भारत सरकार Government of India
विद्युत मंत्रालय Ministry of Power
उत्तर पूर्वी क्षेत्रीय विद्युत समिति
North Eastern Regional Power Committee
एन ई आर पी सी कॉम्प्लेक्स, डोंग पारमाओ, लापालाङ, शिल्लोंग-७९३००६, मेघालय
NERPC Complex, Dong Parmaw, Lapalang, Shillong - 793006, Meghalaya

Ph. No: 0364 - 2534039
Fax No: 0364 - 2534040
Website: www.nerpc.nic.in

No. NERPC/SE (O)/PCC/2018/***484-522*** Dated: May 24, 2018

To,

1. Managing Director, AEGCL, Bijuli Bhawan, Guwahati – 781 001
2. Managing Director, APDCL, Bijuli Bhawan, Guwahati – 781 001
3. Managing Director, APGCL, Bijuli Bhawan, Guwahati – 781 001
4. Director (Generation), Me. PGCL, Lumjingshai, Short Round Road, Shillong – 793 001
5. Director (Distribution), Me. ECL, Lumjingshai, Short Round Road, Shillong – 793 001
6. Director(Transmission), Me. PTCL, Lumjingshai, Short Round Road, Shillong – 793 001
7. Managing Director, MSPDCL, Secure Office Bldg. Complex, South Block, Imphal – 795 001
8. Managing Director, MSPCL, Electricity Complex, Keishampat, Imphal – 795 001
9. Director (Tech.), TSECL, Banamalipur, Agartala -799 001.
10. Director (Generation), TPGCL, Banamalipur, Agartala -799 001.
11. Chief Engineer (WE Zone),Department of Power ,Govt. of Arunachal Pradesh, Itanagar- 791111
12. Chief Engineer (EE Zone),Department of Power, Govt. of Arunachal Pradesh, Itanagar- 791111
13. Chief Engineer (TP&MZ),Department of Power, Govt. of Arunachal Pradesh, Itanagar- 791111
14. Engineer-in-Chief (P&E), Department of Power, Govt. of Mizoram, Aizawl – 796 001
15. Engineer-in-Chief (P), Department of Power, Govt. of Nagaland, Kohima – 797 001
16. CGM, (LDC), SLDC Complex, AEGCL, Kahilipara, Guwahati-781 019
17. Group General Manager, NTPC, Bongaigoan Thermal Power Project, P.O. Salakati, Kokrajhar- 783369
18. ED, NERTS, PGCIL, Dongtieh-Lower Nongrah, Lapalang, Shillong -793 006
19. ED (O&M), NEEPCO Ltd., Brookland Compound, Lower New Colony, Shillong-793003
20. ED (Commercial), NEEPCO Ltd., Brookland Compound, Lower New Colony, Shillong-793003
21. ED (O&M), NHPC, NHPC Office Complex, Sector-33, Faridabad,Haryana-121003
22. Vice President (Plant), OTPC, Badarghat Complex, Agartala, Tripura - 799014
23. ED, NERLDC, Dongtieh, Lower Nongrah, Lapalang, Shillong -793 006
24. Member Secretary, ERPC, 14 Golf Club Road, Tollygunge, Kolkata-700033
25. Chief Engineer, GM Division, Central Electricity Authority, New Delhi – 110066
26. Chief Engineer (NPC), NRPC Complex, Katwaria Sarai, SJSS Marg., New Delhi - 110016

Sub: Minutes of 50th PCC Meeting.

Sir/Madam,

Please find enclosed herewith the minutes of 50th PCC Meeting held at Guwahati on the **10th May, 2018** for your kind information and necessary action. The minute is also available on the website of NERPC, **www.nerpc.nic.in**.

Any comments/observations may kindly be communicated to NERPC Secretariat at the earliest.

Encl: As above

भवदीय / Yours faithfully,

बि. लिंगखोइ / B. Lyngkhoi
निदेशक / **Director/ SE**

1. CGM, AEGCL, Bijuli Bhavan, Guwahati - 781001
2. CGM, APGCL, Bijuli Bhavan, Guwahati - 781001
3. CGM, DISCOM, Bijuli Bhavan, Guwahati - 781001
4. Head of SLDC, Me.ECL, Lumjingshai, Short Round Road, Umjarain, Shillong – 793 022
5. Head of SLDC, Department of Power, Govt. of Arunachal Pradesh, Itanagar- 791 111
6. Head of SLDC, Department of Power, Dimapur, Nagaland
7. Head of SLDC, Electricity Department, Govt. of Manipur, Keishampat, Imphal – 795 001
8. Head of SLDC, Department of Power, Govt. of Mizoram, Aizawl – 796 001
9. Head of SLDC, TSECL, Agartala – 799 001
10. GM, NERLDC, Dongtieh, Lower Nongrah, Lapalang, Shillong - 793006
11. Chief Engineer(Elect), Loktak HEP,Vidyut Vihar, Kom Keirap, Manipur- 795124
12. Addl. GM (EED), NTPC Ltd., Bongaigoan Thermal Power Project, P.O. Salakati, Kokrajhar- 783369
13. GM (C&M), OTPC, 6th Floor, A-Wing, IFCI Tower -61, Nehru Place, New Delhi – 110019.

निदेशक / **Director/ SE**

North Eastern Regional Power Committee

MINUTES OF THE 50th PROTECTION COORDINATION SUB-COMMITTEE MEETING OF NERPC

Date : 10/05/2018 (Thursday)

Time : 10:00 hrs

Venue : "Hotel Rajmahal", Guwahati.

The List of Participants in the 50th PCC Meeting is attached at **Annexure – I**

Shri B.Lyngkhoi, Director/S.E(O&P), NERPC welcomed all the participants to the 50th PCC meeting. He noted the presence of participants from all the utilities except Arunachal Pradesh and Manipur. He informed that the fresh list of members of PCC have been prepared and requested present members from various organizations to continue to attend future meetings. He further informed that the draft tender/RfQ for Protection Database Management System(PDMS) has been circulated to prospective members of the tender committee and requested them to provide their comments as early as possible.

Thereafter, SE(O&P), NERPC took up the agenda items for discussion.

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 49th MEETING OF PROTECTION SUB-COMMITTEE OF NERPC.

The minutes of 49th meeting of Protection Sub-committee held on 13th March, 2018 at Guwahati were circulated vide letter No. NERPC/SE/PCC/2018/2565-589 dated 23rd March, 2018.

The Sub-committee confirmed the minutes of 49th PCCM of NERPC as no comments/observations were received from the constituents.

ITEMS FOR DISCUSSION

1. FOLLOW UP OF REMEDIAL ACTIONS:

The suggested measures as per 49th PCC:

Sl	Name of element	Actions to be taken	Concerned Utilities	Status as per 49th PCC Meeting	Latest status

1	132 kV Haflong - Umrangsu Line	Over Current Settings (to be made directional) at Umrangsu end need to be reviewed by AEGCL.	AEGCL	By April'18	AEGCL informed that O/C was directional. It was suggested to keep TMS at 0.25 higher compared to Khandong TMS 0.2. **To be dropped**
2	134 kV Haflong - Umranshu Line	Healthiness of Protection System as well as DPR settings at Umranshu for 132 kV Haflong - Umranshu Line to be checked.	AEGCL	By April'18	Healthiness checked and found satisfactory. **To be dropped.**
3	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	Status could not be updated due to absence of DoP, AP
4	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	Under PSDF works By Nov'18
5	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	Under PSDF works By Nov'18
6	400 kV Killing (Byrnihat) - Silchar Line	DT from Byrnihat before dead time to be rectified by Byrnihat	MePTCL	NR replaced on 20.12.17 but problem still persists. Works will be attended during shut down of Silchar-Byrnihat Line.	Resolved. **To be dropped**.

7	132 kV Monarchak - Udaipur Line, 132 kV Rokhia - Agartala I line & 132 kV Monarchak - Rokhia Line	Review of relay Settings at Monarchak, Rokhia, 79-Tilla & Udaipur	NEEPCO & TSECL	Team will visit Monarchak, Rokhia , 79 Tilla (Agartala) and Udaipur Substation and resolve the matter	Pls refer to discussion in item **B.3.**
8	133 kV Monarchak - Udaipur Line, 132 kV Rokhia - Agartala I line & 132 kV Monarchak - Rokhia Line	Relay co-ordination of downstream substations of Monarchak are to be done with Monarchak	NEEPCO & TSECL	Team will visit Monarchak, Rokhia , 79 Tilla (Agartala) and Udaipur Substation and resolve the matter	Pls refer to discussion in item **B.3.**
9	132kV Khliehriat-Khliehriat I	Activation of DPR	NERTS & MePTCL	NERTS end done. MePTCL to activate by 21.03.18.	MePTCL informed that DPR for Khliehriat-Khliehriat-I at Khliehriat (MEG) has been activated. **To be dropped**.
10	400 kV Bongaigaon TPP-Bongaigaon Line	Maloperation 86A relay	NTPC	Status could not be updated due to absence NTPC	Backside plugin connectors of 86A were not terminated properly. Resolved and **to be dropped**.
11	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	Status could not be updated due to absence by P&ED, MZ	POWERGRID & P &ED Mizoram to co-ordinate the settings.

12	132 kV Kolasib-Badarpur line & 132 kV Kolasib-Aizwal line	Checking of healthiness of Protection System (Relays, Circuit breaker, DC system etc) of downstream substations	P & ED Mizoram	Status could not be updated due to absence by P&ED, MZ	Checked and rectified. **To be dropped**.
13	132 kV Aizawl - Zungtui Line	Relay coordination of downstream substations of Aizwal is to be done by P&ED Mizoram in consultation with POWERGRID.	P&ED Mizoram	Status could not be updated due to absence by P&ED	Pls refer to discussion in item **B.3.**
14	133 kV Aizawl - Zungtui Line	Checking of healthiness of Protection System (Relays, Circuit breaker, DC system etc) of downstream substations	P&ED Mizoram	Status could not be updated due to absence by P&ED	Pls refer to discussion in item **B.3.**
15	220 kV AGBPP - Mariani (AEGCL) 1 Line & 220 kV Mariani (AEGCL) - Misa 1 Line	Review of Settings of Earth Fault relays of 220 kV AGBPP - Mariani (AEGCL) Line at Mariani (AS) (Directionality of Earth fault Relay at Mariani to be checked).	POWERGRID	By Mar'18	Issue with the directionality has been attended on 04.04.18. **To be dropped**
16	400 kV Azara - Bongaigaon Line	AEGCL(Azara) to keep the fault clearing time within 100 msec.	POWERGRID & AEGCL	Specific case to be sent by NERLDC to POWERGRID and AEGCL. POWERGRID and AEGCL will review the settings.	Mail sent on 09.05.18. NERTS & AEGCL to revert back.
17	132 kV Lekhi - Nirjuli Line	Relay coordination to be done at Nirjuli & downstream substations of Nirjuli by POWERGRID & DoP, AP.	POWERGRID & DoP, AP	NERTS end complete.	Completed. **To be dropped**.

18	132kV Haflong-Umrangshu	Checking of healthiness of protection system(CB, relay, DC supply etc.) at Umrangshu	AEGCL	Apr'18	Checked and found to be healthy. **To be dropped**.
19	132kV Khliehriat-Khleihriat I	O/C, E/F relay auxiliary contacts to be assigned to NR for DR indication.	MePTCL	By 21.03.18	Assigned to DR. **To be dropped.**
20	132 kV AGTCCPP-Agartala	Over-reach of DPR at AGTCCPP. Setting to be revised after HTLS upgradation.	NEEPCO/ NERTS	Mar'18	Settings sent to NERTS. Conductor parameters to be confirmed and setting is to be changed accordingly.
21	132 kV Rangia - Motonga	Checking of relay settings at Rangia	NERTS	NERPC to write to NLDC. Subsequently NERTS to visit.	NERPC written to NLDC vide letter dtd.07.05.18 AEGCL to provide DR and Relay flag of Rangia end of this line henceforth.
22	400kV Balipara-BNC I&II	POR settings to be disabled. Till SVC is in service Z-I to be kept at 80%	NERTS	Mar'18	Oct'18
23	220/132kV Dimapur ICT-1	Backup O/C, E/F settings to be reviewed such that it operates before Z-III at Misa	NERTS	Mar'18	May'18
24	220kV Dimapur-Misa -2	Z-III protection timing to be reviewed such that it operates after operation of backup of ICT at Dimapur	NERTS	Mar'18	May'18
25	132kV Palatana-Udaipur	NR to be time synchronized at Palatana	OTPC	-	Completed.

26	132kV Bus Bar at Palatana	Healthiness/operation of bus bar protection need to be reviewed	OTPC	-	May'18.

Deliberation of the sub-Committee:

SE(O&P) thanked the members for the swift action, thus resolving more than half of the pending actions. He hoped that the remaining recommended actions would be completed as per schedule.

The Sub-Committee noted as above.

Action: All utilities.

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

The 48th PCC Forum decided that Report of 1st Phase of 3rd Party Protection Audit of NER Substations has to be completed by the Committee formed during Subgroup Meeting held on 06.12.17 by 31.01.18, only after which the 2nd Phase of 3rd Party Protection Audit shall be started. DGM, NERLDC informed the Forum that the report shall comprise of both recommendations as well as action plans. Corrective actions that are taken by Power Utilities against observations of audit team may be monitored in the PCC Meeting.

The Forum discussed the audit procedures followed for +/- 800 kV Biswanath Chariali HVDC Station as it is different from other substations. NERLDC expressed that the DC protection part is complex and would need more than 1 day to audit the entire Substation.

Member Secretary, NERPC requested POWERGRID to find out the audit procedures of other HVDC stations outside NER like +/- 500 kV Rihand – Dadri, +/- 500 kV Talcher – Kolar HVDC Station etc, which can be practiced in NER as well.

Member Secretary informed the forum that proposal has been sent recently for obtaining Protection Database Management System(PDMS) from PSDF. PDMS will comprise of mainly 2 parts: i) Collection of data from all stations of NER and ii) Collection of Settings. This will make the auditing practice easier as unavailability of Data and Settings is one of the common issue that has been observed during 1st phase of 3rd Party Protection Audit.

Also, NERLDC informed the forum that as per draft "Reliability Standard for Protection System", periodic protection audit has to be conducted once in year for critical substation and once in four years other substations. Subgroup had discussed to find out the list of critical substations in the Meeting held on 6th December, 2017. After detailed deliberation, forum finalized the **critical substations of NER** and are as follows:

a. POWERGRID: 400/220/33 kV Balipara, 400/132 kV Biswanath Chariali, 400/220/33 kV Bongaigaon, 400/220/33 kV Misa, 400/132/33 kV Silchar, 220/132 kV Dimapur, 220 kV Mariani (PG), 220/132 kV Salakati.

b. NEEPCO: 400/132 kV Ranganadi, 220/132 kV AGBPP

c. OTPC: 400/132 kV Palatana

d. NTPC: 400/220 kV BgTPP

e. AEGCL: 400/220 kV Azara, 220/132/66/33 kV Agia, 220/132/33 kV BTPS, 220/132/66/33 kV Mariani, 220/132/33 kV Samaguri, 220/132/33 kV Sarusajai, 220/132 kV Sonabil

f. MePTCL: 400/220/132 kV Byrnihat (Killing)

g. TSECL: 132/33/11 kV Agartala (79 Tilla), 132/33 kV Surajmani Nagar

In 49th PCC, Member Secretary enquired about the status of the Audit Report. It was intimated that the First Phase Audit report is in final stage and would be submitted by 31.03.2018. EE (System Protection), MePTCL informed the forum that the First Phase Audit report and Template settings as per Ramakrishna Task Force Committee is completed and will be submitted to the Convener Audit Protection for approval. MS,NERPC opined that upon his visit to +/-800kV HVDC it was observed that only audit of AC system is possible.

DGM(SO-II), NERLDC suggested forum to arrange a separate meeting to discuss the observations and recommendations of 3rd Party Protection Audit Report before next PCC Meeting for fruitful deliberation in the PCC Meeting.

EE(System Protection), MePTCL has already submitted the Audit Report for Meghalaya and Mizoram.

Deliberation of the sub-Committee:

CM, NERTS informed that the all audit reports have been completed except Assam. AM, AEGCL informed that Assam Audit Report would be submitted by 10.05.2018.

SE(O&P), NERPC informed that a meeting would be convened tentatively in the last week of May'18 to discuss the findings of the Protection Audit. He requested concerned members to attend the meeting, date and venue of which would be intimated in due course of time.

The Sub-Committee noted as above.

Action: All concerned utilities/NERPC.

A.2 Standardization of Disturbance Recorder Channels:

AEGCL informed the forum that they have implemented the standardization of DR channel in all lines connected to other utilities . AEGCL will intimate the updated status through mail.

MePTCL informed the forum that they have standardized DR channels for Micom relay. They are facing problem for ABB relay and referred to NERTS, POWERGRID for help. The Forum requested POWERGRID to assist on this matter.

NERLDC requested all power utilities to provide DR output (DAT and CFG file) of all the transmission elements for verification.

In 49th PCCM, AEGCL representative informed that for remaining 6 sub-stations standardization would be completed by May'18. E E (System Protection), MePTCL informed that after obtaining the ABB software from AEGCL, the standardisation for remaining stations of Mendipathar SS, Killing SS, Stage III PS and Stage IV PS will be completed by 30.04.2018. The forum requested NERLDC to circulate the DR template to all concerned utilities.

SE(O&P),NERPC suggested that during erection works under R&U scheme the commissioning engineers should do the work of DR channel standardization.

Deliberation of the sub-Committee:

NERLDC informed the forum that list of elements for which DR standardization has been completed will be circulated to all constituents. Forum requested all constituents to update the status.

SE(O&P),NERPC requested other utilities to submit a schedule in alignment with R&U works.

The Sub-committee noted as above.

Action: DoP Ar. Pradesh, MSPCL, P&ED Mizoram, DoP Nagaland, TSECL.

The Sub-committee noted as above.

Action: All utilities as above.

A.3 Implementation of SPAR

In 48th PCCM, NTPC informed the forum that they are having problem with implementation of the scheme due to coordination issue between differential and distance protection. POWERGRID informed that they will take up the issue.

NERLDC suggested to the forum that Single Phase/Three Phase Auto-reclosing scheme as applicable considering breaker mechanism has to be implemented in all the lines to ensure reliability. For Single pole breaker, Single Phase Auto reclosing scheme has to be enabled for maintaining synchronism through other healthy phases. Also, priority scheme is to be ensured in one and half breaker scheme.

In 49th PCCM, DM(E/M), NEEPCO enquired whether there are any specific guidelines regarding activation of A/R for lines connecting two generating stations e.g. 132kV Khandong-Kopili D/C.

NERLDC informed the forum that as per Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010, 3 ph A/R should be in place for 132 kV lines.

EE, System Protection, MePTCL informed that a feasibility report regarding implementation of A/R in MePTCL system would be submitted by Apr'18. The forum decided that availability of A/R facility would be specifically mentioned in the Protection Audit Report. It was also discussed that once installation of Numerical Relays under PSDF scheme is done, the implementation of Auto-reclosing schemes in all the states can be done more effectively.

Deliberation of the sub-Committee:

DM(E/M), NEEPCO once again re-iterated that for 132kV Khandong-Kopili D/C a detailed study is required regarding which end should be dead sync and which end check sync as both end involve generator. He informed that it would be a retrograde step to implement 3-ph A/R for 132kV Khandong-Kopili D/C.

OTPC representative also expressed similar concerns regarding 132kV Palatana - SMNagar because of poor fault clearing times at 132kV SM.Nagar and beyond.

DGM(SO-II), NERLDC informed that as per CEA (Technical Standards for Construction of Electric Plants and Lines) Regulations, 2010 it is mandatory to implement A/R for all 132kV and above lines. Members noted the concern of OTPC & NEEPCO and decided that the matter would be referred to CEA/NPC with 3-ph fault levels of the respective buses.

A list detailing the status of implementation of A/R for different lines is attached at **Annexure-A.3.** SE(O&P),NERPC requested all the utilities to update the status in the attached list before the next meeting.

The Sub-committee noted as above.
Action: All state transmission utilities.

A.4 Disturbance in Tripura System

As discussed in previous PCC meeting there have been a number of disturbances in Tripura system. However no fruitful resolution was achieved due to non-participation by TSECL. Brief recommendations of 48th PCC are as follows:

- Non-directional E/M relays for O/C, E/F at PKBari to be made directional
- Installation of Numerical relay at 132kV PKBari
- Installation of Line differential relay for 132kV PKBari - Kumarghat

These are to be addressed immediately.

Further Kumarghat blackout happened on 04.02.18. This could not be analyzed in the Sub-group meeting on 06.03.18 due to absence of DR/EL outputs from Tripura.

In 49th PCCM DGM(AM),NERTS informed that line differential relay for 132kV P.K.Bari-Kumarghat would be installed at both ends by NERTS. The Sub-Committee decided that TSECL would hand over spare NR at 132kV PKBari to NEEPCO for installation at AGTCCPP for 132 kV AGTCCPP – Kumarghat line.

DGM(SO-II),NERLDC informed that a team from NERLDC would visit Rokhia, 79Tilla, Udaipur, Monarchak to co-ordinate downstream relay settings.

Deliberation of the sub-Committee:

Sr. Manager, TSECL informed that R&U works have been taken up in earnest. He informed that works at 79Tilla, Rokhia, Udaipur and PKBari would be carried out with utmost priority. The approximate timeline agreed by TSECL is as follows:

Name of sub-station	***Time of completion***
79Tilla	Jul'18
Rokhia	Aug'18
Udaipur	Oct'18
PKBari	Oct'18

Members requested that in view of the large number of grid incidences concerning Tripura, the R&U works be expedited ASAP. Forum requested TSECL to ensure installation of DPR at both ends of the lines emanating from these substations.

CM, NERTS informed that Line Differential Relay for 132kV PK.Bari-Kumarghat and 132kV AGTCCPP-Agartala D/C would be commissioned by Dec'18.

The Sub-committee noted as above.

Action: TSECL, NERTS.

A.5 Voltage Collapse observed in Tripura Power System at 16:11 Hrs on 23rd Sep'17

In the 48th PCC Meeting, NERTS, POWERGRID informed the forum that the PD setting for ICT is 500ms and for line is 2.5s. After detailed deliberation, it was decided that this is to be followed by all utilities at the earliest.

In 49th PCCM, Palatana was requested to intimate the PD timing for both ICTS in the next meeting

Deliberation of the sub-Committee:

Executive, OTPC informed that the PD timing of both ICT has been set to 500ms. The forum decided to drop the agenda item.

The Sub-committee noted as above.

B.1. Operation of SPS-3 due to spurious signal on 21st April'18 & 30th April'18

As communicated by Palatana OTPC, there was an incident of operation of SPS-3 at 17:36 Hrs on 21st April'18 and due to spurious signal resulting in tripping of GTG-I & GTG II at Palatana.

Before that there were 2 more incidents of spurious operation of SPS-3 in the last 6 months:

At 16:35 Hrs on 8th February'18
At 18:05 Hrs on 21st September'17

As communicated by OTPC, SPS-3 operated due to spurious signal on 30th April'18 at 17:42 Hrs also.

All these events occurred in the evening hours with sudden loss of generation from largest plant in NER, which is a serious threat to the safe operation of NER Grid.

Deliberation of the sub-Committee:

Executive, OTPC observed that all the incidences so far occurred approximately around 17:30 hrs in the evening. Considering the timing it should not be considered as spurious and thorough RCA should be done. SE(O&P),NERPC informed that detailed discussion would be done in the 144th OCCM.

The Sub-committee noted as above.
Pls refer to discussion in 144th OCC.

B.2. Identification of short lines to install line differential protection

As per deliberation of 47th PCC Meeting of NERPC, it was decided to change the criterion for installation of Line Differential Protection (LDP) in 132 kV lines from 5 kms. to 10 kms to cover important lines of NER like 132 kV AGTCCPP – Agatala D/C.

During 47th PCC Meeting of NERPC, Member Secretary, NERPC requested all constituents make a list of following information:

List of all short lines.
List of lines where differential protection was commissioned.

List of all short lines where differential protection was installed but not commissioned.

List of all short lines where installation of differential protection is envisaged

The forum requested all states to make the above-mentioned list and make DPR for PSDF funding for installation of differential protection.

Deliberation of the sub-Committee:

Sr. Manager, TSECL informed that 132kV 79Tilla-Bodhjannagar is to be included in the list of lines for Line Differential Protection. CM, NERTS stated that FO between two stations are essential for implementing Line Differential Protection in the line. In this regard SE(O&P), NERPC requested all states to approach for PSDF funding under 'Reliable Communication' category. He also requested all STUs to kindly prepare a list of lines of length less than 10km and submit before next PCCM. NERLDC informed that a list has been prepared for important grid elements under the category of short lines and the same is attached at **Annexure B.2** for reference.

SE (O&P) requested all states to identify short lines in their power system for installation of LDP. MePTCL representative informed that MePTCL has already submitted DPR for Line Differential Protection and Reliable Communication factoring

in the FO and allied materials required for line differential protection and both DPRs are awaiting approval of Appraisal Committee. NERTS informed that 15 Nos. of lines has been identified for installation of LDP and expected to be commissioned by Dec'18.

The Sub-committee noted as above.

Action: All state transmission utilities/NERTS.

B.3. Review of relay settings- Substation wise (including downstream state substation):

In 47th PCC Meeting, NERLDC informed the forum that frequent tripping of upstream elements is occurring due to improper relay coordination at downstream state-substations (33 kV & 11 kV) especially in Tripura, Mizoram & Nagaland power systems.

The committee visited the following substations and the relay settings of the downstream was reviewed, verified and changed accordingly if necessary:

132/33 kV Dimapur (DoP, Nagaland) on 8th March'18
132/33 kV Kohima (DoP, Nagaland) on 9th March'18
132/33 kV Zuangtui (P&ED, Mizoram) on 17th March'18
132/33 kV Agartala (TSECL) on 22nd March'18
132/33 kV Rokhia (TSECL) on 24th March'18
132/33 kV Udaipur (TSECL) on 24th March'18
132/33 kV Lekhi (DoP, Arunachal Pradesh) on 28th March'18

Deliberation of the sub-Committee:

SDO, DoP Nagaland informed the forum about the blackout that happened in Nagaland on 09.05.2018. Upon investigation it was found that the TMS for O/C relay was set at 0.12 at Dimapur(PG) for 132kV Dimapur-Dimapur D/C. Settings were changed at Dimapur(PG) without prior intimation. This resulted in repeated tripping of 132 kV Dimpaur(PG) – Dimapur(DoP Nagalnd) 1 & 2 lines from Dimapur(PG) which should actually have been cleared at Dimapur(NAG). CM, NERTS informed that initially TMS was set lower due to Dimapur(PG) blackout incident on 14th Feb'18. However after visit of committee members,, the downstream issues at Dimapur have been resolved. The TMS at Dimapur(PG) has since been reset to 0.4 on 09.05.2018 and the problem would not recur. He also opined that tripping of line on earth fault while charging the transformer may be due to abnormal inrush currents during

charging of 132/66kV 100MVA ICT at Dimapur. The forum requested DoP Nagaland to investigate this issue alongwith NERTS.

SE (O&P), NERPC requested all utilities to intimate NERPC before changing any relay settings so that proper intimation can be given to all concerned utilities.

Members thanked NERLDC for the proactive step and resolving downstream related issues. The forum also requested all the STUs to periodically revise settings for any configuration change in the downstream.

The Sub-committee noted as above.

Action: All state transmission utilities.

B.4. Root cause and remedial measures of Grid Events

As per IEGC 5.9.4, root cause of each grid event is identified based on the data submitted by Power Utilities and accordingly remedial measures are suggested for these events.

In case of any difference in root cause as per analysis at your end, Power Utilties are requested to intimate NERLDC & NERPC the root cause with necessary justifications within 1 week from the date of reporting. Otherwise, it is requested to take necessary actions at your end as per suggested remedial measures and intimate NERLDC & NERPC the status within 15 days from the date of reporting.

Event report along with root cause, remedial measures and actions taken will be uploaded in the NERLDC website for information.

Deliberation of the sub-Committee:

NERLDC informed that from DR analysis and after discussion in Sub-group possible causes are highlighted. However the event report remains incomplete without the root cause, which is to be furnished by the respective utilities.

SE(O&P), NERPC concluded that most of the grid incidences are due to transient fault/lightning fault. He requested all the utilities to furnish the actual cause with location number so that DR/EL records may be verified.

The Sub-committee noted as above.

Action: All transmission utilities.

B.5. Analysis & Discussion on Events, Grid Incidences, Grid Disturbances which occurred in NER Grid w.e.f 1st March 2018 - 30th April 2018.

The following numbers of Grid Disturbances (GD) & Grid Incidents (GI) occurred during the period w.e.f 1st March 2018 - 30th April 2018:

Sl. No.	Control Area	Grid Incidents in nos. (Mar'18 to Apr'18)	Grid Disturbance in nos. (Mar'18 to Apr'18)	Grid Incidents in nos. (Jan'18 to Apr'18)	Grid Disturbance in nos. (Jan'18 to Apr'18)
1	Palatana	3	0	5	0
2	AGBPP	11	0	13	0
3	AGTPP	20	1	24	1
4	Ranganadi	0	0	0	0
5	Kopili	2	0	5	0
6	Khandong	1	0	1	0
7	Doyang	0	0	0	0
8	Loktak	0	0	0	0
9	BgTPP	6	0	9	0
10	Ar. Pradesh	0	14	0	17
11	Assam	0	6	0	8
12	Manipur	0	4	0	4
13	Meghalaya	0	0	0	0
14	Mizoram	0	4	0	7
15	Nagaland	0	9	0	14
16	Tripura	0	13	0	16

Sl. No.	Category of GD / GI	Grid Disturbance in nos.	
		Mar'18 to Apr'18	Jan'18 to Apr'18
1	GI-I	21	25
2	GI-II	22	32
3	GD 1	43	59
4	GD 2	1	1
5	GD 3	0	0
6	GD 4	0	0
7	GD 5	0	0
8	Total GI	43	57
9	Total GD	44	60

Deliberation of the sub-Committee:

The forum decided that due to high number of transient faults, regular patrolling and vegetation clearance is required particularly in the pre-monsoon period. It was decided that self-certified patrolling reports would be submitted by the utilities and the item would be monitored in OCC under item **B.1(3).**

The Sub-Committee noted as above.

Action: All state transmission utilities/NERPC.

B.6 Actions recommended by Sub-group:

The Sub-group in its meeting held on 04.05.18 recommended the following actions:

Sl. No	Name of element	Actions to be taken	Concerned Utilities	Latest Status
1	400 kV Killing (Byrnihat) - Silchar Line	Regular patrolling and necessary vegetation clearance. *High priority*	NETC	Referred to OCC.
2	220 kV BTPS - Salakati	05.04.2018 14:24 hrs. Root cause not concluded due to unavailability of DR / EL outputs. Unwanted operation of Trip relay at BTPS to be investigated y AEGCL.	AEGCL	DR erased due to frequent pickup of Earth fault function. Y-ph current pickup but not trip. NERTS to check and revert back. NERLDC requested AEGCL to furnish the DR & EL output to NERLDC within 24 Hrs of the event.
3	132 kV Rangia - Motonga	AEGCL to provide proper relay indication & DR output of Rangia end. NERPC letter to NLDC issued vide. dtd.07.05.18	AEGCL/NERTS	Pls refer to discussion in item **1.**
4	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	No trip at AGBPP & Misa due to carrier not being in service. Both implementations of O/V settings(settings suggested by subgroup ##) and attending issue with the carrier by May'18. ##
5	132 kV Badarpur - Kolasib Line & 132 kV Aizawl - Kolasib Line	Review of relay settings and testing of relays at Kolasib end of 132 kV Badarpur - Kolasib line. Directionality of Earth fault relay at Kolasib end to be ensured. Review of downstream settings at Kolasib SS	NERTS/ P&ED Mizoram	Pls refer to discussion in item **1.**
6	Disturbance in Tripura on 22nd, 26th & 31st Mar'18 and 30th Apr'18	Status of Installation of DPR in 132 kV Rokhia - Agartala D/C	TSECL	Aug'18
		O/C & E/F co-ordination after installation of DPR		Aug'18

	Fault in 132 kV Rokhia - Agartala D/C. Delayed fault clearance due to absence of DPR.	Review of Z-II (to be 150% of line length) settings at SM Nagar for Agartala D/C		May'18
		R & B phase analog DR input to be reversed at SM Nagar.		May'18
		Review of Z-II (to be 120% of line length) settings at Budhajnagar for Agartala line		May'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	May'18
7	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 132kv AGTCCPP-79Tilla D/C - Dec'18 Review of settings after confirmation of impedance, by May'18.
8	132 kV Dimapur (PG) - Dimapur (DoP, Nagaland)	Co-ordination of O/C & E/F relay settings at Dimapur(PG) & Dimapur(DoP Nagaland)	NERTS/ DoP Nagaland	Completed.
9	220 kV Mariani (AS) - Misa Line & 220 kV AGBPP - Mariani (AS) Line on 11.04.18	Review of DPR & Earth Fault settings at Mariani (AS)	NERTS	Rectified on 04.04.18. In view of recurrence to be reviewed.
10	132 kV Khliehriat (MePTCL) - Khliehriat (PG) 2 Line	Healthiness of Protection System at Khliehriat end & Leshka end of 132 kV Khliehriat - Leshka D/C line to be ensured, Z-II settings at KHL(MePTCL) for Leshka lines to be reduced.	MePTCL	By May'18
		DPR & Earth Fault Relay settings at Khliehriat(PG) for Khliehriat(MePTCL) line-2 to be reviewed	NERTS& MePTCL	Completed
11	400 kV Balipara - Biswanath Chariali 4 Line	Review of DPR settings to clear the fault within limits allowed in CEA standards	NERTS	By May'18

** **At Mariani PG**

Mokokchung-I: 110%, 5s

Mokokchung-II :110%, 6 sec

AGBPP: 111%, 6 sec

Misa: 111% 5 sec

At Mokokchung PG

Mariani-I :110%, 5 sec

Mariani-II: 110% , 6 sec

Issues already attended/rectified by concerned utilities:

Sl. No	Name of element/incident	Actions taken	Name of respective utility
1	220 kV BTPS - Salakati on 22.03.18	Earth wire snapped near gantry at Salakati end due to lightning. **Rectified**.	NERTS.
2	220/132 kV Dimapur - Transformer 2	CT PT cards of NR **replaced**	NERTS
3	132 kV Khliehriat (MePTCL) - Khliehriat (PG) 2 Line	earth fault high set settings **re-configured**	MePTCL
4	400 kV Balipara - Bongaigaon 2 Line & 400 kV Balipara - Biswanath Chariali 4 Line tripping.	Problem with the contact of 86 **rectified**	NERTS
5	400 kV Balipara - Biswanath Chariali 3 Line	Z-4 settings of DPR of 400 kV Balipara - Biswanath Chariali 3 Line at Balipara **has been disabled**	NERTS

Deliberation of the sub-Committee:

##NERLDC informed that as per Ramakrishna Task Force Recommendations O/V settings are 110-112% (typically 110%) with a time grading of 5sec. For D/C lines time grading of 1-3 sec should be provided. However as per CEA (Grid Standards) the tolerable O/V for 220kV is 245kV (i.e. roughly 111%). SE(O&P), NERPC decided that for now the settings recommended by sub-group may be implemented, and later on CEA guidelines will be sought.

The forum thanked respective utilities for providing clear timeline against various corrective actions. He hoped that Rangia issue would be sorted out very soon upon visit by NERTS.

The Sub-Committee noted as above.

Action: All utilities as above.

B.7 Tripping of 400kV BgTPP-Bongaigaon-I on 08.05.18:

400 kV Bongaigaon - BgTPP Line I tripped at 17:39 Hrs on 08.05.18 due to DT Received from Bongaigaon.

400 kV Bongaigaon - BgTPP I Line had also tripped on 06.10.17 at 15:50 Hrs due to DT received at BgTPP end and no tripping at Bongaigaon.

Tripping of 400 kV Bongaigaon - BgTPP I and II Lines is a very critical issue and pose a threat to the security and reliability of the grid.

Deliberation of the sub-Committee:

CM, NERTS informed that on 08.05.18 due to Main DC(+/- 220V) Mixing, DT was send to BgTPP from the respective PLCC panel. Mixing of DC (220 V & 48 V) occurred due to DC earth fault at Bongaigaon(PG). AGM(OS), NTPC opined that since the problem was recurring in nature, PLCC panels may be checked immediately. He also suggested that inter-trip for main protection may be shifted to OFC for Line Differential protection, by using the spare core. It was decided that NERTS would investigate the issue thoroughly and rectify the issue at the earliest.

The Sub-Committee noted as above.

Action: NERTS.

B.8 Technical presentation in PCCM:

SE(O&P), NERPC stated that as decided in earlier PCC meeting; technical presentation would be given on important topics once PCC deliberations are completed. It was decided that on the 51st PCC meeting, presentations on (1)Ramakrishna Task Force Recommended settings by NERTS (2) D/R inference and analysis will be given by NERTS.

The Sub-Committee noted as above.

Action: NERTS.

Minutes of 12th System Studies Meeting in NER

Date: 10.05.2018. **Venue: Hotel RajMahal, Guwahati**

1. Review of SPS 1 & 4.

SPS-1:

As per design, when both Modules of Palatana CCGT trip, a signal will be generated from trip relay of the Modules. This signal should then trip the CB of 132 kV Silchar – Srikona D/C, 132 kV Silchar – Panchgram S/C & 132 kV Silchar –Dullavcherra S/C lines at Silchar. Subsequent to tripping of 132 kV Silchar – Panchgram line, a signal will be generated from trip relay of 132 kV Silchar –Panchgram line. This signal should trip the CB of 132 kV Badarpur – Panchgram line at Badarpur.

SPS-4:

As per design, when 400 kV Silchar – Byrnihat line and 400 kV Silchar – Azara line trips (with no generation from Palatana), a signal will be generated from trip relays at Silchar. Also, in case of outage of either 400 kV Silchar – Byrnihat line or 400 kV Silchar – Azara line, if other line trips, signal will be generated from trip relays at Silchar. This signal should then trip the CB of 132 kV Silchar – Srikona D/C, 132 kV Silchar – Panchgram S/C & 132 kV Silchar –Dullavcherra S/C lines at Silchar. Subsequent to tripping of 132 kV Silchar – Panchgram line, a signal will be generated from trip relay of 132 kV Silchar –Panchgram line. This signal should trip the CB of 132 kV Badarpur – Panchgram line at Badarpur.

132 kV Silchar (PG)- Hailakandi (AEGCL) D/C was commissioned in 30th November'17. After commissioning of 132 kV Silchar (PG)- Hailakandi (AEGCL) D/C, the network configuration changed due to non-exisiting of 132 kV Silchar – Panchgram S/C & 132 kV Silchar –Dullavcherra S/C. Currently after operation of SPS 1 & 4, only 132 kV Silchar – Srikona D/C lines will trip which will lead to cascading tripping in Southern Part of NER.

In view of the above, it is requested to review SPS I and SPS 4.

Deliberation of the sub-Committee:

NERLDC presented the study results attached at **Annexure-1.1**. After detailed deliberation the following modifications were decided:

SPS-1

- –Tripping of 132 kV Silchar - Srikona D/C from Silchar End (already functioning)
- –Tripping of 132 kV Badarpur – Panchgram S/C from Badarpur End after receiving signal from Silchar End (to be implemented)
- –Tripping of 132 kV Silchar – Hailakandi D/C from Silchar End (1 ckt functioning & to be implemented in other ckt)

SPS-4

- –Tripping of 132 kV Silchar - Srikona D/C from Silchar End (already functioning)
- –Tripping of 132 kV Badarpur – Panchgram S/C from Badarpur End after receiving signal from Silchar End (to be implemented)
- –Tripping of 132 kV Silchar – Hailakandi D/C from Silchar End (1 ckt functioning & to be implemented in other ckt)

CM,NERTS informed that these modifications will be implemented by Jun'18.

He also informed that 132kV Silchar-Melriat and 400/132kV 315MVA ICT-III at Silchar would be commissioned very soon. He requested the forum to decide the modifications in any SPS scheme due to these commissioning(s).

DGM(SO-II), NERLDC stated that SPS related to network configuration change due to expected commissioning of 132kV Silchar - Melriat and 400/132kV 315MVA ICT-III may be discussed in the next system study meeting.

The forum decided that all SPS related to load shedding at South Assam area are to be kept in off-condition till completion of the suggested modifications.

The Sub-Committee noted as above.

Action: NERTS.

2. Review of Island II

Load-generation balance of Island no 2 consisting of Island comprising of generating units of AGTPP (Gas), generating units at Baramura (Gas), Rokhia (Gas) & Gumati (Hydro) and loads of Tripura system & Dullavcherra area (Assam) has changed since commissioning of 132 kV Surajmaninagar- Comilla D/C lines. In recent disturbances

in Tripura system, Island no. 2 could not survive due to load-generation balance mismatch.

In view of the above, it is requested to review Island No. 2

Deliberation of the sub-Committee:

SE(O&P),NERPC gave a presentation(**attached at Annexure 1.2**) on the background of the Islanding Schemes in NER and on the reasons for modification to Islanding Scheme-II. As per new system conditions the generation in the island is 260MW approx. while load is 360MW(including Bangladesh load). So additional shedding through UFR to the tune of 100MW is required. Sr. Manager, TSECL informed that shedding at Udaipur (40MW approx.) and 79Tilla(50-60MW approx.) may be done, however exact details he would revert back at the earliest.

The Sub-Committee noted as above.

Action: TSECL.

3. Capacity Building on PSSE

NERLDC conducted training for SLDCs and NERPC on PSSE focusing on the state control area wise, state subsystem wise and group of control-area wise TTCs for NER Grid. Members from SLDC Assam, SLDC Meghalaya, SLDC Mizoram, NERTS and NERPC were present in the workshop.

S.E.(O&P),NERPC appreciated the efforts of NERLDC and concluded that this practice of imparting training on PSSE will continue in subsequent system study meetings. He also requested NERLDC to engage more number of trainers to facilitate individual attention to trainees.

The Sub-Committee noted as above.

Date & Venue of next OCC meeting

It is proposed to hold the 51st PCC meeting of NERPC on second week of August, 2018. However, the exact date and venue will be intimated in due course.

The meeting ended with thanks to the Chair.

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Annexure-I

List of Participants in the 50th PCC Meetings held on 10.05.2018

SN	Name & Designation	Organization	Contact No.
1.	Sh. Abhishek Kalita, AM	Assam	08486213068
2.	Sh. Nishanta Baruah, AM	Assam	08473036988
3.	Sh. A. G. Tham, AEE, MePTCL	Meghalaya	09774664034
4.	Sh. K.Kynjing, AE, MePTCL:	Meghalaya	09485170070
5.	Sh. Rokobeito Iralu, SDO (Trans.)	Nagaland	09436832020
6.	Sh. Benjamin L.Tlumtea, Sr.EE, (P&ED)	Mizoram	09436151424
7.	Sh. H.Vanlalhlima, EE (P&E)	Mizoram	09436143244
8.	Sh. S. Chaudhuri, Sr. Mgr	Tripura	09436503239
9.	Sh. Ashim Kr. Sarmah, DM(E/M)	NEEPCO	09435078860
10.	Sh. N.R.Paul, GM	NERLDC	09436302723
11.	Sh. Amaresh Mallick, DGM(SO-II)	NERLDC	09436302220
12.	Sh. Jerin Jacob, Engineer	NERLDC	09402120113
13.	Sh. Ankit Jain, Sr. Engineer	NERLDC	09436335381
14.	Smti Palash Jyoti Borah, Engineer	NERLDC	08761093399
15.	Sh. Pinak Nandi, Sr. Eng.	PGCIL	09436335227
16.	Sh. H. Talukdar, CM	PGCIL	09436335237
17.	Sh. Pulak Deka,DM (Mech)	NHPC	09435187838
18.	Sh. Anirban Bhattacharjee, DM (Elect)	NHPC	08811071048
19.	Sh. Subhajit Ganguly, Sr. Executive	OTPC	07980010258
20.	Sh. J.Bhattacharyya, AGM	NTPC	09435720036
21.	Sh. Rajendran R., Manager	NTPC	09445002501
22.	Sh. P.K. Mishra, MS	NERPC	-
23.	Sh. B. Lyngkhoi, Director/S.E (O&P)	NERPC	09436163419
24.	Sh. S. Mukherjee, AD-I/AEE	NERPC	08794277306
25.	Sh. Farouque Iqbal, EE	NERPC	08700450141
26.	Sh. S.Imam, AEE	NERPC	08986666366
27.	Sh. Shaishav Ranjan	NERPC	08794276168

ANNEXURE-A.3

Details of Auto Recloser of Lines in North Eastern Regional Grid

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

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

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

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

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

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

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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

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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	

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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

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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

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

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

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

ANNEXURE-B.2

List of Lines in North Eastern Regional Grid

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
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
3	BTPS - Salakati	2	D/C	AEGCL	POWERGRID	2.7	ACSR Zebra	POWERGRID
G. 132 kV Lines								
1	Agartala - AGTCCPP	1	D/C	TSECL	NEEPCO	8.4	AAAC Panther	POWERGRID
2	Agartala - AGTCCPP	2	D/C	TSECL	NEEPCO	8.4	AAAC Panther	POWERGRID
3	Agartala - Bodhjannagar	1	S/C	TSECL	TSECL	8.0	AAAC Panther	TSECL

List of Lines in North Eastern Regional Grid

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
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
7	Badarpur - Panchgram	1	S/C	POWERGRID	AEGCL	1.0	AAAC Panther	POWERGRID
8	Balipara - Sonabil	1	S/C	AEGCL	AEGCL	10.0	AAAC Panther	AEGCL
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
13	Imphal (MSPCL) - Imphal (PG)	2	S/C	MSPCL	POWERGRID	2.3	ACSR Panther	POWERGRID & MSPCL
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

List of Lines in North Eastern Regional Grid

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
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
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
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
24	Mokochung (PG) - Mokokchung (DoP, Nagaland)	2	D/C	POWERGRID	DoP,Nagaland	1.4	ACSR Zebra	POWERGRID
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 Lines in North Eastern Regional Grid

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
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

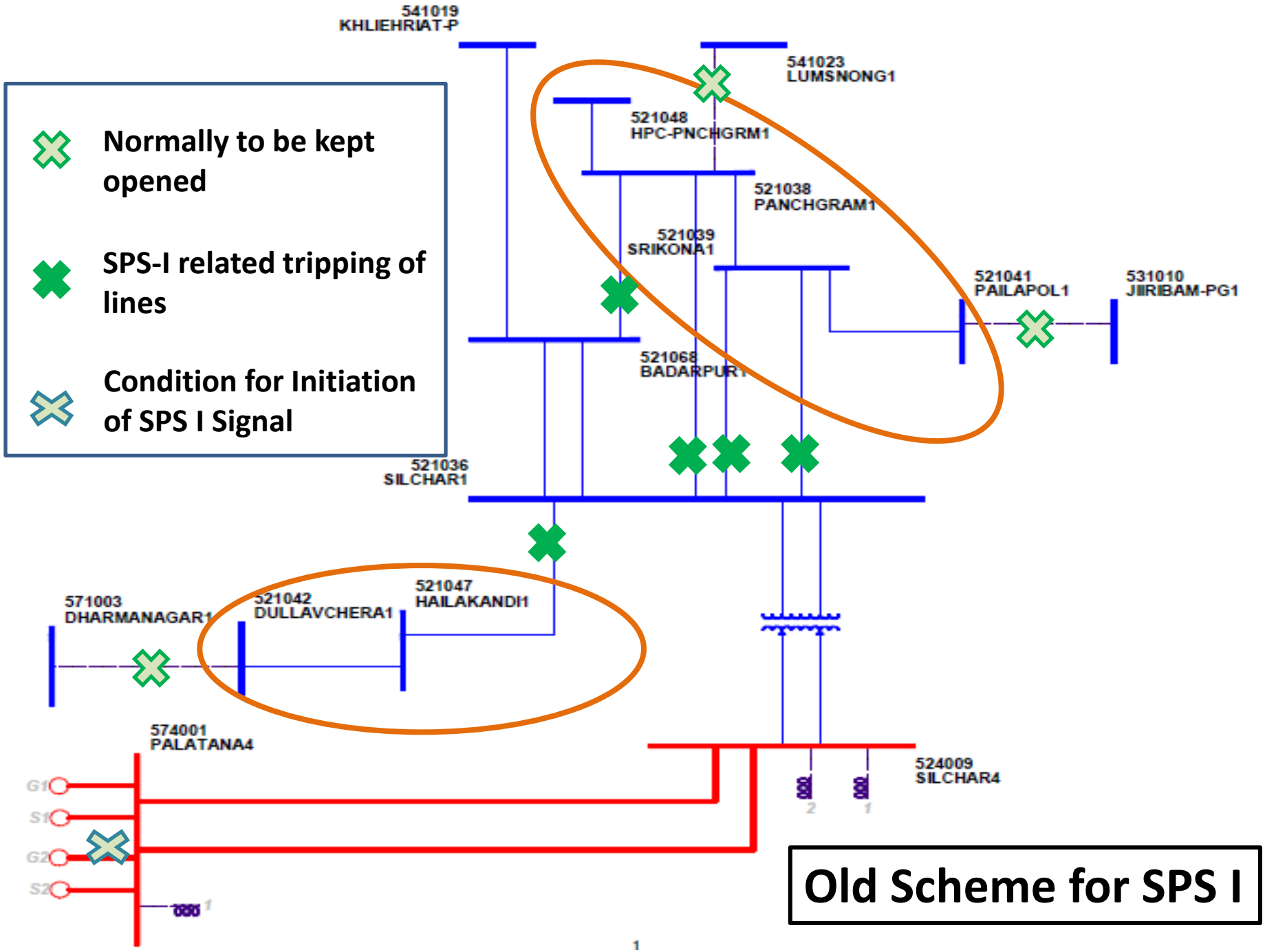
ANNEXURE-1.1

Review of SPS – I & IV and Island II

पावर सिस्टम ऑपरेशन

POSOCO

Review of SPS - I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SPS-I related tripping of lines
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HPC-PNCHGRM1
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PANCHGRAM1
521039
SRIKONA1
521041
PAILAPOL1
531010
JIRIBAM-PG1
521068
BADARPUR1
521036
SILCHAR1
571003
DHARMANAGAR1
521042
DULLAVCHERA1
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PALATANA4
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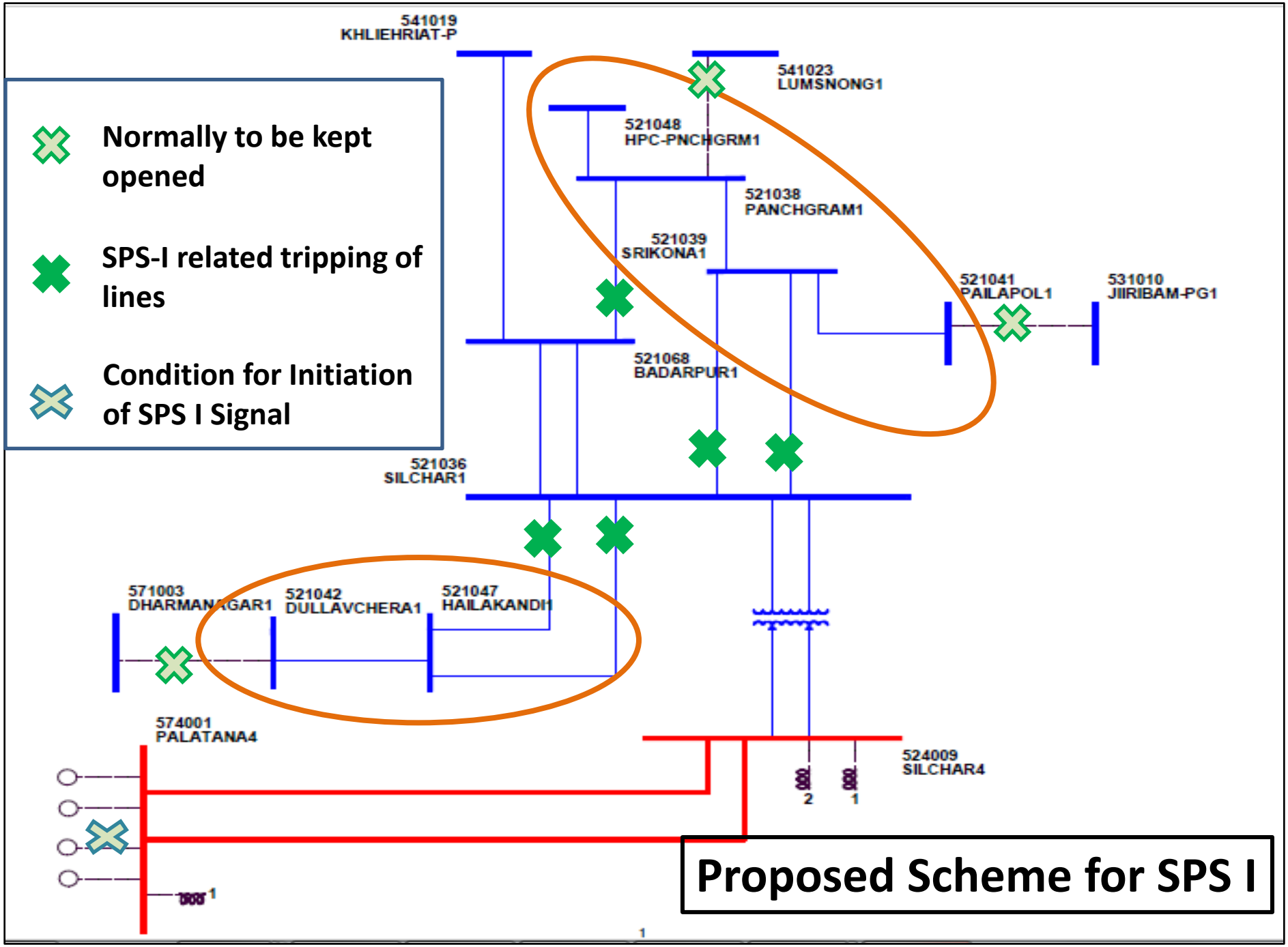
S1
G2
S2
524009
SILCHAR4
Old Scheme for SPS I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SPS-I related tripping of lines
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PANCHGRAM1
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PAILAPOL1
531010
JIRIBAM-PG1
521068
BADARPUR1
521036
SILCHAR1
571003
DHARMANAGAR1
521042
DULLAVCHERA1
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PALATANA4
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SILCHAR4
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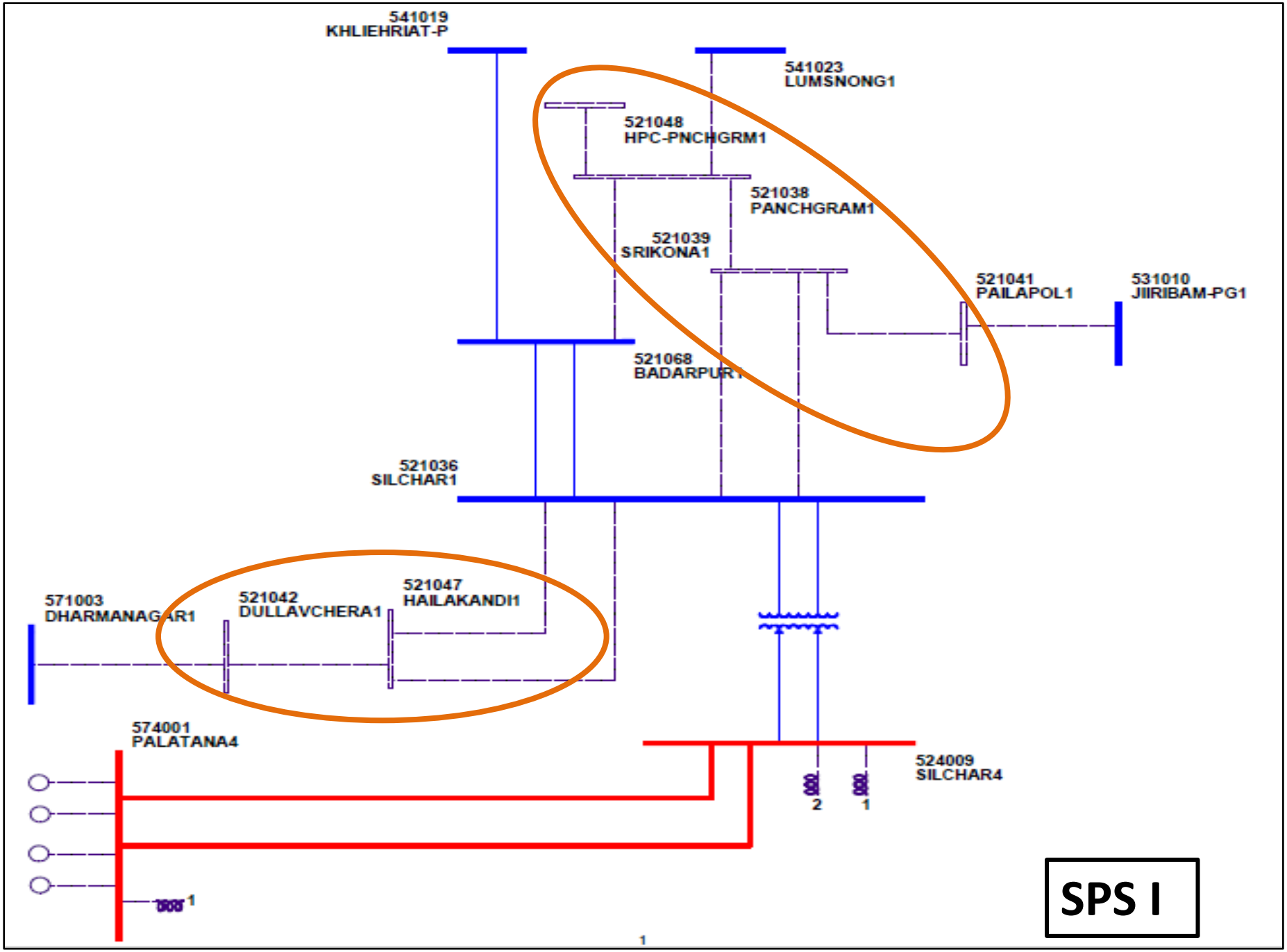
Proposed Scheme for SPS I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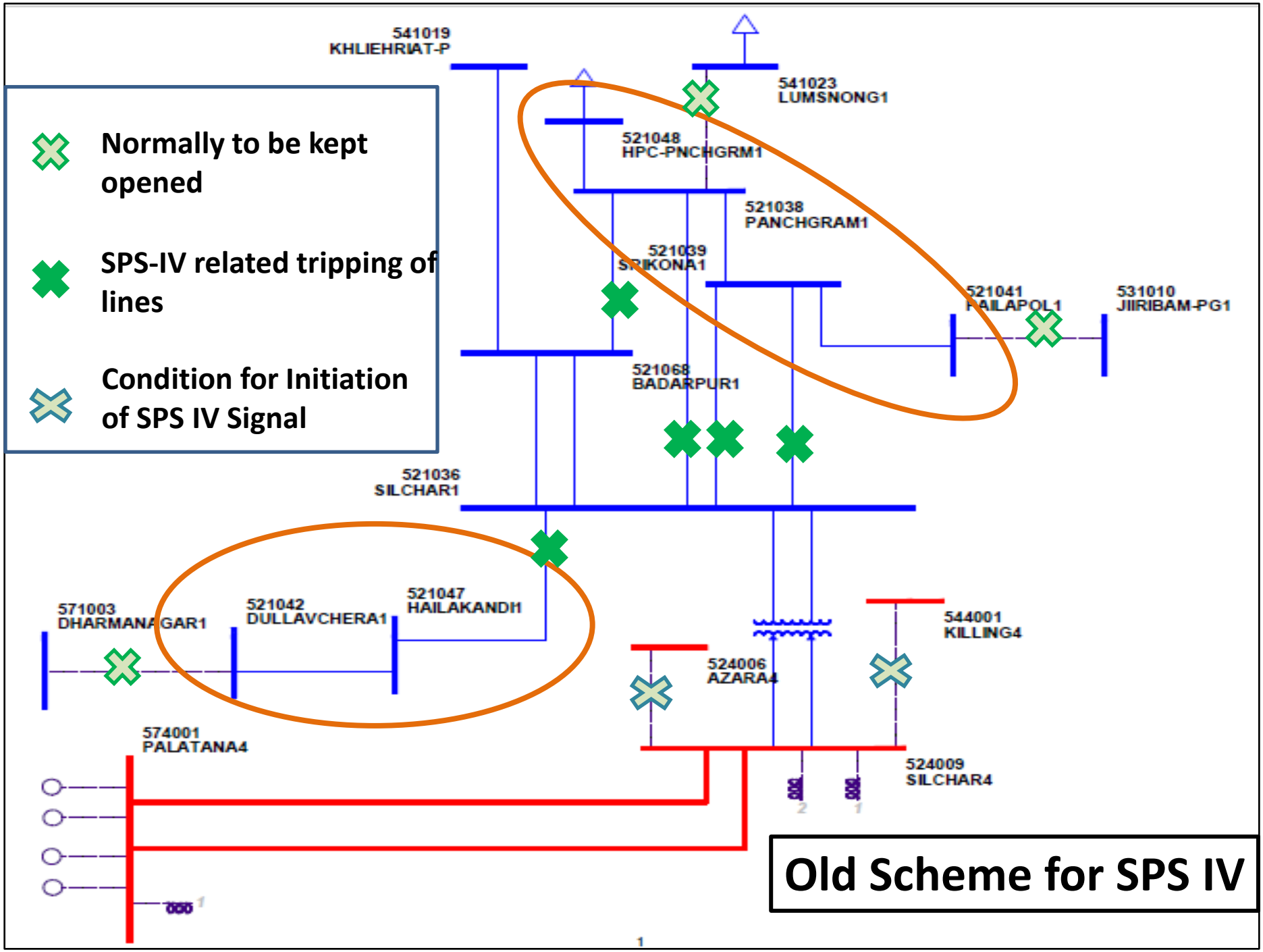
521041
PAILAPOL1
531010
JIIRIBAM-PG1
521068
BADARPUR1
521036
SILCHAR1
571003
DHARMANAGAR1
521042
DULLAVCHERA1
521047
HAILAKANDI1
574001
PALATANA4
524009
SILCHAR4
2
1
1
1
SPS I

Proposed for SPS-I

- **The following are proposed for desired operation of SPS-I:**
  - Tripping of 132 kV Silchar - Srikona D/C from Silchar End **(already functioning)**
  - Tripping of 132 kV Badarpur – Panchgram S/C from Badarpur End after receiving signal from Silchar End **(suggested)**
  - Tripping of 132 kV Silchar – Hailakandi D/C from Silchar End **(1 ckt functioning & other suggested)**

Review of SPS - IV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SPS-IV related tripping of lines
Condition for Initiation of SPS IV Signal
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HPC-PNCHGRM1
521038
PANCHGRAM1
521039
SRIKONA1
521041
531010
JIRIBAM-PG1
521068
BADARPUR1
521036
SILCHAR1
571003
521042
DULLAVCHERA1
521047
HAILAKANDI1
544001
KILLING4
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AZARA4
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PALATANA4
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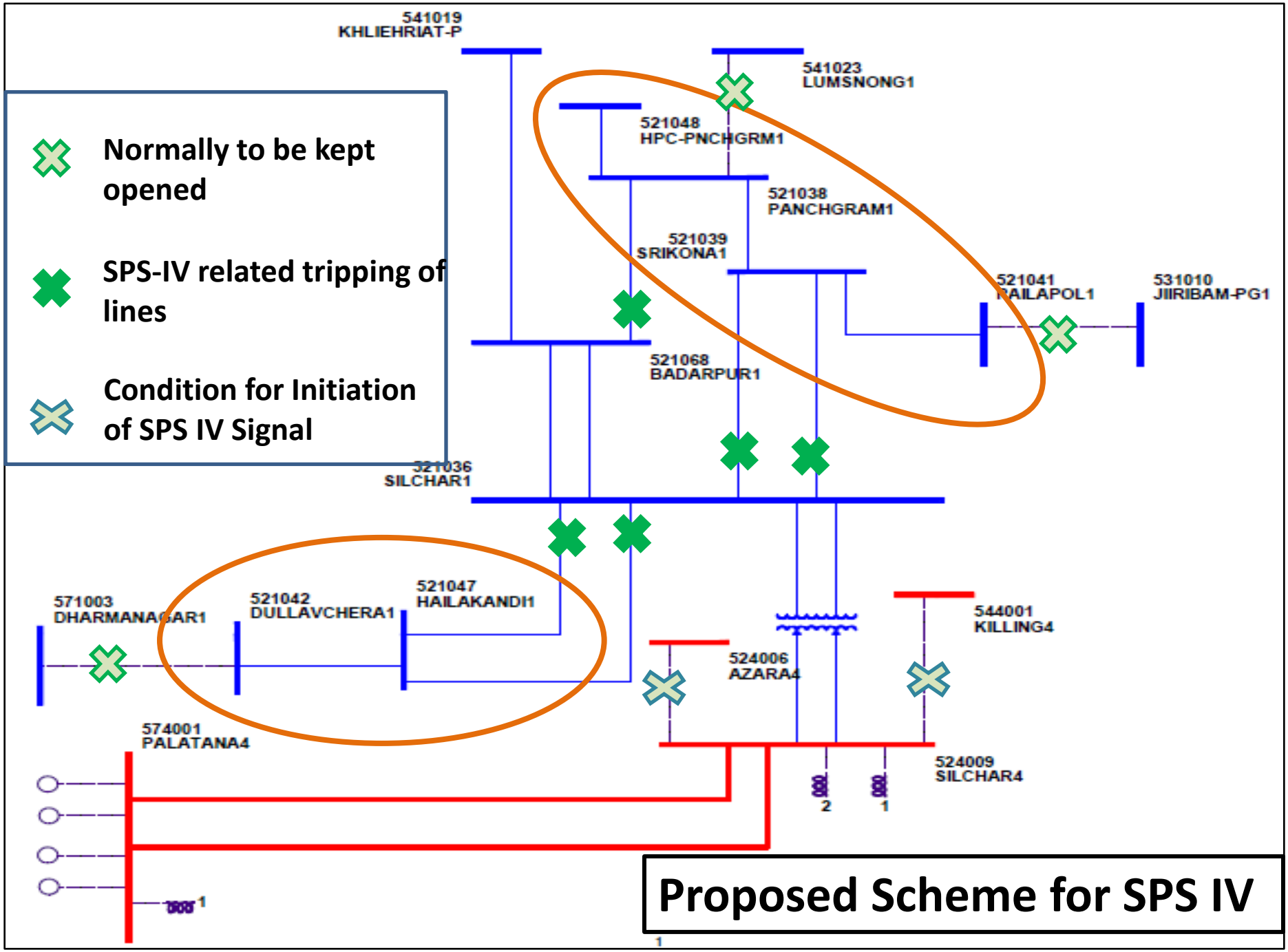
SILCHAR4
Old Scheme for SPS IV


Normally to be kept opened
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Condition for Initiation of SPS IV Signal
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521038
PANCHGRAM1
521039
SRIKONA1
521041
531010
JIRIBAM-PG1
521068
BADARPUR1
321036
SILCHAR1
571003
DHARMANAGAR1
521042
DULLAVCHERA1
521047
HAILAKANDI1
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AZARA4
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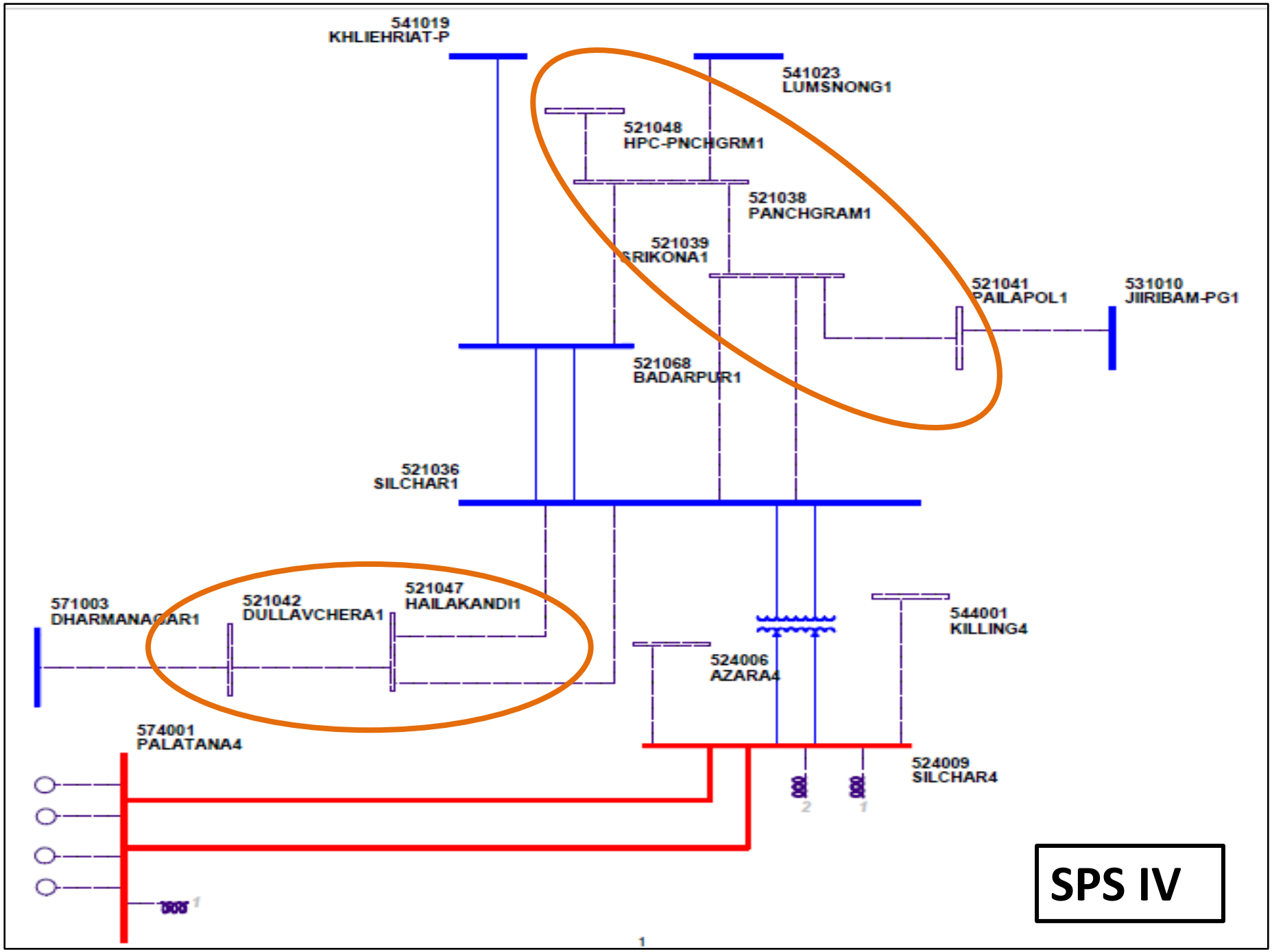
SILCHAR4
2
1
1
Proposed Scheme for SPS IV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HPC-PNCHGRM1
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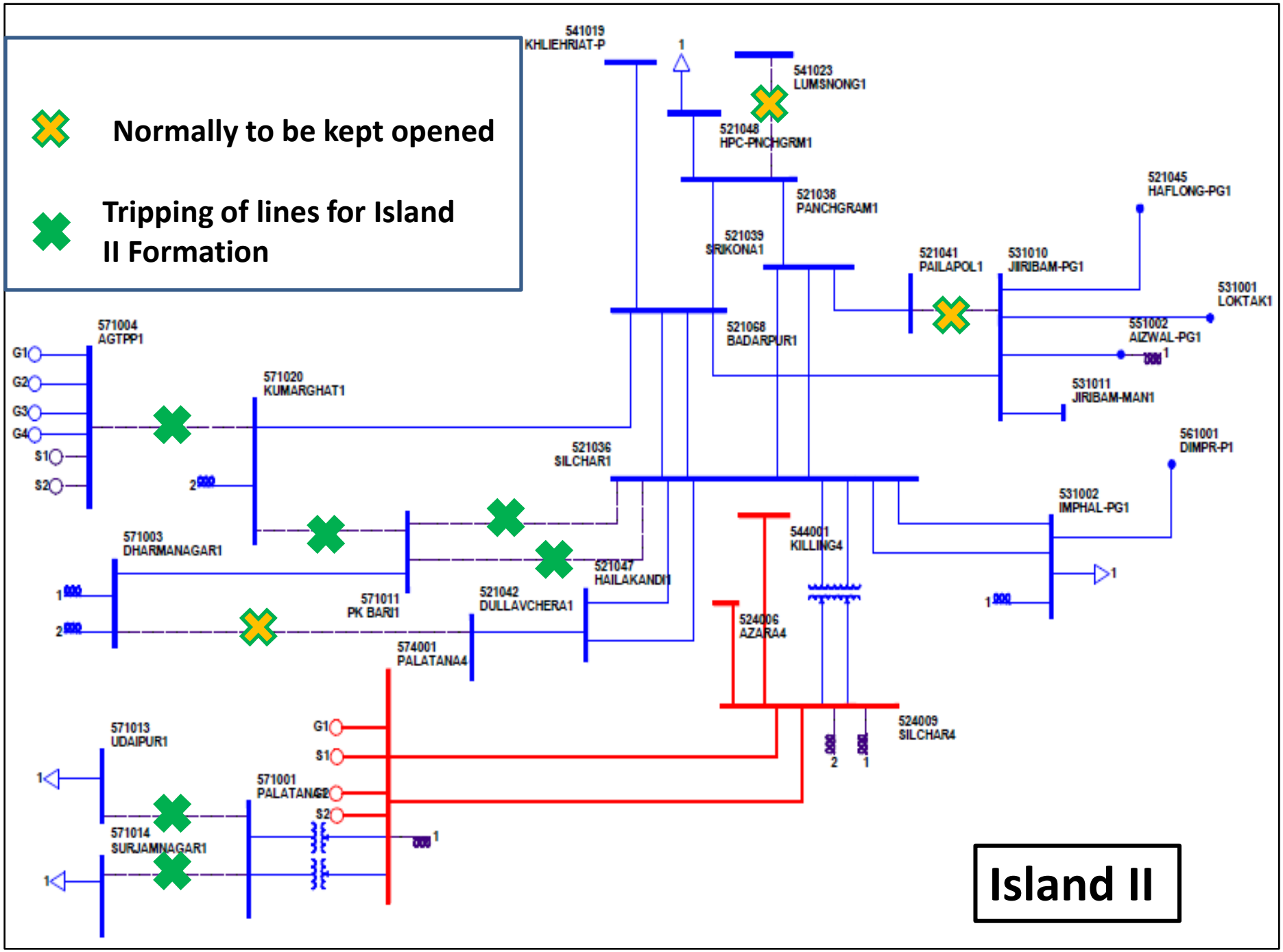
PANCHGRAM1
521039
SRIKONA1
521041
PAILAPOL1
531010
JIRIBAM-PG1
521068
BADARPUR1
521036
SILCHAR1
571003
DHARMANAGAR1
521042
DULLAVCHERA1
521047
HAILAKANDI1
544001
KILLING4
524006
AZARA4
574001
PALATANA4
524009
SILCHAR4
SPS IV

Proposed for SPS-IV

- **The following are proposed for desired operation of SPS-IV:**
  - Tripping of 132 kV Silchar - Srikona D/C from Silchar End **(already functioning)**
  - Tripping of 132 kV Badarpur – Panchgram S/C from Badarpur End after receiving signal from Silchar End **(suggested)**
  - Tripping of 132 kV Silchar – Hailakandi D/C from Silchar End **(1 ckt functioning & other suggested)**

Review of Island II


Normally to be kept opened
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HPC-PNCHGRM1
521038
PANCHGRAM1
521039
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HAFLONG-PG1
521041
PAILAPOL1
531010
JIRIBAM-PG1
531001
LOKTAK1
551002
AIZWAL-PG1
531011
JIRIBAM-MAN1
521068
BADARPUR1
571004
AGTPP1
G1
G2
G3
G4
S1
S2
571020
KUMARGHAT1
521036
SILCHAR1
561001
DIMPR-P1
531002
IMPHAL-PG1
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DHARMANAGAR1
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544001
KILLING4
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PK BARI1
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DULLAVCHERA1
524006
AZARA4
574001
PALATANA4
524009
SILCHAR4
571013
UDAIPUR1
571001
PALATANA2
571014
SURJAMNAGAR1
Island II

Generation:

Monarchak: 80 MW

AGTCCPP: 100 MW

Baramura: 21 MW

Rokhia: 53 MW

Gumti: 6 MW

Total Generation in the Island: 260 MW

Total Load in the Island:

Tripura (with Bangladesh): **360 MW**, Bangladesh: **160 MW**

Action: At least **100 MW** load reduction is required.

Discussion: To identify the location for tripping of loads and discuss the feasibility of tripping relay.

End of Presentation

ISLANDING SCHEME FOR NER

NERPC

(Central Electricity Authority)

OUT LINE

1. GRID DISTURBANCE
2. WHAT IS ISLANDING
3. WHY ISLANDING
4. PROPOSED ISLANDING SCHEME FOR NER

1. GRID DISTURBANCE

- In any power system under normal circumstances a load generation balance is achieved which in turn governs the system frequency at any instant of time.

- Sudden increase of decrease in load or generation can lead to unstable system and loss of synchronism.

1. GRID DISTURBANCE

Grid disturbances could be due to following reasons:

- **Under / Over Voltage (± v)**
- **Under / over Frequency (± f)**
- **Rapid rise / fall in frequency (± df/dt)**
- **Fault in Grid**

1. GRID DISTURBANCE

- Major disturbance may lead loss in generation and transmission elements.

- Further leads to overloading and cascade tripping of the remaining network.

Objective

- To regain normalcy as early as possible

2. WHAT IS ISLANDING

- Dividing the whole system into Sustainable Small System (SSS) consisting of group of generators and group of loads (Preferably generation exceeding loads) to avoid total failure of grid

3. WHY ISLANDING

- Not to allow the system to disintegrate leading to total grid failure

- To regain normalcy faster

<u>Normal time to bring generating units into service</u>

- Thermal unit : About 6 to 8 Hours
- C C Gas based unit : About ½ to 3 Hours
- Hydro unit : About 1/2

PRESENT ISLANDING SCHEME - II FOR NER

- Island to sustain at frequency 48.50 Hz

- Island comprising of generating units of AGTPP (Gas), generating units at Baramura (Gas), Rokhia (Gas) & Gumati (Hydro) and loads of Tripura system & Dullavcherra area (Assam)
- As per scheme – Total generation 150-160MW
- As per scheme – Total load 110MW (off-peak)-150MW (peak)

Contd.....

FOR OPERATION OF ISLANDING SCHEME FOLLOWING LINES ARE TO BE OPENED VIA UFR OPERATION

- **Lines to be opened** — **UFR Location**
- i) 132 kV Palatana – Udaipur
-
- UFR-1 at Palatana(500ms)
- ii) 132 kV Palatana – Surjamani Nagar
-
- iii) 132 kV Silchar – Dullavcherra — UFR -2 at Silchar(500ms)
-
- iv) 132 kV AGTPP – Kumarghat
- UFR-3 at Kumarghat(500ms)
- v) 132 kV P K Bari – Kumarghat

Changes since activation of Islanding Scheme in 2014

- CoD of AGTCCPP Extn i.e. injection of additional of 46MW generation in the island.
- DoCO of 132kV SMNagar-Comilla D/C lines i.e. additional load of 60MW(appx.)
- Increase in Tripura load
- Increase in Durlavcherra load
- **ALL OF THE ABOVE NECESSITATES CHANGES TO THE ISLANDING SCHEME**

ACTIONS REQUIRED

- Current generation : 200-210 MW Current load: 230MW(off-peak), 270-280MW (peak)

- Feeders to be identified by TSECL for disconnection
- This will enable the island to be sustained in event of disturbances.

THANK YOU