

I/12003/2020



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

संलग्नसूची के अनुसार
As per list enclosed

विषय: उत्तर पूर्वी क्षेत्रीय विद्युत समिति (पारेषण योजना) (उपक्षेविसपायो) की दूसरी बैठक के कार्यवृत्त ।

Subject: Minutes of 2nd meeting of North Eastern Regional Power Committee (Transmission Planning) (NERPCTP) .

महोदय(Sir)/महोदया(Madam),

उत्तर पूर्वी क्षेत्रीय विद्युत समिति (पारेषणयोजना) (उपक्षेविसपायो) की दूसरी बैठक 25 सितम्बर,2020 को वीडियो कॉन्फ्रेंसिंग द्वारा आयोजित की गई थी। बैठक के कार्यवृत्त संलग्न है।

The 2nd meeting of North Eastern Regional Power Committee (Transmission Planning) (NERPCTP) was held on 25th September, 2020 through video conferencing. Minutes of the meeting is enclosed herewith.

भवदीय/Your faithfully,

(प्रदीप जिंदल/Pardeep Jindal)

मुख्य अभियन्ता/ Chief Engineer

I/12003/2020

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.	The Managing Director, Assam Electricity Grid Corporation Limited, Bijulee Bhawan; Paltan Bazar, Guwahati (Assam) – 781001.
3.	The Chairman-cum-Managing Director, Tripura State Electricity Corporation Limited, Bidyut Bhavan, Banamalipur, Agartala, Tripura.	4.	The Chairman-cum-Managing Director, Meghalaya Energy Corporation Limited, LumJingshai, Short Round Road, Shillong (Meghalaya) – 793001.
5.	The Managing Director, Manipur State Power Company Ltd. (MSPCL), Electricity Complex, Patta No. 1293 under 87(2), Khwai Bazar, Keishampat, District – Imphal West, Manipur – 795001	6.	The Chief Engineer (Power), Vidyut Bhawan, Department of Power, Zero Point Tinali, Itanagar (Arunachal Pradesh) – 791111.
7.	The Chief Engineer (T&G), Department of Power, Electricity House, A.G. Colony, Kohima, Nagaland- 797001	8.	Engineer-in-Chief Power & Electricity Department, Kawlphetha Building, New Secretariat Complex, Khatla, Aizawl Mizoram- 796001
9.	COO(CTU-Planning), Power Grid Corporation of India Ltd., “Saudamini” Plot no-2, Sector-29, Gurugram- 122001, Haryana	10.	Director (System Operation), POSOCO, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi – 110016.
11.	Chairman-cum-Managing Director NTPC Limited, NTPC Bhawan, SCOPE Complex, Institutional Area, Lodhi Road, New Delhi – 110003	12.	Chairman-cum-Managing Director NHPC Limited, N.H.P.C. Office Complex, Sector-33, Faridabad - 121003 (Haryana)
13.	Chairman, Solar Energy Corporation of India Limited, 1st Floor, D-3, A Wing, Prius Platinum Building, District Centre, Saket, New Delhi - 110017.	14.	The Chairman and Managing Director North Eastern Electric Power Corporation Ltd. Brookland Compound, Lower New Colony, Shillong (Meghalaya)- 793003

Minutes of 02nd meeting of North Eastern Regional Power Committee (Transmission Planning) (NERPCTP)

List of Participants is enclosed at Annexure-I.

Chairperson, CEA and Member (PS-additional charge), welcomed the participants. After, brief introduction of the participants, he requested the committee members to have positive deliberations, so that consensus could be reached on critical issues.

Chief Engineer (PSPA-II), CEA stated that the agenda for the meeting has been prepared in accordance with the Terms of Reference (ToR) of the NERPCTP as laid out in MoP Order dated 04th November, 2019. He also informed that few issues of Cross Border interlink have been included in the agenda points. As the cross-border links are not covered in the ToR, he enquired from the members whether such issues could be discussed in the present meeting. Members were of the opinion that North-Eastern states shares boundaries with neighbouring countries such as Bangladesh, Myanmar and Bhutan and also have cross-border interconnection them. Therefore, agenda points related to cross-border links should be discussed in this forum.

Thereafter, Chief Engineer (PSPA-II), CEA requested Director (PSPA-II), CEA to take up the agenda points.

1. Confirmation of minutes of the 1st meeting of North Eastern Region Power Committee-Transmission Planning (NERPCTP)

1.1. Director (PSPA-II), CEA stated that the minutes of the 1st meeting of North Eastern Regional Power Committee (Transmission Planning) (NERPCTP) held on 08th November, 2019 at Shillong were circulated vide CEA's letter no. 1/8459/2019 dated 13.12.2019. Subsequently, based on the comments received from POWERGRID, a corrigendum was issued vide letter no. 1/8540/2019 dated 24.12.2019.

1.2. Members confirmed the minutes along with the corrigendum.

A. ToR-I : QUARTERLY REVIEW AND STRENGTHNING OF INTER-REGIONAL TRANSMISSION SYSTEM

Carry out a quarterly review of the Transmission system in the region; asses the growth in generation capacity and the demand in various parts of the region; and draw up proposals for strengthening inter-Regional transmission system. The transmission planning is required to keep in mind the areas where the generation is likely to grow and areas where load demand will grow so that the transmission system at any point of time is capable to meet the demand in every corner of the country and comply with the mandate under the Tariff policy of developing transmission system ahead of the generation for ensuring smooth operation of the grid

2. Quarterly Review of transmission line and substation

2.1. Director (PSPA-II), CEA presented a list Transmission lines and substations/ICTs commissioned in the North Eastern Region during FY 2019-20 and Q1 of FY 2020-21. He requested the members to update the status, if any.

- 2.2. Representative of DoP, AP informed that in Arunachal Pradesh,, under Private Sector, the following transmission lines have been commissioned during 2019-20 and same information needs to be updated:
- 132kV S/c Dikshi-Tenga Switching S/s
 - 132kV D/c Tenga Switching S/s – Nechipu LILO connection (on Balipara -Khupi 132 kV line)
- 2.3. Chief Engineer (PSPA-II), CEA informed that as per the EA-2003, there is requirement for each state to convey the status of progress of their transmission lines and substations to CEA. However, the information as provided by DoP, AP has been noted and will also be shared with Power System Project Monitoring (PSPM) Division of CEA for record.

The updated list is enclosed at **Annexure-II**.

- 2.4. Members noted the information.

3. **Assessment of growth in generation capacity and demand in the region**

- 3.1. Director (PSPA-II) presented the list of existing/ planned generation capacity (MW) and actual/anticipated peak demand of states in North Eastern region. The same is available at **Annexure-III**. He requested members to update the data, if any, for better projection/ reassessment.
- 3.2. Chief Engineer (PSPA-II), CEA stated that there was difference in projected (as per EPS) and actual peak demand met in 2019-20. Further, he enquired, whether States can sustain their demands in 2024-25 with the values as projected according to the 19th EPS.
- 3.3. DoP, Arunachal Pradesh stated that the difference in projection vis-à-vis actual peak demands in 2019-20 is due to delay in commissioning of the transmission systems under Comprehensive Scheme for Arunachal Pradesh and Sikkim (CSAS). He added that they would be able to sustain the projection of 2024-25, if CSA&S schemes implemented as per schedule.
- 3.4. Assam stated that they are hopeful to match the projection of 3590MW in 2024-25 as per EPS and accordingly, the transmission/distribution infrastructure of the state is also gearing up..
- 3.5. Manipur informed that they have latent demand which is presently could not be met due to transmission line challenges. With the advent of railways and trans-highway in the state of Manipur, the demand would further increase. Manipur is also feeding Tamu (Myanmar) radially via 11kV transmission line and demand from Tamu (Myanmar) is also expected to increase. Accordingly, Manipur state would match the projection demand of 553 MW in 2024-25 as per EPS.

- 3.6. Meghalaya informed that the figures projected are reasonable. Further, state of Meghalaya is trying to revise the tariff for Power Intensive Consumers so that industries enter their setup in the state.
- 3.7. DoP, Nagaland, informed that due to inadequate transmission and distribution system in the state, they could not match the projected demand in 2019-20. However, due to infrastructure strengthening and expected demand growth, Nagaland would try to achieve the expected demand per 19th EPS.
- 3.8. TSECL, Tripura informed that they would be able to meet up the demand projected in 19th EPS due to the ongoing system strengthening scheme of NERPSIP in the state of Tripura.
- 3.9. POSOCO stated that the 19th EPS demand figures for NER constituents are on the higher side. It has been seen on regular basis now that the growth in real-time demand lags significantly compared to the growth projected in EPS. Also, as the planning studies are carried out taking the EPS demand forecast as base, it is of utmost importance that this forecasted demand is as close to the actual demand in real-time as possible. The inflated demand forecast could impact the effectiveness and efficiency of the transmission plan.

He further stated that CEA may carry out an independent exercise on demand forecast (considering the transmission and distribution upgrades being carried out) to arrive at more realistic demand figures which may then be used in transmission planning studies for optimal system planning. It was also informed that over the years, domestic load has been the most significant contributor to the growth in demand in NER with moderate growth coming from industrial and commercial sector. In the daily power supply position too, many of the states are showing nil shortage.

- 3.10. Chief Engineer (PSPA-II), CEA stated that commercial mechanism to handle the above issue was proposed through GNA mechanism wherein the state which is projecting the demand, needs to agree to pay the transmission charges for the transmission system planned to meet that demand. However, ToR of the committee are restricted to assess the demand and that is being done by taking views of the representatives from states. He proposed that the issue raised by POSOCO could be discussed in appropriate forum of EPS Committee.
- 3.11. CTU stated that for more realistic projections, we should also consider the generation being decommissioned (though a small number) along with new generation.
- 3.12. Considering above deliberations, it was agreed that as per views of states, demand data as projected in 19th EPS for 2024-25 would be considered for transmission planning studies. However, the peak demand projections of the states of NER would be reviewed in the next meeting.

4. Requirement for strengthening of Inter-regional transmission system

4.1. Director (PSPA-II), CEA stated that for assessment of requirement for strengthening of inter-regional transmission system, following studies have been carried out :

(1.i) Based on the generation/demand pattern of NER in previous three years, nine scenarios have been considered (Annexure-IV(A)).

(1.ii) Demand factors for the scenarios have been calculated in respect of peak demand met (Annexure-IV(B)).

(1.iii) Normalized demand for 2019-20, 2021-22 and 2024-25 have been arrived by multiplying peak demand as per EPS with the demand factors (Annexure-IV(C)).

(1.iv) Fuel wise anticipated installed capacity in the region was considered as agreed in agenda item-3 above. The same is also available at Annexure-IV(D).

(1.v) Considering generation availability factors, under different scenarios for thermal, gas, hydro, Wind/Solar etc. (Available at Annexure-IV(E)), anticipated generation was calculated, which is available at Annexure-IV(F).

(1.vi) From normalized demand and anticipated generation, surplus/deficit scenario of NER for the period 2019 to 2025 was calculated and available at Annexure-IV(G).

(1.vii) It was observed that during 2024-25, maximum surplus in NER would be 1102 MW in June, night off peak (Scenario-3) and maximum deficit of 769 MW in August evening peak (Scenario-5). Summary of maximum surplus/ deficit for the period 2019 to 2025 is available at Annexure-IV(H).

(1.viii) Details of inter-regional links with north-eastern region are given at Annexure-IV(I). From the details, it is observed that, by 2024-25 NER export and import transmission capacities would be 6550 MW and 3550 MW respectively. Import/ export transmission capacities of NER for 2021-22 & 2024-25 and ATC for June 2020 available at Annexure-IV(J).

(1.ix) As there is sufficient inter-regional capacity to cater import/export requirement of NER during surplus and deficit scenario, additional inter-regional links from NER may not be required by 2024-25.

4.2. Chief Engineer (PSPA-II), CEA stated that with the commissioning of Subansiri Hydro Generation project by 2024-25, the maximum deficit seen during 2021-22 of 1191 MW gets reduced to 769 MW. Further, as seen from import/export capabilities, NER region will have sufficient inter-regional transmission capabilities in case of both surplus and deficit scenarios. As such, there is no requirement of additional inter-regional links to be planned till 2024-25.

- 4.3. Director (SO), POSOCO stated that the hydro dispatch ranging from 30% to 70% has been considered in winter (February) scenarios (7, 8 & 9). However, the actual hydro generation during this period is very less going down to zero during night hours and same may therefore be reviewed. Further, the variable cost of BGTPP is high and the actual dispatch of the plant may vary from the dispatch considered in the LGB prepared by CEA.

He stated that the change in LGB assumptions may significantly change the maximum surplus and deficit figures of the region and may affect the adequacy of the system in the long run.

- 4.4. Chief Engineer (PSPA-II), CEA stated that during February (winter season), the storage based hydro like Subansiri Lower HEP can be assumed to operate at about 70% during evening peak. Regarding BGTPP, he stated that the plant has to be operated during deficit scenario. We may not consider zero dispatch from a generating station throughout the year. Therefore, if we take zero dispatch for winter night in 2024-25, as suggested by POSOCO, the deficit will increase to 910 MW from 769 MW. Even in such scenario, the present/planned inter-regional transmission capability remains adequate.
- 4.5. CTU stated that based on the assumptions, maximum deficit of 770MW is projected in 2024-25. However, delay in commissioning of one generation project i.e. L. Subansiri HEP (2000MW), these figures will alter two-three times. Another factor is that transmission system for supplying 500MW to Myanmar from North-Eastern state is also planned. In case, that gets materialized, it will further make the region more deficit.
- 4.6. Representative of NHPC informed that scheduled commissioning date of first unit of L. Subansiri (HEP-2000MW) is May 2023. Thereafter, every month one unit would be commissioned.
- 4.7. With respect to the observations made by POSOCO and CTU, Chief Engineer (PSPA-II), CEA informed that the assessment made here would be a regular process in the NERPC-TP meetings. The studies will be reassessed in another 3 months of time. During this duration, the assumptions could further improve and there might be clarity about the cross border link of Myanmar for exporting 500MW load.
- 4.8. CTU stated that they had circulated formats to collect data for system studies of North-Eastern states. It would be regular process, wherein CTU would collect data from NE states so as to represent their system in a more accurate form.
- 4.9. Chief Engineer (PSPA-II), CEA expressed that correctness and detailing of data is important so that a more realistic model and system studies are carried out to assess the requirement of transmission system in North Eastern states. The same has been requested to North Eastern states in previous meetings of the committee. It is once again requested to submit the data to CTU in the format sought.

- 4.10. After deliberations, it was agreed that no additional inter-regional links is to be planned till 2024-25 at present. However, the same would be reviewed in the next meeting of NERPCTP.

5. Review of Transmission system from operational considerations

- 5.1. Director (PSPA-II), CEA stated that as per data obtained from NLDC website, Available Transfer Capability (ATC) for June 2020 for ER-NER and NER-ER corridor were 1255 MW and 2555 MW respectively. He also informed that as per the operational feed back, no congestion was seen in the market in Q1 of 2020-21.
- 5.2. CTU informed that as per their studies for June 2020, ER-NER ATC was 1520MW. Further, it was about 1960 MW for April 2023.
- 5.3. Chief Engineer (PSPA-II), CEA stated that there should be efforts to reconcile methodology/ data used by POSOCO and CTU for calculation of ATC/TTC, to reduce the difference.
- 5.4. NERLDC presented the list of transmission line constraints, ICT constraints, node experiencing high voltage/ low voltage during Q1 of 2020-21. List of constraints faced, is at **Annexure-V**. He stated that transmission system for remedial measures of these constraints have already been planned and planning for new transmission element is not required. He added that some of the constraints mentioned above would have been avoided if the transmission elements agreed in the previous standing committee meetings, are implemented as planned. It was noted that no additional transmission system needs to be planned for resolution of the above transmission constraints. Further, CTU/STUs were requested for expediting implementation of the agreed transmission system in time, for smooth operation of the NER grid.

6. Subsystems not fulfilling N-1 – Agenda by NERLDC

- 6.1. Director (PSPA-II), CEA stated that in the 01st meeting of NERPC (TP), NERLDC informed that N-1 criterion was not fulfilled in many subsystems and transmission lines of NER posing threat to the reliability and security of the NER Grid. Further, upgradation of transmission system was required to ensure 24x7 supply. In that meeting, it was stated that the agenda by POSOCO was received very late, as such it could not be studied and therefore, it was decided that the agenda will be discussed in the next meeting after joint system studies.
- 6.2. The issue was discussed in a meeting held on 17.08.2020 with NERPC, CTU, NLDC and NERLDC, chaired by Chief Engineer (PSPA-II). In that meeting, need for strengthening of intra-state transmission system in some states was

envisaged and have been included in the subsequent agenda points under ToR-V.

- 6.3. Members agreed for discussion of the issues of non-fulfilment of N-1 reliability criteria in the state-wise agenda points under ToR-V.

B. ToR-II: ASSESSMENT OF TRANSMISSION SYSTEM REQUIREMENTS IN NEAR, MEDIUM AND LONG TERM AND FORMULATETRANSMISSION SCHEME

7. Interconnection of 132kV substations in upper Assam (below Brahmaputra) with neighbouring substations in Arunachal Pradesh

- 7.1. Director (PSPA-II), CEA stated that in the 1st meeting of NERSCT held on 29.11.2018, requirement of AGBPP (Kathalguri) – Namsai 220kV link or other alternative proposals of Arunachal Pradesh were discussed and following alternative interconnections at higher voltage levels were suggested:

- a) Tinsukia – Namsai 220kV D/c line or
- b) AGBPP (Kathalguri) – Namsai 220kV D/c line

In the above meeting, AEGCL had informed that the 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. AEGCL further proposed that the one connection from Jonai (Assam) to Pasighat (Arunachal Pradesh) may also be established for supply power to Arunachal Pradesh. DoP, Arunachal Pradesh proposed that the interconnection could alternatively be terminated at Niglok (Arunachal Pradesh). Accordingly, the proposal of AEGCL and DoP, Arunachal Pradesh regarding Jonai (Assam) to Pasighat (AP) and Niglok (AP), alongwith reactive compensation was referred for study by CEA / CTU.

- 7.2. Subsequently, a joint study meeting was held on 05.08.2019, wherein establishment of 220/132kV, 2x100MVA substation at Namsai (New) (Arunachal Pradesh) under ISTS along with following scope was recommended:

- a) 220kV, 1x31.5MVAR bus reactor
- b) Kathalguri (NEEPCO) – Namsai (New) 220kV D/c line
- c) 2 no. 220kV lines bays at Kathalguri (NEEPCO)
- d) Namsai (POWERGRID) – Namsai (New) 132kV D/c (Zebra) line
- e) 2 no. 132kV line bays at Namsai (POWERGRID) S/s

In this meeting, representative of NEEPCO stated that there is no space for 2 Nos. 220kV bays at Kathalguri. Further, availability of space for 2 Nos. 220kV bays at Tinsukia also could not be ascertained in the meeting.

- 7.3. In the 1st meeting of NERPC-TP held on 08.11.2019, it was informed that existing 132kV Namsai substation can be upgraded to 220kV instead of

establishing new substation as sufficient space is available there. After deliberation the following were agreed in the 1st meeting of NERPCTP:

- a) Upgradation of existing 132kV Namsai S/s of POWERGRID to 220kV with GIS or Hybrid GIS with following elements under ISTS:
 - (i) 220/132kV, 2x160MVA ICTs
 - (ii) 220kV, 1x31.5MVAr bus reactor
 - (iii) Kathalguri (NEEPCO) / Tinsukia (AEGCL) – Namsai (POWERGRID) 220kV D/c line
 - (iv) 2 no. 220kV lines bays at Kathalguri (NEEPCO) / Tinsukia (AEGCL)
- b) A team comprising of members from CEA, POWERGRID (NERTS), NERLDC, NERPC, NEEPCO and AEGCL to visit Kathalguri and Tinsukia S/s to ascertain availability of space for implementation of 2 Nos. 220kV bays. NERPC secretariat will coordinate the visit of the team and submit the report to CEA within one month.

- 7.4. Accordingly, a team lead by NERPC and comprising of members from POWERGRID (NERTS), NEEPCO, DoP, Arunachal Pradesh and AEGCL have visited AGBPP, Kathalguri Power Project of NEEPCO, 132 kV Namsai S/s of POWERGRID and 220kV Tinsukia S/s of AEGCL and submitted the report on 03rd March 2020. The team has recommended for termination of the 220 kV D/C Line from Namsai at AGBPP, Kathalguri using GIS bays.
- 7.5. NEEPCO expressed difficulty in carrying out operation and maintenance of the Kathalguri (NEEPCO) 220kV S/s bay extension and Kathalguri (NEEPCO) – Namsai (POWERGRID) 220kV D/c line.
- 7.6. Representative of POWERGRID informed that due to space constraints at 132kV Namsai (POWERGRID) S/s, upgradation of existing 132kV Namsai (POWERGRID) S/s to 220kV through GIS may be considered.
- 7.7. After detailed deliberations, the following transmission system was agreed to be implemented as North Eastern Region Strengthening Scheme-XV (NERSS-XV) under ISTS:
 - (a) Upgradation of existing 132kV Namsai (POWERGRID) S/s to 220kV (with 220kV side as GIS)

220kV:

- ICTs: 220/132kV, 2x160MVA
- ICT bay: 2 no.
- Bus reactor: 220kV, 1x31.5MVAr
- Bus reactor bay: 1 no.
- Line bays: 2 no. [for termination of Kathalguri (NEEPCO) – Namsai (POWERGRID) 220kV D/c line]
- Space for future line bays: 4 no.

132kV:

- ICT bays: 2 no.
 - Space for future line bays: 4 no.
- (b) Kathalguri (NEEPCO) – Namsai (POWERGRID) 220kV D/c line
- (c) Extension at Kathalguri (NEEPCO) switchyard: 2 nos. of GIS line bays for termination of Kathalguri (NEEPCO) – Namsai (POWERGRID) 220kV D/c line
- (d) Estimate Cost of the Project : Rs. 130 Crores
- (e) Expected completion schedule : 36 months from Date of Allocation from MoP

8. 400kV Connectivity of 400/132kV Surajmaninagar (TSECL)S/s

8.1. Director (PSPA-II), CEA stated that following system was inter-alia included in the North Eastern Region Strengthening Scheme-V as agreed in the 5th meeting of SCPSPNER 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

- (i) Establishment of 2x315 MVA 400/132 kV S/s at Surajmaninagar
- (ii) Establishment of 2x315 MVA 400/132 kV S/s at P. K. Bari
- (iii) Surajmaninagar - P. K. Bari 400 kV D/c line
- (iv) Termination of Palatana – Surajmaninagar 400kV D/C line (presently operated at 132kV) at 400kV bus of Surajmaninagar ISTS substation
- (v) 2 no. 400 kV line bays at Palatana GBPP switchyard for termination of Palatana – Surajmaninagar 400kV D/c line

Under the scope of TSECL

- (vi) Surajmani Nagar (ISTS) – Surajmani Nagar (TSECL) 132kV D/c line with high capacity/ HTLS (equivalent of single moose) (by TSECL)
 - (vii) P.K. Bari (ISTS) – P.K. Bari (TSECL) 132kV D/c line with high capacity/ HTLS (equivalent of single moose) (by TSECL)
- 8.2. CERC had given license to M/s NER-II Transmission Limited for transmission works (under TBCB) which inter-alia covers works mentioned at (i), (ii), (iii) and (v) above and is under implementation with completion schedule of July 2020. Item (iv) is being implemented by POWERGRID under RTM.
- 8.3. Subsequently, following modification in NERSS-V scheme and Surajmaninagar-Comilla (North) 400 kV link were agreed in 01st meeting of North Eastern Regional Power Committee (Transmission Planning) (NERPCTP) / 2nd meeting

of North Eastern Region Standing Committee on Transmission (NERSCT) held on 08.11.2019.

“18.14 (a) Shifting of Palatana – Surajmaninagar (TSECL) 400kV D/c line (operated at 132kV) to the 400/132kV ISTS S/s at Surajmaninagar – implementation by POWERGRID (by July 2020) as already allocated to them by MoP, GoI

However, the above work may get delayed and may not match the commissioning schedule of Surajmaninagar (ISTS) S/s i.e. July, 2020, due to reasons as detailed in previous paragraphs.

(b) LILO of Palatana-Surajmaninagar (ISTS) 400kV D/c line at 400/132kV Surajmaninagar (TSECL) s/s along with associated 4 no. 400kV line bays in matching timeframe of upgradation of 400/132kV Surajmaninagar (TSECL) substation would be implemented under ISTS”

For 18.14 (b) above TSECL stated that they would send their opinion by 30th November, 2019. In this regard, TSECL vide their letter dated 10thDecember 2019 has submitted the observations and proposal.”

8.4. Considering the proposal of Tripura, a meeting was convened under Chairmanship of Member (PS), CEA on 08.01.2020 at CEA. In the meeting, TSECL proposed the following system, till the completion of their 400 kV Surajmaninagar S/s (TSECL):

- a) The 132 kV Surajmaninagar S/s (TSECL) to remain connected with Palatana generation project (charged at 132 kV) with existing one circuit.
- b) For 400 kV operation of Palatana–Surajmaninagar D/c line: 2nd circuit of Palatana–Surajmaninagar D/c line to be disconnected from 132 kV Surajmaninagar S/s (TSECL) and terminated to 400 kV Surajmaninagar S/s (ISTS) through one circuit of the 400 kV D/c line (to be constructed under ISTS) from Surajmaninagar 400 kV S/s (TSECL) to Surajmaninagar 400 kV S/s (ISTS).
- c) For 132 kV operation of Surajmaninagar (TSECL)–Surajmaninagar(ISTS) line, 2nd circuit of the 400 kV D/c line (to be constructed under ISTS) from Surajmaninagar 400 kV S/s (TSECL) to Surajmaninagar 400 kV S/s (ISTS) to be terminated at existing Surajmaninagar 132 kV S/s (TSECL).

In this meeting, it was deliberated that as per Section 73 (a) of the Electricity Act, 2003, CEA is to co-ordinate the activities of the planning agencies for the optimal utilisation of resources. However, if TSECL proposal (as given above) is considered, it would result in non-utilisation of the transmission elements at Palatana and Surajmaninagar, which is being implemented with license from CERC and for which Tripura has already signed TSA. Therefore, the proposed transmission system of TSECL was not agreed and it was decided that the issue of TSECL, with above facts would be sent to MoP for further direction in this matter.

- 8.5. Further, CEA, vide letter dated 10.06.2020 requested MoP's direction to resolve the issue of shifting of Palatana-Surjamaninagar (TSECL) 400kV D/c line (operated at 132kV) to the 400/132kV ISTS S/s at Surajmaninagar (ISTS). MoP vide letter 29th June 2020 communicated that issue/request raised by Tripura may be discussed in the next meeting of North Eastern Regional Power Committee (Transmission Planning) for taking appropriate decision in consultation with stakeholders of all NER States.
- 8.6. TSECL vide letter dated 27th May 2020 had acknowledged the scheme of LILO of Palatana-Surajmaninagar (ISTS) 400kV D/c line at 400/132kV Surajmaninagar (TSECL) S/s.
- 8.7. The works with regard to shifting of Palatana – Surajmaninagar 400kV D/c line (operated at 132kV) to the 400/132kV ISTS S/s at Surajmaninagar is being taken up by POWERGRID as envisaged earlier. The scheme with regard to LILO of Palatana-Surajmaninagar (ISTS) 400kV D/c line at 400/132kV Surajmaninagar (TSECL) S/s along with associated 4 no. 400kV line bays (in matching timeframe of upgradation of 400/132kV Surajmaninagar (TSECL) substation) was discussed in the 3rd meeting of NCT held on 26th-28th May 2020. In this regard, CTU informed that MoP, vide letter dated 25.09.2020, has allocated the work of *LILO of Palatana-Surajmaninagar (ISTS) 400kV D/c line at 400/132kV Surajmaninagar (TSECL) s/s along with associated 4 no. 400kV line bays in matching timeframe of upgradation of 400/132kV Surajmaninagar (TSECL) substation* to POWERGRID under RTM.
- 8.8. TSECL stated that through this 132kV D/c Palatana-Surajmaninagar (TSECL) link, Tripura used to draw around 225 to 230MW of power. If Palatana is isolated in the interim period from 132kV Surajmaninagar (TSECL) S/s, then Tripura system will be highly insecure and vulnerable. Further, with the proposal agreed in NCT, the issue of whether Tripura will be able to draw its full allocation of share from Palatana and whether Tripura will be able to evacuate 160MW of power to Bangladesh will remain unresolved. Further, if 132kV Palatana-Surajmaninagar (TSECL) is shifted to 400/132kV Surajmaninagar (ISTS), then overloading is observed in intra-state lines. Monarchak power evacuation system will be highly affected. Lastly, in case of failure of 400kV system, to safeguard the Palatana units, Palatana used to draw its auxiliary power from 132kV system. Tripura system will only be connected to Palatana through 132kV Palatana-Udaipur circuit. Accordingly, TSECL requested that till completion of 400/132kV Surajmaninagar (TSECL), one circuit of 132kV Palatana-Surajmaninagar (TSECL) may remain connected as per present configuration. The other circuit may be terminated to 400/132kV Surajmaninagar (ISTS) S/s.
- 8.9. Chief Engineer (PSPA-II), CEA stated that the above issue of retaining one circuit of 132kV Palatana – Surajmaninagar (TSECL) in present condition was discussed in the meeting convened under Chairmanship of Member (PS), CEA on 08.01.2020 at CEA. However, in the case of TSECL proposal the 400kV

bays at both ends would remain unutilized. Further, presently also, the Surajmaninagar 132kV is connected with Palatana only through a single 132kV circuit.

- 8.10. Director (SO), POSOCO enquired about the timeline for upgradation of 132 kV Surajmaninagar (TSECL) – Comilla (Bangladesh) D/C at its rated voltage level (400 kV). He further stated that for the inter-connection between India and Bangladesh in Eastern Region through Bheramara HVDC, TTC/ATC is being declared since long. This brings transparency in system operation, provides the information of capacity and margin available to the stakeholders, and ultimately allows the interested agencies to proceed with power transactions on that corridor which is the essence of open access. Similar practice is also required for Tripura – Bangladesh interconnection for reliable system operation. This will also provide information to Bangladesh and other constituents about the maximum possible power transfer through the link.
- 8.11. CTU informed that upgradation of 132 kV Surajmaninagar (TSECL) – Comilla (Bangladesh) D/C at its rated voltage level (400 kV) is not foreseen in near future and line will remain charged at 132 kV level. Regarding vulnerability of Tripura system due to shifting of 132kV Palatana-Surajmaninagar (TSECL) to 400/132kV Surajmaninagar (ISTS) S/s, he informed that TSECL had proposed LILO of only one circuit of 132 kV D/C line from Surajmaninagar (TSECL) to Bodhjungnagar at Surajmaninagar (ISTS) substation which is not sufficient.
- 8.12. Chief Engineer (PSPA-II), enquired about the status of 400/132kV Surajmaninagar (TSECL) S/s and 132kV D/c Monarchak-Surajmaninagar (TSECL) line being executed by TSECL.
- 8.13. TSECL informed that due to COVID-19 pandemic, the works have been affected. With respect to upgradation of 132kV Surajmaninagar (TSECL) to 400kV level, the works is expected to be awarded by October-2020 with a completion schedule of one (1) year from the date of award. With respect to works of 132kV D/c Monarchak-Surajmaninagar (TSECL), only two towers are left for tower foundation and 22 towers are left for erection. TSECL is trying to bring back the laborers who had left due to COVID-19 pandemic.
- 8.14. POSOCO raised the apprehension of commissioning of 400/132kV ICTs at Surajmaninagar (TSECL) within 01 year of award, as without the transformers the constraint will remain.
- 8.15. CTU stated that Surajmaninagar (TSECL) is scheduled to be connected to Monarchak and Rokhia power plants, through two 132kV S/c. If these two interconnections can be expedited, the issue of power constraint at Surajmaninagar (TSECL) could be avoided. In the study presented by POSOCO, these interconnections were not considered. If these interconnections would have been considered, then the requirement proposed by Tripura would not have arose.

- 8.16. NERPC observed that in the absence of Surajmaninagar (ISTS) - Surajmaninagar (TSECL) 132kV D/C line, which was to be implemented by TSECL, the supply of power to Bangladesh would be affected. He opined that reconductoring of one circuit of Surajmaninagar (TSECL) - Bodhjungnagar line to be LILOfed at Surajmaninagar (ISTS) is required to be implemented on urgent basis.
- 8.17. NERLDC stated that alongwith the reconductoring proposed for Surajmaninagar (TSECL) to tapping point, as per studies 132kV D/c P.K. Bari (TSECL)-P.K.Bari (ISTS) is also to be implemented with reconductoring as to avoid system instability. Till these reconductoring arrangements are carried out, Tripura system remains vulnerable in interim arrangement due to power supply of 160MW to Bangladesh.
- 8.18. TSECL informed that implementation of LILO from tapping point to Surajmaninagar (ISTS) is being carried out by Sterlite with high capacity conductor, on behalf of TSECL. However, regarding the reconductoring proposed for Surajmaninagar (TSECL) to tapping point, as suggested by the members, he stated that this can only be taken up depending on the availability of funds.
- 8.19. NERPC informed that SPS to restrict Bangladesh power export to 160MW has been prepared by NERLDC and NERPC. The scheme will be submitted to NLDC for further interaction with Bangladesh. The same needs to be implemented prior to shifting of Palatana – Surajmaninagar (TSECL) 400kV D/c line to Surajmaninagar (ISTS).
- 8.20. Considering above discussions, the committee requested TSECL to consider implementation of following suggestions on urgent basis :
- (20.i) The export to Bangladesh should not exceed 160 MW, as such suitable System Protection Scheme (SPS) should be implemented.
 - (20.ii) The whole section of Surajmaninagar (TSECL) – Surajmaninagar (ISTS) – Bodhjungnagar should be reconducted with HTLS.
 - (20.iii) The whole section of P.K. Bari (TSECL) – P.K. Bari (ISTS) – Ambassa should be reconducted with HTLS.
 - (20.iv) TSECL should utilize the 1 no. of 132kV bay getting vacant at Palatana after operationalization of 400kV D/c Palatana-Surajmaninagar (ISTS) line. They may implement Palatana – Udaipur 132kV second circuit as suggested by CEA/CTU in 1st meeting of NERPCTP.
 - (20.v) TSECL should expedite completion of Surajmaninagar – Monarchak 132kV D/c line.

9. Three Phase Auto-reclosure for 400kV lines-Agenda from NERPC

9.1. Director (PSPA-II), CEA stated that NERPC, had sought advice from CEA regarding implementation of three phase Auto-reclosure for two 400kV lines i.e. 400kV Silchar-Azara and 400kV Silchar-Byrnihat due to the following:

- a) Both the 400kV lines are very critical in evacuation of power from Palatana GBPP. Tripping of both of these lines may create a GD-IV/V in NER.
- b) The lines pass through the high lightning prone area near Byrnihat.
- c) Repeated 2-ph/3-ph tripping of 400kV Silchar-Azara & 400kV Silchar-Byrnihat due to back flashover has been observed, even though the tower footing resistance is less than 10 ohms for all the locations.

9.2. Considering the above request of NERPC, the issue was discussed in a meeting held on 18.08.2020, with NERPC, CTU, NLDC, NERLDC and PSETD Div., CEA chaired by Chief Engineer (PSPA-II), CEA. In that meeting, following was decided:

- i. The number of multiphase trippings are quite less as per the tripping statistics provided by NERLDC.
- ii. 3-phase A/R scheme is not an alternative to the efforts for reducing the number of trippings. Unlike the 1-phase A/R scheme, the flow on the line would get disrupted for the duration of dead time of 1 second, so it does not help in continuation of some flow on the transmission line.
- iii. To reduce the trippings of 400 kV Silchar – Azara and 400 kV Silchar – Byrnihat due to lightning/backflash, following measures should be undertaken by the transmission licensee/POWERGRID:
 - a) Survey and identify the locations which require installation of TLAs or require tower footing impedance treatment.
 - b) Install Transmission Line Surge Arresters (TLSA) on selected towers.
 - c) Reduce the tower footing impedance by various means like Bentonite treatment, Chemical earthing, enhancement compound, auxiliary mat and counter poise wires etc.

Members noted the above recommendations. Members also noted that with additional of the 400 kV Silchar – Misa D/C and the 400 kV New Mariani – New Kohima – Imphal link, the chances of islanding of southern part of NER become less.

C. ToR-III: APPLICATIONS FOR CONNECTIVITY AND ACCESS

- 10. Connectivity and LTA applications agreed in Connectivity & LTA meetings held after 1st meeting of NERPC-TP**
- 10.1. Representative of CTU stated that one (1) no. of application from ECR for re-allocation of LTA from Nabinagar-I (1000MW) generation project in Bihar was received on 23.01.2020 i.e. after 1st meeting of NERPC-TP held on 08.11.2019. Through this application, 5MW of power was allocated to Assam. CTU has already granted the above modification. Members noted the above information.
- 11. Installation of 125MVAR Bus Reactor at Subansiri Lower HE Project (2000 MW)**
- 11.1. Representative of NHPC stated that initially, installation of Bus reactor at Subansiri Lower HEP was in the scope of POWERGRID. However, POWERGRID vide letter dated 11.03.2010 requested NHPC to install one (1) no 80MVA Bus reactor in Subansiri Lower HEP. Later on, POWERGRID enhanced the capacity of Bus reactor to 3-Ph, 125 MVAR, 400kV and NHPC had also agreed to the enhanced capacity.
- 11.2. Director (PSPA-II), CEA enquired CTU about the required capacity of Bus-reactor at Subansiri Lower HEP.
- 11.3. CTU stated that the bus reactor was always in the scope of NHPC. He further stated that NER faces issues of high voltages, therefore, it is desirable to have distribution of reactors across the region to mitigate the issue. He further stated evacuation lines from Subansiri Lower HEP (i.e. 2xD/c 400kV Lower Subanisri - Biswanath Chariyali lines) are quite long (175km) and have line reactors only at Biswanath Chariyali end. He added that a voltage relief of 10.5kV and 6.8kV was observed when reactors of 125MVAR and 80MVAR respectively were simulated at the generating station for low hydro scenario (only 2 units in operation). Accordingly, a 125 MVAR bus reactor will be required during light load condition.
- 11.4. Representative of NERLDC stated that N-1 contingency should also be considered for reactor. Therefore, he suggested that two nos. of 125MVAR Bus-reactor may be planned at Subansiri Lower HE Project.
- 11.5. Chief Engineer (PSPA-II), CEA enquired about availability of bay/space for additional 125MVAR reactor at Lower Subansiri HEP. Representative of NHPC informed that presently there is provision of only one reactor bay, however, they have to confirm from site about availability of space for additional bay.
- 11.6. After detailed deliberations, the following was agreed:
- i) One no. of 125MVAR, 400kV Bus-reactor at Subansiri Lower HE Project by NHPC.

- ii) NHPC will inform about the availability of bay/space for bay, for installation of one additional bus reactor of 125MVAR at Subansiri Lower HE Project.

D. ToR IV– REVIEW OF UPSTREAM AND DOWNSTREAM NETWORK

12. Downstream system development by STUs from the various commissioned and on-going ISTS substations

- 12.1. Director (PSPA-II), CEA stated that the downstream 220kV or 132kV systems of the following ISTS schemes have to be implemented by STUs. He requested Tripura, Assam and Nagaland to update the status.

Sl. No.	ISTS S/s	Voltage ratio, Trans. Cap	Voltage level (kV)	Total no. of Bays	Lines emanating from S/s	No. of circuit	downstream responsibility	Remarks
1	Surajmaningar	400/132kV, 2x315MVA	132	2 - (RfP Schedule Jul 2020)	Surajmaningar (TSECL) – Surajmaningar (TBCB)	2	Tripura	NERSS-V
2	P. K. Bari	400/132kV, 2x315MVA	132	2 - (RfP Schedule Jul 2020)	P. K. Bari (TSECL) – P. K. Bari (TBCB)	2	Tripura	NERSS-V
3	New Mariani	400/220kV, 2x500MVA	220	Jul 2020	New Mariani – Mariani	2	Assam	NERSS-VI
4	New Kohima	400/220kV, 2x500MVA	220	2 - (RfP Schedule Jul 2020)	New Kohima (TBCB) – New Kohima (Nagaland)	2	Nagaland	NERSS-VI

- 12.2. Representative of Tripura stated that they would be implementing (a) LILO of one circuit of 132 kV Surajmaningar (TSECL) – Bodhjunnagar D/C line at Surajmaningar (ISTS) sub station and (b) LILO of 132 kV Single Circuit Ambasa – P.K. Bari line (TSECL) line at P.K. Bari (ISTS) substation in place of Surajmani Nagar (ISTS) – Surajmani Nagar (TSECL) 132kV D/c line with high capacity/ HTLS (equivalent of single moose) and P.K. Bari (ISTS) – P.K. Bari (TSECL) 132kV D/c line with high capacity/ HTLS (equivalent of single moose). He also stated that the above works would be completed by 15th October 2020.
- 12.3. DoP, Nagaland informed that the proposal of 220kV D/c New Kohima (TBCB) – New Kohima (Nagaland) could not be taken up due to lack of funds. However, it is requested to include this proposal for funding under NERPSIP as there have been savings in the transmission proposals under NERPSIP of Nagaland. Chief Engineer (PSPA-II), CEA informed that as per Secretary (Finance), Department of Economic Affairs, no more change in scope under NERPSIP & CSA&S will be allowed. Further, he mentioned that as per CERC, in case of delay in commissioning of downstream transmission system not matching with the commissioning of ISTS systems, STUs need to bear the ISTS transmission charges. DoP, Nagaland informed that they would approach MoP for funding of 220kV D/c New Kohima (TBCB) – New Kohima (Nagaland).

- 12.4. Representative of Assam stated that construction of gantry from New Mariani-Mariani would be very difficult as most of the lines are emanating from New Mariani are in same direction. He added that ground clearance between the Line and gantry will not be sufficient and only possible solution is to construct 220kV S/c New Mariani-Mariani, 220kV S/c New Mariani-Kathalguri and 220kV S/c Mariani-Kathalguri lines. NERPC suggested that a group may be formed which may visit the site and recommend suitable option.
- 12.5. After deliberations, it was decided that NERPC may coordinated the site visit of a group comprising of members from NERPC, POWERGRID and AEGCL Assam to visit the Mariani and New Mariani substations. NERPC would submit the report regarding feasible options so as to draw maximum number of 220kV outlets from Mariani (POWERGRID) so as to utilize 2x500MVA ICTs being installed under NERSS-VI.
- 13. Status of 400kV substations and other important elements being implemented by STUs in NER under intra-state schemes**
- 13.1. Director (PSPA-II), CEA stated that some 400kV substations have been agreed in the previous meetings of SCPSPNER/NERST/NERPCTP under intra-state strengthening schemes in NER. He requested respective STUs to update the status of the same.
- 13.2. The updated details as per the information provided by STUs are given below:

Sl. No.	Substation/Location	Transformation Capacity/ Element	Date of Award	Completion Schedule
A Assam: to be implemented by AEGCL				
A1	Rangia	400/220kV, 2x500MVA	Dec-2020	24 months from Date of Award
A2	Gogamukh	400/220/132kV, 2x500MVA + 2x160MVA	Feb-2021	
A3	Khumtai	400/220/132kV, 2x500MVA + 2x160MVA	Nov-2020	
A4	Gohpur	2 no. 132kV GIS line bays at Gohpur for termination of LILO of one circuit of BiswanathChariali – Itanagar 132kV D/c line (line works under ISTS through TBCB route)	Nov-20	24 months from Date of Award (ISTS expected in Sept 2020)
B Tripura: to be implemented by TSECL				
B1	Surajmaninagar (TSECL)	400/132kV, 2x315MVA	Nov-20	12 months from Date of Award
C NEEPCO: to be implemented by NEEPCO				

C1	Ranganadi	420kV, 80MVAs bus reactor at Ranganadi generation switchyard	Oct-20	Dec-22
C2	Pare HEP	Bypassing of LILO of Ranganadi - Naharlagun / Nirjuli at Pare HEP so as to form direct Ranganadi - Naharlagun / Nirjuli 132 kV S/C line	No work related to Award of project is started	Matching with ISTS (SCoD is 23-06-2023)
C3	Pare	Re-conductoring of LILO portion at Pare end (of Ranganadi - Naharlagun / Nirjuli 132kV S/c line) with HTLS (HTLS equivalent to ACSR Zebra) along with modification of 132kV bay equipment at Pare HEP		Matching with ISTS (SCoD is 23-06-2023)

14. Utilisation of spare 132kV ISTS bays at Silchar (POWERGRID), P.K.Bari (TSECL), Palatana (OTPC), and Surajmaninagar (TSECL) and Misa (POWERGRID)

14.1. Director (PSPA-II), CEA stated that due to various commissioned/under-implementation schemes in NER, 132kV and 220kV bays under ISTS at Silchar (PG), P.K. Bari (TSECL), Surajmaninagar (TSECL), Palatana (OTPC), Misa (PG) and Mariani (PG) are got/getting vacant. He requested the members to update the utilization plan for the vacant bays.

14.2. The status as updated by members is given below:

Substation	Upgraded 400kV line	No. of vacant bays	Bays vacant from	New transmission line for termination in vacant bays	Date of Award (new line)	Expected commissioning
Silchar 400/132kV (POWERGRID)	Silchar – Imphal	2	Jan 2019	Silchar – Ghungur 132kV D/c	March-2021	24 months from Date of Award
Silchar 400/132kV (POWERGRID)	Silchar – P.K.Bari	2	Expected from Jul 2020	Silchar – Udarbond 132kV D/c	May-2021	
P.K.Bari (TSECL) 132kV S/s	Silchar – P.K.Bari	2	Expected from Jul 2020	132kV S/c P.K.Bari (TSECL)-Kailasahar (District HQ of Unakutty) line 132kV P.K.Bari	DPR has been prepared and shall be forwarded to appropriate funding agency.	

Substation	Upgrade d 400kV line	No. of vacant bays	Bays vacant from	New transmission line for termination in vacant bays	Date of Award (new line)	Expected commissioning
				(TSECL)-Kanchanpur.		
Palatana (OTPC)	Palatana – Surajmani nagar	1	Expected from Jul 2020	Palatana – Udaipur 132kV S/c: existing Palatana – Udaipur 132kV (2 nd) S/c line		DPR will be submitted to appropriate funding agency
Surajmaninagar (TSECL) 132kV S/s	Palatana – Surajmani nagar	2	Expected from Jul 2020	132kV D/c Surajamaninagar (TSECL)-Badarghat		DPR will be submitted to appropriate funding agency
Misa 400/220kV (POWERGRID)	Misa – Mariani section of Misa – Mariani – Kathalguri	2	Expected from Oct 2020	Misa – Sankerdebnagar 220kV D/c line	Oct-2021	24 months from date of Award
Mariani 400/220kV (POWERGRID)	Mariani – Misa section of Misa – Mariani – Kathalguri	2	Expected from Oct 2020	Mariani (POWERGRID) – Diphu 220kV D/c line.	AEGCL to update	AEGCL to update

14.3. POWERGRID informed that the line bays at Silchar S/s would become unusable if they remain unutilized for 3-4 years till AEGCL construct their downstream feeders. Roing – Chapakhowa 132kV D/c line is being implemented by POWERGRID under NERSS-X. The 132kV line bays at Silchar which have been vacated by operation of Silchar – P.K. Bari and Silchar – Imphal D/c lines at 400kV may be utilized at Roing and Chapakhowa respectively. Additional 4 nos. line bays would be provided at Silchar under ISTS for termination of above identified lines as and when required by AEGCL.

14.4. Members agreed with the suggestion of POWERGRID.

E. ToR-V: EXAMINE AND EVALUATE INTRA-STATE PROPOSALS

15. Intra state scheme of Assam for the year 2030

15.1. Director (PSPA-II), CEA stated that augmentation of Intra-state transmission system of Assam was discussed in the 01st meeting of NERPC (TP). Thereafter, Assam had submitted modifications/upgradation in agreed system as well as some new system for discussion. Proposal of Assam is available in the agenda.

- 15.2. To discuss the new proposals of Assam, a joint system study meeting was held on 09.09.2020 with CEA, CTU, and POSOCO. In the meeting, it was agreed that AEGCL will submit their revised proposal including data and system studies. The same would be put up before NERPCTP.
- 15.3. Director (PSPA-II), CEA informed that data and system studies as agreed to be submitted by AEGCL in the joint system study meeting, have not been received.
- 15.4. Representative of CTU stated that it would be difficult to comment on the new proposals of AEGCL without system studies.
- 15.5. Chief Engineer (PSPA-II), CEA informed that data shared by AEGCL regarding load growth of proposed substations for timeframe of 2024 was received very late and could not be studied through simulations. He requested AEGCL to send the revised proposal along with studies so as to convene another joint system study meeting to discuss the new proposals.
- 15.6. AEGCL stated that 400kV Gogamukh substations and its connectivity, is urgent in nature and may be discussed in this meeting. He added that in the 01st meeting of NERPC (TP), 400/220/132kV new AIS at Gogamukh alongwith Biswanath Chariali (POWERGRID) – Gogamukh 400kV D/c (Twin Moose) line was agreed to be implemented by AEGCL under intra-state scheme by 2022. However, because of land constraint at Gogamukh, AEGCL proposed to construct GIS substation at Gogamukh. Further, instead of BnC(POWERGRID)-Gogamukh 400kV D/c line, LILO of one D/c 400kV BnC (Powergrid) - L.Subansiri at Gogamukh is proposed.
- 15.7. CTU stated that in the joint system study meeting, the issue was deliberated. It was observed that LILO of one D/c 400kV BnC (Powergrid) - L.Subansiri at Gogamukh can be considered to be implemented under ISTS. However, AEGCL should assure that new 400/220/132kV Gogamukh S/s is to be implemented with matching time frame as of ISTS.
- 15.8. After detailed deliberations, it was agreed that AEGCL would submit documents/report/load flow studies to CEA and CTU. Further, regarding New Mariani-Mariani interconnection, report of the group constituted in para 12.5 would be considered. Thereafter, the proposals would be discussed in joint system study meeting.

16. 132kV Connectivity of 400/132kV Surajmaninagar (ISTS) S/s

- 16.1. Director (PSPA-II), CEA stated that in the 5th meeting of SCPSPNER held on 08-08-2015, Surajmani Nagar (ISTS) – Surajmani Nagar (TSECL) 132kV D/c line with high capacity/ HTLS (equivalent of single moose) was agreed to be constructed by TSECL.
- 16.2. TSECL vide letter dated 27th May 2020 had proposed construction of LILO of one circuit of 132 kV D/C line (TSECL) from Surajmaninagar (TSECL) to

Bodhjungnagar at Surajmaninagar (ISTS) substation (5.5 kms approximate length) in place of Surajmani Nagar (ISTS) – Surajmani Nagar (TSECL) 132kV D/c line with high capacity/ HTLS (equivalent of single moose) under intra-state system.

- 16.3. CEA vide letter dated 09.06.2020 had communicated no objection in TSECL taking up the above proposed changes in intra-state transmission system. Regarding mode of implementation of these transmission works, it was informed that TSECL may decide themselves since these are intra-state transmission system. Further, the above system needs to be commissioned matching with the commissioning of 400/132 kV Surajmaninagar (ISTS) Substation.
- 16.4. Members concurred the views of CEA. Additionally TSECL was requested to implement the system as proposed at para 8.17 above.

17. 132kV Connectivity of 400/132kV P.K. Bari (ISTS) S/s

- 17.1. Director (PSPA-II), CEA stated that in the 5th meeting of SCPSPNER held on 08-08-2015, P.K. Bari (ISTS) – P.K. Bari (TSECL) 132kV D/c line with high capacity/ HTLS (equivalent of single moose) was agreed to be constructed by TSECL.
- 17.2. TSECL vide letter dated 27th May 2020 had proposed construction of LILO of 132 kV Single Circuit Ambasa - P.K. Bari (TSECL) line at P.K. Bari (ISTS) substation (2.5 kms approximate length).
- 17.3. CEA vide letter dated 09.06.2020 had communicated no objection in TSECL taking up the above proposed changes in intra-state transmission system. Regarding mode of implementation of these transmission works, it was informed that TSECL may decide themselves since these are intra-state transmission system. Further, the above system needs to be commissioned matching with the commissioning of 400/132 kV P.K. Bari (ISTS) Substation.
- 17.4. Members concurred the views of CEA. Additionally TSECL was requested to implement the system as proposed at para 8.17 above.

18. Re-conductoring and strengthening of aged 132 kV lines in Manipur with HTLS

- 18.1. Director (PSPA-II), CEA stated that in the 1st meeting of NERPCTP held on 08.11.2019 MSPCL proposed to strengthen and re-conductor the old 132 kV lines with HTLS conductor in three stages/phases. In that meeting, it was opined that the agenda was received very late and could not be studied/examined. Accordingly, it was decided to discuss it in the next meeting.

He further, stated that CEA vide letter dated 30.06.2020 has requested MSPCL to submit the relevant System Studies for the proposal, timeline of completion of the proposed works, and report on healthiness of towers for each circuit. However, the information from MSPCL was not received.

- 18.2. MD, MSPCL stated that the lines proposed for reconductoring have been in service since 1980s and completed around 30-40 years of service. Further, MSPCL is planning to make a ring on 132kV substations in the state. As per EPS projections, the expected demand is expected to grow to about 400-450MW. Further, railways is coming to state in two years of time. As there is RoW constraints, reconductoring is proposed. Unless the reconductoring is taken up, it will be difficult to met this growth in demand. Load flow studies have been carried out to justify the requirement of reconductoring of these line. MSPCL also stated that they had carried out system studies and are ready to share the studies.
- 18.3. Chief Engineer (PSPA-II), CEA stated that in the absence of system studies, it would be difficult to agree on the proposal. He proposed that a joint study meeting may be held with CEA, CTU and Manipur to discuss the proposals in detail.
- 18.4. After detailed deliberations, it was agreed that the proposal of MSPCL would be discussed in a joint study meeting to be held with CEA, CTU, NERLDC, NERPC and Manipur after receipt of following details from MSPCL:
- i) Age of each of the lines proposed for reconductoring or commissioning date,
 - ii) MSPCL to certify that the existing towers are healthy to sustain the installation with HTLS conductors.
 - iii) Load flow studies carried out by MSPCL.

19. N-1 reliability issue for meeting power requirement in the south of Manipur

- 19.1. Director (PSPA-II), CEA stated that in accordance with ToR-I of the committee i.e. quarterly review of the transmission system (at Agenda-6), a meeting was held on 17.08.2020 to discuss non-compliance of N-1 reliability requirement in NER. In that meeting, it was deliberated that, regarding N-1 reliability issues in south of Manipur, MSPCL would be requested to provide status regarding commissioning of Imphal (POWERGRID) – Thoubal 400kV D/c line along with charging of 400/132kV ICTs at Thoubal, in the NERPCTP meeting.
- 19.2. MD, MSPCL informed that they would be able to commission the Imphal (POWERGRID) – Thoubal 400kV D/c line along with charging of 400/132kV ICTs at Thoubal by 31st October, 2020.
- 19.3. Members noted the above information.

20. N-1 reliability requirement at Ranganadi, Arunachal Pradesh

- 20.1. Director (PSPA-II), CEA stated that in accordance with ToR-I of the committee i.e. quarterly review of the transmission system (at Agenda-6), a meeting was held on 17.08.2020 to discuss non-compliance of N-1 reliability requirement in NER. In that meeting, it was deliberated that, N-1 reliability issue of 132 kV Ranganadi - Ziro - Daporijo - Along - Pasighat - Roing - Tezu – Namsai section would be complied after commissioning of Roing – Chapakhowa 132kV D/c line (under construction) and 220kV D/c Namsai-Kathalguri line (planned).
- 20.2. Representative of GoAP stated that no additional system would be needed after above strengthening, as of now.
- 20.3. Members noted the information.

21. N-1 reliability requirement at Mawlai, Meghalaya

- 21.1. Director (PSPA-II), CEA stated that in accordance with ToR-I of the committee i.e. quarterly review of the transmission system (at Agenda-6), a meeting was held on 17.08.2020 to discuss non-compliance of N-1 reliability requirement in NER. In that meeting, NLDC raised the issue of radial 132kV line between Mawlai and Sohra (Cherapunji). He proposed for additional connectivity of Sohra with either Mawngap or Mawlai. Accordingly, it was agreed that this issue of intra-state strengthening of transmission system in Meghalaya would be included as part of agenda in this NERPCTP meeting.
- 21.2. Representative of MeTCL, Meghalaya stated that in the 01st meeting of NERPC-TP, Mawngap (Meghalaya) – Nangalbibra (Meghalaya) 220kV D/c line alongwith 220kV line bays at both ends, was agreed to be implemented by MePTCL under intra state scheme. However, due to space constraint in Mawngap (Meghalaya), it is now proposed to connect Cherrapunji/Sohra with Nangalbibra bypassing Mawangap i.e. Cherrapunji (Meghalaya) – Nangalbibra (Meghalaya) 400kV D/c (charged at 220kV). Further, Cherrapunji is proposed to be connected to Silchar-Byrnihat 400kV D/c line at Mynkre, near Khlieriat i.e. LILO of 400kV D/c Silchar-Byrnihat line at 220kV Mynkre S/s and at 220kV New Shillong S/s. This would form a ring main based system of 400kV and would also strengthen the southern part of Meghalaya. Southern part of Meghalaya is rich in minerals and potential for tourism sector is there, leading to demand growth in future. Meghalaya is also planning to install hydro generation projects in southern part of Meghalaya.
- 21.3. Chief Engineer (PSPA-II), CEA stated that CEA did not have any information about the details of the generation plants planned by MePTCL in southern part of Meghalaya. He requested MePTCL to share the details of generating plants

i.e. timeline/expected commissioning schedule, capacity, location etc. to CEA. After receipt of these details, decision regarding 400kV transmission system would be taken. In case, Meghalaya is planning to inject state owned generation through ISTS (as proposed by MePTCL), they will need to apply for LTA. Regarding, proposal of Meghalaya for exporting power to Bangladesh, he informed that any import/export of power and planning of links would be governed by Guidelines on Import/Export (Cross Border) of Electricity-2018 issued by MoP, Gol.

21.4. CTU informed that for 400kV Silchar-Byrnihat line is being LILOed at Sonapur by AEGCL and LILO of the same line have been proposed at two more locations by MePTCL (Mynkre & New Shillong). The merit of the proposal can only be justified after verified by comprehensive study. The proposal could be studied once MePTCL submits the required details of the generating sources, load growth etc.

21.5. After detailed deliberations, following was agreed :

- a) MePTCL, Meghalaya would furnish Substation-wise load growth demand in Meghalaya and Details of generating sources planned in 4-6 years of timeframe i.e. timeline, capacity, location etc. to CEA within 15 days.
- b) The proposal of Meghalaya would be discussed in joint study meeting.
- c) The outcome of joint study would be deliberated in next meeting of NERPCTP.

22. N-1 reliability requirement at Zuangtui, Mizoram

22.1. Director (PSPA-II), CEA stated that in accordance with ToR-I of the committee i.e. quarterly review of the transmission system (at Agenda-6), a meeting was held on 17.08.2020 to discuss non-compliance of N-1 reliability requirement in NER. In that meeting, it was deliberated that connectivity of Zuangtui and Champai need to be strengthened. Accordingly, it was agreed that this issue of intra-state strengthening of transmission system in Mizoram would be included as part of agenda in this NERPCTP meeting.

22.2. Representative of Power & Electricity Department, Mizoram proposed following intr-state transmission system to make a ring main of 132kV in the state and ensure N-1 compliance :

- i) 132kV Substations proposed under 10% GBS:
 - a. Khawzawl
 - b. Lawngtlai
- ii) 132kV S/c Lines proposed under 10% GBS:
 - a. Tuirial HEP-Bawktland (Kolasib)

- b. Marpara-Thenhlum
- c. Bukpui-Hnahthial
- d. Hnahthial-Sangau
- e. Sangau-Saiha
- f. Saiha-Lawngtlai
- g. Lawngtlai-S.Bungltang

iii) Additional 33kV S/c lines proposed under 10% GBS:

- a. Tuirial-Sakawrdai
- b. Sakawrdai-Darlawn
- c. Ngopa-Hnahlan
- d. Hnahlan-Champai

22.3. Chief Engineer (PSPA-II), CEA stated that the 10%GBS proposal of Mizoram has been received in CEA via MoP and CEA had requested some information on the proposal. As the proposal involves funding, Mizoram may send proposal related to funding to MoP. However, for system requirement related aspects, Mizoram may furnish the details directly to CEA.

He added that CEA is receiving many transmission scheme proposals from the North-eastern states. However, these proposals are not supported by system studies reports which leads to delay in assessing the proposals. He proposed that NERPC and NERLDC may take steps to improve system study capability of NER states.

22.4. After deliberations, following were agreed:

(4.i) P&E Deptt, Mizoram will furnish following information to CEA:

- (a) Present load at the existing S/s,
- (b) Expected loads at the proposed substations,
- (c) Details of the new lines proposed such as conductor type, line lengths, voltage level etc.
- (d) Load flow studies,
- (e) Grid Map depicting the existing and the proposed system.

(4.ii) NERPC and NERLDC may organizing workshops for enhancing system study capabilities of North Eastern States.

<p>F. ToR-VI: REVIEW AND FACILITATE CONSTRUCTION OF INTER-REGIONAL GRID STRENGTHNING SCHEME</p>
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23. Under construction inter-regional transmission schemes with NER

23.1. Director (PSPA-II), CEA stated that in the 01st meeting of NERPC-TP held on 08.11.2019, the reconductoring of the following lines were agreed:

a. Reconductoring of Siliguri – Bongaigaon 400kV D/c 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 – under ISTS. The reconductoring will be carried out in accordance with outage permission from ERPC/NERPC/NLDC.

b. Reconductoring of the Alipurduar – Salakati (Bongaigaon) 220kV D/c line with single HTLS (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 – under ISTS

23.2. CTU informed that MoP has allocated the above work of reconductoring of lines under RTM to POWERGRID on 25-09-2020 with implementation schedule of 30 months.

23.3. Members noted the information.

24. Conversion of 132kV bus bar at Imphal & Nirjuli substations and North Eastern Region Strengthening Scheme-IX (NERSS-IX)

24.1. Representative of CTU stated that in the 1st meeting of NERPC-TP held on 08-11-2019, conversion of 132kV level of 400/132kV Imphal and 132/33kV Nirjuli substations to Double Main Transfer bus scheme preferably with Bus Sectionalisation on AIS depending on layout or alternatively on GIS/ Hybrid GIS if layout does not permit AIS Bus sectionalisation was agreed under ISTS. The scheme was also approved in the 3rd meeting of NCT held on 26th& 28th May 2020. Further, MoP has allocated the above work of reconductoring of lines under RTM to POWERGRID with implementation schedule of 30 months.

He also added that implementation of 2 nos. of 132 kV bays at Nirjuli S/s for termination of LILO of one circuit of Pare HEP - North Lakhimpur (AEGCL) 132kV D/c line (with ACSR Zebra) was inter alia part of NERSS-IX scheme agreed in the 6th SCMPSPNER held on 03-10-2016. The work is being carried out by POWERGRID.

24.2. However, after detailed engineering, it was gathered that the above approved 132kV bus conversion works at Imphal and Nirjuli substations could be implemented with following broad scope:

(a) 132kV bus at Imphal 400/132kV S/s

- Conversion/Upgradation of older 132kV bus section and bays (associated with 132/33kV, 2x50MVA ICTs, 1x20MVAr bus reactor, Imphal-Imphal (Manipur) 132kV ckt-1, Imphal-Dimapur 132kV S/c, and Imphal-Loktak 132kV S/c) to Double Main (instead of approved Double

Main Transfer) can be implemented through hybrid GIS due to space constraints.

- Conversion/Upgradation of newer 132kV bus section and bays (associated with 400/132kV, 2x315MVA ICTs, Imphal-Imphal (Manipur) 132kV ckt-2 & ckt-3, and Imphal-Ningthoukhong 132kV D/c) to Double Main (instead of approved Double Main Transfer) would be implemented in AIS. Major details are as below:
 - Upgradation of capacity of existing transfer bus to be used as main bus by replacing the existing twin ACSR Zebra to twin HTLS Zebra (equivalent to quad ACSR Zebra)
 - Imphal-Imphal (Manipur) 132kV ckt-2, which needs to be upgraded from AIS to Hybrid GIS due to layout constraints.
 - 2 no. 145kV circuit breaker associated with 132kV ICT bay for 2x315MVA ICTs to be upgraded from gang operated mechanism to single phase operating mechanism (with new circuit breaker) to meet the layout requirement.
 - Modification in the existing layout to be done by additional structures/hardware/BPI and re-location of LA/CT/CVT/Isolator as per layout requirement
 - Modification of 132kV (C&R) protection system as per the requirement.
 - Upgradation/conversion of 132kV bus section and 132kV line bays owned by Manipur for following lines is also proposed:
 - (a) The 132kV line bay associated with Imphal-Imphal (Manipur) 132kV ckt-3 owned by state.
 - (b) 2 no. 132kV line bays are under construction for termination of Imphal – Ningthoukhong 132kV D/c line, under NERPSIP scheme.

(b) 132kV bus at Nirjuli 132/33kV S/s

- Existing Single Main and Transfer bus can be upgraded to Double Main (in place of earlier agreed Double Main Transfer) through GIS due to space constraints.

24.3. Chief Engineer (PSPA-II), CEA raised apprehension regarding inclusion of detailed engineering aspects such as modification of 132kV (C&R) protection system, in the scope of system planning forum i.e. NERPC (TP).

24.4. POWERGRID requested that due to space constraints, construction of 2 nos. 132kV bays at Nirjuli S/s for termination of LILO of one circuit of Pare HEP - North Lakhimpur (AEGCL) 132kV D/c line may be agreed through GIS.

24.1. POWERGRID informed that implementation of Imphal S/s may be broadly divided into two stages:

- (i) Older stage comprising of older 132kV bus section and bays (associated with 132/33kV, 2x50MVA ICTs, 1x20MVA bus reactor, Imphal-Imphal (Manipur) 132kV ckt-1, Imphal-Dimapur 132kV S/c, and Imphal-Loktak 132kV S/c)
- (ii) Newer stage comprising of newer 132kV bus section and bays (associated with 400/132kV, 2x315MVA ICTs, Imphal-Imphal (Manipur) 132kV ckt-2 & ckt-3, and Imphal-Ningthoukhong 132kV D/c)

Due to space and layout constraint at Imphal S/s, conversion/upgradation of older 132kV bus section & bays to Double Main may be implemented through hybrid GIS and newer 132kV bus section & bays to Double Main may be implemented in AIS (instead of approved Double Main Transfer). Further, Imphal-Imphal (Manipur) 132kV ckt-2 of the new section needs to be upgraded from AIS to GIS due to layout constraints.

24.5. It was suggested that there are three no. of bays owned by States at Imphal substation and feasibility of upgradation of State owned bays under ISTS scheme need to be deliberated in detail.

24.6. After detailed deliberations, following were agreed:

- 1.i) Modification in NERSS-IX: 2 no. 132kV **GIS** bays at Nirjuli S/s for termination of LILO of one circuit of Pare HEP - North Lakhimpur (AEGCL) 132kV D/c line (with ACSR Zebra).
- 1.ii) With respect to upgradation works at Imphal S/s: CTU would furnish details of the issue with CEA. The issue would be discussed in the next meeting of NERPC-TP.

G. CROSS BORDER INTERCONNECTIONS

25. Surajmaninagar (India) – Comilla (Bangladesh) 400kV cross border link:

25.1. Director (PSPA-II), CEA stated that 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

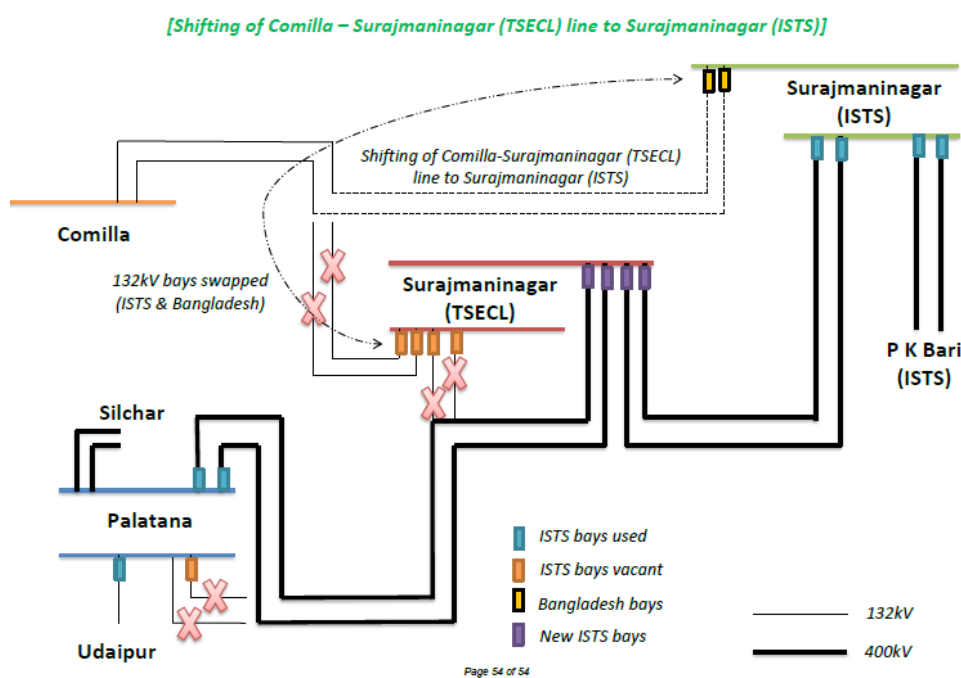
- a) Operation of Surajmaninagar (TSECL) - North Comilia 400kV D/c line (presently operated at 132kV) at 400kV through termination at 400kV bus of Surajmaninagar ISTS S/s - implementation by POWERGRID
- a) 2 nos. 400kV line bays at Surajmaninagar ISTS S/s for termination of Surajmaninagar (TSECL) - North Comilia 400kV D/C line – implementation

by the owner of the Surajmaninagar ISTS substation i.e. NER II Transmission Ltd. an ISTS Transmission Licensee.

- 25.2. Subsequently, in the 17th Indo-Bangladesh JSC/JWG meeting held on 26th August, 2019 in Dhaka, Bangladesh, it was decided that operation of Surajmaninagar-Comilla 400 kV D/c line (presently operated at 132 kV level) at 400kV and the 500 MW HVDC terminal at Comilla would not be required considering technical and financial aspects.
- 25.3. In the 01st meeting of NERPC(TP), it was agreed by all present except TSECL, that Comilla (Bangladesh)-Surajmaninagar (TSECL) 400kV D/c line (operated at 132kV) Cross Border link should be shifted to 400/132kV S/s at Surajmaninagar (ISTS) along with 2 no. 132kV line bays at Surajmaninagar (ISTS), as ISTS scheme. However, this work would be scheduled for completion in April 2021 i.e. after expiry of existing contract of Tripura for sale of power to Bangladesh.
- 25.4. The scheme was also put up for discussion in the 3rd meeting of NCT held on 26th -28th May 2020. NCT directed for re-deliberation of scheme in NERPC-TP.
- 25.5. TSECL stated that as Bangladesh will continue to draw power at 132kV level, shifting of line to Surajmaninagar (ISTS) would lead to incur of additional cost. He proposed to continue the present transmission configuration from 132kV Surajmaninagar (TSECL) S/s as 132kV Surajmaninagar (TSECL) S/s will be upgraded to 400/132kV and it is connected to all the major generating sources i.e. Palatana, Monarchak, Rokhia, Baramura, NEEPCO RC Nagar. Bangladesh power evacuation will be more efficiently and reliably be maintained from 132kV Surajmaninagar (TSECL) S/s rather 400/132kV Surajmaninagar (ISTS) S/s.
- He also informed that State government had applied to MoP to extend Power Sale Agreement between TSECL and BPDB for a period of further 05 years from March 2021.
- 25.6. Chief Engineer (PSPA-II), CEA stated that 400/132kV Surajmaninagar (ISTS) is also a very strong point connected to Palatana, and also to Silchar via P.K. Bari so as to supply power to Comilla (Bangladesh) on a continuous basis and even if the requirement of Bangladesh reaches more than 160MW in future, that can be met as well. He added that Surajmaninagar-Comilla cross border line was implemented by POWERGRID. Moreover, alongwith TSECL, any other state can also supply power to Bangladesh if the interconnection is from an ISTS S/s without additional burden of Tripura state transmission charges.
- 25.7. Representative of Meghalaya stated that as the cross border power exchange between two countries is guided by the rules of CBTE-Guidelines of MoP, the load dispatch should be in the control of NLDC and the interconnection with Bangladesh should be from an ISTS point. He further stated that connecting with ISTS will create level playing field for all the states. Whereas, if this cross

border link remains connected with Tripura system, other states will be at disadvantage and will have to pay additional charges for open access to Tripura for its state transmission system, for cross border trading of power with Bangladesh. This was supported by other states also except Tripura.

- 25.8. NERPC informed that the issue had been discussed in several forums of NERPC. The opinion of NER constituents was always that the interconnection for cross border power exchange should be from an ISTS point.
- 25.9. Considering the views of the states and the fact that connecting Comilla with ISTS will not only create level playing field for all states who want to export their surplus power but also brings the cross border link in the jurisdiction of NERLDC/NLDC, it was agreed to shift Comilla (Bangladesh) interconnection at Surajmani Nagar (ISTS). However, to save the interest of TSECL Tripura, it was also decided that this shifting will be carried out after expiry of present contract (i.e. March 2021) of export of 160 MW from Tripura to Bangladesh. The scheme of shifting is depicted below:



26. Katihar (Bihar) – Parbotipur (Bangladesh) – Bornagar (Assam) 765kV D/c line

- 26.1. Director (PSPA-II), CEA stated that in the 6th meeting of Standing Committee on Power System Planning of NER held on 03-10-2016, Katihar (Bihar) – Parbotipur (Bangladesh) – Bornagar (Assam) 765kV D/c line (initially operated at 400kV) along with HVDC back-to-back at Parbotipur (2x500MW, 1x500MW with 400kV operation and 2nd 1x500MW with 765kV operation) was agreed.

- 26.2. The issue was discussed in the 8th meeting of India-Bangladesh JTT-T held on 15-12-2019 & 06-03-2020. In the 18th meeting of JSC on India-Bangladesh Cooperation in Power Sector held on 07th March 2020, it was mentioned that *“India would like to go ahead with the financing and construction of the entire 765kV D/C Katihar (India) – Parbotipur (Bangladesh) – Bornagar (India) cross border link. The Bangladesh side may synchronize through this link at Parbotipur at an appropriate time as suggested by JWG for drawal of power. Bangladesh side welcomed the proposal of India’s financing and construction of the 765 kV D/c lines”*.
- 26.3. Chief Engineer (PSPA-II), CEA requested CTU to present the system study for this link.
- 26.4. CTU informed that in the studies two extreme scenarios of NER i.e. High Hydro with off peak demand in NER and Low Hydro with peak demand in NER for the period of 2024-25 have been considered. Major transmission lines of ER-NER and power flow on them have been plotted. In the base case, no link of Katihar-Parbotipur-Bornagar line is considered. In the case of high hydro, a flow of 1000MW from NER to ER via 765kV D/C Katihar (India) – Parbotipur (Bangladesh) – Bornagar (India) cross border link is observed with NER being surplus of about 2500MW.
- In case of Low Hydro with NER being power deficit of around 3000MW, power flow of about 1400MW from ER to NER via 765kV D/C Katihar (India) – Parbotipur (Bangladesh) – Bornagar (India) cross border link is observed.
- 26.5. Chief Engineer (PSPA-II), CEA observed that
- For low hydro case: Circulation of power flow between the two regions i.e. NER, ER was observed from the studies as 1000MW is supplied from NER to other regions, and 1400MW is fed back to NER via 765kV D/C Katihar (India) – Parbotipur (Bangladesh) – Bornagar (India) cross border link. He further informed that power imported from Phunasangtu and Jigmeling in Bhutan to India at Alipurduar could be fed back to NER via AC lines as there is a sink in NER in low hydro case. Further, the line flows depicted in BnC-Alipurduar and Alipurduar-Agra is 1000MW wherein the capacity is of 6000MW. 765kV D/C Katihar (India) – Parbotipur (Bangladesh) – Bornagar (India) cross border link may get justified for about 500MW only.
- For High Hydro case: 765kV D/C Katihar (India) – Parbotipur (Bangladesh) – Bornagar (India) cross border link may carry only 20-30 MW, if HVDC systems are optimised to carry about 2500MW from BnC.
- 26.6. POSOCO stated that, the assessment of surplus/shortage of NER need to be reconciled. NERLDC expressed that another 400kV entry point of Bornagar in North Eastern states will be crucial and helpful in system operation.

26.7. Thus, from the above studies, which have considered no drawal of power by Bangladesh, it is seen that there will not be much flow of power for benefit of NER. However, as 765kV D/C Katihar (India) – Parbotipur (Bangladesh) – Bornagar (India) cross border link is a strategic link, further studies need to be carried out.

26.8. NER states and NERPC expressed the following :

- i) Strategically this link is very important.
- ii) However, there should not be any financial implication on NER states.
- iii) They proposed that Central Government may consider construction of this link from their funds.

26.9. It was decided to appraise MoP, accordingly.

ToR IV– REVIEW OF UPSTREAM AND DOWNSTREAM NETWORK

27. Under-utilization of 2x160MVA, 220/132kV ICTs at Balipara

27.1. Representative of CTU stated that in the joint Standing Committee Meeting of ER and NER, held on 03-01-2014, replacement of existing 2x50MVA, 220/132kV ICTs (one owned by AEGCL and other owned by NEEPCO) by 2x160MVA, 220/132kV ICTs at Balipara 400/220/132kV sub-station of POWERGRID along with replacement of 132 kV equipment was agreed. The same has been commissioned in Sep'17 and Apr'20. These augmentation were carried out to feed the growing demand in the load centres of Khupi (Arunachal), Depota/Ghoramari (Assam) and Sonabil/Gohpur (Assam).

27.2. In the Joint study meeting regarding intrastate proposals of Assam held on 09-09-2020, AEGCL informed that they were not able to serve their increasing demand due to congestion in the ICTs. Accordingly, AEGCL had removed their 132kV lines from Balipara S/s by bypassing the Sonabil – Balipara 132kV line with Balipara - Ghoramari 132kV line to form Sonabil – Ghoramari 132kV line (Schematic enclosed). The same was approved in the OCC meeting of NERPC.

27.3. Due to the above rearrangement, the only drawal line available at 132kV level of Balipara substation is Balipara – Khupi 132kV line. The power flow on this line is in the range of 15-20MW. Therefore, the augmentation of transformation capacity at Balipara substation is of no use at present and is a waste of national resource. He requested Assam to plan their intra-state proposal so that underutilization of ICTs could be avoided

- 27.4. NERLDC informed that the above issue had been deliberated in OCC meetings of NERPC. He proposed LILO of Sonabil – Balipara 132kV line at Depota 132kV S/s. That may solve the problem of underutilization of ICTs.
- 27.5. Director (PSPA-II), CEA opined that at agenda item – 15 above, intra-state transmission system proposals of Assam have been agreed to be discussed in Joint system study, the issue may also be discussed there.
- 27.6. After detailed deliberations, it was agreed that the issue of under-utilization of ICT at Balipara would be discussed in the joint system study meeting.

28. Bay rearrangement at 132/33kV Sihhmui S/s

- 28.1. Representative of CTU stated that in the 3rd Meeting of Standing Committee on Power System Planning of North Eastern Region held on 21-12-2011, it was decided that POWERGRID would implement Melriat (PG) – Sihmui (Mizoram) 132 kV D/C line alongwith bays at both ends matching with the commissioning of Sihmui substation of Mizoram under Palatana – Bongaigaon Transmission Scheme for delivery of Mizoram's share from Palatana GBPP. The same was commissioned in May'17.

P&E Deptt, Mizoram expressed their concern that terminating the subject line in the bays constructed by POWERGRID at Sihmui sub station would obstruct entry of other proposed lines (of State deptt.) in to the switchyard.

Based on the mutual discussion between POWERGRID and P&E Dept. Govt of Mizoram, the following was agreed:

- i. P&E Deptt. would utilize the 02 (two) nos bays constructed by POWERGRID for their use.
 - ii. P&E Deptt. Mizoram would construct 02 (two) nos bays for the use of POWERGRID's Melriat(PG) – Sihmui (state) 132 kV D/c Line
 - iii. Untill the new bays are constructed, POWERGRID would temporarily use the two existing bays of Mizoram, originally meant for their Melriat and Luangmual Lines.
- 28.2. Representative of Mizoram informed that the as per the above agreement, 02 (two) nos bays was to be constructed by POWERGRID. However, the same has not been constructed and POWERGRID approached CERC for determination of tariff of the same. Mizoram did not accept the CoD and disputed the case in CERC. Later on, this temporary agreement given above was mutually agreed. However, POWERGRID was requested to expedite the construction works so that permanent arrangement is reached upon.
- 28.3. POWERGRID stated that they had constructed the 02 nos. of bays at Sihmui 132kV S/s as per the schedule. There will be many crossings involved for the lines constructed by Mizoram, If Melriat-Sihmui 132kV D/c line is to be terminated at the assigned bays. On the request of Mizoram, Powergrid used

bays of other side of the Sihmui S/s vis-à-vis the assigned bays, so as to avoid crossing of lines. Mizoram will make two new bays for Powergrid lines, and as a temporary measure, existing bays have to be utilized.

As the lines of POWERGRID as well as the bays were ready, they approached CERC to claim the tariff. Mizoram was also present in CERC hearing. Mizoram informed that their substation would be ready in another four months. Accordingly, CERC released the Orders after four months for claiming the tariff i.e. by Dec-19.

In the last OCC meeting of NERPC, Mizoram requested to postponement of CoD of Melriat (PG) – Sihmui (Mizoram) 132 kV D/C line.

- 28.4. Chief Engineer (PSPA-II), CEA stated that the dispute is of commercial nature and commercial matters are not covered under ToR of this committee.
- 28.5. Members agreed with the views of Chief Engineer (PSPA-II), CEA. Further, POWERGRID and P&E Deptt. Mizoram were requested to mutually settle the issue.

ToR-V: EXAMINE AND EVALUATE INTRA-STATE PROPOSALS
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29. Restoration of Kopili Substation:

29.1. NERPC stated that in the 168th OCC meeting the ownership of bays were confirmed and agreed with NEEPCO as per the following:

I. POWERGRID Ownership -

- a.i.1. 220kV ICT-II (existing) Bay incl. 160MVA 220/132kV Transformer
- a.i.2. 132kV ICT-II (existing) Bay
- a.i.3. 132kV Khandong-I Bay
- a.i.4. 132kV Khandong-II Bay

II. NEEPCO Ownership:

- 1. 220kV Generator-I Bay
- 2. 220kV Generator-II Bay
- 3. 220kV Generator-III Bay
- 4. 220kV Generator-IV Bay
- 5. 220kV Misa-I Bay*
- 6. 220kV Misa-II Bay*
- 7. 220kV Misa-III Bay*
- 8. 220kV Bus Coupler Bay
- 9. 132kV Station Service Transformer Bay (to be converted to GIS) including 5MVA, 132/33kV Transformer

* Ownership of only PLCC Panels of these feeders are with POWERGRID.

29.2. Apart from the above, ownership of following bays, ownership of which was with NEEPCO earlier shall now be with POWERGRID after replacing of equipment and commissioning (under NERSS-III scheme):

- a.i.1. 220kV ICT-I (new) Bay incl. 160MVA 220/132/33kV Transformer
- a.i.2. 220kV ICT-I (new) Bay

29.3. Further, ownership of all 132kV GIS Bays being installed under NERSS-III scheme shall be with POWERGRID.

29.4. NERPC also stated that during 168th OCC meeting it was further informed that with normal AIS, one 220kV line, one 132kV line and one 160MVA ICT can be restored within 90 days i.e.3 months period i.e by Nov'20. POWERGRID also informed that possibility of hiring one Mobile 220kV GIS Bay and one Mobile 132 kV GIS Bay for temporary restoration was also explored. However, the modular GIS would entail an expenditure of INR 8.04 Cr and would be completed in a timeframe of 6months including supply and installation. After detailed deliberation the forum considering the importance from grid perspective and urgency of the restoration, approved in-principle restoration via AIS.

29.5. NERPC requested for the following:

a.i.i) Temporary restoration of Khangdong-Kopili-Misa Link by energizing the following:

- a. 1 no of 132kV line along with Bay
- b. 1 no of 220kV line along with bay
- c. 1 no of 160MVA ICT

Considering the present Covid-19 travel restriction, the completion period for above temporary arrangement may be considered as Jan'21.

a.i.ii) Permanent restoration Plan:

Restoration of both AIS and GIS bays (GIS bays is under NERSS-III).

Tentative Time period: July'2022

a.i.iii) Estimated cost (SI No: 1 + SI No: 2)

(a)AIS Part (restoration due to damages for devastation in Kopili HEP in October, 2019):

Electrical equipment and associated works: INR 674.52 lakhs

Civil works: INR 104.094 lakhs

(b)GIS Part (for damaged portions due to devastation in Kopili in October, 2019): yet to be ascertained.

(c)All the cost to be incurred (as per actual expenditure) against Temporary and Permanent restoration (including AIS and GIS) are to be realized under PoC mechanism

29.6. Chief Engineer (PSPA-II), CEA stated that this issue of temporary as well as permanent arrangement as proposed by NERPC are regarding restoration of existing element and not for planning of new element. As such, these are not covered under ToR of NERPCTP.

29.7. Members agreed with the views expressed by Chief Engineer (PSPA-II), CEA and decided to drop the agenda item.

30. Special Protection Scheme in NER

30.1. NERPC stated that presently numerous SPSs are in operation in NER for N-2 contingency. Amongst these for all SPSs except 2 (TWO) Nos. transmission infrastructure have already been approved by SCM which are in various stages of implementation. Subsequent to the completion of the projects these SPSs designed for N-2 shall be decommissioned.

He proposed for planning of following additional SPS:

SPS Contingency	SPS Contingency	Remarks
When any one of 132 kV Umiam Stg-I to Umiam Stg-III D/C line trips)	Load shedding of about 30 MW near Umiam. Revised scheme is under implementation	Reconductoring of 132 kV Umiam I – Umiam III D/C with HTLS conductor may be planned
Tripping of both 400 kV BgTPP – Bongaigaon I & II lines (D/C)	The scheme will reduce BgTPP Generation to 600 MW and is under implementation	Additional 400kV evacuation path from BgTPP may be planned.

30.2. Chief Engineer (PSPA-II), CEA stated that the as proposed by NERPC are of grid operation and not for planning of new element. As such, these are not covered under ToR of NERPCTP.

30.3. Members agreed with the views expressed by Chief Engineer (PSPA-II), CEA and decided to drop the agenda item.

31. LILO of 400 kV D/C Silchar-Byrnihat along with 400/220 kV 2x315 MVA, 220/132 kV 2x160 MVA substation at Mynkre, Meghalaya

31.1. Representative of MePCL, Meghalaya stated that 400 kV D/C Silchar - Bymihat line is within 2 km distance from the Mynkre substation. The 132/33kV, 2x50 MVA Substation at Mynkre, East Jaintia Hills District under construction is expected to be completed within 1 (one) year depending on settlement of RoW issues. The substation is a part of the NERSIPS funded by World Bank and being executed by Powergrid.

31.2. As per the Scheme, the substation will be connected initially by LILO 132 kV D/C Myntdu-Leshka HEP (126 MW)-132 kV Khliehriat Line at Mynkre. After the commissioning of the Substation, the following existing/new 132 kV Lines will be connected to the Substation:

a.i.i) 132 kV Lumshnong Substation;

- a.i.ii) 132 kV Amrit Cement Industries Limited with a connected load of 10 MW
 - a.i.iii) 132 kV Hills Cement Limited with a connected load of 10 MW
 - a.i.iv) 132 kV Green Valliey Industries Limited with a connected load of 10 MW
 - a.i.v) 132 kV Gold Stone Cement Limited with a connected load of 10 MW
 - a.i.vi) 132 kV Meghalaya Cement Limited with a connected load of 10 MW and future enhancement of 27.0 MW
- 31.3. The 220 kV D/C line for power evacuation from the Myntdu-Leshka HEP Stage-II project (210 MW) to be executed by Meghalaya Power Generation Corporation Limited (MePGCL) is proposed to be connected at Mynkre substation.
- 31.4. Other Hydel Project that are in the planning stage are Umngot (210 MW) allotted to JP Pvt. Ltd. and Selim (80 MW) allotted to MePGCL are proposed to be connected with Mynkre substation.
- 31.5. Further, the State of Meghalaya has directed MePTCL to augment and strengthen the lines and substation at Bangladesh border for providing transmission corridor and exporting of surplus hydel power to Bangladesh. In this regard, a survey for 220 kV D/C Line from Mawphlang to Cherra and 220 kV Line on 400 kV towers to be charged initially at 220 kV from Cherra -Ichamati along with construction of 400/220 kV 2 x 316 MVA Substation at Ichamati for exporting of power to Bangladesh (Bangladesh border) which is very near to Chattah and Sylhet load centre of Bangladesh.
- 31.6. The 220 kV DIC Line from Nangalbibra (POWERGRID) to Mawphlang agreed in the 1st meeting of North Eastern Region Standing Committee on Transmission (NERSCT) for planning of Transmission to be taken by MePTCL as intra-state lines is proposed to be constructed on 400 K towers from Nangalbibra (POWERGRID) to (Cherra to be charged initially at 220 kV. The Lines will provide 400 kV connectivity from Bogaigoan through Nagalbibra to Ichamati whenever the line from Bogaigoan to Nagalbibra is charged at 400 kV.
- 31.7. Further, construction of 400 kV D/C Line from Ichamati to Mynkre is also proposed for the strengthening the 400 kV network for reliability and exporting of power to Bangladesh.
- 31.8. Chief Engineer (PSPA-II), CEA stated that CEA did not have any information about the details of the generation plants planned by MePTCL in southern part of Meghalaya. He requested MePTCL to share the details of generating plants i.e. timeline/expected commissioning schedule, capacity, location etc. to CEA. After receipt of these details, decision regarding 400kV transmission system would be taken. In case, Meghalaya is planning to inject state owned generation through ISTS (as proposed by MePTCL), they will need to apply for

LTA. Regarding, proposal of Meghalaya for exporting power to Bangladesh, he informed that any import/export of power and planning of links would be governed by Guidelines on Import/Export (Cross Border) of Electricity-2018 issued by MoP, Gol.

31.9. After detailed deliberations, following was agreed :

- a) MePTCL, Meghalaya would furnish Substation-wise load growth demand in Meghalaya and Details of generating sources planned in 4-6 years of timeframe i.e. timeline, capacity, location etc. to CEA within 15 days.
- b) The proposal of Meghalaya would be discussed in joint study meeting.
- c) The outcome of joint study would be deliberated in next meeting of NERPCTP.

32. LILO of 400 kV D/C Silchar -Byrnihat along with 400/220kV 2x315 MVA, substation at New Shillong, Meghalaya

32.1. Representative of MePCL, Meghalaya stated that the 400 kV DC Silchar Byrnihat line within 5 km distance from the New Shillong substation. The 220/132 kV, 2 x 160 MVA, 132/33kV, 2x50 MVA Substation at New Shillong, East Khasi Hills District under construction is expected to be targeted to be completed by December 2020 year depending on settlement of RoW issues. The substation is a part of the NERSIPS funded by World Bank and being executed by POWERGRID.

As per the Scheme, the substation will be radially connected by the 220 kV D/C Mawngap New Shillong Line targeted to be completed by December 2020 year depending on settlement of RoW issues. Construction of 400 kV Line In Line Out (LILO) of Silchar -Byrnihat at New Shillong and construction of 400/220 kV 2 x 316 MVA Substation at New Shillong for strengthening the 440 & 220 kV network of the state and to meet the increasing load demand and to provide reliability power supply to Shillong as well as enhancing power export to Bangladesh.

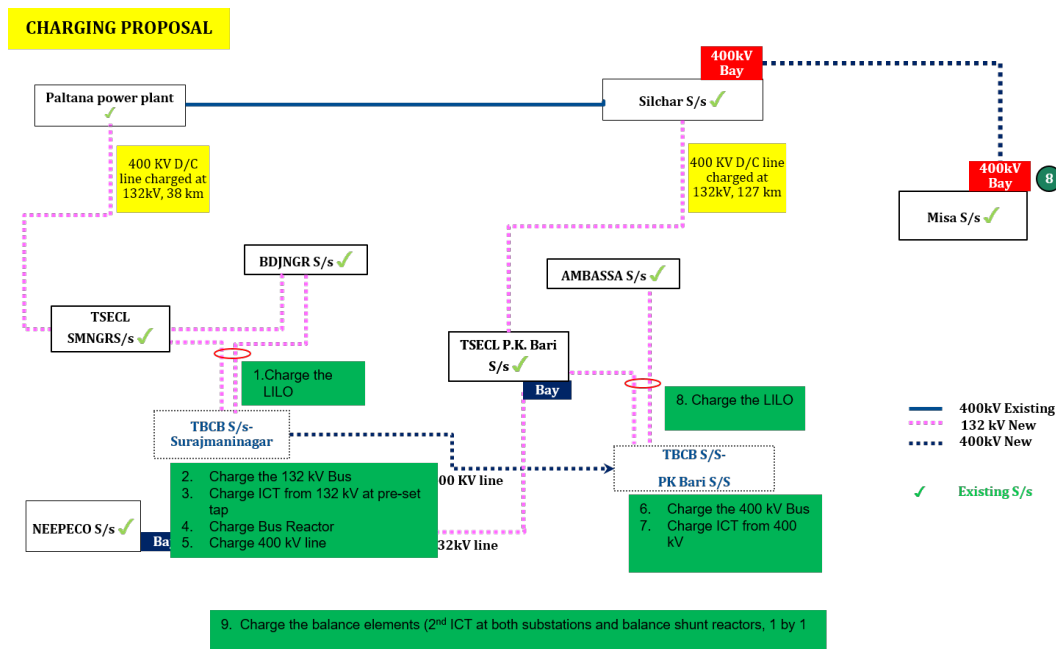
32.2. After detailed deliberations, following was agreed :

- a) MePTCL, Meghalaya would furnish Substation-wise load growth demand in Meghalaya and Details of generating sources planned in 4-6 years of timeframe i.e. timeline, capacity, location etc. to CEA within 15 days.
- b) The proposal of Meghalaya would be discussed in joint study meeting.
- c) The outcome of joint study would be deliberated in next meeting of NERPCTP.

33. Charging of elements under NER System Strengthening Scheme-II (Part-B) and V being executed in the state of Tripura

33.1. Director (PSPA-II), CEA stated that NER System Strengthening Scheme-II (part B) and V is being implemented by NER-II Transmission Limited (Sterlite Power). This scheme inter-alia includes construction of 400/132kV sub-station at Surajmaninagar, 400/132kV sub-station at P.K. Bari and 400 kV Transmission Line connecting Surajmaninagar and P.K. Bari in the state of Tripura. He added that NTL has informed CEA construction of these elements are in advance stage and shall be ready for charging by 15th October, 2020 (Schedule CoD for their scheme was July, 2020). The works of shifting to 400kV Silchar – P.K. Bari D/C line to 400/132kV sub-station at P.K. Bari ISTS and shifting of Paltana – Suranmaninagar 400 kV D/C line to 400/132kV sub-station at Surajmaninagar ISTS are being implemented by POWERGRID and expected to be ready by December, 2020.

33.2. He also stated that NTL had proposed to CEA that in the absence of Paltana – Surajmaninagar and Silchar – P.K. Bari 400 kV lines, their elements i.e. 400/132kV Surajmaninagar substation, 400/132kV P.K. Bari sub-station and Surajmaninagar - P.K. Bari 400 kV D/C line can be charged from 132kV side till commissioning of works by POWERGRID between 15th October, 2020 to December, 2020. The proposal of charging is depicted below:



33.3. Chief Engineer (PSPA-II), CEA stated that a meeting with officials from NERPC, CTU POWERGRID, NERTS POWERGRID, NLDC, NERLDC, TSECL AND Sterlite Power was held on 18.09.2020 to discuss the issue, in which it was agreed that charging can be done, if supported by studies. He requested NERLDC to present the studies.

33.4. Representative of NERLDC stated that with charging of elements by NTL by 15th October, till the works of shifting 132kV Palatana-Surajmaninagar(TSECL) to 400/132kV Surajmaninagar (ISTS) is not completed (expected to complete by December-2020), the proposal of NTL is feasible. The study results are as below:

i) For period 15th October to December, 2020:

- a) From the studies it is seen that 400/132 kV SM Nagar (ISTS) substation, 400/132 kV PK Bari (ISTS) substation, 400 kV SM Nagar (ISTS) – PK Bari (ISTS) D/C, LILO at 132 kV SM Nagar (ISTS) and LILO at 132 kV PK Bari (ISTS) can be kept charged.
- b) However, the 2x 125 MVAR 420 kV Bus Reactors at SM Nanar (ISTS) substation and 2x 125 MVAR 420 kV Bus Reactors at PK Bari (ISTS) substation need not be kept charged until 400 kV Palatana – SM Nagar (ISTS) D/C and/or 400 kV Silchar – PK Bari D/C are charged, as low voltage is observed when the reactor(s) is/are charged.

ii) After December 2020: Major observations are given below:

- a) It is seen that 132 kV SM Nagar(ISTS) – SM Nagar(TSECL) line is loaded to its thermal loading even during normal loads of Tripura and Bangladesh Power System. Also, during N-1 contingency of 132 kV SM Nagar (ISTS) – SM Nagar (TSECL) line, 132 kV SM Nagar (ISTS) – Bodhjungnagar line is seen to be overloaded which may further lead to cascading tripping in Tripura Power System.

Therefore, it is suggested that the entire remaining stretch of 132 kV SM Nagar (ISTS) – SM Nagar (TSECL) line and 132 kV SM Nagar (ISTS) – Bodhjungnagar (TSECL) line are to be replaced by HTLS ACSS conductor to avoid the load restriction of Tripura and Bangladesh Power System

- b) It is necessary that the entire remaining stretch of 132 kV PK Bari (ISTS) – PK Bari(TSECL) line and 132 kV PK Bari(ISTS) – Ambassa(TSECL) line are replaced by HTLS ACSS conductor
- c) It is understood that a 2nd circuit of 132 kV Palatana – Udaipur line is planned to be constructed utilizing the 132 kV Bay at Palatana that will be available after upgradation of 132 kV Palatana – Suramaninagar line to 400 kV level. The same may be expedited.

33.5. After detailed deliberations, the following were agreed:

- i) 400/132 kV SM Nagar (ISTS) substation, 400/132 kV PK Bari (ISTS) substation, 400 kV SM Nagar (ISTS) – PK Bari (ISTS) D/C, LILO at 132 kV SM Nagar (ISTS) and LILO at 132 kV PK Bari (ISTS) can be charged without bus reactors, for period 15th October to December, 2020.

- ii) For such charging, instructions will be given by NERLDC in accordance with the Regulations/Code of CERC, as applicable.
- iii) TSECL should also expedite the works as agreed at para-8.20 above.

ToR III- APPLICATIONS FOR CONNECTIVITY AND ACCESS

34. Connectivity application for Dibang HEP (12x240MW) of M/s NHPC Ltd.

33.1 Representative of CTU stated that connectivity application no. 1200002802 for 2880MW for Dibang HEP in Arunachal Pradesh by M/s NHPC Limited was received on 10.08.2020 in accordance with CERC Connectivity Regulation, 2009 & Detailed Procedure and seeking connectivity from 31.05.2029.

33.2 It was observed that presently, there is no 400kV (or higher voltage level) substation in Arunachal Pradesh close to Dibang HEP. Considering the future hydro projects in nearby areas of Arunachal Pradesh, new pooling station and the connectivity lines for Dibang HEP may be constructed under ISTS. Accordingly, after detailed analysis two alternatives for pooling of power from the generation project have been studied viz. pooling power at Silapathar (about 160km away), and Gogamukh (about 215km away). The tentative location of Dibang HEP, the pooling points and existing 400kV ISTS points are shown in the map below:

Map for Dibang (2880MW), NHPC



33.3 CTU presented the brief details of the proposed transmission system alternatives as given below:

Alternative-1	Pooling at Silapathar (through ISTS line)
By NHPC	<ul style="list-style-type: none"> ● 4 no. 400kV line bays at Dibang, for Dibang – Silapathar 2xD/c lines <ul style="list-style-type: none"> ➤ 4x63MVAr switchable line reactors at Dibang end of Dibang – Silapathar 400kV 2xD/c (Quad) line, one in each circuit ● 2x125MVAr (420kV) bus reactors along with bays at Dibang ● Space for future expansion: <ul style="list-style-type: none"> ➤ Additional 400kV line bays (along with space for switchable line reactor) / Bus reactors: 4 no.
Under ISTS	<ul style="list-style-type: none"> ● Silapathar 400/220kV, 2x500MVA S/s <ul style="list-style-type: none"> ➤ 8 no. 400kV line bays <ul style="list-style-type: none"> ❖ 4 no. for Dibang - Silapathar 2xD/c lines ❖ 2 no. for Silapathar - Biswanath Chariali D/c line ❖ 2 no. for Silapathar - Lower Subansiri D/c line ➤ 420kV, 2x125MVAr bus reactor along with bays ● Dibang - Silapathar 400kV 2xD/c (Quad) line: about 2x160km ● Silapathar - Biswanath Chariali 400kV D/c (Quad) line: about 230km <ul style="list-style-type: none"> ➤ 2x63MVAr switchable line reactors at Silapathar end, one in each circuit ➤ 2x63MVAr switchable line reactors at Biswanath Chariali end, one in each circuit ● Silapathar-Lower Subansiri 400kV D/c (Quad) line: about 55km ● 2 no. 400kV line bays at Biswanath Chariali for Silapathar -Biswanath Chariali D/c line ● 2 no. 400kV line bays at Lower Subansiri for Silapathar - Lower Subansiri D/c line
Alternative-2	Pooling at Gogamukh (through ISTS line)
By NHPC	<ul style="list-style-type: none"> ● 4 no. 400kV line bays at Dibang, for Dibang – Gogamukh 2xD/c lines <ul style="list-style-type: none"> ➤ 4x63MVAr switchable line reactors at Dibang end of Dibang –Gogamukh 2xD/c lines, one in each circuit ● 2x125MVAr (420kV) bus reactors along with bays at Dibang ● Space for future expansion:

	<ul style="list-style-type: none"> ➤ Additional 400kV line bays (along with space for switchable line reactor) / Bus reactors: 4 no.
Under ISTS	<ul style="list-style-type: none"> • Gogamukh 400/220/132kV, 2x500MVA + 2x200MVA <ul style="list-style-type: none"> ➤ 8 no. 400kV line bays <ul style="list-style-type: none"> ❖ 4 no. for Dibang – Gogamukh 2xD/c lines ❖ 2 no. for Gogamukh – Lower Subansiri D/c line ❖ 2 no. for Gogamukh – Biswanath Chariali D/c line ➤ 420kV, 2x125MVA bus reactor along with bays ➤ 4x63MVA switchable line reactors at Gogamukh end of Dibang – Gogamukh 400kV 2xD/c lines, one in each circuit ➤ 2x80MVA switchable line reactors at Gogamukh end of Gogamukh – Biswanath Chariali 400kV D/c line, one in each circuit • Dibang – Gogamukh 400kV 2xD/c (Quad) line: about 2x215km • Gogamukh – Lower Subansiri 400kV D/c (Quad) line: about 18km • Gogamukh – Biswanath Chariali 400kV D/c (Quad) line: about 175km • 2 no. 400kV line bays at Lower Subansiri for Gogamukh – Lower Subansiri D/c line • 2 no. 400kV line bays at Biswanath Chariali for Gogamukh – Biswanath Chariali D/c line

33.4 In the 2nd meeting of NERSCT held on 08.11.2019, it was agreed to establish new 400kV substation at Gogamukh and Biswanath Chariali (POWERGRID) – Gogamukh 400kV D/c (Twin Moose) line by AEGCL under intra-state transmission scheme by 2022. Subsequently, in joint study meeting held on 09.09.2020 through video conference, it was discussed that the connectivity of 400kV Gogamukh substation may be provided by LILO of one D/c of Biswanath Chariali (POWERGRID) – Lower Subansiri 400kV 2xD/c (Twin Lapwing) line at Gogamukh (Gogamukh substation to be implemented by AEGCL under intra-state scheme and LILO to be implemented under ISTS). In view of ISTS lines terminating at Gogamukh S/s, it is proposed to grant Connectivity of 2880MW to M/s NHPC Ltd. for its Dibang HEP through transmission system proposed under Alternative-2 above.

33.5 Upon grant of Connectivity, M/s NHPC Ltd. need to sign requisite agreements and provide applicable Bank Guarantee for taking up implementation of immediate evacuation system under ISTS. Further they also need to sign

requisite Connection Agreements prior to physical interconnection with ISTS grid, failing which the Connectivity shall be liable for closure/cancellation.

- 33.6 After detailed deliberations, it was agreed that the connectivity to Dibang HEP may be granted at its switchyard. However, the transmission systems to evacuate the power suggested by CTU would be discussed in the joint system study meeting.

ANNEXURE-I**List of Participants to the 2nd meeting of North Eastern Regional Power Committee (Transmission Planning)****CEA:**

1. Sh. Prakash Mhaske, Chairperson/Member(PS-Additional Charge)
2. Sh. Pardeep Jindal, Chief Engineer (PSPA-II)
3. Sh. B.S. Bairwa, Director (PSPA-II)
4. Sh. S.K. Dotan, Deputy Director (PSPA-II)
5. Sh. Deepanshu Rastogi, Assistant Director-I (PSPA-II)

NERPC:

1. Sh. B. Lyngkhoi, SE
2. Sh. S.M. Aimol, SE
3. Sh. Srijit Mukherjee, EE

POWERGRID:

1. Dr. Subir Sen, COO (CTU)
2. Sh. Ashok Pal, CGM (CTU)
3. Sh. R. K. Tyagi, CGM (I/c) NERTS
4. Sh. U Kakati, CGM(AM), NERTS
5. Sh. Prasanta Kanungo, Sr. GM (NERTS)
6. Sh. Rajesh Kumar, GM (CTU)
7. Sh. Manish Ranjan Keshari, Manager (CTU)
8. Sh. Shyam Sunder Goyal, Manager (CTU)
9. Sh. Anupam Kumar, Dy. Manager (CTU)
10. Sh. Dwaipayan Sen, Dy. Manager (CTU)
11. Sh. Abhilash Thakur, Engineer (CTU)

POSOCO/NERLDC:

1. Sh. S.R. Narasimhan, Director (SO)
2. Sh. S.C. De, GM (SO)
3. Sh. Rajib Sutradhar, CGM (SO)
4. Sh. R.K. Porwal, Sr. GM (SO)
5. Sh. Priyam Jain, Dy. Manager (SO)
6. Sh. Palash Jyoti Borah, Dy. Manager (SO)
7. Sh. Sachin Kumar Singh, Dy. Manager (SO)

AEGCL, Assam:

1. Sh. P.K. Sakia, CGM, PP&D
2. Sh. G.K. Bhuyan, DGM
3. Sh. B. Bora, DGM, SLDC
4. Sh. S.M. Singha, DGM, PP&D
5. Sh. A. Choudhary, AGM, HQ
6. Smt. Jharna Devi, DM, PP&D
7. Sh. Neelkamal Sharma, AM, P&E

DoP, Arunachal Pradesh:

1. Sh. T.K. Tara, SE
2. Sh. H.R. Bado, SE

MSPCL, Manipur:

1. N. Sarat Singh, MD

MePTCL, Meghalaya:

1. Sh. E Kharmujai, Director
2. Sh. A. Kharpan, CE(Trans)
3. Sh. F E Kharsiing, SE(Trans)

P&E Dept., Mizoram:

1. Er F.Lalrinpuia, Superintending Engineer (Planning)
2. Er Lalbiaksanga, Superintending Engineer (SLDC)
3. Er Benjamin L Tlumte, Senior Executive Engineer (SLDC)

TSECL, Tripura:

1. Dr. M.S. Kele, CMD
2. Sh. Debasis Sarkar, CGM
3. Sh. R Deb Barman, AGM

DoP, Nagaland

1. Sh. Shikato Sema, Engineer-in-Chief

NEEPCO:

1. Sh. Joypal Roy, DGM

NHPC:

1. Sh. J.R. Chaudhary
2. J.C. Sarkar

ANNEXURE-II

A. Transmission lines commissioned in the North Eastern Region during FY 2019-20:

State/Sector	Transmission Lines	Voltage Level (in KV)	Circuit Type	Executing Agency	Month of Completion
Central Sector	-NIL-				
Private Sector					
Assam	Bongaigaon TPS - Rangia (Salakati)	220	D/c	AEGCL	Nov-19
Meghalaya	-NIL-				
Manipur					
Mizoram					
Tripura					
Nagaland					
Arunachal Pradesh	132kV S/c Dikshi-Tenga Switching S/s			Dikshi HEP	
	132kV D/c Tenga Switching S/s – Nechipu LILO connection (on Balipara -Khupi 132 kV line)			Dikshi HEP	

B. Substations/ICTs commissioned in the North Eastern Region during FY 2019-20:

State/Sector	Substation/ICTs	Voltage Ratio	Transformation Capacity (MW/MVA)	Executing Agency	Month of Completion
Central Sector	Misa (2x500 MVA) ICT-II	400/220	500	POWERGRID	Aug-19
Central Sector	Bongaigaon (2nd ICT) S/s.	400/220	315	POWERGRID	April-19
Private Sector	-NIL-				
Assam	Kukumara S/s	220/132	2x50	AEGCL	Nov-19
	Rangia S/s	220/132	2x100	AEGCL	Nov-19
	Sonapur	220/132	2x100	AEGCL	Nov-19
Meghalaya	-NIL-				
Manipur					
Mizoram					
Tripura					
Nagaland					
Arunachal Pradesh	132kV Tenga Switching S/s			Dikshi HEP	

I/12003/2020

Minutes of the 02nd meeting of NERPC-TP held on 25th September 2020

C. Transmission lines commissioned in the North Eastern Region during Q1 of 2020-21:

State/Sector	Transmission Lines	Voltage Level (in KV)	Circuit Type	Executing Agency	Month of Completion
Central Sector	-NIL-				
Private Sector					
Assam					
Meghalaya					
Manipur					
Mizoram					
Tripura					
Nagaland					
Arunachal Pradesh					

D. Substations/ICTs commissioned in the North Eastern Region during Q1 of 2020-21:

State/Sector	Substation/ICTs	Voltage Ratio	Transformation Capacity (MW/MVA)	Executing Agency	Month of Completion
Central Sector	Repl. of 1x50 MVA to 1x160 MVA at Balipara S/stn.(ICT-II)	220/132	110	POWERGRID	April-20
Private Sector	-NIL-				
Assam					
Meghalaya					
Manipur					
Mizoram					
Tripura					
Nagaland					
Arunachal Pradesh					

ANNEXURE-III

A. Existing and planned generation capacity (MW) in North Eastern Region:

State	Coal	Hydro	Solar	Gas	DG	2019-20	2021-22	2024-25
Arunachal Pradesh								
Assam		100		328.49		428.49	464.64*	464.64
Manipur					36	36	36	36
Meghalaya		322				322	322	322
Mizoram							0	0
Nagaland							0	0
Tripura				169.5		169.5	169.5	169.5
Central Sector	750	1195		1253.6		3198.6	3498.6*	5498.6
Private		110		24.5		134.5	134.5	134.5
						4289.09	4625.24	6625.24

Generation Units planned to be commissioned by 2022 are Kameng HEP U#3 & U#4 in central sector and Namrup CCGT U#2 in Assam.

B. The actual and anticipated peak demand of states in North Eastern region are as under:

State	Peak Demand (in MW) according to 19th EPS			Actual peak demand (MW)
	2019-20	2021-22	2024-25	2019-20
Arunachal Pradesh	224	278	386	158
Assam	2,297	2,713	3590	2,193
Manipur	339	410	553	226
Meghalaya	453	488	552	371
Mizoram	148	171	213	133
Nagaland	204	234	284	186
Tripura	351	391	452	320
Total	3,856	4,499	5790	2,989

ANNEXURE-IV

Demand and generation scenario in NER

A. Scenarios considered for studies

Scenario-1	Scenario-2	Scenario-3	Scenario-4	Scenario-5	Scenario-6	Scenario-7	Scenario-8	Scenario-9
June	June	June	August	August	August	February	February	February
noon	Evening Peak	Night off peak	noon	Evening Peak	Night off peak	noon	Evening Peak	Night off peak

B. Demand Factor for the 09 scenarios:

Scenario-1	Scenario-2	Scenario-3	Scenario-4	Scenario-5	Scenario-6	Scenario-7	Scenario-8	Scenario-9
0.65	0.97	0.5	0.7	0.99	0.56	0.53	0.91	0.4

C. Normalized Demand (= Peak Demand as per EPS x Demand Factor)

	Sc-1	Sc-2	Sc-3	Sc-4	Sc-5	Sc-6	Sc-7	Sc-8	Sc-9
2019-20	2506	3740	1928	2699	3817	2159	2044	3509	1542
2021-22	2924	4364	2250	3149	4454	2519	2384	4094	1800
2024-25	3764	5616	2895	4053	5732	3242	3069	5269	2316

D. Anticipated Installed Capacity (MW):

	Coal	Hydro	Solar	Gas	DG	Total
2019-20	750	1727	0	1776	36	4289
2021-22	750	2027	0	1812	36	4625
2024-25	750	4027	0	1812	36	6625

E. Availability Factor for the scenarios:

Scenario	Sc-1	Sc-2	Sc-3	Sc-4	Sc-5	Sc-6	Sc-7	Sc-8	Sc-9
Coal	0	0	0	0	0	0	0.55	0.85	0.65
Hydro	0.7	0.9	0.7	0.6	0.85	0.7	0.3	0.7	0.3
Solar	0.5	0	0	0.6	0	0	0.7	0	0
Gas	0.8	0.85	0.65	0.8	0.85	0.6	0.8	0.85	0.3
DG	0	0	0	0	0	0	0	0	0

F. Anticipated Available Generation:

	Sc-1	Sc-2	Sc-3	Sc-4	Sc-5	Sc-6	Sc-7	Sc-8	Sc-9
2019-20	2630	3064	2363	2457	2978	2275	2351	3356	1538
2021-22	2869	3365	2597	2666	3263	2506	2470	3597	1639
2024-25	4269	5165	3997	3866	4963	3906	3070	4997	2239

G. NER surplus/deficit scenario for the period 2019 to 2025:

	Sc-1	Sc-2	Sc-3	Sc-4	Sc-5	Sc-6	Sc-7	Sc-8	Sc-9
2019-20	123	-676	435	-242	-840	115	308	-153	-4
2021-22	-56	-999	347	-483	-1191	-13	86	-497	-160
2024-25	505	-452	1102	-187	-769	664	2	-272	-77

H. Max Surplus/Max deficit:

	Max Surplus	Max deficit
2019-20	435	-840
2021-22	347	-1191
2024-25	1102	-769

I. Details of inter-regional links with north-eastern region are given below:

Region / Tr. Lines	Present (Up to Oct'17)	Expected by 2022	2024-25
EAST- NORTH EAST (ER – NER)			
Birpara-Salakati 220kV D/c	260	260	350 ^s
Siliguri- Bongaigaon 400 kV D/c	1,000	1,000	1,600 \$(After HTLS reconductoring)
Siliguri - Bongaigaon 400 kV D/c (Quad) line	1,600	1,600	1,600
Sub-total	2,860	2,860	3,550
NORTH EAST-NORTH (NER – NR)			
BiswanathChariali - Agra +/- 800 kV, 3000 MW HVDC Bi-pole	3,000	3,000	3,000
Sub-total	3,000	3,000	3,000
Total	5860	5860	6,550

J. NER Import/export capacity/capability:

	NER Export (in MW)	NER Import (in MW)
By 2021-22	5860	2860
June 2020 ATC	2555	1255
By 2024-25	6550	3550

ANNEXURE-V

Transmission Line Constraints

Sl. No.	Corridor	Season/ Antecedent Conditions	Description of the constraints	Remedial Measure:
1	220 kV BTPS-Salakati I & II lines (POWERGRID)	Normal Hydro / Heavy demand in Downstream Dhaligaon of Assam and Downstream Mendipathar of Meghalaya	During April 0.11%, May 3.88% & June 28.17% of the time loading of these elements together was more than 200 MW, thus not satisfying the N-1 contingency criterion. Tripping of one of these lines will result in reduction in reliability in NER Grid.	Upgradation of the 220 kV BTPS-Salakati I & II lines with HTLS conductor with requisite modification in bay equipment at both ends was agreed in the 2 nd Meeting of NERSCT. Also, in the 7 th SCM of NER, it was agreed that 400/220 kV Rangia S/S may be established through LILO of both circuits of 400 kV Balipara-Bongaigaon D/C (Twin Moose) line. After commissioning of aforementioned elements Loading in 220 kV BTPS-Salakati I & II will be reduced.
2	132 kV BiswanathChariali (PG) - BiswanathChariali (Pavoi) (AEGCL) I & II lines (POWERGRID)	Normal Hydro / Heavy demands in Gohpur, Pavoi areas of Assam	During April 16.12%, May 13.0% & June 15.74% of time, loading of these elements together was more than 80 MW, thus not satisfying N-1 contingency criterion. Tripping of any of these lines may result in Grid disturbance in downstream area of Pavoi&Gohpur after cascaded tripping.	To address this constraint, 132 kV BiswanathChariali – Itanagar D/C has been approved by Joint Standing Committee of ER and NER on 03.01.2014. LILO of one circuit of 132 kV BiswanathChariali (PG) – Itanagar at Gohpur was approved in 6 th Standing Committee of NER held at Imphal on 03.10.16 & 17 th NERPC meeting on 04.10.16. The project is under execution by Sterlite Grid 4 and was expected to be completed by Mar 2020 and latest status was May 2020 as per 166 th OCCM. 132 kV Pare – N.Lakhimpur D/C along with LILO of one circuit at Nirjuli (POWERGRID) was approved under NERSS-IX. After commissioning of these lines, there will be enhancement in drawl capability in Arunachal Pradesh power system as well as reliability of supply will increase.

ICT Constraints

Sl. No.	ICT	Season/ Antecedent Conditions	Description of the constraints	Remedial Measure:
1	220/132 kV, 160 MVA ICT at	High Hydro	N-1 criteria is not	It was agreed in Joint Standing Committee Meeting of Eastern and North Eastern Region on

	Kopili		satisfied.	Power System Planning held at Guwahati on 03-01-2014, the proposal of replacement of existing 60 MVA, 220/132kV ICTs by 1x160 MVA, 220/132 kV ICT at Kopili HEP of NEEPCO by POWERGRID. Kopili Substation is under outage since 07.10.19 due to flooding caused by bursting of penstock. Debris caused by flood needs to be removed from site to restore Khandong – Kopili – Misa link. This needs to be expedited.
2	400/132 kV, 2x125 MVA ICT at Palatana	High Hydro	During April 7.35%, May 27.71% & June 40.23% of time, loading of these elements was more than 119 MW. Tripping of one ICT at Palatana will result in reduction of reliability in NER.	Commissioning of 400/132 kV Surjamaninagar (TBCB) Sub-station with 400/132 kV, 2x315 MVA ICTs at Surjamaninagar (TBCB) executed by Sterlite Grid 4 and upgradation of existing 132 kV Palatana – Surjamaninagar (TSECL) D/C to 400 kV level is to be expedited.

Nodes Experiencing Low Voltage

Sl. No.	Node	Season/ Antecedent Conditions	Description of the constraints	Remedial Measure:
NIL				

Nodes Experiencing High Voltage

Sl. No.	Node	Season/ Antecedent Conditions	Description of the constraints	Remedial Measure:
1	Ranganadi (NEEPCO)	High Hydro / Off-Peak load hours	During April 14.13%, May 6.85% & June 3.37% of time, 400 kV bus voltage of this node was more than 420 kV.	It was agreed in 5th and 7th Standing Committee Meeting of NER for installation of 420 kV, 80 MVAR Bus Reactor by NEEPCO at Ranganadi Bus with associated GIS bays. Also, conversion of remaining two 420 kV, 63 MVAR line reactors at BiswanathChariali end (of Lower Subansiri – BiswanathChariali 400kV 2xD/c lines) as bus reactors through suitable modifications in existing 400kV line bays under ISTS was agreed in the 2 nd Meeting of NERSCT.

2	Balipara (POWERGRID)	High Hydro / Off-Peak load hours	During April 0.14%, May 0.53% & June 0% of time 400 kV Bus voltage of this node was more than 420 kV	It was agreed in 5th and 7th Standing Committee Meeting of NER for installation of 420 kV, 80 MVAR Bus Reactor by NEEPCO at Ranganadi Bus with associated GIS bays. Also, conversion of remaining two 420 kV, 63 MVAR line reactors at BiswanathChariali end (of Lower Subansiri – BiswanathChariali 400kV 2xD/c lines) as bus reactors through suitable modifications in existing 400kV line bays under ISTS was agreed in the 2nd Meeting of NERSCT.
3	Misa (POWERGRID)	High Hydro	During April 0.21%, May 0.53% & June 0.31% of time, 400 kV bus voltage of this node was more than 420 kV	It was agreed in 5th and 7th Standing Committee Meeting of NER for installation of 420 kV, 80 MVAR Bus Reactor by NEEPCO at Ranganadi Bus with associated GIS bays. Also, conversion of remaining two 420 kV, 63 MVAR line reactors at BiswanathChariali end (of Lower Subansiri – BiswanathChariali 400kV 2xD/c lines) as bus reactors through suitable modifications in existing 400kV line bays under ISTS was agreed in the 2nd Meeting of NERSCT.
4	BiswanathChariali (POWERGRID)	High Hydro / Off-Peak load hours	During April 0.12%, May 0.03% & June 0% of time, 400 kV Bus voltage of this node was more than 400 kV for considerable time.	It was agreed in 5th and 7th Standing Committee Meeting of NER for installation of 420 kV, 80 MVAR Bus Reactor by NEEPCO at Ranganadi Bus with associated GIS bays. Also, conversion of remaining two 420kV, 63 MVAR line reactors at BiswanathChariali end (of Lower Subansiri – BiswanathChariali 400kV 2xD/c lines) as bus reactors through suitable modifications in existing 400kV line bays under ISTS was agreed in the 2nd Meeting of NERSCT.
5	Palatana (OTPC)	High Hydro	During April 0.01%, May 0% & June 0.08% of time, 400 kV bus voltage of this node was more than 420 kV	420 kV, 63 MVAR line reactor of Palatana-Silchar-I at 400 kV Palatana is under forced outage since 25.04.2019. OTPC informed in 166 th OCCM that 63 MVAR line reactor is expected by March'20.
6	Byrnihat (MePTCL)	High Hydro	During April 0.31%, May 0.77% & June 0.56% of time, 400 kV bus voltage of this node was more than 420 kV	The 63 MVAR Bus Reactor at Byrnihat is under prolonged outage. Bus Reactor at Byrnihat may mitigate the high voltage problem. In 161 th OCC Meeting, MePTCL informed that DPR for 80 MVAR Bus Reactor at Byrnihat has submitted to NLDC/NPC and agreed and as per 166 th OCC Meeting, LoA is in progress.

Note: Percentage High Voltage of these above nodes is calculated based on SCADA data.