

I/3859/2019



सत्यमेव जयते

भारत सरकार
Government of India

विद्युत मंत्रालय

Ministry of Power

केंद्रीय विद्युत प्राधिकरण

Central Electricity Authority

विद्युत प्रणाली योजना एवं मूल्यांकन प्रभाग -II

Power System Planning & Appraisal Division-II

सेवा में/To

As per list of Addresses

विषय :पारेषण तंत्र पर पूर्वोत्तर क्षेत्र स्थायी समिति (एनईआरएससीटी) की पहली बैठक का कार्यवृत्त।

Subject: Minutes of the 1st meeting of North Eastern Region Standing Committee on Transmission (NER SCT) for planning of Transmission.

महोदय/Sir,

The 1st meeting of North Eastern Region Standing Committee on Transmission (NER SCT) was held on 29.11.2018 at Guwahati (Assam). The Minutes of the meeting are enclosed herewith.

भवदीय/yours faithfully,

(प्रदीप जिंदल/Pardeep Jindal)

मुख्य अभियन्ता/ Chief Engineer

I/3859/2019

List of Addresses:

1	The Member Secretary, North Eastern Regional Power Committee(NERPC), Meghalaya State Housing Finance Co-Operative Society Ltd. Building Nongrim Hills, Shillong (Meghalaya) – 793003	2	COO(CTU-Planning), Power Grid Corporation of India Ltd., “Saudamini” Plot no-2, Sector-29, Gurgaon- 122001, Haryana
3	Director (System Operation), POSOCO, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi – 110016	4	The Managing Director, Assam Electricity Grid Corporation Limited, Bijulee Bhawan; Paltan Bazar, Guwahati (Assam) – 781001
5	The Chairman-cum-Managing Director, Tripura State Electricity Corporation Limited, Bidyut Bhavan, Banamalipur, Agartala, Tripura-799001	6	The Chairman-cum-Managing Director, Meghalaya Energy Corporation Limited, Lum Jingshai, Short Round Road, Shillong (Meghalaya) – 793001
7	The Managing Director, Manipur State Power Company Ltd. (MSPCL), Electricity Complex, Patta No. 1293 under 87(2), Khwai Bazar, Keishampat, Imphal West, Manipur – 795001	8	The Chief Engineer (Power), Vidyut Bhawan, Department of Power, Zero Point Tinali, Itanagar (Arunachal Pradesh) – 791111.
9	The Chief Engineer (T&G), Department of Power, Electricity House, A.G. Colony, Kohima, Nagaland- 797001	10	Engineer-in-Chief Power & Electricity Department, Kawlphepha Building, New Secretariat Complex, Khatla, Aizawl Mizoram- 796001

Copy to:

PPS to Member (PS), Central Electricity Authority, Sewa Bhawan, R. K. Puram, New Delhi-110066

Minutes of the 1st meeting of North Eastern Region Standing Committee on Transmission (NERSCT) held on 29.11.2018 at Guwahati (Assam)

List of the participants is enclosed at **Annexure-I**.

Member (Power System) welcomed the participants and thanked POWERGRID for hosting the meeting in Guwahati. He informed that MoP vide letter dated 13.04.2018 has constituted the North Eastern Region Standing Committee on Transmission (NERSCT) for planning of Transmission system in the Region. Accordingly, this is the first meeting of NERSCT. He requested all participants to actively participate in discussion and to be specific on the issues to resolve them amicably through healthy and result oriented discussions.

Chief Engineer (PSPA-II), CEA also welcomed the participants to the meeting. He briefed the agenda points and requested participants to actively participate in the discussion. After a brief introduction of participants, he requested Director (PSPA-II), CEA to take up the agenda items for discussion.

1. Minutes of 7th meeting of Standing Committee on Power System Planning of North Eastern Region (SCPSPNER)

- 1.1. Director (PSPA-II), CEA informed that the minutes of the 7th meeting of the Standing Committee on Power System Planning of NER held on 17.05.2018 at Guwahati (Assam) were circulated vide CEA's letter no. I/1921/2018(15) dated 30.08.2018. No comments have been received on the minutes.
- 1.2. Superintending Engineer, NERPC stated that they have two observations on MOM of 7th SCM of NER i.e. regarding installation of 80MVAR Bus reactor at Ranganadi by NEEPCO and upgradation of bus system at Khandong S/s.
- 1.3. SE, NERPC stated that in the minutes, it has been recorded that NEEPCO would install 1x80 MVAR 400kV Bus reactor alongwith associated GIS bay at Ranganadi. However, NERPC is of the opinion that during expansion of transmission system, adequate reactor compensation for overvoltage should be taken care by transmission utility. If NEEPCO installs the Bus reactor at Ranganadi then extra tariff burden would be shared by NER states. He proposed that 80MVAR Bus reactor at Ranganadi may be installed by POWERGRID/CTU instead of generator.
- 1.4. Chief Engineer (PSPA-II), CEA stated generator may install the Bus reactor at Ranganadi and recover cost through generation tariff. If installation of Bus reactor at Ranganadi is agreed to be installed under ISTS, its tariff would be shared by all ISTS customers across the country. In that case, similar demand would arise from other regions and NER states would have to also pay for them.
- 1.5. Member (PS) stated that installation of reactor at Ranganadi is technically requirement and NEEPCO may approach CERC for revision in generation tariff.

- 1.6. Representative of NEEPCO informed that, estimated cost of installation of reactor is about Rs.34 crore.
 - 1.7. Representative of CTU stated that transmission system is not planned based on sharing of tariff but planned as per technical requirement. In case of space constraint in Ranganadi switchyard and to reduce cost of installation, NEEPCO may consider installing the reactor as switchable line reactor.
 - 1.8. POSOCO stated that to control over-voltage in the 400 kV corridor, number of 400 kV lines are opened on daily basis and there is a need to install the reactor at Ranganadi HEP.
 - 1.9. After deliberations it was agreed that POSOCO would provide the voltage profile inputs at Ranganadi end to CEA & CTU, and based on the inputs the proposal would be reviewed.
 - 1.10. SE, NERPC stated that second observation was on upgradation of bus system at Khandong S/s. He had proposed that POWERGRID may upgrade the bus at Khandong S/s.
 - 1.11. Representative of CTU stated that the matter had already been discussed in previous SCM, wherein, it was decided that the matter in respect of bus upgradation at Khandong S/s is a design related issue and it is not part of transmission planning. It was also decided that NEEPCO may consult CPRI / CEA / any other agency for technical consultancy.
 - 1.12. Representative of NEEPCO stated that they have taken up the bus upgradation matter with CPRI considering reconductoring of 132kV Kopili – Khandong Line-1 (PGCIL) with HTLS Conductor instead of ACSR Panther conductor.
 - 1.13. SE, NERPC stated that upgradation of bus system at Khandong S/s along with reconductoring of 132kV Kopili–Khandong Line-1 (PGCIL) with HTLS Conductor instead of ACSR Panther conductor would be required.
 - 1.14. CTU stated that both issues are separate and have already been discussed in previous SCM.
 - 1.15. Members opined that, there was only clubbing of two issues i.e. 132kV bus upgradation at Khandong S/s and reconductoring of 132kV Kopili – Khandong Line-1 (PGCIL) with HTLS conductor instead of ACSR Panther conductor, amendment in minutes is not required.
- 2. Establishment of Roing – Chapakhowa 132kV D/c and Tinsukia – Namsai 220kV D/c lines**
- 2.1. Director (PSPA-II), CEA informed that the long 132kV network of Arunachal Pradesh viz. Ranganadi – Ziro – Daporijo – Along – Pasighat – Roing – Tezu – Namsai – Miao – Jairampur – Changlang – Khonsa – Deomail – Kathalguri is fed from Ranganadi & Pare HEPs at one end and Kathalguri at other end. In the 7th meeting of SCPSPNER, to improve reliability of power supply in this long 132kV network, implementation of Roing (Arunachal Pradesh) – Chapakhowa (Assam)

- 132kV S/c line on D/c tower as ISTS for system strengthening in NER was agreed. It was also agreed that requirement of AGBPP (Kathalguri) – Namsai 132kV link or other alternative proposal of Arunachal Pradesh to be decided in the joint study meeting.
- 2.2. Further, Director (PSPA-II), CEA stated that a joint study meeting was held among CEA, POWERGRID, POSOCO and NER states on 12-11-2018 at New Delhi. It was observed that the power flow will generally be from Roing (Arunachal Pradesh) to Chapakhowa (Assam). Interconnection of 132kV substations in upper Assam (below Brahmaputra) with neighbouring substations in Arunachal Pradesh will result in either very low power flow to Arunachal Pradesh or power flow is from Arunachal Pradesh to Assam. To supply power to Arunachal Pradesh and improve system reliability, following alternative interconnections at higher voltage levels were suggested during the study:
- a) Tinsukia-Namsai 220kV D/c line or
 - b) AGBPP (Kathalguri) – Namsai 220kV D/c line
- 2.3. Representative of CTU stated that during the system studies, with regard to Roing – Chapakhowa 132kV line, it was observed that Chapakhowa is about 60km from Rupai (Assam) and about 30km from Roing (Arunachal Pradesh). Thus, power flow will generally be from Roing (Arunachal Pradesh) to Chapakhowa (Assam). Interconnection of 132kV substations in upper Assam (below Brahmaputra) with neighbouring substations in Arunachal Pradesh will result in either very low power flow to Arunachal Pradesh or power flow is from Arunachal Pradesh to Assam. In both the cases power flows in the range of about 25MW from Assam to Namsai. However, with both interconnections viz. Roing – Chapakhowa 132kV and Tinsukia/AGBPP (Kathalguri) – Namsai 220kV, the power flow from Assam to Namsai (Arunachal Pradesh) increases to about 45MW, while about 20MW flows back to Assam through Roing – Chapakhowa line. Thus, there is circulation of power between Assam and Arunachal Pradesh through the above two 132kV and 220kV ISTS interconnections.
- 2.4. Representative of AEGCL stated that due to space constraint 220kV bays cannot be constructed at Tinsukia S/s. Accordingly, AGBPP (Kathalguri) – Namsai 220kV D/c line is the feasible option. Representative of AEGCL proposed that the one connection from Jonai (Assam) to Pasighat (Arunachal Pradesh) may also be established for supply power to Arunachal Pradesh. Representative of DoP, Arunachal Pradesh proposed that the interconnection could alternatively be terminated at Niglok (Arunachal Pradesh).
- 2.5. Chief Engineer (PSPA-II), CEA stated that circulation of power between Assam and Arunachal Pradesh is technically not optimal solution and will increase losses in the system. Further, due to very long route having low short circuit capacity, voltage will rise and accordingly proper reactive compensation in 132 kV ring of Arunachal Pradesh would be required.

- 2.6. Representative of CTU stated that as the purpose of new interconnection between Assam and Arunachal Pradesh is to provide alternative path for power supply to 132kV system of Arunachal Pradesh during contingency conditions, only the Roing – Chapakhowa 132kV line may be taken up as of now. Further, it was proposed that to avoid stringing complications in future, already agreed Roing (Arunachal Pradesh) – Chapakhowa (Assam) 132kV S/c line on D/c tower may be implemented as Roing (Arunachal Pradesh) – Chapakhowa (Assam) 132kV D/c line.
- 2.7. After deliberations, following were agreed:
- (i) Implementation of Roing (Arunachal Pradesh) – Chapakhowa (Assam) 132kV D/c line as ISTS for system strengthening in NER instead of already agreed Roing (Arunachal Pradesh) – Chapakhowa (Assam) 132kV S/c line on D/c tower.
 - (ii) Proposal of AEGCL and Arunachal Pradesh regarding Jonai (Assam) to Pasighat (AP) and Niglok (AP), alongwith reactive compensation would be studied by CEA / CTU and will be discussed in next meeting of NERSCT.

3. Reconductoring of Siliguri-Bongaigaon 400kV D/c Twin Moose line with Twin HTLS conductor

- 3.1. Director (PSPA-II), CEA stated that the peak demand of NER is expected to be about 4500MW in 2021-22. During peak demand and low hydro scenario in NER, there would be an import requirement on ER to NER corridor of at least about 1700-1800MW. In the ER-NER corridor, there are two 400kV lines viz. New Siliguri – Bongaigaon 400kV D/c line & Alipurduar – Bongaigaon 400kV D/c (Quad) line and Alipurduar – Bongaigaon 220kV D/c line to serve this demand. The Siliguri – Bongaigaon line is designed to operate at maximum temperature of 75°C. Under N-1-1 of the quad moose line, loading on the remaining twin moose line would be close to/beyond thermal rating. Moreover, any further lower availability of generation in NER during low hydro scenario shall only aggravate the situation under N-1-1. In the 7th SCM of NER held on 17-05-2018 it was decided to study the requirement of subject proposal in the joint system study with NER states.
- 3.2. In the joint system study held on 12-11-2018, it was observed that N-1-1 of Alipurduar – Bongaigaon/Bornagar 400kV D/c (Quad) line not only results in overloading of Siliguri – Bongaigaon 400kV D/c line, but also Alipurduar – Bongaigaon (one circuit via Agamoni-Assam S/s) 220kV D/c line (designed to operate at maximum temp of 75°C). Further, it was observed that on considering Bornagar – Parbotipur (Bangladesh) – Katihar cross-border interconnection, the overloading on Siliguri – Bongaigaon subsides, however, 220kV line was still observed to be overloaded under said N-1-1. Accordingly, following two options were suggested for strengthening works in the ER-NER inter-regional corridor:
- (a) Reconductoring of Siliguri – Bongaigaon line with Twin HTLS conductor (ampacity of single HTLS shall be 1596A, which is equivalent to Twin ACSR

Moose conductor for 45°C ambient and 85°C maximum conductor temperature) along with requisite modifications in line bay equipment at both ends.

- (b) To relieve critical/over loading on Alipurduar-Bongaigaon 220kV section, Assam may LILO both circuit of Alipurduar – Bongaigaon 220kV D/c line at new substation Agamoni 220/132kV, 2x160MVA. Bus split arrangement may made at both 220kV and 132kV levels at Agamoni S/s so that one section (with first 220/132kV, 160MVA ICT) is fed from Alipurduar (Gossaigaon 132kV may be fed from this section) and the other section (with second 220/132kV, 160MVA ICT) is fed from Bongaigaon (Gauripur 132kV may be fed from this section).
- 3.3. Chief Engineer (PSPA-II), CEA stated that bus split arrangement at both 220kV and 132kV levels at Agamoni S/s will help to reduce the overloading problem of Alipurduar-Bongaigaon 220kV section. He suggested that recondutoring of Siliguri – Bongaigaon line with Twin HTLS conductor may be considered in future after implementation of Bornagar – Parbotipur (Bangladesh) – Katihar cross-border interconnection, as per system requirement.
 - 3.4. POSOCO stated that expecting NER demand to go up from 3000 MW today to 4500 MW by 2021-22 appears optimistic. Considering the 400 kV Bornagar-Parbotipur-Katihar cross border interconnection and possibility of at least 1000 MW flow from Agra to BNC over HVDC besides the load assumptions for NER in 2021-22, the recondutoring of 400 kV Siliguri-Bongaigaon D/C could be re-examined.
 - 3.5. AEGCL agreed for implementation of LILO of both circuit of Alipurduar – Bongaigaon 220kV D/c line at new substation at Agamoni 220/132kV, 2x160MVA along with bus split arrangement at both 220kV and 132kV levels at Agamoni S/s, under intra-state scheme.
 - 3.6. After detailed deliberation following were agreed :
 - a) Implementation of LILO of both circuit of Alipurduar – Bongaigaon 220kV D/c line at new substation at Agamoni 220/132kV, 2x160MVA along with bus split arrangement at both 220kV and 132kV levels at Agamoni S/s so that one section (with first 220/132kV, 160MVA ICT) is fed from Alipurduar (Gossaigaon 132kV may be fed from this section) and the other section (with second 220/132kV, 160MVA ICT) is fed from Bongaigaon (Gauripur 132kV may be fed from this section) by AEGCL as intra-state scheme .
 - b) Recondutoring of Siliguri – Bongaigaon line with Twin HTLS conductor. (ampacity of single HTLS shall be 1596A, which is equivalent to Twin ACSR Moose conductor for 45°C ambient and 85°C maximum conductor temperature) along with requisite modifications in line bay equipment at both ends with implementation of Bornagar – Parbotipur (Bangladesh) – Katihar 765kV (initially to be operated at 400kV) D/c cross border line.

4. LILO of Kahilipara – Umtru 132kV D/c line at Killing (Byrnihat) S/s of Meghalaya

- 4.1. Director (PSPA-II), CEA stated that in the 7th meeting of SCPSPNER, AEGCL had proposed LILO of Kahilipara - Umtru 132kV D/c lines at Killing GSS of MePTCL to relieve high loading on ICTs at Sarusajai GSS of AEGCL. In the meeting, it was decided to study the proposal in the joint study meeting.
- 4.2. In the joint study meeting held on 12-11-2018, AEGCL informed that with commissioning of 220kV level at their Sonapur S/s, the power supply situation in Guwahati area had improved. Further, with this commissioning, Kahilipara – Umtru 132kV D/c line is kept opened at times to avoid overloading. Moreover, Assam is establishing 400kV level at Sonapur S/s through LILO of Byrnihat – Silchar 400kV S/c line. It was found that with commissioning of 400kV Sonapur S/s, the issue of overloading on Umtru – Kahilipara and Umtru – Sarusajai 132kV D/c lines subsides.
- 4.3. Representative of MePTCL informed that the Umtru – Kahilipara 132kV D/c line was commissioned along with Umtru HEP in 1960. He proposed for reconductoring of Umtru – Kahilipara and Umtru – Sarusajai 132kV D/c lines.
- 4.4. Representative of AEGCL stated that to avoid the overloading, LILO of Kahilipara – Umtru 132kV D/c line at Killing (Byrnihat) S/s of Meghalaya with reconductoring of Umtru – Kahilipara and Umtru – Sarusajai 132kV D/c line with HTLS conductor will be useful for the system.
- 4.5. Chief Engineer (PSPA-II), CEA stated that LILO of Kahilipara - Umtru 132kV D/c lines at Killing GSS of MePTCL might be agreed. He suggested that reactive compensation requirement need to be studied at Umtru S/s.
- 4.6. Representative of CTU stated that the Umtru – Kahilipara and Umtru – Sarusajai 132kV D/c lines are inter-state lines (owned by Assam and Meghalaya in respective territory).
- 4.7. It was proposed that the Umtru – Kahilipara and Umtru – Sarusajai 132kV D/c lines may be reconducted with HTLS conductor by Assam and Meghalaya in respective territory along with required strengthening of bay equipment and towers.
- 4.8. After detailed deliberation following were agreed:
 - a) LILO of Kahilipara - Umtru 132kV D/c lines at Killing S/S of MePTCL by MePTCL as intra-state scheme of Meghalaya.
 - b) Reconductoring of Umtru – Kahilipara and Umtru – Sarusajai 132kV D/c line with HTLS conductor by AEGCL and MePTCL as intra-state scheme in respective territory along with required strengthening of bay equipment and towers.
 - c) Study of reactive compensation requirement at Umtru S/s which would be discussed in next meeting of NERSCT.

5. Implementation of 132kV line bay at Palatana generation switchyard

- 5.1. Director (PSPA-II), CEA stated that Palatana – Surajmaninagar 400kV D/c line (presently operating at 132 kV) has been commissioned as part of Palatana-Bongaigaon transmission system. At present, 2 nos. 132kV line bays are available at Palatana end. Palatana – Udaipur 132kV S/c line of Tripura has been terminated in one bay and one ckt. of Palatana – Surajmaninagar D/c line is terminated in the other bay. Other ckt. of Palatana – Surajmaninagar D/c line is yet to be connected at Palatana end.
- 5.2. In the 7th SCM of NER it was decided that Palatana – Udaipur 132kV S/c line shall be opened by Sept 2018 to enable termination of 2nd circuit of Palatana – Surajmaninagar line at Palatana end and accordingly NEPRC would take further action.
- 5.3. Representative of TSECL stated that they are constructing Monarchak – Surajmaninagar 132kV D/c line. However, due to severe RoW issues, the line is getting delayed and at least 6 months are required to complete the line. After completion of the line, Palatana – Udaipur 132kV S/c line would be opened to enable termination of 2nd circuit of Palatana – Surajmaninagar line at Palatana end.
- 5.4. Representative of CTU stated that after operation of Palatana – Surajmaninagar 400kV D/c line (presently operated at 132kV) at its rated voltage level, the vacant 132kV line bays could be utilised by TSECL for termination of Udaipur or any other 132kV line.
- 5.5. Members agreed to retain connection of Palatana – Udaipur line in Surajmaninagar line bays at Palatana end for additional six months (upto May 2019). It was emphasized that Tripura may expeditiously complete the Monarchak – Surajmaninagar line to avoid further time extension.

6. Alternative transmission line for evacuation of power from Tuirial HEP (60MW) of NEEPCO

- 6.1. Director (PSPA-II), CEA stated that Tuirial-Kolasib 132kV S/C line (implemented by P&E Dept., Govt .of Mizoram) and Tuirial-Sihhmui 132kV D/c line (to be implemented by NEEPCO/ P&E Dept., Govt of Mizoram) were planned for evacuation of power from Tuirial HEP (60MW). Since, the Tuirial-Sihhmui 132kV D/c line could not be implemented, entire power from Tuirial HEP is being evacuated through Tuirial-Kolasib 132kV S/C line.
- 6.2. In the 7th meeting of SCSPNER, representative of NEEPCO had informed that in the meeting held on 17-02-2017 between NEEPCO & Secretary, Power & Electricity Department, Govt. of Mizoram, it was decided to explore the possibility of LILO of Jiribam – Aizawl (Luangmual) 132kV S/C line at Tuirial HEP for reliable evacuation of power and the line would be constructed by Mizoram. Further, the representative of Mizoram had stated that LILO of Jiribam – Aizawl 132kV S/C line at Tuirial HEP is not feasible due to very difficult terrain and Mizoram doesn't

have fund to construct the 2nd ckt for evacuation of power from Tuirial HEP. Accordingly, in the 7th meeting of SCPSPNER it was agreed that due to problems associated with LILO of Jiribam – Luangmual (Aizawl) 132kV line at Tuirial HEP, Mizoram and NEEPCO would jointly explore the possibility of 2nd connectivity for reliable evacuation of power from Tuirial HEP and the matter would be taken up for discussion in the next Standing Committee Meeting.

- 6.3. Representative of NEEPCO stated that they along with DoP, Mizoram had visited the site on 01.10.2018. However, issues could not be resolved.
- 6.4. Since, representative of DoP, Mizoram were not present in the meeting; latest status from their side could not be ascertained.
- 6.5. POSOCO expressed concern about adequacy of evacuation arrangements for the generating stations.
- 6.6. Member (PS), CEA suggested that NEEPCO may discuss with Mizoram again and inform the progress to CEA. Thereafter, the matter would be taken up for discussion in the next meeting of NERSCT.

7. **Handing over of Balipara-Khupi-Kimi 132kV S/c line along with 132kV substations**

- 7.1. Director (PSPA-II), CEA stated that Balipara-Khupi-Kimi 132kV S/C transmission line and its associated substations were constructed by NEEPCO through POWERGRID on deposit work basis for drawing construction power for Kameng HEP in Ar. Pradesh. In the 7th meeting of SCPSPNER, it was agreed for handing over the assets to Ar. Pradesh and modality of transfer may be decided in a separate meeting in CEA with POWERGRID, Ar. Pradesh and NEEPCO.
- 7.2. Accordingly, a meeting among CEA, POWERGRID, Arunachal Pradesh and NEEPCO was held at CEA on 10-10-2018. In the meeting, it was decided that NEEPCO may hand over the following transmission assets associated with Balipara-Khupi-Kimi 132kV S/c line mentioned below to DoP, Arunachal Pradesh on mutually agreed terms:

Sl. No.	Description
1	<p><u>Transmission Lines:</u></p> <p>(i) Balipara- Khuppi 132 KV S/c or D/c line (68 km)</p> <p>(ii) Khuppi- Kimi (Kameng HEP) 132 KV S/c line (8 km)-(presently charged at 33kV)</p>
2	<p><u>Extension works at 220KV/132 KV Sub Station at Balipara:</u></p> <p>(i) 220 KV ICT Bay-1 no.</p> <p>(ii) 50MVA 220/132 KV Transformer-1 no.</p> <p>(iii) One 132 KV ICT Bay</p> <p>(iv) One 132 KV Bus Coupler Bay</p> <p>(v) One 132 KV Line bay for Khuppi -Balipara 132 kV S/c line</p>
3	<p><u>132/33 KV Sub-Station at Khuppi</u></p> <p>(i) <u>132 KV Switchyard:</u></p> <p>a) One 132 KV bay for Khuppi -Balipara 132 kV S/c line</p> <p>b) 132KV Transformer bay</p>

	<ul style="list-style-type: none"> c) 132KV Bus transfer bay (under S/D) d) One 132KV bay (under S/D) for Khuppi –Kimi 33 kV line (ii) <u>33 KV switchyard:</u> <ul style="list-style-type: none"> a) One 33KV line bay for Khuppi –Kimi 33 kV line b) One 33KV bay for Khuppi –Tenga 33 kV line c) 33KV bay for DoP (iii) <u>Power transformers:</u> <ul style="list-style-type: none"> a) 5MVA 132/33KV Transformers- 4 nos. (including one spare transformer unit) (iv) <u>Distribution transformers:</u> <ul style="list-style-type: none"> a) 630 KVA, 33/0.4 KV-2 nos. (One for S/S, One for NEEPCO colony at Khuppi) (v) 132/ 33 KV Sub-station Control Room with all control equipment, battery & batter chargers etc.
4	<p><u>Associated LT Distribution Systems</u></p> <ul style="list-style-type: none"> (i) Khuppi-Tenga 33 KV Line (5 km) (ii) Tenga-Bichom 33 KV Line (16 km) (iii) 33/11 KV Indoor S/S at Tenga (iv) 33/11 KV Indoor S/S at Bichom (v) Distribution Transformers <ul style="list-style-type: none"> a) 2.5 MVA, 33/11 KV Transformers- 4 nos. (2 at Tenga S/S +2 at Bichom S/s) b) 125 kVA 11/0.4 KV Transformer-2 nos. (One at Bichom S/S + One at Kimi 25 km Village)

7.3. Representative of POWERGRID stated that asset mentioned at SI .No. 2(i), 2(iii) and 2(iv) belongs to POWERGRID. Accordingly, these need to be deleted from the list of items to be transferred.

7.4. After deliberations, it was agreed that the assets mentioned in table at para 7.2 excluding elements at SI .No. 2(i), 2(iii) & 2(iv) may be handed over by NEEPCO to DoP, Arunachal Pradesh on mutually agreed terms. DoP, Arunachal Pradesh agreed that they would operate and maintain them in healthy condition to facilitate reliable power supply from Kameng HEP to 132kV systems in Khupi, Kimi, Bomdila, Tawang, Kalaktang and surrounding areas.

8. Proposal of connection of Dikshi HEP (24MW) in West Kameng, Arunachal Pradesh

8.1. Director (PSPA-II), CEA stated that in the 7th meeting of SCPSPNER, the proposal of connecting Dikshi HEP (24MW) with 132kV Balipara-Khupi line of NEEPCO through a LILO arrangement at a place called Nechipu, was discussed. In the meeting, it was agreed to discuss the matter in a separate meeting in CEA along with Arunachal Pradesh, NEEPCO, CTU (POWERGRID) to decide about the power evacuation arrangement for Dikshi HEP.

8.2. Accordingly, a meeting among CEA, POWERGRID, Arunachal Pradesh and NEEPCO was held at CEA on 10-10-2018 and following was decided :

- (i) Power from Dikshi HEP (24MW) may be evacuated through below mentioned transmission system:

Transmission element

- a) 132kV S/C Dikshi switchyard to Tenga switching station - 10.5 Kms
- b) 132kV D/C Tenga switching station to Nechipu LILO connection (on Balipara-Khupi 132kV line) - 21.5 km

Substations

- c) 132 kV Tenga switching station with 4 no. of bays
 - (ii) Since, the license for transmission system for Dikshi HEP has already been issued by APERC, the issue may be closed with provision of connectivity for Dikshi HEP through the transmission system mentioned above by the generating company.
- 8.3. Chief Engineer (PSPA-II), CEA stated that to control the voltages, 145kV, 1x5MVAR bus reactor would be required at Tenga switching station. However, as the transmission license for system has been issued by APERC to generating company, implementing agency need to be decided.
- 8.4. Member (PS), CEA suggested that Arunachal Pradesh may plan utilisation of 4th bay at Tenga switching station.
- 8.5. After deliberation following were agreed:
- a) DoP, Arunachal Pradesh may decide intra-state implementing agency for 145kV, 1x5MVAR bus reactor at Tenga switching station and inform in the next meeting of NERSCT.
 - b) DoP, Arunachal Pradesh would confirm the utilisation of 4th bay at Tenga switching station in next meeting of NERSCT.

9. Proposed scheme for relieving congestion in Agia substation of Assam – Agenda by Assam

- 9.1. Director (PSPA-II), CEA stated that in the 7th meeting of SCPSNER, the representative of AEGCL informed that load in 220kV substation at Agia has increased due to additional loading on Agia (Assam) - Mendipathar (Meghalaya) 132kV line. Further, AEGCL has no tariff benefit due to PoC mechanism. AEGCL also stated that for reducing loading on lines connected with Agia (Assam) substation and enhancing the reliability of power supply in the western parts of Meghalaya, a 220kV substation either in West Garo Hills district or in the East Garo Hills district of Meghalaya is required. In the meeting, it was decided that the matter may be studied in the joint system study meeting.
- 9.2. During the joint study meeting held on 12-11-2018, it was observed that Agia S/s has 220/132kV, 100MVA+50MVA ICTs and there is only Agia-Mendipathar 132kV line (about 30km) to Meghalaya at Agia. Mendipathar is very close to Assam-Meghalaya border and is connected to Meghalaya system through 132kV line to Nangalbibra (about 80km). The western part of Meghalaya is fed from only two 132kV S/c lines, one from Agia (Assam) and other from Mawngap (Meghalaya). From the system studies, it was observed that major portion of load of western part of Meghalaya is fed from Agia S/s. Meghalaya during the joint

study meeting had informed that load in the western part of Meghalaya is expected to further increase due to Saubhagya and other distribution system schemes. Accordingly, in order to relieve loading on Agia – Mendipathar line and improve reliability of power supply to western part of Meghalaya, it was discussed that a new 220kV substation may be planned in western part of Meghalaya.

- 9.3. Representative of CTU stated that Mawngap and New Shillong are the nearest (at distance of about 130-140km) 220kV S/s in Meghalaya from Nangalbibra (in western Meghalaya), which are under implementation as part of NERPSIP scheme. The Mawngap and New Shillong are proposed to be fed from Byrnihat 400/220kV S/s. Accordingly, following intra-state system strengthening in Meghalaya was suggested in the joint study meeting:
- (a) Establishment of 220/132kV, 2x160MVA substation at Nangalbibra
 - (b) Mawngap-Nangalbibra 220kV D/c line
- 9.4. Representative of MePTCL stated that in Meghalaya power is fed from only Byrnihat S/s at 400 kV S/s level and due to future load growth in Meghalaya, another 400kV fed is required. He proposed 400kV D/c line from BTPS to Nangalbibra.
- 9.5. Representative of AEGCL stated that BTPS-Agia 220kV line is already critically loaded and in case of additional feed from Agia, this line needs to be reconducted.
- 9.6. Chief Engineer (PSPA-II), CEA stated that creating 400kV path parallel to 220 kV ckt in Meghalaya will not serve the purpose as the overloading issues would again arise. He added that BTPS - Nangalbibra link would require river crossing, which would be another issue in its implementation.
- 9.7. After detailed deliberations, it was agreed to carry out joint system study with Assam, Meghalaya, CEA and CTU.

10. Strengthening of southern part of NER Grid

- 10.1. Director (PSPA-II), CEA stated that in the 7th meeting of SCSPNER, it was deliberated that 400/132kV substation at Silchar (POWERGRID) has become very crucial for meeting demand of south Assam, Tripura (including radial load to Bangladesh), Mizoram & Manipur. Major upcoming corridors are planned or under operation/execution connects Silchar with load centres in NER Grid like Silchar – Misa 400kV D/c, Silchar – Melriat 400kV D/c (to be operated at 132kV), Silchar – Palatana 400kV D/c, Silchar – Byrnihat – Bongaigaon 400kV S/c, Silchar – Azara – Bongaigaon 400kV S/c, Silchar – Imphal 400 kV D/c and Silchar – P.K.Bari 400kV D/c. In case of any major fault at 400/132kV Silchar substation, southern part of NER Grid will be severely affected. In the meeting, it was decided that interconnection of substations at Imphal, Melriat and Palatana at 400kV level may be studied in the joint system study meeting.
- 10.2. During the joint study meeting, following scenario has been observed with outage of 400kV level at Silchar S/s:

- (a) Import-export requirement of Tripura with ISTS, can be met via 132kV Kumarghat (POWERGRID) S/s.
 - (b) As per 19th EPS, by 2021-22 power demand of Mizoram is expected to be about 170MW. Present demand is about 105MW. Other than Silchar – Melriat 400kV D/c line (operated at 132kV), Aizawl (POWERGRID) S/s in Mizoram is fed from three 132kV ISTS lines, which can cater to the power requirement of Mizoram under emergency.
 - (c) In regard to Manipur, it has been observed that with non-availability of Silchar – Imphal 400kV D/c line due to sudden outage of Silchar 400kV S/s, the power requirement of Manipur can be met through under construction Mariani – Kohima – Imphal 400kV D/c ISTS line and other existing 132kV ISTS lines.
 - (d) Some of the 132kV lines feeding to southern part of NER Grid may temporarily get critically loaded due to outage of 400kV level at Silchar S/s.
- 10.3. Director (PSPA-II), CEA further stated that as per joint study, alternate 400kV system connecting Imphal, Melriat and Palatana is not required.
- 10.4. Representative of CTU stated that, in case of prolonged outage at Silchar 400kV level bus, the Silchar – PK Bari (about 130km) and Silchar – Imphal (about 170km) 400kV D/c lines could be bypassed at Silchar 400kV bus through tie breaker, as the two lines are terminated on opposite side of two adjacent diameters. This shall establish PK Bari – Imphal 400kV D/c (about 300km) interconnection. Moreover, in one of the circuits of Silchar – Imphal 400kV D/c line, there is an 80MVAR bus reactor on the other side of diameter. Thus, in case of any overvoltage issues in charging of the PK Bari – Imphal line, at least one circuit can be charged using the 80MVAR bus reactor as line reactor.
- 10.5. Representative of POSOCO stated that 10 no. of 400kV lines are emanating from Silchar S/s and it is gateway for Bangladesh back-to-back interconnection at North Comilla (Bangladesh). He further stated that complete outage of substations had happened in past due to flooding, therefore some permanent arrangement is required to cater to such natural calamity. POSOCO added that alternative node may be done by bye-passing 400 kV Silchar node. The feasibility for bye-passing 400 kV Silchar and forming 400 kV Palatana – Byrnihat S/C and 400 kV Palatana – Azara S/C may be studied for temporary arrangement. They also emphasized that other options by bye passing Silchar substation may also be studied taking into consideration the 400 kV upcoming ring in NER (400 kV Palatana- Surajmaninagar- P.K.Bari- Silchar- Palatana & 400 kV Silchar- Misa- New Mariani- New Kohima- Imphal- Silchar).
- 10.6. It was noted that as per CEA's Manual on Transmission Planning Criteria, outage of 400kV substation has not been mandated under reliability criteria. Accordingly, after deliberations it was agreed that at present 400kV system connecting Imphal, Melriat and Palatana is not required. However, bypassing arrangement as proposed by CTU may be reviewed. Further, it was also decided that feasibility of installation of line reactors in the Silchar-Imphal 400kV D/c line at Imphal end

may be studied so as to facilitate charging of PK Bari – Imphal line (via Silchar) as interim arrangement under exigencies.

11. Additional connectivity for Ranganadi (405MW) and Kameng (600MW) HEPs in Arunachal Pradesh

11.1. Director (PSPA-II), CEA stated that power from Ranganadi and Kameng HEPs are being evacuated / planned to be evacuated over one 400kV D/c line each connected with Biswanath Chariali and Balipara respectively. In the 7th meeting of SCPSPNER, it was deliberated that outage of tower would bottle up the generation and hence additional connectivity for evacuation of generation from above HEPs may be planned. Accordingly, it was decided to study the matter in joint study meeting.

11.2. During the joint study meeting held on 12-11-2018, effect of outage of 400kV immediate evacuation lines of Ranganadi and Kameng HEPs was studied. It was observed that outage of Ranganadi – Biswanath Chariali (about 130km) 400kV D/c line doesn't lead to any appreciable effects on EHV system in NER except some overloading of 132kV lines emanating from Ranganadi HEP depending upon load-generation scenario in Arunachal Pradesh and near-by areas in Assam. Similarly, outage of Kameng – Balipara (about 60km) 400kV D/c line doesn't lead to any appreciable effects on EHV system in NER.

11.3. Chief Engineer, CEA stated that as per Clause 6.4 (Criteria for generation radially connected with the grid) of CEA's Manual on Transmission Planning Criteria, for radial system only N-1 is to be considered as permanent fault and N-1-1 is to be considered as temporary fault. Further, if N-1-1 contingency of permanent nature results in disconnection of generation unit from grid, then the remaining grid shall asymptotically reach a new steady state without losing synchronism after loss of generation. He added that implementing the alternate connectivity for Ranganadi and Kameng HEPs will result in over investment in transmission system, which would be a burden on beneficiaries. He enquired about historical data for energy loss due to outage of whole evacuation system. Representative of POWERGRID stated that there were only few instances of towers collapse of the Ranganadi-Biswanath Chariali line, when there was loss of generation.

11.4. It was found that the length of proposed Ranganadi – Kameng line would be about 280km and would pass through huge forest area.

11.5. After detailed deliberations, it was agreed to drop the proposal of additional connectivity for Ranganadi (405MW) and Kameng (600MW) HEPs. However, proposal would be reviewed in future, if required.

12. Reconductoring of Dimapur-Imphal and Leimatak (Loktak)-Jiribam 132kV lines

12.1. Director (PSPA-II), CEA stated that in the 7th meeting of SCPSPNER, Manipur had proposed reconductoring of Dimapur-Imphal and Leimatak (Loktak)-Jiribam

- 132kV ISTS transmission lines. Therein, it was decided to study requirement of the same in the joint study meeting.
- 12.2. During the joint study meeting held on 12-11-2018, it was observed that in 2021-22 time-frame major power import requirement of Manipur from ISTS is met through Silchar – Imphal and New Kohima – Imphal 400kV D/c lines. Moreover, commissioning of said 400kV lines considerably reduces loading on Dimapur-Imphal and Leimatak (Loktak)-Jiribam 132kV lines.
- 12.3. Representative of CTU stated that Silchar – Imphal and New Kohima – Imphal 400kV D/c lines are scheduled to be commissioned in Dec'18/Jan'19 and July'20 respectively. After commissioning of these 400kV lines, power flow on Dimapur-Imphal and Leimatak (Loktak)-Jiribam 132kV lines are observed to be well within limits. Therefore, with implementation of under construction 400kV lines reconductoring of Dimapur-Imphal and Leimatak (Loktak)-Jiribam 132kV lines may not be required.
- 12.4. Representative of MSPCL stated that in case of outage of both ckts of 400kV Silchar – Imphal line, problem may arise in meeting the load in Imphal area. MSPCL was of apprehension that New Kohima – Imphal 400kV D/c line may not be commissioned before 3 years, due to severe RoW problems. He again requested for reconductoring of Dimapur-Imphal and Leimatak (Loktak)-Jiribam 132kV ISTS transmission lines.
- 12.5. Chief Engineer (PSPA-II), CEA stated that Govt. of Manipur should help to resolve the issue of RoW for commissioning of the New Kohima – Imphal 400kV D/c line (being implemented through TBCB under ISTS) as per schedule.
- 12.6. Representative of POSOCO stated that despite two 400 kV substations viz. Imphal and Thoubal within 25 kms. of each other, any outage of 400 kV Imphals substation would lead to load loss in Manipur. So the possibility of bypassing 400 kV Imphal and making one circuit of 400 kV Silchar-Imphal directly through to Thoubal could be studied so that reliability of supply is enhanced.
- 12.7. After deliberations, it was decided that the proposal of reconductoring of Dimapur-Imphal and Leimatak (Loktak)-Jiribam 132kV lines may be again reviewed in joint study.

13. Interconnection of 132kV substation at Surajmani Nagar (TSECL) & 400kV Surajmani Nagar (ISTS) and 132kV substation at P.K. Bari (TSECL) & P.K. Bari (ISTS)

- 13.1. Director (PSPA-II), CEA stated that the following system was agreed in the 5th SCM of NER held on 08-08-2015 to meet the growing demand of the State of Tripura and to provide alternate evacuation path to Palatana (726MW) generation project:

Under the scope of ISTS / Implementation through TBCB

- New 400/132kV, 2x315MVA substations each at Surajmani Nagar and PK Bari (through TBCB)

- Surajmani Nagar – PK Bari 400kV D/c line (through TBCB)
- Termination of Palatana – Surajmani Nagar & PK Bari – Silchar (POWERGRID) 400kV D/c lines (presently operated at 132kV) at 400kV buses of respective substation along with associated bays for 400kV operation of the lines (under scope of PGCIL).

Under the scope of TSECL

- Surajmani Nagar (ISTS) – Surajmani Nagar (TSECL) 132kV D/c line with high capacity/ HTLS (equivalent of single moose) (by TSECL)
- P.K. Bari (ISTS) – P.K. Bari (TSECL) 132kV D/c line with high capacity/ HTLS (equivalent of single moose) (by TSECL)

13.2. The project was awarded to M/s Sterlite Grid 4 Limited after TBCB process and the Special Purpose Vehicle (SPV) company viz. NER II Transmission Limited was acquired on 31-03-2017 with completion schedule for the two new 400kV substations as 40 months i.e. July 2020.

13.3. As per provisions of the bidding document and the Transmission Service Agreement (TSA) signed by Long Term Transmission Customers (LTTCS) including Tripura, the land for new substation has been selected by M/s Sterlite at a distance of about 10km from existing Surajmani Nagar (TSECL) S/s. Accordingly, establishment of Surajmani Nagar (ISTS) S/s 10km away from existing 132kV substation necessitated rerouting of Palatana – Surajmani Nagar and Comilla (Bangladesh) – Surajmani Nagar 400kV D/c lines (presently operated at 132kV) to Surajmani Nagar (ISTS) S/s for 400kV operation of the said lines. Further, TSECL needs to construct interconnecting 132kV lines viz. Surajmani Nagar (TSECL) – Surajmani Nagar (ISTS) & P.K. Bari (TSECL) – P.K. Bari (ISTS) line for drawl of power from ISTS network, which was decided in the 5th SCM.

13.4. In the 2nd meeting of Empowered Committee on Transmission held on 06.08.2018 following Indian Portion for 500MW HVDC back -to -back station at North Comilia (Bangladesh) for transfer of power through Surjamaninagar (India)- North Comilia (Bangladesh) was agreed for implementation under RTM

(a) Operation of Surajmaninagar (TSECL) - North Comilia 400kV D/c line (presently operated at 132kV) at 400kV through termination at 400kV bus of Surajmaninagar S/s - implementation under RTM by POWERGRID

(b) 2 nos. 400kV line bays at Surajmaninagar S/s for termination of Surajmaninagar (TSECL) - North Com ilia 400kV D/C line – implementation under RTM by the owner of the ISTS substation i.e. NER II Transmission Ltd. an ISTS Transmission Licensee.

13.5. Representative of TSECL stated that the demand of their state will be doubled in next 3-4 years. He added that the substation being implemented under TBCB is at Purba Noagaon and not at Surajmani Nagar and their agreement with

Bangladesh for delivery of power is Surajmani Nagar substation of TSECL. Accordingly, he proposed the following:

- (i) Up-gradation of existing Surjamaninagar 132kV sub-station to 400kV by TSECL.
- (ii) Termination of existing 400kV Palatana - Surajmani Nagar line at TSECL Surajmani Nagar 400kV sub-station along with linking of TSECL Surajmani Nagar 400kV sub-station to TBCB Purba Noagaon 400kV substation, to be constructed by POWERGRID as ISTS.
- (iii) Existing Surajmani Nagar - Comilla 400kV connectivity to be continued from new TSECL Surajmani Nagar 400kV sub-station

13.6. It was observed that present peak demand of Tripura is about 300MW. As per 19th EPS, the demand is expected to reach about 390MW and 495MW at end of 2021-22 and 2026-27 respectively. To meet the above demand, at present, there is one no. 400/132kV, 2x125MVA substation at Palatana generation project for drawl of power by Tripura from National Grid. Two new 400/132kV substations at PK Bari (ISTS) and Surajmani Nagar (ISTS) with transformation capacity of 400/132kV, 2x315MVA each are already under construction through TBCB route.

Therefore, creation of a new 400/132kV substation by the state in close vicinity of under construction 400/132kV Surajmani Nagar (ISTS) S/s may not be techno-economically justifiable, at present. However, if required, additional 400kV substations can be planned in future at Surajmani Nagar or any suitable locations in Tripura as per power requirement of the state.

13.7. Chief Engineer, CEA stated that proposal of up-gradation of existing Surajmani Nagar TSECL 132kV sub-station to 400kV can be examined based on demand of the state, load growth in different pockets and upcoming generation projects in Tripura.

13.8. To facilitate interconnection between Surajmani Nagar (ISTS) and Surajmani Nagar (TSECL), it was proposed that instead of terminating Palatana – Surajmani Nagar (TSECL) line at Surajmani Nagar (ISTS), the line can be LILLOed at Surajmani Nagar (ISTS). In this scenario, Palatana - Surajmani Nagar (ISTS) line section will be charged at 400kV and Surajmaninagar (ISTS) - Surajmani Nagar (TSECL) line charged at 132kV. In this proposal, the requirement of connecting Surajmani Nagar (ISTS) with Surajmani Nagar (TSECL) at 132kV by TSECL, as agreed in 5th meeting of SCPSPNER gets reviewed and instead this inter-connection would be implemented as ISTS work. This would, therefore, benefit Tripura state. TSECL representative said that they would examine this proposal and send their views.

13.9. Representative of TSECL also insisted that delivery point of power to Bangladesh to be retained at Surajmani Nagar (TSECL) as per their agreement with Bangladesh.

13.10. Chief Engineer, CEA stated that shifting of Comilla (Bangladesh) – Surajmani Nagar (TSECL) line to Surajmani Nagar (ISTS) has already been decided in the 13th Joint Steering Committee (JSC) and Joint Working Group (JWG) meetings on Indo-Bangladesh Cooperation in Power Sector held on 27th-28th Sept 2017 at Dhaka.

Further, the capacity of Surajmani Nagar (India) – Comilla (Bangladesh) interconnection line is being enhanced from 160MW to 500MW, which would require transfer of additional power from ISTS national grid. As the ultimate capacity of transmission line which is about 1000MW, additional power to the tune of 500MW (total 1000MW) may need to be transferred through this link from India to Bangladesh, in future.

It would not be proper to export 500MW (or 1000MW in future) through Tripura state grid. Exporting through state grid would be unfair to other states/sellers in India who would like to export power to Bangladesh. Also, the Surajmani Nagar (India) – Comilla (Bangladesh) cross border line has been built by PGCIL and not by Tripura (TSECL).

Regarding the present agreement with Tripura and Bangladesh for delivery of 160MW power at Surajmani Nagar (TSECL), it does not necessarily require a direct physical link between TSECL and Bangladesh. It is only a commercial aspect which means that the transmission charges/losses are to be borne by the buyer from TSECL point of injection at Surajmani Nagar. However, if needed, a mechanism can be framed so that the existing contract which is upto 2020-21 in the new scenario would not be adversely affected.

Thus, keeping in view the importance of Surajmani Nagar S/s as take-off point for supplying power to Bangladesh from India, it would be prudent that the Cross-Border interconnection is terminated at an ISTS substation.

13.11. After detailed deliberations, following was agreed:

- (i) Modification in part scope of the scheme – “POWERGRID works associated with NERSS-V” (Subject to views of TSECL – as per para 13.8 above)

Earlier scope:

- Additional 400kV D/c line at Surajmani Nagar end for termination of Palatana – Surajmani Nagar 400kV D/c line (op. at 132kV) line at 400kV Surajmani Nagar (ISTS) S/s

Revised scope:

- LILO of Palatana – Surajmani Nagar (TSECL) 400kV D/c line (op. at 132kV) at Surajmani Nagar (ISTS) S/s and operation of Palatana – Surajmani Nagar (ISTS) section at rated voltage level of 400kV & operation of Surajmani Nagar (TSECL) – Surajmani Nagar (ISTS) section at 132kV (with provision to operate the line at 400kV level in future, as and when required).

- (ii) Upgradation of 132kV Surajmani Nagar (TSECL) S/s to 400kV level, can be examined when TSECL submits relevant study alongwith system data and load growth/generation addition planned in Tripura..

14. Utilization of spare 132kV bays available at 400/132kV Silchar Substation

- 14.1. In the 7th meeting of SCPSPNER, it was discussed that operation of Silchar - P.K. Bari 400kV D/C (presently operating at 132kV level) and Silchar - Imphal 400kV D/C (presently operating at 132kV level) lines at their rated voltage (i.e. 400kV) would result in availability of 4 nos. of spare 132kV bays at Silchar S/s. In view of above NER constituents to plan for utilization of above bays. In the meeting, it was decided that the same would be discussed in joint study meeting.
- 14.2. During the joint study meeting held on 12-11-2018, AGM, AEGCL stated that they would inform about utilization of 132kV spare line bays at 400/132kV Silchar S/s after discussion with senior officers in AEGCL.
- 14.3. In the meeting, representative of AEGCL stated that they would be able to use only 2 no. of spare 132kV bays at 400/132kV Silchar Substation for connecting 132/33kV new substations at Ghungur and Udarbond. Time frame for utilization of the two bays would be Dec 2021.

15. Enhancement of transformers capacity to 2x500 MVA instead of 2x315 MVA at the upcoming 400/220kV S/s at Sonapur S/s

- 15.1. Representative of AEGCL stated that in the 5th meeting of SCPSPNER, establishment of 2x315MVA, 400/220kV Sonapur GSS in eastern part of Guwahati was agreed to be implemented by AEGCL as an intra-state scheme for mitigating the contingency of 400kV Azara GSS through LILO of Silchar-Byrnihat 400kV line. However, CEA vide letter dated 15.10.2018 recommended for enhancement of capacity from 2x315MVA to 2x500MVA. AEGCL agrees with the recommendation of CEA for modification in the transformation capacity to 2x500MVA in the new 400/220kV Sonapur GSS.
- 15.2. Members agreed to the proposed modification in transformation capacity at 400/220kV Sonapur substation of Assam from 2x315MVA to 2x500MVA.

16. Intra-state transmission system strengthening at various voltage levels in Assam

- 16.1. Representative of AEGCL stated that as per the vision of Govt. of India "24x7 Power for all" and Planning for 2017-22 period, 24 nos. of new substations and associated transmission lines, capacity augmentation of transformers (total capacity addition 769MVA), Re-conductoring by HTLS (total 186ckm), Bay extension (29 nos.), Conversion of one no. AIS to GIS (132/33KV Gohpur S/s) and Replacement of Existing Ground Wire of the transmission lines with OPGW (615km) are proposed under "Enhancement of Intra State Transmission System" in Assam. AEGCL further, stated that they are availing funding from ADB and entire system is expected to be completed progressively by Dec. 2022.

16.2. Chief Engineer (PSPA-II), CEA stated that the detailed proposal of Assam was studied during the joint system study meeting on 12-11-2018 and following comments/suggestion were made on the proposed transmission system of AEGCL:

(a) Ghungur 132/11kV sub-station: Due to 400kV operation of Silchar-PK Bari and Silchar-Imphal, it is expected that 4 no. 132kV line bays shall be vacant at Silchar (POWERGRID) 400/132kV S/s. Accordingly, it was suggested that Ghungur S/s may be connected through Ghungur – Silchar 132kV S/c line instead of Ghungur – Srikona 132kV S/c line. Moreover, it has been observed that Silchar – Srikona 132kV D/c line was overloaded under N-1 contingency. Connection of Ghungur to Silchar would avoid additional loading on already critically loaded Silchar-Srikona 132kV D/c line. Connectivity to ISTS point shall also improve reliability of power supply in the area.

- AEGCL agreed to connect Ghungur 132kV substation to Silchar (POWERGRID) S/s utilising the vacant 132kV line bays as mentioned above at para 14.3.

(b) Rowta 220/132kV: It has been proposed to connect Rowta new substation to Rangia (existing) 220kV S/s. It was suggested that Rowta 220kV S/s may be connected to the proposed Rangia 400/220kV, 2x500MVA S/s (proposed under this scheme itself).

- AEGCL agreed to connect the new 220kV substation at Rowta with their proposed Rangia 400/220kV, 2x500MVA S/s.

(c) Rangia 400/220kV:

(i) It has been proposed by AEGCL to establish Rangia through LILO of one circuit of Balipara – Bongaigaon 400kV D/c (Twin Moose) line. However, in the 7th SCM of NER it was agreed that Rangia S/s may be established through LILO of both circuits of Balipara – Bongaigaon 400kV D/c (Twin Moose) line. Thus, AEGCL may consider LILO of both circuits as agreed in the 7th SCM of NER.

- AEGCL agreed to the proposal.

(ii) Similarly, at 220kV level in the 7th SCM of NER, it was agreed that both circuit of Rangia – Amingaon 220kV D/c line may be LILoed at Rangia 400/220kV S/s. However, AEGCL has proposed LILO of one circuit of Rangia – Amingaon 220kV D/c line. Thus, AEGCL may consider LILO of both circuits as agreed in the 7th SCM of NER.

- AEGCL agreed to the proposal. Further, AEGCL also agreed to implement Agamoni 220/132kV substation with provisions suggested at para 3.5 (a) above.

(iii) As mentioned above, Rowta 220kV may be connected to Rangia 400/220kV S/s instead of existing Rangia 220kV S/s.

- AEGCL agreed to connect the new 220kV substation at Rowta with their proposed Rangia 400/220kV, 2x500MVA S/s.
- 16.3. Members agreed to the proposal of proposal of AEGCL for “Enhancement of Intra State Transmission System” in Assam State to be implemented as intra-state scheme by AEGCL with modifications mentioned at para 16.2 above. And, accordingly, the intra-state strengthening system in Assam, as agreed, is given at **Annex-II**.
- 17. Installation of 15MVar (4x5MVar single phase) bus reactor at 132kV level at Melriat (POWERGRID) substation under Palatana and Bongaigaon transmission system.**
- 17.1. Representative of POWERGRID stated that the Palatana-Bongaigaon transmission system inter alia included construction of Melriat 132kV switching station and Silchar (POWERGRID) – Melriat 400kV D/c line (operated at 132kV). However, no bus reactor at 132kV level at Melriat (POWERGRID) substation was mentioned in the scope. Based on the review of line length from site, bus reactor of 132kV, 15MVar (4x5MVar single phase) bus reactor at 132kV level at Melriat (POWERGRID) was procured for voltage control as part of this scheme. The bus reactor is ready for commissioning. Accordingly, POWERGRID requested for post-facto approval for installation of 15MVar (4x5MVar single phase) bus reactor at 132kV level at Melriat (POWERGRID) substation under Palatana and Bongaigaon transmission system.
- 17.2. Representative of POSOCO stated that the provisional charging clearance for charging of 132 kV, 4x5 MVAR Bus Reactor at Melriat (PG) will be given based on the discussion in this meeting.
- 17.3. Members agreed to the proposal of POWERGRID. However, constituents were advised to put up the agenda in meeting of Standing Committee on Transmission in advance to avoid post-facto approval.
- 18. Downstream system development by STUs from the various commissioned and on-going ISTS substations**
- 18.1. Representative of POWERGRID stated that it is implementing 132kV switching station at Melriat along with (a) Silchar – Melriat 400kV D/c line (initially operated at 132kV) (b) Melriat – Sihhmui 132kV D/c line and (c) LILO of Aizawl – Zemabawk at Melriat under Palatana-Bongaigaon transmission scheme. The elements at (a) to (c) are ready for commissioning. However, the downstream network at Sihhmui (Mizoram) S/s, which includes installation of 132/33kV ICTs and 33kV lines are not ready. In 7th meeting of SCPSPNER, Mizoram stated that all work including erection of transformers at Sihhmui S/s has been completed and Sihhmui S/s is ready for commissioning. Due to shortage of O&M staff in P & E, Mizoram, it could not be energized and operated.

18.2. No representative from Mizoram were present in the meeting. However, SE, NERPC informed that the Sihhmui S/s of Mizoram would be commissioned by March, 2019.

18.3. CTU requested that the downstream intra-state system mentioned below should be ready in matching time frame and states of NER should expedite the works at their substation. Latest status as updated by constituents are as under:

Sl. No.	ISTS S/s	Voltage ratio, Trans. Cap	Voltage level (kV)	Total no. of line bays	Lines emanating from S/s	No. of circuit	Scheme	Status of Lines
1	Surajmaninagar (TBCB)	400/132kV, 2x315MVA	132	2 - (RfP Schedule Jul 2020)	Surajmaninagar (TSECL) – Surajmaninagar (TBCB)	2	NERSS-V	Agreed to be implemented under ISTS as per scheme agreed at para 13.9 (i)
2	P. K. Bari (TBCB)	400/132kV, 2x315MVA	132	2 - (RfP Schedule Jul 2020)	P. K. Bari (TSECL) – P. K. Bari (TBCB)	2	NERSS-V	In matching timeframe
3	New Mariani (POWERGRID)	400/220kV, 2x500MVA	220	2 – expected by Jul 2020	New Mariani (POWERGRID) – Mariani (Assam)	2	NERSS-VI	Timeframe 2021-22 with HTLS conductor
4	New Kohima (TBCB)	400/220kV, 2x500MVA	220	2 - (RfP Schedule Jul 2020)	New Kohima (TBCB) – New Kohima (Nagaland)	2	NERSS-VI	Nagaland not present. Status not ascertained.

19. Closure of 66MW and 120MW connectivity granted to Adishankar Khuitam Power Pvt. Ltd. and KSK Dibbin Hydro Power Pvt. Ltd. respectively

19.1. Representative of CTU informed that, Adishankar Khuitam Power Pvt. Ltd. (AKPPL) and KSK Dibbin Hydro Power Pvt. Ltd. (KSKDHPPL) were granted Connectivity for 66MW and 120MW to ISTS for their Khuitam HEP (3x22MW) and Dibbin HEP (2x60MW) respectively in Arunachal Pradesh with start date of Connectivity as Oct'16 and May'17 respectively. Further, CTU had granted 58MW and 120MW LTA to M/s AKPPL and M/s KSKDHPPL with start date of LTA as Jul'16 and May'17 respectively, subject to availability of associated transmission system.

19.2. In 8th Connectivity and LTA meeting of NER held on 18.11.2015, it was proposed that applications of generation projects which are yet to make any significant progress may be closed. Accordingly, CTU vide letter dated 04.02.2016 directed M/s AKPPL and M/s KSKDHPPL to sign necessary Connectivity / LTA Agreement within 15 days failing which their granted connectivity and LTA may be revoked.

19.3. The matter regarding non-signing of LTA Agreement was referred to CERC under Petition No: 96/MP/2015 and in accordance with CERC's order dated 08.03.2017 in the said petition, CTU vide letters dated 30.11.2017 had revoked LTA of 58MW and 120MW granted to Adishankar Khuitam Power Pvt. Ltd. and KSK Dibbin Hydro Power Pvt. Ltd. for Khuitam HEP and Dibbin HEP respectively. Therein, it was also mentioned that M/s AKPPL and M/s KSKDHPPL have failed in their duty to coordinate with CTU in terms of Section 10(3)(b) of the Electricity Act,

2003. It was mentioned in the said communications that the connectivity granted to these projects shall be liable for revocation if they fail to submit on affidavit that sufficient progress of generating stations have been achieved and connectivity is likely to be put to use in the next 1-2 years.
- 19.4. Pursuant to above, M/s AKPPL vide letter dated 31.01.2018 has informed that expected commissioning schedule of U-I, U-II & U-III are Feb'22, Mar'22, Apr'22 respectively. Further, M/s KSKDHPPL vide letter dated 10.12.2017 and 22.12.2017 has informed that expected commissioning schedule of U-I & U-II are Sep'22 and Dec'22 respectively.
- 19.5. Further, CTU stated that it is clear from the communications of the generation project developers that the Connectivity granted to them shall not be put to use in reasonable future period of 1-2 years. It has been observed by Hon'ble CERC in its various orders that if a generation developer acquires connectivity and takes no action towards project development for a long period of time then the connectivity granted cannot be allowed to continue ad infinitum (i.e. for perpetuity). Accordingly, it is proposed that Connectivity granted to M/s AKPPL and M/s KSKDHPPL for their respective generation project mentioned above in Arunachal Pradesh may be revoked / withdrawn.
- 19.6. Representative of M/s KSKDHPPL informed that presently no construction works are going on at its project site due to financial constraints. No representative of M/s AKPPL was present in the meeting.
- 19.7. CTU proposed that connectivity granted to M/s AKPPL and M/s KSKDHPPL should be revoked. If project is viable in future, project developer may apply again for connectivity as new applicant.
- 19.8. Chief Engineer (PSPA-II), CEA stated that grant of connectivity is the process of planning of transmission system and if no action was taken by project developer then the connectivity granted cannot be allowed to continue.
- 19.9. After deliberations, it was agreed that Connectivity of M/s KSKDHPPL and M/s AKPPL for their Dibbin HEP (2x60MW) and Khuitam HEP (3x22MW) respectively shall be revoked as generation project developers are not expected to use the granted Connectivity in reasonable future period of 1-2 years. Representative of M/s KSKDHPPL agreed for the same. Further, Generation developers were advised to apply afresh on achieving considerable progress in their respective project implementation.
- 20. Re-routing of 132 kV D/C Transmission Line from R.C Nagar (NEEPCO) to P.K Bari (TSECL) under TBCB through existing TSECL Bodhjungnagar 132 kV Sub-station.**
- 20.1. Representative of TSECL stated that AGTPP, R.C Nagar (NEEPCO) to P.K Bari (TSECL) 132kV D/c line is being implementing under TBCB. Bodhjungnagar S/s is only 1km away from AGTPP (NEEPCO). TSECL proposed for rerouting of under construction AGTCCPP(NEEPCO) – P.K. Bari (TSECL) 132 kV D/c line

through 132 kV Bodhjungnagar Substation (TSECL) with associated bays to prevent intra-state grid congestion.

- 20.2. Chief Engineer (PSPA-II), CEA stated that the AGTPP (NEEPCO) - P.K Bari (TSECL) 132kV D/c line is already under implementation under TBCB and change in scope scheme would involve commercial, regulatory and contractual issues. Therefore, it may not be advisable to reroute the line under the scope of the TSP implementing this project under TBCB.
- 20.3. It was agreed that the proposal of TSECL may be explored for implementation under inter-state or intra-state transmission system strengthening and accordingly would be taken up in next meeting of NERSCT.

21. Modification in installation scheme of 100MVAR (4x25MVAR three phase) reactor at 33kV level at Misa (POWERGRID) S/s

- 21.1. Representative of CTU stated that the under implementation NERSS-IV scheme inter alia includes removal of 400/220kV, 4x105MVA (single phase) ICT at Misa (POWERGRID) S/s and installation of 400/220kV, 2x500MVA ICTs in the space created. After removal of 4x105MVA ICT, the existing 33kV system including 100MVAR (4x25MVAR three phase) reactor and 1MVA, 33/0.415kV LT Transformer (earlier connected to 4x105MVA, 400/220kV, 3-phase transformers) would be connected to tertiary of new 500MVA, 400/220/33kV ICT (i.e. ICT-1).
- 21.2. Representative of POSOCO stated that availability of the subject 100MVAR reactor during off-peak hours is critical for maintaining grid voltage. He added that 4x25 MVAR Tertiary reactors to be connected in such a way that it can be used even after outage of one ICT.
- 21.3. Chief Engineer (PSPA-II), CEA suggested that switching scheme need to be designed carefully.
- 21.4. CTU proposed that the 100MVAR reactor could be connected in such a way that outage of any ICTs at Misa (POWERGRID) S/s would not affect its availability. The same could be ensured by connecting the existing 4x25MVAR, 33kV reactor with 2 no. of 400/220kV ICTs instead of 1 no. ICT at Misa s/s.
- 21.5. After detailed deliberations, members agreed for modification in installation scheme of 100MVAR (4x25MVAR three phase) reactor at 33kV level at Misa (POWERGRID) S/s to ensure availability of reactors in the event of outage of any ICTs at Misa (POWERGRID) S/s, as part of ongoing works under NERSS-IV scheme. CTU should submit a copy of the switching scheme for these reactors to CEA.

22. Construction of a new 400kV substation in upper Assam area (above Brahmaputra)

- 22.1. Representative of AEGCL stated that entire power demand in Upper Assam (above Brahmaputra River) is met through long 132kV transmission system. Total load beyond and including Pavoi (Biswanath Chariali) in upper Assam

above, Brahmaputra is about 160MW spread across six 132kV substations. The system is fed from two 400kV ISTS substations namely Balipara & Biswanath Chariali and one 220kV state substation namely Sonabil through 132kV lines. The area suffers from low voltage problems and with increase in demand the situation is expected to further aggravate. Accordingly, Assam had suggested for implementation of a new 400kV substation in the area at Bihpuria through Biswanth Chariali – Bihpuria 400kV D/c line.

22.2. Director (PSPA-II), CEA stated that In the 7th meeting of SCPSPNER, AEGCL proposed to form a 400kV ring and extend the 400kV connectivity upto Mariani via AGBPP as given below:

- i) Bihpuria 400/220kV Substation: Biswanath Chariali (HVDC) – Bihpuria S/C line, and Bihpuria – Khumtai S/C line.
- ii) Khumtai 400/220kV Substation: Biswanath Chariali (HVDC) – Khumtai S/C line and Khumtai – Bihpuria S/C line.
- iii) Margherita Generation: Margherita – Khumtai, 400kV D/C line & Margherita – AGBPP-Mariani 400kV D/C line.

22.3. AEGCL also requested for allotment of two numbers of 400kV line bays at Biswanath Chariali (POWERGRID) HVDC station for Assam. In the meeting, it was agreed to carry out joint system study on the issue.

22.4. Representative of CTU stated that due to uncertain progress of Lower Subansiri (2000MW) HEP, construction works of Biswanath Chariali – Lower Subansiri 2xD/c line is under standstill. During the joint study held on 12-11-2018, it was discussed that to feed the proposed new substation another 400kV D/c corridor from Biswanath Chariali may be not be constructed. Instead, one of the Biswanath Chariali – Lower Subansiri 400kV 2xD/c lines may be utilised for feeding power to a new 400kV substation in the upper Assam area. It was discussed that the new 400kV substation may be planned in Gogamukh area in upper Assam (instead of Bihpuria), which is close to the Lower Subansiri HEP. The 400kV Gogamukh substation may be fed by terminating one of the Biswanath Chariali – Lower Subansiri 400kV 2xD/c lines at Gogamukh. In future, upon implementation of Lower Subansiri generation project, the Biswanath Chariali – Gogamukh line could be extended to Lower Subansiri HEP to complete the initially planned Biswanath Chariali – Lower Subansiri 400kV 2xD/c lines (with one D/c via Gogamukh).

22.5. The study was carried out with the following connectivity at 400/220/132kV (2x500MVA + 2x100MVA) Gogamukh substation:

- (a) Biswanath Chariali – Gogamukh 400kV D/c (Twin Lapwing) line using one of the 400kV D/c line of Biswanath Chariali – Lower Subansiri 2xD/c (Twin Lapwing) lines
- (b) Gogamukh – Bihpuria 220kV D/c line
- (c) LILO of North Lakhimpur – Dhemaji 132kV S/c line at Gogamukh

- 22.6. From the study results, it was observed that the drawl of power at Gogamukh substation is not substantial. About 95MW power flows from Biswanath Chariali towards Gogamukh, of which about 45MW flows into 132kV network and balance flows towards Bihpuria 220kV S/s. However, the proposed substation improves voltages at nearby 132kV substations.
- 22.7. Representative of AEGCL stated that they prefer to have new substation at Bihpuria in place of Gogamukh as identified during joint study.
- 22.8. Member (PS), CEA suggested that comprehensive system study should be carried out before implementing a new 400 kV Substation.
- 22.9. After deliberations, it was agreed to carry out joint system study by CEA, CTU and Assam to access requirement of a new 400kV substation in upper Assam area (above Brahmaputra).
- 23. 400/220kV, 500MVA spare ICT and 420kV, 125MVAr spare bus reactor in NER**
- 23.1. SE, NERPC stated that installation of 400/220kV, 500MVA ICTs and 420kV, 125MVAr bus reactors have been planned for first time in NER system and are already under implementation. Accordingly, a spare 400/220kV, 500MVA ICT and spare 420kV, 125MVAr reactor are required to take care of contingency of failure of such ICTs/reactors. He added that in the 19th TCC and NERPC meetings it has been agreed to have one spare ICT of 400/220kV, 500MVA and one spare reactor of 420kV, 125MVAr in the region.
- 23.2. Members noted the decision of TCC/NERPC.

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Annexure-I

List of participants:

Sl. No	Name (Smt./Shri)	Designation
Central Electricity Authority		
1	P S Mhaske	Member(PS)
2	Pardeep Jindal	Chief Engineer
3	B. S. Bairwa	Director
4	Satyendra Kumar Dotan	Dy. Director
NERPC		
5	P K Mishra	Member Secretary
6	B Lyngkhoi	Director
7	Srijit Mukharjee	AEE
POWERGRID		
8	Subir Sen	COO (CTU-Plg)
9	Ashok Pal	CGM(CTU-Plg)
10	Laxmi Kant	DGM (CTU-Plg)
11	Manish Ranjan Keshari	Dy. Manager (CTU-Plg)
12	Prasanta Kanungo	GM
POSOCO/NERLDC		
13	S. R. Narasimhan	Director (System Operation)
14	S C Saxena	DGM
15	Amaresh Mallick	DGM
16	Momoi Dey	Sr. Engineer
NEEPCO		
17	D.Dey	GM
18	H.K. Deka	GM
19	Bhaskan Grgwom	SE
20	Joypal Roy	Sr.Mng.(E/M)
AEGCL, Assam		
21	J K Baishya	CGM
22	P K Medhi	CGM
23	S.M. Singha	AGM
24	Karuna Sarma	Consultant
TSECL, Tripura		
25	R Deb Barman	Addl. GM
26	A.Gan Choudhuri	DGM
27	Sisir Debbarman	DGM

Sl. No	Name (Smt./Shri)	Designation
MePTCL, Meghalaya		
28	A Kharpam	CE (Trans.)
29	M. Marbaniay	ACE (T)
30	F E Kharshing	SE (SLDC)
MSPCL, Manipur		
31	N G Subhachandra	ED (T)
32	Ng. Birjit Singh	GM (Plg.)
33	L. Dinesh Kumar Singh	GM (SLDC/CEI)
34	Varun Drengbam	Manager
DoP, Arunachal Pradesh		
35	Nangkong Perme	SE
36	Takar Mara	Advisor
KSK Dibbin		
37	Neeraj Kumar	Project Mangaer

Annexure-II

A. Details of substations and lines (New works)

SL NO	SCOPE OF WORK	ROUTE LENGTH / LOAD (CKM/MW)	TYPE OF CONDUCTOR	Remarks (NEW/EXISTING/AUGMENTATION)	Approval in
1	Establishment of new 220/132 kV (2 X 160 MVA) and 132/33 kV (2 X 50 MVA) S/s at Khumtai			New Substation	5 th SCM
	220 kV:				
	LILO of Mariani-Samaguri (AEGCL-Existing) S/C Line 1 at Khumtai (AEGCL-New)	6 km	ACSR Zebra	New	
	LILO of Mariani-Samaguri (AEGCL-Existing) S/C Line 2 at Khumtai (AEGCL-New)	5 km	AAAC Zebra	New	
	132 kV:				
	LILO of Jorhat (W)-Bokakhat (AEGCL-Existing) at Khumtai (AEGCL-New) S/C Line	5 km	AAAC Panther	New	
	Khumtai (AEGCL-New) - Sarupathar (AEGCL-Existing) S/C Line	60 km	AAAC Panther	New	
	Load	20MW	Load	at 33 kV Bus	
2	Establishment of new 220/33 kV (2 X 100 MVA) S/s at Bihpuria			New Substation	1 st NERSCT
	220 kV:				
	220KV Bihpuria (AEGCL-New) - Sonabil (AEGCL-Existing) D/C Line	78km	AAAC Zebra	New	
	Load	30 MW	Load		
3	Establishment of new 220/132 kV (2 X 160 MVA) and 132/33 kV (2 X 50 MVA) GIS Substation at Agamoni			New Substation	6 th SCM
	220 kV:				
	LILO of both ckt of Alipurduar (PGCIL) - Bongaigaon (PGCIL) D/C line at Agamoni (AEGCL- New)	25 km	ACSR Zebra	New	
	132 kV:				
	LILO of Gossaigaon - Gauripur S/C (AEGCL-Existing) Line at Agamoni (AEGCL- New)	10 km	HTLS	New	
	Load	16 MW	Load		
4	Establishment of new 220/132 kV (2 X 160 MVA) GIS Substation at Shankardevnagar			New Substation	5 th SCM
	220 kV:				
	Shankardevnagar (AEGCL-New) - Misa (AEGCL-Existing) D/C Line	25 km	ACSR Zebra	New	
	Shankardevnagar (AEGCL-New) – Lower Kopili HEP (APGCL) D/C Line- (Other Source)	50 km	AAAC Zebra	New	

SL NO	SCOPE OF WORK	ROUTE LENGTH / LOAD (CKM/MW)	TYPE OF CONDUCTOR	Remarks (NEW/EXISTING/AUGMENTATION)	Approval in
5	Establishment of new 220/33 kV (2 X 100 MVA) GIS Substation at Boragaon (Jalukbari)			New Substation	1 st NERSCT
	220 kV:				
	Boragaon (Jalukbari) (AEGCL-New) - Kukurmara (AEGCL-Existing) D/C Line	21 kM	18 kM OH & 3 kM UG Cable	New	
	Load	30 MW			
6	Establishment of new 220/33 kV (2 X 100 MVA) GIS Substation at Panjabari			New Substation	1 st NERSCT
	220 kV:				
	LILO of Sonapur-Sarusajai (AEGCL-Existing) -S/C Line at Panjabari (AEGCL- New)	3 kM	AAAC Zebra	New	
	Load	30 MW			
7	Establishment of new 220/33 kV (2 X 100 MVA) GIS Substation at Jakhlabandha			New Substation	1 st NERSCT
	220KV:				
	LILO of 220kv Samaguri-Mariani line 1 (AEGCL-Existing) at Jakhlabandha(AEGCL-New) S/C line	10KW	AAAC Zebra	New	
	Load	18MW			
8	Establishment of new 132/33 kV (2 X 50 MVA) Substation at Dhing			New Substation	1 st NERSCT
	132 kV:				
	Dhing (AEGCL- New) - Nagaon (AEGCL-Existing) - S/C Line	35 kM	AAAC Panther	New	
	Load	12 MW			
9	Establishment of new 132/11 kV (2 X 31.5 MVA) GIS Substation at Ghungur (Silchar-2)			New Substation	1 st NERSCT
	132 kV:				
	Ghungur (AEGCL- New) - Silchar (POWERGRID) S/C Line	10 kM	XLPE Armoured Al Cable	New	
	Load	20 MW			
10	Establishment of new 132/33 kV (2 X 50 MVA) GIS Substation at Titabor			New Substation	1 st NERSCT
	132 kV:				
	Titabor (AEGCL-New) - Mariani (AEGCL-Existing) D/C Line	20 kM	AAAC Panther	New	
	Load	24 MW			

SL NO	SCOPE OF WORK	ROUTE LENGTH / LOAD (CKM/MW)	TYPE OF CONDUCTOR	Remarks (NEW/EXISTING/AUGMENTATION)	Approval in
11	Establishment of new 132/11 kV (2 X 31.5 MVA) GIS Substation at Zoo Road			New Substation	1 st NERSCT
	132 kV:				
	Zoo Road (AEGCL-New) - GMC (AEGCL-Existing) S/C Line	8 kM	XLPE Armoured Al Cable	New	
	Load	25 MW			
12	Establishment of new 132/33 kV (2 X 50 MVA) GIS Substation at Chhaygaon			New Substation	1 st NERSCT
	132 kV:				
	Chhaygaon (AEGCL-New) - Boko (AEGCL-Existing) D/C Line	20 kM	AAAC Panther	New	
	Load	28 MW			
13	Establishment of new 132/33 kV (2 X 50 MVA) GIS Substation at Kumarikata			New Substation	1 st NERSCT
	132 kV:				
	Kumarikata (AEGCL-New) - Nalbari (AEGCL-Existing) S/C Line on D/C Tower	40 kM	AAAC Panther	New	
	Load	10 MW			
14	Establishment of new 132/33 kV (2 X 50 MVA) GIS Substation at Burhigaon			New Substation	1 st NERSCT
	132 kV:				
	LILO of Rowta-Sipajhar (AEGCL-Existing) S/C Line at Burhigaon (AEGCL-New)	15 kM	AAAC Panther	New	
	Load	15 MW			
15	Establishment of new 132/33 kV (2 X 50 MVA) GIS Substation at Chabua			New Substation	1 st NERSCT
	132 kV:				
	LILO of Tinsukia (AEGCL-Existing) - Dibrugarh (AEGCL-Existing) S/C Line	8 kM	AAAC Panther	New	
	Load	18 MW			
16	Establishment of new 132/33 kV (2 X 50 MVA) GIS Substation at Morigaon			New Substation	1 st NERSCT
	132 kV:				
	Baghijhap(Existing)-Morigaon(New) D/C Line.	20km	AAAC Panther	New	

SL NO	SCOPE OF WORK	ROUTE LENGTH / LOAD (CKM/MW)	TYPE OF CONDUCTOR	Remarks (NEW/EXISTING/AUGMENTATION)	Approval in
	Load	15 MW			
17	Establishment of new 132/33 kV (2 X 50 MVA) GIS Substation at Nagaon-2			New Substation	1 st NERSCT
	132 kV:				
	132 kV Samaguri (AEGCL- Existing) - Nagaon-2 (AEGCL-New) D/C Line	41 km	AAAC Panther	New	
	Load	25 MW			
18	Establishment of new 132/33 kV (2 X 50 MVA) GIS Substation at Amayapur			New Substation	1 st NERSCT
	132 kV:				
	Amayapur (AEGCL- New) - Hajo (AEGCL- Existing) D/C Line	25 km	AAAC Panther	New	
	Load	15 MW			
19	Establishment of new 132/33 kV (2 X 50 MVA) GIS Substation at Lumding			New Substation	1 st NERSCT
	132 kV:				
	LILO of Shakardevnagar (AEGCL- Existing) S/C Line - Diphu (AEGCL-Existing) S/C Line at Lumding (AEGCL-New)	10 km	AAAC Panther	New	
	Load	16 MW			
20	Establishment of new 132/33 kV (2 X 50 MVA) Substation at Serfanguri			New Substation	1 st NERSCT
	132 kV:				
	Serfanguri (AEGCL- New) - Kokrajhar (AEGCL-Existing) D/C Line	18 km	AAAC Panther	New	
	Load	15 MW			
21	Establishment of new 220/132 kV (2 X 160 MVA) Substation at Rowta			New Substation	1 st NERSCT
	220 kV:				
	Rowta (AEGCL- New) – 400/220 kV Rangia (AEGCL) D/C Line	80 km	AAAC Zebra	New	
22	Establishment of new 132/33 kV (2 X 50 MVA) Substation at Dhupdhara			New Substation	1 st NERSCT
	132 kV:				
	Dhupdhara (AEGCL- New) - Boko (AEGCL- Existing) D/C Line	25 km	AAAC Panther	New	
	Load	8 MW			
23	Establishment of new 400/220 kV (2 X 500 MVA) Substation at Rangia			New Substation	7 th SCM
	400 kV:				

SL NO	SCOPE OF WORK	ROUTE LENGTH / LOAD (CKM/M W)	TYPE OF CONDUCTOR	Remarks (NEW/EXISTING/AUGMENTATION)	Approval in
	LILO of both ckt of Balipara (PGCIL)-Bongaigaon (PGCIL) 400kV (Twin Moose) D/c Line at Rangia (AEGCL-New)	21 km	ACSR Twin Moose	New	
	125 MVAR Bus Reactor	2 no.		New	
	220 kV:				
	LILO of both ckt of Rangia - Amingaon (Existing-AEGCL) D/c Line at Rangia (AEGCL-New)	20 km	ACSR Zebra	New	5 th SCM
24	Establishment of new 400/220 kV (2 X 500 MVA) Substation at Sonapur			New Substation	
	400 kV:				
	LILO of Silchar (PGCIL)-Byrnihat (Meghalaya) 400kV S/c Line at Sonapur (AEGCL-New)	25 km	ACSR Twin Moose	New	
	50 MVAR Switchable Line Reactor in Sonapur-Silchar section at Sonapur end	1 nos.			
	80 MVAR Bus Reactor	2 no.			

B. Details of cost components of transformer capacity augmentation of existing substations (agreed in 1st meeting of NERSCT)

SL. NO.	Name of Substation	Net Capacity Addition in MVA
1.01	Narengi: 2x50 MVA, in place of 2x25 MVA, 132kV	50
1.02	Bornagar: 2x50 MVA, in place of 2x25 MVA, 132/33kV	50
1.03	Moran: 2x50 MVA, in place of 2x16 MVA, 132/33kV	68
1.04	Gauripur: 2x50 MVA, in place of 2x25 MVA, 132/33kV	50
1.05	Dibrugarh: 2x50 MVA, in place of 2x31.5 MVA, 132/33kV	37
1.06	Depota: 2x50 MVA, in place of 2x31.5 MVA, 132/33kV	37
1.07	Kahilipara: 3x50 MVA, in place of 2x31.5 MVA & 1x30 MVA, 132/33kV	57
1.08	Rangia: 2x50 MVA, in place of 2x25 MVA, 132/33kV	50
1.09	Golaghat: 2x50 MVA, in place of 2x25 MVA, 132/33kV	50
1.10	Sankardeb Nagar: 2x50 MVA, in place of 2x25MVA, 132/33kV	50
1.11	Panchgram: 2x50 MVA, in place of 2x25MVA, 132/33kV	50
1.12	Boko: 1x160 +1x100 MVA, in place of 1x50 +1x100 MVA, 220/132kV	110

1.13	Agia: 1x160 +1x100 MVA, in place of 1x50 +1x100 MVA, 220/132kV	110
1.14	Kukurmara: 2x50 MVA, in place of 1x25+1x16MVA, 132/33kV	59
	TOTAL	828.00

C. Capacity Augmentation of Transmission lines (agreed in 1st meeting of NERSCT)

SI No	Name of Line	Route Length KM	Circuit Type	CkM
1	2	3	4	
1	<u>TRANSMISSION LINES</u>			
1.01	BTPS (Salekati) – Dhaligaon 132kV D/C line	38	D/C	76
1.02	Kukurmara – Sarusajai 220kV D/C line	24	D/C	48
*1.03	Gossaigaon – Gauripur 132kV S/C line	62	S/C	62
	TOTAL	124		186

* Re conducting of this line is recommended by CEA because of overloading of Gossaipur-Gauripur line due to feeding of power from 220KV Agamoni SS by LILoing of this line.

D. Bay Extension in Existing Substations (In accordance with agreed system)

SL. NO.	Name of Existing Substation where bay Extension required	No. of Bays
1.01	Azara: Two 220 kV line bays for Azara-Boragaon 220 kV Line	2
1.02	Mariani: Two 132 kV Line bays for Mariani - Titabor D/C line.	2
1.03	Srikona: One 132 kV Line bay for Srikona - Ghungur S/C Cable line.	1
1.04	Baghjap (Jagiroad): Two 132 kV Line Bays for Nagaon - Baghjap D/C line	2
1.05	Nagaon: Three 132 kV Line Bays for Nagaon - Baghjap D/C line.	3
1.06	Moran: Two 132 kV Line Bays for Moran-Betbari S/C Line	2
1.07	Sibasagar: Two 132 kV Line Bays for Moran-Betbari S/C Line	2
1.08	Sarupathar: One 132 kV Line Bay for Khumtai - Sarupathar 132 kV S/C Line	1
1.09	GMC GIS: One 132kV GIS Line Bay for GMC - Zoorad UG Cable line	1
1.1	Nalbari: One 132kV line bay for Nalbari - Kumarikata 132kV line	1
1.11	BOKO: Four line bays for Boko - Chhaygaon 132kV D/C line& Boko – Dhupdhara 132kV D/C line	4
1.12	BOKAJAN: One 132kV line bay for Bokajan-Diphu 132kV S/C line	1
1.13	DIPHU: One 132kV line bay for Bokajan-Diphu 132kV S/C line	1
1.14	HAJO: Two line bays for Hajo - Bogaribari 132kV D/C line	2
1.15	Boko: Two 132 kV line bays for Boko-Dhupdhara 132 kV D/C Line	2
1.16	Kokrajhar: Two 132 kV line bays for Kokrajhar-Serfanguri 132 kV D/C Line	2
	TOTAL BAY EXTENSION	29

E. Conversion of Air Insulated S/S(AIS) to Gas Insulated S/s(GIS) (agreed in 1st meeting of NERSCT)

SI No	Name of Work	Name Of Substation
1.01	Conversion of Air Insulated S/s (AIS) to Gas Insulated S/s(GIS) (One No.)	132/33KV Gohpur

F. Replacement of Ground Wire to OPGW (agreed in 1st meeting of NERSCT)

SL. NO.	Name of Links	km/nos.
1	Fiber Optics on balance transmission lines of AEGCL,	615km
2	Fiber Optics on Station Equipments at various Substation	18nos.