

1/3021/2018 | 1262-1277



भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण

Central Electricity Authority
विद्युत प्रणाली योजना एवं मूल्यांकन-I प्रभाग
Power System Planning & Appraisal-I Division

-As per list enclosed-

विषय: उत्तरी क्षेत्र की ट्रांसमिशन पर स्थायी समिति की दूसरी बैठक के विषय में

Sub: 2nd Meeting of Northern Region Standing Committee on Transmission- Minutes of Meeting

Sir/ Madam,

2nd Meeting of Northern Region Standing Committee on Transmission was held on 13.11.2018 (Tuesday) at 11:30hrs at NRPC, New Delhi. Minutes of meeting are available on CEA website: www.cea.nic.in (path to access – Home Page –Wing- Power System-PSPA-I- Standing Committee on Power System Planning- Northern Region).

Yours faithfully,

(Ravinder Gupta)

Chief Engineer (PSPA-I)

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1.	Member, Secretary, NRPC, 18-A Shajeed Jeet Singh Sansanwal Marg, Katwaria Sarai, New Delhi - 110016 (Fax-011-26865206)	2.	Director (W &P) UPPTCL, Shakti Bhawan Extn,3rd floor, 14, Ashok Marg, Lucknow - 226 001 (Fax:0522-2287822)	3.	Director (Projects) PTCUL, Vidhyut Bhawan, Near ISBT -Crossing, Saharanpur Road, Majra, Dehradun-248002. Uttarakhand Fax-0135-2645744
4.	Director (Technical), Punjab State Transmission Corporation Ltd. (PSTCL) Head Office The Mall Patiala -147001 Fax-0175-2304017	5.	Member (Power) BBMB, Sector-19 B Madhya Marg, Chandigarh-1 60019 (Fax-01 72-2549857)	6.	Director (Operation) Delhi Transco Ltd. Shakti Sadan, Kotla Marg, New Delhi-110002 (Fax-01123234640)
7.	Director (PP&D) RVPN, 3 rd Floor, Room no 330, Vidhyut Bhawan, Janpath, Jaipur-302005. Fax-:0141-2740794 ce.ppm@rvpn.co.in	8.	Director (Technical) HVPNL Shakti Bhawan, Sector-6 Panchkula-134109 Fax-0172-256060640	9.	Director (Technical) HPSEB Ltd. Vidut Bhawan, Shimla -171004 Fax-0177-2813554
10.	Managing Director, HPPTCL, Barowalias, Khalini Shimla-171002 Fax-0177-2623415	11	Chief Engineer (Operation) Ministry of Power, UT Secretariat, Sector-9 D Chandigarh -161009 Fax-0172-2637880	12	Development Commissioner (Power), Power Department, Grid Substation Complex, Janipur, Jammu, Fax: 191-2534284
13.	Director (Projects) POWERGRID Saudamini Plot no. 2, Sector - 29. Gurgaon-122 001 (Fax-0124-2571809)	14	CEO, POSO B-9, Qutab Institutional Area, Katwaria Sarai New Delhi – 110010 (Fax:2682747)	15	COO (CTU) POWERGRID, Saudamini, Plot no. 2, Sector -29, Gurgaon-122 001 (Fax-0124-2571809)

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Minutes of the 2nd Meeting of Northern Region Standing Committee on Transmission held on 13-11-2018

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

Chief Engineer, CEA welcomed the participants to the 2nd meeting of Northern Region Standing Committee on Transmission (NRSCT). He stated that Chairperson CEA / Member (Power System), CEA has to attend an urgent meeting in the Ministry of Power and he will join the meeting subsequently. Chairperson CEA has advised to start the proceedings.

1.1 Confirmation of the Minutes of the 1st meeting of Northern Region Standing Committee on Transmission held on 11th September 2018.

1.2 CEA stated that the minutes of 1st meeting of NRSCT were issued vide CEA letter no. CEA-PS-11-21(19)/2/2018-PSPA-I Division /I/2611/2018 (4) dated 23rd Oct., 2018. No comments have been received from the constituents. Therefore, he requested members to confirm the minutes of the 1st meeting of NRSCT.

1.3 RVPNL stated that at S.no 1 of table at item no 2.8 (regarding 400kV transmission system under implementation by RVPNL) of the minutes of 1st NRSCT, under the heading Remarks / Justification, (a) Akal-Jodhpur 400kV D/C line – 230 km Twin Moose line may be corrected as Akal-Jodhpur (Soorpura) 400kV twin moose line (20.223 km D/c & 204.366km S/c). Also, the conductor against Akal-Jodhpur-New (U/C) 400kV D/C line had been mentioned as twin moose instead of quad moose. The same needs to be corrected

1.4 CEA stated that “(a) Akal-Jodhpur 400kV D/C line – 230 km Twin Moose line” mentioned at S.no 1 of the table given at item no 2.8 under the heading Remarks / Justification may be read as (a) “Akal- Jodhpur (Soorpura) 400kV twin moose line (20.22 km D/c & 204.366 km S/c)” and “(c) Akal-Jodhpur-New (U/C) 400kV D/C line- 240 km Twin Moose” may be read as “(c) Akal-Jodhpur-New (U/C) 400kV D/C line – 240 km Quad Moose”.

1.5 Members confirmed the minutes of 1st meeting of NRSCT with the above corrections suggested by RVPNL.

2.0 Evolution of transmission scheme for integration of envisaged RE generation capacity in Solar & Wind Energy Zones and Transmission Schemes for Solar Energy Zones (SEZs) in Rajasthan.

2.1 CEA stated that the transmission scheme for integration of envisaged RE generation capacity in Solar & Wind Energy Zones and Transmission Schemes for Solar Energy Zones (SEZs) in Rajasthan was deliberated in 1st meeting of NRSCT held on 11.9.2018. The scheme mainly envisaged the following SEZs (10 GW) in Rajasthan based on Stage-II applications already received near Fatehgarh, Bikaner and Bhadla as well as Solar Potential pockets in Western Rajasthan as indicated by SECI for SEZ phase-I development:

Part-A:

- i) Fatehgarh SEZ (4 GW) (Fatehgarh-I : 1.2 GW, Fatehgarh-II : 2.8 GW)
- ii) Phalodi / Bhadla SEZ (3 GW) (Bhadla-I : 0.8 GW, Bhadla-II : 2.2 GW)
- iii) Bikaner – Pugal SEZ (1.85 GW)

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Part-B:

i) Ramgarh / Kuchcheri SEZ (1.15 GW)

2.2 He further stated that the transmission system evolved through system studies was deliberated in 1st meeting of NRSCT held on 11.9.2018 in Delhi, wherein, it was agreed that a separate meeting of CEA, CTU, RVPNL and HVPNL would be called on 20th September, 2018 to further deliberate and study the proposed scheme. Therefore, a meeting was held on 20.9.2018 in Gurgaon, wherein, RVPNL and HVPNL had suggested some modifications in their intra-state network. Based on their suggestions, revised studies were carried out for various scenarios like off peak, Solar minimised / maximised, peak demand for the proposed transmission scheme. It was decided that the scheme may be prioritised out of phase-I Rajasthan REZ capacity (10 GW) considering LTA / Stage-II connectivity applications and some part of the future potential. Accordingly, transmission system was evolved for evacuation of power from Fatehgarh (4 GW), Phalodi/Bhadla (3 GW), Bikaner (1.85GW) (Part –A) and from Ramgarh / Kuchcheri in Fatehgarh (1.15 GW*) (Part-B).

2.3 Subsequently, as requested by RVPNL, a meeting was held on 9.10.2018 (copy of the minutes enclosed as **Annexure-II**) under the Chairmanship of Director (Op) & Director (Tech), RVPNL in RVPNL office at Jaipur, wherein, based on various studied scenarios, following transmission system was technically agreed for evacuation of power from the generation projects for which applications for Stage-II/LTA in Phalodi/Bhadla, Fatehgarh & Bikaner complex has been received as well as some part of future potential in above complexes :

- i) Establishment of 765/400/220kV, 3x1500MVA (765/400kV), 5x500 MVA (400/220kV) pooling station at suitable location near Phalodi/ Bhadla in Jodhpur (Bhadla-II)
- ii) Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Khetri
- iii) Augmentation of transformation capacity at Bhadla (PG) by 400/220kV, 2x500MVA (6th & 7th) transformers
- iv) Creation of 220 kV level at Bikaner (PG) with transformation capacity of 2x500MVA, 400/220kV transformers
- v) LILO of both circuits of Ajmer – Bikaner 765kV D/c line at Bhadla-II
- vi) Bhadla-II – Bhadla (PG) 400kV D/c Line (Twin HTLS)
- vii) Bikaner(PG) – Khetri S/s 765kV D/c line
- viii) LILO of both circuits of Phagi – Bhiwani 765kV D/c line at Khetri S/s
- ix) Khetri – Sikar (PG) 400kV D/c line (Twin HTLS)
- x) Augmentation with 765/400kV, 1x1500MVA transformer (3rd) at Moga S/s
- xi) Augmentation with 765/400kV, 1x1000MVA, transformer (3rd) at Bhiwani (PG) S/s
- xii) Establishment of Transformation capacity at Fatehgarh (TBCB) with 3x500MVA, 400/220kV transformers
- xiii) Establishment of 400/220kV, 4x1500MVA (765/400kV), 5x500 MVA (400/220kV) pooling station at suitable location near Fatehgarh in Jaisalmer Distt (Fatehgarh-II)
- xiv) Fatehgarh-II – Bhadla -II 765kV D/c line
- xv) LILO of both circuits of Fatehgarh (TBCB) – Bhadla (PG) 765 kV D/c line (op. at 400kV) at Fatehgarh-II so as to establish Fatehgarh (TBCB) – Fatehgarh -II 765 kV D/c line (to be op. at 400kV) and Fatehgarh-II-Bhadla (PG) 765kV D/c line

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- xvi) Charging of Fatehgarh-II –Bhadla section at 765kV level
- xvii) Ajmer (PG)– Jhatikara 765kV D/c line
- xviii) 1x125 MVA (420kV), 2x240 MVA (765kV) Bus Reactor each at Fatehgarh-II, Bhadla-II & Khetri Substation
- xix) 1x330 MVAR Switchable Line reactors for each circuit at each end of Ajmer – Jhatikara 765kV D/c line
- xx) 1x240 MVA Switchable line reactor for each circuit at each end of Bikaner – Khetri 765kV D/c line
- xxi) 1x330 MVA Switchable line reactor for each circuit at Bhadla-II end for Ajmer-Bhadla-II 765kV line (after LILO)
- xxii) 1x240 MVA Switchable line reactor for each circuit at Bhadla-II end for Bikaner-Bhadla-II 765kV line (after LILO)
- xxiii) 220kV line bays for interconnection of solar projects at Fatehgarh-II (9 nos), Bhadla-II (9 nos) and Bikaner (4 nos) S/s

It was also decided that scheme for evacuation of power from Ramgarh/Kuchcheri in Jaisalmer & additional potential of Rajasthan SEZ may be taken up subsequently based on stage-II connectivity/LTA applications.

In the 2nd NRSCT meeting, RVPNL again requested to see the impact of new proposed transmission system on Rajasthan intra-state transmission system. Accordingly, CTU showed load flow cases carried out for various scenarios to the stakeholders including RVPNL to observe incidental power flow due to these interconnections in RVPNL network, which were found in order.

CTU stated that presently 6,430MW stage-II connectivity applications are granted at Bhadla (3380MW at 220kV level), Fatehgarh (2200MW at 400kV level) and Bikaner (850MW at 400kV level). Out of above, new stage-II connectivity application is for about 3100 MW in above complexes. Further, LTA of about 3330 MW is already granted with under construction Bhadla / Fatehgarh Solar park transmission system along with transformation capacity augmentation at Bhadla PS.

Above proposed system was identified to cater to LTA applications received (2.85 GW) recently in above complexes and to cater to some future potential at the locations (Fatehgarh, Bhadla/Phalodi & Bikaner) as well.

- 2.4** RVPNL stated that the Rajasthan intra state network is already facing high voltage problem due to RE addition and addition of this inter-state transmission system in Rajasthan would add to the high voltage problem under no solar generation conditions. RVPNL also stated that in view of NHAI crossing, line crossings and severe RoW problems, RVPNL is unable to frame suitable proposal for utilisation of 2 no. of 220 kV line bays at Sikar 400/220 kV sub-station allocated to them under the scheme “Augmentation of transformation capacity at Mainpuri and Sikar”. RVPNL requested to allocate the 220 kV bays for solar / wind developers or utilise for any other purpose.

- 2.5** CTU stated that studies were carried out under no solar condition in one of the scenario and suitable reactive compensation has also been planned in ISTS as part of proposed scheme. The RE potential is envisaged in Western Rajasthan, from where new ISTS transmission system needs to be planned for its evacuation. However, RVPNL may also evolve requirement of reactive compensation in Intra state, if any, to mitigate prevailing high voltage conditions. With regard to RVPNL proposal for utilisation of 2 no. 220 kV line bays at Sikar, CTU stated that these bays were implemented on the request from RVPNL, however, allocation of these bays to RE developers can be considered in future depending on the stage-II application received at Sikar.

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With regard to RVPNL proposal for utilisation of 2 no. 220 kV line bays at Sikar, it was agreed that allocation of these bays to RE developers can be considered in future depending on the stage-II application received at Sikar

- 2.6 SECI stated that due to availability of land resource at cheap price and higher insolation level in Western Part of Rajasthan, developers are quoting lowest price for solar generations in this part of Rajasthan.
- 2.7 CTU stated that the above transmission system proposed is mostly based on the RE generations for which Stage-II / LTA applications have already been received. The proposed system is minimum system required for the evacuation of 8.9 GW of solar generation in Western Rajasthan (Applications- 3.1 GW, Future potential-5.8 GW).
- 2.8 SECI stated that global focus is to bring more RE based generation sources into the system to reduce dependence on fossil fuels based generations, improve energy security and reduce carbon emission. This is the step towards saving the environment. SECI requested the constituents to concur the schemes so that its implementation process could be initiated. Moreover, these schemes are required to be taken up on urgent basis as the gestation period for implementation of RE projects is shorter as compared to that of transmission.
- 2.9 RVPNL opined that the RE generation developers are applying for connectivity at ISTS due to waiver of inter-state transmission charges for RE projects to be commissioned before 2022. The PoC charges of Rajasthan shall increase on account of this Renewable energy integration the above system. The generation tariff of the upcoming RE projects may be low but Discoms have to pay also for the backing down of thermal generation during RE generation and the waiver of ISTS transmission charges for RE projects, which leads to increase in the cost of energy.
- 2.10 With regard to the concerns of the constituents of increased PoC charges due to transmission scheme being evolved for RE projects, CEA stated that waiver of ISTS transmission charges is applicable only for the generation projects based on solar and wind resources (awarded through competitive bidding process as per guideline of Central Government) commissioned till 31-03-2022 and the projects entering into Power Purchase Agreements (PPAs) with all entities, including distribution companies, for sale of power from solar and wind projects for compliance of their Renewable Purchase Obligation. Further, CERC has constituted a task force to review the PoC mechanism on request of various stake holders and has already raised the issue of the waiver of interstate transmission charges with MoP vide their D.O. letter dated 19th July, 2018. In view of above, CEA requested the constituents to examine the scheme technically.
- 2.11 RVPNL stated that captive generations are also coming in a substantial quantum, which would also reduce the effective load. Therefore, it is anticipated that the demand would be lesser than that considered in the studies.
- 2.12 On the query of BBMB whether the studies have been carried out considering backing down of RE generations, CTU stated that no such studies have been carried out as RE generations are having must run status in our country.
- 2.13 CTU stated that 1200 MW Stage-II connectivity applications has been recently granted at 400kV level at Fatehgarh (TBCB) PS. Therefore, establishment of transformation capacity at Fatehgarh (TBCB) with 3x500MVA, 400/220kV transformers may be deferred presently. Also, with charging of Fatehgarh-II –Bhadla (PG) section at 765kV level, 2 nos. of 400kV bays would be spared at Bhadla (PG) S/s, which could be utilized for 400kV Bhadla-II – Bhadla (PG) D/c line (Twin HTLS). Same was agreed.
- 2.14 CTU stated that creation of 220kV level along with 400/220kV transformers at Fathegath-2, Bhadla-2 and Bikaner (PG) pooling stations shall be taken up in progressive manner as per the receipt of stage-II/LTA applications for above pooling stations. Accordingly, transformer requirement at 765/400kV & 400/220kV at Fatehgarh-II,

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Bhadla-II PS as well as 400/220kV Bikaner may be phased in the present proposal as per the requirement and can be taken up subsequently for implementation. Further, in view of the space constraints at under implementation Bhadla and Bikaner substations, 220kV side will be implemented with hybrid (AIS+GIS) technology. The same was agreed.

2.15 CTU also stated that for the recent LTA applications at Bhadla, Fatehgarh and Bikaner, Transmission system out of above identified transmission scheme may also be segregated.

2.16 After detailed deliberations, the following system was technically agreed for evacuation of 8.9 GW solar power from Bhadla/Phalodi (3.55 GW), Fatehgarh (3.5 GW) & Bikaner (1.85 GW) complexes.

- i) Establishment of 765/400/220kV, 3x1500MVA (765/400kV), 5x500 MVA (400/220kV) pooling station at suitable location near Phalodi/ Bhadla in Jodhpur (Bhadla-II PS)
- ii) Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Khetri
- iii) Augmentation of transformation capacity at Bhadla (PG) by 400/220kV, 2x500MVA (6th & 7th) transformers
- iv) Creation of 220 kV level at Bikaner (PG) with Installation of 400/220kV, 2x500MVA transformers at Bikaner (PG)
- v) LILO of both circuits of Ajmer – Bikaner 765kV D/c line at Bhadla-II PS
- vi) Bhadla-II PS – Bhadla (PG) 400kV D/c Line (Twin HTLS)
- vii) Bikaner(PG) – Khetri 765kV D/c line
- viii) LILO of both circuits of Phagi – Bhiwani 765kV D/c line at Khetri S/s
- ix) Khetri – Sikar (PG) 400kV D/c line (Twin HTLS)
- x) Augmentation with 765/400kV, 1x1500MVA transformer (3rd) at Moga S/s
- xi) Augmentation with 765/400kV, 1x1000MVA, transformer (3rd) at Bhiwani (PG) S/s
- xii) Establishment of 765/400/220kV, 4x1500MVA (765/400kV), 5x500 MVA (400/220kV) pooling station at suitable location near Fatehgarh in Jaisalmer Distt (Fatehgarh-II PS)
- xiii) Fatehgarh-II PS– Bhadla -II PS 765kV D/c line
- xiv) LILO of both circuits of Fatehgarh (TBCB) – Bhadla (PG) 765 kV D/c line (op. at 400kV) at Fatehgarh-II PS so as to establish Fatehgarh (TBCB) – Fatehgarh -II 765 kV D/c line (to be op. at 400kV) and Fatehgarh-II-Bhadla (PG) 765kV D/c line
- xv) Charging of Fatehgarh-II PS–Bhadla section at 765kV level
- xvi) Ajmer (PG)– Jhatikara 765kV D/c line
- xvii) 1x125 MVA (420kV), 2x240 MVA (765kV) Bus Reactor each at Fatehgarh-II PS, Bhadla-II PS & Khetri Substation
- xviii) 1x330 MVAR Switchable Line reactors for each circuit at each end of Ajmer – Jhatikara 765kV D/c line
- xix) 1x240 MVAR Switchable line reactor for each circuit at each end of Bikaner – Khetri 765kV D/c line
- xx) 1x330 MVAR Switchable line reactor for each circuit at Bhadla-II PS end for Ajmer-Bhadla-II PS 765kV line (after LILO)
- xxi) 1x240 MVAR Switchable line reactor for each circuit at Bhadla-II PS end for Bikaner-Bhadla-II PS 765kV line (after LILO)

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xxii) 220kV line bays for interconnection of solar projects at Fatehgarh-II (9 nos), Bhadla-II (9 nos) and Bikaner (4 nos) S/s

2.17 Subsequently, RVPNL vide letter dated 15.11.2018 has proposed following modifications in above agreed transmission system:

S. No.	Transmission elements agreed in 2 nd NRSCT	Transmission Elements proposed as alternate by RVPNL
1	Ajmer (PG)– Jhatikara 765kV D/c line-360km	Ajmer (PG)– Phagi 765kV D/c line-110km
2	LILLO of both ckts of 765kV Phagi – Bhiwani D/c line at Khetri S/s-2x10km	Khetri – Jhatikara 765kV D/c line-170km

RVPNL in the above letter has mentioned that the proposed alternative lines reduces 765 kV D/C line length by 100km implying lesser cost, and also lesser reactive power injection. RVPNL also requested to incorporate above observations in the MoM of 2nd NRSCT.

Accordingly, studies were carried out by CEA & CTU with proposed RVPNL modifications and it was observed that there is no significant difference in the power flow in the proposal given by RVPNL. Therefore, the proposal of RVPNL was found acceptable and was also circulated to all stakeholders vide CEA mail dated 22.11.18 (**copy enclosed as Annexure-III**) requesting for their comments by 27.11.18, if any. RVPNL vide email dated 26.11.2018 also requested for review of high capacity conductor for Khetri-Sikar 400kV D/c (HTLS) line. In the meeting held on 27.11.18 in Rajasthan amongst CEA, PGCIL & RVPNL, the matter was discussed, wherein AL59 twin conductor was agreed for Khetri-Sikar 400kV D/c line instead of HTLS conductor.

As no other observations from any of the constituent state has been received, the above proposal was considered for inclusion in 2nd NRSCT minutes.

2.18 Based on above, following transmission system was technically agreed for evacuation of solar power from Bhadla/Fatehgarh/Bikaner complexes.

Transmission system for Solar Energy Zones in Rajasthan

- i) Establishment of 765/400/220kV, 3x1500MVA (765/400kV), 5x500MVA (400/220kV) pooling station at suitable location near Phalodi/ Bhadla in Jodhpur (Bhadla-II PS)**
- ii) Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Khetri **
- iii) Augmentation of transformation capacity at Bhadla (PG) by 400/220kV, 2x500MVA (6th & 7th) transformers
- iv) Creation of 220 kV level at Bikaner (PG) with Installation of 400/220kV, 2x500MVA transformers at Bikaner (PG)
- v) LILLO of both circuits of Ajmer – Bikaner 765kV D/c line at Bhadla-II PS
- vi) Bhadla-II PS – Bhadla (PG) 400kV D/c Line (Twin HTLS)
- vii) Bikaner(PG) –Khatri S/s 765kV D/c line
- viii) Khatri – Jhatikara 765kV D/c line
- ix) Khatri – Sikar (PG) 400kV D/c line (Twin AL59)
- x) Augmentation with 765/400kV, 1x1500MVA transformer (3rd) at Moga S/s
- xi) Augmentation with 765/400kV, 1x1000MVA, transformer (3rd) at Bhiwani (PG) S/s

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- xii) Establishment of 765/400/220kV, 4x1500MVA (765/400kV), 5x500MVA (400/220kV) pooling station at suitable location near Fatehgarh in Jaisalmer Distt (Fatehgarh-II PS)**
- xiii) Fatehgarh-II PS– Bhadla -II 765kV D/c line
- xiv) LILO of both circuits of Fatehgarh (TBCB) – Bhadla (PG) 765 kV D/c line (op. at 400kV) at Fatehgarh-II PS so as to establish Fatehgarh (TBCB) – Fatehgarh -II 765 kV D/c line (to be op. at 400kV) and Fatehgarh-II-Bhadla (PG) 765kV D/c line
- xv) Charging of Fatehgarh-II PS –Bhadla section at 765kV level
- xvi) Ajmer (PG)– Phagi 765kV D/c line
- xvii) 1x125 MVA_r (420kV), 2x240 MVA_r (765kV) Bus Reactor each at Fatehgarh-II PS, Bhadla-II PS & Khatri Substation
- xviii) 1x240 MVAR Switchable Line reactors for each circuit at Jhatikara end of Khatri – Jhatikara 765kV D/c line
- xix) 1x240 MVA_r Switchable line reactor for each circuit at each end of Bikaner – Khatri 765kV D/c line
- xx) 1x330 MVA_r Switchable line reactor for each circuit at Bhadla-II PS end for Ajmer-Bhadla-II PS 765kV line (after LILO)
- xxi) 1x240 MVA_r Switchable line reactor for each circuit at Bhadla-II PS end for Bikaner-Bhadla-II PS 765kV line (after LILO)
- xxii) 220kV line bays for interconnection of solar projects at Fatehgarh-II PS (9 nos), Bhadla-II PS (9 nos) and Bikaner (4 nos) S/s_

****Space provision to be kept at Bhadla-II PS, Fatehgarh-II PS, Khatri S/s for future transformers, bays, switchable line/bus reactors etc.**

2.19 Further, based on present Stage-II/LTA applications in Bhadla/Fatehgarh/Bikaner complexes as well as future solar potential of these complexes, scheme was agreed to be implemented in two parts, viz. Part-A and Part-B which is as under:

2.20

Transmission system for Solar Energy Zones in Rajasthan

Part A

- i) Establishment of 765/400kV, 2x1500MVA pooling station at suitable location near Phalodi/ Bhadla in Jodhpur (Bhadla-II PS)**
- ii) Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Khatri
- iii) Augmentation of transformation capacity at Bhadla (PG) by 400/220kV, 2x500MVA (6th & 7th) transformers
- iv) LILO of both circuits of Ajmer–Bikaner 765kV D/c line at Bhadla-II PS
- v) Bhadla-II PS–Bhadla (PG) 400kV D/c Line (Twin HTLS)
- vi) Bikaner(PG)–Khatri S/s 765kV D/c line
- vii) Khatri – Jhatikara 765kV D/c line
- viii) Khatri – Sikar (PG) 400kV D/c line (Twin AL59)
- ix) Augmentation with 765/400kV, 1x1500MVA transformer (3rd) at Moga S/s

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- x) Augmentation with 765/400kV, 1x1000MVA, transformer (3rd) at Bhiwani (PG) S/s
- xi) Establishment of 765/400kV, 3x1500MVA pooling station at suitable location near Fatehgarh in Jaisalmer Distt (Fatehgarh-II PS)**
- xii) Fatehgarh-II PS– Bhadla -II 765kV D/c line
- xiii) LILO of both circuits of Fatehgarh (TBCB) – Bhadla (PG) 765 kV D/c line (op. at 400kV) at Fatehgarh-II PS so as to establish Fatehgarh (TBCB) – Fatehgarh -II 765 kV D/c line (to be op. at 400kV) and Fatehgarh-II-Bhadla (PG) 765kV D/c line
- xiv) Charging of Fatehgarh-II PS –Bhadla section at 765kV level
- xv) Ajmer (PG)– Phagi 765kV D/c line
- xvi) 1x125 MVAr (420kV), 2x240 MVAr (765kV) Bus Reactor each at Fatehgarh-II PS, Bhadla-II PS & Khetri Substation
- xvii) 1x240 MVAR Switchable Line reactors for each circuit at Jhatikara end of Khetri – Jhatikara 765kV D/c line
- xviii) 1x240 MVAr Switchable line reactor for each circuit at each end of Bikaner – Khetri 765kV D/c line
- xix) 1x330 MVAr Switchable line reactor for each circuit at Bhadla-II PS end for Ajmer-Bhadla-II PS 765kV line (after LILO)
- xx) 1x240 MVAr Switchable line reactor for each circuit at Bhadla-II PS end for Bikaner-Bhadla-II PS 765kV line (after LILO)

****Space provision to be kept for 220kV level**

Part B

Augmentation works to be taken up in above scheme after receipt of Stage-II connectivity/LTA applications at Fatehgarh-II PS, Bhadla-II PS & Bikaner (PG) S/s in Rajasthan (400/220kV ICT shall be taken up in progressive manner commensurate to stage-II connectivity/LTA applications on above pooling stations)

- i) Augmentation with 765/400kV, 1x1500MVA transformer (3rd) at Bhadla-II PS
- ii) Creation of 220 kV level at Bhadla-II PS with Installation of 400/220kV, 5x500MVA transformers at Bhadla-II PS
- iii) Augmentation with 765/400kV, 1x1500MVA transformer (4th) at Fatehgarh-II PS
- iv) Creation of 220 kV level at Fatehgarh-II with Installation of 400/220kV, 5x500MVA transformers at Fatehgarh-II PS
- v) Creation of 220 kV level at Bikaner (PG) with Installation of 400/220kV, 2x500MVA transformers at Bikaner (PG)
- vi) 220kV line bays for interconnection of solar projects at Fatehgarh-II PS (9 nos), Bhadla-II PS (9 nos) and Bikaner (4 nos) S/s

Further following future scope/space provision to be kept at new substations/pooling stations was also agreed. This space provision scope is in addition to above Part A & Part-B scope.

- 1) 765/400/220kV Bhadla-II pooling station
 - 765/400kV, 1x1500MVA transformer
 - 400/220kV, 4x500MVA transformer
 - 4 nos. 765kV line bays with switchable Line reactor
 - 6 nos. 400kV line bays with switchable Line reactor

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- 7 nos. 220kV line bays
- 2) 765/400kV Khetri substation
- 400/220kV, 4x500MVA transformer
 - 4 nos. 765kV line bays with switchable Line reactor
 - 4 nos. 400kV line bays with switchable Line reactor
 - 6 nos 220kV line bays
- 3) 765/400/220kV Fatehgarh -II pooling station
- 400/220kV, 6x500MVA transformer
 - 4 nos. 765kV line bays with switchable Line reactor
 - 6 nos. 400kV line bays with switchable Line reactor
 - 10 nos. 220kV line bays

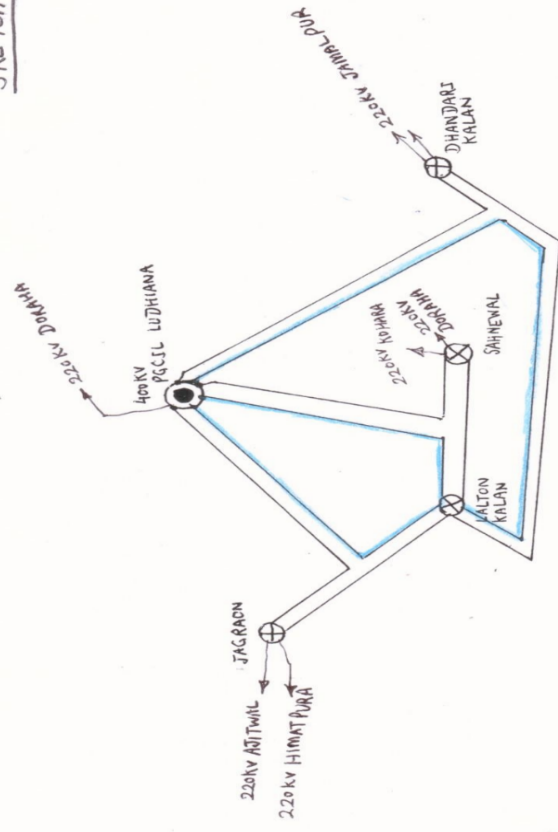
Further, segregated transmission scheme out of above composite scheme for evacuation of power from Fatehgarh, Phalodi/Bhadla and Bikaner complexes for purpose of grant of LTA is enclosed at **Annexure-IV**.

3.0 Replacement of conductors of 220kV Ludhiana –Lalton Kalan line (3 circuits) and Verpal -Mall Mandi 132kV line with HTLS conductor: PSTCL proposal regarding

- 3.1 CEA stated that National Power Committee (NPC), CEA vide their letter dated 24-10-2018 had sent record note of discussions of a meeting with PSTCL representatives regarding PSTCL's proposal for replacement of conductors of 220kV Ludhiana –Lalton Kalan 220kV line (2-3 km) and Verpal -Mall Mandi 132kV line (12km) with HTLS conductor for PSDF funding. The Techno Economic Subgroup (TESG), who had examined the proposal, in its meeting held on 22.10.2018 has, interalia, sought recommendation of NRSCT on the above proposal.
- 3.2 CEA further stated that PSTCL vide their e-mail dated 30-10-2018 has provided sketches (shown below) of existing 220 kV network inter-connection between Ludhiana (PG) and Lalton Kalan (PSTCL) and proposed rearrangement at Lalton Kalan (PSTCL) after which, there would be 2 no. 220 kV circuits between Ludhiana (PG) and Lalton Kalan (PSTCL). PSTCL has indicated loading on these line during paddy season for past three years i.e from 2016 to 2018, which is of the order of 640A touching 695A this year.

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SKETCH-1



⊕ → 400kv s/s
 ⊗ → 220KV s/s

NOTE:-
 i) L1LO OF ONE CKT EACH OF
 220KV LALTON KALAN - 220KV SARHEWAL
 220KV LALTON KALAN - 220KV DHANDAJI KALAN
 220KV LALTON KALAN - 220KV JAGRAN
 AT 220KV BUS OF 400KV PGCIL LUDHIANA
 ii) WITH THIS ARRANGEMENT THERE ARE
 3 CKTS BETWEEN 400KV PGCIL LUDHIANA
 AND 220KV LALTON KALAN.

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- 3.5 On a query from CTU about the rating of HTLS conductor proposed for replacement, PSTCL stated that the rating of conductor for 220kV and 132kV lines would be 1200A and 800A respectively.
- 3.6 NRLDC stated that replacement of conductor on Ludhiana (PG) – Lalton Kalan 220kV circuits may increase the loading of ICTs at Ludhiana. Therefore, suitable augmentation of transformation capacity at 400/220kV Ludhiana may also be planned.
- 3.7 After deliberation, following was agreed:
- i) Replacement of conductors of 2 no. 220 kV circuits between Ludhiana (PG) and Lalton Kalan (PSTCL) (remaining after proposed rearrangement at Lalton Kalan shown in sketch 2 above) with HTLS conductors – by PSTCL
 - ii) Replacement of conductor of Verpal -Mall Mandi 132kV line with HTLS conductor – by PSTCL
 - iii) POWERGRID to carry out the studies to examine the adequacy of transformation capacities at 400/220kV Ludhiana Substation after above modifications in the network and suggest remedial measure, if any.

4.0 Issue related to signing of Transmission Agreement/LTA Agreements for implementation of UITP Scheme (deemed ISTS) by PTCUL for evacuation of power from various Generators:

- 4.1 CEA stated that to deliberate the issues related to signing of Transmission Agreement/LTA Agreements for implementation of UITP Scheme (deemed ISTS) by PTCUL for evacuation of power from various Generators, a meeting was held on 12.9.2018 in CEA with the representatives of NTPC, THDC, L&T, Lanco, SJVNL, PTCUL, CTU and POSOCO. Minutes of the meeting are enclosed as Annexure-III. Subsequently, PTCUL vide their letter dated 20.10.2018 has forwarded their observations on the minutes of the meeting.
- 4.2 CEA added that during the 40th SCPSNR, PTCUL had proposed to implement 220/33 kV 10x6MVA transformers at Baramwari (Rudrapur) substation. To cater to local demand in Baramwari (Rudrapur) area and also for injection of power from SHPs of UJVNL Ltd. (Kaliganga-I - 4 MW, Kaliganga-II - 4.5MW & Madhyamaheshwar - 15 MW). The proposed 220/33 kV substation would be connected to 400kV Srinagar S/s i.e. ISTS network through Baramwari-Srinagar 220kV D/c line (Phase -I & II), which is also part of ISTS Network. Therefore, in the meeting held on 12.9.2018, CEA stated that for implementation of above proposal PTCUL may apply for connectivity/LTA for the quantum of power to be exchanged through ISTS at Baramwari Switching Station. However, PTCUL observed that if power from SHP's of UJVNL is to be evacuated through 220 kV S/s Baramwari (ISTS network) then UJVNL will have to bear applicable PoC (ISTS) Charges.

Based on the above observation of PTCUL 4th paragraph of **Point no. 2 (v)** of the minutes i.e. **Baramwari – Srinagar D/c Line may be modified as.**

“CEA stated that for implementation of above proposal UJVNL may apply for connectivity/LTA for the quantum of power to be exchanged through ISTS at Baramwari Switching Station. CEA also pointed out that Baramwari Switching Station would be required in matching time frame of Phatabyoung. Therefore, PTCUL needs to start the implementation process for the same.”

- 4.3 CEA further stated that regarding query raised by PTCUL for signing of transmission agreements with generators, it was mentioned in the minutes of meeting held on 12.9.2018 that a tripartite agreement needs to be signed between CTU, PTCUL and generation developers. However, PTCUL had made the observation that that as per

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CERC Connectivity Regulations, Transmission Agreement is signed for dedicated lines only. Here, all the transmission elements to be implemented by PTCUL are part of ISTS network and there is no need of signing of a separated Transmission Agreement for the same. CTU, vide its letter dated 23.06.2016 to M/s L&T has also clarified that Transmission Agreement as per FORMAT-CON-8 is not needed as the transmission line is built by the deemed ISTS licensee under coordinated transmission system planning.”

- 4.4** CTU clarified that as per clause 7.3 of the detailed procedures for Grant of Connectivity, Long-term Access and Medium-term Open Access in inter-State Transmission and related matters) Regulations, 2009, where dedicated transmission system up to point of connection is to be undertaken by CTU / Inter-State Transmission licensee, the applicant after grant of connectivity shall sign transmission agreement within one month of the grant of connectivity. The Transmission Agreement is for the security of the investment made by developer of transmission network. Therefore, PTCUL should immediately sign a tripartite transmission agreement with CTU and generator.
- 4.5** PTCUL requested CTU to share the format of Tripartite Transmission Agreement. CTU agreed for the same.
- 4.6** PTCUL opined that the generators may not agree to sign the transmission agreement. CTU clarified that the signing of the agreement is as per the detailed procedure. In case Generators do not agree for signing of the agreement, PTCUL may approach CEA/CTU.
- 5.0 Energization of 220/33 kV substation Pirankaliyar and LILO of 220 kV Roorkee (Puhana PGCIL) - Roshnabad line in District Haridwar, Uttarakhand.**
- 5.1** CEA stated that PTCUL vide their letter dated 19.9.2018 had requested for in-principle approval for 220/33 kV (2x50 MVA) Pirankaliyar substation and LILO of 220 kV Roorkee (Puhana PGCIL)- Roshnabad line, which were ready for the energisation. PTCUL had also intimated that this project was envisaged in 2011. The approval of standing committee of CEA could not be taken at that time. CEA vide its email dated 22.9.2018 has informed NRLDC that as far establishment of Pirankaliyar 220 kV substation is concerned, it has already been discussed and agreed in the 39th meeting of SCSPNR held on 29th -30th May 2017. In that SCSPNR meeting, PTCUL has intimated the implementation of Roorkee (PG)-Pirankaliyar 220 kV D/C line along with Pirankaliyar 220 kV substation as intra state transmission system by PTCUL and members had noted the same. For feeding additional load at Pirankaliyar, one no. of 1x500 MVA, 400/220kV transformer along with associated bays at Roorkee (PG) 400/220kV Substation was also agreed as an ISTS scheme. In the letter PTCUL has informed that Roorkee (PG)-Pirankaliyar 220 kV D/C line is under implementation and there were some RoW issues, whereas the substation is ready for charging by LILO of Roorkee (Puhana)-Roshnabad 220 kV line. They have sought approval for energization of the sub-station through LILO of Roorkee (Puhana)-Roshnabad 220 kV line. As establishment of Pirankaliyar 220 kV substation and corresponding ICT augmentation at Roorkee under ISTS has already been agreed in the 39th SCSPNR, CEA had requested NRLDC to consider energization of Pirankaliyar 220 kV S/S by LILO of Roorkee (Puhana)-Roshnabad 220 kV line, as requested by PTCUL.
- 5.2** CEA pointed out that the first meeting of NRSCT was held on 11.09.2018, wherein PTCUL could have taken the approval for energisation of Pirankaliyar 220 kV substation by LILO of Roorkee (Puhana)-Roshnabad 220 kV line. In the meeting, it was specifically pointed out that post facto approval by constituents needs to be avoided. PTCUL was advised to take approval all its intrastate schemes from the NRSCT in advance and CEA requested NRSCT to concur charging of Pirankaliyar 220/33 kV (2x50 MVA) substation through LILO of 220 kV Roorkee (Puhana) (PGCIL) - Roshnabad line.

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- 5.3 On a query from CEA whether LILO of 220 kV Roorkee (Puhana PGCIL)- Roshnabad line for charging of Pirankaliyar 220/33 kV (2x50 MVA) substation is an interim arrangement or permanent arrangement, PTCUL stated that the LILO of 220 kV Roorkee (Puhana PGCIL)-Roshnabad S/c line at Pirankaliyar 220/33 kV (2x50 MVA) substation is a permanent arrangement and after commissioning of Roorkee (PG)-Pirankaliyar 220 kV D/C line, there will be four outlets from Pirankaliyar 220/33 kV (2x50 MVA) substation. He further informed that Roorkee (PG)-Pirankaliyar 220 kV D/C line is anticipated to be completed by March 2019.
- 5.4 CEA stated that PTCUL's implementation of four no. of 220 kV outlets for transformation capacity of 2x50 MVA at 220/33 kV Pirankaliyar Sub-station is not justifiable.
- 5.5 PTCUL stated that the same has been proposed in view of anticipated 2x100 MVA, 220/132 kV transformation capacity envisaged at Pirankaliyar substation in near future.
- 5.6 PGCIL enquired about the utilisation of 220kV outlets from Puhana (PG) 400/220 kV substation. PTCUL stated that 2 no of existing line bays at Puhana 400/220 kV substation had been utilised for Puhana-Roorkee (PTCUL) 220 kV S/c line and Puhana-Roshanabad 220 kV S/c line. Two no. of 220 kV line bays would be utilized for Puhana-Pirankaliyar 220 kV D/c line (under construction expected by March 2019). In addition to this two no of 220 kV line bays at 400/220kV Puhana (PG), which are under implementation by POWERGRID would be utilized for LILO of Roorkee-Nara 220kV S/c line at Puhana (PG) (expected by March 2022).
- 5.7 After deliberations, members concurred the proposal of charging of Pirankaliyar 220/33 kV (2x50 MVA) substation through LILO of Roorkee (Puhana) (PGCIL)-Roshnabad 220 kV line.
- 6.0 Power Evacuation of the projects in Chenab Basin and establishment of 400/132kV substation at Kishtwar:**
- 6.1 CEA stated that in the 40th meeting of SCPSPNR held on 26.7.2018 Chenab Valley Power Projects Ltd. (CVPPL), (JV of NHPC, JKSPDC and PTC) had made a request for establishment of 400/132kV S/s at Kishtwar evacuation of power from Pakaldul (1000MW), Kiru (624 MW) and Kwar (540 MW) HEP projects. In the meeting, it was decided that various activities like identification of suitable site for establishment of Kishtwar pooling station, phasing of the identified evacuation system etc. would be taken up only after application for connectivity / LTA by the project developer.
- 6.2 CEA further stated that CVPPL had submitted the application for grant of connectivity for Pakaldul HEP project to CTU and requested to expedite the power evacuation plan of the projects in Chenab Basin and firming up the establishment of 400/132kV S/s at Kishtwar.
- 6.3 CEA added that transmission system for evacuation of power from Kiru, Kwar and Pakal Dul HEPs was identified as part of master plan for evacuation of power from HEPs in J&K and Himachal Pradesh considering various generation projects in Chenab basin and RoW constraints. In that master plan, it was proposed that 400 kV D/c (Triple HTLS Conductor – equivalent to current carrying capacity of 2300MW) line would be constructed from Kiru HEP to Kishtwar Pooling station (High capacity common corridor-II), one circuit of which would be LILO at Kwar HEP and Pakaldul HEP. Further, establishment of Kishtwar pooling would be required to be developed under ISTS considering transfer of power from generation projects in J&K and Himachal Pradesh
- 6.4 CTU stated that the connectivity application has been received for Pakaldul HEP only and the matter has been discussed in 16th meeting of NR for connectivity and LTA

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applications held on 24.10.2018 at POWERGRID, Gurgaon, wherein the following transmission system was agreed in-principle for connectivity:

- i) 400 kV D/c (Triple HTLS Conductor) line from Pakal Dul HEP – Kishtwar Switching station along with associated bays at both ends – under scope of applicant
- ii) Establishment of 400 kV switching station at Kishtwar (GIS) by LILO one circuit of Kishenpur – Dulhasti 400kV D/c (Quad) line (Single Circuit Strung).
- iii) GIS switchyard equipment, XLPE cables and other associated equipment may be designed for current carrying capacity of 4000 Amps.
- iv) 420 kV, 125 MVAR Bus Reactor each at Pakal Dul HEP and Kishtwar Switching Station

6.5 Regarding the status of these generation projects, CVPPL informed that for Pakaldul HEP (1000 MW), Connectivity application has already been submitted to CTU. For Kiru HEP, techno-economic clearance has already been received from CEA and the project is presently under PIB approval stage with Ministry of Power. For Kwar HEP, TEC is awaited from CEA.

6.6 After deliberations, following was agreed:

1. Transmission system was agreed for providing connectivity to Pakal Dul HEP (1000 MW):
 - i) 400 kV D/c (Triple HTLS Conductor) line from Pakal Dul HEP–Kishtwar Switching station along with associated bays at both ends – under scope of generation developer
 - ii) Establishment of 400 kV switching station at Kishtwar (GIS) by LILO one circuit of Kishenpur – Dulhasti 400kV D/c (Quad) line (Single Circuit Strung) –under ISTS
 - iii) GIS switchyard equipment, XLPE cables and other associated equipment may be designed for current carrying capacity of 4000 Amps - under scope of generation developer
 - iv) 420 kV, 125 MVAR Bus Reactor at Pakal Dul HEP - under scope of generation developer
 - v) 420 kV, 125 MVAR Bus Reactor at Kishtwar Switching Station - under ISTS
 - vi) One and a half breaker switching scheme for 400kV Generation switchyard - under scope of generation developer
2. Generation developer to sign the Transmission agreement and submit the Bank Guarantee to CTU as per the CERC connectivity Regulation.

7.0 Rajasthan proposal for establishment of 400kV/220kV GSS at Sangod (New GSS) or creation of 220 kV level at Anta (existing 765/400 kV GSS) with 220kV GSS at Sangod and associated interconnections for removing evacuation constraint in Kalisind-Chhabra-Kawai Generation Complex.

7.1 CEA stated that RVPNL vide their email dated 6.11.2018 had forwarded the proposal for removing evacuation constraint in Kalisind-Chhabra-Kawai Generation Complex. In the proposal RVPNL has studied two alternatives viz (i) establishment of 400/220 kV GSS at Sangod (New GSS) along with connectivity lines and (ii) creation of 400/220 kV level at GSS Anta (existing 765/400 kV GSS) along with 220kV GSS at Sangod and associated interconnections. CEA requested RVPNL to present their proposal.

7.2 RVPNL stated that the issue of evacuation constraints in Chhabra, Kalisindh & Kawai Generation Complex of approx. 4840 MW (details at Table-1) due to single 315 MVA,

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400/220kV ICT each at Chhabra and Kalisindh has been continuously raised by NRLDC for the past 2 years at various forums viz. OCC, NRPC and Standing Committee.

TABLE - 1

S. No.	Generating Plant	Installed capacity in MW	
1.	Kalisindh	2x 600	1200
2.	Kawai	2x 660	1320
3.	Chhabra TPS	4x 250	1000
4.	Chhabra SCTPS	2x 660	1320
TOTAL			4840

A sub-committee of NRSCT was formed to resolve the above issue and its first meeting was held on 2.04.2018, wherein CEA, interalia, advised to explore the possibility of creating a new 400kV GSS of RVPN in this corridor. Accordingly, various alternative proposals viz. creating 400kV GSS at Dahara / Sangod , creation of 220 kV level at Anta or placing additional ICTs at Chhabra and augmenting capacity of ICTs at Kalisindh by 500MVA / 315MVA were considered. The two most suitable alternatives has been submitted by RRVPNL along with Exhibits of Load Flow Studies for the consideration of Northern Standing Committee meeting on Transmission. The details of the studies are as follows:

LOAD FLOW STUDY

7.2.1 Load flow studies have been carried out for the total system load of 14430 MW corresponding to 2021-22 for base case, Alternative -1 and Alternative -2. The study results are enclosed as **Annexure-A1**.

(i) **Base Case:-** With existing transmission system the power plots of load flow study for Base Case are placed at **Exhibit-1**.

(ii) **Alternative-1:-** Creation of 220 kV level at existing 765/400 kV GSS at Anta & 220kV GSS at Sangod area Distt. Kota along with following interconnections.

- 2x500MVA, 400/220 kV Power Transformer at existing 765/400 kV GSS at Anta (Distt. Kota).
- 2x160MVA, 220/132kV Power Transformer at proposed 220kV GSS Sangod (Distt. Kota).
- 6 km 220kV D/C Anta (765kV)-Baran (220kV) line.
- 30km 220kV D/C Sangod (220kV)(Proposed)-Anta (765kV) line.
- 44km 220kV S/C line extension of existing 220kV S/C Dahara (220kV)-Anta (NTPC) line upto Anta (765kV).

(iii) **Alternative-2:-** Establishment of 400/220kV GSS at Sangod area Distt. Kota along with following interconnections.

- 2x500MVA, 400/220 kV Power Transformer at proposed 400kV GSS Sangod (Distt. Kota).
- 20km LILO of one circuit of 400kV D/C Kalisindh TPS (400kV)-Anta (765kV) line at 400kV GSS Sangod.
- 2x160MVA, 220/132kV Power Transformer at 400kV GSS Sangod (Distt. Kota).

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- 30km 220kV D/C line Sangod (400kV)-Baran (220kV) line.

7.2.2 The above two alternatives were studied under the two contingency conditions:

Con-1: when ICT at Kalisindh is out and

Con.-2: when ICT at Chhabra is out

Description of the various load flow cases studied is as under:

Exhibit-1 –Base case RRVPNL system losses (503.203 MW)	-	-
Exhibit 2A- Alternative 1 RRVPNL system losses : (493.818 MW)	Exhibit 2B- Alternative 1, Contingency - 1	Exhibit 2C- Alternative 1, Contingency 2
Exhibit 3A- Alternative 2 RRVPNL system losses : (496.154 MW)	Exhibit 3B- Alternative 2, Contingency- 1	Exhibit 3C- Alternative 2, Contingency- 2

- 7.3** From the study results it is seen that system losses are minimum in alternative-1 and a saving of 9.385 MW (355.158 LU's). Further under N-1 contingency i.e. when ICT is out either at Kalisindh or Chhabra the loadings on all the transmission elements is within safe limits. Alternative-1 also helps in reducing power flow on recently commissioned Ant-Kota 400 kV S/C line from 827 MW in base case to 616 MW.
- 7.4** RRVPNL further stated that the proposal of creating 220 kV level at existing 765/400 kV Anta GSS and 220 kV GSS at Sangod area along with associated interconnections is technically and financially more suitable as compared to alternative-2, which involves LILO of one circuit of 400 kV D/c Kalisindh TPS (400 kV)-Anta (765 kV) line at 400 kV GSS Sangod, which may involve line crossings.
- 7.5** CEA opined that even if with the implementation of the above system, the requirement of augmentation of transformation capacity at Kalisindh still persist in case of outage of even one circuit of Kalisindh –Anta 400kV D/C line.
- 7.6** RVPNL stated that there is a space constraint at Kalisindh and installation of SPS, augmentation of transformation capacity or construction of new 400 kV outlets from Kalisindh would be difficult. The replacement of transformer of 315 MVA with 500 MVA may be possible, but the same needs to be deliberated with RRVUNL
- 7.7** POSOCO stated that this complex has huge generation of about 5000 MW and transmission system from the complex should be planned keeping in view N-2/N-1-1 contingency criteria. Therefore, in addition to the above proposed system, RRVPNL should also carry out the replacement of transformer at Kalisindh at the earliest to overcome the evacuation constraint under contingency condition up to some extent. POSOCO enquired how the 2x500 MVA 400/220 kV transformers and 220 kV interconnections proposed at Anta would be linked with existing 400kV switchyard at Anta.
- 7.8** RVPNL clarified that 400 kV bus of the existing 765/400 kV switchyard would be extended (L shape) and bus sectionaliser would be provided between 765/400 kV and 400/220 kV switchyards at 400 kV. With regard to planning for N-2/N-1-1 contingency criteria, RRVPNL stated that this would entail additional burden on the consumers. Generation developers may not agree for additional expenditure at their generation switchyard. Further thermal generation needs to be backed down in view of renewable generation addition.

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- 7.9 After further deliberations, following transmission system was agreed to be implemented by RVPNL as intra-state transmission system:
- i) 2x500MVA, 400/220 kV Power Transformers at existing 765kV GSS Anta (Distt. Kota).
 - ii) 2x160MVA, 220/132kV Power Transformers at proposed 220kV GSS Sangod (Distt. Kota).
 - iii) Anta (765)-Baran (220) 220kV D/C line - 6 km.
 - iv) Anta (765)-Sangod (220)(Proposed) 220kV D/C line - 30km
 - v) Extension of existing Dahara (220)-Anta (NTPC) 220kV S/C line up to Anta (765) 220kV S/C line - 44km
- 7.10 NLDC stated that to reduce the overloading of Anta- Kota 400kV S/c portion of Chhabra- Anta-Kota 400kV S/c line, the line may be opened at Anta, thus forming Chhabra-Kota 400kV S/c line, till the commissioning of 2x500 MVA, 400/220 kV power transformers at 765 kV GSS Anta.
- 7.11 Members agreed for the same.

8.0 Grant of LTA to M/s NTPC Ltd. for Tanda TPS Stage-II (2x660 MW) for transfer of 356.78 MW power to NR Beneficiaries

- 8.1 CTU stated that in the 40th meeting of SCPSPNR and 12th meeting of Connectivity/LTA for NR held on 22.06.2018, it was agreed to grant LTA to NTPC for transfer of 356.78 MW power from Tanda Stage-II (2x660MW) TPS to Northern Region beneficiaries with UPPTCL transmission system. In these meetings, NTPC had informed that 1st unit of Tanda TPS Stage-II generation project is expected to be commissioned by 31st March, 2019 and 2nd unit by 31st July, 2019. However, NTPC vide letter dated 03.10.2018 has stated that as per work progress at Tanda Stage-II TPS, the expected COD dates of Unit-I & II are June 2019 and De. 2019 respectively. NTPC has requested to grant LTA for 1st and 2nd units from 01.07.2019 and 01.01.2020 respectively.
- 8.2 CTU added that the matter was taken up in 16th meeting of Connectivity/LTA for NR held on 24.10.2018, as there was no representation from UPPTCL in that meeting, the matter was not discussed. UPPTCL vide their email dated 24.10.2018 had informed that the dates for grant of LTA for 1st and 2nd units may be considered as 01.03.2019 and 01.01.2020.
- 8.3 The issue could not be discussed in the meeting as NTPC is not a member of NRSCT and it was decided to take up the matter in next LTA/Connectivity meeting for NR constituents. Based on the discussions, LTA may be granted to NTPC for Tanda TPS Stage-II (2x660 MW). UPPTCL was requested to coordinate with their commercial department on the above subject

9.0 Connectivity/LTA Applications received by CTU

- 9.1 CTU provided following details about the connectivity/LTA applications, which had been received by CTU:

9.1.1 Stage-I Connectivity Applications

The details of Stage-I Connectivity granted to various IPPs in 15th LTA/Connectivity meeting of NR held on 11-09-2018 is enclosed at **Annexure-B1**.

9.1.2 Stage-II Connectivity Applications

CTU stated that as per Clause 5.3.1 of the RE Connectivity Procedure, terminal bays at the ISTS sub-station shall be under the scope of transmission licensee owning the ISTS sub-station subject to compliance of relevant provision of tariff policy. Under Para 5.3.2,

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an option has been provided to wind power generators/developers who have emerged successful in the bidding conducted by Central/State Government designated agency before coming into force of the RE Connectivity Procedure (i.e. 15.05.2018) to implement the terminal bays on their own.

CTU added that in the 15th Connectivity/LTA meeting for NR held on 11.09.2018, considering the time lines for implementation of bays under ISTS sub-station, it was suggested by the applicants that the developers may be given the option of implementing the bay at ISTS sub-station at their cost. Thus, keeping in view the requirement of matching of terminal bays at ISTS substation for RE generators and based on the confirmation to implement the bays by the applicants at their own cost, renewable generators have been granted Stage-II Connectivity with the implementation of respective bays at ISTS substations in their scope. The same has also been informed to Hon'ble CERC vide letter dated 08-08-2018 and 15-10-2018 for inclusion of option for implementation of terminal bays at ISTS substation by RE generators in the Detailed Procedure.

The following Connectivity transmission system for grant of Stage-II Connectivity was agreed in the 15th Connectivity/LTA meeting of NR held on 11/09/2018 and the same has been granted.

TABLE 1

Sl. No.	Application No.	Applicant	Location	Date of Application	Quantum of Stage-I	Stage-II Connectivity Sought (MW)/date	Proposed location for Grant of Stage-II Connectivity	Dedicated Tr. System
Connectivity applications near Bhadla								
1.	1200001 627	Mahindra Susten Private Limited	Jodhpur, Rajasthan	08/08/18	250 (Stage-I : 1200001519)	250/01.06.2019	765/400/20 kV Bhadla S/s (Under Implementation)	Mahindra Susten 250 MW Solar Project– Bhadla 220kV S/c line
2.	1200001 644	Azure Power India Private Limited	Jodhpur, Rajasthan	18/08/18	500 (Stage-I: 1200001163)	50/Revised from 01.09.2018 to 15.10.2020	765/400/20 kV Bhadla S/s (Under Implementation)	Azure Solar PV Plant Bhadla 2 - Bhadla 220kV S/c line (250 MW Stage-II is already granted with above line. Considering 50 MW, total Stage-II connectivity with above line shall become 300 MW)
3.	1200001 654	Mahoba Solar (UP)	Jodhpur, Rajasthan	22/08/18	300 (Stage-I :	50 (Stage-II	765/400/20 kV Bhadla	Mahoba Solar Power Plant Switch Yard –

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Sl. No.	Application No.	Applicant	Location	Date of Application	Quantum of Stage-I	Stage-II Connectivity Sought (MW)/date	Proposed location for Grant of Stage-II Connectivity	Dedicated Tr. System
		Private Limited	han		1200001370)	Enhancement) / 01.07.2020	S/s (Under Implementation)	Bhadla 220kV S/c line (200 MW Stage-II is already granted with above line. Considering 50 MW, total Stage-II connectivity with above line shall become 250 MW)
Connectivity applications near Fatehgarh (being implemented by FBTL)								
4.	1200001643	ACME Solar Holdings Limited	Jaisalmer, Rajasthan	22/08/18	300 (Stage-I : 1200001634)	300 (Fatehgarh III) / 26.10.2020	400 kV Fatehgarh * (Under Implementation)	<ul style="list-style-type: none"> Pooling of power of ACME Fatehgarh III & IV Solar Power Plant at common pooling station of ACME Fatehgarh I & II Solar Power Plant Common Pooling Point of ACME Fatehgarh I, II, III & IV Solar Power Plant - Fatehgarh 400 kV S/c line (already agreed with Fatehgarh I & II Solar Power Plant) suitable to carry at least 1200 MW at nominal voltage
5.	1200001642	ACME Solar Holdings Limited	Jaisalmer, Rajasthan	22/08/18	300 (Stage-I : 1200001636)	300 (Fatehgarh IV) / 26.10.2020	400 kV Fatehgarh * (Under Implementation)	

* For effecting the Connectivity at Fatehgarh S/s, following ISTS elements (being implemented by ISTS Licensee through TBCB) shall be required:

- Fatehgarh Pooling Station - Bhadla (PG) 765kV D/c line (to be operated at 400kV level)
- Establishment of 400kV Fatehgarh Pooling Station

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- iii) 2 nos. 400kV line bays at Fatehgarh Pooling Station
- iv) 2 nos. 400kV line bays at Bhadla (PG)
- v) 1x 125 MVAR Bus reactors at 400kV Fatehgarh Pooling Station

9.1.3 LTA Applications:

The following LTA applications were agreed for grant in the 15th meeting of Connectivity/LTA of NR held on 11-09-2018:

TABLE 2

Sl. No	Application No./Date (Online)/ (Physical)	Applicant	Connectivity/ Injection Point	Drawl Point	LTA (MW)/ Start & End Date (Sought)	Proposal/Remarks
	12000016 45 (23/08/18))/ (24/08/18))	Mahindra Susten Private Limited	220kV Bhadla	Chhattisgarh, WR (Target)	250 (Start : 01/09/20 End : 01/09/45)	For transfer of power, transmission system finalised under Agenda item (2) of the present meeting shall be required. Accordingly grant may be processed.
	12000016 51 (22/08/18))/ (30/08/18))/	Azure Power India Private Limited	220kV Bhadla	WR (Target)	50 (Start : 15/10/20 End : 15/10/45)	For transfer of power, transmission system finalised under Agenda item (2) of the present meeting shall be required. Accordingly grant may be processed.
	12000016 53 (22/08/18))/ (23/08/18))	Acme Solar Holdings Limited	220kV Bhadla	Maharashtra, WR (Target)	250 (Start : 16/09/19 End : 15/09/44)	For transfer of power, transmission system finalised under Agenda item (2) of the present meeting shall be required. Accordingly grant may be processed.
	12000016 63 (24/08/18))/ (24/08/18))	Hero Solar Energy Private Limited	220kV Bhadla	Jharkhand/ ER (Target)	250 (Start : 02/09/20 End : 30/11/45)	For transfer of power, transmission system finalised under Agenda item (2) of the present meeting shall be required. Accordingly grant may be processed.
	12000016 40 (21/08/18))/ (23/08/18))	Renew Solar Power Private Limited	400kV Bikaner	WR (Target)	250 (Start : 26/10/19 End : 25/10/4)	For transfer of power, transmission system finalised under Agenda item (2) of the present meeting shall be required. Accordingly grant may be processed.

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Sl. No	Application No./Date (Online)/(Physical)	Applicant	Connectivity/ Injection Point	Drawl Point	LTA (MW)/ Start & End Date (Sought)	Proposal/Remarks
					4)	processed.
	1200001650 (22/08/18)/ (30/08/18)	Azure Power India Private Limited	400kV Bikaner	ER (Target)	300 (Start : 15/10/20 End : 15/10/45)	For transfer of power, transmission system finalised under Agenda item (2) of the present meeting shall be required. Accordingly grant may be processed.
	1200001655 (22/08/18)/ (30/08/18)	Azure Power India Private Limited	400kV Bikaner	100 (NR) 200 (ER) Target	300 (Start : 15/10/20 End : 15/10/45)	For transfer of power, transmission system finalised under Agenda item (2) of the present meeting shall be required. Accordingly grant may be processed.
	1200001664 (27/08/18)/ (29/08/18)	Acme Solar Holdings Limited	400 kV Fatehgarh	Delhi/NR (Target)	300 (Start : 19/10/20 End : 18/10/45)	For transfer of power, transmission system finalised under Agenda item (2) of the present meeting shall be required. Accordingly grant may be processed.
	1200001669 (29/08/18)/ (29/08/18)	Acme Solar Holdings Limited	400 kV Fatehgarh	Delhi/NR (Target)	300 (Start : 19/10/20 End : 18/10/45)	For transfer of power, transmission system finalised under Agenda item (2) of the present meeting shall be required. Accordingly grant may be processed.

Note : Transmission System required for LTA from Fatehgarh, Bhadla & Bikaner has been segregated and detailed at Item no. 2 of this MOM..

Application No. (1) to (4) are for evacuation of power from Bhadla onwards. The total LTA from Bhadla including evacuation of power from solar parks along with these applications shall become 3130 MW (Earlier-2330 MW + Present 800 MW).

Regarding, injection of power by solar generators, the applicants informed they shall be setting up higher capacities on DC side so as to ensure full injection of LTA quantum on AC side. After detailed deliberations, it was agreed that full dispatch as given in the application may be considered for finalizing the scheme and also the "N-1" criteria may not be applied to the immediate connectivity of wind/solar farms with the ISTS/Intra-

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STS grid i.e. the line connecting the farm to the grid and the step-up transformers at the grid station as mentioned in Transmission Planning Criteria.

9.2 Members noted the same.

10.0 Augmentation of 1x1500MVA, 765/400kV ICT (3rd) at Moga S/s and Provision of 125MVAR bus reactors each at Jalandhar & Patiala

10.1 CTU stated that augmentation of transformation capacity at 765/400kV Moga S/s by 1x1500MVA, ICT was discussed in 1st NRSCT held on 11.09.2018 under scheme “Evolution of transmission scheme for integration of envisaged RE generation capacity in Solar & Wind Energy Zones and Transmission Schemes for Solar Energy Zones (REZs) in Rajasthan”. A site visit was made to explore possibility of using GIS switchgears in place of AIS due to space constraints. Based on the site visit, installation of 1x1500MVA, 765/400kV ICT at Moga was found to be feasible using GIS switchgears and GIB interconnections. Accordingly, 1500MVA ICT at Moga may be installed considering outdoor 765kV & 400kV GIS switchgear and GIB interconnections (in place of AIS).

10.2 CTU further added that provision of bus reactors at various substations was discussed and agreed in the 39th meeting of SCSPNR held on 29-30th May, 2017. During the meeting, it was also agreed that the identified bus reactors may be provided by the owner of the substation subject to the availability of space. Subsequently, during the 2nd Meeting of Empowered Committee on Transmission (ECT) held on 06-08-2018, it was decided that the reactors at POWERGRID substations shall be implemented by POWERGRID. The approved scheme also included 125 MVAR reactor each at Patiala and Jalandhar. However, there are space constraints at these substations and provision of these reactors is feasible by providing GIB interconnections and GIS instead of AIS switchgear. Considering the high voltage conditions in the Punjab area, reactors are being installed with the GIB interconnections along with GIS switchgear for provision of these 125 MVAR reactors one each at Patiala and Jalandhar.

10.3 Members agreed to the same.

11.0 Connectivity to Luhri St-I, II and Sunni Dam HEPs

11.1 CTU stated that three nos. of Hydro Projects viz. Luhri HEP St-I (210 MW), Luhri HEP St-II (172 MW) and Sunni Dam HEP (382 MW) are proposed to be developed by SJVNL in Kullu & Mandi District of Himachal Pradesh. SJVNL had submitted a Connectivity application for Luhri Stage-I HEP in Nov. 16. To discuss the issues regarding transmission system required for evacuation of power from Luhri Stage-I HEP, a meeting was held on 10-01-2017 in CEA with representatives from CEA, CTU, SJVNL and HPPTCL/HPSEB. During the meeting, representative from SJVNL informed that Luhri project is on Satluj River and its upstream and downstream projects are Rampur and Koldam respectively. Initially, Luhri HEP was contemplated as single stage project of 775 MW. Thereafter, project layout was reviewed and it was decided to develop Luhri HEP in three stages with capacity of 210 MW (St-I), 207 MW (St-II) and 363 MW (St-III). All three stages of Luhri HEP are to be implemented by SJVNL.

11.2 CTU added that connectivity application of Luhri Stage-I was discussed in 10th LTA/Connectivity meeting of NR held on 30-05-2017, wherein, it was decided that transmission system for grant of Connectivity for Luhri Stage-I HEP may be planned in an integrated manner considering future stages of the project. Connectivity to Luhri HEP Stage-I was also discussed in 40th meeting of SCSPNR held on 22-06-2018, wherein it was informed that a team of officers from CEA, SJVNL HPPTCL, HPSEB and CTU visited 3 sites of Luhri-I, II and III on 14-06-2018. The team also saw the tentative

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locations of the pooling station. The team proposed that power from all the three stages of Luhri HEP would be evacuated at 220 kV level and would be pooled at 400/220 kV proposed ISTS pooling station tentatively identified at a place 'Nange' located near Luhri-II HEP and further evacuated to Koldam through 400 kV D/C line. System beyond Koldam sub-station shall be finalized after system studies. For taking up the implementation of the associated transmission system, SJVNL was advised to apply for Connectivity/LTA at the earliest for all the three stages.

- 11.3 CTU further added that connectivity application for Luhri Stage-II (172 MW) has been received from SJVNL in Aug. 18 and was discussed in 15th meeting of LTA/Connectivity for NR held on 28-09-2018. Establishment of 400/220 kV Nange Pooling Station (Tentatively identified near Luhri Stage-II HEP) and Nange Pooling Station-Koldam 400kV D/c line along with associated bays at both ends was agreed as common transmission system subject to confirmation from NTPC Ltd. regarding availability of space for 2 nos. of 400kV bays at Koldam switchyard. Recently, SJVNL had submitted connectivity application for Sunni Dam (Luhri Stage-III) for 382 MW and has sought Connectivity with effect from 31.03.2024. Hence, it is proposed to pool the power from Sunni dam to Nange Pooling Station through 220kV D/c line.
- 11.4 On a query from CEA about the commissioning schedule of Luhri Stage-I, Luhri Stage-II and Sunni Dam, SJVNL informed that Luhri Stage I, II and Sunni dam is expected to be commissioned by April 2023, March 2026 and March' 24 respectively
- 11.5 CEA stated that the dedicated transmission line (to be developed by SJVNL) from Sunni Dam HEP to 400/220 kV Nange Pooling station should be of high capacity.
- 11.6 After further deliberations, following transmission system was agreed for connectivity to Luhri St-I, II and Sunni Dam HEPs subject to confirmation from NTPC Ltd. for availability of space at Koldam switchyard for construction of 2 nos. of 400kV bays:

A) Connectivity System:

- a) Connectivity system for Luhri Stage-I 210MW (with effect from 30.04.2023) :**
Under the scope of Generation Developer
 - i) Luhri Stage-I – 400/220kV Nange Pooling Station 220kV D/c line along with associated bays at both ends
- b) Connectivity system for Luhri Stage-II 172MW (with effect from 31.03.2026):**
Under the scope of Generation Developer
 - i) Luhri Stage-II – 400/220kV Nange Pooling Station 220kV D/c line along with associated bays at both ends
- c) Connectivity system for Sunni Dam (Luhri Stage-III) 382MW (with effect from 31.03.2024):** Under the scope of Generation Developer
 - i) Sunni Dam (Luhri Stage-III) – 400/220kV Nange Pooling Station 220kV D/c line along with associated bays at both ends

B) Common system for connectivity of Luhri Stage-I & II: : Under ISTS

- i)** Establishment of 400/220kV Nange Pooling Station(Tentatively Identified near Luhri Stage-II HEP)
- ii)** Nange Pooling Station - Koldam 400kV D/c line along with associated bays at both ends

- C) CEA/CTU to get confirmation from NTPC Ltd. about availability of space at Koldam switchyard for construction of 2 nos. of 400kV bays**

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- D) SJVNL to apply for LTA for the HEPs in order to enable implementation of the proposed system under ISTS
- E) SJVNL stated that the timeframe for implementation of Luhri-I, II & Sunni Dam HEP is under revision. CTU asked SJVNL to formally submit the request for revision of dates and they will be accordingly incorporated.

12.0 Downstream network by State Utilities from ISTS Stations

12.1 CEA stated that augmentation of transformation capacity in various existing substations as well as addition of new substations along with line bays for downstream network are under implementation at various locations in Northern Region. Therefore, he requested States to implement the 220kV system for proper utilization of the line bays and inform the status of planned 220kV system for the substations listed in table 4.

12.2 The status as furnished by States is as follows:

TABLE 3

S. No.	Substation	Downstream network requirement	Schedule	Planned system and Implementation Status	Status
1	400/220kV, 3x315 MVA Samba	2 nos. bays utilized under ISTS. Balance 4 Nos to be utilized	Commissioned	LILO of 220kV Bishnha – Hiranagar D/c line: Under Tendering (PMDP) LoA has been issued and Material has reached the site. Targeted Completion – Nov 2019 Samba(PG) – Samba (JKPDD) 220 kV D/C line. PDD, J&K to update.	No updates received
2	400/220kV, 2x315 MVA New Wanpoh	6 Nos. of 220 kV bays to be utilized	Commissioned	220kV New Wanpoh – Mirbazar D/c line: Under Tendering (PMDP)-Anticipated-Mar'19 220kV Alusteng – New Wanpoh line Anticipated-MAR-19 PDD, J&K to update.	No updates received
3	400/220kV, 2x315 MVA Parbatipooling Station	2 Nos. of 220 kV bays to be utilized.	Commissioned	220kV Charor- Banala D/c line (18km): Under Construction Targeted Completion-Dec'18 HPSEBL to update.	No updates received

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S. No.	Substation	Downstream network requirement	Schedule	Planned system and Implementation Status	Status
4	400/220kV, 2x500 MVA Kurukshetra (GIS)	8 nos. of 220 kV bays to be utilized	Commissioned	<p>LILO of one circuit of Kaul-Pehowa 220kV D/c line</p> <p>LILO of one circuit of Kaul-Bastara 220kV D/c line</p> <p>Work awarded on 12.03.2018. Contractual completion period upto 31.10.2019. Likely date of completion by 31.12.2018.</p> <p>220 kV D/C Bhadson –to Salempur with HTLS conductor equivalent to twin Moose.</p> <p>Price bid opened and likely to be awarded by 30.09.2018. Likely completion by 31.03.2020</p>	<p>• Work awarded to M/s R.S. Infra Projects Pvt. Ltd. on 12.03.2018. Contractual completion period up to 31.10.2019.</p> <p>• LOA issued to M/s KRR on 03.10.2018. Contractual completion date is 30.04.2020.</p>
5	400/220kV, 2x500 MVA Bagpat GIS	5 nos. of 220 kV downstream lines to Baraut, Shamli, Muradnagar and Bagpat commissioned. Balance 3 Nos. of 220 kV bays to be utilized	Commissioned	<p>Bagpat- Baraut 220kV S/c Line- Commissioned</p> <p>Bagpat(PG)-Modipuram-II 220kV D/c line -exp. by Jan'20</p> <p>Revision in Connectivity LILO of 220kV Muradnagar II -Baghpat (PG) at Baghpat UP- Severe Row- Mar'19</p> <p>UPPTCL to update.</p>	No updates received
6	400/220 kV, 2x315 MVA Saharanpur	6 nos. 220 kV downstream lines commissioned. (Khara, Shamli, Nanauta, Saharanpur (UP) and Sarsawa)	Commissioned	<p>LILO of Khara- Shamli 220kV S/c line at Saharanpur PG- Commissioned</p> <p>Saharanpur(PG)-Sarsawa (new) 220 kV D/c- Commissioned</p> <p>LILO of Saharanpur-Nanauta 220 kV S/c line at Saharanpur PG- Commissioned.</p>	No updates received

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S. No.	Subst ation	Downstrea m network requireme nt	Schedule	Planned system and Implementation Status	Status
7	400/220 kV, 2x315 MVA Dehradun	Out of 6 bays, only two bays used. Balance 4 bays to be utilised.	Commissioned	2 bays for 220 kV Dehradun – Jhajra line One bay for proposed Naugaon S/s 2 bays for proposed S/s at Selakui PTCUL to update.	No updates received
8	400/220 kV, 2x315 MVA Sohawal	4 Nos 220 kV bays utilized balance 2 Nos 220 kV bays to be utilized.	Commissioned	2 nos of bays utilized for Sohawal 220kV UP-Commissioned 2 nos for Barabanki 220 kV s/s- Commissioned 2 nos of bay utilized for 220kV New Tanda-Sohawal line Severe RoW UPPTCL to update.	No updates received
9	Shahjahanpur, 2x315 MVA 400/220 kV	Partially utilized. Balance 5 Nos. of 220 kV bays to be utilized.	Commissioned	One bay used for 220 kV Shahjahnpur-Hardoi line commissioned. 2 no of bays for 220kV Shahjahnpur - Azizpur D/c line- Sep'19 2 no of bays for 220kV Shahjahnpur – Gola,Lakhimpur D/c line- Sep'19 UPPTCL to update.	No updates received
10	02 nos. bays at Moga	Partially utilized. Balance 2 nos. of 220kV bays to be utilized.	Commissioned	PSTCL informed that Moga–Mehalkalan 220kV D/c line- Works Completed but Commissioning Pending. Targeted Completion- SEP-18 PSTCL to update.	No updates received
11	Hamirpur 400/220 kV 2x315 MVA Sub-station (Augmentation by 3x105 MVA	04 nos. 220 kV downstream lines commissioned under ISTS. Balance two bays to be utilised by HPSEBL	Sep'18	Dehan-Hamirpur 220 kV D/c line- Expected by Apr'20 HPSEBL to update.	No updates received

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S. No.	Substation	Downstream network requirement	Schedule	Planned system and Implementation Status	Status
	ICT)				
12	Kaithal 400/220 kV 1x2 Nos. of 315 MVA Sub-station	220kV bays to be utilized	Commissioned	220kV Kaithal(PG)-Neemwala D/c line - Work awarded on 08.06.2018. Tentative completion date is 31.01.2020. 220 kV Neemwala - Work awarded on 06.09.2018. Contractual completion period upto 05.04.2020. HVPNL to update.	• Work awarded on 08.06.2018. Contractual completion upto 31.01.2020. • Work awarded to M/s HPL Electric & Power Ltd on 06.09.2018. Contractual completion period upto 05.04.2020.
13	Sikar 400/220 kV, 1x2 Nos. of 315 MVA S/s	220 kV bays	Commissioned	RRVPNL representative stated that studies would be conducted to formulate how bays could be utilized. RRVPNL to update.	No updates received
14	400/220 kV Kota Sub-station (1 No. of 400 kV Bay)	1 No. of 400 kV Bay	Commissioned	Anta- Kota 400kV line commissioned.	No updates received
15	Bhiwani 400/220 kV S/s	6 nos. of 220kV bays	Commissioned	220kV D/c line from Bhiwani (PG) to 220kV Isherwal (HVPNL) S/s 220kV D/c line from Bhiwani (PG) to 220kV Isherwal (HVPNL) S/s Likely to be completed by 31.06.2020	Tender opened on 30.10.2018 and is under evaluation. The work is likely to be awarded by 31.12.2018.
16	Jind 400/220 kV S/s	6 nos. of 220kV bays	Commissioned	LILO of both circuits of 220kV D/c Narwana - Mund line at Jind (PG) NIT floated on 20.08.2018 Likely to be completed by 31.06.2020	Tender opened on 30.10.2018 and is under evaluation. The work is likely to be awarded by 31.12.2018.

Establishment of new 400/220kV substations in Northern Region:

S. No.	Name of Substation	MVA Capacity	Expected Schedule	Downstream connectivity furnished by States in 41 st NRPC	Status
1	400/220 kV	4x 500	Dec'18	2x160MVA, 220/66kV ICTs – expected by 2021-	Scheme is being framed.

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S l. N o.	Name of Substation	MVA Capacity	Expected Schedule	Downstream connectivity furnished by States in 41 st NRPC	Status
	Dwarka-I GIS (8 nos. of 220kV bays)			22 2x160MVA, 220/66kV ICTs – Future LILO of 220kV Papankalan-III – Naraina & Papankalan-I Line at Dwarka-I – expected along with charging of 400kV S/s	Route alignment for LILO work has been finalized and further final survey and profiling/engineering is under progress.
2	400/220 kV Tughlakabad GIS (8 nos. of 220kV bays)	4x 500	Charged	LILO of Badarpur-Mehrauli 220kV D/c line at Tughlakabad – Expected with 400kv S/s Okhla-Tughlakabad 220kV D/c line- Expected with 400kv S/s Masjidmoth-Tughlakabad 220kV D/c line- Expected by 2020-21 R.K.Puram-Tughlakabad (U?G cable) 220kV D/c line- Expected by 2020-21	Line charged. Under execution Scheme is being framed. Scheme is being framed.
3	220/66kV Chandigarh GIS (8 nos. of 66kV bays)	2x 160	Feb'19	Chandigarh to update.	No updates received
4	400/220 kV Jauljivi GIS (6 nos. of 220kV bays)	2x315	Dec'2019	2 bays for 220kV Almora-Jauljibi line 2 bays for 220kV Brammah-Jauljibi line PTCUL to update.	No updates received
5	400/220 kV Sohna Road Sub-station (TBCB) (8 nos. of	2x500	May'19	LILO of both circuits of 220kV D/c Sector-69 - Roj Ka Meo line at 400kV Sohna Road – Under Survey LILO of both circuits of 220kV D/c Badshahpur-Sec77 line at 400kV Sohna Road – Under	Due to ROW issues with M/s GPTL route of the LILO is not finalized yet.

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S l. N o	Name of Substati on	MVA Capacity	Expect ed Schedu le	Downstream connectivity furnished by States in 41 st NRPC	Status
	220kV bays)			Survey	
6	400/220 kV Prithla Sub- station (TBCB) (8 nos. of 220kV bays)	2x500	May'1 9	LILO of both ckt of 220kV D/c Ranga Rajpur – Palwal line – Expected by Mar'20 220kV D/C for Sector78, Faridabad – Expected by Jul'20	LOA issued on 08.10.2018 to M/s R.S. Infra Project Pvt. Ltd. Contractual completion date is 07.02.2020. Tender opened on 30.10.18 and is under evaluation. The work is likely to be awarded by 31.12.2018.
7	400/220 kV Kadarpu r Sub- station (TBCB) (8 nos. of 220kV bays)	2x500	May'1 9	Land details submitted by M/s Sterlite recently. M/s Sterlite has been asked to change the orientation of GELO in order to ensure proper emanation of 220 kV line. The survey of line to evacuate power is in process and downline of 400 kV substation Kadarpur will be finalized shortly.	Route Plan and BOQ is under evaluation.
8	400/220 kV Kala Amb GIS (TBCB) (6 nos. of 220kV bays)	2x315	Commi ssioned	HPSEBL has planned one no. of 220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Kala Amb S/s. HPSEBL informed that they have planned 220kV Kala Amb- Trilokpur 220kV D/c line. The site for the substation has been identified HPSEBL to update.	No updates received
9	400/220 kV Amargar h GIS (TBCB) (6 nos. of 220kV	2x315	Oct'18	LILO of both circuits of Zainkote – Delina 220kV D/c line at Amargarh Works Completed but line yet to be charged PDD, J&K to update.	No updates received

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S l. N o.	Name of Substation	MVA Capacity	Expected Schedule	Downstream connectivity furnished by States in 41 st NRPC	Status
	bays)				

13.0 Renaming of Srinagar-Kashipur 400kV D/c (Quad) line

- 13.1 CTU stated that renaming of Srinagar-Kashipur 400kV D/C (Quad) line as Khandukhal-Rampura 400 kV D/C (Quad) line was noted in 1st meeting of NRSCT held on 11-09-2018. However, renaming of terminal substations Srinagar and Kashipur was not mentioned in the minutes of the meeting. Accordingly, PTCUL may clarify regarding renaming of Srinagar & Kashipur substations along with Srinagar-Kashipur 400kV D/C (Quad) line as Khandukhal-Rampura 400 kV D/C (Quad) line.
- 13.2 PTCUL clarified that Srinagar and Kashipur substations will be renamed as Khadukhal and Rampura substations respectively.
- 13.3 On enquiry by CEA about the status of Khandukhal – Rampura 400 kV D/c line, PTCUL appraised that NIT for the transmission line is expected to be done by the end of November 2018 and will be awarded by March 2019.
- 13.4 Members noted the above and advised PTCUL to expedite the implementation of this line.

14.0 LTA/Connectivity for hydro projects in Uttarakhand

- 14.1 CTU stated that the following Connectivity and Long Term Access (LTA) applications/grants were discussed in the earlier meetings of SCSPNR and Connectivity/LTA meetings. In the last meeting of SCSPNR, it was decided that a separate meeting would be called with various stake holders to resolve the issues related to grant of connectivity / LTA. To discuss various issues related to generation projects in Uttarakhand and implementation of UITP Scheme (deemed ISTS) by PTCUL, a meeting was held in CEA on 12-09-2018. During the meeting, PTCUL requested for inclusion of complete transmission System (including connectivity system) to be implemented by PTCU in the intimation letter for grant of LTA to various generation developers. In the meeting, it was decided that CTU will revised the LTA intimations to various generation developers indicating that the connectivity system would also be required in addition to LTA system for affecting the LTA. Based on the discussions held during the meeting following is summarized and is proposed for approval:

TABLE 4

S. No.	Applicant	Application Date (Connectivity / LTA)	Revised time frame	Connectivity/ LTA grant
i.	Lanco Mandakini Hydro Energy Pvt. Ltd. (Phata Byung HEP)	Aug'15/ May'08	Uncertain	Connectivity: Oct'17. LTA : July'09, Later revised in Oct'17
ii.	L&T Uttaranchal Hydropower Ltd. (Singoli Bhatwari HEP)	May'15/ April' 17	Mar'19	Connectivity: Apr'16, revised in Oct'17. LTA put on hold due to non-concurrence from

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				PTCUL
iii.	NTPC Ltd. (Tapovan Vishnugad HEP)	Oct'15/ Jan'07	Dec'19	Connectivity: Aug'16 LTA : July'09, later revised in Oct'17
iv.	THDC Ltd. (Vishnugad Pipalkoti HEP)	July'14/ Not applied	June'20	Connectivity: Aug'16 LTA Application: Not received in conformity with CERC regulations.
v.	SJVN Ltd. (Naitwar Mori HEP)	Apr'16 / Nov'17	Nov'21	Connectivity: Oct.'17 LTA proposal in present agenda.
vi.	SJVN Ltd. (Devsari HEP)	Apr'16	Jul'22 (Original)	Connectivity : Oct'17 LTA Application: Not Received.

14.2 Further, with renaming of Srinagar-Kashipur 400kV D/C (Quad) line as Khandukhal-Rampura 400 kV D/C (Quad) line as agreed during 1st NRSCT meeting held on 11-09-2018 and renaming of the terminal stations as Khandukhal and Rampura also needs to be reflected in the intimation letter. Accordingly, details of transmission system to be included in Connectivity/ LTA intimation is given below:

A. Connectivity and LTA to Phata Byung Hydro project (76 MW) of M/s Lanco Mandakini Hydro Energy Pvt. Ltd. in Uttarakhand.

Connectivity and revised LTA intimations have been issued in October, 2017, however in view of PTCUL request for name change and inclusion of connectivity system in LTA intimations, it is proposed to revise the system of Connectivity and LTA intimations as given below:

Transmission System for Connectivity	
Existing Intimation	Revised Intimation
<p>i. Interim Arrangement:</p> <ul style="list-style-type: none"> Phata Byung generation switchyard – Proposed site of Baramwari (PTCUL) 220kV D/c (To be implemented by the applicant including 220kV bays at generation end). Common transmission system required for Connectivity(Deemed ISTS): Proposed site of Baramwari (PTCUL) – Srinagar (PTCUL) 220kV D/c line (To be implemented by PTCUL) <p>ii. Final Arrangement:</p> <ul style="list-style-type: none"> Phata Byung generation switchyard – Baramwari 220kV D/c (To be implemented by the applicant including 220kV bays at both ends). 	<ul style="list-style-type: none"> Phata Byung generation switchyard – Baramwari (PTCUL) 220kV D/c (To be implemented by the applicant including 220kV bays at both ends) Common transmission system required for Connectivity(Deemed ISTS): <ul style="list-style-type: none"> Baramwari 220 kV S/s (PTCUL) – Srinagar (PTCUL) 220kV D/c line (To be implemented by PTCUL) Establishment of Baramwari 220 kV Pooling station <p>In case of change of name in Srinagar substation, connectivity system to be suitably amended.</p>

Transmission System for LTA	
Existing Intimation	Revised Intimation

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<p><u>Transmission System for LTA :</u> Srinagar- Kashipur 400kV D/c line along with associated 400 kV bays at both ends (to be implemented by PTCUL)</p>	<p><u>Transmission System for LTA :</u> Khandukhal-Rampura 400 kV D/C (Quad) line [earlier named as Srinagar- Kashipur 400kV D/C (Quad) line] along with associated 400 kV bays at both ends (to be implemented by PTCUL-Deemed ISTS) Note: in addition to above LTA system, following Connectivity transmission system (being implemented by PTCUL as deemed ISTS Licensee) shall also be required for LTA:</p> <ul style="list-style-type: none"> • Phata Byung generation switchyard – Baramwari (PTCUL) 220kV D/c (To be implemented by the applicant including 220kV bays at both ends) • <i>Common transmission system required for Connectivity(Deemed ISTS):</i> <ul style="list-style-type: none"> ○ Baramwari 220 kV S/s (PTCUL) – Srinagar (PTCUL) 220kV D/c line (To be implemented by PTCUL) ○ Establishment of Baramwari 220 kV Pooling station <p>In case of change of name in Srinagar substation, connectivity system to be suitably amended.</p>
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B. Connectivity and LTA to Singoli Bhatwari HEP (99MW) of M/s L&T Uttaranchal Hydropower Ltd. in Uttarakhand.

The connectivity to Singoli Bhatwari HEP (99MW) of M/s L&T Uttaranchal Hydropower Ltd. in Uttarakhand was granted with transmission system mentioned in table below (Existing section) considering Phata Byung HEP would come up before Singoli Bhatwari HEP, however, as now Phata Byung HEP has become uncertain, the interim connectivity system needs to be modified in line with the Minutes of Meeting held in CEA on 25/09/2017. The revised proposal for interim connectivity is:

- 220 kV D/C line from generation switchyard to point of interconnection of Baramwari - Srinagar 220 kV D/C line (to be implemented by generation developer).
- 220 kV D/C line from point of interconnection of Baramwari-Srinagar 220 kV D/C line to Srinagar S/s (to be implemented by PTCUL as deemed ISTS).

However, the final connectivity system shall remain same as mentioned above. Accordingly, Connectivity intimation to L&T Uttaranchal Hydropower Ltd. for Singoli Bhatwari HEP shall be revised with transmission system as given below:

Transmission System for Connectivity	
Existing Intimation	Revised Intimation
<p>i. Interim Arrangement:</p> <ul style="list-style-type: none"> • LILO of one circuit of Baramwari (Initially line shall be from Phata Byung as Phata Byung is coming before Singoli Bhatwari) – Srinagar 220kV D/c at Singoli Bhatwari 	<p>i. Interim Arrangement:</p> <ul style="list-style-type: none"> • 220 kV D/C line from generation switchyard to point of interconnection of Baramwari Srinagar 220 kV D/C line (to be implemented by generation

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<p>generation switchyard (LILO portion to be implemented by the applicant including 220kV bays at generation end).</p> <ul style="list-style-type: none"> • Common inter-state transmission system required for Connectivity: proposed site of Baramwari substation (PTCUL) – Srinagar (PTCUL) substation 220kV D/c line (To be implemented by PTCUL) as deemed ISTS. <p>ii. Final Arrangement:</p> <ul style="list-style-type: none"> • Singoli Bhatwari generation switchyard – Baramwari substation 220kV D/c, with the opening of LILO as mentioned above in interim arrangement (To be implemented by applicant including 220kV bays at both ends). • Common inter-state transmission system required for Connectivity: proposed site of Baramwari substation (PTCUL) – Srinagar (PTCUL) substation 220kV D/c line (To be implemented by PTCUL) as deemed ISTS. <p>Note: Baramwari 220 kV switching station and Baramwari – Srinagar 220 kV D/c line to be implemented by PTCUL as part of Common Transmission system for Connectivity of Phatabyung and Singoli Bhatwari HEPs. The commissioning of Baramwari may be matched with the later (2nd) generator, out of the two.</p>	<p>developer).</p> <ul style="list-style-type: none"> • Common inter-state transmission system required for Connectivity: 220 kV D/C line from point of interconnection of Baramwari-Srinagar 220 kV D/C line to Srinagar S/s (to be implemented by PTCUL as deemed ISTS). <p>ii. Final Arrangement:</p> <ul style="list-style-type: none"> • Singoli Bhatwari generation switchyard – Baramwari substation 220kV D/c, with the opening of LILO as mentioned above in interim arrangement (To be implemented by applicant including 220kV bays at both ends). • Common inter-state transmission system required for Connectivity: Baramwari substation (PTCUL) – Srinagar (PTCUL) substation 220kV D/c line (To be implemented by PTCUL) as deemed ISTS. <p>Note: Baramwari 220 kV switching station and Baramwari – Srinagar 220 kV D/c line to be implemented by PTCUL as part of Common Transmission system for Connectivity of Phatabyung and Singoli Bhatwari HEPs. The commissioning of Baramwari may be matched with the later (2nd) generator, out of the two.</p>
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Proposal for LTA:

Proposal for grant of LTA was circulated to the constituents vide CTU letter C/CTU/NR/LTA dated 06/11/2017 with Srinagar- Kashipur 400kV D/c line along with associated 400 kV bays at both ends (under scope of PTCUL as part of deemed ISTS).

However, PTCUL had stated that considering the uncertainty of Phata Byung HEP, the status of 220 kV D/C line to Srinagar needs to be reviewed and accordingly, did not give its consent to issue the LTA intimation to Singoli Bhatwari HEP due to which intimation could not be issued. Subsequently, in a meeting held at CEA on 04/04/2018, PTCUL informed that they have issued the LOA for the line with commissioning schedule as March, 2019.

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Subsequently, during the meeting held at CEA on 12/09/2018, it was agreed that 99 MW LTA intimation to Singoli Bhatwari HEP may be issued by CTU. Accordingly, it is proposed to grant LTA to L&T Uttaranchal Hydropower Ltd. in Uttarakhand for Singoli Bhatwari HEP with following transmission system.

Transmission System for LTA :

Khandukhal-Rampura 400 kV D/C (Quad) line [earlier named as Srinagar- Kashipur 400kV D/c (Quad) line] along with associated 400 kV bays at both ends (to be implemented by PTCUL-Deemed ISTS)

Note: in addition to above LTA system, completion of following Connectivity transmission system (being implemented by PTCUL as deemed ISTS Licensee) shall also be required for effecting the LTA:

Interim Arrangement:

- 220 kV D/C line from generation switchyard to point of interconnection of Baramwari Srinagar 220 kV D/C line (to be implemented by generation developer).
- **Common inter-state transmission system required for Connectivity:** 220 kV D/C line from point of interconnection of Baramwari-Srinagar 220 kV D/C line to Srinagar S/s (to be implemented by PTCUL as deemed ISTS).

Final Arrangement:

- Singoli Bhatwari generation switchyard – Baramwari substation 220kV D/c, with the opening of LILO as mentioned above in interim arrangement (To be implemented by applicant including 220kV bays at both ends).
- **Common inter-state transmission system required for Connectivity:** Baramwari substation (PTCUL) – Srinagar (PTCUL) substation 220kV D/c line (To be implemented by PTCUL) as deemed ISTS.

Note: Baramwari 220 kV switching station and Baramwari – Srinagar 220 kV D/c line to be implemented by PTCUL as part of Common Transmission system for Connectivity of Phatabyung and Singoli Bhatwari HEPs. The commissioning of Baramwari may be matched with the later (2nd) generator, out of the two.

It may be reiterated that during the meeting held on 25/09/2017 in CEA, PTCUL was advised to implement the proposed Baramwari-Srinagar 220kV D/C line in two phases, Phase-I from LILO point to Srinagar matching with Singoli Bhatwari HEP and Phase-II matching with Phatabyung HEP.

C. Connectivity and LTA to Tapovan Vishnugarh HEP (520 MW) of NTPC Ltd.

Connectivity and revised LTA intimations have been issued in August, 2016 & October, 2017 respectively. However, in view of PTCUL request for name change and inclusion of connectivity system in LTA intimations, it is proposed to revise the system of Connectivity and LTA intimations as given below:

Transmission System for Connectivity	
Existing Intimation	Revised Intimation
Connectivity system:	No change

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i) Tapovan Vishnugad HEP– Proposed site of Pipalkoti 400 kV S/s 400kV D/c (Twin Moose) line ii) Proposed site of Pipalkoti 400 kV S/s- Srinagar 400kV D/c (Quad Moose) line	However, in case of change of name in Srinagar substation, connectivity system to be suitably amended.
Note: The bays at Generation end are to be implemented by NTPC	

Transmission system proposed in amended LTA intimation

The connectivity to Tapovan Vishnugad HEP(520 MW) of NTPC Ltd. was granted with transmission system mentioned in table below(Existing section).Now, as per PTCUL request, it is proposed to revise transmission system in the LTA intimation as given below :

Transmission System for LTA	
Existing Intimation	Revised Intimation
<p>Transmission System for LTA : Srinagar- Kashipur 400kV D/c line along with associated 400 kV bays at both ends (to be implemented by PTCUL)</p>	<p>Transmission System for LTA :</p> <ul style="list-style-type: none"> • Khandukhal-Rampura 400 kV D/C (Quad) line [earlier named as Srinagar- Kashipur 400kV D/c (Quad) line] along with associated 400 kV bays at both ends (to be implemented by PTCUL-Deemed ISTS) <p>Note: in addition to above LTA system, following Connectivity transmission system (being implemented by PTCUL as deemed ISTS Licensee) shall also be required for effecting the LTA:</p> <ul style="list-style-type: none"> • Tapovan Vishnugad HEP– Proposed site of Pipalkoti 400 kV S/s 400kV D/c (Twin Moose) line • Proposed site of Pipalkoti 400 kV S/s- Srinagar 400kV D/c (Quad Moose) line <p>Bays at generation end are to be implemented by NTPC.</p>

D. Connectivity to Vishnugarh Pipalkoti HEP (444 MW) of THDC Ltd.

Connectivity intimation has been issued in August, 2016 through following Transmission system to be implemented by PTCUL as deemed ISTS Licensee:

Transmission System for Connectivity	
Existing Intimation	Revised Intimation
i. Pipalkoti HEP– 400 kV Pipalkoti switching station 400kV D/c (Twin Moose) line ii. Establishment of 400 kV Pipalkoti switching station iii. Diversion of Tapovan Vishnugad HEP– Proposed site of Pipalkoti (400 kV S/s) 400kV D/c (Twin Moose) line	<p>No change</p> <p>However, in case of change of name in Srinagar substation, connectivity system to be suitably amended.</p> <p>Regarding connectivity intimation, PTCUL has observed that under connectivity system,</p>

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<p>iv. at Pipalkoti switching station Diversion of Proposed site of Pipalkoti (400 kV S/s)– Srinagar 400kV D/c (Quad) line at Pipalkoti switching station</p> <p>Note: The bays at Generation end are to be implemented by THDC</p>	<p>Srinagar-Kashipur 400kV D/C line, Srinagar-Srinagar (HEP) 400 kV line alongwith 400 kV Srinagar substation may be included which have already been suitably replied by CTU.</p>
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LTA application in conformity with CERC regulation is not yet received from THDC Ltd for Vishnugarh Pipalkoti HEP (444 MW).

Members may discuss.

E. Connectivity and LTA to Naitwar Mori HEP (2X30MW) of SJVN Ltd.

Connectivity was granted to Naitwar Mori HEP of SJVNL in October, 2017 through following transmission system:

- Naitwar Mori HEP - # Location of Mori 220/132kV (PTCUL) Substation 220kV D/c line (to be implemented by applicant alongwith 220kV bays at generating end)
- # Location of Mori 220/132kV (PTCUL) – Dehradun 220kV D/c line (to be implemented by PTCUL)
- # Mori 220/132 kV substation is not required in the time frame of connectivity of Naitwar Mori HEP.

Meanwhile, PTCUL desired to change the location of their proposed Mori substation. In the meeting held on 04/04/2018 at CEA to discuss the status and issues related to transmission elements of UITP scheme under implementation by PTCUL, the following was agreed:

- PTCUL to finalize the location of Mori substation jointly with M/s SJVNL within 15-20 days
- PTCUL to review the status of hydro generation projects in Yamuna basin and submit a report to CEA in 15 days time.
- Based on the report of PTCUL regarding Yamuna Basin hydro generation projects, decision regarding the capacity of Mori-Dehradun 220 kV D/c line would be taken

PTCUL may update the status.

Proposal for LTA:

Grant of LTA to SJVN Limited for Naitwar Mori Hydro Electric Power Project has been agreed during 12th Connectivity/LTA meeting of Northern Region system held on 22/06/2018 with existing transmission. Details of which are mentioned below:

<p>Name of the Applicant Application no: Name of Power Plant Applied for Quantum (MW) Time Frame Connectivity Point</p>	<p>M/s SJVN Limited. 1200000925 Naitwar Mori Hydro Electric Power Project LTA 60 (Target – NR) 30th Nov'2021 Location of Mori 220/132kV (PTCUL)</p>
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In view of PTCUL request to include Connectivity System in LTA intimations, it is proposed to include following transmission system in the LTA intimation.

Transmission System to be included in LTA intimation

LTA is granted on existing transmission system.

However, following Connectivity transmission system shall also be required for effecting the LTA:

- Naitwar Mori HEP - # Location of Mori 220/132kV (PTCUL) Substation 220kV D/c line (to be implemented by applicant alongwith 220kV bays at generating end)
- # Location of Mori 220/132kV (PTCUL) – Dehradun 220kV D/c line (to be implemented by PTCUL as ISTS Licensee)
- # Mori 220/132 kV substation is not required in the time frame of connectivity of Naitwar Mori HEP.

F. Connectivity to Devsari HEP (252 MW) of SJVN Ltd.

Connectivity was granted to Devsari HEP of SJVNL in October, 2017 through following to be implemented by PTCUL as deemed ISTS Licensee::

Transmission System for Connectivity	
Existing Intimation	Revised Intimation
<ul style="list-style-type: none"> ➤ Devsari HEP generation switchyard – Karanprayag 400/220 kV Substation 220 kV D/c(Twin Zebra) line. ➤ Establishment of 2x315 MVA, 400/200 kV Karanprayag substation of PTCUL by LILO of both circuits of Pipalkoti-Srinagar 400 kV(Quad) D/c line at Karanprayag 	<p>No change</p> <p>However, in case of change of name in Srinagar substation, connectivity system to be suitably amended.</p>

PTCUL stated that due to paucity of time, they could not study in detail the revised system of connectivity and LTA and will revert back in a week.

CTU informed that as per the meeting held in CEA on 12/09/2018, the transmission system for LTA has been proposed in the present Agenda indicating that for effecting the LTA, Connectivity system shall also be required.

Further, regarding Connectivity/LTA of above projects, (Sl. No. A to F), PTCUL was suggested to sign Tripartite Transmission Agreement with CTU and Applicants. PTCUL stated that they are ready to sign Tripartite Transmission Agreement with SJVN for Naitwar Mori HEP.

CTU stated that PTCUL can confirm the same before the LTA/Connectivity meeting of NR constituents scheduled to be held on 26/10/2018 at POWERGRID, Gurgaon . PTCUL stated that comments/suggestions will be forwarded before the meeting.

SJVNL stated that the timeframe for implementation of Naitwar Mori HEP may be changed from 30th November, 2021 to 30th August'2021 while granting connectivity. CEA/CTU asked SJVNL to formally submit the request for revision of dates and they will be accordingly incorporated.

15.0 Proposal for grant of LTA for drawl of power in Northern Region:

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- 15.1 CTU stated that Grant of LTA has been discussed & agreed for injection of power in Southern Region and drawl of power in other regions including Northern Region as per deliberations held in 27th Connectivity/LTA meeting of Southern region held on 24/10/2018 as detailed below.

TABLE 5

S. No.	Application No.	Applicant	Location	Date of Application	Status of connectivity	LTA Sought (MW)	Date of Start of LTA
1	1200001694	Mytrah Energy (India) Private Limited	Palakkad, Kerala	31/08/2018	Stage-II grantee	300 (NR target)	29/02/2020

- 15.2 Members noted the same.

16.0 Finalization of switching Scheme for GIS substations

- 16.1 CTU stated that generally double circuit lines are terminated in separate diameter to avoid tripping of both lines under tie breaker stuck condition (if terminated in the same diameter). This guideline is also being specified in RfP documents for Inter State transmission system under TBCB projects. In line with above, for 765 & 400kV substations, one and a half breaker switching scheme is followed by POWERGRID.
- 16.2 In the 42nd meeting of SCPSPWR held on 17.11.2017, members had decided that in view of the complexities involved in the interfacing of GIS modules of different manufacturers, the complete diameter (with 3 circuit breaker bays) shall be installed in the beginning itself even though the third circuit breaker would be used for an upcoming feeder in future. This would not only facilitate ease of integration of future transmission elements, as and when they are planned, but would also enhance system reliability.
- 16.3 Recently in Nagapattinam 400kV GIS substation case, CERC has not allowed the capitalization of unutilized (future) GIS bays. Matter was again taken up with CERC to allow capitalization considering complexities involved in GIS substations. CERC suggested for construction of full diameter (Present-Tie-Future bay), only if there is concrete plan for utilization of future bay.
- 16.4 As per the clause 15.7 of CEA Manual on Transmission Planning Criteria, 'One and half breaker' scheme should be used for 400kV and 765kV sub-stations and it should be continued to be used for all the 400 kV and 765 kV S/s. Accordingly, in cases where there is no plan in near future to utilize the bays, POWERGRID proposed to construct 2 diameters with double breaker switching scheme (in place of one & half CB scheme) & continue to operate as Double CB scheme and it will not be possible to convert them in one & half CB scheme in future, due to GIS complexities mentioned above.
- 16.5 After deliberations, in view of the complexities involved in the interfacing of GIS modules of different manufacturers, it was agreed that the complete diameter (with 3 CB bays) shall be installed in the beginning itself even though the third CB would be used for an upcoming feeder in future..

17.0 Improvement in Reliability with outdoor AIS bus bar in GIS S/s

- 17.1 CTU stated that it has been observed that during failure of any GIS switchgear or GIB, long duration outage is involved in restoration of GIS bay due to proprietary nature of GIS equipment & skilled efforts are needed. Many a time since limited quantity of spares are procured, restoring of the bay takes more time (example of Maharanibagh GIS) as

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required spares are to be sourced from abroad. Considering the same and to have more availability & reliability of power system, a scheme is developed where on both side of GIS building, outdoor AIS bus bar is provided with one hot spare bay. This arrangement can act as hot standby arrangement (like 1-Ph 765kV hot spare ICT/Reactor).

- 17.2 CTU further stated that it may be deliberated for in principle approval so that it can be considered for new S/s & at existing S/s wherever feasible (due to space requirements). CTU gave a presentation highlighting the advantages of the new hot standby arrangement vis-à-vis one and half breaker scheme.
- 17.3 CEA stated that the proposal can be deliberated in detail in the next meeting of NRSCT. PGCIL was also advised to submit the detailed scheme to PSETD Division of CEA for examination.

18.0 Change in the connectivity of 765/400/220 kV Sub-station Moradabad:

- 18.1 CEA stated that Moradabad 765 kV Sub-station was approved in 38th meeting of SCPSPNR held on 30th May, 2016 at NRPC Katwaria Sarai, New Delhi. However, due to availability of land for 765 kV Sub-station at Rampur near Moradabad, UPPTCL has proposed following changes in connectivity:

Sl. No.	Agreed in 38 th meeting of SCPSPNR	Modification Suggested by UPPTCL
1-	Construction of 765/400 kV, 2x1500 MVA; 2x500 MVA, 400/220 kV substation at Moradabad	Construction of 765/400 kV, 2x1500 MVA; 2x500 MVA, 400/220 kV substation at Rampur(GIS) with 330 MVAR Bus Reactor
2-	LILO of approved Ghatampur TPS-Hapur 765 kV S/C line at Moradabad	LILO of approved Ghatampur TPS-Hapur 765 kV S/C line at Rampur-55 Km. with 240 MVAR line reactor at Rampur end for Rampur-Ghatampur section.
3-	Moradabad (765 kV)-Sambhal 400 kV D/C line- 50 Km.	Rampur (765 kV)-Sambhal 400 kV D/C line- 70 Km.
4-	Moradabad (765 kV)-Moradabad 400 kV D/C line-25 Km.	<u>LILO of one ckt. Of existing 400 kV DC PGCIL Bareilly(PG)-Moradabad line at Rampur (765)- 03 Km.</u>
5-	Creation of 400/220 kV, 2x500 MVA S/S Sambhal	Creation of 400/220 kV, 2x500 MVA S/S Sambhal
6-		LILO of 220 kV existing SC line Moradabad(400)-Rampur(220) at Rampur(765) – 10 Km.
7-		Rampur(765)-Moradabad-II 220 kV (Proposed) DC line on Moose conductor - 70 Km.

- 18.2 UPPTCL stated that system studies have been carried out considering the above modifications and the same is generally in order. The study results are enclosed as Annexure- IV.

- 18.3 After deliberations members agreed for the above modifications proposed by UPPTCL.

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Meeting ended with thanks to the chair.

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Annexure-I

List of participants of 2nd Meeting of Northern Region Standing Committee on Transmission held on 13.11.2018 (Tuesday) at 11:30hrs at NRPC, New Delhi.

CEA

- | | |
|----------------------------|-----------------------|
| 1. P. S. Mhaske | Member (Power System) |
| 2. Ravinder Gupta | Chief Engineer |
| 3. Manjari Chaturvedi | Deputy Director |
| 4. Priyam Srivastava | Asst. Director |
| 5. Kanhaiya Singh Kushwaha | Asst. Director |
| 6. Vikas Sahu | Sr. Manager |

MNRE

- | | |
|-------------------|------|
| 7. Rohit Thakwani | SC-8 |
|-------------------|------|

PSTCL

- | | |
|----------------------|---------|
| 8. Er. Kamal Krishan | Addl-SE |
| 9. Er. Jatin Gupta | AEE |

RVPN

- | | |
|--------------------|-----------|
| 10. Er. R.K. Jain | CE |
| 11. Anjana Agrawal | Ex. Engr. |

HVPNL

- | | |
|---------------------|---------------------|
| 12. Man Mohan Mate | SE |
| 13. J.K. Juneja | Consultant Planning |
| 14. Arjun Chugh | CE/Plg |
| 15. Neeraj Ahuja | SE/STU |
| 16. Ravi Sher Singh | SE/STU |

HPPTCL

- | | |
|-----------------------|------------|
| 17. Sandeep Sharma | AGM (Plg.) |
| 18. Kaushalesh Kapoor | GM (C&D) |

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19. Amrik Singh CE (Elect.)

SJVN

20. Sumeet Gupta ED
21. Rajeev Agarwal DGM

UPPTCL

22. Neeraj Swaroop SE

PTCUL

23. Himanshu Baliyan EE
24. Vikas Sharma SE
25. Kamal Kant CE
26. Deep Shah CE
27. Sanjaya Mittal Director (Projects)
28. Ashok Kumar EE(SS)

POWERGRID

29. Subir Sen COO (CTU-PLG & SG)
30. Mukesh Khanna CGM (CTU-PLG.)
31. Rajesh Verma DGM (CTU-PLG.)
32. Swapnil Verma Deputy Manager (Law CTU-PLG.)
33. Kashish Bhambhani CMC
34. Sandeep Kumawat Deputy Manager. (Powergrid)
35. V.M.S. Prakash. Y Manager. (CTU)
36. Jivesh Khanna Deputy Manager. (AM)
37. Yatin Sharma Engineer
38. Sandeep Behera Deputy Manager (CTU-PLG.)
39. Roushan Kumar AET

NRPC

40. Upendra Kumar SE
41. M.A.K.P. Singh Member Secretary

Solar Energy Corp. of India Ltd.

42. S.K. Mishra Director (PS)

I/3021/2018

NRLDC, POSOCO

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|---------------------|----------------|
| 43. Rajeev Porwal | Deputy Manager |
| 44. S.R. Narasimhan | ED NLDC |