

I/2028/2018(1)



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 पहली बैठक के विषय में

Sub: 1st Meeting of Northern Region Standing Committee on Transmission- Agenda Note

Sir/ Madam,

Agenda Note for 1st Meeting of Northern Region Standing Committee on Transmission scheduled to be held on 11.9.2018 (Tuesday) at 1030hrs at conference Room, NRPC Katwaria Sarai, New Delhi is 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).

Kindly make it convenient to attend the meeting.

Yours faithfully,

Ravinder Gupta)
Chief Engineer

I/2028/2018(1)

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. Uttrakhand 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, Sectot-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)

I/2028/2018(1)

Agenda note for 1st Meeting of Northern Region Standing Committee on Transmission**1.1 Confirmation of the Minutes of the 40th meeting of the Standing Committee on Power System Planning of Northern Region held on 22 July 2018.**

1.2 The Minutes of 40th meeting of the Standing Committee on Power System Planning of Northern Region (SCPSPNR) were issued vide CEA letter no.CEA-PS-11-21(19)/1/2018-PSPA-I/I/1590/2018 dated 30th July, 2018. HVPNL vide their letter CH-8/HSS-152/Vol-20 dated 4.9.2018 had requested to add the following under item no 8 of the minutes i.e. LILO of both circuits of Madanpur –Kunihar 220kV D/c line at 220kV Pinjore (HVPNL) S/s:

“After execution of LILOs by HVPNL and HPSEB/HPPTCL, the nomenclature of 220kV Kunihar –Madanpur line may be read as under:

220kV D/c Madanpur- Sector 32 Panchkula –PGCIL(Panchkula)- Pinjore – Baddi-Kunihar line”

1.3 The above may be added to point no 8.3 of the minutes of 40th meeting of SCPSPNR.

1.4 No further comments have been received from the constituents. Therefore, the minutes of the 40th meeting of SCPSPNR along with above modifications in Para 8 of the minutes may please be confirmed.

2.0 Approval of 400 kV transmission lines and reactor of RRVPNL:

2.1 RRVPNL vide their letter no. RVPN/SE(P&P)/XEN-2(P&P)/AE-2/F./D 689 dated 02.08.2018 had requested CEA to grant in-principle approval for the three transmission elements viz Chhabra - Kota 400 kV S/C line, Chittorgarh – Bhilwara 400 kV D/C line and 1x50 MVAR 400kV reactor at Bhilwara, which were ready for commissioning.

2.2 To discuss the issue, a meeting was held on 6.8.2018 (enclosed as Annexure-I) in CEA, wherein, following was agreed:

i) Intra-state transmission elements of RRVPNL were noted and agreed in – principle is given below: ure

a) Chhabra – Anta 400 kV S/C line.

b) Chittorgarh – Bhilwara 400 kV D/C line.

c) 1x50 MVAR Bus Reactor at 400 kV Bhilwara S/s.

The same would be formalized / brought to the notice of members of NRSCT.

ii) RRVPNL to intimate NRSCT all Intra - State transmission schemes which involve reconfiguration of ISTS elements, inter-connection with ISTS elements and all 400 kV Intra – State schemes which are already under implementation and has not been intimated earlier in Standing Committee on Power System Planning.

iii) RRVPNL to include new/planned Intra - State transmission schemes which involve reconfiguration of ISTS elements, inter-connection with ISTS elements and all 400 kV Intra – State schemes as agenda of NRSCT for deliberation.

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

- 2.3 Members may please concur the in-principle approval for the following three Intra-state elements of RRVPNL:
- Chhabra – Anta 400 kV S/C line.
 - Chittorgarh – Bhilwara 400 kV D/C line.
 - 1x50 MVAR Bus Reactor at 400 kV Bhilwara S/s.

3.0 Connectivity of Railways' Traction Sub Stations (TSSs) with ISTS Network for Ludhiana-Delhi-Sonnagar route:

3.1 The issue of providing connectivity to Railways' TSS with ISTS network (Abdullapur S/s and Meerut S/s in NR) for Ludhiana-Delhi-Sonnagar route was discussed in 40th meeting of SCPSPNR held on 22.6.2018, wherein, it was agreed that Railways would utilize existing two number of 220 kV bays at Abdullapur substation (presently used for 220 kV supply to Jagadhari TSS) to meet their additional traction load requirement. The required technical upgradation of the 220 kV line (presently only two phases has been strung) would be carried out by Railways subject to fulfilment of all the existing agreements with HVPNL. In the meeting Railways representative informed that at present two phases of Abdullapur - Jagadhari 220 kV D/C lines are strung and there is some space constraint / safety clearance related issue for stringing of 3rd phase at Abdullapur sub-station. It was decided that a joint visit may be done by CEA, HVPNL, Railways and POWERGRID and necessary modifications required at Abdullapur sub-station for providing 2 no. 220 kV bays for Abdullapur - Jagadhari 220 kV D/C line may be done by Railways at their cost.

3.2 Subsequently, a joint visit to Abdullapur S/S was carried out on 25.8.2018 by a team consisting of CEA, POWERGRID, Railways and HVPNL. The observation of the team is enclosed at Annexure-II.

3.3 Subsequently Railways vide their e-mail dated 01-09-2018 has informed the following:

i) Conversion of existing Two Phase Transmission Line to Three Phase (feeding the existing Traction Sub-Station of Indian Railways at Jagadhri Workshop) :

Provision of 3rd phase can be done by providing bottom Cross Arms on the existing towers. But it is not possible to maintain the requisite minimum Electrical Clearance, as per statutory requirement for 220 kV overhead line, at five locations. It requires raising the tower height (with modification in foundation) for 9 (out of 23) towers. *Since the Transmission Line is feeding the Railway Traction Sub-Station (having a single source of supply), it is practically not possible to take frequent and/or prolonged shut down for this line.*

ii) Modification of existing 220 kV, Two phase Bays to Three phase Bays at Abdullapur:

It requires casting of foundations, erection of equipment for 3rd phase, dismantling and re-erection of Bay Marshalling Kiosks and CB Marshalling Boxes. It also requires modification in the protection scheme. It will require dismantling of all cables pertaining to Bay Marshalling Kiosks and CBs. Bay Marshalling Kiosks consists of all cablings for isolators. It will be difficult to carry out this work. *Since the existing 220kV bays are feeding the Railway Traction Sub-Station (having a single source of supply), it is not practically possible to take frequent and/or prolonged shut down for these bays.*

iii) Progress Status of ongoing works:

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

The work for new 220 kV, two numbers bays is in progress. All the 06 nos gantry foundations & 01 no lightning mast tower foundation has been completed & towers along with beam have been erected. Out of 94 nos equipment foundation, 86 nos have been completed and only 08 nos are balance. 80 meters cable trench has been constructed. 60% earth mat work is also completed.

In addition, partial construction of new 220kV/ three phase, Double Circuit Line has been carried out. Out of 35 tower foundations, 23 have been cast.

iv) Additional Information:

The proposed new DFCC Bays are on the extreme end of the Abdullapur Sub-Station (Towards Yamuna-Nagar) and the ROW of new Transmission Line is just on the outskirts of a village. It appears that the new proposed bays and this new ROW may not be useful for a future project. However, the existing Railway Bays, if released, including ROW of the existing Two Phase Railway Transmission Line can be used for a future project.

3.4 In view of above, Railways has proposed that the work of New Transmission Line and New Bays may be carried out as per plan. The existing 2 no. 220 kV bays, being used by Indian Railway at present, may be surrendered after completion of work of new Transmission Line. The existing ROW of Two phase, Double Circuit Transmission Line can be used by HVPNL / any other agency to meet their future requirements, if any.

3.5 Members may like to deliberate.

4.0 DTL Agenda for Enhancement of transformation capacity at 400/220kV Maharani Bagh S/Stn.

3.1 DTL vide their letter F.DTL/202/Opr(Plg)/DGM(Plg)/2018-19/F-20/72 dated 11.07.2018 informed that 400/220kV Maharani Bagh ISTS is presently having the capacity of 1630MVA (2x315MVA + 2x500MVA) and the load on the S/Stn. has been running above the contingency limit (N-1) since last few years. Peak load met in July 2018 at Maharani Bagh was 1287 MW. NRLDC has also advised to take immediate steps to remove the constraints

3.2 In the 39th Standing Committee meeting held on 29th & 30th May, 2017, following additional inter-connections were also agreed at Maharani Bagh :

ISTS Scheme (under PGCIL scope of already awarded scheme):

i) LILO of both circuits of Mandola-Bawana 400 kV D/C line at Maharani Bagh (existing) with Twin HTLS conductor on multi-circuit towers (already under construction by PGCIL).

(Note: This would take care the requirement of additional interconnection at Maharani Bagh. In view of above LILO, NRSS-XXXIX scheme was agreed to be dropped.)

ISTS Scheme (to be taken up):

i) 4 no. of 400 kV bays at 400/220kV Maharani Bagh (existing) substation.

I/2028/2018(1)

ii) *By passing of LILO one circuit of 400 kV Dadri–Ballabgarh D/C line at Maharani Bagh (existing) (to be used during emergency).*

- 3.3 The Rapid Rail Transport System (RRTS) is going to come up in the vicinity of S/Stn. and the managing utility NCRTC has requested for power to the tune of 150MW from Maharani Bagh S/Stn. by the year 2021-22 to meet the demand. DMRC has also requested for additional 50MW Power Grid S/Stn. to meet the power requirement of Phase- 4 Projects. Further additional feed to meet the requirement a S/Stn. of 220/66kV (320MVA) and 220/33kV (300MVA) substation proposed to be established in the vicinity of S/Stn. Also additional feed to Park Street and feed to upcoming 220/33kV Devnagar & 220/33kV Sarojini Nagar is proposed from the Maharani Bagh S/Stn.
- 3.4 The augmentation of the capacity of Maharani Bagh from the present level of 1630MVA to 2000MVA was earlier put up in the 37th meeting of SCSPNR held on 20.01.2016, wherein, it was decided as under:-

16.0 Augmentation of transformation capacity at 400kV Maharani Bagh Substation (PG)

16.1 *Director (PSP&PA-I), CEA stated that DTL vide their letter no F.DT/Dir(O)15-16/F12-/42 dated 22/26-05-2015 had proposed to augment the transformation capacity of 400kV Maharani Bagh Substation from the present 1630 MVA to 2000 MVA by replacing existing 2 Nos. 400/220kV, 315MVA ICTs to 2 nos. 400/220kV, 500 MVA ICTs.*

16.2 *AGM, PGCIL stated that as per the CERC directions, the replaced ICTs need to be decapitalized and hence replacement of ICTs is not a good option, especially when life of ICTs is still remaining. Further, the process of replacement would take around one year.*

16.3 *Member Secretary, NRPC stated that the issue has to be seen in totality as the same has tariff implications and utilization of the assets for the remaining period of useful life. The representative of DTL stated that due to decommissioning of 210 MW units at Badarpur TPS, to meet ensuing summer load, the augmentation of ICTs were urgently required.*

16.4 *COO, CTU stated that the replacement of ICTs would take time around one year, as the same involves the activities like investment approval and placement of award. Timeline for augmenting the ICT by summer 2016 would not be met.*

16.5 *ED, POSOCO stated that before closing down any unit of BTPS, the reliability of the whole power system has to be seen. Members were of the view that already four substations of total capacity of 8000 MW have been approved for Delhi with the commissioning schedule of March, 2017 and loads at Maharani Bagh substation may be diverted to these new substations.*

16.6 *After deliberation, it was observed that the time to be taken for augmentation for ICTs would match with commissioning of the proposed new substations, hence the committee members were of the view to drop this augmentation proposal and impressed upon for the timely completion of approved substations for NCT of Delhi. The committee also decided that all the pros and*

I/2028/2018(1)

cons of environmental vis-à-vis the reliable operation of power system must be seen before shutting down of BTPS and desired that immediate shut down is not advisable.

- 3.5 The State Steering Committee of Delhi in its meeting held on 04.07.2018, advised DTL to take up the issue for augmentation of capacity of Maharani Bagh from 1630 MVA to 2000MVA in NRSCT.
- 3.6 In view of the shelving of 400/220kV, 2000MVA ISTS at Rajghat/IP, the infeed augmentation of 400/220kV Maharani Bagh, proposed additional load to be connected at Maharani Bagh and decommissioning of BTPS in October, 2018, DTL has requested NRSCT to concur the proposal of augmentation of the transformation capacity of 400/220kV Maharani Bagh ISTS from 1630MVA to 2000MVA by Summer 2019. The Standing Committee is also requested to consider that in case the present Tariff Regulations do not allow the augmentation, the 2x315MVA transformer after the augmentation be considered as Regional Spare transformers.
- 3.7 Load flow studies have been carried out considering Tuglakabad 400/220kV S/s and it is observed that after commissioning of Tuglakabad S/s, the loading at Maharani Bagh S/s reduces considerably i.e. around 800 MW.
- 3.8 POWERGRID may furnish the status of progress at Tuglakabad S/s. Members may like to deliberate.

5.0 Strengthening of Intra-state and Inter-State Transmission system of Punjab:

- 5.1 PSTCL vide their letter 254/P-I/dated 20.6.2018 has informed that as per the anticipated loading condition for 13th Plan as well as studies carried out by Punjab, following augmentations have been planned for Intra-State transmission system of Punjab to meet n-1 criteria:

- i) 1x500 MVA, 400/220kV additional ICT at 400kV Muktsar
- ii) 1x500 MVA, 400/220kV additional ICT at 400kV Makhu
- iii) 1x500 MVA, 400/220kV additional ICT at 400kV Dhuri

- 5.2 In addition to above, PSTCL has also informed that 1x500 MVA, 400/220kV additional ICT shall be required at 400kV Balachak S/s of PGCIL under ISTS to meet n-1 contingency.
- 5.3 PSTCL/ NRLDC may provide the present maximum loading on these sub-stations. Members may like to deliberate.

6.0 Oscillations observed in the grid due to tripping of one of the evacuation line from 220kV Dhauliganga HEP:

- 6.1 NRLDC vide their letter no NRLDC\TS-15\1251-1258 dated 30.7.2018 has informed that oscillations have been observed in the grid repeatedly during outage of any one transmission circuit from Dhauliganga HEP (4x70 MW). During these events, entire power plant has tripped. The power from the HEP is evacuated as:
- a. Dhauliganga (HEP)-Bareilly (Twin Moose) 400 kV D/c line (presently charged at 220kV) (235km) with one circuit LILO at Pithoragarh (59km from Dhauliganga).

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

6.2 Consolidated summary of last three incidents of growing nature of oscillation is tabulated below:

Particulars	Event at 18:07hrs of 18.04.2018	Event at 14:49hrs of 25.07.2018	Event at 16:56hrs of 29.07.2018
Antecedent Generation at Dhauliganga HEP	280MW	285MW	285MW
Event Brief	At Dhauliganga HEP, testing was underway from 17:00hrs of 18-Apr-2018 to address the issue of oscillation observed at Dhauliganga HEP in the past. During this, as reported, full generation (280MW) at Dhauliganga was made to evacuate through one 220kV Pithoragarh ckt only. The testing also included different scenarios of PSS ON and OFF on different number of units (two units PSS ON and two units PSS off). Initiation of oscillations in the grid and resulted in tripping of unit number-1 at Dhauliganga. Immediate backing down (10MW from 70MW) was done at other units which resulted in damping of oscillations	Tripping of 220kV Dhauliganga-Pithoragarh ckt on B-N fault resulted into 285MW loading on Bareilly ckt. It further initiated the growing nature of oscillation in the system	Tripping of 220kV Dhauliganga-Pithoragarh ckt on R-N fault resulted into 285MW loading on Bareilly ckt. It further initiated the growing nature of oscillation in the system
Faulted phase and duration	No fault, testing was underway	B-N fault & 100ms	R-N fault & 100ms
Dominant mode of oscillation (in Hz)	0.8Hz	0.8Hz	0.87Hz
Damping	Negative	Negative	Negative
Duration of Oscillation	2 Minutes	24 second	13 second
Generation Loss (in MW)	70	285	285
Oscillation continued till	Tripping of one unit and manual generation backing down.	Tripping of remaining circuit (220kV Dhauliganga-Bareilly (UP))	Tripping of remaining circuit (220kV Dhauliganga-Bareilly (UP)) on

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

		in Z-1 and all the running units of Dhauliganga HEP	out of step (OOS) protection and all the running units of Dhauliganga HEP
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6.3 Apart from aforesaid event, similar kind of event also occurred on 25th, 29th August 2017. NRLDC also mentioned that the impact of oscillation was widespread in the grid and oscillation also observed on Inter Regional lines from NR.

6.4 400/220kV, 2x315 MVA GIS Baram / Jauljivi sub-station was agreed in 36th meeting of SCPSPNR held on 13.7.2015 with following detailed scope of works:

Phase I: By PTCUL under Uttarakhand Intra-State system

- (i) Creation of 220/33kV Jauljivi (PTCUL) substation by LILO of one circuit of 220kV Dhauliganga-Pithoragarh (PG) line at 220kV Jauljivi (PTCUL) substation

Phase II: Part by POWERGRID under ISTS as “NRSS XXXVII”

- (i) Creation of 400/220kV, 7x105MVA GIS Substation in Jauljivi area under ISTS by LILO of both ckts. of Dhauliganga-Bareilly 400kV D/c (presently charged at 220kV) at 400/220kV Jauljivi (PG) (line from Dhauliganga to Jauljivi shall remain charged at 220kV and from Jauljivi to Bareilly shall be charged at 400kV)

The 400/220 kV Jauljivi substation to have the following provision:

400 kV side

- 7*105 MVA Single Phase ICTs along with ICT bays
- line bays - 2 nos.
- 2x63MVAR switchable line reactors in Bareilly-Jauljivi 400kV D/C at Jauljivi end for providing voltage control under various operating conditions. These 63MVAR line reactors shall be taken up as single phase units, if required.
- Space provision for 2 future bays

220 kV side

- 2 nos. of ICT bays
 - 8 nos. of line bays (Pithoragarh-2, Almora-2, Jauljivi-2 & Dhauliganga-2)
 - One no. of 220kV sectionaliser
 - Shifting of 25 MVAR line reactor already available in 220kV Dhauliganga – Bareilly line at Dhauliganga end to 400/220kV Jauljivi S/s as a bus reactor at 220kV
 - Disconnection of 220 kV LILO of Dhauliganga-Bareilly at Pithoragarh and connection of Pithoragarh line to Jauljivi 400/220 kV S/s at 220kV.
- (ii) Diversion of Dhauliganga-Bareilly 400kV D/C line (operated at 220kV) at Bareilly end from Bareilly(UP) to Bareilly(PG) along with 2 nos. of 400 kV bays at Bareilly

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

Phase II: By PTCUL under Uttarakhand intra State system

- (iii) 220kV GIS substation at Almora & associated 220kV Almora–Jauljivi (PG) D/C line
- (iv) Existing LILO line of Dhauliganga- Pithoragarh (PG) at 220/33kV Jauljivi (PTCUL) Substation would be disconnected & 220/33kV Jauljivi (PTCUL) would be connected to Jauljivi (ISTS) 400/220kV substation through 220kV D/C line.

6.5 In view of above repeatedly occurring oscillations, it is suggested that the implementation of Phase –II transmission system (as mentioned above) may be expedited by POWERGRID and PTCUL.

6.6 Members may like to deliberate.

Agenda items received from UPPTCL:**7.0 UPPTCL's proposal regarding augmentation of transformation capacity at 400/220kV Sarojininagar, Lucknow and Moradabad sub-stations:**

7.1 UPPTCL vide letter dated 03.08.2018 and 29.8.2018 has informed that they have under taken augmentation of transformation capacity at following substations in order to meet the growing demand and for n-1 compliance:

- i) 400/220kV Sarojininagar, Lucknow S/s from 2x315 MVA to 2x500MVA
- ii) 400/220kV Moradabad S/s from 2x500 MVA to 2x500+1x240 MVA
- iii) 400/220kV Muzaffarnagar S/s from 3x315 MVA to 2x315+1x500 MVA

7.2 UPPTCL may provide the details about the present loading on the transformers at 400/220kV Sarojininagar Moradabad & Muzaffarnagar S/Ss, and utilization of replaced transformers.

7.3 Members may like to discuss.

8.0 UPPTCL proposal regarding modification in connectivity lines of 400kV Basti (UPPTCL):

8.1 UPPTCL vide their letter dated 29.8.2018 has submitted that in 40th meeting of SCSPNR, construction of 400/220/132 kV 2x500, 2x220MVA Basti substation through LILO of both ckt of Gorakhpur PG – Lucknow PG 400 kV DC (Quad) existing PGCIL line at Basti (400) substation was approved. It is to inform that Gorakhpur- Lucknow (PG) line is with Twin Moose conductor and therefor LILO line to Basto S/S will be constructed with twin Moose conductor. The changes proposed by UPPTCL vis-à-vis agreed transmission scheme is tabulated below:-

Sl. No.	Agreed Transmission System	Modification suggested by UPPTCL
i.	Construction of 400/220/132kV, 2x500, 2x200 MVA GIS substation at Basti along with 1x125 MVAR bus reactor.	No change
ii.	LILO of both ckt of Gorakhpur (PG) – Lucknow (PG) 400 kV D/C (Quad)	LILO of two ckt (ckt no. 3&4) of Gorakhpur (PG)-Lucknow (PG) 400kV

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

	existing PGCIL line at Basti (400) substation – 25km. (LILO point distance from Lucknow PG – 200km and from Gorakhpur PG 60km)	D/C (twin) existing PGCIL line at Basti (400) substation – 28&30km (<i>LILO point approx distance from Lucknow (PG)-200km. and from Gorakhpur (PG) – 60km.</i>)
iii.	50 MVAR line reactors in both circuit of Lucknow(PG)-Basti 400 kV D/C Quad line at Basti end.	50 MVAR line reactors in both circuit of Lucknow (PG)-Basti (400) 400kV D/C Twin Moose line at Basti end.
iv.	LILO of Gonda (220)-Basti (220) (UPPTCL) 220kV S/C line at Basti (400) substation-20km.	No Change
v.	Basti(400)-Bansi (220) 220kV D/C line-50km.	Basti (400) – Dulhipar/Khalilabad (Siddharth Nagar) (220) 220kV D/C line-60km. (<i>Basti 400-Bansi 220kV line is not feasible due to severe ROW</i>)
vi.	LILO OF Gorakhpur PG (400)-Bansi (220) 220 kV S/C existing line at Khalilabad -20km	LILO of Gorakhpur PG (400)- Bansi 220kV S/C existing line at Dulhipar/Khalilabad (Siddharth Nagar) (220)-15 km <i>Khalilabad S/S named as Dulhipar</i>
vii.	Khalilabad–Pharenda (Anandnagar) 220kV DC line – 40km	Dulhipar/Khalilabad (220)–Pharenda (Anandnagar) 220kV D/C (Moose) line – 58km.
viii	<ul style="list-style-type: none"> • Basti (400)-Haraiya 132kV D/C line • Basti (400)-Nathnagar 132kV D/C line • Basti (400)-Mehdawal 132kV D/C line 	<ul style="list-style-type: none"> • Basti (400)-Kalwari (Basti) 132kV D/C line-45km • Basti (400)-Rudauli (Basti) 132kV D/C line-35km • LILO of Harraiya (Basti)–Darshannagar (Faizabad) existing 132kV S/C line at Basti (400)-15km
ix.		Creation of 220/132/33kV, 2x160, 2x40 MVA) Dulhipar/Khalilabad (Sant Kabirnagar)

8.2 Members may concur.

9.0 Downstream at Shahjahanpur 400/220kV PGCIL Substation :-

9.1.1 Construction of 220/132/33kV, 2x160, 2x40MVA Mallawan, Sandila (Hardoi) substation.

UPPTCL vide their letter dated 29.8.2018 has submitted that Shahjahanpur PG (400) is already connected to existing Hardoi 220kV substation through 220 kV S/C line. A new 220/132/33 kV substation Mallawan (Hardoi) has been planned by UPPTCL, which is part of 13th plan already noted by SCSPNR. The load center connectivity proposed and downstream network from the POWERGRID S/S at Shahjahanpur would change as under :-

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

- i. Creation of 220/132/33 kV 2x160, 2x40MVA substation at Mallawan (Hardoi).
- ii. Jehta (Lucknow) 400– Mallawan (Hardoi) 220kV D/C (Moose) line – 85km.
(Jehta 400 (Lucknow) substation is under construction and already approved by SCSPNR).
- iii. Mallawan (Hardoi)-Hardoi (220) 220kV D/C line - 55km. (only one line termination at Hardoi 220)
- iv. Since space for 220kV bays are not available at 220kV substation Hardoi, Shahjahanpur (PG)–Hardoi 220kV S/C line from Hardoi end will be disconnected and will be terminated at Mallawan (Hardoi) 220 Substation thus system after reorientation will be Shahjahanpur (PG)–Mallawan 220kV S/C line - 110km.

9.1.2 Construction of 220/132/33kV, 2x160, 2x40MVA Lakhimpur substation.

Shahjahanpur PGCIL 400kV Substation has 6 no. 220kV line bays, while 2 no. line bays has already been utilized. 2 no. will be utilized for Azizpur (Shahjahanpur) Substation 2 no shall be used for 220kV Lakhimpur Substation as follows:-

- i. Creation of 220/132/33 kV 2x160, 2x40MVA substation at Lakhimpur.
- ii. Shahjahanpur PG (400) – Lakhimpur 220kV D/C (Moose) line – 55km.
- iii. LILO of Shahjahanpur (PG)–Nighasan (Lakhimpur) 220kV existing UPPTCL line at 220kV substation Lakhimpur - 15km. (LILO point from Shahjahanpur PG – 55km. and from Nighasan (220) – 102km)
- iv. Lakhimpur (220) – Palia (Lakhimpur) 132kV D/C (Zebra) Line – 60km.
- v. Lakhimpur (220) – Puwayan (Shahjahanpur) 132kV D/C (Zebra) Line – 40km.
- vi. LILO of Bandaa (Shahjahanpur) – Gola (Lakhimpur) 132kV existing S/C line at Lakhimpur (220) – 13Km.

Members may like to note.

Agenda items received from CTU:

10.0 Additional 1x500 MVA, 400/220kV ICT at Bhadla Pooling Station

- 10.1 For evacuation of 1500MW of power from solar parks near Bhadla, 3 nos. of 500 MVA ICTs are being implemented at Bhadla Pooling Station. Further, in addition to this, 4th ICT of 500 MVA was agreed in 39th meeting of SCSPNR held on 29-30th May, 2017 and 2nd ECT held on 02/06/2018, is being taken up for implementation. Subsequently, 830MW LTA (details given in Table-3) has been agreed for grant in 14th Connectivity / LTA meeting of NR held on 17/08/2018. Thus total LTA from Bhadla including evacuation of power from solar parks along with these applications shall become 2330 MW (Earlier-1500 MW + Present 830 MW) against already planned transformation capacity of 2000 MW.
- 10.2 Further, as per Transmission Planning Criteria, the “N-1” criteria may not be applied to the immediate connectivity of wind/solar farms with the ISTS/Intra-STG grid i.e.

I/2028/2018(1)

the line connecting the farm to the grid and the step-up transformers at the grid station.

10.3 Therefore, to evacuate power from solar parks, additional (5th) ICT of 500MVA is required at Bhadla. Accordingly, it is proposed to augment the capacity of Bhadla Pooling Station by 1x500 MVA ICT.

10.4 **Members may please discuss and concur.**

11.0 **50 MVAR line reactor (New) for Allahabad-Singrauli 400kV line at Allahabad.**

11.1 Considering the requirement of transmission system in Rihand / Anpara/ Obra complex as well as for transfer of power beyond Allahabad, Singrauli-Allahabad 400kV S/c line was discussed and agreed in 31st meeting of SCPSPNR held on 02/01/2013 under NRSS-XXX. The scheme has also been agreed in the 28th Meeting of Northern Regional Power Committee, held on 26/04/2013.

11.2 The length of line was about 230 km. Hence, to compensate the reactive power generation and to control voltage along the line, line reactor of 50 MVAR was planned at Allahabad end. As per earlier practice, only main elements of transmission scheme i.e. lines and substation were discussed and agreed in the Standing Committee meetings. Generally, the reactive compensation was finalized by CTU at the DPR stage when more accurate details about line lengths and voltage profile become available. Accordingly, 50MVAR Line reactor along with associated bay at Allahabad, which is a part of “Northern Regional System Strengthening Scheme-NRSS XXX”, was incorporated in the DPR. Subsequently, after investment approval the scope of work including the reactors has been also circulated to the constituents.

11.3 **Members may kindly note.**

12.0 **Various Connectivity / LTA Applications received from Renewable energy Sources**

CERC has notified the Detailed Procedure for Grant of connectivity to projects based on renewable sources to ISTS on 15.05.2018 in the Petition No. 145/MP/2017. As per the procedure, the connectivity applications shall be processed for grant of Connectivity in two stages i.e. Stage-I & Stage-II. Stage-I Connectivity shall be granted by indicating two locations- one Primary and other alternate location. The grantee shall be allocated bay in either primary or indicated alternate location, which shall be specified at the time of grant of Stage-II Connectivity based on the availability of bay at that time. The Stage-I Connectivity grantee is required to apply for Stage-II Connectivity within 24 months from grant of Stage-I Connectivity for physical connectivity with the ISTS grid, failing which the same shall be ceased.

12.1 **Stage-I Connectivity Applications**

The details of Stage-I Connectivity granted to various IPPs in 11th, 13th and 14th LTA/Connectivity meeting of NR held on 07/06/2018, 11/07/2018 and 17/08/2018 respectively are attached at Annexure-III.

Further, 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, an option has been provided to wind power generators/developers who have

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

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.

In the 13th & 14th Northern Region Constituents Meeting regarding Connectivity/LTA Applications in NR held on 11.07.2018 and 17.08.2018 respectively at POWERGRID, Gurgaon, various RE connectivity applicants expressed their concern regarding mismatch in the commissioning of the generation project and the terminal bays at ISTS, if terminal bays are to be implemented under ISTS. Thus, RE connectivity applicants requested that they may be allowed to implement the terminal bays at the ISTS connectivity sub-station to meet the tight commissioning schedule.

Keeping in view the 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 in their scope at ISTS substations. The same has also been informed to Hon'ble CERC vide letter dated 08/08/2018 for inclusion of option of implementation of terminal bays at ISTS Substation by RE generators in the Detailed Procedure.

12.2 Stage-II Connectivity Applications

The following Connectivity transmission system for grant of Stage-II Connectivity was agreed in the 13th Connectivity/LTA meeting of NR held on 11/07/2018 and the same has been granted.

Table: 1

Sl. No.	Applicant No.	Applicant	Location	Start Date	Quantum of Stage-I Sought (MW)	Stage-II Connectivity Sought (MW)/ Start date	Quantum won in SECI/State bids (MW)	Proposed location for Grant of Stage-II Connectivity	Dedicated Tr. System
Connectivity applications near Bikaner									
1.	1200001432	ReNew Solar Power Pvt. Ltd.	Bikaner, Rajasthan	30.11.2019	500	250	MSEDCL 250	Bikaner	ReNew Solar – Bikaner 400kV S/c line
Connectivity applications near Bhadla									
2.	1200001443	Mahoba Solar (UP) Pvt. Ltd.	Jodhpur, Rajasthan	01.07.2019	300	200	MSEDCL 200	Bhadla	Mahoba Solar – Bhadla 220kV S/c line

Subsequently, the following Connectivity transmission system for grant of Stage-II Connectivity was agreed for grant in the 14th Connectivity/LTA meeting of NR held on 17/08/2018:

Table: 2

I/2028/2018(1)

Sl. No	Applicat ion No.	Applican t	Location	Start Date	Quantu m of Stage-I Sought/ Granted (MW)	Stage-II Connectivity Sought (MW)/Star t date	Quantum won in SECI/ State bids (MW)	Proposed location for Grant of Stage-II Connectivity	Dedicated Tr. System
Connectivity applications near Bhadla									
1.	1200001 494	ACME Solar Holding s Limited	Jodhpur, Rajasthan	16.09.19	250	250 (16/09/19)	MSEDC L 250	Bhadla	ACME Bhadla Solar Power Plant– Bhadla 220kV S/c line
2.	1200001 498	Tata Power Renewa ble Energy Limited	Jodhpur, Rajasthan	01.08.19	500	150 (revised to 01/08/19 from 01/04/19)	MSEDC L 150	Bhadla	TPREL 500 MW Solar Power Project Chhayan – Bhadla 220kV S/c line
3.	1200001 551	Azure Power India Private Limited	Jodhpur, Rajasthan	30.08.19	500	130 (revised to 30/08/19 from 31/08/18)	MSEDC L 130	Bhadla	Azure Power India Private Limited – Bhadla 220kV S/c line
4.	1200001 600	Azure Power India Private Limited	Bhadla, Rajasthan	15.10.20	500	250 (revised to 15/10/20 from 01/09/18)	Land & Auditor Certificate basis	Bhadla	AZURE Solar PV Plant Bhadla 2 – Bhadla 220 kV S/c line.
5.	1200001 601	Azure Power India Private Limited	Bhadla, Rajasthan	15.10.20	500	300 (revised to 15/10/20 from 01/09/18)	Land & Auditor Certificate basis	Bhadla	AZURE Solar PV Plant Bhadla – Bhadla 220 kV S/c line.
6.	1200001 575	Hero Solar Energy Private Limited	Jodhpur, Rajasthan	30.06.20	250	250 (30/06/20)	SECI 250	Bhadla	Hero Solar Energy Private Limited – Bhadla 220kV S/c line
Connectivity applications near Fatehgarh									
7.	1200001 602	ACME Solar Holding s Limited	Jaisalmer, Rajasthan	19.10.20	300	300 (19/10/20)	SECI 300	Fatehgar h	Common pooling point of ACME Fatehgarh I Solar Power Plant & ACME Fatehgarh II Solar Power Plant – Fatehgarh 400 kV S/c line(It was agreed to pool power at common pooling station by ACME and connect it
8.	1200001 603	ACME Solar Holding s Limited	Jaisalmer, Rajasthan	19.10.20	300	300 (19/10/20)	SECI 300	Fatehgar h	

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

Sl. No.	Application No.	Applicant	Location	Start Date	Quantum of Stage-I Sought/Granted (MW)	Stage-II Connectivity Sought (MW)/Start date	Quantum won in SECI/State bids (MW)	Proposed location for Grant of Stage-II Connectivity	Dedicated Tr. System
									with Fatehgarh S/s
Connectivity applications near Bikaner									through 400kV S/c line)
						300			Common pooling
9.	1200001572	Azure Power India Private Limited	Bikaner, Rajasthan	15.10.20	500	(revised to 15/10/20 from 01/09/18)	SECI 300	Bikaner	point of both Azure Bikaner 500 MW projects - Bikaner 400kV S/c line (It is agreed to pool power at common pooling station and connect it with Bikaner S/s
10.	1200001573	Azure Power India Private Limited	Bikaner, Rajasthan	15.10.20	500	(revised to 15/10/20 from 01/09/18)	SECI 300	Bikaner	through 400kV S/c line)

The following LTA applications were agreed for grant in 14th Connectivity/LTA meeting of NR held on 17/08/2018:

12.3 LTA Applications:**Table: 3**

Sl. No.	Application No./ (Online Date)/ (Physical Receipt Date)	Applicant	Connectivity/ Injection Point	Drawl Point	LTA (MW)/ Start & End Date (Sought)	Remarks
	1200001580 (25/07/18) / (26/07/18)	Suryakanta Hydro Energies Private Limited	66kV Switchyard of Ghanvi II HEP of HPSEBL	Tata Power Delhi Distribution Ltd., Delhi	14 (Start : 01/10/18 End : 22/05/37)	For transfer of 14 MW loading on existing transmission system is in order. Accordingly, it was agreed to grant LTA to M/s Suryakanta Hydro Energies Private Limited for 14 MW from Suryakanta Hydro Energies Private Limited to Tata Power Delhi Distribution Ltd with existing transmission system from 01/10/2018 to 22/05/2037.
	1200001474 (29/06/18) / (12/07/18)	Tata Power Renewable Energy Ltd	Rajasthan, NR	WR (Target)	150 (Start : 16/08/2019 End : 15/08/2044)	Stage-II application is received for grant of connectivity at 220kV Switchyard of Bhadla & as per confirmation by applicant during the meeting, the same has been considered for processing of LTA application. During the meeting applicant requested for change in start date of LTA. Further, applicant, vide letter dated 21/08/18 requested to change the start date from 01/05/2019 to 16/08/2019. Applicant vide letter dated 29/08/2018 requested to change the end

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

S I. N o	Applicati on No./ (Online Date)/ (Physical Receipt Date)	Applica nt	Connectivi ty/ Injection Point	Drawl Point	LTA (MW)/ Start & End Date (Sought)	Remarks
						date from 15/04/2019 to 15/08/2044. For transfer of 150 MW, loading on existing transmission system from NR to WR is in order. Accordingly, it was agreed to grant LTA to Tata Power Renewable Energy Ltd for 150 MW from Rajasthan to WR on Target basis with existing transmission system from 16/08/2019 to 30/04/2044 subject to submission of Application BG in prescribed format.
	12000015 23 (13/07/18) (16/07/18)	Azure Power India Pvt. Ltd.	Rajasthan, NR	WR (Target)	130 (Start : 30/08/20 19 End : 31/08/20 44)	Stage-II application is received for grant of connectivity at 220kV Switchyard of Bhadla & as per confirmation by applicant during the meeting, the same has been considered for processing of LTA application. During the meeting applicant requested for change in start date of LTA. Further, applicant, vide letter dated 20/08/18 requested to change the start date from 31/08/2019 to 30/08/2019. For transfer of 130 MW, loading on existing transmission system from NR to WR is in order. Accordingly, it was agreed to grant LTA to Azure Power India Pvt. Ltd. for 130 MW from Rajasthan to WR on Target basis with existing transmission system from 30/08/2019 to 31/08/2044.
	12000015 65 (23/07/18) (24/07/18)	Azure Power India Pvt. Ltd.	Rajasthan, NR	NR (Target)	200 (Start : 15/10/20 20 End : 15/10/20 45)	Stage-II application is received for grant of connectivity at 220kV Switchyard of Bhadla & as per confirmation by applicant during the meeting, the same has been considered for processing of LTA application. For transfer of 200 MW, loading on existing transmission system within NR is in order. Accordingly, it was agreed to grant LTA to Azure Power India Pvt. Ltd. for 200 MW from Rajasthan to NR on Target basis with existing transmission system from 15/10/2020 to 15/10/2045.
	12000015 74 (24/07/18) / (27/07/18)	Azure Power India Pvt. Ltd.	Rajasthan, NR	WR (Target)	50 (Start : 15/10/20 20 End : 15/10/20 45)	Stage-II application is received for grant of connectivity at 220kV Switchyard of Bhadla & as per confirmation by applicant during the meeting, the same has been considered for processing of LTA application. For transfer of 50 MW, loading on existing transmission system from NR to WR is in order. Accordingly, it was agreed to grant LTA to Azure Power India Pvt. Ltd. for 50 MW from

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

Sl. No	Application No./ (Online Date)/ (Physical Receipt Date)	Applicant	Connectivity/ Injection Point	Drawl Point	LTA (MW)/ Start & End Date (Sought)	Remarks
						Rajasthan to WR on Target basis with existing transmission system from 15/10/2020 to 15/10/2045.
	1200001562 (23/07/18) (24/07/18)	Azure Power India Pvt. Ltd.	Rajasthan, NR	ER (Target)	300 (Start : 15/10/2020 End : 15/10/2045)	Stage-II application is received for grant of connectivity at 220kV Switchyard of Bhadla & as per confirmation by applicant during the meeting, the same has been considered for processing of LTA application. For transfer of 300 MW, loading on existing transmission system from NR to WR is in order. Accordingly, it was agreed to grant LTA to Azure Power India Pvt. Ltd. for 300 MW from Rajasthan to ER on Target basis with existing transmission system from 15/10/2020 to 15/10/2045.

Application No. (2) to (6) are for evacuation of power from Bhadla. At present 3 nos. of 500 MVA ICT are being implemented. Further, in addition to this, 4th ICT of 1x500 MVA is being taken up for implementation. The total LTA from Bhadla including evacuation of power from solar parks along with these applications shall become 2330 MW (Earlier-1500 MW + Present 830 MW) against already planned transformation capacity of 2000 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 the “N-1” criteria may not be applied to the immediate connectivity of wind/solar farms with the ISTS/Intra-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.

It was agreed that implementation of additional (5th) 400/220 kV, 500 MVA ICT at Bhadla is required for grant of above LTAs. Since application from Sl. No (2) to (6) are physically received in the same month, i.e. July, 2018 (Sl. No.2 physically received after 7th day), all the applications shall have the same priority as per the CERC Regulations/Detailed Procedure. Accordingly, it was agreed to grant LTA to applications from Sl. No. (2) to (6) with 5th 400/220 kV, 500 MVA ICT at Bhadla under ISTS. Also the same shall be taken up in forthcoming Standing Committee on Transmission of Northern Region.

13.0 Agenda Item-Transmission Scheme for Solar Energy Zones (REZs) in Rajasthan

13.1 Govt. of India had set a target for establishing 175 GW renewable capacity by 2022 which, interalia, includes 100 GW Solar, 60 GW Wind generation capacity. Gestation period of RE project is short in comparison to development of its transmission

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

facilities. Therefore, transmission implementation need to be taken up in advance so that it can match with renewable generation.

- 13.2** To plan transmission scheme for envisaged solar generation, solar potential zones in various districts of six (6) RE rich states were identified by SECI in association with MNRE for 50 GW quantum. SECI vide letter dated 20.07.18 shared modified district wise Solar & Wind capacity addition plan Ph-1 (by 2020) i.e. 20 GW Solar & 9 GW Wind, whereas Ph-2 (by 2021) included 30 GW Solar & 7.5 GW Wind (Copy enclosed at Annex-II). In Rajasthan, Ramgarh/Kuchheri (Jaisalmer distt), Fatehgarh (Jaisalmer distt), Phalodi (Jodhpur distt), Koyalat /Pugal (Bikaner distt) & Barmer has got solar potential of 4 GW, 4 GW, 3 GW, 4 GW and 5 GW respectively. The above RE capacity addition plan by SECI was also evolved in consultation by MNRE & RE project developers. Based on the inputs, a consolidated transmission system was identified (Already circulated along with meeting notice) by MNRE constituted sub-committee for providing ISTS connectivity to Renewable energy zones for Ph-I & 2 time frames.
- 13.3** In NR, developable Solar potential is indicated in Rajasthan (20 GW) by end of 2021 time frame by SECI. It may be mentioned that Inter State transmission for Bhadla-III (500 MW), Bhadla –IV (250 MW), Essel (750 MW) and Fatehgarh (1000 MW) is already under various stages of implementation. Therefore, this is considered as harnessed potential and is not included in future potential.
- 13.4** Details of prioritized SEZs (20,000 MW) in two phases i.e. Dec'20 & Dec'21 in Rajasthan/NR is as under:

State/District	Taluk/Tehsil	Ph-1(GW)	Ph-2(GW)	Total
		2020	2021	
Rajasthan				
Jaisalmer	Ramgarh	2.5	1.5	4
	Fatehgarh	2.5	1.5	4
Jodhpur	Phalodi	2	1	3
Bikaner	Koyalat /Pugal	3	1	4
Barmer	Barmer	0	5	5
Total		10	10	20

- 13.5** RRECL vide their letter dated 20.07.18 has also indicated Solar potential Zones in Pugal, Bikaner (1.5 GW), Kolyat, Bikaner (1.5 GW), Kuchchri, Jaisalmer (3 GW), Fatehgarh, Jaisalmer (2 GW), Bhadla (2480 MW+2000 MW).
- 13.6** In reference to the RVPN letter dated 29.08.18 (copy enclosed) regarding PPA of 10GW Solar in Rajasthan, SECI vide letter dated 31.08.18 (copy enclosed) informed that solar bid of 2600 MW is already concluded and majority of PPA/PSA has been signed and balance shall be completed in a fortnight. In addition, a tender of 10,000 MW solar is going to be closed in Sep'18 for which PPA / PSA shall be concluded in next 3 months. In addition, NTPC has also concluded bids for 2 GW solar recently.

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

SECI also stated that as per their bid trajectory approx. 18 GW Solar & 10 GW wind projects is to be bid out in this FY. Accordingly SECI has requested to finalize transmission planning in ensuing regional SCT of NR/WR.

13.7 It is also to mention that CTU is in receipt of applications for connectivity (Stage-II) as well as LTA in some of the common pockets out of above indicated SEZ viz. Bhadla near Phalodi (Stage-II: 3130 MW, LTA:4110 MW)), Fatehgarh (Stage-II: 2200 MW, LTA-1600 MW) and Bikaner (Stage-II: 850 MW, LTA: 850 MW). Some of the applicants have been/are being granted LTA with scheme under implementation viz. 765kV Bhadla-Bikaner-Moga/Ajmer corridors, while others shall require additional transmission in case above Stage-II applications are converted to LTA. In addition, Stage-I applications for connectivity are also concentrated near Fatehgarh (8900 MW), Bhadla (7900 MW) and Bikaner (5000 MW) in Rajasthan.

13.8 Accordingly, for evolving the transmission scheme for solar RE projects under Phase-I (i.e., 10 GW), studies has been carried out considering the following list of ISTS applications/grants as well as prioritized Solar Potential zones.

S.No	Complex/pooling station	St-I Connectivity received (MW)	St-II Connectivity received (MW)	LTA received (MW)	Solar potential considered in studies (MW)
1	Fatehgarh (Jaisalmer)	8900	2200 (1000MW deemed St-II, + 600 MW under grant)	1600 (1000MW granted)	4000 (St-II applications:1200MW (2200-1000) + SEZ Potential : 2800MW)
2	Bhadla (Jodhpur)	7914	3130 (1500MW deemed St-II, + 1530 MW under grant)	4110 (2330MW granted)	3000 (St-II applications:800MW (3130-2330) + SEZ Potential : 2200MW)
3	Bikaner	5000	850 (250 granted, 600 under grant)	850	1850 (St-II applications:850MW + SEZ Potential : 1000MW @)
4	Ramgarh/ Kuchheri (Jaisalmer)				1150 (SEZ potential)
	Total (MW)	21814	6180	6560	10000 (St-II applications: 2850MW + SEZ Potential : 7150MW)

@ Injection Capacity limitation at 220kV due to space available for 400/220kV ICTs

Based on Stage-II applications already received near Fatehgarh, Bikaner and Bhadla as well as Potential pockets in Western Rajasthan, following SEZs (10 GW) in Rajasthan are considered in a phased manner out of SECI SEZ pockets:

Part-A:

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

- i) Fatehgah (4 GW) [Fathegarh-1.2 GW, Fathegarh-2: 2.8 GW]
- ii) Phalodi/ Bhadla SEZ (3 GW) [Bhadla- 0.8 GW, Bhadla-2: 2.2 GW]
- iii) Bikaner –Pugal (1.85 GW)

Part-B:

- i) Ramgarh/Kuchcheri (1.15 GW)

13.9 Based on the SECI potential quantum and locations, applications as well as inputs from RRVPN on their Intra RE generation in Western Rajasthan (letter enclosed at Annexure-IV), studies have been carried out and two alternatives have been evolved. The results of system studies for the two alternatives is enclosed at Annexure-V. From the studies, it is observed that line loadings are in order as per the CEA planning criteria.

Following transmission system is proposed for various Solar Energy Zones (10 GW) in Rajasthan in Northern region.

Alternative -I

Part A: Transmission system for evacuation of power from Fatehgah (4 GW), Phalodi/Bhadla (3 GW), Bikaner (1.85GW)

- i) Establishment of 400/220kV, 5x500 MVA pooling station at suitable location near Phalodi/ Bhadla in Jodhpur (Bhadla-2)
- ii) Establishment of 765/400kV, 2x1500 MVA S/s near Khetri
- iii) Augmentation of transformation capacity at Bhadla (PG) by 2x500MVA (6th/7th), 400/220kV transformers
- iv) Transformation capacity at Bikaner (PG) with 2x500MVA, 400/220kV transformers
- v) Bhadla-2 – Bhadla (PG) 400kV D/c Line (Twin HTLS) -30 km
- vi) Bhadla (PG) – Bikaner (PG) 765kV D/c line (2nd)- 175 km
- vii) Bikaner(PG) – Khetri S/s 765kV D/c line -220 km
- viii) LILO of both ckts of 765kV Phagi – Bhiwani D/c line at Khetri S/s- 10 km
- ix) Khetri – Sikar (PG) D/c line (twin HTLS) – 70 km
- x) Augmentation of 1x1500MVA,765/400kV transformer (4th) at Bhadla (PG)
- xi) Augmentation of 1x1500MVA,765/400kV transformer (3rd) at Moga S/s
- xii) Augmentation of 1x1000MVA,765/400kV transformer (3rd) at Bhiwani (PG)
- xiii) Establishment of Transformation capacity at Fatehgah (TBCB) with 3x500MVA, 400/220kV transformers
- xiv) Establishment of 765/400/220kV, 4X1500MVA, 6x500 MVA pooling station at suitable location near Fatehgah in Jaisalmer Distt (Fatehgah-2)
- xv) Establishment of 400/220kV, 2x500 MVA S/s near Jodhpur**
- xvi) LILO of 400kV Fatehgah (TBCB) – Bhadla (PG) D/c line at Fatehgah-2 – 20km
- xvii) Charging of 400kV Fatehgah-2 –Bhadla section at 765kV level
- xviii) Fatehgah-2 – Jodhpur S/s 400 kV 2xD/c Line (Twin HTLS on M/c tower) -150 km
- xix) Bhadla-2 – Jodhpur S/s 400 kV D/c Line (Twin HTLS) -120 km
- xx) Jodhpur – Ajmer (PG) 400 kV 2xD/c Line (Twin HTLS on M/c tower) -225 km
- xxi) Jodhpur – Jodhpur-new (RVPN) 400 kV D/c Line (Twin HTLS) -55 km
- xxii) Ajmer (PG)– Jhatikara 765kV D/c line -360 km
- xxiii) 2x125 MVAr Bus Reactors each at Jodhpur & Bhadla-2 Substations

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

- xxiv) 1x125 MVar (420kV), 1x240 MVar Bus Reactor each at Khetri & Fatehgarh-2 Substation
- xxv) 1x63 MVar switchable Line reactors at both end for Ajmer- Jodhpur 2xD/c line
- xxvi) 1x240 MVar Switchable line reactor at each end of Bhadla – Bikaner 765kV D/c (2nd) line
- xxvii) 1x330 MVAR Switchable Line reactors each at Ajmer & Jhatikara end for Ajmer – Jhatikara 765kV D/c line
- xxviii) 1x240 MVar Switchable line reactor at each end of Bikaner – Khetri 765kV D/c line
- xxix) 220kV line bays for interconnection of solar projects at Fatehgarh-2, Fatehgarh, Bhadla, Bhadla-2 and Bikaner S/s- *to be discussed in view of CERC regulation*
- xxx) Provision of 220kV Bus couplers +TBC & common facilities at pooling/substation i.e. Fatehgarh, Fatehgarh-2, Khetri, Bhadla-2, Jodhpur, Bikaner, Bhadla under ISTS as per regulation – under the scope of ISTS

Part B: Transmission system for evacuation of power from Ramgarh/Kuchcheri in Fatehgarh (1.15 GW*)

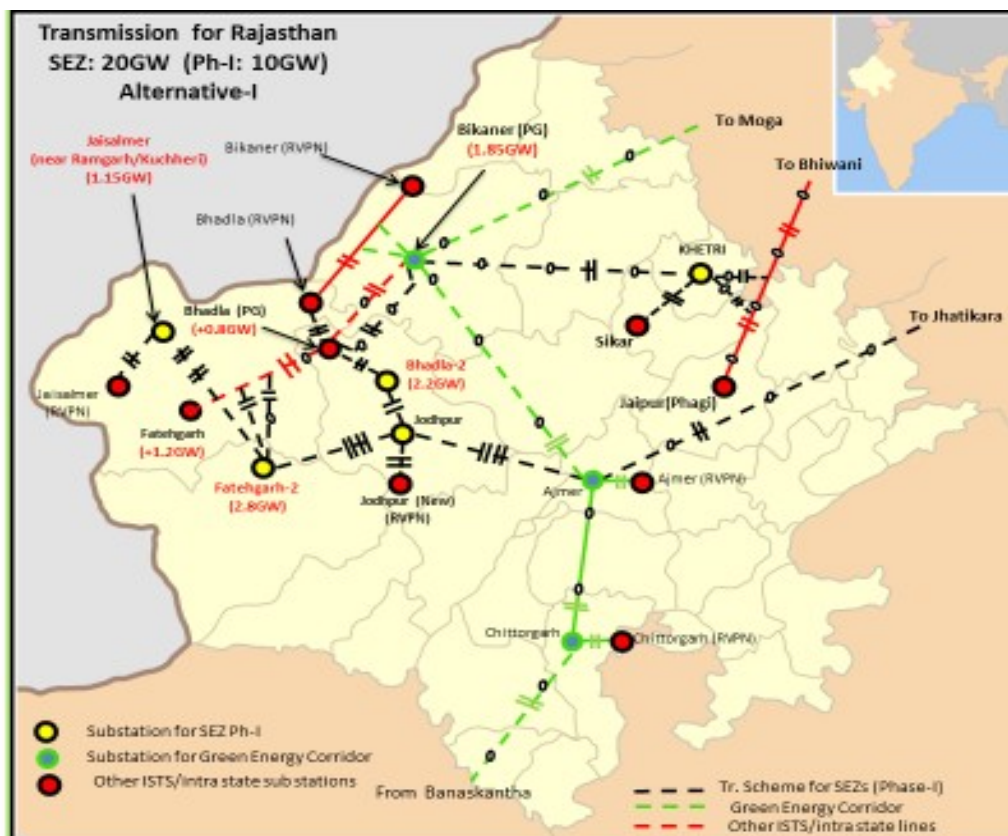
- i) Establishment of 400/220kV 3x500 MVA pooling station at suitable location in Jaisalmer Distt (near Ramgarh/Kuchheri)
- ii) Ramgarh/Kuchheri pooling station –Fatehgarh-2 400 kV 2xD/c Line (Twin HTLS on M/c tower) -150 km
- iii) Ramgarh/Kuchheri pooling station – Jaisalmer -2 (RVPN) 400 kV D/c Line (Twin HTLS)- 60 km
- iv) 220kV line bays for interconnection of solar projects at Ramgarh/Kuchheri pooling station-- *to be discussed in view of CERC regulation*
- v) Provision of 220kV Bus couplers +TBC & common facilities at Ramgarh/Kuchheri PS

**It may be mentioned that out of 2.5 GW potential in Ramgarh/Kuchcheri, about 1.5 GW potential can be evacuated through transmission corridor identified above at Part (B) . Additional transmission requirement for balance 1 GW (balance Ph-1), if any may be evolved based on the requirement subsequently.*

*** Only In case of drawl required by RVPN, else 400kV switching station at Jodhpur may be considered*

Estimated Cost (Alternate-1): Rs 9400 Cr

I/2028/2018(1)



Alternative -II

Part A: Transmission system for evacuation of power from Fatehgarh (4 GW), Phalodi/Bhadla (3 GW), Bikaner (1.85GW)

- i) Establishment of 765/400/220kV, 3x1500MVA, 5x500 MVA pooling station at suitable location near Phalodi/ Bhadla in Jodhpur (Bhadla-2)
- ii) Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Khetri
- iii) Augmentation of transformation capacity at Bhadla (PG) by 2x500MVA (6th/7th), 400/220kV transformers
- iv) Transformation capacity at Bikaner (PG) with 2x500MVA, 400/220kV transformers
- v) LILO of 765kV Ajmer – Bikaner D/c line (both ckts) at suitable point with interconnection of suitable point to Bhadla-2-135km
- vi) Bhadla-2 – Bhadla (PG) 400kV D/c Line (Twin HTLS) -30 km
- vii) Bikaner(PG) – Khetri S/s 765kV D/c line -220 km
- viii) LILO of both ckts of 765kV Phagi – Bhiwani D/c line at Khetri S/s- 10 km
- ix) Khetri – Sikar (PG) D/c line (twin HTLS) – 70 km
- x) Augmentation of 1x1500MVA,765/400kV transformer (3rd) at Moga S/s
- xi) Augmentation of 1x1000MVA,765/400kV transformer (3rd) at Bhiwani (PG)
- xii) Establishment of Transformation capacity at Fatehgarh (TBCB) with 3x500MVA, 400/220kV transformers
- xiii) Establishment of 765/400/220kV, 5X1500MVA, 6x500 MVA pooling station at suitable location near Fatehgarh in Jaisalmer Distt (Fatehgarh-2)
- xiv) Fatehgarh-2 – Bhadla -2 765kV D/c line -130km
- xv) LILO of 400kV Fatehgarh (TBCB) – Bhadla (PG) D/c line at Fatehgarh-2 – 20km

I/2028/2018(1)

- xvi) Charging of 400kV Fatehgarh-2 –Bhadla section at 765kV level
- xvii) Ajmer (PG)– Jhatikara 765kV D/c line -360 km
- xviii) 1x125 MVar (420kV), 1x240 MVar Bus Reactor each at Fatehgarh-2, Bhadla-2 & Khetri Substation
- xix) 1x330 MVAR Switchable Line reactors each at Ajmer & Jhatikara end for Ajmer – Jhatikara 765kV D/c line
- xx) 1x240 MVar Switchable line reactor at each end of Bikaner – Khetri 765kV D/c line
- xxi) 1x330 MVar Switchable line reactor at Bhadla-2 end for Ajmer-Bhadla-2 765kV line (after LILO)
- xxii) 220kV line bays for interconnection of solar projects at Fatehgarh-2, Fatehgarh, Bhadla, Bhadla-2 and Bikaner S/s- to be discussed in view of CERC regulation
- xxiii) Provision of 220kV Bus couplers +TBC & common facilities at pooling/substation i.e. Fatehgarh, Fatehgarh-2, Khetri, Bhadla-2, Bikaner, Bhadla under ISTS as per regulation – under the scope of ISTS

Part B: Transmission system for evacuation of power from Ramgarh/Kuchcheri in Fatehgarh (1.15 GW*)

- i) Establishment of 400/220kV 3x500 MVA pooling station at suitable location in Jaisalmer Distt (near Ramgarh/Kuchheri)
- ii) Ramgarh/Kuchheri pooling station –Fatehgarh-2 400 kV 2xD/c Line (Twin HTLS on M/c tower) -150 km
- iii) Ramgarh/Kuchheri pooling station – Jaisalmer -2 (RVPN) 400 kV D/c Line (Twin HTLS)- 60 km
- iv) 220kV line bays for interconnection of solar projects at Ramgarh/Kuchheri pooling station-- *to be discussed in view of CERC regulation*
- v) Provision of 220kV Bus couplers +TBC & common facilities at Ramgarh/Kuchheri PS

**It may be mentioned that out of 2.5 GW potential in Ramgarh/Kuchcheri, about 1.5 GW potential can be evacuated through transmission corridor identified above at Part(B). Additional transmission requirement for balance 1 GW (balance Ph-1), if any may be evolved based on the requirement subsequently.*

Estimated Cost (Alternate-2) : Rs 9000 Cr

I/2028/2018(1)



Members may deliberate

14.0 Downstream network by State Utilities from ISTS Stations

14.1 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. States are requested to implement the 220kV system for proper utilization of the line bays and inform the status of planned 220kV system identified with following sub-stations:

S. No.	Substation	Downstream network requirement	Schedule	Planned system and Implementation 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 2018 PDD, J&K to update.
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) 220kV Alusteng – New Wanpoh line

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

S. No.	Substation	Downstream network requirement	Schedule	Planned system and Implementation Status
				Targeted Completion – Dec 2018 Anticipated-Nov'19 PDD, J&K to update.
3	400/220kV, 2x315 MVA Parbati Pooling Station	2 Nos. of 220 kV bays to be utilized.	Commissioned	220kV Charor-Banala D/c line (18km): Under Construction Targeted Completion- Oct'17 Anticipated – Aug'18 HPSEBL to update.
4	400/220kV, 2x500 MVA Kurukshetra (GIS)	8 nos. of 220 kV bays to be utilized	Commissioned	LILO of one circuit of Kaul-Pehowa 220kV D/c line LILO of one circuit of Kaul-Bastara 220kV D/c line Work awarded with contractual completion date 02/01/2018. Target Completion-Mar'19 HVPNL to update.
5	400/220kV, 2x500 MVA Bagpat GIS	3 nos. of 220 kV downstream lines to Shamli, Muradnagar and Bagpat commissioned. Balance 5 Nos. of 220 kV bays to be utilized	Commissioned	Bagpat- Baraut 220kV S/c Line- Severe RoW LILO of 220kV Muradnagar II -Baghat (PG) at Baghat UP- Severe Row Bagpat(PG)-Modipuram New 220kV D/c-exp. by Oct.18 UPPTCL to update.
6	400/220 kV, 2x315 MVA Saharanpur	2 nos. 220 kV downstream lines commissioned. (Saharanpur (UP) and Nanauta) Balance 4 Nos. of 220 kV bays to be utilized	Commissioned	LILO of 220 kV Khara- Shamli at Saharanpur PG- Commissioned Saharanpur(PG)-Sarsawa (new) 220kV D/c- Commissioned
7	400/220kV, 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.
8	400/220 kV, 2x315 MVA	4 Nos 220 kV bays utilized	Commissioned	2 nos of bays utilized for Sohawal 220kV UP-

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

S. No.	Substation	Downstream network requirement	Schedule	Planned system and Implementation Status
	Sohawal	balance 2 Nos 220 kV bays to be utilized.		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.
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 - Azimpur D/c line- Planned UPPTCL to update.
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. PSTCL to update.

11	Hamirpur 400/220 kV 2x315 MVA Sub-station (Augmentation by 3x105 MVA ICT)	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.
12	Kaithal 400/220 kV 1x 315 MVA Sub-station	2 Nos. of 220kV bays to be utilized	Commissioned	220kV Kaithal(PG)- Neemwala D/c line - Work awarded on 25.10.2016. Tentative completion date is 23.05.2018. Contract Cancelled, retendering, under process 220kV S/s Neemwala-Tenders opened for NIT dated 23.05.2016. Tender enquiry under process HVPNL to update.
13	Sikar 400/220kV, 1x 315 MVA S/s	2 Nos. of 220 kV bays	Commissioned	RRVPNL representative stated that studies would be conducted to formulate how bays could be utilized. RRVPNL to update.
14	400/220kV Kota	1 No. of 400 kV	Commissioned	Line ready for charging

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

S. No.	Substation	Downstream network requirement	Schedule	Planned system and Implementation Status
	Sub-station (1 No. of 400 kV Bay)			RRVPNL to update.
15	Bhiwani 400/220kV S/s	6 nos. of 220kV bays	Commissioned	220kV D/c line from Bhiwani (PG) to 220kV Isherwal (HVPNL) S/s – Likely to be completed by 31.2.2019 HVPNL to update.
16	Jind 400/220kV S/s	6 nos. of 220kV bays	Commissioned	LILO of both circuits of 220kV D/c Narwana – Mund line at Jind (PG) HVPNL to update.

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

Sl. No.	Name of Substation	MVA Capacity	Expected Schedule	Downstream connectivity furnished by States in 40 th SCSPNR
1	400/220kV Dwarka-I GIS (8 nos. of 220kV bays)	4x 500	Oct'18	2x160MVA, 220/66kV ICTs – expected by 2021-22 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 DTL to update
2	400/220kV Tughlakabad GIS (8 nos. of 220kV bays)	4x 500	Sep'18	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

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

Sl. No.	Name of Substation	MVA Capacity	Expected Schedule	Downstream connectivity furnished by States in 40 th SCSPNR
				line- Expected by 2020-21 DTL to update
3	220/66kV Chandigarh GIS (8 nos. of 66kV bays)	2x 160	Feb'19	Chandigarh to update.
4	400/220kV 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.
5	400/220kV Sohna Road Sub-station (TBCB) (8 nos. of 220kV bays)	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 Survey HVPNL to update.
6	400/220kV Prithla Sub-station (TBCB) (8 nos. of 220kV bays)	2x500	May'19	LILO of both ckt of 220kV D/c Ranga Rajpur – Palwal line – Expected by Mar'20 220kV D/C for Sector78, Faridabad – Expected by Sep'19 HVPNL to update.
7	400/220kV Kadarapur Sub-station (TBCB) (8 nos. of 220kV bays)	2x500	May'19	HVPNL informed that downstream line of 400kV S/stn. Kadarapur could not be envisaged by TS wing due to non-finalization of Kadarapur sub-station site by M/s Sterlite. HVPNL to update.
8	400/220kV Kala Amb GIS (TBCB) (6 nos. of 220kV bays)	2x315	Commissioned	HPSEBL has planned one no. of 220kV D/c line from Kala Amb 400/220kV S/s to

Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

Sl. No.	Name of Substation	MVA Capacity	Expected Schedule	Downstream connectivity furnished by States in 40 th SCSPNR
				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.
9	400/220kV Amargarh GIS (TBCB) (6 nos. of 220kV bays)	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.

15.0 Agenda by RVPN “Regarding approval of Intra-State transmission schemes which involve reconfiguration of ISTS elements, Inter-Connection with ISTS elements up-coming 400/220kV transmission elements of Rajasthan State”

15.1 RRVPN vide their letter dated 31.08.2018 has informed in the previous meetings of SCSPNR, it was highlighted that the upcoming/under construction intra-State transmission schemes/elements need to be specifically deliberated in the meeting of Northern Region Standing Committee for the knowledge/noting of Standing Committee members. Therefore, RRVPN has informed the following:

15.1.1 RRVPNL’s upcoming/under construction Reactors: -

- i. 1 no. 125 MVAR, 400kV Bus Reactor at 400kV GSS Akal. Presently approximate 1985 MW Wind projects are already commissioned at 400kV Akal GSS and 400 kV Akal GSS is connected to intra state grid as under:
 - a) Akal-Jodhpur 400kV D/C line – 230 km Twin Moose
 - b) Akal-Ramgarh 400kV D/C lines – 100 km Twin Moose
 - c) Akal-Jodhpur-New (U/C) 400kV D/C line – 240 km Twin Moose

The interconnecting transmission lines generate MVAR resulting in high voltage during low wind period.

- ii. 1 no. 50MVAR, 400kV line Reactor for Bhadla-Jodhpur 400kV line at Bhadla 400kV GSS (initially to be charged as bus reactor till completion of line). There is high Solar injection at Bhadla 400kV GSS from Bhadla Solar Park (1430 MW capacity) and nearby 220/132 kV GSSs namely Kanasar, Khetusar, PS-2, PS-3

I/2028/2018(1)

etc. During night hours no solar power is available, hence reactor is required to control voltage rise.

- iii. 1 no. 80MVA_r, 400kV Bus Reactor at Chittorgarh 400kV GSS. The transformer capacity at 400kV GSS is 2x315MVA and peak load (2017-18) of the GSS is 334MVA. 3 nos 400kV lines are being connected at Chittorgarh 400kV GSS. Therefore, 80MVA_r Reactor is required to control the voltage.

15.1.2 RRVPNL's upcoming/under construction GSS and lines: -

- Up-coming 220kV GSS and lines, which are under construction and shall be commissioned in due course of time are indicated at Annexure-VI(A)

15.1.3 RRVUNLS's upcoming/under construction/ready to charge Reactors: -

- i. 2 no. 50MVA_r Reactors installed on 400kV Suratgarh (SSCTPP)-Biner line I & II (Line length-170km, conductor Twin Moose) at Suratgarh Super Critical Thermal Power Plant (SSCTPP) end & ready to charge.
- ii. 2 no. Switchable Line Reactor 50MVA_r, 420kV at Chhabra Thermal Power Plant, RVUNL, Chhabra; one will be connected at 400kV CTPP-Hindaun line (Line length-270km) at 417 bay and second reactor will be charged as bus reactor. The justification note is enclosed at Annexure-VI (B).

Members may like to note.

16.0 Review of Evacuation arrangement for Shongtong Karcham (450 MW) in Satluj Basin –Agenda by HPPTCL

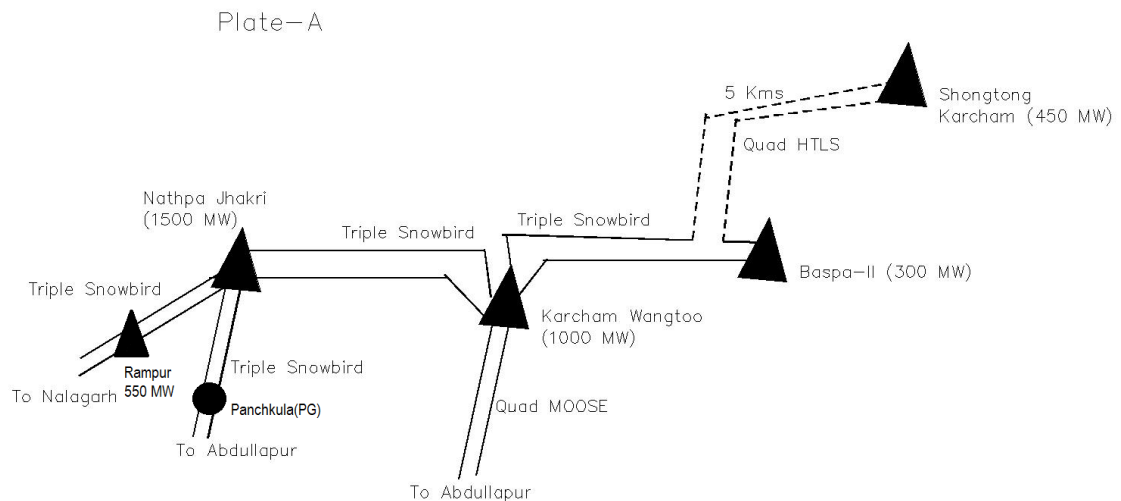
16.1 As per Master Plan for Satluj basin, Power of Shongtong Karcham (450 MW) HEP shall be evacuated by construction of 400 kV D/C (Quad HTLS) line up to 400/220/66 kV substation of HPPTCL under construction at Wangtoo. This line was to be developed as ISTS through TBCB route as per CERC regulations at that time stipulated that for a single hydro project of 250 MW and above, CTU shall plan and implement the dedicated line as ISTS. This line had capacity of 3000 MW considering (n-1) contingency sufficient to evacuate power of projects located upstream of Shongtong Karcham HEP. On a petition filed by CTU in CERC on 11.8.2017, CERC issued the order on 19.3.2018 stating: “the scheme was envisaged in the year 2011 i.e. 7 years back. A considerable time has lapsed since the inception of the complete scheme and there may be changes in the commissioning schedules of projects in the Satluj Basin. Therefore, there is a need to review the scheme in the Standing Committee. In the light of this, we are not inclined to grant regulatory approval at this stage. We direct CTU to discuss the scheme in the Standing Committee Meeting of the Northern Region again in consultation with CEA and may approach Commission for regulatory approval, if required.”.

16.2 During the discussions in 40th meeting of Standing Committee on Power System Planning-NR held on 22.6.2018, it was decided that this line shall be developed as dedicated line of Shongtong Karcham by HPPCL.

16.3 HPPTCL vide their letter dated 31.8.2018 has proposed the following after taking into consideration the uncertainty of upstream projects:

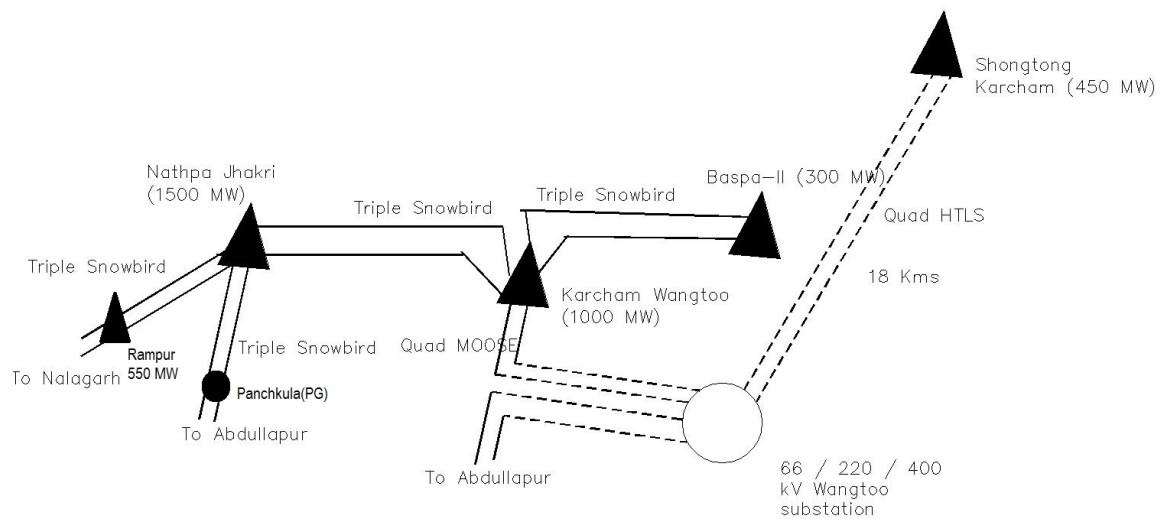
I/2028/2018(1)

- i) LILO of one circuit of 400 kV Baspa-II-Karcham Wangtoo-Nathpa Jhakri D/C line of M/S JSW (Triple Snow bird) at Shongtong Karcham HEP. LILO (about 5 Kms) is proposed to be done on Quad HTLS configuration.
- ii) As per agreement dated 1.10.1992 entered between Government of Himachal Pradesh and JIL, the line can also be utilized for evacuation of power from any other generation project established or to be established in the area. In Hon'ble CERC order dated 7.5.2015 on the petition No. 37/TT/2011 for approval of transmission tariff for transmission system associated with evacuation of power of Karcham Wangtoo HEP for tariff block 2009-14 period, it has been recorded that Baspa-II-Jhakri 400 kV D/C line was established, operated and maintained by JHPL as main transmission line and not as a dedicated line
- iii) This is an interim arrangement till the upstream generation is available. In due course of time, when upstream generation progresses, The LILO shall be opened and extended to 220/400 kV substation of HPPTCL under construction at Wangtoo. Thus, there will not be any change in the firmed up evacuation arrangement for Shongtong Karcham HEP and other upstream projects. Plate-A and Plate-B show the interim and final evacuation arrangements for Shongtong Karcham HEP.



I/2028/2018(1)

Plate-B



16.4 Studies were carried out considering the above proposal. Study results are enclosed as Annexure-VII. Members may like to deliberate.

17.0 Any other agenda item –with the permission of chair.

I/2028/2018(1)

Annexure-I**Minutes of meeting regarding in-principle approval of 400 kV transmission lines and reactors of RRVPNL held on 06.08.2018 in CEA**

RRVPNL vide their letter no. RVPN/SE(P&P)/XEN-2(P&P)/AE-2/F./D 689 dated 02.08.2018 had requested CEA to grant in-principal approval for following transmission elements which were ready for commissioning:

1. 400 kV Chhabra – Anta S/C line.
2. 400 kV Chittorgarh – Bhilwara D/C line.
3. 1 x 50 MVAR Bus Reactor at 400 kV Bhilwara S/s.

To discuss the issue, a meeting was scheduled in CEA with CTU, POSOCO and RRVPNL. List of participants are enclosed at Annexure –I. There was no participation from CTU. Following deliberations were made in the meeting:

1. Representative of RRVPNL stated that Chhabra - Kota 400 kV S/C transmission line was originally planned as a part of evacuation system from Chhabra TPS. This line passes in vicinity of Anta 765/400kV S/s. Due to Row issues in Chhabra - Anta section, the Kota – Anta section was charged by terminating the line at Anta 765/400kV S/s.

The balance section has also been completed and the same has been decided by RRVPNL to terminate at Anta, thus resulting in formation of Chhabra – Anta 400 kV S/C line.

Further, 400 kV Chittorgarh – Bhilwara D/C line was planned for evacuation of power from upcoming solar generation in and around that area and 1x50 MVAR 400kV reactor at Bhilwara S/s has been shifted from Merta 400 kV S/s. At Merta S/s a new reactor of 125 MVAR has been installed.

All the above elements viz Chhabra - Kota 400 kV S/C line, Chittorgarh – Bhilwara 400 kV D/C line and 1x50 MVAR 400kV reactor at Bhilwara have been completed and for charging these elements, their SLDC has requested charging code from RLDC. RLDC has sought Standing Committee approval for these elements. Accordingly, in-principle approval has been sought from CEA for these three elements.

2. CEA stated that load flow studies done on June 2018 file shows no considerable change in power flow pattern and short circuit levels with and without these elements. Further, the progress of 400kv lines (viz Chhabra - Kota 400 kV S/C line and Chittorgarh – Bhilwara 400 kV D/C line), are already figuring in monitoring reports of PSPM Division, CEA.
3. DGM, POSOCO stated that all Intra - State transmission schemes which involve reconfiguration of ISTS elements, Inter-Connection with ISTS elements and all 400 kV Intra – State schemes planned by state has impact on the grid, therefore these schemes/elements need to be specifically deliberated in the meeting of Northern Region Standing Committee on Transmission" (NRSCT). Also, other Intra- State schemes planned by the state may also be intimated to NRSCT.

4. After deliberation, the following was agreed:

iv) The following intra-state transmission elements of RRVPNL were noted and
Agenda Note -1st meeting of NRSCT

I/2028/2018(1)

agreed in – principle:

- d) 400 kV Chhabra – Anta S/C line.
- e) 400 kV Chittorgarh – Bhilwara D/C line.
- f) 1 x 50 MVAR Bus Reactor at 400 kV Bhilwara S/s.

The same would be formalized / brought to the notice of members of NRSCT.

- v) RRVPNL to intimate NRSCT all Intra - State transmission schemes which involve reconfiguration of ISTS elements, inter-connection with ISTS elements and all 400 kV Intra – State schemes which are already under implementation and has not been intimated earlier in Standing Committee on Power System Planning.
- vi) RRVPNL to include new/planned Intra - State transmission schemes which involve reconfiguration of ISTS elements, inter-connection with ISTS elements and all 400 kV Intra – State schemes as agenda of NRSCT for deliberation.

The meeting ended with thanks to the chair.

Annex-I

List of Participants of the meeting held on 06.08.2018 regarding charging of 400 kV transmission lines and reactors under construction by RRVPNL held on 06.08.2018 in CEA.

Sl. No.	Name Shri/Smt CEA	Designation
	I	
1.	Awdhesh Kumar Yadav	Director
2.	Manjari Chaturvedi	Dy. Director
3.	Kanhaiya Singh Kushwaha	Asstt. Director
	II	
	POSOCO	
4.	H K Chawla	DGM
5.	Kamaldeep	Dy. Manager
	RRVPNL	
6.	Anjana Agrawal	EE(Planning)

Minutes of Meeting for 220 KV under construction DFCC bays on 25.08.2018 at
POWERGRID Abdullapur s/s

Following were present:-

- 1) Sh Faraz, Dy Director, CEA
- 2) Sh Kanhaiya Singh Kushwaha,
Assistant Director, CEA
- 3) Sh Chanky Garg, Project Manager
Electrical, DFCCIL, Ambala
- 4) Sh K.Singh, Assistant Project
Manager/DFCC
- 5) Sh P.K.Panchal, Executive Engineer,
TS Division, HVPNL, Ambala
- 6) Sh Mahesh kumar, SDO
Construction, HVPNL, Ambala
- 7) Sh R.S.Meena, ADEE/TND/Railway
- 8) Sh Yuvraj Singh, SSE/TRD/N.Rly
- 9) Sh G.K.Verma, DGM, PGCIL
Abdullapur
- 10) Sh Virendra Singh, Chief Manager
S/S, Abdullapur

Committee constituted by 40th Standing Committee on Power System Planning for Northern Region visited 400/220 KV POWERGRID, Abdullapur s/s on 25.08.2018 for deliberations on under construction 220 KV DFCC bays.

Following issues were discussed:-

- 1) Area demarcated for 02 nos, 220 KV Rajokheri bays for HVPNL was seen. There are 02 nos towers for 400 KV Abdullapur-Baḡwana line & 400 KV Abdullapur-Kurukshetra line erected, in line of transfer bus at Abdullapur sub-station POWERGRID. Therefore 02 no, 220 KV bays for 220 KV D/C Abdullapur-Rajokheri line will be placed adjacent to terminal tower of 400 KV Abdullapur-Kurukshetra line. HVPNL has no objection for this area as the line entry for the Abdullapur-Rajokheri line is convenient for HVPNL at this point.
- 2) Existing bays (Bay 203 & 206) for Abdullapur-Jagadhri 220 KV D/C (Indian Railways) 2-phase railway line were seen. There is no space constraint for incorporating 3rd phase. However it requires casting of foundation, erection of equipments for 3rd phase, dismantling & re-erection of bay marshalling kiosk & circuit breaker marshalling box, additional cable laying works, required modifications in protection scheme.
- 3) Partially constructed 220 KV bays for DFCC were seen. POWERGRID informed that all the 06 nos gantry foundations & 01 no lightning mast tower foundations were completed

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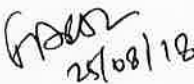
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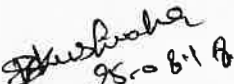
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& towers have been erected along with beam. Out of 94 nos equipment foundation, only 08 nos are balance. 80 mtrs cable trench is constructed. 60% earth mat work is also completed (Progress report is attached).


- 4) POWERGRID clarified that partial construction of new 220 KV, 3-phase D/C line for DFCC sub-station has been carried out. Out of 35 towers foundation, already 23 are constructed.
- 5) As per POWERGRID survey of existing, 2-phase, 220 KV line (report attached), there are 5 spans, wherein sufficient clearance for bottom conductor is not available. Out of these 5 locations, 3 locations were jointly checked and vertical ground clearances appeared insufficient.


For CEA


25/08/18
(Faraz)


25-08-18
(Kanhaiya Singh)

For DFCC


(Chanky Garg)


(K Singh)

For HVPNL


(P.K.Panchal)

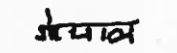

(Mahesh Kumar)

For Railways


(R.S.Meena)


(Yuvraj Singh)

For POWERGRID


(G.K.Verma)


(Virendra Singh)

Annexure-III

1. Stage-I Applications granted as per 11th LTA/Connectivity meeting of NR:

Sl. No	Application No.	Applicant	Date of Application	Location	Connectivity Sought (MW)	Nature of Applicant	Proposed Primary location for Connectivity/Tr. System under ISTS	Dedicated Tr. System	Proposed Alternative location for Connectivity / Tr. System under ISTS	Dedicated Tr. System for alternative connectivity
Connectivity Applications at Bhadla										
1	1200000804	Orange Jagat Wing Power Pvt. Ltd. (Kanasar Wind Farm)	30.06.17	Jaisalmer, Rajasthan	250	Wind	Bhadla (Under Implementation)	Kanasar Wind Farm - Bhadla Pooling Station 220kV S/c line	Fatehgarh <ul style="list-style-type: none"> 400kV Pooling Station at Fatehgarh (with a provision to include 220kV level) Installation of 1x500MVA, 400/220kV transformer at Fatehgarh Pooling Station along with Bus Coupler and transformer bay Fatehgarh-Bhadla765kV D/c line to be 	Kanasar Wind Farm - Fatehgarh Pooling Station 220kV S/c line
2	1200000803	Kintech (Rajasthan) Windpark Pvt. Ltd. (Akhadhana Wind Farm)	03.07.17	Jodhpur, Rajasthan	300	Wind		Akhadhana Wind Farm - Bhadla Pooling Station 220kV S/c line		Akhadhana Wind Farm - Fatehgarh Pooling Station 220kV S/c line
3	1200000896	Greenko Solar Energy Pvt. Ltd. (Badla Solar Farm)	20.11.17	Jodhpur, Rajasthan	500 (Sought at 400kV)	Solar		Badla Solar Farm - Bhadla Pooling Station 400kV S/c line		Badla Solar Farm - Fatehgarh Pooling Station 400kV S/c line
4	1200000918	Nandikeshwar Renewable Energy Pvt. Ltd. (Shira Wind Farm)	24.11.17	Jodhpur, Rajasthan	250	Wind		Shira Wind Farm - Bhadla Pooling Station 220kV S/c line		Shira Wind Farm - Fatehgarh Pooling Station 220kV S/c line

Sl. No	Application No.	Applicant	Date of Application	Location	Connectivity Sought (MW)	Nature of Applicant	Proposed Primary location for Connectivity/Tr. System under ISTS	Dedicated Tr. System	Proposed Alternative location for Connectivity / Tr. System under ISTS	Dedicated Tr. System for alternative connectivity
5	1200000910	Rajasthan Solarpark Development Company Ltd. (Nokh Solar Park)	5.12.17	Jaisalmer, Rajasthan	980	Solar Park Developer		Nokh Solar Park - Bhadla Pooling Station 220kV 2xD/c line	operated at 400kV	Nokh Solar Park - Fatehgarh Pooling Station 220kV 2xD/c line
6	1200001163	Azure Power India Private Ltd.	15.05.18	Jodhpur, Rajasthan	500	Solar		Azure Power GS - Bhadla Pooling Station 220kV D/c line		Azure Power GS - Fatehgarh Pooling Station 220kV D/c line
7	1200001165	Azure Power India Private Ltd.	15.05.18	Jodhpur, Rajasthan	500	Solar		Azure Power GS - Bhadla Pooling Station 220kV D/c line		Azure Power GS - Fatehgarh Pooling Station 220kV D/c line
8	1200001166	Azure Power India Private Ltd.	15.05.18	Jodhpur, Rajasthan	500	Solar		Azure Power GS - Bhadla Pooling Station 220kV D/c line		Azure Power GS - Fatehgarh Pooling Station 220kV D/c line

Connectivity Applications at Fatehgarh :

Sl. No	Application No.	Applicant	Date of Application	Location	Connectivity Sought (MW)	Nature of Applicant	Proposed Primary location for Connectivity/Tr. System under ISTS	Dedicated Tr. System	Proposed Alternative location for Connectivity / Tr. System under ISTS	Dedicated Tr. System for alternative connectivity
9	1200000740	Distinguished Consultancy Solutions Pvt. Ltd. (Fatehgarh Wind Farm)	26.05.17	Jaisalmer, Rajasthan	300	Wind	Fatehgarh <ul style="list-style-type: none"> 400kV Pooling Station at Fatehgarh (with a provision to include 220kV level) Installation of 1x500MVA, 400/220kV transformer at Fatehgarh Pooling Station along with Bus Coupler and transformer bay Fatehgarh-Bhadla 765kV D/c line to be operated at 400kV 	Fatehgarh Wind Farm - Fatehgarh Pooling Station 220kV S/c line	Bhadla (Under Implementation)	Fatehgarh Wind Farm - Bhadla Pooling Station 220kV S/c line
10	1200000919	Maski Renewable Energy Pvt. Ltd. (Madhopura Wind Farm)	24.11.17	Jaisalmer, Rajasthan	200	Wind		Madhopura Wind Farm - Fatehgarh Pooling Station 220kV S/c line		Madhopura Wind Farm - Bhadla Pooling Station 220kV S/c line
11	1200001123	Adani Renewable Energy Park Rajasthan Ltd.	17.04.18	Jaisalmer, Rajasthan	500 (Sought at 400kV)	Solar Park Developer	Fatehgarh	AREPL Solar Farm - Fatehgarh Pooling	Bhadla	AREPL Solar Farm - Bhadla Pooling Station 400kV S/c line

Sl. No	Application No.	Applicant	Date of Application	Location	Connectivity Sought (MW)	Nature of Applicant	Proposed Primary location for Connectivity/Tr. System under ISTS	Dedicated Tr. System	Proposed Alternative location for Connectivity / Tr. System under ISTS	Dedicated Tr. System for alternative connectivity
							<ul style="list-style-type: none"> 400kV Pooling Station at Fatehgarh 	Station 400kV S/c line	(Under Implementation)	
12	1200000751	Greenko Solar Energy Pvt. Ltd. (Parewar solar Farm)	30.05.17	Jaisalmer, Rajasthan	500 (Sought at 400kV)	Solar	<ul style="list-style-type: none"> Fatehgarh-Bhadla 765kV D/c line to be operated at 400kV 	Parewar Solar Farm - Fatehgarh Pooling Station 400kV S/c line		Parewar Solar Farm - Bhadla Pooling Station 400kV S/c line
Connectivity Applications at Bhinmal										
13	1200000859	Azure Power India Pvt. Ltd. (Khanpur Solar Park)	20.09.17	Jalore, Rajasthan	100	Solar	Bhinmal	Khanpur Solar Park – Bhinmal Substation 220kV S/c line	Bhinmal (New) <ul style="list-style-type: none"> Establishment of 400/220 kV, 1x 500 MVA Pooling Station at Bhinmal (New) 	Khanpur Solar Park – Bhinmal (New) Substation 220kV S/c line
14	1200000865	Orange Saundatti Wind Power Pvt. Ltd.	05.10.17	Jalore, Rajasthan	300	Wind		Orange Saundatti GS – Bhinmal Substation 220kV S/c line		Orange Saundatti GS – Bhinmal (New) Substation 220kV S/c line

Sl. No	Application No.	Applicant	Date of Application	Location	Connectivity Sought (MW)	Nature of Applicant	Proposed Primary location for Connectivity/Tr. System under ISTS	Dedicated Tr. System	Proposed Alternative location for Connectivity / Tr. System under ISTS	Dedicated Tr. System for alternative connectivity
15	1200000874	Azure Power India Pvt. Ltd. (Khanpur Solar Park)	20.10.17	Jalore, Rajasthan	50	Solar		Khanpur Solar Park – Bhinmal Substation 220kV S/c line	<ul style="list-style-type: none"> LILO of Kankroli – Zerda 400kV S/c at Bhinmal (New) 	Khanpur Solar Park – Bhinmal (New) Substation 220kV S/c line
Connectivity Applications at Jaisalmer										
16	1200000781	Clean Wind Power (Jaisalmer) Pvt. Ltd. (Sadrasar Wind Farm)	20.06.17	Jaisalmer, Rajasthan	300	Wind	Fatehgarh <ul style="list-style-type: none"> 400kV Pooling Station at Fatehgarh (with a provision to include 220kV level) Installation of 1x500MVA, 400/220kV transformer at Fatehgarh Pooling Station along with Bus Coupler and transformer bay Fatehgarh-Bhadla765kV 	Sadrasar Wind Farm.- Fatehgarh 220 kV S/c line	Parewar (New) <ul style="list-style-type: none"> Establishment of 400/220 kV, 1x 500 MVA Pooling Station at Parewar Fatehgarh-Parewar 765 kV D/c(Initially charged at 400 kV) 	Sadrasar Wind Farm - Parewar 220 kV S/c line

Sl. No	Application No.	Applicant	Date of Application	Location	Connectivity Sought (MW)	Nature of Applicant	Proposed Primary location for Connectivity/Tr. System under ISTS	Dedicated Tr. System	Proposed Alternative location for Connectivity / Tr. System under ISTS	Dedicated Tr. System for alternative connectivity
							D/c line to be operated at 400kV			
Connectivity Applications at Jalandhar										
17	1200000838	Azure Power India Pvt. Ltd.	08.09.17	Kartarpur, Punjab	100	Solar	Jalandhar	Azure Power GS – Jalandhar S/s 220kV S/c	Amritsar	Azure Power GS Amritsar 220 kV S/c
Connectivity Applications at Kankroli										
18	1200000861	Azure Power India Private Limited (Solar Park)	22.09.17	Kankroli, Rajasthan	100	Solar	Kankroli	Azure Power GS – Kankroli S/s 220kV S/c	Chittorgarh(PG) <ul style="list-style-type: none"> Installation of 1x500MVA, 400/220kV ICT at Chittorgarh (PG) 	Azure Power GS – Chittorgarh(PG) S/s 220kV S/c

2. Stage-I Applications agreed for grant in 13th LTA/Connectivity meeting of NR:

Sl. No.	Application No.	Applicant	Location	Date of Application	Connectivity Sought (MW)	Nature of Applicant	Proposed primary location for Connectivity	Dedicated Tr. System	Proposed Alternative location for Connectivity / Tr. System under ISTS	Dedicated Tr. System for alternative connectivity
Connectivity applications near Bhadla										
1.	1200001306	Acme Solar Holdings Ltd. (Acme Bhadla Solar Power Plant)	Jodhpur, Rajasthan	25.05.2018	250	Solar	Bhadla (Under Implementation)	Acme Bhadla Solar Power Plant – Bhadla 220kV S/c line	Fatehgarh <ul style="list-style-type: none"> 400kV Pooling Station at Fatehgarh (with a provision to include 220kV level) Installation of 1x500MVA, 400/220kV transformer at Fatehgarh Pooling Station along with Bus Coupler and transformer bay 	Acme Bhadla Solar Power Plant – Fatehgarh 220kV S/c line
2.	1200001312	Eden Renewable Cite Pvt. Ltd.	Jodhpur, Rajasthan	28.05.2018	250	Solar		Eden Renewable – Bhadla 220kV S/c line		Eden Renewable – Fatehgarh 220kV S/c line
3.	1200001370	Mahoba Solar (UP) Pvt. Ltd.	Jodhpur, Rajasthan	02.06.2018	300	Solar		Mahoba Solar – Bhadla 220kV S/c line		Mahoba Solar – Fatehgarh 220kV S/c line

Sl. No.	Application No.	Applicant	Location	Date of Application	Connectivity Sought (MW)	Nature of Applicant	Proposed primary location for Connectivity	Dedicated Tr. System	Proposed Alternative location for Connectivity / Tr. System under ISTS	Dedicated Tr. System for alternative connectivity
4.	1200001471	Tata Power Renewable Energy Ltd. (TPREL)	Jaisalmer, Rajasthan	28.06.2018	500	Solar		TPREL 500MW Solar Power Project – Bhadla 220kV D/c line	<ul style="list-style-type: none"> Fatehgarh-Bhadla 765kV D/c line to be operated at 400kV 	TPREL 500MW Solar Power Project – Fatehgarh 220kV D/c line
Connectivity applications near Bikaner										
5.	1200001308	Acme Solar Holdings Ltd.	Bikaner, Rajasthan	25.05.2018	250 (Sought at 400kV)	Solar	Bikaner (Under Implementation)	Acme Noorsar & Lalsar Solar Power Plant – Bikaner 400kV S/c line	Bikaner-II (New) Bikaner-II(New)-Bikaner(Existing) 400 kV D/c	Acme Noorsar & Lalsar Solar Power Plant – Bikaner-II(New) 400 kV S/c line
6.	1200001309	Acme Solar Holdings Ltd.	Bikaner, Rajasthan	25.05.2018	250 (Sought at 400kV)	Solar		ReNew Solar – Bikaner 400kV S/c line		ReNew Solar – Bikaner-II(New) 400 kV S/c line
7.	1200001431	ReNew Solar Power Pvt. Ltd.	Bikaner, Rajasthan	09.06.2018	500 (Sought at 400kV)	Solar				

3. Stage-I Applications agreed for grant in 14th LTA/Connectivity meeting of NR:

Sl. No.	Application No.	Applicant	Location	Date of Application	Connectivity Sought (MW)	Nature of Applicant	Proposed primary location for Connectivity	Dedicated Tr. System	Proposed Alternative location for Connectivity / Tr. System under ISTS	Dedicated Tr. System for alternative connectivity
Connectivity applications near Bhadla										
1.	1200001516	Hero Solar Energy Pvt. Ltd.	Jodhpur, Rajasthan	11.07.2018	250	Solar		Hero Solar Energy Pvt. Ltd. – Bhadla 220kV S/c line	Fatehgarh <ul style="list-style-type: none"> 400kV Pooling Station at Fatehgarh (with a provision to include 220kV level) Installation of 1x500MVA, 400/220kV transformer at Fatehgarh Pooling Station along with Bus Coupler and transformer bay Fatehgarh-Bhadla765kV D/c line initially to be operated at 400kV 	Hero Solar Energy Pvt. Ltd. – Fatehgarh 220kV S/c line
2.	1200001519	Mahindra Susten Pvt. Ltd.	Jodhpur, Rajasthan	13.07.2018	250	Solar	Bhadla (Under Implementation)	Mahindra Susten Pvt. Ltd. 250 MW Solar Project – Bhadla 220kV S/c line		Mahindra Susten Pvt. Ltd. 250 MW Solar Project – Fatehgarh 220kV S/c line
3.	1200001533	Giriraj Renewables Pvt. Ltd.	Jodhpur, Rajasthan	17.07.2018	600	Solar		Giriraj Renewables Pvt. Ltd Solar PV Project– Bhadla 220kV D/c line		Giriraj Renewables Pvt. Ltd Solar PV Project – Fatehgarh 220kV D/c line
Connectivity applications near Bikaner										

Sl. No.	Application No.	Applicant	Location	Date of Application	Connectivity Sought (MW)	Nature of Applicant	Proposed primary location for Connectivity	Dedicated Tr. System	Proposed Alternative location for Connectivity / Tr. System under ISTS	Dedicated Tr. System for alternative connectivity
4.	1200001528	Hero Solar Energy Pvt. Ltd.	Bikaner, Rajasthan	13.07.2018	500 (Sought at 400 KV)	Solar	Bikaner (Under Implementation)	Hero Solar Energy Pvt. Ltd. – Bikaner 400kV S/c line	Bikaner-II (New) 400 kV Bikaner-II(New) S/s	Hero Solar Energy Pvt. Ltd. – Bikaner-II(New) 400 kV S/c line
5.	1200001536	SBE Renewables Ten Private Limited	Bikaner, Rajasthan	20.07.2018	1100 (Sought at 400 KV)	Solar		SB Bikaner Rajasthan Power Project - Bikaner 400kV S/c line (suitable to carry at least 1100 MW at nominal voltage)	Bikaner-II(New)-Bikaner(Under Implementation) 400 kV D/c(Quad Moose) line	SB Bikaner Rajasthan Power Project – Bikaner-II(New) 400 kV S/c line(suitable to carry at least 1100 MW at nominal voltage)
6.	1200001550	Azure Power India Private Limited	Bikaner, Rajasthan	23.07.2018	500	Solar		Common pooling point of Azure Bikaner 500 MW Power Project and Azure Bikaner 500 MW Solar Park – Bikaner 400kV S/c line(suitable to carry atleast 1000 MW at nominal voltage)		Common pooling point of Azure Bikaner 500 MW Power Project and Azure Bikaner 500 MW Solar Park – Bikaner-II(New)
7.	1200001570	Azure Power India Private Limited	Bikaner, Rajasthan	24.07.2018	500	Solar		(It was agreed to pool power at common pooling station by Azure and connect it with Bikaner S/s through 400kV S/c line)		400 kV S/c line(suitable to carry atleast 1000 MW at nominal voltage) (It was agreed to pool power at common pooling station by Azure and connect it with Bikaner-II(New) S/s through 400kV S/c line)

Sl. No.	Application No.	Applicant	Location	Date of Application	Connectivity Sought (MW)	Nature of Applicant	Proposed primary location for Connectivity	Dedicated Tr. System	Proposed Alternative location for Connectivity / Tr. System under ISTS	Dedicated Tr. System for alternative connectivity
Connectivity applications near Fatehgarh										
8.	1200001495	Giriraj Renewables Pvt. Ltd.	Jaisalmer, Rajasthan	09.07.2018	600	Solar	Fatehgarh <ul style="list-style-type: none"> 400kV Pooling Station at Fatehgarh (with a provision to include 220kV level) Installation of 1x500MVA, 400/220kV transformer at Fatehgarh Pooling Station along with Bus Coupler and transformer bay Fatehgarh-Bhadla 765kV D/c line initially to be operated at 400kV 	Giriraj Renewables Pvt. Ltd. Solar PV Project – Fatehgarh 220kV D/c line	Fatehgarh – II (New) <ul style="list-style-type: none"> Establishment of 400/220 kV, 1x 500 MVA Pooling Station at Fatehgarh – II (New) Fatehgarh – Fatehgarh – II(New) 400kV D/c(Quad) line 	Giriraj Renewables Pvt. Ltd. Solar PV Project – Fatehgarh – II (New) 220kV D/c line
9.	1200001543	ACME Solar Holdings Limited	Jaisalmer, Rajasthan	19.07.2018	300	Solar		Common pooling point of ACME Fatehgarh-I Solar Power Plant and ACME Fatehgarh-II Solar Power Plant - Fatehgarh 400 kV S/c line (It was agreed to pool power at common pooling station by ACME and connect it with Fatehgarh S/s through 400kV S/c line, which has also been confirmed by applicant vide letter no.ACME/BUS/2008 18/1315 dated 20/08/18)		Common pooling point of ACME Fatehgarh-I Solar Power Plant and ACME Fatehgarh-II Solar Power Plant - Fatehgarh – II (New) 400 kV S/c line (It was agreed to pool power at common pooling station by ACME and connect it with Fatehgarh S/s through 400kV S/c line, which has also been confirmed by applicant vide letter no.ACME/BUS/200818/ 1315 dated 20/08/18)
10.	1200001546	ACME Solar Holdings Limited	Jaisalmer, Rajasthan	19.07.2018	300	Solar				

Sl. No.	Application No.	Applicant	Location	Date of Application	Connectivity Sought (MW)	Nature of Applicant	Proposed primary location for Connectivity	Dedicated Tr. System	Proposed Alternative location for Connectivity / Tr. System under ISTS	Dedicated Tr. System for alternative connectivity
11.	1200001581	SB Energy Six Private Limited	Jaisalmer, Rajasthan	30.07.2018	2000 (Sought at 400 kV)	Solar		SB Fatehgarh Rajasthan Power Project – Fatehgarh 400 kV D/c line (suitable to carry at least 2000 MW at nominal voltage)		SB Fatehgarh Rajasthan Power Project – Fatehgarh – II (New) 400 kV D/c line (suitable to carry at least 2000 MW at nominal voltage)
12.	1200001612	Tata Power Renewable Energy Limited(TPREL)	Jaisalmer, Rajasthan	31.07.2018	500	Solar		TPREL 500 MW Solar Power Project Pokhran – Fatehgarh 220kV D/c line		TPREL 500 MW Solar Power Project Pokhran – Fatehgarh – II (New) 220kV D/c line
Connectivity applications near Bhinmal										
13.	1200001489	AT Capital Advisory India Private Limited	Bhinmal, Rajasthan	06.07.2018	300	Solar		Bhinmal Solar Project – Bhinmal 220kV S/c line	Bhinmal (New) <ul style="list-style-type: none"> Establishment of 400/220 kV, 1x 500 MVA Pooling Station at Bhinmal (New) 	Bhinmal Solar Project – Bhinmal (New) Substation 220kV S/c
14.	1200001527	Hero Solar Energy Private Limited	Jalore, Rajasthan	13.07.2018	300 (revised from 200)	Solar	Bhinmal	Hero Solar Energy Private limited – Bhinmal 220kV S/c line		Hero Solar Energy Private Limited – Bhinmal (New) Substation 220kV S/c line

Sl. No.	Application No.	Applicant	Location	Date of Application	Connectivity Sought (MW)	Nature of Applicant	Proposed primary location for Connectivity	Dedicated Tr. System	Proposed Alternative location for Connectivity / Tr. System under ISTS	Dedicated Tr. System for alternative connectivity
15.	1200001591	Aditya Birla Renewables Limited	Jalore, Rajasthan	27.07.2018	200	Solar		Aditya Birla Renewables Limited (Bhinmal) – Bhinmal 220kV S/c line	<ul style="list-style-type: none"> LILO of Kankroli – Zerda 400kV S/c at Bhinmal (New) 	Aditya Birla Renewables Limited (Bhinmal) – Bhinmal (New) Substation 220kV S/c line

Annexure-IV



RVPN
An ISO 9001:2000
Certified Company

RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LIMITED.

[Corporate Identity Number (CIN):L40109RJ2000SGC016485]

(Regd. Office: VidyutBhawan, Jan Path, Jyoti Nagar, Jaipur - 302 005)

OFFICE OF THE SUPERINTENDING ENGINEER (P&P)

☐ +91-141-2740623, Fax: +91-141-2740794; e-mail: www.rvpn.co.in



No. RVPN/SE(P&P)/XEN-II/AE-III/F. /D 811 Jaipur, Dt. 29-8-2018

To,

Dr. Subir Sen,

Chief Operating Officer, Central transmission Utility,

Powergrid Corporation of India Limited,

Saudamini, Plot No.2, Sector 29, Near IFFCO Chowk,


Gurgaon (Haryana)- 122001

Sub: Composite transmission scheme for Solar Energy Zone in Rajasthan-
Integration of 10,000 MW Solar Power in Phase-I.

Sir,

On the above subject, as discussed in the meeting of MNRE held on 28.08.2018, kindly provide load flow study of transmission system for integration of 10 GW Solar Power under Phase-I in Rajasthan. Also please provide PPA of these 10 GW Solar power projects.

This may please be treated as Most urgent.


29/8
(Kamal Jain)
Director (Technical)
RVPN, Jaipur

Copy to the following for kind information and necessary action:

1. The Secretary, Ministry of New and Renewable Energy (MNRE), Room no. 105, Block No.14 CGO Complex Lodhi Road, New Delhi.
2. The Chief Engineer, Central Electricity Authority, Sewa Bhawan, Rama Krishna Puram, Sector-I, New Delhi-110066.


Director (Technical)
RVPN, Jaipur



ANNEXURE-1

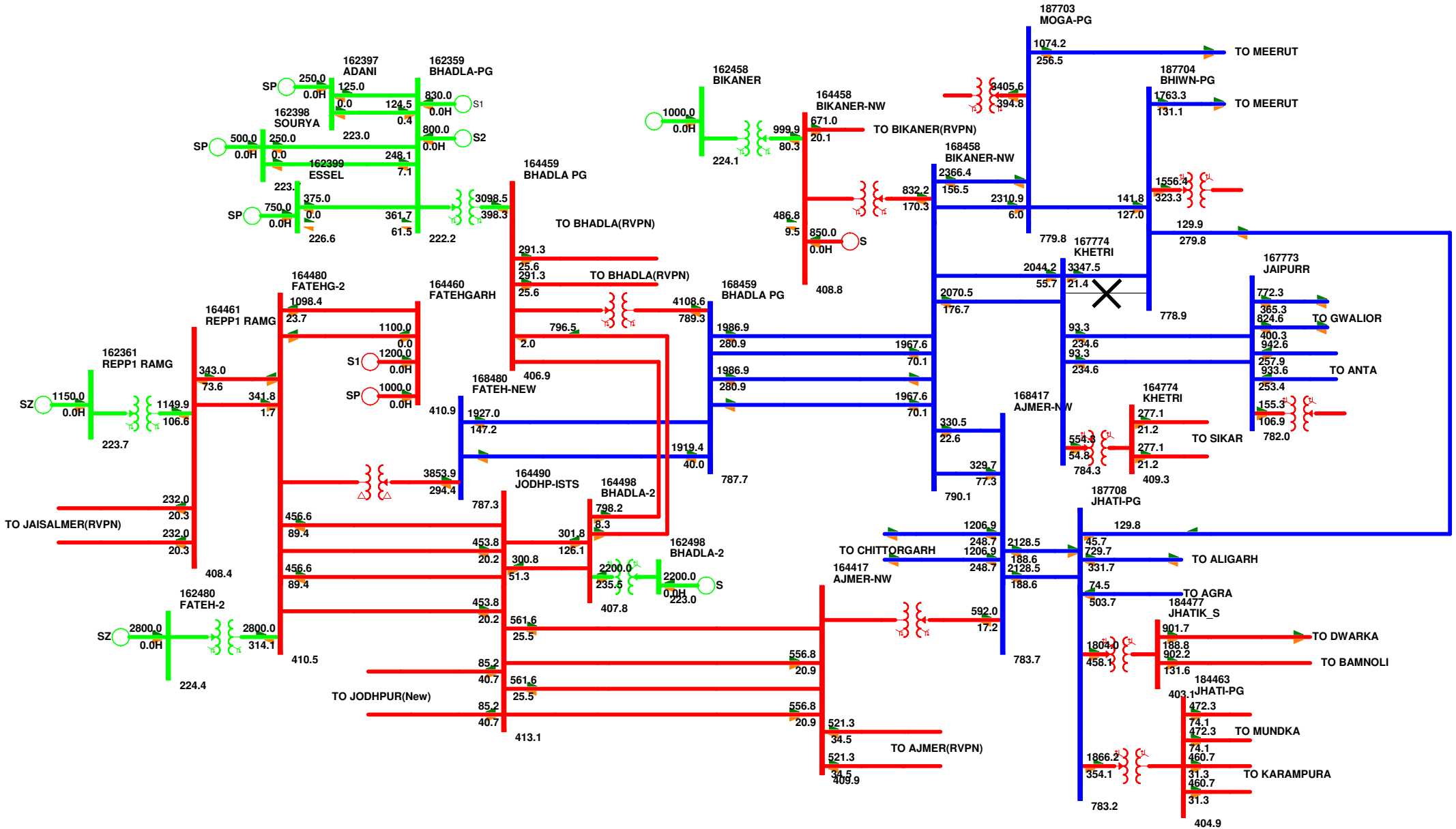
WIND AND SOLAR POWER GENERATION SCHEDULE FOR CONDITION CORRESPONDING TO 2021-22 (As on 29.08.2018)

Sr. No.	Name of District	Name of GSS	Wind Farm Capacity (MW)		Solar Project Capacity (MW)		Total Solar+Wind Projects (MW)			
			Sanct-ioned	Comm.	Sanct-ioned	Comm.	Sanct-ioned	Comm.	Balance to be commissioned	
WESTERN RAJASTHAN										
400 kV GSS										
1	Jodhpur	Bhadla (Presently charged at 220 kV Voltage level)	0	0	1505	740	1505	740	765	
220 kV GSS										
2		Tinwari	141.9	141.9	15	15	156.9	156.9	0	
3		Bhopalgarh	52.7	52.7	0	0	52.7	52.7	0	
4		Dechu	0	0	290	140	290	140	150	
5		Bap	0	0	171	171	171	171	0	
6		Kanasar	0	0	90	90	90	90	0	
7		Badisid	0	0	163.45	160	163.45	160	3.45	
8		Aau	0	0	0	0	0	0	0	
9		Bhawad	0	0	105	105	105	105	0	
132 kV GSS										
10		Baori	59.4	59.4	0	0	59.4	59.4	0	
11		Osian	30	30	10	10	40	40	0	
12		PS_8	98.4	98.4	0	0	98.4	98.4	0	
13		Chamu	31.5	31.5	0	0	31.5	31.5	0	
14		PS_5	2.1	2.1	0	0	2.1	2.1	0	
15		Sanwareej	0	0	40	40	40	40	0	
16		Aau	0	0	5	5	5	5	0	
17		PS_1	0	0	0	0	0	0	0	
18		PS_2	0	0	55	55	55	55	0	
19		PS_3	0	0	120.9	120.9	120.9	119.9	1	
20		PS_4	0	0	3	3	3	3	0	
21	Lohawat	0	0	0	0	0	0	0		
22	Khetusar	0	0	70	70	70	70	0		
			416	416	2643.35	1724.9	3059.35	2139.9	919.45	
400 kV GSS										
23	Jaisalmer	Akal	2449.65	1985.2	0	0	2449.65	1985.2	464.45	
24		Ramgarh (Presently charged at 220 kV Voltage level)	411.6	384.5	14	14	425.6	398.5	27.1	
25		Jaisalmer-2 (U/C)	0	0	500+500	0	500+500	0	500+500	
220 kV GSS										
26		Amarsagar	1057.66	1057.66	0	0	1057.66	1057.66	0	
132 kV GSS										
27		Jaisalmer	41.16	41.16	0	0	41.16	41.16	0	
28		Pokaran	0	0	200	100	200	100	100	
29		Ramgarh GTPS	0	0	5	5	5	5	0	
			3960.07	3468.52	1219	119	5179.07	3587.52	1591.55	
400 kV GSS										
30	Barmer	Barmer		0	0		0	0		
220 kV GSS										
31		Balotra	0	0	5	5	5	5	0	
132 kV GSS										
32	Sheo	49.6	49.6	0	0	49.6	49.6	0		
			49.6	49.6	5	5	54.6	54.6	0	
220 kV GSS										
33	Bikaner	Gajner	0	0	174.83+300	168.36	174.83+300	168.36	306.47	
34		Barsingsar Switchyard /400 kV GSS Bikaner	0	0	0	0	0	0	0	
132 kV GSS										
35		Kolayat	0	0	97.15	85.6	97.15	85.6	11.55	
36		Gajner (Nokha Dahiya)	0	0	16	16	16	16	0	
37	Pugal Road	0	0	2.5	0	2.5	0	2.5		
			0	0	590.48	269.96	590.48	269.96	320.52	
Other Parts of Rajasthan										
220 kV GSS										
38	Nagaur	Kheenvsar	0	0	5	5	5	5	0	
132 kV GSS										
39	Jayal	0	0	40	40	40	40	0		
			0	0	45	45	45	45	0	

Sr. No.	Name of District	Name of GSS	Wind Farm Capacity (MW)		Solar Project Capacity (MW)		Total Solar+Wind Projects (MW)		
			Sanct-ioned	Comm.	Sanct-ioned	Comm.	Sanct-ioned	Comm.	Balance to be commissioned
		220 kV GSS							
40	Bhilwara	Gulabpura	0	0	5	5	5	5	0
		132 kV GSS							
41		Gangapur(Bhilwara)	0	0	2	2	2	2	0
42		Shahpura (Bhilwara)	0	0	10	10	10	10	0
			0	0	17	17	17	17	0
		220 kV GSS							
47	Paratap Garh	Pratapgarh(Uppgradation)	230.25	230.25	0	0	230.25	230.25	0
		132 kV GSS							
51		Deogarh	0	0	0	0	0	0	0
45		Dalot	124.5	124.5	0	0	124.5	124.5	0
			354.75	354.75	0	0	354.75	354.75	0
		220 kV GSS							
46	Pali	Bali	0	0	10	10	10	10	0
		132 kV GSS							
49		Rani	0	0	30.12	30	30.12	30	0.12
			0	0	40.12	40	40.12	40	0.12
		220 kV GSS							
47	Alwar	Neemrana	0	0	5	5	5	5	0
		132 kV GSS							
48	Sikar	Khood	12	12	0	0	12	12	0
50	Ajmer	Masuda	0	0	0	0	0	0	0
B									
51		Others/connected at Discom's sub station	9.675	9.675	5.1	0	14.775	9.675	5.1
52		In House Captive SPP HZL : 12+4 MW Wonder Cement : 2 MW RSWM : 1.50 MW Others : 2 MW	0	0	66.72	24.68	66.72	24.68	42.04
		Total	4802.10	4310.55	4636.77	2250.54	9438.865	6560.09	2878.78

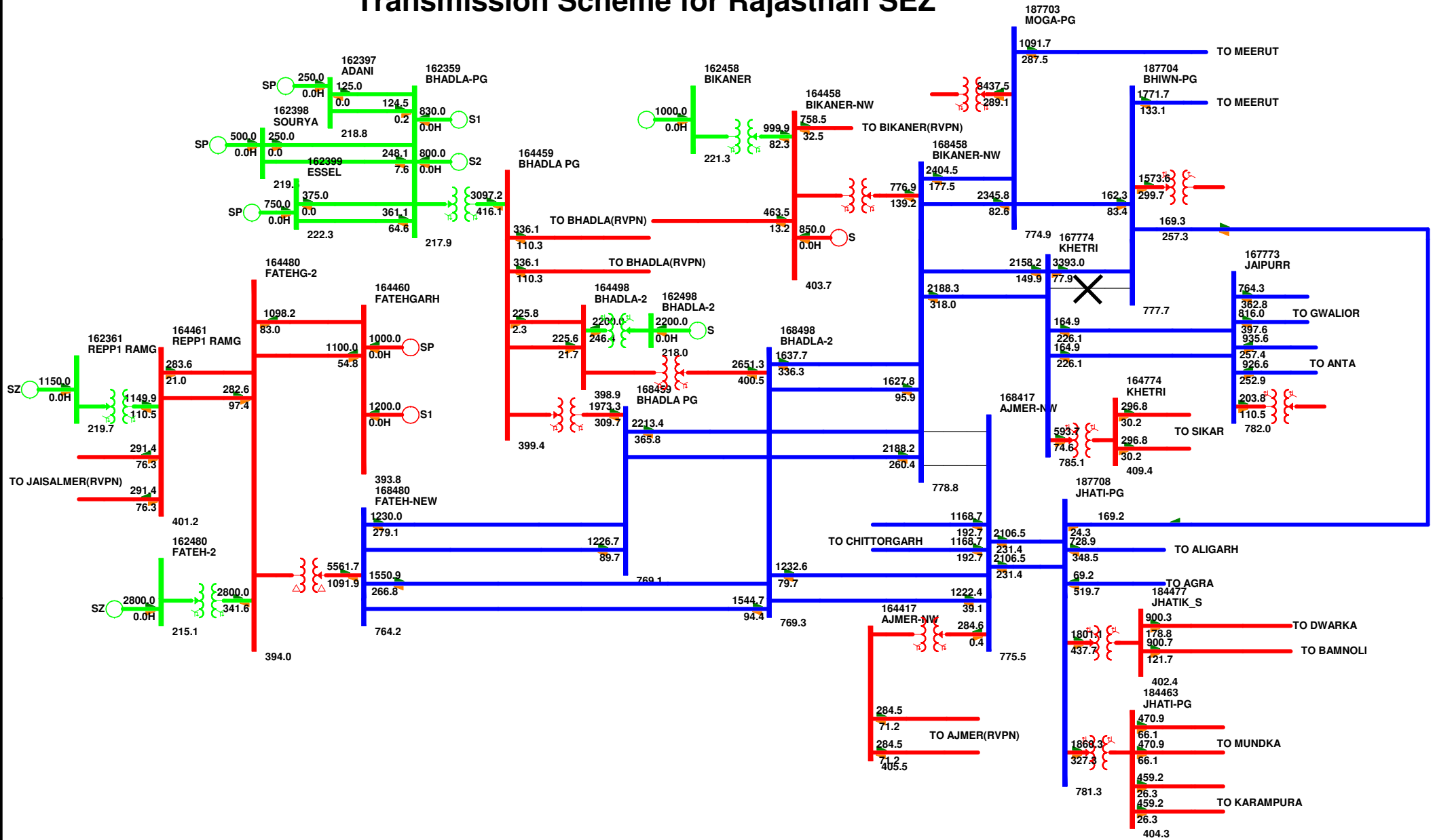
Alternate-1: Outage of one ckt of Khetri-Bhiwani 765 kV D/c Line

Transmission Scheme for Rajasthan SEZ



Alternate-2: Outage of one ckt of Khetri-Bhiwani 765 kV D/c Line

Transmission Scheme for Rajasthan SEZ



Upcoming Transmission System of RVPN

220 KV GSS :

1. Aklera Transformer Capacity 1*160=160MVA
2. Navalgarh (PPP) Transformer Capacity 1*160=160MVA
3. Bherunda (Upgraded) Transformer Capacity 1*160=160MVA
4. NPH Transformer Capacity 1*160=160MVA
5. Halasar Transformer Capacity 1*160=160MVA
6. Chhatargarh Transformer Capacity 1*160=160MVA
7. Rawatsar Transformer Capacity 1*160=160MVA

220KV LINE :

1. LILO of 220 kV S/C Jhalawar-Chhabra line (80 CkM) for 220KV GSS Aklera
2. 220 KV LILO line from Existing 220 KV Ajmer- KSG for 400 KV GSS Ajmer.
3. 220 KV S/C Dhod- Danta Ramgarh line (31.080kM)
4. 220 Kv D/C from 400 KV GSS Ajmer to Bherunda (60kM).
5. 220Kv D/C Jodhpur(New) Kakani -Jhalamand.
6. 220Kv D/C Jodhpur(New) Kakani -Barli.
7. 220KV S/C Sirohi-Pindwara line (25 km).
8. LILO of one circuit of 220KV D/C STPS -Ratangarh line at proposed 220KV GSS, Halasar 3.8 KM.
9. 220KV D/C line from Gajner-Chhatargarh (200 Ckt Km).
10. 220KV D/C Akal-Jaisalmer-2 line 75Km.
11. 220KV LILO of one circuit of 220KV D/C STPS-RATANGARH LINE (30KM) at 220kV GSS Rawatsar.

RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LTD.



Corporate Identity Number (CIN) – U40102RJ200SGC016484

Regd. Office & H.Q.: Vidyut Bhawan, Janpath, Jyoti Nagar, Jaipur -302005

O/o THE SUPERINTENDING ENGINEER (Elect.) CHHABRA THERMAL POWER PROJECT

Service building Room No. 406, CTPP, Site Motipura, Teh.-Chhabra, Distt-Baran-325220

Mob. No. 9413349725 Fax No. 07452-225005 Email ID: se.elect.ctpp@rrvun.com [website : www.rvunl.com](http://www.rvunl.com)



No. RVUNL/CTPP/ SE (Elect.)/F/ D- 874

Date 30 / 08 /2018

To,

The Superintending Engineer (P&P)
RVPNL, Jaipur.

Sub:- Approval of charging of 2 Nos. Reactor of 50MVA_r, 420kV rating at CTPP, RVUNL, Chhabra from standing committee of CEA.

Dear Sir,

Please arrange the approval of charging of 2 Nos. Reactor of 50MVA_r, 420kV rating at CTPP, RVUNL, Chhabra from standing committee of CEA. The details are as follows:-

S. No.	Type of Reactor	Switchable/ Non-Switchable	Description	Bay no. of reactor at CTPP switchyard	Name of Line which will be connected with reactor	Target date of charging
1	Line Reactor	Switchable	Rating: 50MVA _r , 420kV Make: ABB, Sr. No. 15007-002	417R	400kV CTPP-Hindaun line at 417 bay	Sep-18
2	Line Reactor	Switchable	Rating: 50MVA _r , 420kV Make: ABB, Sr. No. 15007-001	414R	No line at 414 bay but can be charged as bus reactor	Dec-18

Due to the following reasons the charging of 2 nos. line reactor of 50MVA_r capacity each at 400kV switchyard of CTPP is required:-

1. Charging requirement of line reactor at 417R bay:-

- The 400kV CTPP-Hindaun feeder at 417 bay is very long feeder having length of 305 km. Whenever this feeder is charged from Hindaun end, the voltage of this feeder at CTPP end becomes very high from 425 to 435kV and it becomes very difficult to synchronize the line at CTPP end.
- Sometimes this line does not hold and trips on overvoltage protection during the charging of line from Hindaun end.
- When this 400kV CTPP-Hindaun line is charged from CTPP end, very high capacitive MVA_r (from -170 MVA_r to -200MVA_r) is received at CTPP buses through this line and these MVA_r is absorbed by CTPP generators through operating in leading zones.
- The charging of 50 MVA_r reactor at 417R bay on this line would resolve these problems.

2. Charging requirement of line reactor at 414R bay:-

- a. Another reactor is installed at 414R bay. Although at present no line is connected at 414 bay, but the reactor may be utilized as a bus reactor whenever the voltage profile of 400kV system at CTPP becomes high.
 - b. Since CTPP is connected to 765/400kV Anta GSS through directly from 400kV CTPP-Anta line and indirectly through 400kV CTPP-Adani line, high voltage profile is experienced when generation at CTPP, Adani-Kawai or Kalisindh becomes low and our generators operate at leading zones. The existing 2 nos. bus reactors of 50MVAR capacity at 400kV system of CTPP are not sufficient to overcome with the high voltage problem.
 - c. This problem of high voltage at CTPP is many times reported at LD Jaipur. This reactor at 414R bay would resolve this problem to a great extent.
3. These two line reactors are part of 2 x 250MW CTPP, Phase-II, Stage-I project and was in the scope of BOP contractor M/s. IPL but due to dispute between M/s. IPL and its sub contractor M/s. ABB, these reactors could not be charged till now.

Therefore kindly arrange the approval of standing committee for charging of these two reactors.

R. Baldva
30/08/18
(R.C. Baldva)
Superintending Engineer(Elect.)
CTPP, RRVUNL, Chhabra

Copy Submitted/forwarded to the following for information /necessary action please:-

1. The Chief Engineer CTPP. RVUNL, Chhabra.
2. The Addl. Chief Engineer (O&M), CTPP, RVUN. Chhabra.
3. The Dy. Chief Engineer (O&M-I), CTPP, RVUN, Chhabra.

R. Baldva
Superintending Engineer(Elect.)
CTPP, RRVUNL, Chhabra

