North Eastern Regional Power Committee

Agenda For

52nd PCC Sub-Committee Meeting

Time of meeting : 14:00 Hrs.

Date of meeting : 13th December, 2018 (Thursday)

Venue : "Hotel Nandan", Guwahati.

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 51st MEETING OF PROTECTION SUB-COMMITTEE OF NERPC.

The minutes of 51st meeting of Protection Sub-committee held on 9th August, 2018 at Guwahati were circulated vide letter No. NERPC/SE/PCC/2018/2565-589 dated 30th August, 2018.

The Sub-committee may confirm the minutes of 51st PCCM of NERPC as no comments/observations were received from the constituents.

ITEMS FOR DISCUSSION

1. FOLLOW UP OF REMEDIAL ACTIONS:

The suggested measures with status as per 51st PCC:

Sl. No	Name of element	Actions to be taken	Concerned Utilities	Status as per 51st PCC Meeting	Latest status
1	133 kV Lekhi - Nirjuli Line	Checking of healthiness of Protection System (Relays, Circuit breaker, DC system etc) of downstream substations	DoP, AP	Status could not be updated due to absence by DoP, AP	
2	132 kV Agia - Medipathar I line and 132 kV Mawngap - Nongstoin I line	Healthiness of Protection System at Nongstoin for 132 kV Mawngap - Nongstoin Line to be done by MePTCL.	MePTCL	Under PSDF works By Nov'18	
3	133 kV Agia - Medipathar I line and 132 kV Mawngap - Nongstoin I line	Checking of healthiness of Protection System (Relays, Circuit breaker, DC system etc) of downstream substations	MePTCL	Under PSDF works By Nov'18	

4	132 kV Kolasib-Badarpur line & 132 kV Kolasib-Aizwal line	Relay Coordination to be done at Kolasib & downstream substations of Kolasib by P&ED Mizoram.	P & ED Mizoram, NERTS	By 17.08.18	
7	132 kV AGTCCPP-Agartala	Over-reach of DPR at AGTCCPP. Setting to be revised after HTLS upgradation.	NEEPCO	NEEPCO to revise settings upon discussion with NERTS by Aug'18.	
8	132 kV Rangia - Motonga	Checking of relay settings at Rangia	NERTS	Standardisation of DR channels to be co-ordinated by NLDC	
9	400kV Balipara-BNC I&II	POR settings to be disabled. Z-I to be kept at 80%	NERTS	Oct'18	
12	132kV Bus Bar at Palatana	Healthiness/operation of bus bar protection need to be reviewed	OTPC	By 1st week of Sep'18.	
14	Blackout of 220 kV Mariani(PG) on 06.03.18	POWERGRID to review over voltage setting at Mariani and Mokokchung SS and time grading may be provided.** Issue of non-tripping at AGBPP end of Mariani(PG)-AGBPP line & at Misa end of Mariani(PG)-Misa line are to be attended.	NERTS/NEEPCO	Setting revised. Carrier to be checked by 15.09.18.	
15	Disturbance in Tripura on 22nd, 26th & 31st Mar'18 and 30th Apr'18 Fault in 132 kV Rokhia - Agartala D/C. Delayed fault clearance due to absence of DPR.	Status of Installation of DPR in 132 kV Rokhia - Agartala D/C	TSECL	By 15.10.18	
		O/C & E/F co-ordination after installation of DPR		By 15.10.18	
		Review of Z-II (to be 150% of line length) settings at SM Nagar for Agartala D/C		By 31.08.18	

		R & B phase analog DR input to be reversed at SM Nagar.		By 31.08.18	
		Review of Z-II (to be 120% of line length) settings at Budhajnagar for Agartala line		By 31.08.18	
		Review of Z-II & Z-III settings at Palatana for SM Nagar line. Adopted CT ratio & CT ratio in relay settings at Palatana for SMNagar line to be checked.	OTPC	By 10.09.18	
16	132 kV AGTCCPP - Agartala D/C on 31.03.18	Installation of Line Differential in 132 kV AGTCCPP - 79 Tilla D/C & Review of impedance setting of both ends as a temporary measure.	NERTS/NEEPCO	LDP - Jun'19(LOA date) Settings by 31.08.18.	
17	220kV Misa blackout and loss of generation of Khandong and Kopili on 21.05.18	ICT-2 at Misa delayed fault clearance is to be analysed.	NERTS	ICT to be replaced under NERSS-V. Settings will be done afresh.	
		Z-2 overlapping of 220 kV Misa - Samaguri and 220 kV Samaguri -Sarusajai to be checked.	AEGCL/NERTS	By Aug'18	
18	Faults in 132kV 79Tilla-Rokhia D/C	Rokhia E/F relay to be made directional. OR Directional Earth Fault function of DPR is to be enabled and then disable backup earth fault relay (EM).	TSECL	After DPR installation. By Oct'18	
19	Repeated trippings of 132kV Doyang-Mokokchung and 132kV Mokokchung-Mokokchung D/C	Timings at 132 kV Mokokchung(PG) and 132kV Doyang to be increased.	NERTS/NEEPCO	By Aug'18	
		Relay and protection system healthiness of all elements to be checked at Mokokchung(NAG).	DoP Nagaland	-	

20	Jiribam blackout on 06.06.18	Downstream settings at Pailapol to be coordinated if not done	AEGCL	By 28.08.2018	
		Protection settings and relay healthiness for 132kV Pailapol-Srikona at Pailapol to be ensured	AEGCL	By 28.08.2018	
21	Tripping of 400kV Palatana-Silchar D/C on 11.05.18	Non attempt of Auto recloser at Palatana of 400 kV Silchar – Palatana 2 line to be investigated	OTPC	By Aug'18	
22	Tripping of 220kV Misa-Byrnihat-I on 09.05.18	Maloperation of Earth Fault relay at Misa to be attended	NERTS	By Aug'18	
23	Repeated tripping of 400kV Palatana-Silchar-2	Maloperation of B/U impedance relay. DT sent due to relay restart/self-restart to be investigated.	NERTS	OEM visited. Detailed report to be given by 15th Sep'18.	
24	Tripping of 400kV Balipara-Bongaigaon-3 on 26.07.18	Maloperation of O/C relay at Bongaigaon	NERTS	By Aug'18	
25	Tripping of 220kV Misa-Samaguri-2 on 02.07.18	SOTF operation while transferring from one bus to another (non-operation of changeover switch) at Samaguri.	AEGCL	Fault in relay rectified by NERTS. AEGCL- By Aug'18	
26	Tripping of 132kV Bus-B at RHEP due to bus differential on 07.07.18	Bus bar protection to be configured in DR of all elements at RHEP.	NEEPCO	By Sep'18	
27	Repeated Tripping of 132kV Palatana-SMNagar and 132kV SMNagar-Comilla	DPR at Palatana over-reached. Settings to be reviewed and DPR tested.	OTPC	By 10.09.2018	

Concerned utilities may please intimate the latest status.

A. OLD ITEMS

A.1 Third Party Protection audit of NER Sub-Stations

In 51st PCCM, Director(O&P), NERPC updated the status of the third party protection audit. He informed that a comparative summary (detailing 2012-13 audit status & 2017-18 audit) has been circulated to all the utilities, for updation of latest status and timeline. The forum requested all the utilities to submit the status and timeline for completion of suggested remedial actions by 31.08.2018.

The comparison report for all utilities has been attached at **Annexure-A.1.**

Latest status has been submitted by AEGCL, MSPCL and MePTCL. Other utilities may please give the latest status.

Members may please discuss

A.2 Standardization of Disturbance Recorder Channels:

Decision as per previous meeting:

- Format for DR standardization i.r.o. One and half breaker, DMT and MT has been circulated.
- All utilities to submit a schedule for DR standardization in alignment with R&U works at the earliest.

Members may please discuss

A.3 Implementation of SPAR

Decision(s) as per deliberation in previous meeting(s):

- All the utilities to update the status of A/R wherever information is not yet available as per format attached as **Annexure A.3**(circulated previously also).

- OTPC vide their letter no. OTPC/UDP/PLT/2018-19/Electrical/42 dated 23rd Aug'18, wherein OTPC requested to allow them to keep auto reclose function of 132 kV Transmission lines at Palatana in "Non-auto mode". Director, NERPC vide mail dated. 07.09.18 had requested OTPC to abide by the decision of the 51st PCC meeting to keep AR in "Auto" mode for 132kV Palatana-Surjmaninagar. OTPC may please inform the status.

- Previous PCC forums as well as Sub-group in its meetings had recommended that AR for 132kV Dimapur-Kohima has to be activated at the earliest. DoP Nagaland may please intimate the latest status.

Members may please discuss.

A.4 Disturbance in Tripura System

The timeline as decided in 51st PCCM for completion of R&U works by TSECL for important stations:

Name of sub-station	***Time of completion***
79Tilla	By 15.10.18
Rokhia	By 15.10.18
Udaipur	By 15.10.18

PKBari	By 15.10.18

Latest status for installation of line differential relay for 132kV P.K. Bari - Kumarghat and 132kV AGTCCPP- Agartala D/C by NERTS - Dec'18.

NERTS/TSECL may please update the status.

A.5. Identification of short lines to install line differential protection

Decision as per deliberations in the previous meeting(s):

- A draft list prepared by NERLDC for important short lines was circulated previously. The same has been attached at **Annex. A.5.** for reference.
- NERTS has considered 220kV transmission lines with length less than 10km for installation of LDP.
- For 132kV lines impedance is to be matched with 220kV lines and accordingly lines have to be identified.
- All state utilities are to conduct the exercise and revise the list accordingly with modification of DPR if necessary.

Members may please discuss.

A.7 Technical presentation in PCCM:

It was decided that on the 52nd PCC meeting, presentations on Ramakrishna Task Force Recommended settings would be given by NERTS

NERTS may please give the presentation.

B. NEW ITEMS

B.1 Actions recommended by Sub-group:

The Sub-group in its meeting held on 30.08.2018, 09.10.18, 22.11.18 & 10.12.18 recommended the following actions:

Sl. No	Brief details of the disturbance/incidence	Actions to be taken	Concerned Utilities	Latest Status
1	Frequent tripping of 220kV Misa-Killing D/C	Location to be identified for any flashover in each of the cases viz. 220kV Killing - Misa #II on 05.08.18, 18.08.2018 and 23.08.18 & 220kV Killing - Misa #I on 23.08.18,05.09.18	MePTCL	
2		Tower footing resistance measurement to be done for the identified locations. Necessary corrective measures for improving of soil resistivity in line with soil reactivating chemical	MePTCL	

		compound treatment as per IS or installation of TLA may be considered for vulnerable lines		
3		Fault location to be identified and Vegetation clearance to be done for 220kV Misa - Byrnihat #I tripping on 26.09.18, 07.10.18 & 03.11.18 and for 220kV Misa - Byrnihat #II on 08.09.18 & 26.09.18	MePTCL	
4		Multiple tripping of 220kV Misa- Byrnihat D/C on 06.09.18 & 07.09.18. Suspected DC mixing during breaker testing of 220 kV Misa – Dimapur -1 line at Misa end to be checked by NERTS.	NERTS	
5		P444 Main-II relay settings to be checked for 220kV Misa - Byrnihat -II (relay not operated for fault on 08.09.18)	MePTCL	
6		Relay to be fed from Line CVT instead of Bus CVT at Byrnihat for 220kV Misa-Byrnihat-I	MePTCL	
7		A/R operation at Byrnihat to be checked for 220kV Misa-Byrnihat-I	MePTCL	
8	Tripping of 400kV Balipara - Bongaigaon-IV on 13.09.18 & 15.09.18	FSC protection issued trip command to line breaker instead of operation of Bypass breaker of FSC. Issue taken with OEM.	NERTS	
9	Frequent tripping of 400kV Silchar-Azara 24.09, 15.10, 17.10 &31.10	Tripping on 24.09.18 - Main-I relay non-operation at Silchar to be checked.	NERTS	
10		Tripping on 24.09.18 - Delayed clearance on DEF at Azara to be checked.	AEGCL	

11		DEF to be configured in DR	NERTS/AEGCL	
12		Vegetation clearance to be done	NETC/NERTS	Completed for identified fault locations
13	Frequent tripping of 132kV Lumshnong-Panchgram	Tripping due to vegetation fault - 06.08.18,07.08.18, 24.10.18,16.11.18. Fault location to be identified and Vegetation clearance to be done.	MePTCL/AEGCL	
14		Location to be identified for any flashover for tripping on 09.08.18, 15.08.18	MePTCL/AEGCL	
15	Tripping of 220/132kV 160MVA ICT-1&2 at Killing on 23.08.18	i) OSR operation to be checked ii)Flashover spot to be identified, iii)OLTC oil parameters to be checked.	MePTCL	
16	Aizawl blackout in Aug'18	Settings alongwith directionality of earth fault relay may be reviewed for 132kV P.K.Bari-Kumarghat at P.K.Bari.		
17	Tripping of 132kV Doyang-Dimapur D/C on 01.08.18, 16.08.18, 19.08.18	DPR zone timings to be checked at Doyang end for Ckt#II	NEEPCO	
18		Tower top patrolling is to be carried out for identification of lightning prone areas.	NERTS	
19		Tower footing resistance measurement to be done for the identified locations.	NERTS	
20		Exact location to be identified and vegetation clearance to be done.		
21	Frequent tripping of 400kV Palatana-Silchar #II on 14.08.18, 19.08.18, 18.09.18,	All faults on vegetation.Vegetation clearance to be done and patrolling report to be	NERTS	

	06.10.18	submitted.		
22		Z-III reach to be checked at Palatana end	OTPC	
23		Carrier status to be delinked from A/R operation in PSL at Palatana for 400kV Silchar.	OTPC	
24		Z-II instantaneous tripping (no carrier received observed in DR) at Palatana to be checked	OTPC	
25		Carrier health to be checked and monitored at Silchar/Palatana	NERTS/OTPC	
26		Delayed fault clearance and non-operation of M-I at Silchar to be attended	NERTS	
27	Tripping of 400kV Palatana-Silchar D/C on 17.10.18	Main-2 relay at Silchar for 400kV Palatana Ckt#I maltripping due to overreach(CT ratio increase). To be checked and rectified with OEM	NERTS	
28		Vegetation clearance to be done and patrolling report to be submitted.	NERTS	
29	Blackout of Ranganadi, Pare and Ar. Pradesh on 29.09.18	Overvoltage settings for 132 kV RHEP – Pare 2 line & 132 kV Itanagar – Pare line at 132 kV Pare to be reviewed	NEEPCO	
30		Delay in outage of filter bank after tripping of Pole to be investigated	NERTS	
31	Tripping of 400kV Byrnihat-Bongaigaon on 25.09.18, 09.10.18, 16.11.18	Main-I & Main-II relay at Byrnihat channel standardization to be done.	MePTCL	
32		Main-I relay (at Byrnihat) neutral feed to be checked.	MePTCL	
33		Healthiness of carrier to be checked at Bongaigaon and Byrnihat end.	MePTCL/NERTS	

34		A/R non-operation to be checked at Byrnihat end.	MePTCL	
35		Carrier status to be checked at Byrnihat	MePTCL	
36		Tower top patrolling to be done and lightning location to be identified	NERTS	
37		Tower footing resistance measurement to be done for the identified locations. Necessary corrective measures for improving of soil resistivity in line with soil reactivating chemical compound treatment	NERTS	
38		Numerical Relay at Bongaigaon/Byrnihat to be time synced	NERTS/MePTCL	
39		Vegetation clearance to be done and patrolling report to be furnished	NETC	
40	Disturbance in Tripura System on 27.09.18	Tower top patrolling to be done, lightning location to be identified and tower footing resistance to be measured for 132kV AGTCCPP-Agartala D/C if required.	NERTS	
41		Relay settings and CT connection to be reviewed for 132kV Agartala - SMNagar D/C at Agartala.	TSECL	
42		Carrier inter-trip to be implemented for 132kV Agartala-Budhjunnagar immediately.	TSECL	
43		DPR Settings to be reviewed for 132kV Palatana - SMNagar line at Palatana.	OTPC	
44		Patrolling report to be submitted for 132kV Agartala-Budhjunnagar line.	TSECL	

45	Tripping of 400kV Bongaigaon-Alipurduar-2 on 25.09.18	Z-I over reaching of M-2 relay at Bongaigaon end of 400 kV Bongaigaon - Alipurduar 2 line to be investigated	NERTS	
46	Disturbance in Nagaland System on 19.09.18	LBB mal-operation checked and rectified at Dimapur.	NERTS	Completed
47		The relay 7SA 522 at Misa has temporarily been put out of service for further investigation. Another Distance Relay (GE-Make) and B/U O/C & E/F protection is put in service.	NERTS	Completed
48		Tower top patrolling to be done for 220kV Mariani-Mokokchung D/C.	NERTS	
49	Frequent tripping of 220kV mariani-Mokochung-I on overvoltage	Y-ph CVT error to be rectified	NERTS	
50	Tripping of 132kV Pare-Lekhi and Pare Units on 30.09.18	Vegetation clearance of 132 kV Pare – Lekhi line to be done	DoP Ar.Pradesh/NERTS	
51		GT neutral over current protection settings of Pare units to be reviewed	NEEPCO	
52	Repeated tripping of 132kV Ranganadi-Pare	Carrier healthiness to be checked at Pare	NEEPCO	
53		Vegetation fault clearance to be done	DoP Ar.Pradesh	
54	Tripping of 400kV Bongaigaon-APD-I on 09.10.18	Main-I Z-2 non-detection to be checked at Bongaigaon	NERTS	
55		Main -2 relay at Bongaigaon non-operation to be checked	NERTS	
56	Tripping of 132kV Badarpur-Panchgram on 18.10.18, 27.10.18	Z-III timing to be checked at Badarpur end	NERTS	
57	Grid Incidence on 05.12.18	Combine the existing TEED and Reactor Differential Protection Zone as well as replace the existing old differential relays by new Numerical Differential Relay.	NERTS	Dec'18

58		Multiple E/F in buried cables to be addressed with GIS upgradation	NERTS	Mar'19
59		Commissioning of Aux.BCU	NERTS	Jan'19
60		Review of HVDC pole protection philosophy	NERTS	Dec'18

Members may please discuss.

B.2 Frequent trippings in Manipur System:

Tripping of 132kV Aizawl - Tipaimukh and 132kV Jiribam - Tipaimukh on 20.08.18

Findings of the Sub-group:

- Suspected downstream fault at Tipaimukh

Remedial actions to be taken:

- Reasons for non-tripping at Tipaimukh end to be furnished by MSPCL.
- Status of PLCC for protection at Tipaimukh to be intimated by MSPCL

Frequent Tripping of 132 kV Loktak – Ningthoukhong line

132 kV Loktak – Ningthoukhong line tripped 2 times in the month of Sep'18 and 3 times in Nov'18.

Findings of the Sub-group:

- Fault in the line for incidents in Sep'18
- Downstream fault for incidents in Nov'18.

Remedial actions to be taken:

- MSPCL is requested to submit the patrolling report and action taken report
- E/F to be made directional at Ningthoukong
- DR to be furnished

Frequent tripping of 132kV Loktak-Rengpang

132kV Loktak-Rengpang tripped 6 times in Sep'18 and 5 times in Oct'18

Findings of the Sub-group:

- As per DR submitted from Loktak end vegetation fault on all occasions

Remedial actions to be taken:

- Vegetation clearance to be done and patrolling report to be furnished by MSPCL.
- DR for Rengpang end to be furnished by MSPCL at the earliest.

MSPCL may please intimate the latest status.

B.3 Relay setting co-ordination in Nagaland system:

In discussions of Sub-group it was highlighted that co-ordination in settings is required for the following lines:

- 132kV Doyang-Mokokchung(PG)-Mokokchung(NAG)
- 132kV Doyang-Sanis-Wokha-Kohima-Dimapur

Suggested settings are attached at **Annex. B.3**

Members may please discuss.

AGENDA ITEMS FROM NERLDC:

B.4 Grid Disturbance of NER on 05.12.18 at 10:19 Hrs

At 10:19 Hrs on 05.12.18, Bus fault occurred at 400 kV Bongaigaon Sub-Station resulting in bus dead of 400 kV Bongaigaon, 400 kV Balipara, 400 kV Biswanath Chariali, 400 kV Ranganadi and 400 kV Misa Sub-Stations. As a result of these dead buses, power supply to Khupi area & Capital area of Arunachal Pradesh and Sonabil area of Assam interrupted , As a result, there was about 140 MW load loss in these areas..

The tripping of 400 kV lines from ER (Alipurduar & Binaguri) which were exporting approx. 800 MW to NER led to the overloading of 220 kV lines (220 kV APD-Salakati-D/C) for the short period when loading on each circuit is approx. 220 MW plus for 3 SCADA samples. Through these 220 kV lines ER-NER remain synchronized with the grid and islanding of NER was saved, tripping of even one line would have caused severe high loading of other and ultimately separation of NER. The low value of net NER-IR exchange (HVDC export nearly equal to import by 400 kV and 220 kV AC lines) and survival of 220 kV lines during the fault saved the separation of NER.
The following lines tripped:

1. 400 kV Bongaigaon – New Siliguri I & II
2. 400 kV Bongaigaon – Alipurduar I & II
3. 400 kV Bongaigaon – Balipara I, II &III
4. 400 kV Bongaigaon – Azara
5. 400 kV Bongaigaon – Byrnihat
6. 400 kV Bongaigaon – BgTPP I and II
7. 400 kV Balipara – Misa I & II
8. 400 kV Balipara – Biswanath Chariali I, II, III & IV
9. 400 kV Biswanath Chariali- Ranganadi I
10. 220 kV Mariani – Mokochung I,&II
11. 400/220 kV 315 MVA ICT I and II at Azara
12. 400/220 kV 315 MVA ICT I and II at Misa
13. 400/220 kV 315 MVA ICT I and II at Balipara
14. 400/132 kV 200 MVA ICT I and II at Biswanath Chariali
15. 132 kV Biswanath Chariali – Pavoi D/C, 132 kV Pavoi – Gohpur, 132 kV Sonabil – Pavoi, 132 kV Sonabil – Gohpur, 132 kV Balipara – Sonabil,
16. 800 kV HVDC Pole I & 2

Preliminary information from NERTS reveals that R-phase isolators of Bus Reactor-II at Bongaigaon Substation opened automatically on load signaling that the Isolator/Breaker/ Earth Switch interlock did not function. Also, apparently the Bus Bar Protection Schemes and LBB Schemes did not operate.

NERTS may intimate and explain the reason of automatic signal generation for opening of the Isolators of Bus Reactor II, and the reason for non-functioning of Bus Bar Protection Schemes and LBB Schemes at Bongaigaon Substation.

For ensuring the safe and secure operation of the grid, the Isolator/Breaker/Earth Switch interlock schemes, Bus Bar Protection Schemes and LBB schemes of all the major substations at NER is to be done by all the concerned constituents.

NERLDC may please deliberate.

B.5 Reconstitution of Protection Subgroup

At present, members of Protection Sub Group of NERPC are from NERPC, NERLDC, POWERGRID, MePTCL and NEEPCO. Some of Events, GDs and GIs could not be discussed/ analyzed during last few Protection Sub Group Meetings as these events were pertaining to other utilities who are not members of this group.
It is requested that Protection Sub Group may be reconstituted.
NERLDC may please deliberate.

B.6 Analysis & Discussion on Events, Grid Incidences, Grid Disturbances which occurred in NER Grid w.e.f 1st August 2018 – 30th November 2018.

The following numbers of Grid Disturbances (GD) & Grid Incidents (GI) occurred during the period **w.e.f 1st August 2018 – 30th November 2018:**

Sl. No.	Control Area	Grid Incidents in nos. (Aug'18 to Nov'18)	Grid Disturbance in nos. (Aug'18 to Nov'18)	Grid Incidents in nos. (Jan'18 to Nov'18)	Grid Disturbance in nos. (Jan'18 to Nov'18)
1	Palatana	1	0	13	1
2	AGBPP	9	0	30	0
3	AGTPP	6	0	34	2
4	Ranganadi	1	0	1	0
5	Kopili	5	0	15	1
6	Khandong	6	0	13	2
7	Doyang	0	1	2	2
8	Loktak	2	1	2	2
9	BgTPP	3	0	21	0
10	Pare	2	0	6	0
11	Arunachal Pradesh	0	16	3	45

12	Assam	0	5	0	30
13	Manipur	0	12	0	27
14	Meghalaya	0	0	0	9
15	Mizoram	0	7	0	20
16	Nagaland	0	25	0	56
17	Tripura	0	11	0	36

Sl. No.	Category of GD / GI	Grid Disturbance in nos.	
		Aug'18 to Nov'18	Jan'18 to Nov'18
1	GI-I	16	69
2	GI-II	19	68
3	GD 1	76	203
4	GD 2	0	1
5	GD 3	0	1
6	GD 4	0	0
7	GD 5	0	0
8	**Total GI**	35	137
9	**Total GD**	76	205

This is for information to the members.

B.7 Status of implementation of protection audit recommendations by M/s Tractabel

Protection audit of 6 substations of NER was conducted by Tetrabel (Consultancy firm to review the status of implementation of recommendation of Enquiry Committee on Grid Disturbance and Protection Audit) in Jun-Sep'2016. Following substations were audited by Tetrabel:

1. 400/220 kV Bongaigaon-Salakati (PG)
2. 400/220 kV Balipara (PG)
3. 400/220 kV Byrnihat (MePTCL)
4. 400/220 kV Misa (PG)
5. 400/132 kV Ranganadi HEP (NEEPCO)
6. 220 kV Sarusajai (AEGCL)

Relevant pages of Audit report submitted by Tetrabel is attached as **Annexure-B.7**.

POWERGRID, MePTCL, AEGCL & NEEPCO are requested to intimate the status of implementation of protection audit recommendations by Tetrabel.

NERLDC may please deliberate.

B.8 Standard for Station Event Logger/Events in SCADA system

Since the installation of Event Loggers, SAS/SCADA, etc. under R & M works funded from PSDF is going on/completed in NER states, it is proposed that utilities may adopt the standard followed by POWERGRID for EL/Events in SCADA system. This will help in post analysis after any grid disturbance. List of minimum required inputs which are to be configured in Station Event Logger/SACADA is attached as **Annexure-B.8**.

NERLDC may please deliberate.

AGENDA ITEM FROM NERTS:

B.9 Replacement of C&R panel against 132KV Silchar-I & II feeder at 132/33KV Srikona Ss, AEGCL by M/s Siemens

During recent replacement of C&R panel at 132KV Silchar Feeder-II following problems has been observed after replacement of old C&R panel with new C&R panel supplied by AEGCL:

a) Distance relay has been installed instead of differential relay as per original scheme.
b) A/R of CB is not possible as the scheme is suitable for 3-pole gang operation.
c) Features like CB Spring charge status of individual pole, trip circuit supervision of all poles are not available.
d) Binary inputs of CB such as PD signal are not available in the relay.
e) Relay SAS signal could not be verified due to shortage of time during shut down.

However in 132KV Silchar Feeder - I replacement of C&R has not yet been done. As such keeping in view the above problems incurred after replacement in Silchar feeder-II, arrangement may be made to try to interface the BCU etc. as applicable in up gradation by AEGCL in our existing C&R panel and its proper functionality to be confirmed.

Thus if the above process is successful, then AEGCL may reinstall the old POWERGRID C&R panel (which has been replaced) of Silchar Feeder-II and reinstall the interfacing unit as required by AEGCL in that panel and confirm its functionality.

Alternatively other option which may be adopted is that after solving the issues as mentioned in Sl No. a, b, c, d,e in Silchar Feeder-II then only work against Silchar Feeder - I may be started.

NERTS may please deliberate.

Any other item:

Date and Venue of next PCC

It is proposed to hold the 53rd PCC meeting of NERPC on second week of March, 2019. The date & exact venue will be intimated in due course.

*****

Details of Auto Recloser of Lines in North Eastern Regional Grid **ANNEXURE-A.3**

Sl No	*Voltage Level*	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Owner	AR Details (SPAR/3-Ph AR/Not Available/Information not Available	Remarks
1	132 kV	132 kV South Comilla (Bangladesh) - Surajmani Nagar	1	D/C	PGCB	TSECL	47.0	POWERGRID	Information not Available	
2	132 kV	132 kV South Comilla (Bangladesh) - Surajmani Nagar	2	D/C	PGCB	TSECL	47.0	POWERGRID	Information not Available	
1	132 kV	132 kV Gelyphu (Bhutan) - Salakati	1	S/C	BPCL	POWERGRID	49.2	POWERGRID	SPAR in service	
2	132 kV	132 kV Motonga (Bhutan) - Rangia	1	S/C	BPCL	AEGCL	49.0	POWERGRID & BPC	Information not Available	
1	400 kV	400 kV Azara - Bongaigaon	1	D/C	AEGCL	POWERGRID	162.9	NETC(1.8%) &AEGCL (98.2%)	SPAR in service	
2	400 kV	400 kV Azara - Silchar	1	D/C	AEGCL	POWERGRID	256.0	NETC(37.5%) & AEGCL(62.5%)	SPAR in service	
3	400 kV	400 kV Balipara - Biswanath Chariali	1	D/C	POWERGRID	POWERGRID	60.0	POWERGRID	SPAR in service	
4	400 kV	400 kV Balipara - Biswanath Chariali	2	D/C	POWERGRID	POWERGRID	60.0	POWERGRID	SPAR in service	
5	400 kV	400 kV Balipara - Biswanath Chariali	3	D/C	POWERGRID	POWERGRID	57.1	POWERGRID	SPAR in service	
6	400 kV	400 kV Balipara - Biswanath Chariali	4	D/C	POWERGRID	POWERGRID	57.1	POWERGRID	SPAR in service	
7	400 kV	400 kV Balipara - Bongaigaon	1	D/C	POWERGRID	POWERGRID	289.7	POWERGRID	SPAR in service	
8	400 kV	400 kV Balipara - Bongaigaon	2	D/C	POWERGRID	POWERGRID	289.7	POWERGRID	SPAR in service	
9	400 kV	400 kV Balipara - Bongaigaon	3	D/C	POWERGRID	POWERGRID	304.6	POWERGRID	SPAR in service	
10	400 kV	400 kV Balipara - Bongaigaon	4	D/C	POWERGRID	POWERGRID	304.6	POWERGRID	SPAR in service	
11	400 kV	400 kV Balipara - Misa	1	D/C	POWERGRID	POWERGRID	95.9	POWERGRID	SPAR in service	
12	400 kV	400 kV Balipara - Misa	2	D/C	POWERGRID	POWERGRID	95.9	POWERGRID	SPAR in service	

Details of Auto Recloser of Lines in North Eastern Regional Grid **ANNEXURE-A.3**

Sl No	*Voltage Level*	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Owner	AR Details (SPAR/3-Ph AR/Not Available/Information not Available	Remarks
13	400 kV	400 kV Biswanath Chariali - Ranganadi	1	D/C	POWERGRID	NEEPCO	131.0	POWERGRID	SPAR in service	
14	400 kV	400 kV Biswanath Chariali - Ranganadi	2	D/C	POWERGRID	NEEPCO	131.0	POWERGRID	SPAR in service	
15	400 kV	400 kV Bongaigaon - Byrnihat	1	D/C	POWERGRID	MePTCL	203.5	NETC(97.91 %) & MePTCL(2.09%)	SPAR in service	
16	400 kV	400 kV Binaguri - Bongaigaon	1	D/C	POWERGRID	POWERGRID	218.0	POWERGRID	SPAR in service	
17	400 kV	400 kV Binaguri - Bongaigaon	2	D/C	POWERGRID	POWERGRID	218.0	POWERGRID	SPAR in service	
18	400 kV	400 kV Alipurduar - Bongaigaon	1	D/C	POWERGRID	POWERGRID	106.0	ENICL	SPAR in service	
19	400 kV	400 kV Alipurduar - Bongaigaon	2	D/C	POWERGRID	POWERGRID	106.0	ENICL	SPAR in service	
20	400 kV	400 kV BgTPP - Bongaigaon	1	D/C	NTPC	POWERGRID	3.1	POWERGRID	SPAR Available	Due to LDP, SPAR is not attempting
21	400 kV	400 kV BgTPP - Bongaigaon	2	D/C	NTPC	POWERGRID	3.1	POWERGRID	SPAR Available	Due to LDP, SPAR is not attempting
22	400 kV	400 kV Byrnihat - Silchar	1	D/C	MePTCL	POWERGRID	217.0	NETC(98.06%)& MePTCL(1.94%)	SPAR in service	
23	400 kV	400 kV Pallatana - Silchar	1	D/C	OTPC	POWERGRID	247.0	NETC	SPAR in service	
24	400 kV	400 kV Pallatana - Silchar	2	D/C	OTPC	POWERGRID	247.0	NETC	SPAR in service	
1	220 kV	220 kV AGBPP - Mariani	1	S/C	NEEPCO	AEGCL	162.9	POWERGRID	Information not available	AGBPP-SPAR enabled, Mariani end-POWERGRID may intimate
2	220 kV	220 kV AGBPP - Mariani(PG)	1	S/C	NEEPCO	POWERGRID	160.5	POWERGRID	SPAR in service	
3	220 kV	220 kV Mariani - Misa	1	S/C	AEGCL	POWERGRID	220.0	POWERGRID	Information not available	POWERGRID may intimate the status
4	220 kV	220 kV Mariani (PG) - Misa	1	S/C	POWERGRID	POWERGRID	222.7	POWERGRID	SPAR in service	
1	132 kV	132kV Imphal - Silchar	1	D/C	POWERGRID	POWERGRID	166.5	POWERGRID	SPAR in service	
2	132 kV	132kV Imphal - Silchar	2	D/C	POWERGRID	POWERGRID	166.5	POWERGRID	SPAR in service	
3	132 kV	132kV P K Bari - Silchar	1	D/C	TSECL	POWERGRID	127.2	POWERGRID	SPAR in service	
4	132 kV	132kV P K Bari - Silchar	2	D/C	TSECL	POWERGRID	127.2	POWERGRID	SPAR in service	
1	220 kV	220 kV AGBPP - Deomali	1	S/C	NEEPCO	DoP,Arunachal Pradesh	19.0	DoP, Arunachal Pradesh	Information not available	DoP AP may intimate the status
2	220 kV	220 kV AGBPP - Tinsukia	1	S/C	NEEPCO	AEGCL	24.6	AEGCL	SPAR not in service	SPAR available at both ends, but is not enabled at AGBPP as per Audit report
3	220 kV	220 kV AGBPP - Tinsukia	2	S/C	NEEPCO	AEGCL	24.6	AEGCL	SPAR not in service	SPAR available at both ends, but is not enabled at AGBPP as per Audit report

Details of Auto Recloser of Lines in North Eastern Regional Grid **ANNEXURE-A.3**

Sl No	*Voltage Level*	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Owner	AR Details (SPAR/3-Ph AR/Not Available/Information not Available	Remarks
4	220 kV	220 kV Agia - Azara	1	D/C	AEGCL	AEGCL	107.0	AEGCL	Not Available	SPAR available at Azara, Agia end will be done in R&M works
5	220 kV	220 kV Agia - Boko	1	D/C	AEGCL	AEGCL	70.0	AEGCL	Not Available	SPAR will be done in R&M works
6	220 kV	220 kV Agia - BTPS	1	D/C	AEGCL	AEGCL	62.5	AEGCL	Not Available	SPAR will be done in R&M works
7	220 kV	220 kV Agia - BTPS	2	D/C	AEGCL	AEGCL	62.5	AEGCL	Not Available	SPAR will be done in R&M works
8	220 kV	220 kV Azara - Boko	1	D/C	AEGCL	AEGCL	38.0	AEGCL	Not Available	SPAR available at Azara, other end will be done in R&M works
9	220 kV	220 kV Azara - Sarusajai	1	D/C	AEGCL	AEGCL	24.0	AEGCL	Not Available	SPAR available at Azara, other end will be done in R&M works
10	220 kV	220 kV Azara - Sarusajai	2	D/C	AEGCL	AEGCL	24.0	AEGCL	Not Available	SPAR available at Azara, other end will be done in R&M works
11	220 kV	220 kV Balipara - Sonabil	1	S/C	POWERGRID	AEGCL	10.0	AEGCL	SPAR in service	AEGCL & POWERGRID may confirm
12	220 kV	220 kV Alipurduar - Salakati	1	D/C	POWERGRID	POWERGRID	100.6	POWERGRID	SPAR in service	
13	220 kV	220 kV Alipurduar - Salakati	2	D/C	POWERGRID	POWERGRID	100.6	POWERGRID	SPAR in service	
14	220 kV	220 kV BTPS - Salakati	1	D/C	AEGCL	POWERGRID	2.7	POWERGRID	SPAR in service	AEGCL & POWERGRID may confirm
15	220 kV	220 kV BTPS - Salakati	2	D/C	AEGCL	POWERGRID	2.7	POWERGRID	SPAR in service	AEGCL & POWERGRID may confirm
16	220 kV	220 kV Dimapur - Misa	1	D/C	POWERGRID	POWERGRID	123.5	POWERGRID	SPAR in service	
17	220 kV	220 kV Dimapur - Misa	2	D/C	POWERGRID	POWERGRID	123.5	POWERGRID	SPAR in service	
18	220 kV	220 kV Jawaharnagar - Samaguri	1	D/C	AEGCL	AEGCL	119.0	AEGCL	Not Available	SPAR available at JawaharNagar, other end will be done in R&M works
19	220 kV	220 kV Jawaharnagar - Sarusajai	1	D/C	AEGCL	AEGCL	11.0	AEGCL	Not Available	SPAR available at JawaharNagar, other end will be done in R&M works

Details of Auto Recloser of Lines in North Eastern Regional Grid **ANNEXURE-A.3**

Sl No	*Voltage Level*	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Owner	AR Details (SPAR/3-Ph AR/Not Available/Information not Available	Remarks
20	220 kV	220 kV Karbi Langpi - Sarusajai	1	S/C	APGCL	AEGCL	108.0	AEGCL	Not Available	SPAR will be done in R&M works
21	220 kV	220 kV Karbi Langpi - Sarusajai	2	S/C	APGCL	AEGCL	108.0	AEGCL	Not Available	SPAR will be done in R&M works
22	220 kV	220 kV Byrnihat - Misa	1	S/C	MePTCL	POWERGRID	113.4	MePTCL	SPAR in service	
23	220 kV	220 kV Byrnihat - Misa	2	S/C	MePTCL	POWERGRID	113.4	MePTCL	SPAR in service	
24	220 kV	220 kV Kopili - Misa	1	D/C	NEEPCO	POWERGRID	73.0	POWERGRID	SPAR in service	
25	220 kV	220 kV Kopili - Misa	2	D/C	NEEPCO	POWERGRID	73.0	POWERGRID	SPAR in service	
26	220 kV	220 kV Kopili - Misa	3	S/C	NEEPCO	POWERGRID	75.8	POWERGRID	SPAR in service	
27	220 kV	220 kV Mariani (AEGCL) - Samaguri	1	S/C	AEGCL	AEGCL	168.0	AEGCL	Not Available	will be done in PSDF scheme
28	220 kV	220 kV Mariani (PG) - Mokokchung (PG)	1	D/C	POWERGRID	POWERGRID	48.8	POWERGRID	SPAR in service	
29	220 kV	220 kV Mariani (PG) - Mokokchung (PG)	2	D/C	POWERGRID	POWERGRID	48.8	POWERGRID	SPAR in service	
30	220 kV	220 kV Misa - Samaguri	1	D/C	POWERGRID	AEGCL	34.4	POWERGRID	Information not available	POWERGRID may intimate the status
31	220 kV	220 kV Misa - Samaguri	2	D/C	POWERGRID	AEGCL	34.4	POWERGRID	Information not available	POWERGRID may intimate the status
32	220 kV	220 kV NTPS - Tinsukia	1	D/C	AEGCL	AEGCL	39.8	AEGCL	Not Available	will be done in PSDF scheme
33	220 kV	220 kV NTPS - Tinsukia	2	D/C	AEGCL	AEGCL	39.8	AEGCL	Not Available	will be done in PSDF scheme
34	220 kV	220 kV Samaguri - Sarusajai	1	D/C	AEGCL	AEGCL	130.0	AEGCL	Not Available	AEGCL may intimate the plan of action
35	220 kV	220 kV Samaguri - Sarusajai	2	D/C	AEGCL	AEGCL	130.0	AEGCL	Not Available	will be done in PSDF scheme
35	220 kV	220 kV Samaguri - Sonabil	1	S/C	AEGCL	AEGCL	56.0	AEGCL	Not Available	Due to problem at Samaguri end. Implemeted in R&M scheme funded from PSDF
36	220 kV	220 kV Samaguri - Sonabil	2	S/C	AEGCL	AEGCL	56.0	AEGCL	Not Available	Due to problem at Samaguri end. Implemeted in R&M scheme funded from PSDF
1	132 kV	132 kV Agartala - AGTCCPP	1	D/C	TSECL	NEEPCO	8.4	POWERGRID	Not Available	SPAR available at AGTCCPP, PLCC is not in service

Details of Auto Recloser of Lines in North Eastern Regional Grid **ANNEXURE-A.3**

Sl No	*Voltage Level*	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Owner	AR Details (SPAR/3-Ph AR/Not Available/Information not Available	Remarks
2	132 kV	132 kV Agartala - AGTCCPP	2	D/C	TSECL	NEEPCO	8.4	POWERGRID	Not Available	SPAR available at AGTCCPP, PLCC is not in service
3	132 kV	132 kV Agartala - Bodhjannagar	1	S/C	TSECL	TSECL	8.0	TSECL	Not Available	TSECL may intimate the plan of action
4	132 kV	132 kV Agartala - Dhalabil	1	S/C	TSECL	TSECL	45.0	TSECL	Not Available	TSECL may intimate the plan of action
5	132 kV	132 kV Agartala - Rokhia	1	D/C	TSECL	TSECL	35.0	TSECL	Not Available	TSECL may intimate the plan of action
6	132 kV	132 kV Agartala - Rokhia	2	D/C	TSECL	TSECL	35.0	TSECL	Not Available	TSECL may intimate the plan of action
7	132 kV	132 kV Agia - Mendipathar	1	S/C	AEGCL	MePTCL	31.3	MePTCL	Not Available	Agia end: 3-ph AR will be will be implemented under R&M works, **Mendipathar-MePTCL may intimate the status**
8	132 kV	132 kV AGTCCPP - Kumarghat	1	S/C	NEEPCO	POWERGRID	7.8	POWERGRID	Not Available	AGTCCPP end: Single pole CB, E/M AR relay available; **Kumarghat end: Gang operated CB**
9	132 kV	132 kV Aizawl - Jiribam	1	S/C	POWERGRID	POWERGRID	172.3	POWERGRID	3-Ph AR in service	

Details of Auto Recloser of Lines in North Eastern Regional Grid **ANNEXURE-A.3**

Sl No	*Voltage Level*	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Owner	AR Details (SPAR/3-Ph AR/Not Available/Information not Available	Remarks
10	132 kV	132 kV Aizawl - Kolasib	1	S/C	POWERGRID	P&ED, Mizoram	66.1	POWERGRID	3-Ph AR in service	POWERGRID may confirm
11	132 kV	132 kV Aizawl - Kumarghat	1	S/C	POWERGRID	POWERGRID	132.9	POWERGRID	3-Ph AR in service	
12	132 kV	132 kV Aizawl - Luangmual	1	S/C	POWERGRID	P&ED, P&ED, Mizoram	0.8	P&ED, Mizoram	Not Available	
13	132 kV	132 kV Aizawl - Melriat(PG)	1	S/C	POWERGRID	POWERGRID	6.7	POWERGRID	Not Available	
14	132 kV	132 kV Ambasa - Gamaitila	1	S/C	TSECL	TSECL	25.0	TSECL	Information not available	TSECL may intimate the status
15	132 kV	132 kV Ambasa - Kamalpur	1	S/C	TSECL	TSECL	31.0	TSECL	Information not available	TSECL may intimate the status
16	132 kV	132 kV Ambasa - P K Bari	1	S/C	TSECL	TSECL	45.0	TSECL	Information not available	TSECL may intimate the status
17	132 kV	132 kV Badarpur - Jiribam	1	S/C	POWERGRID	POWERGRID	67.2	POWERGRID	Information not available	POWERGRID may intimate the status
18	132 kV	132 kV Badarpur - Kolasib	1	S/C	POWERGRID	P&ED, Mizoram	107.2	POWERGRID	Information not available	POWERGRID may intimate the status
19	132 kV	132 kV Badarpur - Kumarghat	1	S/C	POWERGRID	POWERGRID	118.5	POWERGRID	3-Ph AR in service	
20	132 kV	132 kV Badarpur - Panchgram	1	S/C	POWERGRID	AEGCL	1.0	POWERGRID	Information not available	**POWERGRID may intimate the status**, Panchgram end: 3 ph AR will be implemeted under R&M
21	132 kV	132 kV Badarpur - Silchar	1	D/C	POWERGRID	POWERGRID	19.2	POWERGRID	Information not available	Silchar end: AR in BCU available, **AEGCL may intimate the status**
22	132 kV	132 kV Badarpur - Silchar	2	D/C	POWERGRID	POWERGRID	19.2	POWERGRID	Information not available	Silchar end: 3-ph AR in BCU available, **AEGCL may intimate the status**
23	132 kV	132 kV Balipara - Bhalukpong	1	S/C	POWERGRID	DoP, Arunachal Pradesh		NEEPCO & DoP, Arunachal Pradesh	Not Available	
24	132 kV	132 kV Balipara - Depota	1	S/C	POWERGRID	AEGCL	29.8	AEGCL	Not Available	AEGCL&POWERGRID may intimate the plan of action
25	132 kV	132 kV Balipara - Sonabil	1	S/C	AEGCL	AEGCL	10.0	AEGCL	Information not available	Sonabil end: 3-ph AR available, **Balipara end: POWERGRID may intimate**

Details of Auto Recloser of Lines in North Eastern Regional Grid **ANNEXURE-A.3**

Sl No	*Voltage Level*	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Owner	AR Details (SPAR/3-Ph AR/Not Available/Information not Available	Remarks
26	132 kV	132 kV Baramura - Gamaitilla	1	S/C	TSECL	TSECL	14.0	TSECL	Not Available	TSECL may intimate the status
27	132 kV	132 kV Baramura - Jirania	1	S/C	TSECL	TSECL	12.6	TSECL	Not Available	TSECL may intimate the status
28	132 kV	132 kV Bhalukpong - Khupi	1	S/C	DoP, Arunachal Pradesh	NEEPCO		NEEPCO & DoP, Arunachal Pradesh	Not Available	
29	132 kV	132 kV Biswanath Chariali - Pavoi	1	D/C	POWERGRID	AEGCL	12.9	POWERGRID	Not Available	Pavoid end- 3-ph AR will be implemented, BNC: POWERGRID may intimate the status
30	132 kV	132 kV Biswanath Chariali - Pavoi	2	D/C	POWERGRID	AEGCL	12.9	POWERGRID	Not Available	Pavoid end- 3-ph AR will be implemented, BNC: POWERGRID may intimate the status
31	132 kV	132 kV Pavoi - Sonabil	1	S/C	AEGCL	AEGCL	39.0	AEGCL	Not available	Sonabil end: 3-ph AR available, **Pavoid end: 3-ph AR under R&M**
32	132 kV	132 kV Bodhjannagar - Jirania	1	S/C	TSECL	TSECL	13.5	TSECL	Not Available	TSECL may intimate the status
33	132 kV	132 kV Bokajan - Dimapur	1	S/C	AEGCL	POWERGRID	26.4	AEGCL	Not available	
34	132 kV	132 kV Bokajan - Golaghat	1	S/C	AEGCL	AEGCL	15.0	AEGCL	Not available	AEGCL may intimate the plan of action
35	132 kV	132 kV BTPS - Dhaligaon	1	D/C	AEGCL	AEGCL	21.5	AEGCL	Not available	3-ph AR under R&M
36	132 kV	132 kV BTPS - Dhaligaon	2	D/C	AEGCL	AEGCL	21.5	AEGCL	Not available	3-ph AR under R&M
37	132 kV	132 kV BTPS-Kokrajhar	1	S/C	AEGCL	AEGCL	10.3	AEGCL	Not available	AEGCL may intimate the plan of action
38	132 kV	132 kV Bilashipara-Kokrajhar	1	S/C	AEGCL	AEGCL	24.2	AEGCL	Not available	AEGCL may intimate the plan of action
39	132 kV	132 kV Bilashipara-Gauripur	1	S/C	AEGCL	AEGCL	37.6	AEGCL	Not available	AEGCL may intimate the plan of action
40	132 kV	132 kV Bornagar - Dhaligaon	1	S/C	AEGCL	AEGCL	41.3	AEGCL	Not available	AEGCL may intimate the plan of action
41	132 kV	132 kV Bornagar - Rangia	1	S/C	AEGCL	AEGCL	85.7	AEGCL	Not available	AEGCL may intimate the plan of action

Details of Auto Recloser of Lines in North Eastern Regional Grid **ANNEXURE-A.3**

Sl No	*Voltage Level*	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Owner	AR Details (SPAR/3-Ph AR/Not Available/Information not Available	Remarks
42	132 kV	132 kV Budhjangnagar - Surjamaninagar	1	D/C	TSECL	TSECL	18.3	TSECL	Not available	
43	132 kV	132 kV Budhjangnagar - Surjamaninagar	2	D/C	TSECL	TSECL	18.3	TSECL	Not available	
44	132 kV	132 kV Dhalabil - Kamalpur	1	S/C	TSECL	TSECL	32.0	TSECL	Not available	
45	132 kV	132 kV Dhaligaon-Gossaigaon	1	S/C	AEGCL	AEGCL	64.0	AEGCL	Not available	AEGCL may intimate the plan of action
46	132 kV	132 kV Dharmanagar - Dullavcherra	1	S/C	TSECL	AEGCL	29.0	AEGCL	Not available	AEGCL&TSECL may intimate the plan of action
47	132 kV	132 kV Dullavcherra - Hailakandi	1	S/C	AEGCL	AEGCL	33.8	AEGCL	Not available	AEGCL may intimate the plan of action
48	132 kV	132 kV Dharmanagar - P K Bari	1	S/C	TSECL	TSECL	36.5	TSECL	Not available	
49	132 kV	132 kV Dimapur - Doyang	1	D/C	POWERGRID	NEEPCO	92.5	POWERGRID	SPAR in service	
50	132 kV	132 kV Dimapur - Doyang	2	D/C	POWERGRID	NEEPCO	92.5	POWERGRID	SPAR in service	
51	132 kV	132 kV Dimapur - Imphal	1	S/C	POWERGRID	POWERGRID	168.9	POWERGRID	SPAR in service	
52	132 kV	132 kV Dimapur (PG) - Dimapur (DoP, Nagaland)	1	S/C	POWERGRID	ED, DoP, Nagaland	0.5	DoP, Nagaland	Not Available	DoP Nagaland may please intimate the plan of action
53	132 kV	132 kV Dimapur (PG) - Dimapur (DoP, Nagaland)	2	S/C	POWERGRID	ED, DoP, Nagaland	0.5	DoP, Nagaland	Not Available	DoP Nagaland may please intimate the plan of action
54	132 kV	132 kV Dimapur (PG) - Kohima	1	S/C	POWERGRID	ED, DoP, Nagaland	45.0	DoP, Nagaland	Not Available	DoP Nagaland may please intimate the plan of action
55	132 kV	132 kV Doyang - Mokokchung (DoP, Nagaland)	1	S/C	NEEPCO	ED, DoP, Nagaland	30.1	DoP, Nagaland	Not Available	DoP Nagaland may please intimate the plan of action
56	132 kV	132 kV Doyang - Sanis	1	S/C	NEEPCO	DoP, Nagaland	6.4	DoP, Nagaland	Not Available	NEEPCO & DoP Nagaland may please intimate the plan of action
57	132 kV	132 kV EPIP II - Byrnihat	1	D/C	MePTCL	MePTCL	10.3	MePTCL	Not Available	
58	132 kV	132 kV EPIP II - Byrnihat	2	D/C	MePTCL	MePTCL	10.3	MePTCL	Not Available	
59	132 kV	132 kV EPIP II - Umtru	1	D/C	MePTCL	MePTCL	0.7	MePTCL	Not Available	
60	132 kV	132 kV EPIP II - Umtru	2	D/C	MePTCL	MePTCL	0.7	MePTCL	Not Available	

Details of Auto Recloser of Lines in North Eastern Regional Grid **ANNEXURE-A.3**

Sl No	*Voltage Level*	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Owner	AR Details (SPAR/3-Ph AR/Not Available/Information not Available	Remarks
61	132 kV	132 kV Gauripur-Gossaigaon	1	S/C	AEGCL	AEGCL	63.0	AEGCL	Not available	AEGCL may intimate the plan of action
62	132 kV	132 kV Gohpur - Pavoi	1	S/C	AEGCL	AEGCL	51.0	AEGCL	Not available	AEGCL may intimate the plan of action
63	132 kV	132 kV Gohpur - Nirjuli	1	S/C	AEGCL	POWERGRID	42.5	POWERGRID	Not available	AEGCL may intimate the plan of action
64	132 kV	132 kV Golaghat - Mariani (AEGCL)	1	S/C	AEGCL	AEGCL	45.0	AEGCL	Not available	AEGCL may intimate the plan of action
65	132 kV	132 kV Haflong - Jiribam	1	S/C	POWERGRID	POWERGRID	100.6	POWERGRID	Not available	AEGCL may intimate the plan of action
66	132 kV	132 kV Haflong - Umranshu	1	S/C	AEGCL	POWERGRID	8.2	AEGCL	Not available	AEGCL may intimate the plan of action
67	132 kV	132 kV Imphal (MSPCL) - Imphal (PG)	1	S/C	MSPCL	POWERGRID	1.5	POWERGRID	Not available	AEGCL may intimate the plan of action
68	132 kV	132 kV Imphal (MSPCL) - Imphal (PG)	2	S/C	MSPCL	POWERGRID	2.3	POWERGRID & MSPCL	Not available	AEGCL may intimate the plan of action
69	132 kV	132 kV Imphal (MSPCL) - Karong	1	S/C	MSPCL	MSPCL	60.0	MSPCL	Not Available	AEGCL may intimate the plan of action
70	132 kV	132 kV Imphal (PG) - Ningthoukong	1	S/C	POWERGRID	MSPCL	27.5	MSPCL	Not Available	AEGCL may intimate the plan of action
71	132 kV	132 kV Imphal (PG) - Loktak	1	S/C	POWERGRID	NHPC	35.0	POWERGRID	SPAR in service	
72	132 kV	132 kV Jiribam - Loktak	2	S/C	POWERGRID	NHPC	82.4	POWERGRID	SPAR in service	
73	132 kV	132 kV Jiribam - Pailapool	1	S/C	POWERGRID	AEGCL	15.0	AEGCL/ MSPCL	Not Available	POWERGRID & AEGCL may intimate the plan of action
74	132 kV	132 kV Jiribam(PG) - Jiribam(MA)	1	S/C	POWERGRID	MSPCL	1.0	MSPCL	Not available	AEGCL may intimate the plan of action
75	132 kV	132 kV Jorhat - Mariani	1	S/C	AEGCL	AEGCL	19.5	AEGCL	Not Available	AEGCL may intimate the plan of action
76	132 kV	132 kV Jorhat - Mariani	2	S/C	AEGCL	AEGCL	19.5	AEGCL	Not Available	AEGCL may intimate the plan of action
77	132 kV	132 kV Jorhat - Nazira	1	S/C	AEGCL	AEGCL	69.0	AEGCL	Not Available	AEGCL may intimate the plan of action
78	132 kV	132 kV Kahilipara - Kamalpur	1	S/C	AEGCL	AEGCL	57.0	AEGCL	Not Available	AEGCL may intimate the plan of action
79	132 kV	132 kV Kamalpur - Rangia	1	D/C	AEGCL	AEGCL		AEGCL	Not Available	AEGCL may intimate the plan of action
80	132 kV	132 kV Kamalpur - Rangia	2	D/C	AEGCL	AEGCL		AEGCL	Not Available	AEGCL may intimate the plan of action
81	132 kV	132 kV Kahilipara - Sarusajai	1	D/C	AEGCL	AEGCL	3.5	AEGCL	Not Available	AEGCL may intimate the plan of action
82	132 kV	132 kV Kahilipara - Sarusajai	2	D/C	AEGCL	AEGCL	3.5	AEGCL	Not Available	AEGCL may intimate the plan of action

Details of Auto Recloser of Lines in North Eastern Regional Grid **ANNEXURE-A.3**

Sl No	*Voltage Level*	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Owner	AR Details (SPAR/3-Ph AR/Not Available/Information not Available	Remarks
83	132 kV	132 kV Kahilipara - Sarusajai	3	D/C	AEGCL	AEGCL	3.9	AEGCL	Not Available	AEGCL may intimate the plan of action
84	132 kV	132 kV Sarusajai - Sishugram	1	D/C	AEGCL	AEGCL	3.9	AEGCL	Not Available	AEGCL may intimate the plan of action
85	132 kV	132 kV Kamalpur - Sishugram	1	S/C	AEGCL	AEGCL		AEGCL	Not Available	AEGCL may intimate the plan of action
86	132 kV	132 kV Kahilipara - Umtru	1	D/C	AEGCL	MePTCL	11.0	MePTCL	Not Available	
87	132 kV	132 kV Kahilipara - Umtru	2	D/C	AEGCL	MePTCL	11.0	MePTCL	Not Available	
88	132 kV	132 kV Kamalpur - P K Bari	1	S/C	TSECL	TSECL	31.0	TSECL	Not Available	
89	132 kV	132 kV Karong - Kohima	1	S/C	DoP, Nagaland	MSPCL	50.0	MSPCL(65.3%) / DoP, Nagaland(34.7%)	Not Available	
90	132 kV	132 kV Khandong - Khliehriat	1	S/C	NEEPCO	POWERGRID	42.5	POWERGRID	SPAR in service	
91	132 kV	132 kV Khandong - Khliehriat	2	S/C	NEEPCO	POWERGRID	40.9	POWERGRID	Information not available	POWERGRID may intimate the status
92	132 kV	132 kV Khandong - Kopili	1	S/C	NEEPCO	NEEPCO	10.9	POWERGRID	SPAR in service	
93	132 kV	132 kV Khandong - Kopili	2	S/C	NEEPCO	NEEPCO	11.6	POWERGRID	Not Available	Gang operated CB at Kopili end (Owner:POWERGRID)
94	132 kV	132 kV Khandong - Umranshu	1	S/C	NEEPCO	AEGCL	11.4	POWERGRID & AEGCL	Not Available	Due to problem at Umrangshu end, Single pole CB, AR relay available at Khandong end
95	132 kV	132 kV Khliehriat - Badarpur	1	S/C	POWERGRID	POWERGRID	76.7	POWERGRID	3-Ph AR in service	
96	132 kV	132 kV Khliehriat - Mustem	1	S/C	MePTCL	MePTCL	15.7	MePTCL	Not available	
97	132 kV	132 kV Mustem - NEHU line	1	S/C	MePTCL	MePTCL	41.9	MePTCL	Not available	
98	132 kV	132 kV Khliehriat (MePTCL) - Khliehriat (PG)	1	S/C	MePTCL	POWERGRID	7.8	POWERGRID	Not available	
99	132 kV	132 kV Khliehriat (MePTCL) - Khliehriat (PG)	2	S/C	MePTCL	POWERGRID	5.4	MePTCL	Not available	
100	132 kV	132 kV Khliehriat- NEIGRIHMS	1	S/C	MePTCL	POWERGRID	62.8	MePTCL	Not available	

Details of Auto Recloser of Lines in North Eastern Regional Grid **ANNEXURE-A.3**

Sl No	*Voltage Level*	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Owner	AR Details (SPAR/3-Ph AR/Not Available/Information not Available	Remarks
101	132 kV	132 kV Kumarghat - P K Bari	1	S/C	POWERGRID	TSECL	1.0	TSECL	Not Available	Scheme not available at PK Bari end; PLCC not available
102	132 kV	132 kV Lekhi - Nirjuli	1	S/C	DoP, Arunachal Pradesh	POWERGRID	9.5	DoP, Arunachal Pradesh & POWERGRID	Information not available	DoP, Arunachal Pradesh & POWERGRID may please intimate the status
103	132 kV	132 kV Lekhi - Ranganadi	1	S/C	DoP, Arunachal Pradesh	NEEPCO	24.0	DoP, Arunachal Pradesh & POWERGRID	SPAR in service	
104	132 kV	132 kV Loktak - Ningthoukhong	1	S/C	NHPC	MSPCL	10.5	MSPCL	Not Available	
105	132 kV	132 kV Loktak - Rengpang	1	S/C	NHPC	MSPCL	35.0	MSPCL	Not Available	
106	132 kV	132 kV LTPS - Mariani	1	S/C	AEGCL	AEGCL	80.0	AEGCL	Not Available	AEGCL may intimate the plan of action
107	132 kV	132 kV LTPS - Moran	1	S/C	AEGCL	AEGCL	39.0	AEGCL	Not Available	AEGCL may intimate the plan of action
108	132 kV	132 kV LTPS - Nazira	1	D/C	AEGCL	AEGCL	22.0	AEGCL	Not Available	AEGCL may intimate the plan of action
109	132 kV	132 kV LTPS - Nazira	2	D/C	AEGCL	AEGCL	22.0	AEGCL	Not Available	AEGCL may intimate the plan of action
110	132 kV	132 kV LTPS - NTPS	1	D/C	AEGCL	AEGCL	60.0	AEGCL	Not Available	AEGCL may intimate the plan of action
111	132 kV	132 kV LTPS - Sonari	1	D/C	AEGCL	AEGCL	30.0	AEGCL	Not Available	AEGCL may intimate the plan of action
112	132 kV	132 kV Mariani (AEGCL) - Mokokchung (DoP, Nagaland)	1	S/C	AEGCL	ED, DoP, Nagaland	50.0	AEGCL(40%)/ DoP, Nagaland(60%)	Not Available	
113	132 kV	132 kV NEHU - Mawlai	1	S/C	MePTCL	MePTCL	7.9	MePTCL	Not available	MePTCL may intimate the plan of action
114	132 kV	132 kV Mawlai - Umiam Stage I	2	S/C	MePTCL	MePTCL	12.1	MePTCL	Not available	MePTCL may intimate the plan of action
115	132 kV	132 kV Mawphlang - Nongstoin	1	S/C	MePTCL	MePTCL	56.3	MePTCL	Not available	MePTCL may intimate the plan of action
116	132 kV	132 kV Mawphlang - Umiam Stg I	1	D/C	MePTCL	MePTCL	33.1	MePTCL	Not available	MePTCL may intimate the plan of action
117	132 kV	132 kV Mawphlang - Umiam Stg I	2	D/C	MePTCL	MePTCL	33.1	MePTCL	Not available	MePTCL may intimate the plan of action
118	132 kV	132 kV Mawphlang- Mawlai	1	S/C	MePTCL	MePTCL	20.9	MePTCL	Not available	MePTCL may intimate the plan of action
119	132 kV	132 kV Melriat(PG) - Zuangtui	1	S/C	POWERGRID	P&ED, Mizoram	10.2	POWERGRID	Not Available	POWERGRID may intimate the status

Details of Auto Recloser of Lines in North Eastern Regional Grid **ANNEXURE-A.3**

Sl No	*Voltage Level*	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Owner	AR Details (SPAR/3-Ph AR/Not Available/Information not Available	Remarks
120	132 kV	132 kV Mendipathar - Nangalbibra	1	S/C	MePTCL	MePTCL	65.2	MePTCL	Not available	
121	132 kV	132 kV Mokochung (PG) - Mokokchung (DoP, Nagaland)	1	D/C	POWERGRID	DoP,Nagaland	1.4	POWERGRID	Information not available	
122	132 kV	132 kV Mokochung (PG) - Mokokchung (DoP, Nagaland)	2	D/C	POWERGRID	DoP,Nagaland	1.4	POWERGRID	Information not available	
123	132 kV	132 kV Monarchak - Rokhia	1	S/C	NEEPCO	TSECL	29.0	TSECL	Not Available	TSECL may intimate the plan of action
124	132 kV	132 kV Monarchak - Udaipur	1	S/C	NEEPCO	TSECL	41.5	TSECL	Not Available	TSECL may intimate the plan of action
125	132 kV	132 kV Myntdu Leshka - Khleihriat	1	D/C	MePTCL	MePTCL	26.5	MePTCL	Not available	MePTCL may intimate the plan of action
126	132 kV	132 kV Myntdu Leshka - Khleihriat	2	D/C	MePTCL	MePTCL	26.5	MePTCL	Not available	MePTCL may intimate the plan of action
127	132 kV	132 kV Nangalbibra - Nongstoin	1	S/C	MePTCL	MePTCL	57.1	MePTCL	Not available	MePTCL may intimate the plan of action
128	132 kV	132 kV NEHU - NEIGRIHMS	1	S/C	MePTCL	MePTCL	6.7	MePTCL	Not available	MePTCL may intimate the plan of action
129	132 kV	132 kV NEHU - Umiam	1	D/C	MePTCL	MePTCL	6.2	MePTCL	Not available	MePTCL may intimate the plan of action
130	132 kV	132 kV NTPS - Tinsukia	1	S/C	AEGCL	AEGCL	43.0	AEGCL	Not Available	AEGCL may intimate the plan of action
131	132 kV	132 kV NTPS - Sonari	1	D/C	AEGCL	AEGCL	30.0	AEGCL	Not Available	AEGCL may intimate the plan of action
132	132 kV	132 kV Pailapool - Srikona	1	D/C	AEGCL	AEGCL	34.5	AEGCL	Not Available	AEGCL may intimate the plan of action
133	132 kV	132 kV Palatana - Surjamaninagar	1	D/C	OTPC	TSECL	37.2	POWERGRID	Not Available	Gang operated CB at Palatana end
134	132 kV	132 kV Palatana - Udaipur	1	S/C	TSECL	TSECL	11.1	TSECL	Not Available	Gang operated CB at Palatana end
135	132 kV	132 kV Hailakandi - Silchar	1	S/C	AEGCL	POWERGRID	30.3	POWERGRID	Information not available	Silchar end: AR in BCU available, AEGCL may intimate the status
136	132 kV	132 kV Panchgram - Srikona	1	S/C	AEGCL	AEGCL	19.1	AEGCL	Not Available	Will be implemented under R&M works funded from PSDF
137	132 kV	132 kV Ranganadi - Ziro	1	S/C	NEEPCO	POWERGRID	44.5	POWERGRID	SPAR in service	
138	132 kV	132 kV Roing - Pasighat	1	S/C	POWERGRID	POWERGRID		POWERGRID	Information not available	POWERGRID may intimate the status
139	132 kV	132 kV Roing - Tezu	1	S/C	POWERGRID	POWERGRID		POWERGRID	Information not available	POWERGRID may intimate the status
140	132 kV	132 kV Sarusajai - Umtru	1	D/C	AEGCL	MePTCL	37.0	MePTCL	Not Available	Not available at both ends

Details of Auto Recloser of Lines in North Eastern Regional Grid **ANNEXURE-A.3**

Sl No	*Voltage Level*	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Owner	AR Details (SPAR/3-Ph AR/Not Available/Information not Available	Remarks
141	132 kV	132 kV Sarusajai - Umtru	2	D/C	AEGCL	MePTCL	37.0	MePTCL	Not Available	Not available at both ends
142	132 kV	132 kV Silchar - Srikona	1	D/C	POWERGRID	AEGCL	1.2	POWERGRID	Information not available	Silchar end: AR in BCU available, AEGCL may intimate the status
143	132 kV	132 kV Silchar - Srikona	2	D/C	POWERGRID	AEGCL	1.2	POWERGRID	Information not available	Silchar end: AR in BCU available, AEGCL may intimate the status
144	132 kV	132 kV Umiam - Umiam St I	1	S/C	MePTCL	MePTCL	5.1	MePTCL	Not Available	MePTCL may intimate the plan of action
145	132 kV	132 kV Umiam St I - Umiam St II	1	S/C	MePTCL	MePTCL	3.0	MePTCL	Not Available	MePTCL may intimate the plan of action
146	132 kV	132 kV Umiam St I - Umiam St III	1	D/C	MePTCL	MePTCL	17.5	MePTCL	Not Available	MePTCL may intimate the plan of action
147	132 kV	132 kV Umiam St I - Umiam St III	2	D/C	MePTCL	MePTCL	17.5	MePTCL	Not Available	MePTCL may intimate the plan of action
148	132 kV	132 kV Umiam St III - Umiam St IV	1	D/C	MePTCL	MePTCL	8.0	MePTCL	Not Available	MePTCL may intimate the plan of action
149	132 kV	132 kV Umiam St III – Umiam St IV	2	D/C	MePTCL	MePTCL	9.7	MePTCL	Not Available	MePTCL may intimate the plan of action
150	132 kV	132 kV Umiam St III - Umtru	1	D/C	MePTCL	MePTCL	41.1	MePTCL	Not Available	MePTCL may intimate the plan of action
151	132 kV	132 kV Umiam St III - Umtru	2	D/C	MePTCL	MePTCL	41.1	MePTCL	Not Available	MePTCL may intimate the plan of action
152	132 kV	132 kV Umtru - Umiam St IV	1	D/C	MePTCL	MePTCL	29.9	MePTCL	Not Available	MePTCL may intimate the plan of action
153	132 kV	132 kV Umtru - Umiam St IV	2	D/C	MePTCL	MePTCL	29.9	MePTCL	Not Available	MePTCL may intimate the plan of action

List of Short Lines in North Eastern Regional Grid

ANNEXURE-A.5

Sl No	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Type of Conductor	Owner	Status	
									Relays & Accessories	OPGW
C. 400 kV Lines										
1	BgTPP - Bongaigaon	1	D/C	NTPC	POWERGRID	3.1	ACSR Twin Moose	POWERGRID		
2	BgTPP - Bongaigaon	2	D/C	NTPC	POWERGRID	3.1	ACSR Twin Moose	POWERGRID		
F. 220 kV Lines										
1	Balipara - Sonabil	1	S/C	POWERGRID	AEGCL	10.0	ACSR Zebra	AEGCL		
2	BTPS - Salakati	1	D/C	AEGCL	POWERGRID	2.7	ACSR Zebra	POWERGRID	Under procurement LOA by Feb'19	Under NERFO by Aug'19
3	BTPS - Salakati	2	D/C	AEGCL	POWERGRID	2.7	ACSR Zebra	POWERGRID	Under procurement LOA by Feb'19	Under NERFO by Aug'19
G. 132 kV Lines										
1	Agartala - AGTCCPP	1	D/C	TSECL	NEEPCO	8.4	AAAC Panther	POWERGRID	Under procurement LOA by Feb'19	In service
2	Agartala - AGTCCPP	2	D/C	TSECL	NEEPCO	8.4	AAAC Panther	POWERGRID	Under procurement LOA by Feb'19	In service
3	Agartala - Bodhjannagar	1	S/C	TSECL	TSECL	8.0	AAAC Panther	TSECL		

List of Short Lines in North Eastern Regional Grid **ANNEXURE-A.5**

Sl No	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Type of Conductor	Owner	Status	
4	AGTCCPP - Kumarghat	1	S/C	NEEPCO	POWERGRID	7.8	ACSR Panther	POWERGRID		
5	Aizawl - Luangmual	1	S/C	POWERGRID	P&ED, P&ED, Mizoram	0.8	ACSR Panther	P&ED, Mizoram		
6	Aizawl - Melriat(PG)	1	S/C	POWERGRID	POWERGRID	6.7	ACSR Panther	POWERGRID	Under procurement LOA by Feb'19	In service
7	Badarpur - Panchgram	1	S/C	POWERGRID	AEGCL	1.0	AAAC Panther	POWERGRID	Under procurement LOA by Feb'19	In service
8	Balipara - Sonabil(Tezpur)	1	S/C	POWERGRID	AEGCL	10.0	AAAC Panther	AEGCL	Under procurement LOA by Feb'19	To be updated by AEGCL
	Dimapur-Dimapur	1(old)	S/C	POWERGRID	DoP,Nagaland	0.7		POWERGRID	Under procurement LOA by Feb'19	Under NERFO by Nov'18
	Dimapur-Dimapur	2(new)	S/C	POWERGRID	DoP,Nagaland	0.7		POWERGRID	Under procurement LOA by Feb'19	To be awarded by Jan'19
9	EPIP II - Umtru	1	D/C	MePTCL	MePTCL	0.7	ACSR Panther	MePTCL		
10	EPIP II - Umtru	2	D/C	MePTCL	MePTCL	0.7	ACSR Panther	MePTCL		
11	Haflong - Umranshu	1	S/C	AEGCL	POWERGRID	8.2	ACSR Panther	AEGCL		
12	Imphal (MSPCL) - Imphal (PG)	1	S/C	MSPCL	POWERGRID	1.5	ACSR Panther	POWERGRID	Under procurement LOA by Feb'19	Under MW vacation by Oct'18

List of Short Lines in North Eastern Regional Grid

ANNEXURE-A.5

Sl No	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Type of Conductor	Owner	Status	
13	Imphal (MSPCL) - Imphal (PG)	2	S/C	MSPCL	POWERGRID	2.3	ACSR Panther	POWERGRID & MSPCL	Under procurement LOA by Feb'19	To be awarded by Jan'19
14	Kahilipara - Sarusajai	1	D/C	AEGCL	AEGCL	3.5	ACSR Panther	AEGCL		
15	Kahilipara - Sarusajai	2	D/C	AEGCL	AEGCL	3.5	ACSR Panther	AEGCL		
16	Kahilipara - Sarusajai	3	D/C	AEGCL	AEGCL	3.9	ACSR Panther	AEGCL		
17	Sarusajai - Sishugram	1	D/C	AEGCL	AEGCL	3.9	ACSR Panther	AEGCL		
18	Khliehriat (MePTCL) - Khliehriat (PG)	1	S/C	MePTCL	POWERGRID	7.8	ACSR Panther	POWERGRID	Under procurement LOA by Feb'19	Under NERFO by Nov'18
19	Khliehriat (MePTCL) - Khliehriat (PG)	2	S/C	MePTCL	POWERGRID	5.4	ACSR Panther	MePTCL		
20	Kumarghat - P K Bari	1	S/C	POWERGRID	TSECL	1.0	ACSR Panther	TSECL	Under procurement LOA by Feb'19	To be updated by TSECL
21	Lekhi - Nirjuli	1	S/C	DoP, Arunachal Pradesh	POWERGRID	9.5	ACSR Panther	DoP, Arunachal Pradesh & POWERGRID		
22	NEHU - Mawlai	1	S/C	MePTCL	MePTCL	7.9	ACSR Panther	MePTCL		
23	Mokochung (PG) - Mokokchung (DoP, Nagaland)	1	D/C	POWERGRID	DoP,Nagaland	1.4	ACSR Zebra	POWERGRID	Under procurement LOA by Feb'19	Under MW vacation by Nov'18
24	Mokochung (PG) - Mokokchung (DoP, Nagaland)	2	D/C	POWERGRID	DoP,Nagaland	1.4	ACSR Zebra	POWERGRID	Under procurement LOA by Feb'19	Under MW vacation by Nov'18

List of Short Lines in North Eastern Regional Grid **ANNEXURE-A.5**

Sl No	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Type of Conductor	Owner	Status	
25	NEHU - NEIGRIHMS	1	S/C	MePTCL	MePTCL	6.7	ACSR Panther	MePTCL		
26	NEHU - Umiam	1	D/C	MePTCL	MePTCL	6.2	ACSR Panther	MePTCL		
27	Ranganadi - Pare	1	S/C	NEEPCO	NEEPCO	9.0	ACSR Panther	POWERGRID		

List of Short Lines in North Eastern Regional Grid **ANNEXURE-A.5**

Sl No	*Name of Element (Emanating - Terminating)*	*Ckt ID*	Tower Configuration (S/C or D/C)	Agency at End 1	Agency at End 2	Line Length in km	Type of Conductor	Owner	Status	
28	Silchar - Srikona	1	D/C	POWERGRID	AEGCL	1.2	ACSR Panther	POWERGRID		
29	Silchar - Srikona	2	D/C	POWERGRID	AEGCL	1.2	ACSR Panther	POWERGRID		
30	Umiam - Umiam St I	1	S/C	MePTCL	MePTCL	5.1	ACSR Panther	MePTCL		
31	Umiam St III - Umiam St IV	1	D/C	MePTCL	MePTCL	8.0	ACSR Panther	MePTCL		
32	Umiam St III – Umiam St IV	2	D/C	MePTCL	MePTCL	9.7	ACSR Panther	MePTCL		

Review of Back-up Over Current and Earth Fault Relay Settings (Calculation done for a fault current of 500 A)

Station	Line / Equipment	Relay	CTR	Current Setting	Time Setting	Secondary Current	Relay Current	Time from Charecteristics	Relay Operating Time
Time grading from Kohima to Doyang (should be gradually increasing with about 400 mS difference)									
Kohima	132/33 kV Transformer	O/C	150	0.8	0.2	3.33	4.16	4.9	0.98
		E/F	150	0.3	0.15	3.33	11.1	2.1	0.31
Wokha	132 kV Kohima Line	O/C	400	0.55	0.3	1.25	2.27	9.2	2.76
		E/F	400	0.18	0.22	1.25	6.94	3.3	0.726
Sanis	132 kV Wokha Line	O/C	400	0.55	0.32	1.25	2.27	10	3.2
		E/F	400	0.2	0.23	1.25	6.25	3.5	0.8
			Suggested		0.32				1.12
Doyang	132 kV Sanis Line	O/C	300	0.7	0.35	1.67	2.38	8	2.8
			Suggested	0.8					3.5
		E/F	300	0.3	0.25	1.67	5.57	3.9	0.975
			Suggested		0.39				1.52
Time grading from Doyang to Kohima (should be gradually increasing with about 400 mS difference)									
Kohima	132 kV Wokha Line	O/C	300	0.7	0.27	1.67	2.38	8	2.16
			Suggested		0.5				4
		E/F	300	0.25	0.2	1.67	6.68	3.4	0.68
			Suggested		0.5				1.7
Wokha	132 kV Sanis Line	O/C	300	0.7	0.29	1.67	2.38	8	2.32
			Suggested		0.45				3.6
		E/F	300	0.25	0.21	1.67	6.68	3.4	0.714
			Suggested		0.35				1.2
Sanis	132 kV Doyang Line	O/C	400	0.55	0.33	1.25	2.27	10	3.3
		E/F	400	0.2	0.24	1.25	6.25	3.6	0.864

ANNEXURE-B.8

SCADA SIGNAL LIST FOR VARIOUS PROTECTION & CONTROL SIGNALS

REQUIRED SIGNALS FOR DISTANCE RELAYS			
SL. NO.	TYPE	EVENT/ALARM NAME	WHETHER ALARM TO BE GENERATED
1	SPI	OVERVOLATGE STAGE 1 START	
2	SPI	OVERVOLATGE STAGE 1 GEN TRIP	Y
3	SPI	OVERVOLATGE STAGE 2 GEN TRIP	Y
4	SPI	DEF START	
5	SPI	DEF GEN TRIP	Y
6	SPI	STUB PROTECTION OPERATED	Y
7	SPI	SOTF OPERATED	Y
8	SPI	START, Z1 R PH	
9	SPI	START, Z1 Y PH	
10	SPI	START, Z1 B PH	
11	SPI	START, Z2	
12	SPI	START, Z3	
13	SPI	START, Z4	
14	SPI	START, Z5	
15	SPI	TRIP, Z1 R PH	Y
16	SPI	TRIP, Z1 Y PH	Y
17	SPI	TRIP, Z1 B PH	Y
18	SPI	GENERAL TRIP, Z2	Y
19	SPI	GENERAL TRIP, Z3	Y
20	SPI	GENERAL TRIP, Z4	Y
21	SPI	GENERAL TRIP, Z5	Y
22	SPI	CARRIER SEND	Y
23	SPI	CARRIER RECEIVE	Y
24	SPI	CARRIER AIDED SCHEME OPERATED	Y
25	SPI	POWER SWING DETECTED	Y
26	SPI	POWER SWING BLOCKING	Y
27	SPI	DISTANCE RELAY GENERAL TRIP	Y
28	DINT	FAULT LOCATOR DISTANCE	
29	SPI	CVT FUSE FAIL	Y
30	System Diagnosis (SON)	TIME SYNCHRONIZATION ERROR	Y

31	System Diagnosis (SON)	M1 IED UNHEALTHY	Y
32	SPI	START AR	
33	SPI	LINE ISOLATOR OPEN FOR STUB ACTIVATION	
34	SPI	DT SEND CH 1	Y
35	SPI	DT SEND CH 1	Y
36	SPI	DT RECEIVE CH 1	Y
37	SPI	DT RECEIVE CH 2	Y
38	SPI	MAIN CB R PH OPEN	
39	SPI	MAIN CB Y PH OPEN	
40	SPI	MAIN CB B PH OPEN	
41	SPI	TIE CB R PH OPEN	
42	SPI	TIE CB Y PH OPEN	
43	SPI	TIE CB B PH OPEN	
44	SPI	TRIP RELAY 86 A HEALTHY (SUPERVISION)	
45	SPI	TRIP RELAY 86 B HEALTHY (SUPERVISION)	
46	SPI	GR A RELAY OPERATED	Y
47	SPI	GR B RELAY OPERATED	Y
48	SPI	CARRIER CHANNEL 1/2 OUT OF SERVICE	Y
49	SPI	CARRIER CHANNEL 1 FAIL	Y
50	SPI	CARRIER CHANNEL 2 FAIL	Y
51	SPI	MAIN 2/1 RELAY FAIL	Y
52	SPI	GOOSE RECEIPT FAIL/TROUBLE	Y
53		**ANY ADDITIONAL SIGNAL AS PER SCHEME**	

REQUIRED SIGNALS FOR ICT DIFFERENTIAL RELAYS			
SL. NO.	**TYPE**	**EVENT/ALARM NAME**	**WHETHER ALARM TO BE GENERATED**
1	SPI	OVEREXCITATION HV START	
2	SPI	OVEREXCITATION HV ALARM	Y
3	SPI	OVEREXCITATION HV TRIP	Y
4	SPI	DIFFERENTIAL CURRENT ALARM	Y
5	SPI	DIFFERENTIAL PROTECTION TRIP	Y
6	INT	RESTRAINED MODE (RESTRAINED OR UNRESTRAINED)	
7	SPI	GENERAL TRIP	Y

8	System Diagnosis (SON)	TIME SYNCHRONIZATION ERROR	Y
9	System Diagnosis (SON)	DIFFRENTIAL IED UNHEALTHY	Y
10	SPI	DIFFERENTIAL RELAY GENERAL TRIP	Y
11	SPI	OTI ALARM	Y
12	SPI	WTI HV ALARM	Y
13	SPI	WTI IV ALARM	Y
14	SPI	WTI MV ALARM	Y
15	SPI	BUCCHOLZ TRIP	Y
16	SPI	OSR 1 TRIP	Y
17	SPI	PRD 1 TRIP	Y
18	SPI	FIRE PROTECTION OPERATED	Y
19	SPI	LOW OIL LEVEL	Y
20	SPI	OTI R PH ALARM	Y
21	SPI	OTI Y PH ALARM	Y
22	SPI	OTI B PH ALARM	Y
23	SPI	OTI SPARE ICT ALARM	Y
24	SPI	WTI HV R PH ALARM	Y
25	SPI	WTI HV Y PH ALARM	Y
26	SPI	WTI HV B PH ALARM	Y
27	SPI	WTI HV SPARE ICT ALARM	Y
28	SPI	WTI MV R PH ALARM	Y
29	SPI	WTI MV Y PH ALARM	Y
30	SPI	WTI MV B PH ALARM	Y
31	SPI	WTI MV SPARE ICT ALARM	Y
32	SPI	WTI IV R PH ALARM	Y
33	SPI	WTI IV Y PH ALARM	Y
34	SPI	WTI IV B PH ALARM	Y
35	SPI	WTI IV SPARE ICT ALARM	Y
36	SPI	BUCCHOLZ R PH TRIP	Y
37	SPI	BUCCHOLZ Y PH TRIP	Y
38	SPI	BUCCHOLZ B PH TRIP	Y
39	SPI	BUCCHOLZ SPARE ICT TRIP	Y
40	SPI	OSR 1 R PH TRIP	Y
41	SPI	OSR 1 Y PH TRIP	Y
42	SPI	OSR 1 B PH TRIP	Y
43	SPI	OSR 1 SPARE ICT TRIP	Y
44	SPI	PRD 1 R PH TRIP	Y
45	SPI	PRD 1 Y PH TRIP	Y
46	SPI	PRD 1 B PH TRIP	Y
47	SPI	LOW OIL LEVEL R PH	Y
48	SPI	LOW OIL LEVEL Y PH	Y
49	SPI	LOW OIL LEVEL B PH	Y
50	SPI	LOW OIL LEVEL SPARE ICT	Y

51	SPI	FIRE PROTECTION R PH OPERATED	Y
52	SPI	FIRE PROTECTION Y PH OPERATED	Y
53	SPI	FIRE PROTECTION B PH OPERATED	Y
54	SPI	FIRE PROTECTION SPARE ICT OPERATED	Y
55	SPI	MAIN CB R PH OPEN	
56	SPI	MAIN CB Y PH OPEN	
57	SPI	MAIN CB B PH OPEN	
58	SPI	TIE CB R PH OPEN	
59	SPI	TIE CB Y PH OPEN	
60	SPI	TIE CB B PH OPEN	
61	SPI	TRIP RELAY 86 A HEALTHY (SUPERVISION)	Y
62	SPI	TRIP RELAY 86 B HEALTHY (SUPERVISION)	Y
63	SPI	GR A RELAY OPERATED	Y
64	SPI	GR B RELAY OPERATED	Y
65	SPI	REF RELAY FAIL	Y
66	SPI	GOOSE RECEIPT FAIL/TROUBLE	Y
67	SPI	**ANY ADDITIONAL SIGNAL AS PER SCHEME**	

REQUIRED SIGNALS FOR ICT REF RELAYS

SL. NO.	TYPE	EVENT/ALARM NAME	WHETHER ALARM TO BE GENERATED
1	SPI	OVEREXCITATION MV START	
2	SPI	OVEREXCITATION MV ALARM	Y
3	SPI	OVEREXCITATION MV TRIP	Y
4	System Diagnosis (SON)	TIME SYNCHRONIZATION ERROR	Y
5	System Diagnosis (SON)	DIFFRENTIAL IED UNHEALTHY	Y
6	SPI	REF RELAY ALARM	Y
7	SPI	REF TRIP	Y
8	SPI	GENERAL TRIP	Y
9	SPI	REF TRIP	Y
10	SPI	OTI TRIP	Y
11	SPI	WTI HV TRIP	Y

12	SPI	WTI MV TRIP	Y
13	SPI	WTI LV TRIP	Y
14	SPI	OSR 2 TRIP	Y
15	SPI	PRD 2 TRIP	Y
16	SPI	BUCCHOLZ ALARM	Y
17	SPI	OTI R PH TRIP	Y
18	SPI	OTI Y PH TRIP	Y
19	SPI	OTI B PH TRIP	Y
20	SPI	OTI SPARE ICT TRIP	Y
21	SPI	WTI HV R PH TRIP	Y
22	SPI	WTI HV Y PH TRIP	Y
23	SPI	WTI HV B PH TRIP	Y
24	SPI	WTI HV SPARE ICT TRIP	Y
25	SPI	WTI MV R PH TRIP	Y
26	SPI	WTI MV Y PH TRIP	Y
27	SPI	WTI MV B PH TRIP	Y
28	SPI	WTI MV SPARE ICT TRIP	Y
29	SPI	WTI IV R PH TRIP	Y
30	SPI	WTI IV Y PH TRIP	Y
31	SPI	WTI IV B PH TRIP	Y
32	SPI	WTI IV SPARE ICT TRIP	Y
33	SPI	BUCCHOLZ R PH ALARM	Y
34	SPI	BUCCHOLZ Y PH ALARM	Y
35	SPI	BUCCHOLZ B PH ALARM	Y
36	SPI	BUCCHOLZ SPARE ICT ALARM	Y
37	SPI	OSR 2 R PH TRIP	Y
38	SPI	OSR 2 Y PH TRIP	Y
39	SPI	OSR 2 B PH TRIP	Y
40	SPI	OSR 2 SPARE ICT TRIP	Y
41	SPI	PRD 2 R PH TRIP	Y
42	SPI	PRD 2 Y PH TRIP	Y
43	SPI	PRD 2 B PH TRIP	Y
44	SPI	PRD 2 SPARE ICT TRIP	Y
45	SPI	GOOSE RECEIPT FAIL/TROUBLE	Y
46		**ANY ADDITIONAL SIGNAL AS PER SCHEME**	

GNALS FOR DIRECTIONAL OVERCURRENT AND EARTH F

SL. NO.	TYPE	EVENT/ALARM NAME	WHETHER ALARM TO BE GENERATED
1	SPI	DEF START	
2	SPI	DEF GEN TRIP	Y
3	SPI	DIRECTIONAL OVERCURRENT START	Y

4	SPI	DIRECTIONAL OVERCURRENT TRIP	Y
5	SPI	GENERAL TRIP	Y
6	System Diagnosis (SON)	TIME SYNCHRONIZATION ERROR	Y
7	System Diagnosis (SON)	M1 IED UNHEALTHY	Y
8	SPI	GOOSE RECEIPT FAIL/TROUBLE	Y
9		**ANY ADDITIONAL SIGNAL AS PER SCHEME**	

EQUIRED SIGNALS FOR REACTOR DIFFERENTIAL RELAY

L.NO.	**TYPE**	**EVENT/ALARM NAME**	**WHETHER ALARM TO BE GENERATED**
1	SPI	DIFFERENTIAL PROTECTION TRIP	Y
2	SPI	DIFFERENTIAL CURRENT ALARM	Y
3	SPI	TEE DIFFERENTIAL PROTECTION TRIP	Y
4	System Diagnosis (SON)	TIME SYNCHRONIZATION ERROR	Y
5	System Diagnosis (SON)	DIFFRENTIAL IED UNHEALTHY	Y
6	SPI	DIFFERENTIAL RELAY GENERAL TRIP	Y
7	SPI	OTI ALARM	Y
8	SPI	WTI ALARM	Y
9	SPI	BUCCHOLZ TRIP	Y
10	SPI	OSR TRIP	Y
11	SPI	PRD TRIP	Y
12	SPI	FIRE PROTECTION OPERATED	Y
13	SPI	LOW OIL LEVEL	Y
14	SPI	OTI R PH ALARM	Y
15	SPI	OTI Y PH ALARM	Y
16	SPI	OTI B PH ALARM	Y
17	SPI	OTI SPARE PH ALARM	Y
18	SPI	WTI R PH ALARM	Y
19	SPI	WTI Y PH ALARM	Y

20	SPI	WTI B PH ALARM	Y
21	SPI	WTI SPARE ICT ALARM	Y
22	SPI	BUCCHOLZ R PH TRIP	Y
23	SPI	BUCCHOLZ Y PH TRIP	Y
24	SPI	BUCCHOLZ B PH TRIP	Y
25	SPI	BUCCHOLZ SPARE PH TRIP	Y
26	SPI	OSR R PH TRIP	Y
27	SPI	OSR Y PH TRIP	Y
28	SPI	OSR B PH TRIP	Y
29	SPI	OSR SPARE ICT TRIP	Y
30	SPI	PRD R PH TRIP	Y
31	SPI	PRD Y PH TRIP	Y
32	SPI	PRD B PH TRIP	Y
33	SPI	LOW OIL LEVEL R PH	Y
34	SPI	LOW OIL LEVEL Y PH	Y
35	SPI	LOW OIL LEVEL B PH	Y
36	SPI	LOW OIL LEVEL SPARE ICT	Y
37	SPI	FIRE PROTECTION R PH OPERATED	Y
38	SPI	FIRE PROTECTION Y PH OPERATED	Y
39	SPI	FIRE PROTECTION B PH OPERATED	Y
40	SPI	FIRE PROTECTION SPARE ICT OPERATED	Y
41	SPI	MAIN CB R PH OPEN	Y
42	SPI	MAIN CB Y PH OPEN	Y
43	SPI	MAIN CB B PH OPEN	Y
44	SPI	TIE CB R PH OPEN	Y
45	SPI	TIE CB Y PH OPEN	Y
46	SPI	TIE CB B PH OPEN	Y
47	SPI	TRIP RELAY 86 A HEALTHY (SUPERVISION)	Y
48	SPI	TRIP RELAY 86 B HEALTHY (SUPERVISION)	Y
49	SPI	GR A RELAY OPERATED	Y
50	SPI	GR B RELAY OPERATED	Y
51	SPI	REF RELAY FAIL	Y
52	SPI	REACTOR CB R PH OPEN	APPLICABLE FOR SWITCHABLE REACTOR APPLICAT
53	SPI	REACTOR CB Y PH OPEN	
54	SPI	REACTOR CB B PH OPEN	
55	SPI	REACTOR CB SPARE PH OPEN	
56	SPI	GR A RELAY OPERATED	Y
57	SPI	GR B RELAY OPERATED	Y
58	SPI	GOOSE RECEIPT FAIL/TROUBLE	Y
59	SPI	**ANY ADDITIONAL SIGNAL AS PER SCHEME**	

REQUIRED SIGNALS FOR REACTOR REF RELAYS			
SL. NO.	TYPE	EVENT/ALARM NAME	WHETHER ALARM TO BE GENERATED
1	System Diagnosis (SON)	TIME SYNCHRONIZATION ERROR	Y
2	System Diagnosis (SON)	DIFFRENTIAL IED UNHEALTHY	Y
3	SPI	REF RELAY ALARM	Y
4	SPI	REF TRIP	Y
5	SPI	GENERAL TRIP	Y
6	SPI	REF TRIP	Y
7	SPI	OTI TRIP	Y
8	SPI	WTI TRIP	Y
9	SPI	BUCCHOLZ ALARM	Y
10	SPI	OTI R PH TRIP	Y
11	SPI	OTI Y PH TRIP	Y
12	SPI	OTI B PH TRIP	Y
13	SPI	OTI SPARE ICT TRIP	Y
14	SPI	WTI R PH TRIP	Y
15	SPI	WTI Y PH TRIP	Y
16	SPI	WTI B PH TRIP	Y
17	SPI	WTI SPARE PH TRIP	Y
18	SPI	BUCCHOLZ R PH ALARM	Y
19	SPI	BUCCHOLZ Y PH ALARM	Y
20	SPI	BUCCHOLZ B PH ALARM	Y
21	SPI	BUCCHOLZ SPARE PH ALARM	Y
22	SPI	GOOSE RECEIPT FAIL/TROUBLE	Y
23		**ANY ADDITIONAL SIGNAL AS PER SCHEME**	

SIGNALS FOR REACTOR BACKUP IMPEDANCE PROTECT

SL. NO.	TYPE	EVENT/ALARM NAME	WHETHER ALARM TO BE GENERATED
1	SPI	START Z1	
2	SPI	Z1 TRIP	Y
3	SPI	GENERAL TRIP	Y
4	DINT	FAULT LOCATOR DISTANCE	
5	SPI	CVT FUSE FAIL	Y
6	System Diagnosis (SON)	TIME SYNCHRONIZATION ERROR	Y
7	System Diagnosis (SON)	M1 IED UNHEALTHY	Y
22	SPI	GOOSE RECEIPT FAIL/TROUBLE	Y
8		**ANY ADDITIONAL SIGNAL AS PER SCHEME**	

REQUIRED SIGNALS FOR BUS BAR PROTECTION RELAYS

L.NO.	TYPE	EVENT/ALARM NAME	WHETHER ALARM TO BE GENERATED
1	SPI	BUS ZONE 1 TRIP	Y
2	SPI	BUS ZONE 2 TRIP	Y
3	SPI	BUS BAR BLOCKED EXTERNAL	Y
4	SPI	BUS BAR BLOCKED DUE TO COMMUNICATIONN ERROR	Y
5	SPI	BUS BAR BLOCKED DUE TO INTERMEDIATE STATUS	Y
		CT CIRCUIT ERROR	Y

IALS FOR BREAKER FAILURE PROTECTION RELAY PROT

SL. NO.	TYPE	EVENT/ALARM NAME	WHETHER ALARM TO BE GENERATED
1	SPI	BREAKER FAILURE PROTECTION START	Y
2	SPI	BREAKER FAILURE TRIP	Y
3	SPI	BREAKER FAILURE RETRIP	Y
4	System Diagnosis (SON)	TIME SYNCHRONIZATION ERROR	Y
5	System Diagnosis (SON)	M1 IED UNHEALTHY	Y
6	SPI	GOOSE RECEIPT FAIL/TROUBLE	Y
7			
8		**ANY ADDITIONAL SIGNAL AS PER SCHEME**	

REQUIRED SIGNALS FOR BAY CONTROL UNIT				
L.NO	**TYPE**	**EVENT/ALARM NAME**	**WHETHER ALARM TO BE GENERATED**	**ADDITIONAL REMARKS**
1	INT	BCU IN LOCAL/ REMOTE		
2	SPI	CLOSE COMMAND FROM BCU FOR AUTORECLOSE		
3	SPI	BLOCK AUTORECLOSE FUNCTION	Y	
4	**INT**	**STATUS 1 AUTORECLOSE FUNCTION READY**		
		STATUS 2 AUTORECLOSE IN PROGRESS	**Y**	
		STATUS 3 AUTORECLOSE SUCCESSFUL	**Y**	
		STATUS 10 AUTORECLOSE UNSUCCESSFUL	**Y**	Available in Edition 2 IEDs, not in Edition 1 IEDs
5	CMD	BAY_CB_COMMAND		

6	SPI	BAY_CB_OPEN PERMITTED OR ENABLED		
7	SPI	BAY_CB_CLOSE PERMITTED OR ENABLED		
8	DPI	BAY_CB R PH POSITION		
9	DPI	BAY_CB Y PH POSITION		
10	DPI	BAY_CB B PH POSITION		
11	DPI	BAY_89A_ISOLATOR POSITION		
12	CMD	BAY_89A_ISO COMMAND		
13	SPI	BAY_89A_ISO OPEN PERMITTED OR ENABLED		
14	SPI	BAY 89A_CLOSE PERMITTED OR ENABLED		
15	DPI	BAY_89AE_ISOLATOR POSITION		IF BUS EARTH SWITCH IS IN THE BAY FOR WHICH THE ASSIGNMENT IS BEING DONE, CSWI3 SHALL BE USED FOR 89 AE 1, i.e BUS EARTH SWITCH. FOR BAY SIDE EARTH SWITCH(89AE2)
16	CMD	BAY_89AE_ISO COMMAND		
17	SPI	BAY_89AE_ISO OPEN PERMITTED OR ENABLED		
18	SPI	BAY_89AE_CLOSE PERMITTED OR ENABLED		
19	DPI	BAY_89 B_ISOLATOR POSITION		
20	CMD	BAY_89 B_ISO COMMAND		
21	SPI	BAY_89 B_ISO OPEN PERMITTED OR ENABLED		
22	SPI	BAY_89 B_CLOSE PERMITTED OR ENABLED		
23	DPI	BAY_89 BE_ISOLATOR POSITION		
24	CMD	BAY_89 BE_ISO COMMAND		
25	SPI	BAY_89 BE_ISO OPEN PERMITTED OR ENABLED		
26	SPI	BAY_89 BE_CLOSE PERMITTED OR ENABLED		
27	DPI	BAY_89 C/L/T_ISOLATOR POSITION		FOR 3 PHASE TRANSFORMERS CSWI7 MAY BE USED FOR 89 T BUT FOR SINGLE PHASE TRANSFORMERS SAME HAS BEEN SEPARATELY MENTIONED
28	CMD	BAY_89 C/L/T_ISO COMMAND		
29	SPI	BAY_89 C/L/T_ISO OPEN PERMITTED OR ENABLED		
30	SPI	BAY_89 C/L/T_CLOSE PERMITTED OR ENABLED		
31	DPI	BAY_89 CE/LE/TE_ISOLATOR POSITION		FOR 3 PHASE TRANSFORMERS CSWI7 MAY BE USED FOR 89 TE BUT FOR SINGLE PHASE TRANSFORMERS SAME HAS BEEN
32	CMD	BAY_89 CE/LE/TE_ISO COMMAND		
33	SPI	BAY_89 CE/LE/TE_ISO OPEN PERMITTED OR ENABLED		

34	SPI	BAY_89 CE/LE/TE_CLOSE PERMITTED OR ENABLED		SAME HAS BEEN SEPARATELY MENTIONED
35	DPI	BAY_89 R_ISOLATOR POSITION		
36	CMD	BAY_89 R_ISO COMMAND		
37	SPI	BAY_89 R_ISO OPEN PERMITTED OR ENABLED		
38	SPI	BAY_89 R_CLOSE PERMITTED OR ENABLED		
39	DPI	BAY_89 RE_ISOLATOR POSITION		
40	CMD	BAY_89 RE_ISO COMMAND		
41	SPI	BAY_89 RE_ISO OPEN PERMITTED OR ENABLED		
42	SPI	BAY_89 RE_CLOSE PERMITTED OR ENABLED		
43	DPI	BAY_89AE 2_ISOLATOR POSITION		USED FOR SECOND EARTH SWITCH OF ISOLATOR, WHEN BUS EARTH SWITCH IS PROVIDED
44	CMD	BAY_89AE 2_ISO COMMAND		
45	SPI	BAY_89AE 2_ISO OPEN PERMITTED OR ENABLED		
46	SPI	BAY_89AE 2_CLOSE PERMITTED OR ENABLED		
THE LOGICAL NODES FOR ISOLATOR & EARTHSWITCHES FOR 3 PH ICTs & REACTORS , e.g 89 RR,RR1,RR2 & RE and for 89TR,TR1,TR2,TRE MAY BE				
47	System Diagnosis (SON)	TIME SYNCHRONIZATION ERROR	Y	
48	System Diagnosis (SON)	BCU UNHEALTHY	Y	
49	SPI	CONDITIONS OK FOR SYNCHRONIZATION		
50	SPI	SPRING DISCHARGED	Y	ANNUNCIATION FOR CIRCUIT BREAKER
51	SPI	AC MOTOR SUPPLY FAIL	Y	
52	SPI	SF6 GAS LOW	Y	
53	SPI	OPERATION LOCKED OUT	Y	
54	SPI	CB READY FOR AUTORECLOSURE	Y	
55	SPI	DC SUPPLY FAIL	Y	
56	SPI	TC-1 FAIL	Y	
57	SPI	TC-2 FAIL	Y	
58	SPI	POLE DISCREPANCY RELAY OPTD	Y	
59	SPI	COMPRESSOR SUPPLY FAIL	Y	
60	SPI	AIR PRESSURE LOW	Y	
61	SPI	COMPRESSOR RUN TIME SUPERVISION	Y	

62	SPI	CSD FAIL	Y	
63	SPI	GAS COMPARTMENT n Alarm Stage n	Y	ANNUNCIATION FOR GIS BAYS
64	SPI	LCC PANEL AC SUPPLY FAIL	Y	
65	SPI	LCC PANEL DC SUPPLY FAIL	Y	
66	SPI	SELECTOR SWITCH POSITION LOCAL/REMOTE	Y	
67	SPI	BUS VT MCB TRIP	Y	FOR BCUs HAVING BUS VT INPUT
6	SPI	GOOSE RECEIPT FAIL/TROUBLE	Y	
68	SPI	ADDL SIGNALS FOR CB TROUBLE ETC AS PER SCHEME		