			Gohpur II										
78	Dispur-KHP	132	Dispur	Yes(P442 MICOM)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			KHP	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
79	Dispur-Chandrapur	132	Dispur	Yes(P442 MICOM)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Chandrapur	Yes(D60 GE)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
80	Bokajan-Dimapur	132	Bokajan										
			Dimapur										
81	Chandrapur-Bagjap	132	Chandrapur										
			Bagjap										
82	LTPS (Maidela) - Nazira I	132	LTPS (Maidela)	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Nazira I	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
83	LTPS (Maidela) - Nazira II	132	LTPS (Maidela)	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Nazira II	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
84	Sankardev Nagar (Lanka) - Diphu	132	Sankardev Nagar (Lanka)	Yes(P442 MICOM)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Diphu	Yes(GRZ-100 TOSHIBA)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
85	Sankardev Nagar (Lanka) - TELCOM	132	Sankardev Nagar (Lanka)	Yes(P442 MICOM)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			TELCOM	Not KNown	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
2. Owner of Line/End: MSPCL (Manipur)													
1	Ningthoukhong - Churanchandpur I	132	Ningthoukhong	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
			Churanchandpur	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
2	Ningthoukhong - Churanchandpur II	132	Ningthoukhong	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
			Churanchandpur	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
3	Rengpang - Jiribam	132	Rengpang	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
			Jiribam(Manipur)	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
4	Imphal(Manipur) - Karong	132	Imphal(Manipur)	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
			Karong	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
5	Imphal(Manipur) - Yaingangpokpi	132	Imphal(Manipur)	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
			Yaingangpokpi	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
6	Yaingangpokpi - Kongba	132	Yaingangpokpi	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
			Kongba	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
7	Kongba - Kakching	132	Kongba	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
			Kakching	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
8	Kakching - Churanchandpur	132	Kakching	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
			Churanchandpur	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
3. Owner of Line/End: Meghalaya, MePTCL													
1	Umiam St IV (Nongkhyllem) - Umtru I	132	Umiam St IV (Nongkhyllem)	Yes, ABB make REL670, Numerical	Yes, Directional P127, Areva make	No	Yes, REL670 Relay	Yes, REL670 Relay	No	1	Yes, REL670 & P127 Relay	Yes, REL670 & P127 Relay	Yes, REL670 Relay
			Umtru	Yes, Areva make P442, Numerical	Yes, Directional CDD, EE make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 Relay	Yes, P442 Relay	Yes, P442 Relay
2	Umiam St IV (Nongkhyllem) - Umtru II	132	Umiam St IV (Nongkhyllem)	Yes, ABB make REL670, Numerical	Yes, Directional P127, Areva make	No	Yes, REL670 Relay	Yes, REL670 Relay	No	1	Yes, REL670 & P127 Relay	Yes, REL670 & P127 Relay	Yes, REL670 Relay
			Umtru	Yes, Toshiba make GRZ100, Numerical	Yes, Directional CDD, EE make	No	Yes, GRZ100 Relay	Yes, GRZ100 Relay	No	1	Yes, GRZ100 Relay	Yes, GRZ100 Relay	Yes, GRZ100 Relay
3	Umiam St III (Kyrdemkulai) - Umtru I	132	Umiam St III (Kyrdemkulai)	Yes, ABB make REL670, Numerical	Yes, Directional P127, Areva make	No	Yes, REL670 Relay	Yes, REL670 Relay	No	1	Yes, REL670 & P127 Relay	Yes, REL670 & P127 Relay	Yes, REL670 Relay
			Umtru	Yes, Areva make P442, Numerical	Yes, Directional JNP096, JVS make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 Relay	Yes, P442 Relay	Yes, P442 Relay
4	Umiam St III (Kyrdemkulai) - Umtru II	132	Umiam St III (Kyrdemkulai)	Yes, Toshiba make GRZ100, Numerical	Yes, Directional P127, Areva make	No	Yes, GRZ100 Relay	Yes, GRZ100 Relay	No	1	Yes, GRZ100 & P127 Relay	Yes, GRZ100 & P127 Relay	Yes, GRZ100 Relay
			Umtru	Yes, Areva make P442, Numerical	Yes, Directional JNP096, JVS make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 Relay	Yes, P442 Relay	Yes, P442 Relay
5	Umiam St III (Kyrdemkulai) - Umiam St I (Sumer) I	132	Umiam St III (Kyrdemkulai)	Yes, ABB make REL670, Numerical	Yes, Directional P127, Areva make	No	Yes, REL670 Relay	Yes, REL670 Relay	No	1	Yes, REL670 & P127 Relay	Yes, REL670 & P127 Relay	Yes, REL670 Relay
			Umiam St I (Sumer)	Yes, Areva make P442, Numerical	Yes, Directional P141, Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P141Relay	Yes, P442 & P141Relay	Yes, P442 Relay

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Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
6	Umiam St III (Kyrdemkulai) - Umiam St I (Sumer) II	132	Umiam St III (Kyrdemkulai)	Yes, ABB make REL670, Numerical	Yes, Directional P127, Areva make	No	Yes, REL670 Relay	Yes, REL670 Relay	No	1	Yes, REL670 & P127 Relay	Yes, REL670 & P127 Relay	Yes, REL670 Relay
			Umiam St I (Sumer)	Yes, Areva make P442, Numerical	Yes, Directional P141, Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P141Relay	Yes, P442 & P141Relay	Yes, P442 Relay
7	EPIP II - Umtru I	132	EPIP II	No	No	No	No	No	No	0	No	No	No
			Umtru	No	Yes, Directional IDMTL, ER make	No	No	No	No	0	No	No	No
8	EPIP II - Umtru II	132	EPIP II	No	Yes, Directional CDD, ER make	No	No	No	No	0	No	No	No
			Umtru	No	Yes, Directional JNP060, JVS make	No	No	No	No	0	No	No	No
9	EPIP II - EPIP I (I)	132	EPIP II	No	No	No	No	No	No	0	No	No	No
			EPIP I	No	No	No	No	No	No	0	No	No	No
10	EPIP II - EPIP I (II)	132	EPIP II	No	No	No	No	No	No	0	No	No	No
			EPIP I	No	No	No	No	No	No	0	No	No	No
11	Khliehriat - Myntdu Leshka I	132	Khliehriat	Yes, ABB make REL670, Numerical	Yes, Directional REX521,ABB make	No	Yes, REL670 Relay	Yes, REL670 Relay	No	1	Yes, REL670 & REX521 Relay	Yes, REL670 & REX521 Relay	Yes, REL670 Relay
			Myntdu Leshka	Yes, ABB make REL670, Numerical	Yes, Directional REX521,ABB make	No	Yes, REL670 Relay	Yes, REL670 Relay	No	1	Yes, REL670 & REX521 Relay	Yes, REL670 & REX521 Relay	Yes, REL670 Relay
12	Khliehriat - Myntdu Leshka II	132	Khliehriat	Yes, ABB make REL670, Numerical	Yes, Directional REX521,ABB make	No	Yes	Yes	No	1	Yes, REL670 & REX521 Relay	Yes, REL670 & REX521 Relay	Yes
			Myntdu Leshka	Yes, ABB make REL670, Numerical	Yes, Directional REX521,ABB make	No	Yes, REL670 Relay	Yes, REL670 Relay	No	1	Yes, REL670 & REX521 Relay	Yes, REL670 & REX521 Relay	Yes, REL670 Relay

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
13	Killing - EPIP II (I)	132	Killing	Yes, ABB make REL670, Numerical	Yes, Areva make P442, Numerical	No	Yes, REL670, P442 Relay	Yes, REL670, P442 Relay	No	1	Yes, REL670, P442 Relay	Yes, REL670, P442 Relay	Yes, REL670, P442 Relay
			EPIP II	Yes, Areva make P442, Numerical	Yes, Directional P127, Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P127 Relay	Yes, P442 & P127 Relay	Yes, P442 Relay
14	Killing - EPIP II (II)	132	Killing	Yes, ABB make REL670, Numerical	Yes, Areva make P442, Numerical	No	Yes, REL670, P442 Relay	Yes, REL670, P442 Relay	No	1	Yes, REL670, P442 Relay	Yes, REL670, P442 Relay	Yes, REL670, P442 Relay
			EPIP II	Yes, Areva make P442, Numerical	Yes, Directional P127, Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P127 Relay	Yes, P442 & P127 Relay	Yes, P442 Relay
15	Umiam St I (Sumer) - Mawngap I	132	Umiam St I (Sumer										
			Mawngap	Yes, Alstom make P442, Numerical	Yes, Directional P141, Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P141Relay	Yes, P442 & P141Relay	Yes, P442 Relay
16	Umiam St I (Sumer) - Mawngap II	132	Umiam St I (Sumer										
			Mawngap	Yes, Alstom make P442, Numerical	Yes, Directional P141, Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P141Relay	Yes, P442 & P141Relay	Yes, P442 Relay
17	Mawlai - Mawngap I	132	Mawlai	Yes, Areva make P442, Numerical	Yes, Directional P127 Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P127 Relay	Yes, P442 & P127 Relay	Yes, P442 Relay
			Mawngap	Yes, Alstom make P442, Numerical	Yes, Directional P141, Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P141Relay	Yes, P442 & P141Relay	Yes, P442 Relay

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
18	Nongstoin - Mawngap	132	Nongstoin	No	No	No	No	0	No	No	No		
			Mawngap	Yes, Alstom make P442, Numerical	Yes, Directional P141, Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P141Relay	Yes, P442 & P141Relay	Yes, P442 Relay
19	Nongstoin - Nangalbibra	132	Nongstoin	Yes, Areva make P442, Numerical	Yes, Directional P127, Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P127 Relay	Yes, P442 & P127 Relay	Yes, P442 Relay
			Nangalbibra	Yes, Areva make P442, Numerical	Yes, Directional P127, Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P127 Relay	Yes, P442 & P127 Relay	Yes, P442 Relay
20	Khliehriat - NEHU	132	Khliehriat	Yes, Areva make P442, Numerical	Yes, Directional CDD, EE make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 Relay	Yes, P442 Relay	Yes, P442 Relay
			NEHU	Yes, Areva make P442, Numerical	Yes, Directional P127 Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P127 Relay	Yes, P442 & P127 Relay	Yes, P442 Relay
21	Khliehriat - NEIGRIHMS	132	Khliehriat	Yes, ABB make REL670, Numerical	Yes, Directional CDD, EE make	No	Yes, REL670 Relay	Yes, REL670 Relay	No	1	Yes, REL670 Relay	Yes, REL670 Relay	Yes, REL670 Relay
			NEIGRIHMS	Yes, Areva make P442, Numerical	Yes, Directional CDD, EE make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 Relay	Yes, P442 Relay	Yes, P442 Relay
22	NEIGRIHMS - NEHU	132	NEIGRIHMS	No	Yes, Directional CDD, EE make	No	No	No	No	0	No	No	No
			NEHU	Yes, EE make RR3V, EM	Yes, Directional P127 Areva make	No	No	No	No	1	Yes, P127 Relay	Yes, P127 Relay	No
23	Nangalbibra - Rongkhon (Tura)	132	Nangalbibra	Yes, Areva make P442, Numerical	Yes, Directional P127, Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P127 Relay	Yes, P442 & P127 Relay	Yes, P442 Relay
			Rongkhon (Tura)	No	Yes, Directional P127, Areva make	No	No	No	No	0	Yes, P127 Relay	Yes, P127 Relay	No

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Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
24	Lumshnong - Khliehriat	132	Lumshnong	No	Yes, Directional IDMTL, ER make	No	No	No	No	0	No	No	No
			Khliehriat	Yes, Areva make P442, Numerical	Yes, Directional CDD, EE make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 Relay	Yes, P442 Relay	Yes, P442 Relay
25	Sohra (Cherrapunjee) - Mawlai	132	Sohra (Cherrapunjee)										
			Mawlai	Yes, Areva make P442, Numerical	Yes, Directional P127 Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P127 Relay	Yes, P442 & P127 Relay	Yes, P442 Relay
26	Umiam St I (Sumer) - Umiam	132	Umiam St I (Sumer)	Yes, Areva make P442, Numerical	Yes, Directional P141, Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P141Relay	Yes, P442 & P141Relay	Yes, P442 Relay
			Umiam	Yes, Toshiba make GRZ100, numerical	Yes, Directional JNP066, JVS make	No	Yes, GRZ100 Relay	Yes, GRZ100 Relay	No	1	Yes, GRZ 100 Relay	Yes, GRZ 100 Relay	Yes, GRZ100 Relay
27	Umiam - NEHU	132	Umiam	No	Yes, Directional JNP066, JVS make	No	No	No	No	0	No	No	No
			NEHU	Yes, EE make RR3V, EM	Yes, Directional P127 Areva make	No	No	No	No	1	Yes, P127 Relay	Yes, P127 Relay	No
28	Umiam St I (Sumer) - Mawlai	132	Umiam St I (Sumer)	Yes, Areva make P442, Numerical	Yes, Directional P141, Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P141Relay	Yes, P442 & P141Relay	Yes, P442 Relay
			Mawlai	Yes, Areva make P442, Numerical	Yes, Directional P127 Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P127 Relay	Yes, P442 & P127 Relay	Yes, P442 Relay
29	Umiam St III (Kyrdemkulai) - Umiam St IV - I (Nongkhyllem)	132	Umiam St III (Kyrdemkulai)	Yes, ABB make REL670, Numerical	Yes, Directional P127, Areva make	No	Yes, REL670 Relay	Yes, REL670 Relay	No	1	Yes, REL670 & P127 Relay	Yes, REL670 & P127 Relay	Yes, REL670 Relay
			Umiam St IV (Nongkhyllem)	Yes, ABB make REL670, Numerical	Yes, Directional P127, Areva make	No	Yes, REL670 Relay	Yes, REL670 Relay	No	1	Yes, REL670 & P127 Relay	Yes, REL670 & P127 Relay	Yes, REL670 Relay

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
30	Umiam St III (Kyrdemkulai) - Umiam St IV - II (Nongkhyllem)	132	Umiam St III (Kyrdemkulai)	Yes, Toshiba make GRZ100, Numerical	Yes, Directional JNP053, JVS make	No	Yes, GRZ100 Relay	Yes, GRZ100 Relay	No	1	Yes, GRZ100 & P127 Relay	Yes, GRZ100 & P127 Relay	Yes, GRZ100 Relay
			Umiam St IV (Nongkhyllem)	Yes, ABB make REL670, Numerical	Yes, Directional P127, Areva make	No	Yes, REL670 Relay	Yes, REL670 Relay	No	1	Yes, REL670 & P127 Relay	Yes, REL670 & P127 Relay	Yes, REL670 Relay
31	Mawlai - NEHU	132	Mawlai	No	Yes, Directional P127 Areva make	No	No	No	No	0	Yes, P127 Relay	Yes, P127 Relay	No
			NEHU	Yes, EE make RR3V, EM	Yes, Directional P127 Areva make	No	No	No	No	1	Yes, P127 Relay	Yes, P127 Relay	No
32	Umiam St I (Sumer) - Umiam St II (Umsumer)	132	Umiam St I (Sumer)	Yes, Areva make P442, Numerical	Yes, Directional P141, Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P141Relay	Yes, P442 & P141Relay	Yes, P442 Relay
			Umiam St II (Umsumer)	No	Digital GRD 130,	No	No	No	No	0	Yes, Digital GRD 130 Relay	Yes, Digital GRD 130 Relay	No
33	EPIP II - Trishul	132	EPIP II	No	Yes, Directional CDD, ER make	No	No	No	No	0	No	No	No
			Trishul										
34	EPIP II - Nalari	132	EPIP II	No	Yes, Directional CDD, ER make	No	No	No	No	0	No	No	No
			Nalari										
35	EPIP I - Shyam Century	132	EPIP I	No	Yes, Directional CDD, ER make	No	No	No	No	0	No	No	No
			Shyam Century										
36	EPIP I - Maithan	132	EPIP I	No	Yes, Directional CDD, ER make	No	No	No	No	0	No	No	No
			Maithan										
37	EPIP I - Sai Prakash	132	EPIP I	No	Yes, Directional CDD, ER make	No	No	No	No	0	No	No	No
			Sai Prakash										
38	EPIP I - Greystone/Nezone	132	EPIP I	No	Yes, Directional CDD, ER make	No	No	No	No	0	No	No	No
			Greystone/Nezone										
39	EPIP I - Megha Carbides	132	EPIP I										

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
39	LPHP I - Megha Carbides	132	Megha Carbides										
40	Lumshnong - CMCL	132	Lumshnong	No	Yes, Directional CDD, ER make	No	No	No	No	0	No	No	No
			CMCL										
41	Lumshnong - MCL	132	Lumshnong	No	Yes, Directional JNC069, JVS make	No	No	No	No	0	No	No	No
			MCL										
42	Lumshnong - Adhunik Cement	132	Lumshnong	No	Yes, Directional JNC069, JVS make	No	No	No	No	0	No	No	No
			Adhunik Cement										
43	Lumshnong - Hill Cement	132	Lumshnong	No	Yes, Directional JNC069, JVS make	No	No	No	No	0	No	No	No
			Hill Cement										
44	Lumshnong - JUD Cement	132	Lumshnong	No	Yes, Directional JNC069, JVS make	No	No	No	No	0	No	No	No
			JUD Cement										
45	Lumshnong - GVIL Cement	132	Lumshnong										
			GVIL Cement										
46	MPL (Meghalaya Power Limited) - Lumnsnong	132	MPL (Meghalaya Power Limited)										
			Lumshnong	No	Yes, Directional P127 Areva make	No	No	No	No	0	No	No	No
47	Sohra (Cherrapunjee) - Mawngap	132	Sohra (Cherrapunjee)	No	Yes, Directional P127, Areva make	No	No	No	No	0	Yes, P127 Relay	Yes, P127 Relay	No
			Mawngap	Yes, Alstom make P442, Numerical	Yes, Directional P141, Areva make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 & P141Relay	Yes, P442 & P141Relay	Yes, P442 Relay

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
4. Owner of Line/End: P&E, Mizoram													
1	Bairabi - Kolasib	132	Bairabi	Micom P430A	Yes	No	No	No	No	4	No	No	No
			Kolasib	No	No	No	No	No	No		No	No	No
2	Zuangtui (Zemabawk) - Bukpui (Serchhip)	132	Zuangtui (Zemabawk)	No	No	No	No	No	No		No	No	No
			Bukpui (Serchhip)	No	No	No	No	No	No		No	No	No
3	Bukpui (Serchhip) - Khawiva (Lunglei)	132	Bukpui (Serchhip)	No	No	No	No	No	No		No	No	No
			Khawiva (Lunglei)	No	No	No	No	No	No		No	No	No
4	Zuangtui (Zemabawk) - Saitual	132	Zuangtui (Zemabawk)	No	Yes (EM)	No	No	No	No		No	No	No
			Saitual	No	Yes (EM)	No	No	No	No		No	No	No
5	Saitual - Khawzawl	132	Saitual	No	Yes (EM)	No	No	No	No		No	No	No
			Khawzawl	No	No	No	No	No	No		No	No	No
5. Owner of Line/End: NEEPCO													
1	Khandong - Kopili -I	132	Khandong										
			Kopili										
2	Khandong - Kopili - II	132	Khandong	Yes, REL 670	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Kopili	Yes, REL 670	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
6. Owner of Line/End: POWERGRID													
1	Badarpur- Jiribam	132	Badarpur (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Jiribam (PG)	Yes, 7SA513	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
2	Aizawl-Kumarghat	132	Aizawl (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Kumarghat (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
3	Badarpur - Khliehriat	132	Badarpur (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Khliehriat (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
4	Badarpur-Kumarghat	132	Badarpur (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Kumarghat (PG)	Yes, 7SA513	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	

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Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
5	Dimapur - Imphal	132	Dimapur (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Imphal (PG)	Yes, 7SA513	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
6	Jiribam - Aizawl	132	Jiribam (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Aizawl (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
7	Jiribam-Haflong	132	Jiribam (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Haflong (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
8	Silchar- Badarpur-1	132	Silchar (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Badarpur (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
9	Silchar- Badarpur-2	132	Silchar (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Badarpur (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
10	Silchar- Imphal-1	132	Silchar (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Imphal (PG)										
11	Silchar- Imphal-2	132	Silchar (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Imphal (PG)										
12	Silchar- Melriat-1	132	Silchar (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Melriat (PG)										
13	Silchar- Melriat-2	132	Silchar (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Melriat (PG)										

Note : 1) Main-I Protection indicates Distance Protection
2) Main-II Protection indicates one of Distance Protection / Directional Comparison Protection / Phase Segregated Line Differential protection
3) Type of Relay indicates it's operational mechanism - Numerical / Static / Electro-mechanical
4) List of inbuilt features of Numerical Relays are also to be furnished alongwith this format

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Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
1. Owner of End : Assam & Meghalaya													
1	Kahilipara-Umtru I	132	Kahilipara	Yes (7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Umtru	Yes, Directional JNP096, JVS make	No	Yes, GRZ100 Relay	Yes, GRZ100 Relay	No	1	Yes, GRZ100 Relay	Yes, GRZ100 Relay	Yes, GRZ100 Relay	
2	Kahilipara-Umtru II	132	Kahilipara	Yes (7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Umtru	Yes, Directional JNP096, JVS make	No	Yes, GRZ100 Relay	Yes, GRZ100 Relay	No	1	Yes, GRZ100 Relay	Yes, GRZ100 Relay	Yes, GRZ100 Relay	
3	Panchgram-Khliehriat	132	Panchgram	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Khliehriat	NoT KNoWN									
4	Panchgram-Lumshnong	132	Panchgram	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Lumshnong	Yes, Areva make P442, Numerical	Non directional CDG, EE make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 Relay	Yes, P442 Relay	Yes, P442 Relay
5	Sarusajai-Umtru	132	Sarusajai	Yes(THR ER)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Umtru	Yes, Areva make P442, Numerical	Yes, Directional CDD, EE make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 Relay	Yes, P442 Relay	Yes, P442 Relay
6	Sarusajai-Umiam Stg IV	132	Sarusajai	Yes(THR ER)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Umiam Stg IV	Yes, Areva make P442, Numerical	Yes, Directional CDD, EE make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 Relay	Yes, P442 Relay	Yes, P442 Relay
7	Agia - Nangalbibra	132	Agia										
			Nangalbibra	No	Yes, Directional P127, Areva make	No	No	No	No	0	Yes, P127 Relay	Yes P127 Relay	No

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
2. Owner of End : Assam & POWERGRID													
1	Mokokchung-Mariani	132	Mokokchung (PG)	Not KNown									
			Mariani	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
2	Pailapool-Jiribam(PG)	132	Pailapool	Yes(7SA SIEMENS)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
			Jiribam(PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
3	Dimapur (PG) - Bokajan	132	Dimapur(PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Bokajan	Yes(THR ER)	Yes (IDMTL)	No	No	Yes	Yes	1	Yes	Yes	Yes
4	Badarpur (PG) - Badarpur		Badarpur (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Badarpur	Yes, MICOM	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
5	Balipara (PG)- Gohpur		Balipara (PG)	Yes, 7SA522	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Gohpur										
6	Gohpur - Nirjuli		Gohpur										
			Nirjuli (PG)	Yes, MICOM	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
7	Haflong (PG)- Haflong		Haflong (PG)	Yes, P442	Yes, P141	Yes	Yes		Yes		Yes	Yes	
			Haflong										
8	Silchar (PG)- Hailakandi I		Silchar (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Hailakandi										
9	Silchar (PG)- Hailakandi II		Silchar (PG)	Yes, MICOM	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Hailakandi										
10	Silchar (PG)- Srikona I		Silchar (PG)	Yes, MICOM P543	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
			Srikona										
11	Silchar (PG)- Srikona II		Silchar (PG)	Yes, MICOM P543	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Srikona										
3. Owner of End : Manipur & POWERGRID													
1	Imphal(Manipur) - Imphal(PG) I	132	Imphal (Manipur)	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
			Imphal(PG)	Yes, O/C	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
2	Imphal(Manipur) - Imphal(PG) II	132	Imphal (Manipur)	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
			Imphal(PG)	Yes, P543 (Differencial)	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
3	Imphal(PG) - Ningthoukhong	132	Imphal(PG)										
			Ningthoukhong	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
4	Jiribam (PG) - Jiribam (Manipur)	132	Jiribam (PG)										
			Jiribam (Manipur)	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
5	Jiribam (PG) - Rengpang	132	Jiribam (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Rengpang										
4. Owner of End : Manipur & NHPC													
1	Loktak - Rengpang	132	Loktak	Yes, Numerical MICOM P442	Yes, (EM relay in addition to Numerical Relay)	Feature exists in SF6 breaker & Numerical Relay	No	Yes	Yes	1 core each	Yes	Yes	Yes
			Rengpang	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No
2	Loktak - Ningthoukhong	132	Loktak	Yes, Numerical MICOM P442	Yes, (EM relay in addition to Numerical Relay)	Feature exists in SF6 breaker & Numerical Relay	No	Yes	Yes	1 core each	Yes	Yes	Yes
			Ningthoukhong	Yes	Yes	Yes	No	No	Yes	4 & 3	No	No	No

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
5. Owner of End : MePTCL & POWERGRID													
1	Khliehriat - Khliehriat (Meghalaya) I	132	Khliehriat (Meghalaya)	Yes, Areva make P442, Numerical	Yes, Directional CDD, EE make	No	Yes, P442 Relay	Yes, P442 Relay	No	1	Yes, P442 Relay	Yes, P442 Relay	Yes, P442 Relay
			Khliehriat (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
2	Khliehriat - Khliehriat (Meghalaya) II	132	Khliehriat (Meghalaya)	No	Yes, Directional P127 Areva make	No	No	No	No	0	Yes, P127 Relay	Yes, P127 Relay	No
			Khliehriat (PG)										
6. Owner of End: P&E, Mizoram & POWERGRID													
1	Badarpur - Kolasib	132	Badarpur (PG)	Yes, MICOM P442	Yes, O/C & E/F	Yes	Yes		Yes		Yes	Yes	
			Kolasib	Yes, 7SA513	Yes, O/C & E/F	Yes	Yes		Yes		Yes	Yes	
2	Kolasib - Aizwal	132	Kolasib	Yes, 7SA513	Yes, O/C & E/F	Yes	Yes		Yes		Yes	Yes	
			Aizwal (PG)	Yes, 7SA513	Yes, O/C & E/F	Yes	Yes		Yes		Yes	Yes	
3	Aizwal - Luangmual	132	Aizwal (PG)										
			Luangmual										
4	Zuangtui (Zemabawk) - Aizwal I	132	Zuangtui (Zemabawk)	No	No	No	No	No	No		No	No	No
			Aizwal (PG)	Yes, 7SA513	Yes, O/C & E/F	Yes	Yes		Yes		Yes	Yes	
5	Zuangtui (Zemabawk) - Aizwal II	132	Zuangtui (Zemabawk)	No	No	No	No	No	No		No	No	No
			Aizwal (PG)	Yes, REL 670	Yes, O/C & E/F	Yes	Yes		Yes		Yes	Yes	

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
7. Owner of End: NEEPCO & POWERGRID													
1	Ranganadi-Nirjuli	132	Rangandi	Semi Numerical, EPAC 3000, Make-Alstom	Yes	Yes (Three Phase)	No	Yes	No	Core-1 of CT & CVT are used for Main-1	No	No	No
			Nirjuli (PG)	Yes, MICOM	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
2	Ranganadi-Ziro	132	Rangandi	Semi Numerical, EPAC 3000, Make-Alstom	Yes	Yes (Three Phase)	No	Yes	No	Core-1 of CT & CVT are used for Main-1	No	No	No
			Ziro (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
3	AGTPP- Kumarghat	132	AGTPP	OPTIMHO (LFZP111S10053E) Make: GEC ALSTOM	No, Directional Inverse type –CDD relay exists	Facility exists but not in service	Yes	Yes	Yes	Core-1 of CT & CVT are used for Main-1	No	No	No
			Kumarghat (PG)	Yes, 7SA513	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
4	Balipara-Khupi	132	Balipara (PG)	Yes, SEL311C	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Khupi										
5	Doyang - Dimapur-I	132	Doyang	Static relay-REL-100, ABB Make	Relay-2TJM-12 (Easun Reyrole)		Yes	No	Yes		Yes		
			Dimapur(PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
6	Doyang - Dimapur-II	132	Doyang	Static relay-REL-100, ABB Make	Relay-2TJM-12 (Easun Reyrole)		Yes	No	Yes		Yes		
			Dimapur(PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
7	Khandong - Haflong	132	Khandong										
			Haflong (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
8	Khandong - Khliehriat-I	132	Khandong										
			Khliehriat (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
9	Khandong - Khliehriat-II	132	Khandong	Yes, 7SA513	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Khliehriat (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
8. Owner of End: NEEPCO & TSECL													
1	132 kV AGTPP-Agartala I	132 kV	AGTPP	OPTIMHO (LFZP111S10053E) Make: GEC ALSTOM	No, Directional Inverse type –CDD relay exists	Facility exists but not in service	Yes	Yes	Yes	Core-1 of CT & CVT are used for Main-1	No	No	No
			Agartala	OPTIMHO		Yes	Yes		Yes		No	No	
2	132 kV AGTPP-Agartala II	132 kV	AGTPP	OPTIMHO (LFZP111S10053E) Make: GEC ALSTOM	No, Directional Inverse type –CDD relay exists	Facility exists but not in service	Yes	Yes	Yes	Core-1 of CT & CVT are used for Main-1	No	No	No
			Agartala	OPTIMHO		Yes	Yes				No	No	

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
9. Owner of End : POWERGRID & NHPC													
1	Loktak - Imphal II	132	Loktak	Yes, Numerical MICOM P442	Yes, (EM relay in addition to Numerical Relay)	Feature exists in SF6 breaker & Numerical Relay will be implemented by Jan'15	Yes	Yes	Yes	1 core each	Yes	Yes	Yes
			Imphal (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
2	Loktak - Jiribam II	132	Loktak	Yes, Numerical MICOM P442	Yes, (EM relay in addition to Numerical Relay)	Feature exists in SF6 breaker & Numerical Relay will be implemented by Jan'15	Feature exists and can be added when required	Yes	Yes	1 core each	Yes	Yes	Yes
			Jiribam (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
10. Owner of End : POWERGRID & DoP, Nagaland													
1	Dimapur (PG)-Kohima	132	Dimapur(PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Kohima										
2	Dimapur (PG)-Dimapur (State)	132	Dimapur(PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Dimapur										
11. Owner of End : POWERGRID & Gov. of Bhutan													
1	Salakti-Gelephu	132	Salakati (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Gelephu										

132 kV Transmission Line Protection Details

Annexure-III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
12. Owner of End : POWERGRID & TSECL													
1	Silchar-P.K.Bari-1	132	Silchar (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			P.K. Bari										
2	Silchar- P.K.Bari-2	132	Silchar (PG)	Yes, MICOM P442	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			P.K. Bari										
13. Owner of End : POWERGRID & DoP, Arunachal Pradesh													
1	Ziro-Daporijo	132	Ziro (PG)	Yes, SEL 311C	Yes, O/C & EF	Yes	Yes		Yes		Yes	Yes	
			Daporijo										
14. Owner of End : NEEPCO & DoP, Nagaland													
1	Doyang- Mokokchung	132	Doyang	Static relay-REL-100, ABB Make	Relay-2TJM-12 (Easun Reyrole)		Yes	No	Yes		Yes		
			Mokokchung										
2	Doyang- Kohima	132	Doyang	Static relay-REL-100, ABB Make	Relay-2TJM-12 (Easun Reyrole)		Yes	No	Yes		Yes		
			Kohima										

Note : **1) Main-I Protection indicates Distance Protection**
2) Main-II Protection indicates one of Distance Protection / Directional Comparison Protection / Phase Segregated Line Differential protection
3) Type of Relay indicates it's operational mechanism - Numerical / Static / Electro-mechanical
4) List of inbuilt features of Numerical Relays are also to be furnished alongwith this format

220 kV Transmission Line Protection Details

Annexure III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details										Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Main II Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) type Earth Fault Relay exists (Yes/No)	Two stage Over-Voltage Protection exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes/No)	Carrier aided Inter-tripping exists (Yes/No)	Power Swing Blocking Feature exists (Yes/No)	Pole Discrepancy Relay exists (Yes/No)	Number of Core used for CT & VT, used for Main I	Number of Core used for CT & VT, used for Main II	Disturbance Recorder exists (Yes/No)	Event Logger / Sequential Event Recorder exists (Yes/No)	Fault Locator exists (Yes/No)
1. Owner of Line : Assam, AEGCL																
1	Agia- BTPS I	220	Agia	Yes(SEL321 SEL)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			BTPS I	Yes(D60 GE)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
2	Agia- BTPS II	220	Agia	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			BTPS II	Yes(D60 GE)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
3	Azara-Sarusajai I	220	Azara	Yes(REL670 ABB)	Yes(REL650 ABB)	Yes(IDMT)	Yes	Yes(1-PH)	Yes	Yes	Yes	1	1	Yes	Yes	Yes
			Sarusajai I	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	Yes	Yes	Yes	1	1	Yes	Yes	Yes
4	Azara-Sarusajai II	220	Azara	Yes(REL670 ABB)	Yes(REL650 ABB)	Yes(IDMT)	Yes	Yes(1-PH)	Yes	Yes	Yes	1	1	Yes	Yes	Yes
			Sarusajai II	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	Yes	Yes	Yes	1	1	Yes	Yes	Yes
5	Boko-Azara	220	Boko	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	Yes	Yes	Yes	1	1	Yes	Yes	Yes
			Azara	Yes(REL670 ABB)	Yes(REL650 ABB)	Yes(IDMT)	Yes	Yes(1-PH)	Yes	Yes	Yes	1	1	Yes	Yes	Yes
6	Agia-Azara	220	Agia	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	Yes	Yes	Yes	1	1	Yes	Yes	Yes
			Azara	Yes(REL670 ABB)	Yes(REL650 ABB)	Yes(IDMT)	Yes	Yes(1-PH)	Yes	Yes	Yes	1	1	Yes	Yes	Yes
7	Agia- Salakati I	220	Agia													
			Salakati I													
8	Agia- Salakati II	220	Agia													
			Salakati II													
9	Agia-Sarusajai	220	Agia													
			Sarusajai													
10	Boko-Agia	220	Boko	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			Agia	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
11	Boko-Sarusajai	220	Boko				No									
			Sarusajai				No									

220 kV Transmission Line Protection Details

Annexure III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details										Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Main II Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) type Earth Fault Relay exists (Yes/No)	Two stage Over-Voltage Protection exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes/No)	Carrier aided Inter-tripping exists (Yes/No)	Power Swing Blocking Feature exists (Yes/No)	Pole Discrepancy Relay exists (Yes/No)	Number of Core used for CT & VT, used for Main I	Number of Core used for CT & VT, used for Main II	Disturbance Recorder exists (Yes/No)	Event Logger / Sequential Event Recorder exists (Yes/No)	Fault Locator exists (Yes/No)
12	Langpi- Sarusajai I	220	Langpi	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			Sarusajai I	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
13	Langpi- Sarusajai II	220	Langpi	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			Sarusajai II	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
14	CMCL - Karbi Langpi	220	CMCL	Not KNown												
			Karbi Langpi	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
15	Sarusajai - CMCL	220	Sarusajai	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			CMCL	Not KNown												
16	Mariani-Samaguri I	220	Mariani													
			Samaguri I													
17	Mariani-Samaguri II	220	Mariani	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			Samaguri II	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
18	Salakati-Harigaon I	220	Salakari	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			Harigaon I	Not KNown												
19	Salakati-Harigaon II	220	Salakari	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			Harigaon II	Not KNown												
20	Samaguri-Balipara	220	Samaguri	Yes(7SA52 SIEMENS)	Yes(P442 MICOM)	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			Balipara	PGCIL	PGCIL	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
21	Samaguri-Sarusajai I	220	Samaguri													
			Sarusajai I													
22	Samaguri - Jawahar Nagar	220	Samaguri	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	Yes	Yes	Yes	1	1	Yes	Yes	Yes
			Jawahar Nagar	Yes(L-PRO ER)	Yes(L-PRO ER)	Yes(IDMT)	No	Yes(1-PH)	Yes	Yes	Yes	1	1	Yes	Yes	Yes

220 kV Transmission Line Protection Details

Annexure III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details										Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Main II Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) type Earth Fault Relay exists (Yes/No)	Two stage Over-Voltage Protection exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes/No)	Carrier aided Inter-tripping exists (Yes/No)	Power Swing Blocking Feature exists (Yes/No)	Pole Discrepancy Relay exists (Yes/No)	Number of Core used for CT & VT, used for Main I	Number of Core used for CT & VT, used for Main II	Disturbance Recorder exists (Yes/No)	Event Logger / Sequential Event Recorder exists (Yes/No)	Fault Locator exists (Yes/No)
23	Jawahar Nagar - Sarusajai	220	Jawahar Nagar	Yes(L-PRO ER)	Yes(L-PRO ER)	Yes(IDMT)	No	Yes(1-PH)	Yes	Yes	Yes	1	1	Yes	Yes	Yes
			Sarusajai	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	Yes	Yes	Yes	1	1	Yes	Yes	Yes
24	Samaguri-Sarusajai II	220	Samaguri	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			Sarusajai II	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
25	Tinsukia-AGBPP I	220	Tinsukia	Yes(7SA SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			AGBPP I	Yes(SEL-321 SWITZER)	Yes(7SA SIEMENS)	Yes(IDMT)	No	Yes(1-PH)	No	Yes	Yes	1	1	Yes	Yes	Yes
26	Tinsukia-AGBPP II	220	Tinsukia	Yes(SEL-321 SWITZER)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			AGBPP II	Yes(SEL-321 SWITZER)	Yes(7SA SIEMENS)	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
27	Tinsukia-Namrup I	220	Tinsukia	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			Namrup I	Yes(7SA61 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
28	Tinsukia-Namrup II	220	Tinsukia	Yes(7SA52 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			Namrup II	Yes(7SA61 SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes		Yes
2. Owner of Line/End: Meghalaya, MePTCL																
1	Misa - Killing (Byrnihat) I	220	Misa													
			Killing (Byrnihat)	Yes, ABB make REL670, Numerical	Yes, Areva make P442, Numerical	Yes	Yes	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay	Yes	1	1	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay
2	Misa - Killing (Byrnihat) II	220	Misa													
			Killing (Byrnihat)	Yes, ABB make REL670, Numerical	Yes, Areva make P442, Numerical	Yes	Yes	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay	Yes	1	1	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay

220 kV Transmission Line Protection Details

Annexure III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details										Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Main II Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) type Earth Fault Relay exists (Yes/No)	Two stage Over-Voltage Protection exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes/No)	Carrier aided Inter-tripping exists (Yes/No)	Power Swing Blocking Feature exists (Yes/No)	Pole Discrepancy Relay exists (Yes/No)	Number of Core used for CT & VT, used for Main I	Number of Core used for CT & VT, used for Main II	Disturbance Recorder exists (Yes/No)	Event Logger / Sequential Event Recorder exists (Yes/No)	Fault Locator exists (Yes/No)
3. Owner of Line/End: POWERGRID																
1	Misa - Dimapur I	220	Misa (PG)	Yes, MICOM P442	Yes, 7SA513			Yes	Yes		Yes			Yes	Yes	
			Dimapur (PG)	Yes, MICOM P442	Yes, 7SA513			Yes	Yes		Yes			Yes	Yes	
2	Misa - Dimapur II	220	Misa (PG)	Yes, MICOM P442	Yes, 7SA513			Yes	Yes		Yes			Yes	Yes	
			Dimapur (PG)	Yes, MICOM P442	Yes, 7SA513			Yes	Yes		Yes			Yes	Yes	
3	Salakti - Birpara I	220	Salakati (PG)	Yes, MICOM P442	Yes, 7SA522			Yes	Yes		Yes			Yes	Yes	
			Birpara (PG)													
4	Salakti - Birpara II	220	Salakati (PG)	Yes, MICOM P442	Yes, 7SA522			Yes	Yes		Yes			Yes	Yes	
			Birpara (PG)													
5	Misa - Mariani (PG)	220	Misa (PG)	Yes, SIEMENS 7SA522	Yes, MICOM P442			Yes	Yes		Yes			Yes	Yes	
			Mariani (PG)	Yes, MICOM P444	Yes, REL 670			Yes	Yes		Yes			Yes	Yes	

Note 1) Main-I Protection indicates Distance Protection
2) Main-II Protection indicates one of Distance Protection / Directional Comparison Protection / Phase Segregated Line Differential protection
3) Type of Relay indicates it's operational mechanism - Numerical / Static / Electro-mechanical
4) List of inbuilt features of Numerical Relays are also to be furnished alongwith this

220 kV Transmission Line Protection Details

Annexure III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details										Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Main II Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) type Earth Fault Relay exists (Yes/No)	Two stage Over-Voltage Protection exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes/No)	Carrier aided Inter-tripping exists (Yes/No)	Power Swing Blocking Feature exists (Yes/No)	Pole Discrepancy Relay exists (Yes/No)	Number of Core used for CT & VT, used for Main I	Number of Core used for CT & VT, used for Main II	Disturbance Recorder exists (Yes/No)	Event Logger / Sequential Event Recorder exists (Yes/No)	Fault Locator exists (Yes/No)
1. Owner of End : Assam, AEGCL & POWERGRID																
1	Mariani-Samaguri I	220	Mariani (PG)													
			Samaguri													
2	Mariani-Samaguri II	220	Mariani (PG)	Yes (7SA52 SIEMENS)	No	Yes (IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			Samaguri	Yes (7SA52 SIEMENS)	No	Yes (IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
3	Samaguri-Balipara	220	Samaguri	Yes (7SA52 SIEMENS)	Yes(P442 MICOM)	Yes (IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			Balipara (PG)	Yes, MICOM P442	Yes, 7SA513			Yes	Yes		Yes			Yes	Yes	
4	Misa-Samaguri I	220	Misa (PG)	Yes, MICOM	Yes, SIMENS 7SA522			Yes	Yes		Yes			Yes	Yes	
			Samaguri	Yes, MICOM	Yes, 7SA522			Yes	Yes		Yes			Yes	Yes	
5	Misa-Samaguri II	220	Misa (PG)	Yes, MICOM	Yes, SIMENS 7SA522			Yes	Yes		Yes			Yes	Yes	
			Samaguri	Yes, MICOM	Yes, 7SA522			Yes	Yes		Yes			Yes	Yes	
6	Salakti - BTPS I	220	Salakati (PG)	Yes, MICOM P442	Yes, 7SA522			Yes	Yes		Yes			Yes	Yes	
			BTPS													
7	Salakti - BTPS II	220	Salakati (PG)	Yes, MICOM P442	Yes, 7SA522			Yes	Yes		Yes			Yes	Yes	
			BTPS													
8	Misa - Mariani	220	Misa (PG)	Yes, SIEMENS 7SA522	Yes, MICOM P442			Yes	Yes		Yes			Yes	Yes	
			Mariani													
2. Owner of End : Assam, AEGCL & NEEPCO																
1	Tinsukia-AGBPP I	220	Tinsukia	Yes(7SA SIEMENS)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			AGBPP I	Yes(SEL-321 EASUN REY)	Yes(SI PROTECH SIEMENS)	Yes(IDMT)	No	Yes(1-PH)	Yes	Yes	Yes	2	3	Yes	Yes	Yes
2	Tinsukia-AGBPP II	220	Tinsukia	Yes(SEL-321 SWITZER)	No	Yes(IDMT)	No	No	No	Yes	Yes	1	1	Yes	Yes	Yes
			AGBPP II	Yes(SEL-321 EASUN)	-	Yes(IDMT)	No	Yes	Yes	Yes	Yes	2	-	Yes	Yes	Yes
3	220 kV AGBPP - Mariani	220	AGBPP	Yes (P442 ALSTOM)	Yes (P443 ALSTOM)	Yes	No	Yes	Yes	Yes	Yes	1	2	Yes	Yes	Yes
			Mariani													

220 kV Transmission Line Protection Details

Annexure III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details										Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Main II Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) type Earth Fault Relay exists (Yes/No)	Two stage Over-Voltage Protection exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes/No)	Carrier aided Inter-tripping exists (Yes/No)	Power Swing Blocking Feature exists (Yes/No)	Pole Discrepancy Relay exists (Yes/No)	Number of Core used for CT & VT, used for Main I	Number of Core used for CT & VT, used for Main II	Disturbance Recorder exists (Yes/No)	Event Logger / Sequential Event Recorder exists (Yes/No)	Fault Locator exists (Yes/No)
3. Owner of End: Meghalaya, MePTCL & POWERGRID																
1	Misa - Killing (Byrnihat) I	220	Misa (PG)													
			Killing (Byrnihat)	Yes, ABB make REL670, Numerical	Yes, Areva make P442, Numerical	Yes	Yes	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay	Yes	1	1	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay
2	Misa - Killing (Byrnihat) II	220	Misa (PG)													
			Killing (Byrnihat)	Yes, ABB make REL670, Numerical	Yes, Areva make P442, Numerical	Yes	Yes	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay	Yes	1	1	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay	Yes, REL670 & P442 Relay
4. Owner of End: POWERGRID & NEEPCO																
1	220 kV AGBPP - Mariani(PG)	220	AGBPP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	1	2	Yes	Yes	Yes
			Mariani (PG)	Yes, MICOM P444	Yes, REL 670		Yes	Yes	Yes		Yes			Yes	Yes	
5. Owner of End: DoP,Arunachal Pradesh & NEEPCO																
1	220 kV AGBPP - Deoamli	220	AGBPP	EPAC 3000 ALSTOM	SHPM 101 ALSTOM	No	No	No	No	Yes	Yes	1	2	Yes	Yes	Yes
			Deomali													
6. Owner of End: POWERGRID & NEEPCO																
1	Misa - Kopili I	220	Misa (PG)	Yes, SIMENS 7SA522	Yes, MICOM P442			Yes	Yes		Yes			Yes	Yes	
			Kopili													
2	Misa - Kopili II	220	Misa (PG)	Yes, SIMENS 7SA522	Yes, MICOM P442			Yes	Yes		Yes			Yes	Yes	
			Kopili													
3	Misa - Kopili III	220	Misa (PG)	Yes, 7SA513	Yes, MICOM P442			Yes	Yes		Yes			Yes	Yes	
			Kopili													

Note 1) Main-I Protection indicates Distance Protection

2) Main-II Protection indicates one of Distance Protection / Directional Comparison Protection / Phase Segregated Line Differential protection

3) Type of Relay indicates it's operational mechanism - Numerical / Static / Electro-mechanical

4) List of inbuilt features of Numerical Relays are also to be furnished alongwith this format

400 kV Transmission Line Protection Details

Annexure III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details										Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Main II Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) type Earth Fault Relay exists (Yes/No)	Two stage Over-Voltage Protection exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes/No)	Carrier aided Inter-tripping exists (Yes/No)	Power Swing Blocking Feature exists (Yes/No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Number of Core used for CT & VT, used for Main II	Disturbance Recorder exists (Yes/No)	Event Logger / Sequential Event Recorder exists (Yes/No)	Fault Locator exists (Yes/No)
1. Owner of Line : NETC																
1	Silchar - Azara	400	Azara	Yes (REL670 ABB)	Yes (REL670 ABB)	Yes	Yes	Yes	Yes	Yes	Yes	1	1	Yes	Yes	Yes
			Silchar (PG)	Yes, MICOM P444	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	
2	Silchar - Killing (Byrnihat)	400	Silchar (PG)	Yes, MICOM P444	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	
			Killing (Byrnihat)													
3	Palatana- Silchar I	400	Palatana													
			Silchar (PG)	Yes, MICOM P444	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	
4	Palatana- Silchar II	400	Palatana													
			Silchar (PG)	Yes, MICOM P444	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	
5	Killing- Bongaigaon	400	Killing (Byrnihat)													
			Bongaigaon (PG)	Yes, MICOM P444	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	
6	Azara- Bongaigaon	400	Azara													
			Bongaigaon (PG)	Yes, MICOM P444	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	

400 kV Transmission Line Protection Details

Annexure III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details										Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Main II Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) type Earth Fault Relay exists (Yes/No)	Two stage Over-Voltage Protection exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes/No)	Carrier aided Inter-tripping exists (Yes/No)	Power Swing Blocking Feature exists (Yes/No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Number of Core used for CT & VT, used for Main II	Disturbance Recorder exists (Yes/No)	Event Logger / Sequential Event Recorder exists (Yes/No)	Fault Locator exists (Yes/No)
2. Owner of Line : POWERGRID																
1	Bongaigaon- Binaguri I	400	Bongaigaon (PG)	Yes, MICOM P442	Yes, SIEMENS 7SA522		Yes	Yes	Yes		Yes			Yes	Yes	
			Binaguri (PG)													
2	Bongaigaon- Binaguri II	400	Bongaigaon (PG)	Yes, MICOM P442	Yes, SIEMENS 7SA522		Yes	Yes	Yes		Yes			Yes	Yes	
			Binaguri (PG)													
3	Bongaigaon- Binaguri III	400	Bongaigaon (PG)	Yes, MICOM P444	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	
			Binaguri (PG)													
4	Bongaigaon- Binaguri IV	400	Bongaigaon (PG)	Yes, MICOM P444	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	
			Binaguri (PG)													
5	Bongaigaon- Balipara I	400	Bongaigaon (PG)	Yes, MICOM P444	Yes, 7SA513		Yes	Yes	Yes		Yes			Yes	Yes	
			Balipara (PG)	Yes, MICOM P442	Yes, SIEMENS 7SA522		Yes	Yes	Yes		Yes			Yes	Yes	
6	Bongaigaon- Balipara II	400	Bongaigaon (PG)	Yes, MICOM P444	Yes, 7SA513		Yes	Yes	Yes		Yes			Yes	Yes	
			Balipara (PG)	Yes, MICOM P442	Yes, SIEMENS 7SA522		Yes	Yes	Yes		Yes			Yes	Yes	

400 kV Transmission Line Protection Details

Annexure III

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details										Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Main II Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) type Earth Fault Relay exists (Yes/No)	Two stage Over-Voltage Protection exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes/No)	Carrier aided Inter-tripping exists (Yes/No)	Power Swing Blocking Feature exists (Yes/No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Number of Core used for CT & VT, used for Main II	Disturbance Recorder exists (Yes/No)	Event Logger / Sequential Event Recorder exists (Yes/No)	Fault Locator exists (Yes/No)
7	Bongaigaon- Balipara III	400	Bongaigaon (PG)	Yes, MICOM P444	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	
			Balipara (PG)	Yes, MICOM P442	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	
8	Bongaigaon- Balipara IV	400	Bongaigaon (PG)	Yes, MICOM P444	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	
			Balipara (PG)	Yes, MICOM P442	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	
9	Balipara- Ranganadi I	400	Balipara (PG)	Yes, MICOM P444	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	
			Ranganadi	Yes, MICOM P442, ALSTOM	Yes, PD571, ALSTOM	No	Yes	Yes (Single Phase)	Yes	Yes	Yes	1	1 & 2	No	No	No
10	Balipara- Ranganadi II	400	Balipara (PG)	Yes, MICOM P444	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	
			Ranganadi	Yes, MICOM P442, ALSTOM	Yes, PD571, ALSTOM	No	Yes	Yes (Single Phase)	Yes	Yes	Yes	1	1 & 2	No	No	No
11	Balipara- Misa I	400	Balipara (PG)	Yes, MICOM P444	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	
			Misa (PG)	Yes, SIEMENS 7SA522	Yes, MICOM P442		Yes	Yes	Yes		Yes			Yes	Yes	
12	Balipara- MIsa II	400	Balipara (PG)	Yes, MICOM P444	Yes, REL670		Yes	Yes	Yes		Yes			Yes	Yes	
			Misa (PG)	Yes, SIEMENS 7SA522	Yes, MICOM P442		Yes	Yes	Yes		Yes			Yes	Yes	

Note 1) Main-I Protection indicates Distance Protection
2) Main-II Protection indicates one of Distance Protection / Directional Comparison Protection / Phase Segregated Line Differential protection
3) Type of Relay indicates it's operational mechanism - Numerical / Static / Electro-mechanical
4) List of inbuilt features of Numerical Relays are also to be furnished alongwith this

Transformer Protection Details

Annexure III

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exists (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTC exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exists (Yes/No)	Overload Alarm exists (Yes/No)
1. Owner of Transformer : Assam, AEGCL																
1	400/220 kV Azara (Mirza) 2x315 MVA ICTs I & II	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	220/132 kV 1x100 MVA Agia ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
	220/132 kV 1x50 MVA Agia ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
3	220/132 kV 1x150 MVA Balipara ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
4	220/132 kV 1x50 MVA Boko ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
5	220/132 kV 2x80 MVA BTPS ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
	220/132 kV 1x160 MVA BTPS ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
6	220/132 kV 2x100 MVA Mariani ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
7	220/132 kV 2x50 NTPS ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
8	220/132 kV 3x50 MVA Samaguri ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
9	220/132 kV 3x100 MVA Sarusajai ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
10	220/132 kV 2x50 MVA Tinsukia ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
11	220/33 kV 2x50 MVA GIS (Jawaharnagar) ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
12	132/33 kV 1x40 MVA Agia ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
	132/33 kV 1X12.5 MVA Agia ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
13	132/33 kV 1X12.5 MVA APM (Ashok Paper Mill)	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
	132/33 kV 1X16 MVA APM (Ashok Paper Mill) ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
14	132/33 kV 2X25 MVA Barnagar ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
15	132/33 kV 2X16 MVA Biswanath Chariali ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
16	132/33 kV 2X16 MVA Bokakhat ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
17	132/33 kV 1X16 MVA Bokajan ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
18	132/33 kV 2X40 MVA Boko	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No

Transformer Protection Details

Annexure III

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exists (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTC exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exists (Yes/No)	Overload Alarm exists (Yes/No)
18	ICTs	HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
19	132/33 kV 1X16 MVA BTPS ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
20	132/33 kV 1X16 MVA Chandrapur (CTPS) ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
	132/33 kV 1X30 MVA Chandrapur (CTPS) ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
21	132/33 kV 2X31.5 MVA Depota ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
22	132/33 kV 2X25 MVA Dhaligaon ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
23	132/33 kV 2X16 MVA Dhemaji ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
24	132/33 kV 2X31.5 MVA Dibrugarh ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
25	132/33 kV 2X16 MVA Diphu ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
26	132/33 kV 3X3.5 MVA Dullavcherra ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
27	132/33 kV 1X25 MVA Garmur ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
28	132/33 kV 2X16 MVA Gauripur ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
29	132/33 kV 1X16 MVA Ghoramari ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
30	132/33 kV 1X16 MVA Gohpur ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
31	132/33 kV 1X10 MVA Gohpur ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
32	132/33 kV 2X25 MVA Golaghat ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
33	132/33 kV 2X16 MVA Gossaigaon (Joyma) ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
34	132/33 kV 2X10 MVA Haflong ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
35	132/33 kV 2X16 MVA Jagiroad (Baghjap) ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
36	132/33 kV 2X25 MVA Jorhat (Garmur) ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
37	132/33 kV 1X16 MVA Jorhat (Garmur) ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No

Transformer Protection Details

Annexure III

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exists (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTC exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exists (Yes/No)	Overload Alarm exists (Yes/No)
38	132/33 kV 1X31.5 MVA Kahilipara ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
39	132/33 kV 2X30 MVA Kahilipara ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
40	132/33 kV 2X10 MVA Ledo (Margherita) ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
41	132/33 kV 2X7.5 MVA LTPS ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
42	132/33 kV 4X5.5 MVA Majuli (Single Phase) ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
43	132/33 kV 2X16 MVA Moran ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
44	132/33 kV 2X16 MVA Nalbari ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
45	132/33 kV 2X25 MVA Narengi ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
46	132/33 kV 2X25 MVA Nazira (Gargaon) ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
47	132/33 kV 2X10 MVA North Lakhimpur (Nalkata) ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
48	132/33 kV 1X31.5 MVA NTPS ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
49	132/33 kV 3X10 MVA Pailapool ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
50	132/33 kV 2X25 MVA Panchgram New ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
51	132/33 kV 2X10 MVA Panchgram Old ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
52	132/33 kV 2X25 MVA Rangia ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
53	132/33 kV 2X25 MVA Rowta ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
54	132/33 kV 2X25 MVA Samaguri ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
55	132/33 kV 1X16 MVA Sankar Dev Nagar (Lanka)	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
56	132/33 kV 3X31.5 MVA Sarusajai ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
57	132/33 kV 2X16 MVA Sibsagar ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
58	132/33 kV 2X16 MVA Sipajhar ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No

Transformer Protection Details

Annexure III

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exists (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTC exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exists (Yes/No)	Overload Alarm exists (Yes/No)
59	132/33 kV 2X31.5 MVA Sishugram (Amingaon) ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
60	132/33 kV 1x40 MVA Sishugram (Amingaon) ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
61	132/33 kV 2X25 MVA Srikona ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
62	132/33 kV 2X25 MVA Khaloigaon ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
63	132/33 kV 2X25 MVA Sonari ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
64	132/33 kV 2X40 MVA Behaiting ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
65	132/66 kV 2X20 MVA Mariani ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
66	132/66 kV 2X25 MVA NTPS ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
67	132/66 kV 1X20 MVA NTPS ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
68	132/66 kV 3X20 MVA Tinsukia ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
69	132/11 kV 2X16 MVA Dispur ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
70	132/11 kV 2X10 MVA Kahilipara ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
71	66/33 kV 3X5 MVA Bokajan ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
72	66/33 kV 2X5 MVA Diphu ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
73	66/33 kV 2X10 MVA Golaghat ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
74	66/33 kV 1X6.3 MVA Golaghat ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
75	66/33 kV 2X16 MVA Mariani ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
76	66/33 kV 2X16 MVA Nazira (Gargaon) ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
77	66/33 kV 3X10 MVA NTPS ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
78	66/33 kV 3X10 MVA Rupai (Doomdooma) ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
79	66/33 kV 3x20 MVA Tinsukia ICTS	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
		HV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No

Transformer Protection Details

Annexure III

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exists (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTC exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exists (Yes/No)	Overload Alarm exists (Yes/No)
2. Owner of Transformer : MSPCL, Manipur																
1	132/33 kV Churachandpur (Kheljang) 1x20 MVA	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
	132/33 kV Churachandpur (Kheljang) 1x20 MVA	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
2	132/33 kV Jiribam 1x20 MVA Transformer	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
3	132/33 kV Kakching 1x20 MVA Transformer I	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
	132/33 kV Kakching 1x20 MVA Transformer II	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
4	132/33 kV Karong 1x20 MVA Transformer I	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
	132/33 kV Karong 1x20 MVA Transformer II	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
5	132/33 kV Ningthoukong 1x20 MVA Transformer I	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
	132/33 kV Ningthoukong 1x12.5 MVA Transformer II	LV side														
		HV side														
6	132/33 kV Rengpang 1x12.5 MVA Transformer	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
7	132/33 kV Yaingangpokpi1x20 MVA	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
		HV side		No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
	132/33 kV Yaingangpokpi 1x20 MVA Transformer-II	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
8	132/33 kV Yurembam 1x20 MVA Transformer I	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes		No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
	132/33 kV Yurembam 1x20 MVA Transformer II	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
	132/33 kV Yurembam 1x20 MVA Transformer III	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
9	132/33 kV Kongba1x20 MVA Transformer-I	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
	132/33 kV Kongba1x20 MVA Transformer-II	LV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No

Transformer Protection Details

Annexure III

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exists (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTC exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exists (Yes/No)	Overload Alarm exists (Yes/No)
3. Owner of Transformer : Meghalaya, MePTCL																
	400/220 kV Killing(Byrnihat) 1x315 MVA Transformer I	LV side														
		HV side														
	400/220 kV Killing(Byrnihat) 1x315 MVA Transformer II	LV side														
		HV side														
1	220/132 kV Killing(Byrnihat) 1x160 MVA Transformer I	LV side	Yes, ABB make, RET670, Numerical	Yes	Yes	Non directional REX ABB make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional REX ABB make	No		Yes					Yes		
	220/132 kV Killing(Byrnihat) 1x160 MVA Transformer II	LV side	Yes, ABB make, RET670, Numerical	Yes	Yes	Non directional REX ABB make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional REX ABB make	No		Yes					Yes		
2	132/33 kV Cherrapunjee (Sohra) 1x12.5 MVA Transformer	LV side	No	No	No	Non directional CDG, EE make	No	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes
		HV side				Non directional CDG, EE make	No		Yes					Yes		
3	132/33 kV EPIP I 1x20 MVA Transformer I	LV side	Yes, ABB make, RET670, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
	132/33 kV EPIP I 1x20 MVA Transformer II	LV side	Yes, ABB make, RET670, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
4	132/33 kV EPIP II 1x50 MVA Transformer	LV side	Yes, Toshiba make, GRT100, Numerical	No	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
	132/33 kV EPIP II 1x20 MVA Transformer	LV side	Yes, ABB make, RET670, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
5	132/33 kV Khliehriat 1x20 MVA Transformer I	LV side	Yes, ABB make, RET670, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes
		HV side				Non directional CDG, EE make	No		Yes					Yes		
	132/33 kV Khliehriat 1x20 MVA Transformer II	LV side	Yes, ABB make, RET670, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		

Transformer Protection Details

Annexure III

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exists (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTC exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exists (Yes/No)	Overload Alarm exists (Yes/No)
6	132/33/11 kV Lumshnong 1x10 MVA Transformer	LV side 11 kV	No	No	No	Non directional CDG, EE make	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
		LV side 33 kV				Non directional JRC 059,JVS make	No		Yes					Yes		
		HV side				Non directional P122 Areva make	No		Yes					Yes		
7	132/33 kV Mawlai 1x20 MVA Transformer I	LV side	Yes, Areva make, P632, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
	132/33 kV Mawlai 1x20 MVA Transformer II	LV side	Yes, Areva make, P632, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
	132/33 kV Mawlai 1x20 MVA Transformer III	LV side	Yes, Areva make, P632, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
8	132/33 kV Nangalbibra 1x12.5 MVA Transformer I	LV side	Yes, EE make, Static type	No	No	Non directional P122 Areva make	No	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
	132/33 kV Nangalbibra 1x12.5 MVA Transformer II	LV side	Yes, Areva make, P632, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
9	132/33 kV NEHU 1x20 MVA Transformer I	LV side	Yes, ABB make, RET670, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
	132/33 kV NEHU 1x20 MVA Transformer II	LV side	Yes, EE make, Static type	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional CDG, EE make	No		Yes					Yes		
10	132/33 kV Nongstoin 1x12.5 MVA Transformer	LV side	Yes, Areva make, P632, Numerical	Yes	Yes	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		

Transformer Protection Details

Annexure III

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exists (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTC exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exists (Yes/No)	Overload Alarm exists (Yes/No)
11	132/33 kV Rongkhon (Tura) 1x20 MVA Transformer I	LV side	Yes, Areva make, P632, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
	132/33 kV Rongkhon (Tura) 1x20 MVA Transformer II	LV side	Yes, Areva make, P632, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
	132/33 kV Rongkhon (Tura) 1x5 MVA Transformer I	LV side	Yes, EE make, Static type	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
	132/33 kV Rongkhon (Tura) 1x5 MVA Transformer II	LV side	Yes, EE make, Static type	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
	132/33 kV Rongkhon (Tura) 1x5 MVA Transformer III	LV side	Yes, EE make, Static type	Yes	No	Non directional CDG, EE make	No	Yes	Yes	Yes	Np	No	Yes	Yes	No	Yes
		HV side				Non directional, CDG EE make	No		Yes					Yes		
12	132/33 kV Umiam 1x20 MVA Transformer I	LV side	Yes, Toshiba make, GRT100, Numerical	Yes	No	Non directional JNC066, JVS make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional JNC066, JVS make	No		Yes					Yes		
	132/33 kV Umiam 1x20 MVA Transformer II	LV side	Yes, Areva make, P632, Numerical	Yes	No	Non directional P141 Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
13	132/33/11 kV NEIGRIHMS 1x10 MVA Transformer I	LV side	Yes, Areva make, P632, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
	132/33/11 kV NEIGRIHMS 1x10 MVA Transformer II	LV side	Yes, Areva make, P632, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		

Transformer Protection Details

Annexure III

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exists (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTC exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exists (Yes/No)	Overload Alarm exists (Yes/No)
14	132/33 kV Mawngap 1x20 MVA Transformer I	LV side	Yes, Areva make, P632, Numerical	Yes	No	Yes, Directional P141, Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Yes, Directional P141, Areva make	No		Yes					Yes		
	132/33 kV Mawngap 1x20 MVA Transformer II	LV side	Yes, Areva make, P632, Numerical	Yes	No	Yes, Directional P141, Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Yes, Directional P141, Areva make	No		Yes					Yes		
15	132/33 kV Umiam Stg I 1x10.6 MVA Transformer I	LV side	Yes, Areva make, P632, Numerical	Yes	No	Yes, Directional P141, Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Yes, Directional P141, Areva make	No		Yes					Yes		
	132/33 kV Umiam Stg I 1x10.6 MVA Transformer II	LV side	Yes, Areva make, P632, Numerical	Yes	No	Yes, Directional P141, Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Yes, Directional P141, Areva make	No		Yes					Yes		
	132/33 kV Umiam Stg I 1x10.6 MVA Transformer III	LV side	Yes, Areva make, P632, Numerical	Yes	No	Yes, Directional P141, Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Yes, Directional P141, Areva make	No		Yes					Yes		
	132/33 kV Umiam Stg I 1x10.6 MVA Transformer IV	LV side	Yes, Areva make, P632, Numerical	Yes	No	Yes, Directional P141, Areva make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Yes, Directional P141, Areva make	No		Yes					Yes		
16	132/33 kV Umiam Stg II 1x10.5 MVA Transformer I	LV side	Digital M-3311, Beckwith Electric Co.	Yes	No	Beckwith Electric Co.	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Beckwith Electric Co.	No		Yes					Yes		
	132/33 kV Umiam Stg II 1x10.5 MVA Transformer II	LV side	Digital M-3311, Beckwith Electric Co.	Yes	No	Beckwith Electric Co.	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Beckwith Electric Co.	No		Yes					Yes		
17	132/33 kV Umiam Stg III 1x37.5 MVA Transformer I	LV side	Yes, ABB make, RET670, Numerical	Yes	Yes	Non directional CDG, EE make	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes
		HV side				Non directional CDG, EE make	No		Yes					Yes		
	132/33 kV Umiam Stg III 1x37.5 MVA Transformer II	LV side	Yes, ABB make, RET670, Numerical	Yes	Yes	Non directional CDG, EE make	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes
		HV side				Non directional CDG, EE make	No		Yes					Yes		

Transformer Protection Details

Annexure III

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exists (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTC exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exists (Yes/No)	Overload Alarm exists (Yes/No)
18	132/33 kV Umiam Stg IV 1x37.5 MVA Transformer I	LV side	Yes, ABB make, RET670, Numerical	Yes	Yes	Non directional CDG, EE make	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes
		HV side				Non directional CDG, EE make	No		Yes					Yes		
	132/33 kV Umiam Stg IV 1x37.5 MVA Transformer II	LV side	Yes, ABB make, RET670, Numerical	Yes	Yes	Non directional CDG, EE make	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes
		HV side				Non directional CDG, EE make	No		Yes					Yes		
19	132/33 kV Umtru 1x7.5 MVA Transformer I	LV side	Yes, ABB make, RET670, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
	132/33 kV Umtru 1x7.5 MVA Transformer II	LV side	Yes, ABB make, RET670, Numerical	Yes	No	Non directional P122 Areva make	No	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes
		HV side				Non directional P122 Areva make	No		Yes					Yes		
20	132/33 kV Leshka 1x45 MVA Transformer I	LV side	Yes, ABB make, RET670, Numerical	Yes	Yes	Non directional REX ABB make	No	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes
		HV side				Non directional REX ABB make	No		Yes					Yes		
	132/33 kV Leshka 1x45 MVA Transformer II	LV side	Yes, ABB make, RET670, Numerical	Yes	Yes	Non directional REX ABB make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional REX ABB make	No		Yes					Yes		
	132/33 kV Leshka 1x45 MVA Transformer III	LV side	Yes, ABB make, RET670,	Yes	Yes	Non directional REX	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional REX ABB make	No		Yes					Yes		
	132/33 kV Leshka 1x45 MVA Transformer I	LV side	Yes, ABB make, RET670, Numerical	Yes	Yes	Non directional REX ABB make	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
		HV side				Non directional REX ABB make	No		Yes					Yes		
4. Owner of Transformer : P&E, Mizoram																
1	132/33 kV Bairabi, 3.15 MVA Transformer	LV side														
		HV side														
	132/11 kV Bairabi, 15 MVA Transformer 1	LV side														
		HV side														
	132/11 kV Bairabi, 15 MVA Transformer 2	LV side														
		HV side														

Transformer Protection Details

Annexure III

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exists (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTC exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exists (Yes/No)	Overload Alarm exists (Yes/No)
2	132/66 kV Kolasib (Bawktlang) 12.5 MVA	LV side	No	No	No	No	No	Yes	Yes	Yes	No	No	No	Yes	No	No
		HV side	No	No	No	No	No	Yes	Yes	Yes	No	No	No	Yes	No	No
	132/33 kV Kolasib (Bawktlang) 12.5 MVA	LV side	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes	No	No
		HV side	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes	No	No
	66/33 kV Kolasib (Bawktlang) 6.3 MVA	LV side	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
		HV side	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
3	132/33 kV Serchip (Bukpui) 12.5 MVA Transformer I	LV side	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
		HV side	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
	132/33 kV Serchip (Bukpui) 6.3 MVA Transformer II	LV side	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes	No	No
		HV side	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes	No	No
4	132/33 kV Lunglei (Khawiva) 12.5 MVA Transformers I	LV side	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
		HV side	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
	132/33 kV Lunglei (Khawiva) 12.5 MVA Transformers II	LV side	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
		HV side	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
5	132/33 kV Khawzawl 12.5 MVA Transformers I	LV side	No	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
		HV side	No	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
6	132/33 kV Luangmual, 12.5 MVA Transformers I	LV side	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
		HV side	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
	132/33 kV Luangmual, 12.5 MVA Transformers II	LV side	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
		HV side	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
	132/33 kV Luangmual, 12.5 MVA Transformers III	LV side	No	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
		HV side	No	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
7	132/33 kV Saitual 1x6.3 MVA Transformer	LV side	No	No	No	No	No	Yes	Yes	Yes	No	No	No	Yes	No	No
		HV side	No	No	No	No	No	Yes	Yes	Yes	No	No	No	Yes	No	No
8	132/33 kV Zemabawk (Zuangtui) 12.5 MVA	LV side	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
		HV side	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
	132/33 kV Zemabawk (Zuangtui) 12.5 MVA	LV side	No	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
		HV side	No	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
5. Owner of Transformer : NEEPCO																
1	53 MVA, 11 kV/132 kV Generator Transformer at Ranganadi	LV side	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
		HV side		No												
2	400 kV/132 kV, 120 MVA ICT-I at Ranganadi	LV side	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes (Neutral Displacement Protection)	No
		HV side		No												
3	400 kV/132 kV, 120 MVA ICT-II at Ranganadi	LV side	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes (Neutral Displacemen	No
		HV side		No												
4	11/220 kV, 50 MVA Generator Transformer 1 at AGBPP	LV side	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
		HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
5	11/220 kV, 50 MVA Generator Transformer 2 at	LV side	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			

Transformer Protection Details

Annexure III

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exists (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTC exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exists (Yes/No)	Overload Alarm exists (Yes/No)
5	Generator Transformer 2 at AGBPP	HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
6	11/220 kV, 50 MVA Generator Transformer 3 at AGBPP	LV side	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
		HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
7	11/220 kV, 50 MVA Generator Transformer 4 at AGBPP	LV side	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
		HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
8	11/220 kV, 50 MVA Generator Transformer 5 at AGBPP	LV side	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
		HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
9	11/220 kV, 50 MVA Generator Transformer 6 at AGBPP	LV side	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
		HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
10	11/220 kV, 50 MVA Generator Transformer 7 at AGBPP	LV side	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
		HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
11	11/220 kV, 50 MVA Generator Transformer 8 at AGBPP	LV side	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
		HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
12	11/220 kV, 50 MVA Generator Transformer 9 at AGBPP	LV side	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
		HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			
13	11/132 kV, 3x12.5(37.5) MVA Generator Transformer 1 at AGTPP	LV side	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
		HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
14	11/132 kV, 3x12.5(37.5) MVA Generator Transformer 2 at AGTPP	LV side	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
		HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
15	11/132 kV, 3x12.5(37.5) MVA Generator Transformer 3 at AGTPP	LV side	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
		HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
16	11/132 kV, 3x12.5(37.5) MVA Generator Transformer 4 at AGTPP	LV side	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
		HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
6. Owner of Transformer : NHPC																
1	11/132 kV, Generator Transformer at Loktak	LV side	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No	Yes	No	Yes
		HV side														

Transformer Protection Details

Annexure III

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exists (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTC exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exists (Yes/No)	Overload Alarm exists (Yes/No)
7. Owner of Transformer : POWERGRID																
1	400/220kV, 315 MVA ICT at Bongaigaon	LV side HV side	Yes, P643			Yes										
2	400/220kV, 315 MVA ICT at Balipara	LV side HV side	Yes, P643			Yes										
3	220/132, 50 MVA ICT 1 at Balipara (NEEPCO asset)	LV side HV side	Yes, Duo-Bias-M			Yes										
4	220/132, 50 MVA ICT2 at Balipara (AEGCL asset)	LV side HV side	Yes, Duo-Bias-M			Yes										
5	400/220kV, 315 MVA ICT 1 at Misa	LV side HV side	Yes, P643			Yes										
6	400/220kV, 315 MVA ICT 2 at Misa	LV side HV side	Yes, P633			P127										
5	400/220kV, 200 MVA ICT 1 at Silchar	LV side HV side	Yes, P633			Yes										
6	400/220kV, 200 MVA ICT 2 at Silchar	LV side HV side	Yes, P633			P127										
7	220/132kV, 50 MVA ICT 1 at Salakati	LV side HV side	Yes, P643			Yes										
8	220/132kV, 50 MVA ICT 2 at Salakati	LV side HV side	Yes, Duo-Bias-M/PC 05770			Yes										
9	220/132kV, 100 MVA ICT 1 at Dimapur	LV side HV side	Yes, DTH-31			Yes										
10	220/132kV, 100 MVA ICT 2 at Dimapur	LV side HV side	Yes, RET670			Yes										
11	132/33 kV, 15 MVA ICT at Ziro	LV side HV side	Yes, P643			Yes										
12	132/33 kV, 5 MVA ICT at Kumarghat	LV side HV side	Yes, DTH			Yes										
13	132/33 kV, 16 MVA ICT at Nirjuli	LV side HV side	Yes, P643			Yes										
14	132/33 kV, 10 MVA ICT at Nirjuli	LV side HV side	Yes, P643			Yes										
15	220/132 kV, 160 MVA ICT at Kopili	LV side HV side	Yes, RET670			Yes										
16	132/33 kV, 50 MVA ICT 1 at Imphal	LV side HV side	Yes, P632			P127										
17	132/33 kV, 50 MVA ICT 2 at Imphal	LV side HV side	Yes, P632			P127										

Note : 1. REF : Restricted Earth Fault, 2. WTI : Winding Temperature Indicator., 3. OTI : Oil Temperature Indicator)

4. MOG : Magnetic Oil Gauge, 5. OSR : Oil Surge Relay, 6. OLTC : On Load Tap Changer

7. PRD : Pressure Relieve Device, 8. SA : Surge Arrestor 9. List of inbuilt features of Numerical Relays are also to be furnished alongwith this format

Reactor Protection Details

Annexure - A.11 (I)

Sl. No.	Name of Line Reactor/ Bus Reactor/ Tertiary Reactor	Differential Protection exists (Yes/No)	REF Protection exists (Yes/No)	Definite Time Over Current Protection exists (Yes/No)	Earth Fault Protection exists (Yes/No)	Buchholz Operation exists (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	SA exists (Yes/No)
1. Owner of Reactor : Assam, AEGCL										
1	400 kV Silchar - Azara (Mirza) line reactor of 63 MVAR at Azara (Mirza) end	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	Bus Reactor of 63 MVAR at Azara (Mirza)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	Bus Reactor I & II of 12.5 MVAR at Mariani	REACTOR NOT IN OPERATION								
4	Bus Reactor I & II of 12.5 MVAR at Samaguri	REACTOR NOT IN OPERATION								
5	Bus Reactor I & II of 12.5 MVAR at Mariani	REACTOR NOT IN OPERATION								
2. Owner of Reactor/ Capacitor Bank : Meghalaya, MePTCL										
1	63 MVAR Bus Reactor at Killing (Byrnihat)									
2	132KV Capacitor Bank at Mawlai	No	No	Yes	Yes	No	No	No	No	Yes
3	132KV Capacitor Bank at EPIP I	No	No	Yes	Yes	No	No	No	No	Yes
4	132KV Capacitor Bank at EPIP II	No	No	Yes	Yes	No	No	No	No	Yes

Reactor Protection Details

Annexure - A.11 (I)

Sl. No.	Name of Line Reactor/ Bus Reactor/ Tertiary Reactor	Differential Protection exists (Yes/No)	REF Protection exists (Yes/No)	Definite Time Over Current Protection exists (Yes/No)	Earth Fault Protection exists (Yes/No)	Buchholz Operation exists (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	SA exists (Yes/No)
3. Owner of Reactor :NEEPCO										
1	50 MVAR line Reactor -I in 400 kV Balipara-RHEP I at Ranganadi end	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes
2	50 MVAR line Reactor -II in 400 kV Balipara-RHEP II at Ranganadi end	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes
4. Owner of BUS Reactors :POWERGRID										
1	50 MVAR 400 kV Bus Reactor-I at Bongaigaon SS	Yes, Differential (CAG)								
2	50 MVAR 400kV Bus Reactor-II at Bongaigaon SS	Yes, Differential (CAG)								
3	80 MVAR 400 kV Bus Reactor-3 at Bongaigaon SS	Yes, Differential (CAG)								
4	80 MVAR 400kV Bus Reactor-4 at Bongaigaon SS	Yes, Differential (CAG)								
5	50 MVAR 400kV Bus Reactor-1 Balipara SS	Yes, Differential (CAG)								
6	80 MVAR 400kV Bus Reactor-2 Balipara SS	Yes, Differential (CAG)								
7	50 MVAR 400kV Bus Reactor Misa SS	Yes, Differential (CAG)								

Reactor Protection Details

Annexure - A.11 (I)

Sl. No.	Name of Line Reactor/ Bus Reactor/ Tertiary Reactor	Differential Protection exists (Yes/No)	REF Protection exists (Yes/No)	Definite Time Over Current Protection exists (Yes/No)	Earth Fault Protection exists (Yes/No)	Buchholz Operation exists (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	SA exists (Yes/No)
8	63 MVAR 400kV Bus Reactor-1 Sichar SS	Yes, Differential (CAG)								
9	63 MVAR 400kV Bus Reactor-2 Sichar SS	Yes, Differential (P633)								
10	20 MVAR 220 kV Bus Reactor at Mariani SS	Yes, Differential (P632)								
11	20 MVAR 132kV Bus Reactor Kumarghat SS	Yes, Differential (CAG)								
12	20 MVAR 132kV Bus Reactor Aizwal SS	Yes, Differential (CAG)								
13	20 MVAR 132kV Bus Reactor Imphal SS	Yes, Differential (P633)								
14	20 MVAR 132kV Bus Reactor Ziro SS	Yes, Differential (P633)								
15	25 MVAR 33kV Reactor-Misa	Yes, Differential (CAG)								
16	25 MVAR 33kV Reactor-Balipara	Yes, Differential (CAG)								

Reactor Protection Details

Annexure - A.11 (I)

Sl. No.	Name of Line Reactor/ Bus Reactor/ Tertiary Reactor	Differential Protection exists (Yes/No)	REF Protection exists (Yes/No)	Definite Time Over Current Protection exists (Yes/No)	Earth Fault Protection exists (Yes/No)	Buchholz Operation exists (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	SA exists (Yes/No)
17	25 MVAR 33kV Reactor-Bongaiagaon	Yes, Differential (CAG)								
5. Owner of Line Reactors: POWERGRID										
1	50 MVAR 400 KV D/C Misa-Kathalguri	Yes , Differential (CAG)								
2	50 MVAR 400 KV D/C Misa-Mariani	Yes, Differential (CAG)								
3	63/50 MVAR 400 KV D/C Balipara-Bongaigaon-I	Yes, Differential (CAG34AF71A)								
4	63/50 MVAR 400 KV D/C Balipara-Bongaigaon-II	Yes, Differential (CAG34AF71A)								
5	63 MVAR 400 KV D/C Balipara-Bongaigaon-3	Yes, Differential (CAG34AF71A)								
6	63 MVAR 400 KV D/C Balipara-Bongaigaon-4	Yes, Differential (CAG34AF71A)								
7	50 MVAR 400KV D/C Balipara-Ranganadi-I	Yes, Differential (DTH31)								

Reactor Protection Details

Annexure - A.11 (I)

Sl. No.	Name of Line Reactor/ Bus Reactor/ Tertiary Reactor	Differential Protection exists (Yes/No)	REF Protection exists (Yes/No)	Definite Time Over Current Protection exists (Yes/No)	Earth Fault Protection exists (Yes/No)	Buchholz Operation exists (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	SA exists (Yes/No)
8	50 MVAR 400KV D/C Balipara-Ranganadi-II	Yes, Differential (DTH31)								
9	63 MVAR 400kV Bongaigaon-Siliguri - I	Yes, Differential (CAG3471)								
10	63 MVAR 400kV Bongaigaon-Siliguri - II	Yes, Differential (CAG3471)								
11	63 MVAR 400kV Bongaigaon-Azara	Yes, Differential (CAG3471)								
12	63 MVAR 400kV Bongaigaon-Byrnihat	Yes, Differential (CAG3471)								
13	50 MVAR 400kV SilChar-Azara	Yes, Differential (CAG3471)								
14	50 MVAR 400kV Sichar-Byrnihat	Yes, Differential (CAG3471)								
13	50 MVAR 400kV SilChar-Pallatana-1	Yes, Differential (P633)								
14	50 MVAR 400kV SilChar-Pallatana-1	Yes, Differential (P633)								

Reactor Protection Details

Annexure - A.11 (I)

Sl. No.	Name of Line Reactor/ Bus Reactor/ Tertiary Reactor	Differential Protection exists (Yes/No)	REF Protection exists (Yes/No)	Definite Time Over Current Protection exists (Yes/No)	Earth Fault Protection exists (Yes/No)	Buchholz Operation exists (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	SA exists (Yes/No)

Note : 1. REF : Restricted Earth Fault, 2. WTI : Winding Temperature Indicator., 3. OTI : Oil Temperature Indicator)

4. MOG : Magnetic Oil Gauge, 5. SA : Surge Arrestor

6. List of inbuilt features of Numerical Relays are also to be furnished alongwith this format

Bus Bar & Local Breaker Backup(LBB) Protection Details

Sl.No.	Name of Substation	Voltage level	Bus Bar Protection exists (Yes/No)	LBB Protection exists (Yes/No)
1. Owner of Bus Bar: MSPCL, Manipur				
1	Churachandpur	132 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
2	Jiribam	132 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
3	Kakching	132 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
4	Karong	132 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
5	Ningthoukong	132 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
6	Rengpang	132 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
7	Yaingangpokpi	132 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
8	Yurembam.	132 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
9	Kongba	132 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
2. Owner of Bus Bar: MePTCL, Meghalaya				
1	Mawlai	132 kV Bus Bar	No	No
2	NEHU	132 kV Bus Bar	No	No
3	NEIGRIHMS	132 kV Bus Bar	No	No
4	Khliehriat	132 kV Bus Bar	No	No
5	Lumshnong	132 kV Bus Bar	No	No
6	Umiam	132 kV Bus Bar	No	No
7	Mawphlang	132 kV Bus Bar	No	No
8	Cherra	132 kV Bus Bar	No	No
9	Nongstoin	132 kV Bus Bar	No	No
10	Nangal	132 kV Bus Bar	No	No
11	Rongkhon	132 kV Bus Bar	No	No
12	EPIP-I	132 kV Bus Bar	No	No
13	EPIP-II	132 kV Bus Bar	No	No
14	Stage-I PH	132 kV Bus Bar	No	No
15	Stage-II PH	132 kV Bus Bar	No	No
16	Stage-III PH	132 kV Bus Bar	No	No
17	Stage-IV PH	132 kV Bus Bar	No	No
18	Umtru PH	132 kV Bus Bar	No	No
19	Leshka PH	132 kV Bus Bar	No	No

Bus Bar & Local Breaker Backup(LBB) Protection Details

Sl.No.	Name of Substation	Voltage level	Bus Bar Protection exists (Yes/No)	LBB Protection exists (Yes/No)
20	Killing	132 kV Bus Bar	Yes	No
		220 kV Bus Bar	Yes	No
3. Owner of Bus Bar: P&E, Mizoram				
1	Kolasib	132 kV Bus Bar	No	No
		66 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
2	Luangmual	132 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
3	Lunglei	132 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
4	Serchip	132 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
5	Saitul	132 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
6	Zemabawk	132 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
7	Bairabi	132 kV Bus Bar	Yes (EM)	No
		33 kV Bus Bar	No	No
8	Khawzawl	132 kV Bus Bar	No	No
		33 kV Bus Bar	No	No
4. Owner of Bus Bar: NEEPCO				
1	Ranganadi	400 kV Bus Bar	Yes	Yes
		132 kV Bus Bar	Yes	Yes
2	AGBPP	220 kV Bus Bar	Yes	Yes
3	AGTPP	132 kV Bus Bar	Yes	Yes
5. Owner of Bus Bar: NHPC				
1	Loktak	132 kV Bus Bar	Yes	Yes
6. Owner of Bus Bar: POWEWRGRID				
1	Aizawl	132 kV Bus Bar	Yes	Yes
2	Badarpur	132 kV Bus Bar		Yes
3	Balipara	400 kV Bus Bar	Yes	Yes
		220 kV Bus Bar	Yes	Yes
4	Bongaigaon	400 kV Bus Bar	Yes	Yes
5	Biswanath Chariali			
6	Dimapur	220 kV Bus Bar	Yes	Yes
		132 kV Bus Bar		Yes
7	Haflong	132 kV Bus Bar		Yes
8	Imphal	132 kV Bus Bar		Yes
9	Jiribam	132 kV Bus Bar		Yes
10	Khliehriat	132 kV Bus Bar		Yes
11	Kumarghat	132 kV Bus Bar		Yes
12	Mariani	220 kV Bus Bar	Yes	Yes
13	Melriat	132 kV Bus Bar		

Bus Bar & Local Breaker Backup(LBB) Protection Details				
Sl.No.	**Name of Substation**	**Voltage level**	**Bus Bar Protection exists (Yes/No)**	**LBB Protection exists (Yes/No)**
14	Misa	400 kV Bus Bar	Yes	Yes
		220 kV Bus Bar	Yes	Yes
15	Mokokchung	220 kV Bus Bar		
		132 kV Bus Bar		
16	Namsai	132 kV Bus Bar		
17	Nirjuli	132 kV Bus Bar		Yes
18	Roing	132 kV Bus Bar		
19	Salakati	220 kV Bus Bar	Yes	Yes
20	Silchar	400 kV Bus Bar	Yes	Yes
		132 kV Bus Bar	Yes	Yes
21	Tezu	132 kV Bus Bar		
22	Ziro	132kV Bus Bar		Yes

Bus Coupler Protection Details

Sl.No.	Name of Substation	Voltage level	Non directional O/C Protection exists (Yes/No)	Non directional E/F Protection exists (Yes/No)
1. Owner of Bus Coupler: MSPCL, Manipur				
1	Churachandpur	132 kV Bus Coupler	No	No
		33 kV Bus Coupler	No	No
2	Jiribam	132 kV Bus Coupler	No	No
		33 kV Bus Coupler	No	No
3	Kakching	132 kV Bus Coupler	No	No
		33 kV Bus Coupler	No	No
4	Karong	132 kV Bus Coupler	No	No
		33 kV Bus Coupler	No	No
5	Ningthoukong	132 kV Bus Coupler	No	No
		33 kV Bus Coupler	No	No
6	Rengpang	132 kV Bus Coupler	No	No
		33 kV Bus Coupler	No	No
7	Yaingangpokpi	132 kV Bus Coupler	No	No
		33 kV Bus Coupler	No	No
8	Yurembam.	132 kV Bus Coupler	No	No
		33 kV Bus Coupler	No	No
9	Kongba	132 kV Bus Coupler	No	No
		33 kV Bus Coupler	No	No
2. Owner of Bus Coupler: MePTCL, Meghalaya				
1	Mawlai	132 kV Bus Coupler	No	No
2	NEHU	132 kV Bus Coupler	Yes	Yes
3	NEIGRIHMS	132 kV Bus Coupler	No	No
4	Khliehriat	132 kV Bus Coupler	No	No
5	Lumshnong	132 kV Bus Coupler	No	No
6	Umiam	132 kV Bus Coupler	No	No
7	Mawphlang	132 kV Bus Coupler	Yes	Yes
8	Cherra	132 kV Bus Coupler	No	No
9	Nongstoin	132 kV Bus Coupler	No	No
10	Nangal	132 kV Bus Coupler	No	No
11	Rongkhon	132 kV Bus Coupler	No	No
12	EPIP-I	132 kV Bus Coupler	No	No
13	EPIP-II	132 kV Bus Coupler	No	No
14	Stage-I PH	132 kV Bus Coupler	Yes	Yes
15	Stage-II PH	132 kV Bus Coupler	Yes	Yes
16	Stage-III PH	132 kV Bus Coupler	Yes	Yes
17	Stage-IV PH	132 kV Bus Coupler	Yes	Yes
18	Umtru PH	132 kV Bus Coupler	No	No
19	Leshka PH	132 kV Bus Coupler	Yes	Yes

Bus Coupler Protection Details

Sl.No.	Name of Substation	Voltage level	Non directional O/C Protection exists (Yes/No)	Non directional E/F Protection exists (Yes/No)
20	Killing	132 kV Bus Coupler	Yes	Yes
		220 kV Bus Coupler	Yes	Yes
3. Owner of Bus Coupler: P&E, Mizoram				
1	Kolasib	132 kV Bus Coupler	Yes	Yes
		66 kV Bus Coupler	No	No
		33 kV Bus Coupler	No	No
2	Luangmual	132 kV Bus Coupler	No	No
		33 kV Bus Coupler	No	No
3	Lunglei	132 kV Bus Coupler	Yes	Yes
		33 kV Bus Coupler	No	No
4	Serchip	132 kV Bus Coupler	Yes	Yes
		33 kV Bus Coupler	No	No
5	Saitul	132 kV Bus Coupler	No	No
		33 kV Bus Coupler	No	No
6	Zemabawk	132 kV Bus Coupler	No	No
		33 kV Bus Coupler	No	No
7	Bairabi	132 kV Bus Coupler	No	No
		33 kV Bus Coupler	No	No
8	Khawzawl	132 kV Bus Coupler	No	No
		33 kV Bus Coupler	No	No
4. Owner of Bus Coupler: NEEPCO				
1	Ranganadi	400 kV Bus Coupler	Buscoupler Backup Protection (50/51A,B,C)	Buscoupler Backup Protection (50/51N)
		132 kV Bus Coupler	Directional O/C Protection	Directional E/F Protection
2	AGBPP	220 kV Bus Bar	Yes	Yes
3	AGTPP	132 kV Bus Bar	Yes	Yes
5. Owner of Bus Coupler: NHPC				
1	Loktak	132 kV Bus Coupler	Yes	Yes

Annexure II

132 kV Transmission Line Protection Details

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details							Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) Over-Current & Earth Fault Relay exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes / No)	Carrier aided Inter-tripping exists (Yes / No)	Power Swing Blocking Feature exists (Yes / No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Disturbance Recorder exists (Yes / No)	Event Logger / Sequential Event Recorder exists (Yes / No)	Fault Locator exists (Yes / No)
1. Owner of Line : POWERGRID													

Note : 1) Main-I Protection indicates Distance Protection

2) Type of Relay indicates it's operational mechanism - Numerical / Static / Electro-mechanical

3) List of inbuilt features of Numerical Relays are also to be furnished alongwith this format

Annexure II

220 kV Transmission Line Protection Details

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details										Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Main II Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) type Earth Fault Relay exists (Yes/No)	Two stage Over-Voltage Protection exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes/No)	Carrier aided Inter-tripping exists (Yes/No)	Power Swing Blocking Feature exists (Yes/No)	Pole Discrepancy Relay exists (Yes/No)	Number of Core used for CT & VT, used for Main I	Number of Core used for CT & VT, used for Main II	Disturbance Recorder exists (Yes/No)	Event Logger / Sequential Event Recorder exists (Yes/No)	Fault Locator exists (Yes/No)
1. Owner of Line :																

Note 1) Main-I Protection indicates Distance Protection

2) Main-II Protection indicates one of Distance Protection / Directional Comparison Protection / Phase Segregated Line Differential protection

3) Type of Relay indicates it's operational mechanism - Numerical / Static / Electro-mechanical

4) List of inbuilt features of Numerical Relays are also to be furnished alongwith

Annexure II

400 kV Transmission Line Protection Details

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details										Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Main II Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) type Earth Fault Relay exists (Yes/No)	Two stage Over-Voltage Protection exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes/No)	Carrier aided Inter-tripping exists (Yes/No)	Power Swing Blocking Feature exists (Yes/No)	Pole Discrepancy Relay exists (Yes / No)	Number of Core used for CT & VT, used for Main I	Number of Core used for CT & VT, used for Main II	Disturbance Recorder exists (Yes/No)	Event Logger / Sequential Event Recorder exists (Yes/No)	Fault Locator exists (Yes/No)
1. Owner of Line : POWERGRID																

Note 1) Main-I Protection indicates Distance Protection

2) Main-II Protection indicates one of Distance Protection / Directional Comparison Protection / Phase Segregated Line Differential protection

3) Type of Relay indicates it's operational mechanism - Numerical / Static / Electro-mechanical

4) List of inbuilt features of Numerical Relays are also to be furnished alongwith

Annexure II

Transformer Protection Details

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exists (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTC exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exists (Yes/No)	Overload Alarm exists (Yes/No)
1. Owner of Transformer :																
1		LV side														
		HV side														
2		LV side														
		HV side														
3		LV side														
		HV side														
4		LV side														
		HV side														
5		LV side														
		HV side														
6		LV side														
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13		LV side														
		HV side														
14		LV side														
		HV side														
15		LV side														
		HV side														

Note : 1. REF : Restricted Earth Fault, 2. WTI : Winding Temperature Indicator., 3. OTI : Oil Temperature Indicator)
4. MOG : Magnetic Oil Gauge, 5. OSR : Oil Surge Relay, 6. OLTC : On Load Tap Changer
7. PRD : Pressure Relieve Device, 8. SA : Surge Arrestor
9. List of inbuilt features of Numerical Relays are also to be furnished

Annexure II

Reactor Protection Details

Sl. No.	Name of Line Reactor/ Bus Reactor/ Tertiary Reactor	Differential Protection exists (Yes/No)	REF Protection exists (Yes/No)	Definite Time Over Current Protection exists (Yes/No)	Earth Fault Protection exists (Yes/No)	Buchholz Operation exists (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	SA exists (Yes/No)
1. Owner of Reactor :										

Note : 1. REF : Restricted Earth Fault, 2. WTI : Winding Temperature Indicator., 3. OTI : Oil Temperature Indicator)
4. MOG : Magnetic Oil Gauge, 5. SA : Surge Arrestor
6. List of inbuilt features of Numerical Relays are also to be furnished alongwith this format

Annexure II

Bus Bar & Local Breaker Backup(LBB) Protection Details

Sl.No.	Name of Bus Bar	Bus Bar Protection exists (Yes/No)	LBB Protection exists (Yes/No)
1. Owner of Bus Bar/LBB			

Note : 1. List of inbuilt features of Numerical Relays are also to be furnished alongwith this

Annexure -A.11

Bus Coupler Protection Details

Sl.No.	Name of Bus Coupler	Non directional O/C Protection exists (Yes/No)	Non directional E/F Protection exists (Yes/No)
1. Owner of Bus Coupler			

Note : 1. List of inbuilt features of Numerical Relays are also to be furnished alongwith this