

**MINUTES OF THE 33rd PROTECTION COORDINATION
SUB-COMMITTEE MEETING OF NERPC**

Date : 19/05/2015 (Tuesday)
Time : 10:00 hrs
Venue : “Hotel Pragati Manor”, Guwahati.

The List of Participants in the 33rd PCC Meeting is attached at **Annexure – I**

Shri P.K. Mishra, Member Secretary, NERPC welcomed all the participants to the 33rd PCC meeting. He informed the house that 28 officers from power utilities of NER have attended the training on Numerical Relays at Misa conducted by POWERGRID on 27th & 28th April, 2015. He requested the forum to put in record the sincere thanks & appreciation to POWERGRID and especially the faculty members i.e. Mr. P. Kanungo, DGM (AM) & Shri Madhavanand, Manager (AM), NERTS for successful conducting of above training. He requested NERTS to repeat the similar training for the second batch whose nominations have already available with NERPC. Further, he requested all the members to actively participate in the meeting so that old pending agenda should be resolved and not be repeated again and again.

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

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 32nd MEETING OF PROTECTION SUB-COMMITTEE OF NERPC.

The minutes of 32nd meeting of Protection Sub-committee held on 22nd April, 2015 at Guwahati were circulated vide letter No. NERPC/SE (O)/PCC/2015/4520-4555 dated 06th May, 2015.

NLDC has furnished their observation and to be incorporated in **Item A.4 “Standardization of Disturbance Recorder Channels”**: as below:

Recorded:

SE(O) informed that during 32nd PCC meeting, DGM (AM) stated that the recorded part of NERPC is correct and separate triggering for **“Reverse Zone Trip”** is not required as the DR will automatically get triggered due to opening of CB in such case.

Amendment - to be Recorded:

NLDC stated that it may be appreciated that if the CB operation would have been sufficient, only that could have been used to trigger the DR no other signal would have been required. Factually, the DR is used to detect the mis-operation of protection system. If we trigger the DR with CB operation, we won't be able to get the Disturbance Record for the incidents where the reverse zone issued a trip command but the breaker did not trip (which shall then be a major incident) in that case we would be helpless. With the availability of almost 32 digital channels in modern digital relays the inclusion of reverse zone protection shall hardly be any issue.

Manager (AM) stated that since POWERGRID is finalizing the DR channels in the whole country, the above suggestion by NLDC will be forwarded to them and the finalization/recommendation by the Corporate Office will be intimated shortly.

NERLDC stated that DR and EL should be extracted by all constituents of NER in time so that the DR is not lost because it was not dumped in time to PC. In case of the GD V on 23.02.15, Main II DR was not provided by NERTS. POWERGRID as it was not dumped and got erased out. Automatic dumping of DR to PC is to be explored at the earliest so that DR can be achieved and whenever required it can be used.

Deliberation of the sub-Committee

The sub-committee agreed and requested to implement the scheme at the earliest.

The Sub-Committee confirmed the minutes of 32nd PCCM of NERPC as No observations or comments were received from the constituents

ITEMS FOR DISCUSSION

A.1 Implementation of 3-phase Auto Reclosure Scheme in all lines associated with Khandong and Kopili HEP:

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

- a) 132kV Khandong – Umranso - Halflongb) 132kV Khliehriat – Khandong # 2
- c) 132kV Kopili – Khandong #1

During 32nd PCC meeting, the sub-committee decided that at Khandong end it should be kept as check synchronization mode and at Khliehriat (PG) end it should be made as dead line charging mode. The Sub-committee requested NERTS and NEEPCO to co-ordinate amongst them and implement the 3-Phase Auto-reclosure at the earliest.

Deliberation of the sub-Committee

After detailed deliberation, the sub-committee requested Assam, NERTS & NEEPCO to co-ordinate amongst them and implement the 3-Phase Auto-reclosure by 15.06.15 and the status should be intimated in the next PCC meeting. Assam, NERTS and NEEPCO agreed.

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

At present, the power flows to Nirjuli, Gohpur and Ziro radially fed 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 31st PCC meeting, EE, SLDC, Ar. Pradesh informed that due to many VIP visits during the month of February, 2015, the shutdown could not be given by them. He requested NEEPCO to avail the shutdown on any dates after 10.04.2015.

Deliberation of the sub-Committee

EE, SLDC AR. Pradesh requested NEEPCO to intimate their plan atleast one week in advance so that necessary action can be taken by them.

The sub-committee requested NEEPCO to take up the matter with Ar. Pradesh so that SPAR on above lines could 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.

In the 32nd PCCM, all the constituents are requested to furnish the data as per check list of Task force in **Annexure A.3(II)** and the data as per format of NERPC in **Annexure A.3(I)** for future reference.

AEGCL have furnished check list of protection objects. AEGCL are requested to confirm whether these protection objects are applicable for all transmission elements owned by them and also requested to furnish details as per format of NERPC. All the other constituents are requested to furnish the details as early as possible.

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

Deliberation of the sub-Committee

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

DGM (SO-II), NERLDC informed that information have been received from AEGCL (as per format II & Details of Protection Audit not received as per format-I), OTPC (as per format II), NEEPCO (Khandong & Kopili as per format-I). He requested the remaining constituents to submit at the earliest.

The sub-committee requested NERPC to write a letter to remaining constituents (i.e. NERTS (POWERGRID), NTPC, NHPC, NEEPCO (except Khandong & Kopili), AEGCL (for Details of Protection Audit as per format II), APGCL, MePTCL, MePGCL, MSPCL, DOP, Mizoram, DOP, Nagaland, DOP, Arunachal Pradesh, TSECL) to furnish the data as per check list of Task Force in Annexure – A.3 (II) and well as the data as per format of NERPC in Annexure A.3 (I) at the earliest.

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.

During 32nd PCC meeting, GM, NERLDC requested NERTS to consider the peculiarity of NER system where 132 kV level is pre-dominant and hence this should be kept in mind while finalizing the procedure.

DGM (AM), NERTS informed that suggestion in this regard has already been communicated by them to their corporate office

Deliberation of the sub-Committee

Manager (AM), NERTS informed that standardization for transformers & reactors are being finalized by their Corporate Centre for the whole country, the report would be circulated as soon as it is received from them. He also informed that suggestion by GM, NERLDC for NER States have already been communicated by them. He stated that as soon as the report is received they will intimate to NERPC/NERLDC accordingly.

The Sub-committee noted as above.

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.

During the 107th OCC meeting, the Sub-committee requested to intimate the Nodal Officer for above issue so that correspondence can be taken up with them directly. The name of Nodal Officer along with contact number is given below:

Constituent	Name of Nodal Officer	Contact No	Email id:
Ar. Pradesh	N. Perme, EE, SLDC	09436288643	sldcitnagar@gmail.com
Assam	B.C. Borah, DGM, LDC	09435119248	sldcaseb@rediffmail.com
Manipur	L. Haokip, Manager	08575004401	l.haokip@mspdcl.com
Mizoram	Vanlalrema, SE, SLDC	09436140353	sldc_mizoram@rediffmail.com
Meghalaya	F.E. Kharshiing, SE, SLDC	09612170657	sldc.shg@gmail.com
	H.F. Shangpliang, EE, MRT	09863315562	hector_fd@rediffmail.com
Nagaland	Atoho Jakhalu, EE, SLDC	09436002696	atoho.jk@gmail.com
Tripura	Mrinal Pal, Manager	09436137022	mrinalpaulnit@gmail.com
NEEPCO	Bhaskar Goswami, Sr. Mgr	09436163983	pbhaskargoswami@yahoo.com
NHPC	R.C. Singh, Manager	09436894889	rcsloktak@yahoo.com
NERTS	Supriya Paul, Dy. Mgr.	09436302995	nerts_os@yahoo.in
	Deep Bhaumick, Engineer	09436335255	-do-
OTPC	Narendra Gupta, Manager	09774233426	nk.gupta@otpcindia.in
NTPC	J. Bhattacharyya, AGM(EMD)	09435720036	jayanbhattacharjee@ntpc.co.in
	G. K. Kundu, AGM(EEMG)	09401826314	

Deliberation of the sub-Committee

SE(O) informed that nomination from NTPC was received only recently, the above meeting could not be conducted. Now since the complete list of nodal officers is received, NERPC will arrange the meeting at the earliest.

The Sub-committee noted as above.

A.6 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, in 30th PCC meeting, MS, NERPC requested that all utilities may 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 earlier minutes.

During 32nd PCC meeting, Meghalaya representative stated that Recent failure of one 63 MVAR reactor at 400 kV S/S Byrnihat of Me.ECL would be sent to CEA for investigation as directed above as suggested by SE(O) to CEA within one week.

DGM (AM) intimated that they have already sent the information to CEA regarding failure of above equipment at Bongaigoan.

Deliberation in the Meeting:

Meghalaya representative requested NERPC to take up the matter with Director (Trans) regarding failure of above equipment at Byrnihat.

The Sub-committee requested NERPC to write to Director (Transmission), Me. PTCL regarding above failure of important reactor at Byrnihat.

A.7 Status of R&M Implementation of NER from PSDF:

The Sub-committee requested all the constituents to intimate the status of progress to NERPC regularly so that the same could be intimated to CERC.

Deliberation in the Meeting:

The Status as intimated during 33rd PCC meeting is attached at **Annexure – A.7.**

The Sub-committee noted as above.

A. 8 Training on Numerical Relay:

The matter has already been noted in the opening speech of Member Secretary.

The Sub-committee noted as above.

A.9 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, NEEPCO (for Khandong, Kopili & Kopili Stg II), OTPC were requested to furnish Protection Details of Transmission Lines as per enclosed format in Annexure – A.9.

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, NEEPCO (for Khandong, Kopili & Kopili Stg II), OTPC were requested to furnish Protection Details of Transformer as per enclosed format in Annexure – A.9.

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.

OTPC was requested to furnish Protection Details of Reactor as per enclosed format in Annexure –A.9.

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 were requested to furnish Bus Bar Protection and Local Breaker Backup Protection as per enclosed format in Annexure –A.9.

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, POWERGRID, NEEPCO (for Doyang, Khandong, Kopili & Kopili Stg II) & OTPC were requested to furnish Bus Coupler Protection as per enclosed format in *Annexure –A.9*.

Deliberation in the Meeting:

Protection System Database prepared based on information furnished by power utilities of NER, which is attached at **Annexure - A.9**). Power utilities of NER were requested to check & validate the same.

The sub-committee requested NERPC to write a letter to remaining constituents (i.e. AEGCL (for Bus Coupler (for all) & Bus Bar & LBB (for BTPS, Agia, Boko, Sarusajai, Langpi, Samaguri, Jawaharnagar, Mariani, Tinsukia)), DoP, Arunachal Pradesh (for Transmission Line, Transformer, Bus Coupler, Bus Bar (for Deomali) & LBB (for Deomali), DOP, Nagaland (for Transmission Line, Transformer, Bus Coupler), NEEPCO (Transmission line (for Khandong & Kopili Stg-II), Transformer (for Kopili, Khandong & Kopili Stg-II), Bus Bar & LBB (Kopili), Bus Coupler (Kopili, Khandong, Kopili St II), OTPC (for Transmission Line, Transformer, Reactor, Bus Copuler, Bus Bar & LBB), POWEERGRID (for Bus Coupler) to furnish the data as per enclosed format in Annexure – A.9 at the earliest.

A.10 Grid Disturbances during March, 2015:

The following numbers of Grid Disturbances (GD) occurred during the period **w.e.f 1st April to 30th April, 2015:**

SI No	Control Area	Grid Disturbance in nos.	
		1 st April, 2015 to 30 th April, 2015	1 st January, 2015 to 30 th April, 2015
1	Palatana	0	4
2	AGBPP	0	1
3	AGTPP	2	3
4	Ranganadi	0	1
5	Kopili	0	1
6	Khandong	0	1
7	Doyang	0	2
8	Loktak	0	4
9	Arunachal Pradesh	6	20
10	Assam	5	21
11	Manipur	11	28
12	Meghalaya	2	3
13	Mizoram	0	3
14	Nagaland	3	12
15	Tripura	0	2

SI No	Category of GD	Grid Disturbance in nos.	
		1 st April, 2015 to 30 th April, 2015	1 st January, 2015 to 30 th April, 2015
1	GD 1	27	65
2	GD 2	0	2
3	GD 3	0	0
4	GD 4	0	0
5	GD 5	0	1
	Total	27	68

Deliberation in the Meeting:

This is for information to the members. Remedial actions to be taken by the concerned power utilities of NER to avoid such disturbances in future.

A.11 Root Cause analysis of Grid Disturbances:

i. Disturbance in Manipur system

- a. At **1157 Hrs on 06.04.15**, 132 kV Imphal (PG) - Imphal (MSPCL) I line tripped (**Imphal (PG)- Earth fault & Imphal (MSPCL)-Not furnished**) & 132 kV Imphal (PG) - Imphal (MSPCL) II line tripped (**Imphal (PG)- Earth fault & Imphal (MSPCL)-Not furnished**). Tripping of these two lines led to load loss in Capital area of Manipur.

Load loss: 28 MW in Manipur.

- b. At **2218 Hrs on 09.04.15**, 132 kV Imphal (PG) - Imphal (MSPCL) I line tripped (**Imphal (PG)- Earth fault & Imphal (MSPCL)-Not furnished**) & 132 kV Imphal (PG) - Imphal (MSPCL) II line tripped (**Imphal (PG)- Earth fault & Imphal (MSPCL)-Not furnished**). Tripping of these two lines led to load loss in Capital area of Manipur.

Load loss: 70 MW in Manipur.

- c. At **2030 Hrs on 10.04.15**, 132 kV Imphal (PG) - Imphal (MSPCL) I line tripped (**Imphal (PG)- Earth fault & Imphal (MSPCL)-No tripping**) & 132 kV Imphal (PG) - Imphal (MSPCL) II line tripped (**Imphal (PG)- Earth fault & Imphal (MSPCL)- No tripping**). Tripping of these two lines led to load loss in Capital area of Manipur.

Load loss: 51 MW in Manipur.

- d. At **2330 Hrs on 10.04.15**, 132 kV Imphal (PG) - Imphal (MSPCL) I line tripped (**Imphal (PG)- Earth fault & Imphal (MSPCL)-No tripping**) & 132 kV Imphal (PG) - Imphal (MSPCL) II line tripped (**Imphal (PG)- Earth fault & Imphal (MSPCL)- No tripping**). Tripping of these two lines led to load loss in Capital area of Manipur.

Load loss: 50 MW in Manipur.

- e. At **2121 Hrs on 20.04.15**, 132 kV Loktak- Ningthoukhong tripped (**Loktak- Not furnished & Ningthoukhong-Not furnished**) & 132 kV Ningthoukhong- Imphal (PG) line tripped (**Ningthoukhong- Not furnished & Imphal (PG) - Earth Fault**). Tripping of these 2 lines led to load loss in Ningthoukhong area of Manipur.

Load loss: 28 MW in Manipur.

- f. At **0853 Hrs on 21.04.15**, 132 kV Loktak- Ningthoukhong tripped (**Loktak- Earth Fault & Ningthoukhong-Not furnished**) & at 0901 Hrs on 21.04.15 132 kV Ningthoukhong- Imphal (PG) line tripped (**Ningthoukhong- Not furnished & Imphal (PG) - Earth Fault**). Tripping of these 2 lines led to load loss in Ningthoukhong area of Manipur.

Load loss: 20 MW in Manipur.

- g. At **0939 Hrs on 21.04.15**, 132 kV Ningthoukhong- Imphal (PG) line tripped (**Ningthoukhong- Not furnished & Imphal (PG) - Earth Fault**). 132 kV Loktak- Ningthoukhong was already out due to tripping at 0853 Hrs on 21.04.15. Tripping of this line led to load loss in Ningthoukhong area of Manipur.

Load loss: 5 MW in Manipur.

- h. At **1716 Hrs on 22.04.15**, 132 kV Imphal (PG) - Imphal (MSPCL) I line tripped (**Imphal (PG)- Earth fault & Imphal (MSPCL)-Not furnished**) & 132 kV Imphal (PG) - Imphal (MSPCL) II line tripped (**Imphal (PG)- Earth fault & Imphal (MSPCL)- Not furnished**). Tripping of these two lines led to load loss in Capital area of Manipur.

Load loss: 55 MW in Manipur.

- i. At **0423 Hrs on 24.04.15**, 132 kV Loktak- Ningthoukhong tripped (**Loktak- DP,Z-II, R-Y-E & Ningthoukhong- falling of tree reported**) & 132 kV Ningthoukhong- Imphal (PG) line tripped (**Ningthoukhong- Not furnished & Imphal (PG) – DP, Z-I, Y-E**). Tripping of these 2 lines led to load loss in Ningthoukhong area of Manipur.

Load loss: 6 MW in Manipur.

- j. At **0542 Hrs on 25.04.15**, 132 kV Loktak- Ningthoukhong tripped (**Loktak- DP,Z-I, B-E & Ningthoukhong- Earth fault, B-phase**) & 132 kV Ningthoukhong- Imphal (PG) line tripped (**Ningthoukhong- Earth fault, Y-phase & Imphal (PG) – DP, Z-II, Y-E**). Tripping of these 2 lines led to load loss in Ningthoukhong area of Manipur.

Load loss: 25 MW in Manipur.

- k. At **1715 Hrs on 28.04.15**, 132 kV Loktak- Ningthoukhong tripped (**Loktak- Earth Fault & Ningthoukhong- No tripping**) & 132 kV Ningthoukhong- Imphal (PG) line tripped (**Ningthoukhong- No tripping & Imphal (PG) – Back-up Earth fault**). Tripping of these 2 lines led to load loss in Ningthoukhong area of Manipur.

Load loss: 20 MW in Manipur.

Category as per CEA Standards: GD-I

Analysis of events:

It is suspected that there may be fault in MSPCL system in all the cases of load loss in Manipur as stated above. It is requested to furnish DR outputs at both ends for above events for further analysis.

DR has been received from Loktak for tripping of 132 kV Loktak- Ningthoukhong line on 20.04.15 at 2121 Hrs.

Deliberation in the Meeting:

The Sub-committee expressed concerned about the frequent tripping in Manipur system and requested NERPC to arrange the meeting with senior officers of Power Dept. Manipur & representatives comprising from NERTS, NERLDC & NERPC to find out the root causes of disturbances as many such incidences have been occurred in Manipur.

A meeting will be convened in Manipur in this regard.

ii. **Power Station Blackout**

- a. At **0247 Hrs on 22.04.15**, 132 kV AGTPP- Agartala I (**AGTPP- Tripped on voltage jerk & Agartala- No tripping**), 132 kV AGTPP- Agartala II (**AGTPP- Tripped on voltage jerk & Agartala- No tripping**) & 132 kV AGTPP- Kumarghat (**AGTPP- Tripped on voltage jerk & Kumarghat- No tripping**).

Generation loss: 80 MW in AGTPP.

- b. At **0014 Hrs on 24.04.15**, 132 kV AGTPP- Agartala I (**AGTPP- DP,Z-II, R-Y-B & Agartala- No tripping**), 132 kV AGTPP- Agartala II (**AGTPP- DP,Z-II, R-Y-B & Agartala- No tripping**) & 132 kV AGTPP- Kumarghat (**AGTPP- DP,Z-II, R-Y-B & Kumarghat- No tripping**).

Generation loss: 59 MW in AGTPP.

Category as per CEA Standards: GD-I

Analysis of events:

Due to tripping of all outgoing feeders from AGTPP, all the running units of AGTPP tripped. It is requested to furnish DR outputs at both ends for above event for further analysis.

DR has been received from Kumarghat for tripping of 132 kV AGTPP- Kumarghat line on 24.04.15 at 0014 Hrs.

Deliberation in the Meeting:

The Sub-committee requested NERPC to take up the matter with AGTPP, NEEPCO & TSECL to find out the reason of above tripping so that the same can be taken up in the next PCC meeting.

iii. Disturbance in Meghalaya system:

- a. **At 0910 Hrs on 04.04.15**, 132kV Khliehriat (PG) - Khliehriat (MePTCL) I (Khliehriat (PG) - DP, Z-III, R-E & Khliehriat (MePTCL)- DP, Z-I, R-E), 132kV Khliehriat (PG) - Khliehriat (MePTCL) II (Khliehriat (PG) - DP, Z-I, R-E & Khliehriat (MePTCL)- No tripping) & 132 kV Khliehriat – Badarpur (Khliehriat (PG)- No tripping & Badarpur- DP, Z-II, R-E) lines tripped.

Load loss: 50 MW in Meghalaya

Category as per CEA Standards: GD-I

Analysis of events:

Due to tripping of these lines, power supply to Khliehriat area of Meghalaya was interrupted. It is suspected that there may be fault in Meghalaya system. It is requested to furnish DR outputs at both ends for above event for further analysis.

Deliberation in the Meeting:

Manager (AM), NERTS informed that there was LA blast at Khliehriat (MePTCL) end and Third Harmonic Resistive Current (THRC) of LAs testing had been carried out by them on regular basis, results are found to be within permissible limits. The report had been sent to corporate office for comments. Further, he stated that THRC is being carried out by them once in a year for all stations.

The Sub-committee noted as above.

iv. Repeated tripping of elements:

DGM (SO-II), NERLDC informed that during the month of April, 2015 there was repeated tripping of 132 kV Silchar- Imphal I and 132 kV Aizawl- Kumarghat S/C.

1. 132 kV Silchar- Imphal I tripped 3 times on 02.04.15.
2. 132 kV Aizawl- Kumarghat line tripped 4 times on 04.04.15.
3. 132 kV Silchar- Imphal I tripped 2 times on 10.04.15.
4. 132 kV Aizawl- Kumarghat line tripped 2 times on 22.04.15.
5. 132 kV Aizawl- Kumarghat line tripped 2 times on 23.04.15.

Details of tripping are given in **Annexure-IV**.

Deliberation in the Meeting:

Manager (AM), NERTS informed that in cases of 1, 2, 4 & 5, the tripping is due to lightning. Where tripping in case of 3 above, the reason is due to OPGW work. He stated that shutdown request for above case 3 has been proposed and once the work is completed, the above problem will be resolved.

The Sub-committee noted as above.

Date and Venue of next PCC

It is proposed to hold the 34th PCC meeting of NERPC in the second week of June, 2015. The exact venue will be intimated in due course.

Annexure-I**List of Participants in the 33rd PCC Meetings held on 19/05/2015**

SN	Name & Designation	Organization	Contact No.
	No Representatives	Ar. Pradesh	
1.	Sh. B.C. Borah, AGM, SLDC	Assam	09435119248
2.	Sh. N. Patir, Dy. Mgr	Assam	09707380294
3.	Sh. G.K. Bhuyan, AGM	Assam	09854015601
4.	Sh. S.P. Singh, Manager, MSPCL	Manipur	09612152014
5.	Sh. Th. Sushanta Singh, Dy. Mgr, MSPCL	Manipur	09862448363
6.	Sh. A.G. Tham, AE, MRT	Meghalaya	09774664034
7.	Sh. S. Saha, AE, PLCC	Meghalaya	09436112798
	No Representatives	Mizoram	
8.	Sh. A. Jakhalu, E.E (Trans)	Nagaland	09436002696
	No Representatives	Tripura	
9.	Sh. M. Madhavanand, Manager (AM)	PGCIL	09436335250
10.	Sh. A. Mallick, DGM (SO-II)	NERLDC	09436302720
11.	Sh. Rahul Chakrabarti, Sr. Engr. (SO-II)	NERLDC	09402507543
12.	Sh. Tanya Taji, Sr.Manager	NEEPCO	09436042053
13.	Sh. B. Goswami, Sr. Manager (E/M)	NEEPCO	09436163983
14.	Sh. J. Bhattacharya, AGM (EMD)	NTPC	09435720036
	No Representatives	ENICL	
15.	Sh. S. Medhi, Dy. Manager (AM)	NHPC	09435534564
16.	Sh. Tapash Karmakar, Asst.Mgr. (E)	OTPC	09435239314
17.	Sh. P.K. Mishra, Member Secretary	NERPC	09968380242
18.	Sh. B. Lyngkhai, Director /S.E (O)	NERPC	09436163419
19.	Sh. S.M. Jha, E.E	NERPC	08731845175
20.	Sh. S. Mukherjee, AEE	NERPC	08794277306
21.	Sh. Shaishav Ranjan, A.E	NERPC	08794276168

Annexure – A.7
Rs. In Crore.

State	Name of Entity	Status	Funding Sought by Entity	Quantum of funding approved by Appraisal Committee (AC)	Quantum of funding approved by Monitoring Committee (MC)
Ar. Pradesh	DoP, AP	DPR submitted to CEA/NLDC- under examination of CEA – now it will be taken up in next meeting of the techno-economic sub-group	33.45	-	-
Assam	AEGCL	Scheme already approved by Monitoring Committee – MoP sanctioned awaited	382.48	299.37	299.37
Manipur	MSPCL	DPR to be submitted	-	-	-
Meghalaya	Me. PTCL	Scheme already approved by Appraisal Committee & approval by Monitoring Committee is awaited	102.8	69.19 and recommended to MC	-
	Me. PGCL	DPR submitted to CEA/NLDC- under examination of CEA – now it will be taken up in next meeting of the techno-economic sub-group	48.16	-	-
Mizoram	DoP, Mizoram	Revised DPR submitted to CEA/NLDC- under examination of CEA – now it will be taken up in next meeting of the techno-economic sub-group	31.38	-	-
Nagaland	DoP, Nagaland	Scheme already approved by Monitoring Committee – MoP sanctioned awaited	39.96	39.96	39.96
Tripura	TSECL	Revised DPR submitted to CEA/NLDC- under examination of CEA – now it will be taken up in next meeting of the techno-economic sub-group	-		

Annexure I

132 kV Transmission Line Protection Details

[illegible]

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 I

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 I

400 kV Transmission Line Protection Details

[illegible]

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 I

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														
		HV side														
7		LV side														
		HV side														
8		LV side														
		HV side														
9		LV side														
		HV side														
10		LV side														
		HV side														
11		LV side														
		HV side														
12		LV side														
		HV side														
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 I

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)
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1. Owner of Reactor :

[illegible]

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 I

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

[illegible]

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

Annexure -A.9 (I)

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)
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1. Owner of Bus Coupler

[illegible]

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

132 kV Transmission Line Protection Details

Annexure-A.9 (II)

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-A.9 (II)

[illegible]

132 kV Transmission Line Protection Details

Annexure-A.9 (II)

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-A.9 (II)

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-A.9 (II)

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-A.9 (II)

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-A.9 (II)

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-A.9 (II)

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
			Dullavchera	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-A.9 (II)

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	Sipajhar	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-A.9 (II)

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-A.9 (II)

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-A.9 (II)

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 (Nongkhylllem) - Umtru I	132	Umiam St IV (Nongkhylllem)	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 (Nongkhylllem) - Umtru II	132	Umiam St IV (Nongkhylllem)	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 (Kyrdekmlai) - Umtru I	132	Umiam St III (Kyrdekmlai)	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 (Kyrdekmlai) - Umtru II	132	Umiam St III (Kyrdekmlai)	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 (Kyrdekmlai) - Umiam St I (Sumer) I	132	Umiam St III (Kyrdekmlai)	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-A.9 (II)

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

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Annexure-A.9 (II)

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

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Annexure-A.9 (II)

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-A.9 (II)

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-A.9 (II)

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	EPF 1 - 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) - Lumshnong	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-A.9 (II)

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	

132 kV Transmission Line Protection Details

Annexure-A.9 (II)

[illegible]

132 kV Transmission Line Protection Details

Annexure-A.9 (II)

[illegible]

7. Owner of Line/End : TSECL

[illegible]

132 kV Transmission Line Protection Details

Annexure-A.9 (II)

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	Bodhjungnagar-SMNagar	132	Bodhjungnagar	Yes	Yes	No	No	Yes	No	3 & 2-Core	No	No	No
			SMNagar	Yes	Yes	No	No	Yes	No	3 & 2-Core	No	No	No
14	SMNagar-Grid	132	SMNagar	Yes	Yes	No	No	Yes	No	3 & 2-Core	No	No	No
			Grid	No	No	No	No	No	No	No	No	No	No
15	PKBari-Gournagar	132	PKBari	No	No	No	No	No	No	No	No	No	No
			Gournagar	No	No	No	No	No	No	No	No	No	No
16	PKBari-Missiontilla	132	PKBari	No	No	No	No	No	No	No	No	No	No
			Missiontilla	Yes	Yes	No	No	Yes	No	3 & 2-Core	No	No	No

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

132 kV Transmission Line Protection Details

Annexure-II

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-II

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-II

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 (Differential)	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-II

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-II

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 (LFZP111S1 0053E) 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-II

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 (LFZP111S1 0053E) 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 (LFZP111S1 0053E) 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	

Annexure-II

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Annexure-II

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										
15. Owner of End : NEEPCO & TSECL													
1	Missiontilla-ASEB	132	Missiontilla	No	No	No	No	No	No	No	No	No	No
			ASEB										
2	Banduar- Palatana	132	Banduar	Yes	Yes	No	No	Yes	No	3 & 2-Core	No	No	No
			Palatana										
3	Banduar- Monarchak	132	Banduar	Yes	Yes	No	No	Yes	No	3 & 2-Core	No	No	No
			Monarchak										
4	Rokhia-Monarchak	132	Rokhia	Yes	Yes	No	No	Yes	No	3 & 2-Core	No	No	No
			Monarchak										
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 II		
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 II		
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 II		
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																	

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220 kV Transmission Line Protection Details															Annexure II		
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 II		
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 II		
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 II		
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 II

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	Yes	No	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	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	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	Yes	No	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	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
4	220/132 kV 1x50 MVA Boko ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
5	220/132 kV 2x80 MVA BTPS ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
	220/132 kV 1x160 MVA BTPS ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
6	220/132 kV 2x100 MVA Mariani ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
7	220/132 kV 2x50 NTPS ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
8	220/132 kV 3x50 MVA Samaguri ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
9	220/132 kV 3x100 MVA Sarusajai ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
10	220/132 kV 2x50 MVA Tinsukia ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
11	220/33 kV 2x50 MVA GIS (Jawaharnagar) ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
12	132/33 kV 1x40 MVA Agia ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
	132/33 kV 1X12.5 MVA Agia ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
13	132/33 kV 1X12.5 MVA APM (Ashok Paper Mill) ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	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	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
14	132/33 kV 2X25 MVA Barnagar ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
15	132/33 kV 2X16 MVA Biswanath Chariali ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
16	132/33 kV 2X16 MVA Bokakhat ICTs	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
17	132/33 kV 1X16 MVA Bokajan ICT	LV side	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		HV side	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	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 II

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exits (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exits (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exits (Yes/No)	OTI Protection exits (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTCT exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exits (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 II

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exits (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exits (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exits (Yes/No)	OTI Protection exits (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTCT exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exits (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 II

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exists (Yes/No)	Over Fluxing Protection exists (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exists (Yes/No)	Impedance 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)	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	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	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	Yes	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	Yes	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	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	Yes	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	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	Yes	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	Yes	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	Yes	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	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	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	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	Yes	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	Yes	NA	No
		HV side	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	No	

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Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exists (Yes/No)	Over Fluxing Protection exists (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exists (Yes/No)	Impedance 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)	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																
1	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														
	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 II

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exits (Yes/No)	Over Fluxing Protection exits (Yes/No)	REF Protection exits (Yes/No)	Directional Over Current Protection exits (Yes/No)	Impedance Protection exits (Yes/No)	Buchholz Operation exits (Yes/No)	WTI Protection exits (Yes/No)	OTI Protection exits (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 II

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 II

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		
	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		
15	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		
	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		
16	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 II

[illegible]

Transformer Protection Details

Annexure II

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exists (Yes/No)	Over Fluxing Protection exists (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exists (Yes/No)	Impedance 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)	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	No	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 Displacement Protection)	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 AGBPP	LV side	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes			

Transformer Protection Details

Annexure I

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exists (Yes/No)	Over Fluxing Protection exists (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exists (Yes/No)	Impedance 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)	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 II

[illegible]

Annexure II

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Transformer Protection Details

Annexure II

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)
10	Udaipur	15 MVA	LV side	Yes	No	No	No	No	No	No	No	No	No	No	Yes	No
		132/11 KV	HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No
		15 MVA	LV side	Yes	No	No	No	No	No	No	No	No	No	No	Yes	No
		132/11 KV	HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No
11	Surjyamaninagar	50 MVA	LV side	Yes	No	Yes	No	No	No	No	No	No	No	No	Yes	No
		132/33 KV	HV side	Yes	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No
		50 MVA	LV side	Yes	No	Yes	No	No	No	No	No	No	No	No	Yes	No
		132/33 KV	HV side	Yes	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No
12	Grid, 79 Tilla	25 MVA	LV side	Yes	No	No	No	No	No	No	No	No	No	No	Yes	No
		132/33 KV	HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No
		15 MVA	LV side	Yes	No	No	No	No	No	No	No	No	No	No	Yes	No
		132/11 KV	HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No
		15 MVA	LV side	Yes	No	No	No	No	No	No	No	No	No	No	Yes	No
		132/33 KV	HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No
		15 MVA	LV side	Yes	No	No	No	No	No	No	No	No	No	No	Yes	No
		132/33 KV	HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No
		15 MVA	LV side	Yes	No	No	No	No	No	No	No	No	No	No	Yes	No
		132/33 KV	HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No
		25 MVA	LV side	Yes	No	No	No	No	No	No	No	No	No	No	Yes	No
		132/33 KV	HV side	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No

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 II		
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 II
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 II
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 Schar SS	Yes, Differential (CAG)								
9	63 MVAR 400kV Bus Reactor-2 Schar 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 II
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-Bongaigaon	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 (CAG34AF71 A)								
4	63/50 MVAR 400 KV D/C Balipara-Bongaigaon-II	Yes, Differential (CAG34AF71 A)								
5	63 MVAR 400 KV D/C Balipara-Bongaigaon-3	Yes, Differential (CAG34AF71 A)								
6	63 MVAR 400 KV D/C Balipara-Bongaigaon-4	Yes, Differential (CAG34AF71 A)								
7	50 MVAR 400KV D/C Balipara-Ranganadi-I	Yes, Differential (DTH31)								

Reactor Protection Details										Annexure II
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

Annexure II

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

Annexure -A.9 (II)

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

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)
19	Leshka PH	132 kV Bus Coupler	Yes	Yes
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- IV

Repeated Trippings of lines during April-2015

Sl. No.	Name of tripping element/ Description	Owner	Data to be furnished by	Date & Time of Event provided by CR operator	Name of Node	Relay indications provided by CR operator	Operation of Auto Reclose	Date and time or restoration provided by CR operator
1	132 kV Silchar - Imphal I	POWERGRID	POWERGRID	2149 Hrs on 02.04.15	Silchar	DP, ZI, B-E	Not Furnished	2204 Hrs on 02.04.15
					Imphal (PG)	DP, ZI, B-E	Not Furnished	
				2220 Hrs on 02.04.15	Silchar	DP, ZI, B-E	Not Furnished	2241 Hrs on 02.04.15
					Imphal (PG)	DP, ZI, R-E	Not Furnished	
				2331 Hrs on 02.04.15	Silchar	DP, ZI, B-E	Not Furnished	1638 Hrs on 04.04.15
					Imphal (PG)	DP, ZI, R-E	Not Furnished	
2	132 kV Aizawl - Kumarghat	POWERGRID	POWERGRID	0525 Hrs on 04.04.15	Aizawl	DP, ZI, B-E	Not Furnished	0533 Hrs on 04.04.15
					Kumarghat	DP, ZI, B-E	Not Furnished	
				0551 Hrs on 04.04.15	Aizawl	DP, ZI, B-E	Not Furnished	0555 Hrs on 04.04.15
					Kumarghat	DP, ZI, B-E	Not Furnished	
				0645 Hrs on 04.04.15	Aizawl	DP, ZI, B-E	Not Furnished	0650 Hrs on 04.04.15
					Kumarghat	DP, ZI, B-E	Not Furnished	
				0741 Hrs on 04.04.15	Aizawl	DP, ZI, B-E	Not Furnished	0748 Hrs on 04.04.15
					Kumarghat	DP, ZI, B-E	Not Furnished	
3	132 kV Silchar - Imphal I	POWERGRID	POWERGRID	0011 Hrs on 10.04.15	Silchar	DP, ZI, Y-B-E	Not Furnished	0020 Hrs on 10.04.15
					Imphal (PG)	DP, ZI, Y-B-E	Not Furnished	
				0020 Hrs on 10.04.15	Silchar	DP, ZI, Y-E	Not Furnished	1827 Hrs on 11.04.15
					Imphal (PG)	DP, ZI, Y-E	Not Furnished	
4	132 kV Aizawl - Kumarghat	POWERGRID	POWERGRID	0032 Hrs on 22.04.15	Aizawl	DP, ZI, B-E	Not Furnished	0042 Hrs on 22.04.15
					Kumarghat	DP, ZI, B-E	Not Furnished	
				0235 Hrs on 22.04.15	Aizawl	DP, ZI, B-E	Not Furnished	0307 Hrs on 22.04.15
					Kumarghat	DP, ZI, B-E	Not Furnished	
5	132 kV Aizawl - Kumarghat	POWERGRID	POWERGRID	0047 Hrs on 23.04.15	Aizawl	DP, ZI, B-E	Lockout	0103 Hrs on 23.04.15
					Kumarghat	DP, ZI, B-E	Not Furnished	
				0106 Hrs on 23.04.15	Aizawl	DP, ZI, R-B-E	Lockout	0645 Hrs on 23.04.15
					Kumarghat	DP, ZI, R-B-E	Not Furnished	