सत्यमेव जयते

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

To

-As per list enclosed-

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

Subject: 2nd meeting of Western Region Standing Committee on Transmission (WRSCT) – regarding

Sir/ Madam,

Agenda Note for 2nd Meeting of Western Region Standing Committee on Transmission scheduled to be held on 21-05-2019 at Indore 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- Western region).

The time and venue of the meeting would be communicated shortly. Kindly make it convenient to attend the meeting.

Yours faithfully,

Signature Not Verified
Digitally signed by RAVINDER GUPTA
Date: 2019.05.02 09:58:15 IST

(Ravinder Gupta)
Chief Engineer

1.	Member Secretary, WRPC, F-3, MIDC Area, Andheri (East), Mumbai – 400093 Fax – 022-28370193	2.	Managing Director, CSPTCL, Dangania, Raipur (CG)-492013 Fax - 0771 - 2574246/ 4066566	3.	Executive Engineer, Administration of Daman & Diu (U.T.), Department of Electricity, Moti Daman-396220
4.	Executive Engineer (Projects), UT of Dadra & Nagar Haveli, Department of Electricity Vidyut Bhavan, Amli, Silvassa - 396230	5.	Chief Engineer, Electricity Department, Government of Goa, Vidyut Bhavan, 3rd Floor, Panaji - 403001 Fax – 0832-2222354	6.	Managing Director, GETCO, Sardar Patel Vidyut Bhawan, Race Course, Vadodara-390007 Fax - 0265-2338164
7.	Chairman and Managing Director, MPPTCL, Shakti Bhawan, Rampur, Jabalpur-482008 Fax – 0761-2664141	8.	Director (Operation), MAHATRANSCO, Plot No.C-19, E-Block, Bandra-Kurla Complex, Bandra (E), Mumbai - 400051 Fax : 022-26591254	9.	CEO, POSOCO B-9, Qutub Institutional Area, Katwaria Sarai New Delhi – 110010 Fax – 011-2682747
10.	COO (CTU) POWERGRID, Saudamini, Plot no. 2, Sector -29, Gurgaon-122 001 Fax-0124-2571809				

1 Confirmation of the Minutes of the 1st meeting of Western Region Standing Committee on Transmission held on 5th September 2018.

1.1 The Minutes of the 1st meeting of Western Region Standing Committee on Transmission were issued vide CEA letter no.CEA-PS-11-23(19)/1/2018-PSPA-I/I/2390/2018 dated 5th October, 2018.

1.2 As no comments have been received from the constituents. Therefore, the minutes of the 1st meeting of WRSCT may please be confirmed.

2 Reviewing the progress of earlier agreed transmission schemes

2.1 The status of implementation of transmission projects through Tariff Based Competitive Bidding in Western Region are enclosed as **Annexure 1A**.

2.2 The status of transmission schemes under implementation by Powergrid in Western Region is enclosed as **Annexure 1B**.

3 Installation of 1X315 MVA, 400/220 kV (3rd) transformer at Pithampur 400 kV substation – Agenda by MPPTCL.

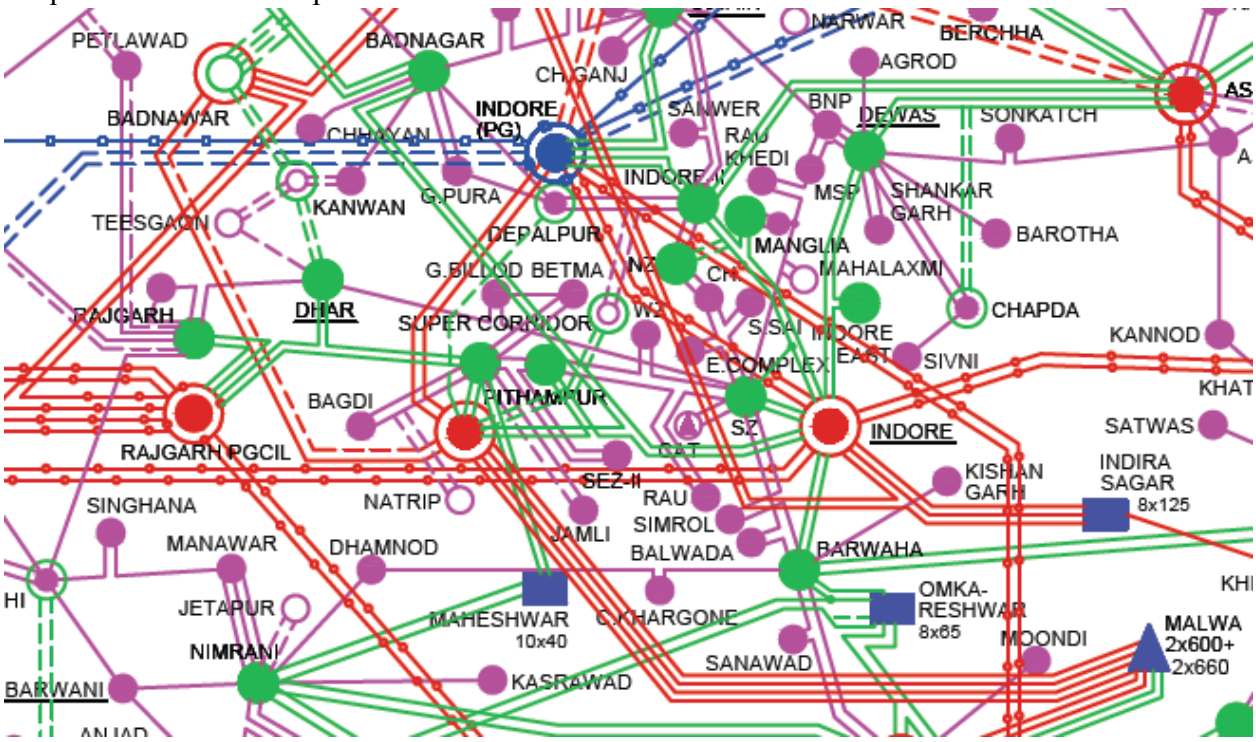
3.1 MPPTCL vide its letter dated 21.01.2019 has proposed to install 1X315 MVA, 400/220 kV (3rd ICT) at Pithampur 400 kV substation by shifting of 1X315 MVA, 400/220 kV (4th) transformer earlier proposed to be installed at Bina (MPPTCL) 400 kV substation.

Installation of 1x315MVA, 400/220 kV (4th) transformer at Bina 400 kV substation was earlier planned as transmission system strengthening works in Madhya Pradesh under Financial assistance from Japan International Cooperation Agency (JICA). The tendering activities for installation of 1x315 MVA, 400/220 kV (4th) transformer at Bina 400 kV substation has been completed and order has been placed on 01.10.2018. JICA has already conveyed their no objection for shifting of the transformer from Bina to Pithampura.

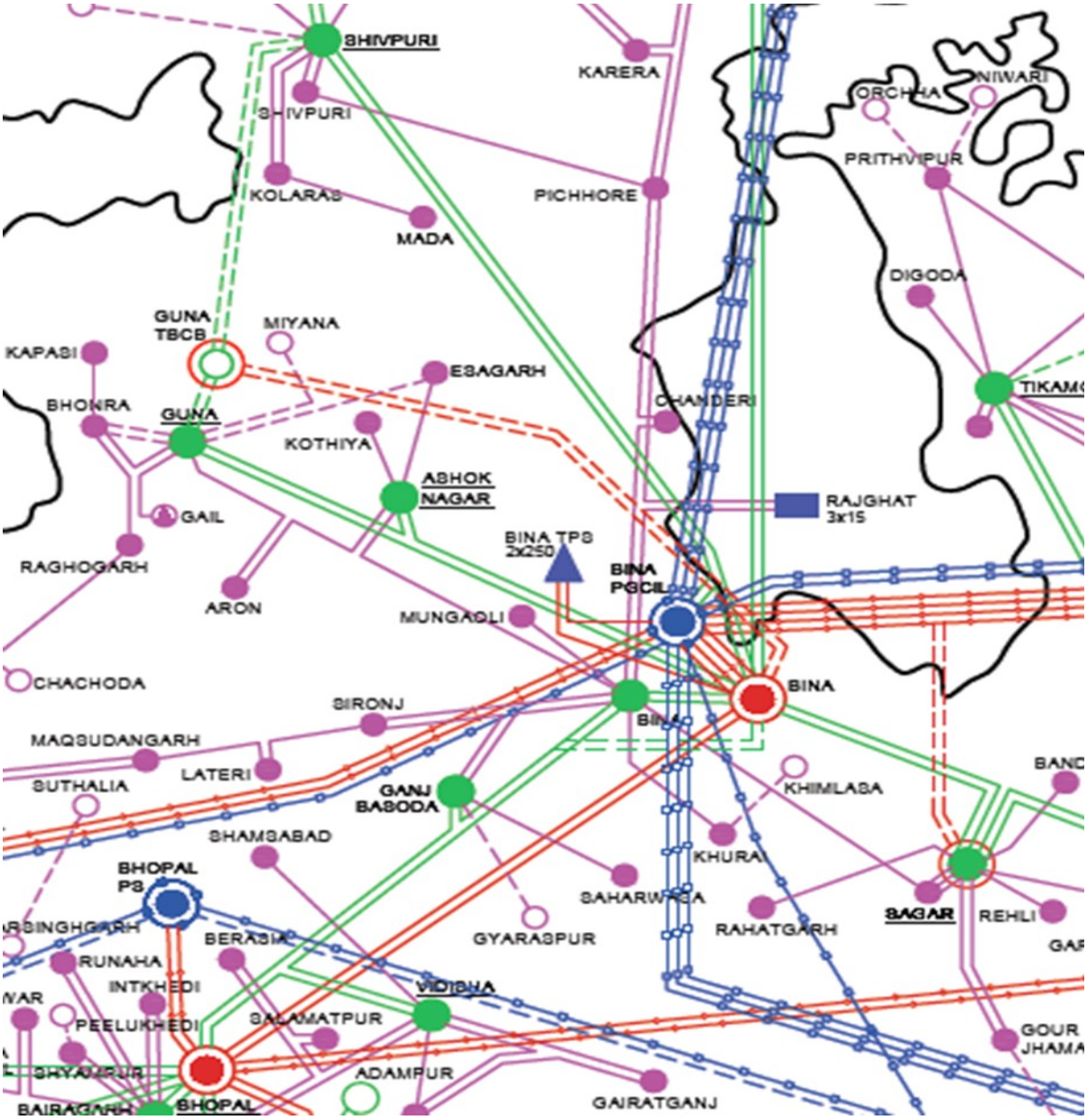
3.2 MPPTCL has proposed the shifting of 1X315 MVA, 400/220 kV transformer from Bina to Pithampura in view of increased drawl requirements at Pithampur 400/220 kV S/s and reduction in drawl requirements at 400 kV Bina MPPTCL S/s in view of implementation of Guna and Sagar 400/220 kV S/s in its vicinity.

Increased Drawal requirements at Pithampur: Existing capacity of 400/220 kV transformers at Pithampur 400 kV Substation is (2x315) i.e. 630MVA and maximum load recorded during past three years is 579MVA (i.e. 92%). At present Pithampur 400 kV S/s is connected from SSTPP Stage-I Project through 400 kV D/C (Twin Moose) line and also connected to Indore (PGCIL) 765 kV S/s through 400 kV D/C line. Further in order to evacuate the power from SSTPP Stage-II (2x660MW) Project, MPPTCL has planned to construct a 400 kV DCDS (Quad) line from SSTPP Stage-II Switchyard to Pithampur 400

kV S/s and 400 kV DCDS (Quad) line from Pithampur 400 kV S/s to Badnawar 400 kV S/s which are targeted to be completed by the end of March-2019. Load growth in Pithampur area in the coming years as well as increase in power flow towards Pithampur 400 kV S/s due to commissioning of SSTPP Stage-II (2x660MW) project, increases the drawl requirements at Pithampura.



Reduction in Drawal requirements at Bina (MPPTCL): Upgradation of Sagar 220 kV S/s to 400 kV S/s with 2x315MVA, 400/220 KV ICTs under Green Energy Corridor Project-I is under construction and proposed to be completed by June-2019. Further, establishment of Guna 400 kV Substation through intra-state TBCB process is also under process by MPPTCL. Both these substations are expected to give relief to loading on the existing 3x315MVA, 400/220 kV (3 nos.) transformers installed at Bina 400 kV Substation and contingent loading will also be manageable with available 3x315MVA ICTs at Bina 400kV Substation. The exhibits showing power flow is enclosed at **Annexure 2**.



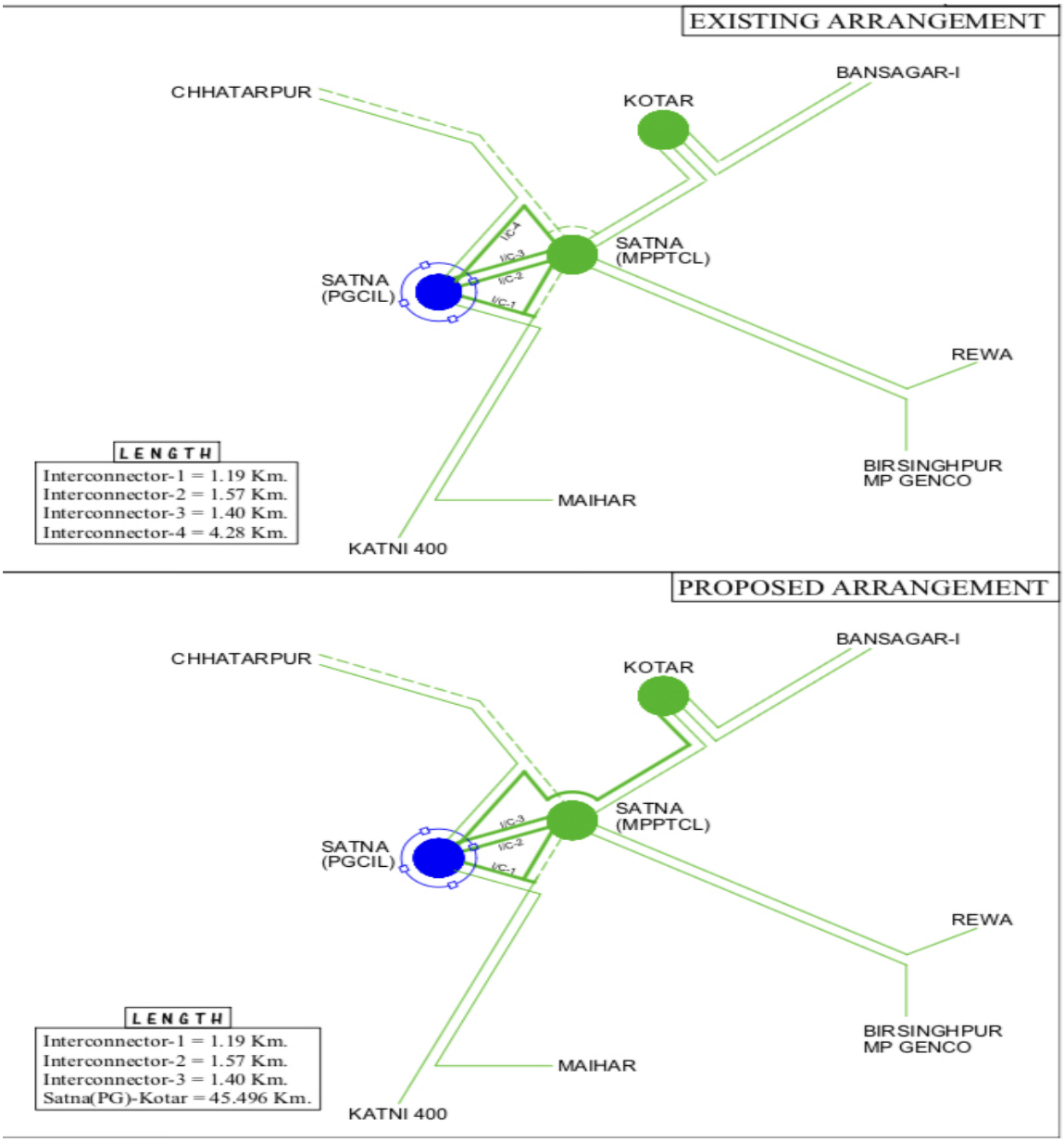
3.3 Members may deliberate MPPTCL proposal of installation of 1x315MVA, 400/220kV (3rd) transformer at Pithampur 400kV Substation by shifting of 1x315MVA, 400/220kV (4th) transformer planned to be installed at Bina 400 kV substation.

3.4 MPPTCL may update the progress of Guna 400/220 kV and Sagar 400/220 kV substations.

4 Extension of 220 kV supply from Satna (PG) 765/400 kV substation to Kotar 220 kV S/s of MPPTCL by using existing interconnector-IV between Satna (PG) – Satna (MPPTCL) S/s

4.1 MPPTCL vide no. 04-02/N-171/2587 dated 26.11.2018 had proposed extension of 220 kV supply from Satna (PGCIL) 765/400 kV substation to Kotar (MPPTCL) 220 kV S/s, using

the existing 220 kV interconnector-IV between Satna (PGCIL) - Satna (MPPTCL) S/s and sought approval of CEA for the same.



4.2 A meeting was held in CEA on 04.02.2019 (copy enclosed as **Annexure 3**) among CEA, CTU and MPPTCL. In the meeting following was agreed:

(i) MPPTCL proposal for extension of 220 kV supply from Satna (PGCIL) 765/400 kV substation to Kotar 220 kV S/s of MPPTCL, by using existing 220 kV interconnector-IV between Satna (PGCIL) - Satna (MPPTCL) S/s, was agreed in principle. The proposal would be formalized in the next meeting of Western Region Standing Committee on Transmission.

(ii) With above proposal, the number of 220 kV interconnectors between Satna (PGCIL) 400/220 kV and Satna (MPPTCL) 220 kV would be reduced to three (from existing 4 nos.). In case of outage of any 220 kV interconnections between Satna (PGCIL) and Satna (MPPTCL), to avoid overloading of the remaining 220 kV circuit(s), MPPTCL/SLDC to take necessary operational measures. As suggested by MPPTCL, opening of Satna (MPPTCL) - Katni 400/220 kV 220 kV S/c line could be one of the options.

4.3 MPPTCL to present the status of implementation of the scheme. Members may kindly deliberate and concur the proposal of MPPTCL.

5 Implementation of Connectivity lines by RE project developers on D/c or M/c towers.

5.1 The RE project developers have been granted Stage-II Connectivity based on the deliberations held in regional meetings of Standing Committee on Transmission/ Meeting regarding LTA and Connectivity applications. To conserve scarce Right of Way (RoW) in vicinity of the pooling station, RE project developers have been advised to implement the section in vicinity of pooling stations on M/c towers. While applying for prior approval under Section 68 to CEA, the RE developers have proposed implementation of entire/major section of their connectivity line (S/c line) on D/c and/or M/c towers.

5.2 The above issue was deliberated with CTU in a meeting held in CEA under the chairmanship of Chairperson, CEA. The minutes of the meeting are enclosed as **Annexure-4**. In the meeting, it was agreed that the proposal of various developers may be considered subject to the following condition:

(i) Implementation of connectivity line on Double Circuit and / or on Multi Circuit towers at their own cost & risk may be considered only after receipt of such request from the developer.

(ii) The developer/s would not make any claim for additional bay or additional quantum of injection or overriding priority at the ISTS pooling station on basis of item. The developer/s has / have to give an undertaking to this effect.

(iii) CTU will include the implementation details of the connectivity line on Double Circuit towers or on Multi Circuit towers or any other configuration in the connectivity intimation, if requested by applicant.

(iv) All issues related to sharing of the Double Circuit and / or Multi Circuit towers have to be coordinated among the developers themselves under intimation to CEA / CTU before taking up implementation.

5.3 In line with the decision taken CTU has revised intimation letter for grant of Stage II Connectivity to the applicants (RE project developers) by including the implementation details of the connectivity line on Double Circuit towers or on Multi Circuit towers or any

other configuration. The summary of revised Stage-II connectivity intimation to RE developers are enclosed as **Annexure-5**.

Members may kindly note.

6 Revised Intra-State Transmission scheme of Gujarat under Green Energy Corridor-I

6.1 The DPR for the Intra-State transmission schemes under Green Energy Corridor (GEC) at estimated cost of 1962.12 Crore for financial assistance from KfW/NCEF was submitted by GETCO to CEA vide their letter dated 03.7.2014. CEA concurred to the proposal on 11.07.2014. The intra state transmission schemes under GEC as submitted by Gujarat were agreed in the 36th & 37th meetings of Standing Committee on Power System Planning of Western Region held on 29.08.2013 & 5.9.2014 respectively. Further, GETCO vide their letter dated 24.5.2016 requested certain modifications in the transmission proposal with respect to that agreed in the above meetings without any change in the estimated cost. CEA vide its letter no 28/1/2015/PSP&PA-I/697 dated 27.5.2016 concurred the modified proposal.

6.2 Further, GETCO vide its letter dated 17.03.2018 has requested CEA for exclusion of feeder bays (package no.27) from Green Energy Corridor-I (GEC-I) and inclusion of Shapar 400/220 kV S/stn under GEC-I so that the overall estimated cost of transmission schemes under GEC-I for GETCO is within Rs. 1962 Crore. CEA vide its letter no CEA-PS-11-23(17)/1/2018/PSPA-I/655/2018/1 dated 25.04.2018 gave its in-principle for exclusion of feeder bays (package no. 27) and inclusion of 400/220 kV Shapar substation under GEC-I.

6.3 The intra-state transmission schemes being implemented by GETCO under GEC-I after incorporating the above modifications is enclosed as **Annexure-6.**

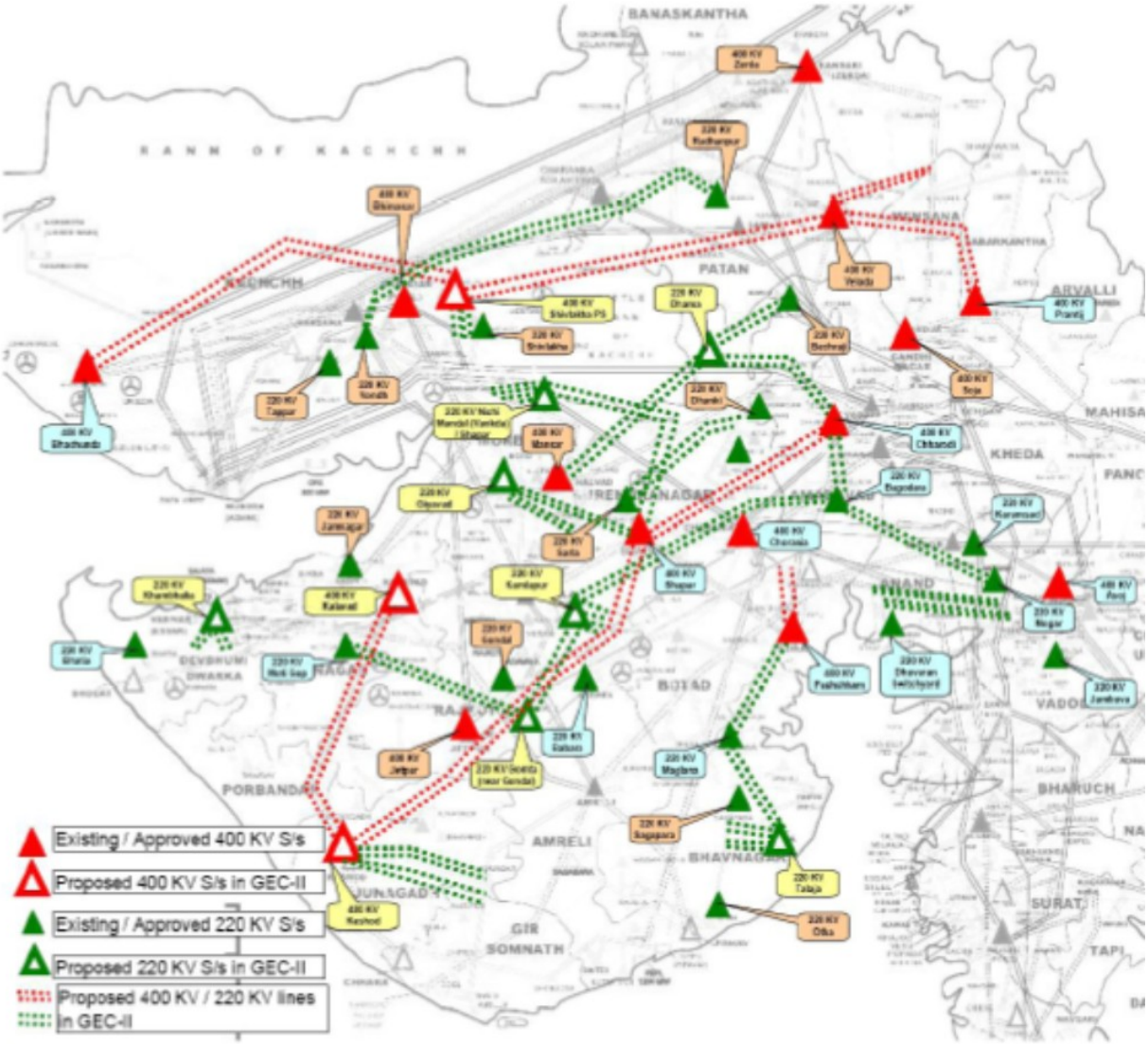
Members may kindly note.

7 Intra state transmission schemes for state of Gujarat for consideration under Green Energy Corridor-II

7.1 GETCO has submitted a proposal amounting Rs. 3738.99 Crores under Intra-State Transmission schemes for Gujarat State for consideration under GEC-II. The scheme includes 400/220/66 KV substations (3 Nos.- Keshod, Kalavad and Shivlakha), 220/66 KV substations (7 Nos.- Gomta, Giyavad, Talaja, Kamalapur,Khambhalia,Nichi Mandal and Dhama), 400 KV transmission lines (2160 CKM) and 220 KV transmission lines (2978 CKM). The element wise details of the scheme is enclosed as **Annexure-7**

7.2 GETCO has intimated that GERC has set the RPO target of 17% (8.25% wind + 8.0% solar + 0.75% other) by 2021-22 for Gujarat. For achieving 17% RPO target considering 20% PLF, more than 13000 MW RE capacity is required to be installed from all RE sources. About 7000 MW RE capacity is already integrated in GETCO network and around 3000 MW additional capacity will be integrated with implementation of the transmission schemes under GEC-I. The schemes proposed under GEC-II will integrate around 4000 MW of RE power from the potential RE areas of Kutch (1000 – 1200 MW), Jamnagar & Junagarh & Dwarka (1500 – 2000 MW), Morbi & Rajkot & Surendranagar (1000 – 1200 MW) and Bhavnagar (200 – 300 MW).

The planned schemes under GEC-I, GEC-II and other Intra-State schemes will be able to handle around 14000 MW RE integration. Further, 750 MW Radhanesda solar park and 500 MW Harshad solar park is already planned and its grid integration is planned through ISTS.



7.3 The above scheme proposed by GETCO under GEC-II has been planned considering RPO targets up to 2022 only. However, considering issues in implementation of transmission corridors, few schemes may take long time for commissioning and accordingly a conservative time-frame of 2025 has been assumed for its implementation. The scheme has been identified based on RE potential areas and prevailing network issues and changes in the schemes may be required at later stage depending on RE growth and network behaviour.

7.4 GETCO may kindly update on RE capacity addition and the schemes proposed under GEC-II. Members may deliberate.

8 Revised Intra-State Transmission scheme of Maharashtra under Green Energy Corridor-I

8.1 MSETCL vide their letter dated 07.08.2015 has submitted to CEA, the proposal for the Intra-State transmission schemes under Green Energy Corridor (GEC) at an estimated cost of Rs. 367 Crore. The intra-state transmission schemes for MSETCL comprised of twenty seven (27) no. of transmission elements (190 ckm of transmission line at 220 kV level, 783.36 ckm of transmission line at 132 kV level, 9 no of 220 kV bays, 48 no. of 132 kV bays and 1x25 MVAR bus shunt reactor at 220 kV Dhule S/s). Out of 27 no. of intra-state transmission elements proposed by MSETCL under GEC-I, 24 no. of elements were already agreed in the 36th meeting of Standing Committee on Power System Planning in Western Region held on 29.08.2013. Three nos. of additional transmission elements were included in the proposal submitted by MSETCL vide its letter dated 07.08.2015. CEA concurred to the proposal vide its letter dated 15.02.2016 (copy enclosed as **Annexure-8**).

8.2 Subsequently, MSETCL vide its email dated 26.02.2019 has submitted the revised list of intra- state transmission elements being implemented by it under GEC-I and the same is enclosed as **Annexure-9.**

8.3 Members may kindly note.

9 Intra state transmission schemes for state of Maharashtra for consideration under Green Energy Corridor-II

9.1 MSETCL vide letter dated 14.06.2016 sought approval for the implementation of schemes under GEC-II (Tranche-III) Part-A. CEA vide letters dated 21.08.2018 and 30.11.2018 has accorded technical approval for following 13 nos. of transmission elements proposed under GEC-II Part-A for the state of Maharashtra:

(i) 2nd circuit stringing of Degaon – Mandrup 132 kV S/C line on D/C line
(ii) LILO on 132 kV Ujani – Naldurg S/C at 220/132 kV Tuljapur S/s
(iii) 2 x 100 MVA, 220/132 kV ICTs at 220 kV Manjarsumbha S/s
(iv) Manjarsumbha – Sarola 132 kV D/C line
(v) Establishment of 2 x 25 MVA, 132/33 kV Sarola S/s with 8 nos. of 33 kV outlets and Sarola – Kaij 132 kV S/C on D/C line

(vi) Renovation of 132 kV Latur – Ujani – Naldurg – Solapur(Bale) D/C line using 0.2 ACSR Panther Conductor
(vii) 2nd ckt. stringing of Kharda – Bhairavnath co-gen 132 kV S/C on D/C line
(viii) 2x100 MVA, 220/132 kV ICTs at 220 kV Patoda S/s
(ix) LILO on Ashti – Kharda 132 kV S/C on D/C line at 220/132 kV Patoda S/s
(x) Patoda – Raimoha 132 kV S/C on D/C line
(xi) Conversion of existing Kale(T) – Wathar 132 kV S/C line to D/C line
(xii) LILO of one ckt. of Jath – Mhaisal 220 kV D/C line at 400/220 kV Alkud S/s
(xiii) LILO of one ckt. of Vita – Mhaisal (on Miraj line) 220 kV D/C line at 400/220 kV Alkud S/s

9.2 Further, in the 42nd meeting of SCPSPWR held on 17.11.2017, MSETCL's proposal under GEC–II Part B for funding under NCEF for evacuation of power from large quantum of existing and proposed RE generation projects in Sakri, Shivaji Nagar and Dondaicha area, with following scope of work has already been agreed:

a) 2 x 500 MVA, 400/220 kV Pooling Sub-Station at Balsane.
b) LILO of both circuit of 400 kV Dhule - Sardar Sarovar D/C line at Balsane 400 kV Pooling S/s.
c) 220 kV D/C line from 400 kV Pooling S/s. to 220 kV Shivajinagar S/s.
d) LILO of 220 kV Dhule – Dondaicha S/C line partially on M/C towers at 400 kV Balsane Pooling S/s.
e) 1 x 125 MVAr Bus Reactor at 400 kV Pooling S/s.

Members may kindly note

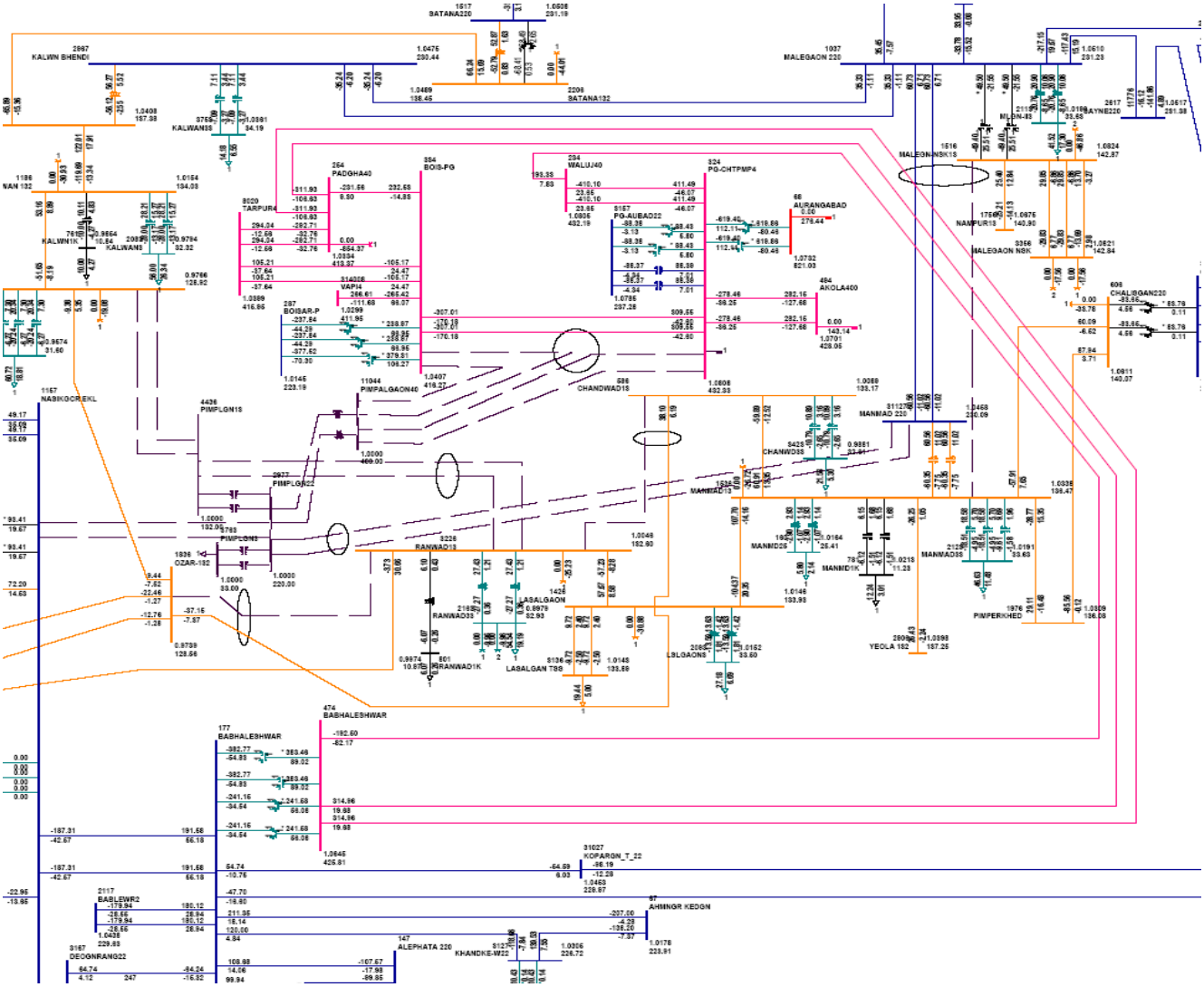
10 Establishment of 400/220 kV Intra State substation at Pimpalgaon (Nashik) by MSETCL

10.1 MSETCL vide its letter no MSETCL/CO/CE/STU/no. 02122 dated 13th March, 2019 has proposed establishment of 400/220 kV Intra State substation at Pimpalgaon (Nashik) with the following scope of works:

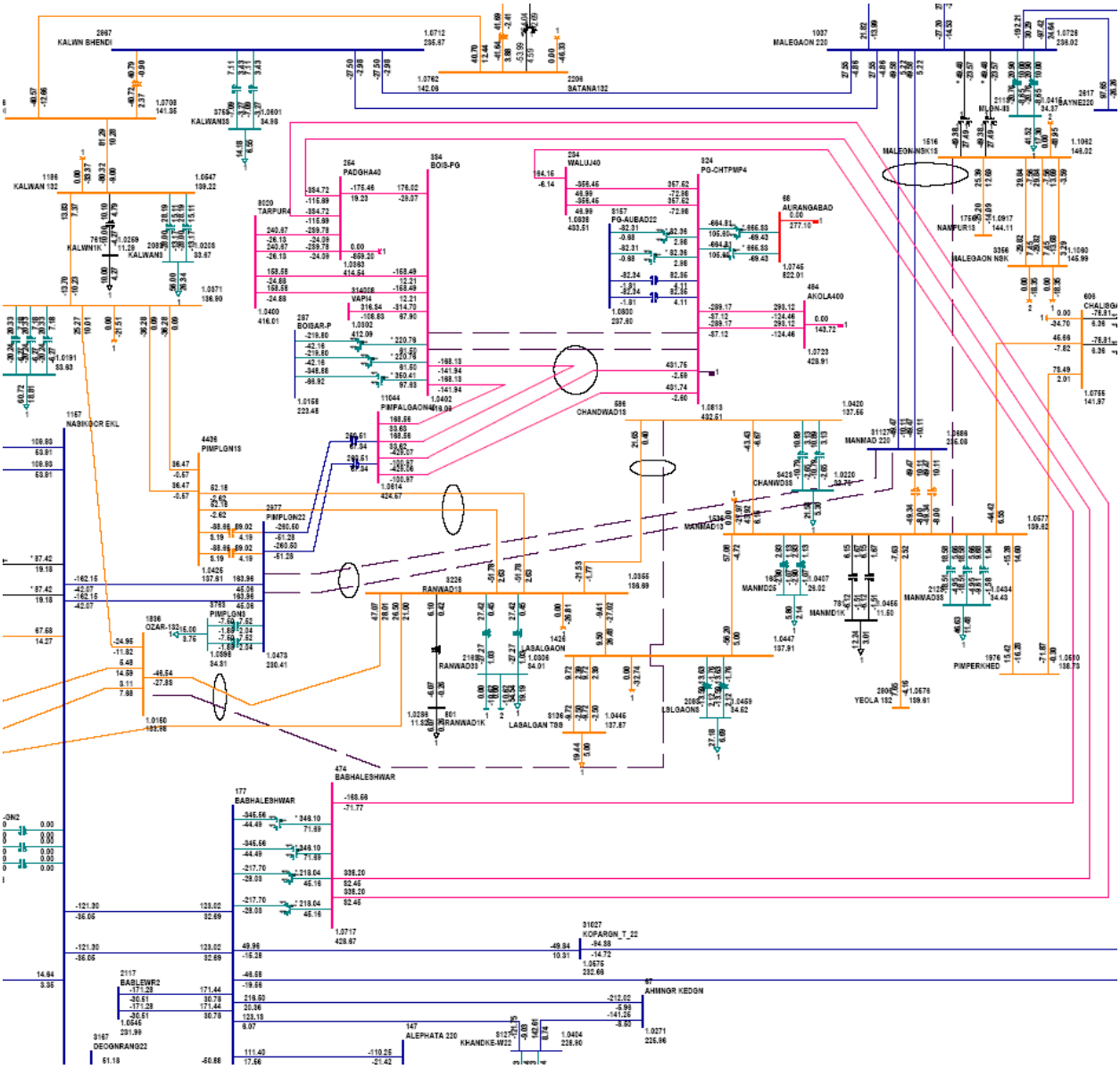
(i) Establishment of 400/220 kV substation at Pimpalgaon (Nashik) with 2x500 MVA 400/220 kV ICT's.
(ii) LILO of both circuit of 400 kV Aurangabad (PG) – Boisar (PG) Quad Moose Line at Pimpalgaon @ route length – 5 Km
(iii) 220 kV D/C Line from proposed 400/200 kV Pimpalgaon substation to existing 220 kV Pimpalgaon substation (Inter Connection)
(iv) Reorientation of existing 220 kV D/C Nashik (GCR) – Pimpalgaon substation at proposed 400/220 kV Pimpalgaon substation.
(v) LILO of 132 kV Ozar – Chandwad at 132 kV Ranwad
(vi) 2nd circuit stringing of 132 kV Pimpalgaon – Ranwad line.

The exhibit showing power flow with and without 400/220 kV Pimpalgaon substation is shown below:

Load Flow without Pimpalgaon 400 kV substation:



Load Flow with Pimpalgaon 400/220 kV substation:



10.2 Presently, Nashik & nearby areas are fed through 220 kV Babhaleshwar – Nashik Line and 3x210 MW Generating Units of Nashik Thermal Power Station. MSETCL has proposed the 400/220 kV Intra State substation at Pimpalgaon (Nashik) to meet the load demand of nearby area and to reduce the loading of 220 kV transmission lines and also to have reliability in view of depleting Nashik TPS Generation.

10.3 The above scope of works would be implemented by MSETCL as a part of their intrastate scheme. The above proposal involves LILO of Aurangabad-Boisar 400 kV D/C quad line, which is an ISTS line.

10.4 MSETCL may present the further details of their proposal like cost of the scheme, implementation time frame etc. Members may deliberate.

11 Connectivity of 50 MW solar park being established by South East Central (SEC) Railways for meeting its RPO obligations as a distribution licensee and change of its

connectivity agreed at Raipur (Kumhari) 400/220 kV PGCIL substation from bulk consumer to Licensee

11.1 The connectivity to Railways at Raipur (Kumhari-POWERGRID) 400/220 kV substation at 220 kV level was agreed in the 29th meeting of Standing Committee on Power System Planning of Western Region held on 10.09.2009. The connectivity line along with the two nos. of 220 kV bays at Raipur 400/220 kV substation of POWERGRID was agreed to be implemented by Railways and CTU has already granted connectivity for a quantum of 100MW to SEC Railways as a Bulk Consumer at Raipur (Kumhari-POWERGRID) vide intimation dated 29.05.2012.

11.2 The issue of reconfirmation of connectivity of SEC Railway 220/132 kV substation at Bhilai in Chhattisgarh to Raipur (Kumhari) 400/220 kV PGCIL substation along with additional connectivity to Railways at Raigarh and Bhatpara was also deliberated in the 42nd meeting of Standing Committee on Power System Planning of Western Region held on 17.11.2017. In the meeting, Railways had confirmed that connectivity at Raipur (Kumhari) 400/220 kV PGCIL S/s was as a bulk consumer, whereas the new connectivity at Raigarh and Bhatpara, was being sought as a Licensee.

11.3 Railway Board vide its letter dated 22.01.2019 has requested CEA to include, the issue of connectivity of 50 MW solar park being established by South East Central (SEC) Railways for meeting its RPO obligations as a distribution licensee and change of its connectivity agreed at Raipur (Kumhari) 400/220 kV PGCIL substation from bulk consumer to Licensee, as an agenda in the Western Region Standing Committee on Transmission. To deliberate on the issue two meetings (on 28.02.2019 and 20.03.2019) were held at CEA, New Delhi under the Chairmanship of Chief Engineer (PSPA-1), CEA. Minutes of the meeting is enclosed as **Annexure –10.** In the meeting held at CEA on 20.03.2019, the following was agreed:

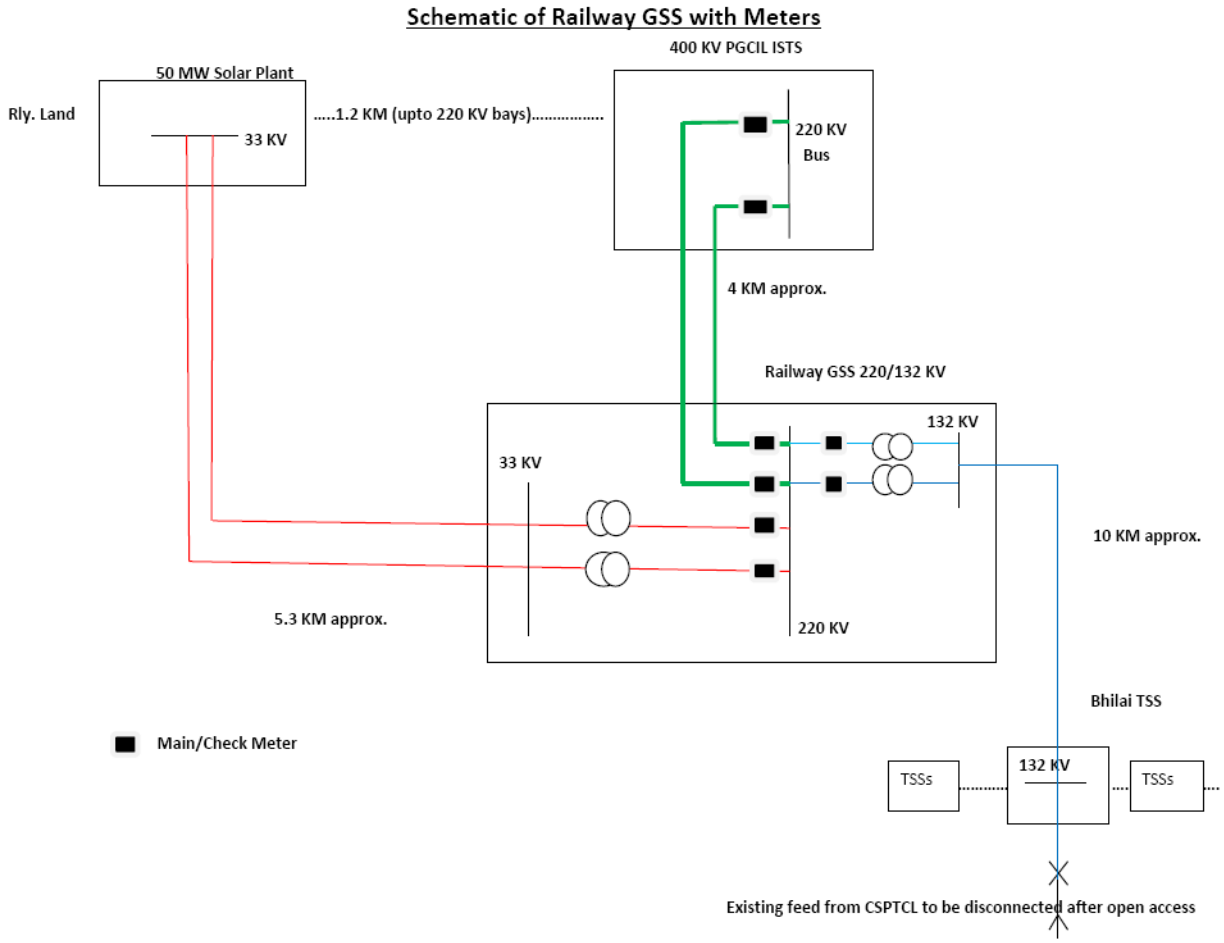
i) Railways request of changing the already granted connectivity at Raipur (Kumhari) 400/220 kV PGCIL S/s as a bulk consumer to that of a Licensee would be deliberated in the next i.e. 2nd meeting of Western Regional Standing Committee on Transmission.

ii) Technically, the connectivity of 50 MW Solar Plant with the 220/132 kV Kumhari GSS of Railway is an optimal solution. But it is neither an ISTS point nor an Intra state point.

iii) No separate grant of connectivity is required for the SPD, if the SPD is connected with Railways 220/132 kV Kumhari GSS, as in that case, the solar plant would be embedded in the Railways system. However, the SPD would be required to apply to CTU for availing the LTA/MTOA through ISTS

iv) Railways to take directions from CERC regarding scheduling, dispatch and energy accounting by WRLDC, based on meters installed at Railways 220/132 kV Kumhari GSS.

v) The connectivity proposal would also put for discussion in the 2nd meeting of WRSCT.



11.4 Members may deliberate.

12 MSETCL proposal for STU connectivity of M/s GWEL generation plant situated at Warora

12.1 M/s GWEL, which is an ISGS with 2x300 MW of installed capacity has total PPA of 550 MW (200 MW to MSEDCL, 200 MW to Dadra & Nagar Haveli and 150 MW to TANGEDCO). Currently, M/s GWEL is connected with ISTS network through dedicated GWEL-Bhadravati 400 kV D/c line and all the beneficiaries are drawing their share of power through ISTS network and paying the respective ISTS charges. As per PPA of Maharashtra with GWEL, Generation bus was the drawl point. Accordingly, MSEDCL has filed a petition before CERC wherein CERC has directed MSEDCL to make arrangement for drawl of their share of 200 MW from GWEL bus bar.

12.2 MSETCL (to provide the STU connectivity to M/s GWEL (ISGS generation) has proposed LILO of one circuit of GWEL – Bhadravati 400 kV D/c line at Warora(MSETCL) 400 kV substation. To discuss the connectivity proposal, a meeting was held in CEA on 19.07.2018 with participation from MSEDCL, MSETCL, M/s GWEL, CTU and POSOCO. In the meeting the following was agreed:

(i) MSETCL to convey their views regarding the proposal for installation of 400/220, 1x315 or 500 MVA ICT at GWEL generation switchyard along with associated ICT bays for drawl of MSEDCL share from GWEL through 220 kV lines.

(ii) M/s GWEL and MSETCL to jointly explore the availability of space for creation of 220 kV level in GWEL generation switchyard.

12.3 The issue was deliberated in the 1st meeting of WRSCT, wherein the scheme of creation of 220 kV level at M/s GWEL premises through 400/220 kV, 1 x 315 MVA ICTs and its interconnection with 220 kV Intra State Transmission Network was technically agreed and MSETCL was suggested to implement the above alternative for STU connectivity at GWEL. In the meeting MSETCL had stated that they would further deliberate on the issue and would revert back

12.4 MSETCL vide letter dated 31.01.2019 (copy enclosed as **Annexure-11**), had intimated that for evacuation of MSEDCL share of power from GWEL power plant, the above scheme has been studied by them and found acceptable.

12.5 Members may kindly note.

13 Inter-State Transmission System Strengthening in Chattarpur area in Madhya Pradesh

13.1 In 40th meeting of SCPSPWR, the following transmission system strengthening scheme was agreed by the members:

Inter State Transmission system strengthening in Chhatarpur area in Madhya Pradesh

(i) Establishment of 2x500 MVA, 400/220 kV substation at Bijawar*

(ii) LILO of both circuits of Satna–Bina 400kV (1st) D/c line at Bijawar. (There are four 400kV circuits between Satna and Bina, out of which one circuit is proposed to be LILOed at Sagar (MPPTCL) substation. This LILO is on one D/c out of the above three remaining 400kV circuits between Satna and Bina).

(iii) 1x125 MVAr, 420 kV Bus Reactor at Bijawar pooling station.

(iv) 4 nos. 220kV line bays for termination of LILO of both ckts of Tikamgarh- Chattarpur 220 kV D/c line at Bijawar.

(v) Space for 4 nos. of 220kV line bays for solar park interconnections

*SPPD shall provide land contiguous to Chhattarpur solar park for establishment of 400/220kV Bijawar substation.

Intra State Transmission system strengthening in Chhattarpur area in Madhya Pradesh

(i) Stringing of 2nd circuit of Tikamgarh – Chhattarpur 220kV S/c on D/c line.

(ii) LILO of both circuits of Tikamgarh-Chhattarpur 220 kV D/c line at Bijawar 400/220 kV substation (60 km)

13.2 The implementation of the Inter State Transmission system strengthening in Chhatarpur area in Madhya Pradesh was taken as a part of the transmission scheme "Connectivity System for Lanco Vidarbha Thermal Power Pvt. Ltd. (LVTPPL) and Inter State Transmission system strengthening in Chhattarpur area in Madhya Pradesh" through TBCB route with PFCCL as the Bid Process Coordinator for the scheme.

13.3 Subsequently, M/s Rewa Ultra Mega Solar Ltd. (RUMSL), the Solar Power Project Developer (SPPD) for development of solar parks in Madhya Pradesh, vide their letter dated 26.08.2017 had stated that RUMSL is unable to develop solar park at Chhattarpur and does not require associated substation in that area, but CEA may take decision on development of proposed ISTS substation at Chhattarpur.

13.4 As establishment of Bijawar 400/220 kV substation was agreed for the purpose of evacuation of power from Chhattarpur Solar Park and to cater the present and future power drawl requirements in Chhattarpur area, CEA vide its letter dated 30.08.2017 had requested MPPTCL to intimate the implementation time frame of the intra-state strengthening scheme in Chhattarpur area (220 kV outlets from proposed Bijawar 400/220 kV substation) and the tentative location(s) of the proposed 400/220 kV substation in Chhattarpur area.

13.5 Empowered Committee in its 37th meeting held on 20.09.2017 had decided that the bidding process for the scheme may be taken up after resolution of financial issue of M/s LVTPL and after ascertaining the progress of the project.

13.6 In the 42nd meeting of SCPSPWR held on 17.11.2017, regarding the time frame for implementation of Bijawar 400/220 kV S/s, MPPTCL had stated that it would be required beyond 2021–22. However, in case the scheme was scheduled in earlier time frame they would take up the implementation of the 220 kV outlets from Bijawar 400/220 kV substation in matching time frame.

13.7 In the 2nd NCT (National Committee on Transmission) meeting held on 04.12.2018, the progress of the transmission scheme "Connectivity System for Lanco Vidarbha Thermal Power Pvt. Ltd. (LVTPPL) and Inter State Transmission system strengthening in Chhattarpur area in Madhya Pradesh" was reviewed. In the meeting CEA had stated that there was no progress in resolution of financial issue by the developer of LVTPPL, therefore, the bidding of the scheme is still on hold. The scheme would be put up in the next WRSCT and based on the deliberations, the bidding process of the scheme could be resumed with the reduced scope of works.

13.8 MPPTCL may intimate the time frame of requirement of Bijawar S/stn and implementation of intra-state strengthening scheme in Chattarpur area (220 kV outlets from proposed 400/220 kV Bijawar S/stn) so that bidding process for "Inter State Transmission system strengthening in Chhattarpur area in Madhya Pradesh" can be resumed.

13.9 Members may deliberate.

14 Review of Reactive compensation on account of LILO of Satna – Bina ckt#3 at Sagar(MP) substation:

14.1 In 38th meeting of SCPSPWR held on 17.07.2015, the intrastate transmission scheme planned by MPPTCL for absorption of power from renewable energy sources in Madhya Pradesh under Green Energy Corridor (Intra-state) was noted. Phase-I of the project inter-alia included the following elements:

(i) Establishment of 2x315MVA, 400/220kV Sagar S/s (Upgradation)
(ii) LILO of one circuit of Satna(PG) – Bina(PG) 400kV line at Sagar(MP) 400kV S/s – 35km LILO length

14.2 MPPTCL vide letter dated 08.03.2018 had submitted the proposal to POWERGRID for the above LILO arrangement (LILO of Satna-Bina ckt#3 at Sagar S/s). The length of Satna – Bina ckts 3 & 4 is 272.586km and both ends of the line have been provided with 420kV, 50MVAr fixed line reactors. With the implementation of LILO, the line lengths of the two sections namely, Satna – Sagar (MP) 400kV section and Sagar (MP) – Bina 400kV section would have become 223.35 km and 97.64 km respectively. After LILO, % compensation on Sagar (MP) – Satna 400kV line would be about 37% and on Sagar (MP) – Bina line section shall be about 85%. Accordingly, in the 1st meeting of WRSCT held on 05.09.2018, CTU had proposed the following reactive compensation on the Bina-Sagar-Satna 400 kV line:

(i) Installation of 50MVAr switchable line reactor at Sagar(MP) end of Satna(PG) - Sagar(MP) 400kV line – Under scope of MPPTCL
(ii) Installation of 125MVAr bus reactor at Sagar (MP) S/s – Under scope of MPPTCL
(iii) Conversion of 50MVAr fixed line reactor at Bina PG) end of Sagar (MP)-Bina(PG) 400kV line into switchable line reactor. – Under scope of ISTS

In the meeting, MPPTCL had stated that 125 MVAr bus reactor at 400 kV Sagar (MP) was already under implementation, as such adequate reactive compensation would be available at Sagar, Bina and Satna S/s and there would be no requirement of 50MVAr switchable line reactor at Sagar (MP) end of Sagar (MP) – Satna(PG) 400kV line. Also, there is space constraint at Sagar S/s for installation of switchable line reactor. In the meeting it was agreed that CTU would carry out the studies with CEA and MPPTCL and the above proposal would be reviewed as per the study results.

14.3 As per the studies conducted by CTU, it has been observed that on account of 34% compensation on Satna – Sagar 400kV line, a total rise of 12kV (11kV line rise & 1kV

source rise) was observed when charging the line from Satna end. With the proposed 50MVAr Line reactor, the compensation becomes about 68% and the total voltage rise of only 4kV (4kV line rise & 0 source rise) was observed while charging the line from Satna end.

Similarly, while charging the line from Sagar end, the total rise observed both without and with the line reactor at Sagar end is 9kV (SR: 5kV & LR: 4kV) and 7kV (SR: 3kV & LR: 4kV) respectively.

14.4 Members may deliberate

15 Establishment of 132/33 kV Sironcha Substation, Tal. – Sironcha, District – Gadchiroli and interconnection with Kistampeth 132 kV substation in Telangana

15.1 In the 1st meeting of WRSCT held on 05.09.2018, the following proposal of MSETCL was taken up for approval as it involved a 132 kV line between two states and two regions also:

i) Establishment of 2x25 MVA, 132/33 kV substation at Sironcha.
ii) 132 kV SCDC line from Kistampeth (Telangana State) with end bays each at Kistampeth and Sironcha S/s – 32 km

In the meeting, MSETCL had informed that Telangana State Transmission Company Limited (TSTCL) have already given their in-principle consent to extend supply from 132 kV Kistampeth S/s to the proposed 132 kV Sironcha S/s. Accordingly, the following was agreed in the 1st meeting of Western Region Standing Committee on Transmission:

(i) The proposed 132 kV line was a natural interstate line, which would facilitate MSETCL in providing reliable supply to Sironcha area and the line should be operated in radial mode.
(ii) MSETCL should not take up conversion of this to an ISTS line in future.
(iii) In view of the in principle consent given by TSTCL to extend supply to 132 kV Sironcha S/s from their 132 kV Kistampeth S/s, MSETCL proposal was agreed by the members with the conditions that Sironcha 132/33 kV substation would operate in radial mode from 132 kV Kistampeth S/s.
(iv) MSETCL needs to finalise the implementation and operational modalities with TSTCL and submit a proposal to CEA so that the same could be referred to Southern Region Standing Committee on Transmission for the approval of Southern Region constituents.

15.2 MSETCL may present the current status of the proposal.

16 Bhuj 400/220kV ICT bay being implemented as Hybrid/MTS on account of bay swapping with ReNew Wind Energy (AP2) Pvt. Ltd.

16.1 In the 1st meeting of WRSCT held on 05.09.2018, an additional 1x500 MVA, 400/220 kV (9th) ICT, for injection from any additional RE project (above 4000 MW under Tranche I to IV of SECI bids) in existing Bhuj PS alongwith associated 400 kV GIS bay and 220 kV

AIS bay was agreed. Accordingly, the following scope of works was approved in 3rd Empowered Committee Meeting held on 21.12.2018 to be implemented by POWERGRID through RTM route:

Sl. No.	Scope of the Transmission Scheme	Capacity /ckm	Estimated Cost (Rs.) Cr.
1.	Additional 1x500MVA 400/220kV (9th) ICT, for injection from any additional RE project (other than 4000MW injection under SECI bids upto Tranche IV) in existing Bhuj PS with associated 400 kV GIS bay and 220kV AIS bay.	1x500MVA, 400/220kV 400kV ICT bay-1 230kV ICT bay-1	37
2.	3 nos. of 220kV line bays(hybrid/MTS) for termination of dedicated lines of RE developers with Stage-II connectivity	220kV bays -3	19.3
	Total Rs (in Crore)		**56.3**

16.2 PGCIL has intimated that on account of space constraints at Bhuj PS for 220 kV ICT bay, detailed engineering was carried out and it was found prudent to allocate 220kV Hybrid/MTS Bay no. 235 to the 9th ICT which was earlier allocated to M/s Renew Wind Energy (AP2) Pvt. Ltd).

Accordingly, reallocation/ re-numbering of 220kV bays at Bhuj PS (which were already allocated to RE applicants viz. M/s Avikiran Solar India Private Ltd. & M/s Renew Wind Energy (AP2) Pvt. Ltd) for the purpose of installation of the 9th ICT was carried out at POWERGRID Gurgaon office on 20.12.2018, which was agreed by the RE developers.

With the above bay reallocation, the 220kV side bay type of the 9th 400/220kV ICT at Bhuj PS has been modified from AIS to Hybrid/MTS.

16.3 POWERGRID to present the station layout details and Members may deliberate.

17 400kV ICT bay for Installation of 1x500MVA ICT (3rd) at Itarsi 400/220kV substation

17.1 The issue of critical loading of several ICTs in Western Region has been discussed in the 42nd & 43rd SCPSPWR held on 10.01.18 & 11.05.2018, in which augmentation of the following transformation capacity in Western Region was agreed to fulfill (n-1) contingency criteria in 2021–22 timeframe:

Sl. No.	Scope of the Transmission Scheme	Existing / Already planned MVA	Proposed ICT (MVA)
1	Jabalpur 400/220kV S/S	2x315	1x500

2	Itarsi 400/220kV	1x315+1x500	1x500

17.2 In the 2nd meeting of Empowered Committee on Transmission held on 06.08.18 the following augmentation works were agreed to be implemented under RTM by POWERGRID.

Transmission Scheme	**Detailed scope of works**	**Estimated Cost (Rs. Crore)**
Augmentation of transformation capacity in Western Region	Jabalpur 400/220 kV S/S • 400/220kV ICT 500MVA • 400kV ICT bay – 1 no. • 220kV ICT bay- 1 no.	**34**
	Itarsi 400/220 kV S/S • 400/220kV 500MVA ICT - 1 no., • 400kV ICT bay -1 no. • 220kV ICT bay-1 no.	34
Total Rs (in Crore)		68

17.3 Now, POWERGRID has intimated that there are space constraints for implementation of the 400kV ICT bay as AIS at Itarsi S/s. However, with the available space, the same may be implemented as outdoor GIS bay (adopting 2-CB scheme).

17.4 POWERGRID to present the substation layout details and constraints in implementation of the ICT bays. Members may deliberate.

18 Grant of ISTS connectivity to LARA STPP Stage-II (2x800MW) of NTPC Ltd. for its Lara STPP-I generation project (2x800MW) located in Chhattisgarh:

18.1 The connectivity for Lara stage-I STPP (2x800 MW) was granted to NTPC Ltd through Lara STPP I – Raigarh (Kotra) PS 400kV D/c line. Long Term Access (LTA) for transfer of 1586.51 MW power from the Lara-I project to various beneficiaries in WR was granted to NTPC Ltd. through Lara STPP I – Champa PS 400kV D/c (quad) line (along with other transmission elements).

18.2 M/s NTPC Ltd. has applied for connectivity for its upcoming 2x800MW Lara STPP-II generation project. The details of the application are given below:

S. No	**Name of the Applicant**	**Location of Generating Station**	**Seeking Connectivity (MW)**	**Date from which Connectivity required**	**Comm. Schedule**
1	NTPC Ltd. (2x800MW Lara Stage-II Project)	Raigarh, Chhattisgarh WR	1600	01.02.2022	30.06.2023

The application was discussed during the 31st WR Conn/LTA Meeting held on 24.10.18

wherein the following was observed:

(i) Connectivity of additional 1600MW at the existing switchyard of Lara STPP-I generation project, which is connected both to Raigarh (Kotra) and Champa pooling stations, leads to the issue of high fault current at Raigarh (Kotra) PS (i.e. beyond the design rating of 50kA).

(ii) Majority of fault contribution comes from Champa PS through Champa PS – Lara STPP (Stage-I & II) – Raigarh (Kotra) 400kV D/c line.

In view of the above, it was proposed to grant connectivity to NTPC Ltd. for its Lara STPP-II generation project with following transmission system (under the scope of NTPC Ltd.):

i) Shifting of Lara STPP I - Raigarh (Kotra) 400kV D/c line to Lara STPP-II bus so as to form Lara STPP II – Raigarh (Kotra) 400kV D/c line along with associated bays at generation end

ii) Lara STPP II - Raigarh(Kotra) 400kV (2nd) D/c line (new) along with associated bays at both ends

iii) Lara STPP-I & Lara STPP-II buses to be kept disconnected from each other under normal operating conditions

In the meeting it was also deliberated that in place of Lara STPP II – Raigarh (Kotra) 400kV (2^{nd}) D/c line (new), the option of reconductoring of Lara STPP I – Raigarh (Kotra) 400kV D/c line with HTLS conductor may also be explored. However, the matter regarding de-capitalisation of old conductor and terminal bay equipment (if required to be upgraded) resulting due to re-conductoring of the line needs to be further deliberated. After deliberations, it was decided that the connectivity arrangement for Lara STPS-II shall be finalised in the next WRSCT meeting after taking into consideration views of all the WR constituents.

18.3 If the above arrangement is agreed then the connectivity line of Lara STPP-I generation project of NTPC shall also stand revised as Lara STPP I – Champa PS 400kV D/c (quad) line (existing).

18.4 Members may deliberate.

19 604 MW LTOA granted to Chattisgarh State Power Trading Company Ltd. (CSPTrCL)

19.1 The current status of 604 MW LTA granted to CSPTrdCL from various generation projects in Chhattisgarh is as given below:

Table 1

Sl. No.	Generation Project	LTA firmed up with CSPDCL	End date of firm power transfer to CSPDCL*	LTA on Target basis in WR
	A. IPPs associated with HCTPC-V			

Sl. No.	Generation Project	LTA firmed up with CSPDCL	End date of firm power transfer to CSPDCL*	LTA on Target basis in WR
1	RKM Powergen Ltd (4X360)	0	NA	66
2	**Athena Chhattisgarh Power Ltd. (2X600)**	**0**	**NA**	**55**
3	Jindal Power Ltd. (4X600)	110	31.12.2030	0
4	SKS Power Gen. (Ch.) Ltd. (4X300)	**55**	**31.10.2030**	**0**
5	Korba West Power Co. Ltd. (1X600)	27	31.12.2030	0
6	DB Power Ltd. (2X600)	0	NA	55
7	KSK Mahanadi Power Co. Ltd. (6X600)	82	31.12.2030	0
8	Bharat Aluminium Co. Ltd. (4X300)	55	31.12.2030	0
9	**Vandana Vidyut Ltd. (2X135 + 1X270)**	**0**	**NA**	**25**
10	**Lanco Amarkantak Power Pvt. Ltd. (2X660)**	**0**	**NA**	**60**
	B. IPPs associated with HCTPC-IV & Part System of HCTPC-I			
1	Maruti Clean Coal & Power Ltd. (1x300 MW)	14	31.12.2030	0
	Total	**343**		**261**

**Based on CSPTCL NOCs dated 29.12.2017 & 10.12.2018*

19.2 The TSAs/DIC status of Athena Chhattisgarh Power Ltd., Vandana Vidyut Ltd. and Lanco Amarkantak Power Pvt. Ltd. have been terminated vide letters dated 27.11.2018, 13.02.2019 and 28.11.2018 respectively w.e.f. the effective date of LTA operationalization (i.e. 01.10.2017) on account of adverse progress as well as default in terms of CERC Regulations & Procedures, BPTA and TSA, making them ineligible to inject power into the grid through any form of open access.

19.3 The matter was taken up in the 36th meeting of WR constituents for Connectivity & LTA Applications held on 27.03.19, which was not attended by CSPTrdCL. However, CSPTrdCL vide e-mail dated 25.03.2019 had intimated that they would not be able to attend the meeting. Therefore, the matter of termination of TSAs/DIC status of Athena Chhattisgarh Power Ltd., Vandana Vidyut Ltd. and Lanco Amarkantak Power Pvt. Ltd was decided to be taken up in the next meeting of Standing Committee Meeting on Power System Planning in Western Region.

19.4 Members may deliberate

20 STU and CTU interconnections proposed by GETCO.

20.1 Considering future load growth and operational feedback from SLDC, GETCO (vide its letter dated 26.04.2019) has proposed new 220 kV substation at Chiloda, Sarigam and Khajod as a part of their intra-state network strengthening along with the following 220 kV interconnections with the CTU:

i) Dehgam (PGCIL) – Chiloda 220 kV D/C line

ii) LILO of Vapi (GETCO)–Tarapur (NPCIL) 220 kV S/C line at proposed Sarigam 220 kV substation

iii) LILO of both circuits of Kawas (NTPC) – Navsari (PGCIL) 220 kV D/C line at proposed Khajod 220 kV substation

20.2 Establishment of Chiloda 220 kV substation through Dehgam (PGCIL) – Chiloda 220 kV D/C line

400/220 kV Dehgam (PGCIL) substation is having 400/220 kV, 2x315 MVA+1x500 MVA installed capacity along with four 220 kV outlets to GETCO s/s (220 kV D/C line each to Ranasan & Khanpur substations). The Dehgam–Khanpur 220 kV D/C line remains critically loaded with around 180-200 MW per circuit. Reconductoring of this line has already been planned and will be implemented in future.

Further, considering load growth surrounding Ahmedabad city area, upgradation of 132 kV Chiloda substation to 220 kV level along with LILO of Gandhinagar TPS – Soja / Ranasan 220 kV line at Chiloda substation has already been planned. However, to provide a strong 220 kV source, GETCO has proposed Dehgam (PGCIL) – Chiloda 220 kV D/C line.

20.3 Establishment of Sarigam 220 kV substation through LILO of Vapi (GETCO) – Tarapur (NPCIL) 220 kV S/C line.

Umargam & Sarigam areas in South Gujarat are having huge industrial demand and are being fed through 66 kV lines from 220 kV Bhilad substation. Considering future load growth & limitation in outlets from 220 kV Bhilad substation, GETCO has planned to upgrade 66 kV Sarigam substation to 220 kV level by constructing 220 kV D/C line from Bhilad substation. However, to have additional infeed, GETCO has proposed LILO of Vapi (GETCO) – Tarapur (NPCIL) 220 kV S/c line at Sarigam substation.

20.4 Establishment of Khajod 220 kV substation through LILO of both circuits of Kawas (NTPC) – Navsari (PGCIL) 220 kV D/C line

To meet future load growth surrounding Surat city area, GETCO has planned 220 kV Khajod substation and its 220 connectivity has been proposed through LILO of both circuits of Kawas (NTPC) – Navsari (PGCIL) 220 kV D/C line at Khajod substation. Further, as an additional connectivity, LILO of Sachin (Talangpore) – Ichchhapore 220 kV S/C line at Khajod will also be taken up in future.

20.5 Navsari (PG) – Bhestan/Popada (GETCO) 220 kV D/C line to be taken up as separate ISTS scheme on priority basis.

20.5.1 This line is part of the scheme "Transmission System associated with DGEN TPS (1200 MW) of Torrent Power Ltd." which was awarded to M/s Instalaciones Inabensa through TBCB route. The implementation schedule of the scheme was 38 months i.e. May, 2018. M/s DGENTPL has not taken up the implementation of the scheme. The issue has been deliberated in earlier standing committee meetings.

20.5.2 In the 42nd meeting of SCPSPWR held on 17.11.2017, it was agreed that the Navsari (PG) – Bhestan 220 kV D/C line is required on an urgent basis. It was decided that a separate

meeting among CEA, CTU, GETCO, M/s Torrent Energy Ltd and PFCCL (BPC) would be called to deliberate upon the following:

i) Necessary action / procedure for cancellation of the transmission scheme as per TSA.

ii) Requirement of DGEN–Vadodara 400kV D/c line for evacuation of power from DGEN

iii) Mode of implementation of Navsari (PG)–Bhestan 220 kV D/C line and DGEN–Vadodara 400 kV D/C line (if required).

20.5.3 In a meeting held on 23.01.2018 at CEA New Delhi , it was agreed that GETCO and CTU would explore scheme (apart from Navsari- Bhesthan 220 kV D/C line) to reduce the overloading on the Vav-Popadiya/Sachin-Navsari (GETCO)- Navsari(PGCIL) 220 kV lines.

20.5.4 GETCO vide letter dated 26.04.2019 has submitted that Navsari- Bhesthan 220 kV D/C line would be very important STU-CTU interconnection in the area and will relieve following congested lines in the area viz:

(i) Navsari (PGCIL)–Navsari (GETCO) 220 kV D/C

(ii) Vav – Bhestan 220 kV S/C

(iii) Vav – Sachin 220 kV S/C.

Further, due to space constraint at Navsari / Sachin substation, it is not possible to plan alternative scheme.

20.5.5 GETCO has requested that Navsari (PG) – Bhestan/Popada 220 kV D/C line may be dropped from DGEN scheme and needs to be taken-up on priority as a separate ISTS scheme.

20.5.6 In operational feedback by NLDC, overloading of Navsari (PG)-Navsari (GETCO) 220 kV D/c lines (loaded above 150MW/ckt most of the time and the system is not N-1 compliant, considering loading as 250MW per circuit) has been reported on consistent basis.

20.5.7 GETCO may present their proposals along with load flow studies.

20.6 Members may deliberate.

21 Progress of downstream network whose terminating bays are under construction by PGCIL

21.1 The 5.4. Proviso (iii) of Indian Electricity Grid Code (IEGC) (Fourth Amendment) Regulations, 2016, of CERC dated 06.04.2016 is as follows:

"Where the transmission system executed by a transmission licensee is required to be connected to the transmission system executed by any other transmission licensee and both transmission systems are executed in a manner other than through tariff based competitive bidding, the transmission licensee shall endeavor to match the commissioning of its transmission system with the transmission system of the other

licensee as far as practicable and shall ensure the same through an appropriate Implementation Agreement."

The status of the 220 kV lines from various 400/220 kV substations were also deliberated with STUs in the 43rd meeting of SCPSPWR held on 11.05.2018 and the updated status of execution of downstream network is indicated in the table below:

Sl. No.	ISTS S/s	Voltage ratio, Trans. Cap	Unutilised bays	Status of ISTS bay	220kV lines for unutilised bays	Status of Lines
1	Mapusa (PG)	400/220kV (3x315 MVA)	2	Existing bay	Mapusa – Cuncolin 220 kV D/c line	Mar-19
			2		Mapusa–Tuem 220 kV D/c line	The agency has been finalized for carrying out work from Mapusa to Tuem D/C line with GIS S/s at Tuem. The work will be awarded after the receipt of approval from the Govt. The completion period will be 20 months from the date of award.
2	Pirana	400/220kV (2x315MVA)	2	Existing bay	Pirana – Barjadi 220 kV D/c line	Dec'19
3	Boisar	400/220kV (2x315kV+500 MVA)	1	Existing bay	Boisar – Borivali 220 kV line S/c line	Jun'19
4	Wardha	400/220 kV (2x315 MVA)	2	Existing bay	Wardha – Yeoavatmal 220 kV D/c line	Jun'19
5	Solapur	400/220 kV (2x315 +1x500 MVA)	2	Existing bay	Solapur – Bale (M) 220kV D/c line	Mar'20
			2		Solapur – Narangwadi 220 kV D/c line	Mar'20
6	Betul GIS	400/220 kV (2x315 MVA)	2	Existing bay	LILO of Sarni - Pandhurna 220kV line at Betul GIS (PGCIL)	Sept'19
7	Navi Mumbai	400/220 kV (2 x 315 MVA)	4	Existing bay	LILO of Apta – Taloja and Apta - Kalwa section of the Apta-Taloja/Kalwa 220 kV D/c line at Navi Mumbai (PG)	Agreed to be implemented under ISTS. Comm. Sch. - 30 months from date of transfer of SPV
8	Indore (PG)	400/220 kV (2 x 500 MVA)	2	Existing bay	Yet to plan	Yet to plan
9	Parli (PG)	400/220 kV (2x500 MVA)	2	Existing bay	LILO of Parli – Harangul 220 kV S/c line	Jun'19

10	Vadodara GIS	400/220 kV (2 x 500 MVA)	2	Existing bay	220 kV Jhambua – Vadodara D/C Line	Jun'19
11	Navsari	400/220 kV (2x315MVA + 1x500 MVA)	2	Existing bay	Navsari – Bhestan 220kV D/c line	M/s DGENTPL is not taking up the implementation of the scheme.

400 kV line bays:

S. No.	STS Substation	Proposed Bays	Commissioning Schedule	Lines emanating from Substation	Latest available status
1	Indore (PG)	2	Jul, 2018	Indore (PG) – Ujjain 400 kV D/c line	Dec, 2019
2	Vadodara(PG)	2	Sep, 2018	DGEN – Vadodara 400kV D/c line	Uncertain

21.2 The current status of the various substations and associated downstream system may be updated by the POWERGRID/STUs. Members may deliberate.

22 Western Region Strengthening Scheme- XIX (WRSS-XIX) and North Eastern Region Strengthening Scheme- IX (NERSS-IX)

22.1 The scheme was recommended for implementation through TBCB route in the 37th meeting of erstwhile Empowered Committee held on 20.09.2017, which has been notified by MoP vide Gazette notification dated 04.05.2018.The transmission scheme includes four parts – A,B,C &D as detailed below:

Western Region Strengthening Scheme- XIX (WRSS-XIX) and North Eastern Region Strengthening Scheme- IX (NERSS-IX)

Part A- Additional 400kV outlets from Banaskantha 765/400 kV S/s

S. No.	Name of the Transmission Element
1	LILO of second circuit of Zerda – Ranchodpura 400 kV D/c line at Banaskantha (PG) PS

Part B: Establishment of new substation at Vapi/Ambethi area and its associated transmission lines.

S. No.	Name of the Transmission Element
1.	Establishment of 2 x 500 MVA, 400/220 kV S/s near Vapi / Ambheti (Vapi – II) (GIS) ICTs : 2x500MVA, 400/220kV 400kV • ICT bays: 2 nos. • Line bays: 4 nos.

	• Space for 2x500MVA, 400/220kV ICTs (future) • Space for 400/220kV ICT bays (future): 2 nos. • Space for Line bays along with Line Reactors (future): 4 nos. <u>220kV</u> • ICT bays: 2 nos. • Line bays: 6 nos. (2 for Sayali (DNH) and 4 nos. for GETCO) • Space for 400/220kV ICT bays (future): 2 nos. •Space for Line bays (future): 6 nos.
2.	LILO of KAPP – Vapi 400 kV D/c line at Vapi – II
3.	125 MVAr bus reactor at Vapi – II Substation
4.	Vapi-II – Sayali D/C 220kV line • From Vapi-II upto LILO point of one circuit of Vapi (PG) –Khadoli 220kV D/c line at Sayali substation with ampacity equivalent to twin zebra conductor. • Interconnection with LILO section (of LILO of one circuit of Vapi (PG) – Khadoli 220kV D/c line at Sayali substation) so as to form Vapi-II – Sayali 220 kV D/c line and Vapi- Khadoli 220 kV D/c line. (The LILO section is with zebra conductor)

Part C: Additional ISTS feed to Navi Mumbai 400/220 kV substation of POWERGRID

S. No.	Name of the Transmission Element
1.	Padghe (PG) – Kharghar 400 kV D/c (quad) line to be terminated into one ckt. of Kharghar – Ghatkopar 400 kV D/c (quad) line (thus forming Padghe (PG) - Kharghar 400 kV S/c (quad) line, Padghe (PG) - Ghatkopar 400 kV S/c (quad) line)
2.	LILO of Padghe (PG) – Ghatkopar 400kV S/c line at Navi Mumbai GIS (PG) (with quad conductor)
3.	LILO of Apta – Kalwa/Taloja 220 kV D/c line (i.e. Apta – Kalwa and Apta Taloja 220kV lines) at Navi Mumbai (PG)

Part D: North Eastern Region Strengthening Scheme – IX

S. No.	Name of the Transmission Element
1.	Pare HEP (NEEPCO) (from near LILO point)– North Lakhimpur (AEGCL) 132 kV D/c line (with ACSR Zebra conductor) along with 2 no. 132 kV line bays at North Lakhimpur end. Note: Two line bays at Pare HEP would be spare due to bypassing of LILO of Ranganadi (NEEPCO) - Naharlagun / Nirjuli (POWERGRID) at Pare HEP (NEEPCO). The bays would be used for connecting with North Lakhimpur (AEGCL) S/s and this line will be constructed from LILO portion.

2.	LILO of one circuit of Pare HEP – North Lakhimpur (AEGCL) 132kV D/c line (with ACSR Zebra) at Nirjuli (POWERGRID) substation

22.2 Additional ISTS feed to Navi Mumbai 400/220 kV substation of POWERGRID: The transmission scheme has been deliberated in the 35th, 38th, 40th, 41st and 42nd meeting of SCPSPWR and was agreed in 41st meeting of SCPSPWR and firmed up with modifications in the 42nd meeting of SCPSPWR. The scheme included portions to be implemented as a part of ISTS and Intra State Transmission scheme, as given below:

A. Under Inter State Transmission System (through TBCB)

Transmission System for providing ISTS feed to Navi Mumbai and drawl of power:

(i) Padghe (PG)–Kharghar 400 kV D/c (quad moose ampacity) line to be terminated into one ckt. of Kharghar–Ghatkopar 400 kV D/c line (thus forming Padghe (PG) – Kharghar 400 kV S/c (quad moose ampacity) line, Padghe (PG) - Ghatkopar 400 kV S/c (quad moose ampacity) line)

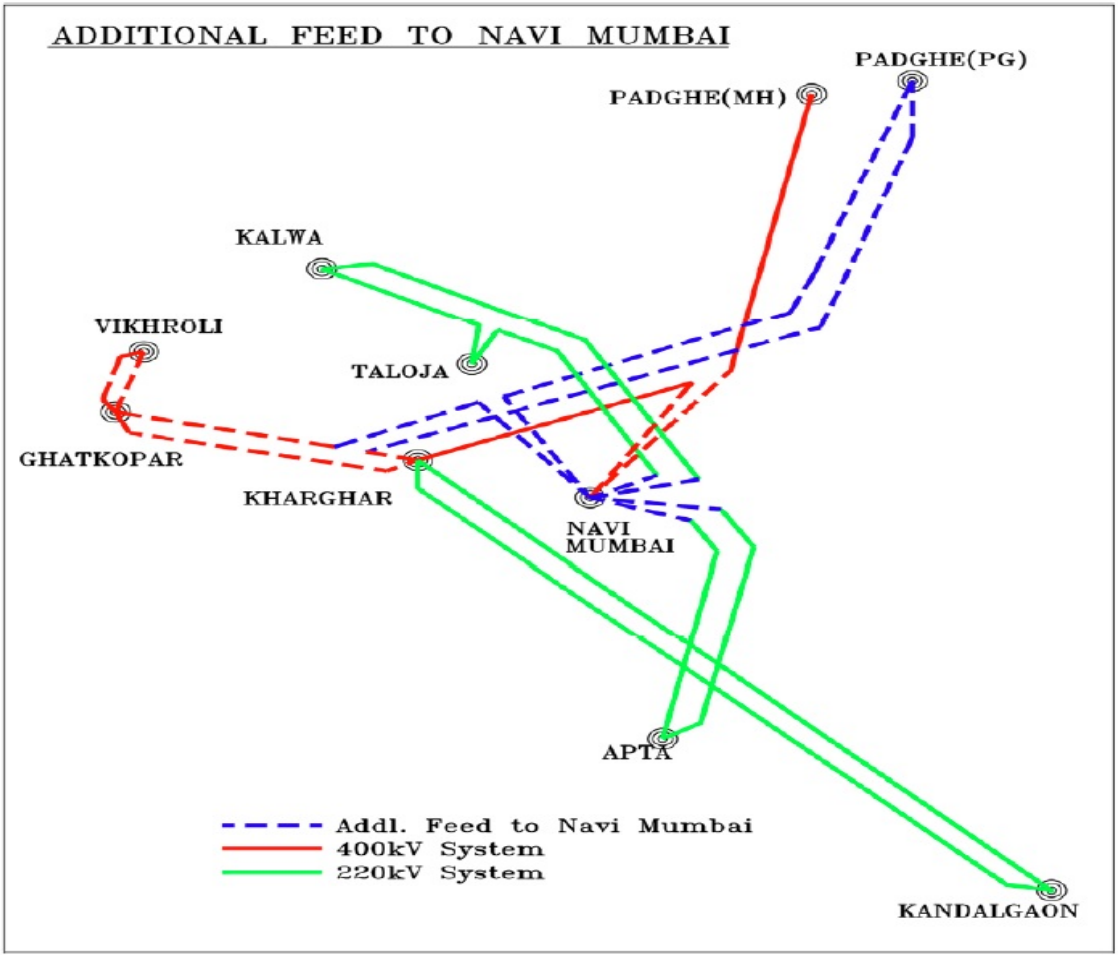
(ii) LILO of Padghe (PG) – Ghatkopar 400kV S/c (quad moose ampacity) line at Navi Mumbai (PG)

(iii) LILO of Apta–Taloja and Apta-Kalwa section of the Apta-Taloja/Kalwa 220 kV D/c line at Navi Mumbai (PG)

B. Under Intra State Transmission System (by MSETCL / Intra state Transmission Licensee)

(i) Reconfiguration of the Kharghar – Kandalgaon 220 kV D/c line and Apta – Taloja / Kalwa 220 kV D/c at their crossing point for achieving balanced power on the 220 kV outlets from Navi Mumbai 400/220 substation.

(ii) Implementation of the planned Kharghar–Ghatkopar 400 kV D/C line (Twin Moose conductor) as Kharghar–Ghatkopar 400 kV D/C (quad moose ampacity) line.



In 43rd meeting of SCPSPWR held on 11.05.2018, MSETCL agreed to expedite the implementation of Kharghar–Vikhroli 400 kV D/C quad line so that the same could be completed ahead of the ISTS scheme (Additional ISTS feed to Navi Mumbai 400/220 kV substation of POWERGRID). Regarding finalisation of coordinates of LILO point (for termination of 400 kV D/C quad line from 765/400 kV Padghe (GIS) into one ckt of Kharghar–Vikhroli 400 kV D/C quad line), it was agreed that the same would be deliberated in a separate meeting.

Accordingly, a meeting was held on 15.12.2018 at MSETCL office Mumbai, amongst MSETCL, CEA, CTU, BPC to deliberate on issues associated with additional ISTS feed to Navi Mumbai 400/220 kV substation of PGCIL under WRSS-XIX scheme. In the meeting, following issues were deliberated and agreed on:

a) Identification of exact point of termination of Padghe (PG) – Kharghar 400 kV D/C (quad) line at Kharghar substation (MSETCL) end

The coordination of the LILO point for termination of Padghe – Kharghar D/C line at Kharghar – Ghatkopar line of MSETCL has been identified near Kharghar 400 kV S/s of MSETCL are 19°2.34’34.5” N and 73°3’35.43” E.

In event of delay in implementation of Kharghar – Ghatkopar (Vikhroli) 400 kV line, CEA requested MSETCL to implement two nos. of 400 kV bays and 400 kV D/C line

(about 300 m) up to termination point of Padghe – Kharghar D/C line matching with its schedule (March 2022) so as to form Padghe – Kharghar 400 kV D/C line.

b) RoW issues along the Padghe – Kharghar line and LILO of 400 kV and 220 kV D/C lines at Navi Mumbai

For the RoW issues pertaining to transmission lines: LILO of Padghe (PG) – Ghatkopar (Vikhroli) 400kV S/c line at Navi Mumbai GIS (PG) and LILO of Apta – Kalwa/Taloja 220 kV D/C line (i.e. Apta – Kalwa and Apta – Taloja 220 kV lines) at Navi Mumbai (PGCIL), it was agreed that the bidders would be given option to consider suitable technological options like cable of equivalent rating, multi-circuit, GIL (gas insulated line) etc. to mitigate the RoW for the 2 km LILO (end portion at Navi Mumbai) of both 400 kV and 220 kV sections.

For RoW issues along Padghe – Kharghar line, it was agreed that in order to mitigate the RoW, the bidders may use any of the available technological options like monopole, GIL, narrow base towers etc.

22.3 Establishment of new substation at Vapi/Ambethi area and its associated transmission lines:

The scheme for establishment of new substation at Vapi/Ambethi area and its associated transmission lines was deliberated in the 39th, 40th, 41st and 42nd meeting of SCPSPWR. The scheme included portions to be implemented as a part of ISTS and Intra State Transmission scheme, as given below:

A. Under Inter State Transmission System (through TBCB)

(i) Establishment of 2 x 500 MVA, 400/220 kV S/s near Vapi / Ambheti (Vapi – II)

(ii) LILO of both circuits of KAPP – Vapi 400 kV D/c line at Vapi – II

(iii) 1 x 125 MVAr bus reactor at Vapi – II Substation

(iv) Vapi-II – Sayali D/C 220kV line

- From Vapi-II to LILO point of one circuit of Vapi (PG) –Khadoli 220kV D/C line at Sayali substation with ampacity equivalent to twin zebra conductor.
- Interconnection with LILO section (of LILO of one circuit of Vapi (PG) –Khadoli 220 kV D/C line at Sayali substation) so as to form Vapi-II – Sayali 220 kV D/C line and Vapi- Khadoli 220 kV D/C line. The LILO section is with zebra conductor.

B. Under Intra State Transmission System (by GETCO)

220 kV outlets to be implemented by GETCO in matching time frame of the Vapi-II 400/220 kV substation:

i) Vapi-II–Atul (GETCO) 220kV D/c line.

ii) LILO of Chikhli (Ambetha)–Vapi (GETCO) 220 kV S/c line at Vapi-II

C. Under Intra State Transmission System (by DNH)

Reconductoring to be implemented by DNH in matching time frame of Vapi-II 400/220 kV substation:

i) Reconductoring of the LILO section (of LILO of one circuit of Vapi(PG)–Khadoli 220kV D/C line at Sayali substation) with ampacity equivalent to twin zebra conductor in matching time-frame of the ISTS line i.e., Vapi-II – Sayali D/C 220kV line.

A meeting was held in CEA on 08.01.2019 to resolve the issues raised by the bidders in pre-bid meeting of the transmission project "Western Region System Strengthening Scheme XIX (WRSS-XIX). The following issues were deliberated and agreed upon in the meeting (Minutes of the meeting are enclosed as **Annexure 12**):

(a) Implementation of Vapi-II/Ambethi 400kV S/s as GIS to reduce/optimize land requirement

In the meeting, it was agreed that, Vapi-II 400/220 kV substation may be establishment as GIS substation to reduce the land requirement because Ambethi area is densely populated and there may be issues in getting about 40 acres contiguous land in this area.

(b) Location of Vapi-II 400kV substation

In the meeting, it was agreed that Vapi-II 400/220 kV S/s is to be established on west side of Kakrapar – Vapi 400 kV D/C line (existing line which is to be LILOed at Vapi-II 400/220 kV). The substation may be established in the region bounded by NH-48, SH- and Kakrapar – Vapi 400 kV D/C line.

22.4 The Technical and Financial bid of the project is scheduled for opening in the first week of May 2019. GETCO, MSETCL and DNH may kindly update the status of implementation of their downstream network associated with the above project.

22.5 Members may kindly note.

23 Additional 400 kV feed to Goa and Additional System for Power Evacuation from Generation Projects pooled at Raigarh (Tamnar) Pool by M/s Goa Tamnar Transmission Projects Limited through TBCB route.

A. Request for Early commissioning of the transmission scheme by M/s GTTPL

B. Inclusion of LILO of both circuits Ambewadi – Ponda 220 kV D/C line at New 400/220 kV Substation of GTTPL under the scope of M/s GTTPL: proposal by Electricity Department, Goa

23.1 The transmission scheme "Additional 400 kV Feed to Goa and Additional System for Power Evacuation from Generation Projects pooled at Raigarh (Tamnar) Pool" by M/s Goa Tamnar Transmission Projects Limited (GTTPL) is under implementation through TBCB route. The scope of works is as given below:

Additional 400 kV feed to Goa

A. Additional 400 kV feed to Goa

a) LILO of one circuit of Narendra (existing) – Narendra (New) 400 kV D/C quad line at Xeldem

b) Xeldem – Mapusa 400 kV D/C (quad) line

c) Xeldem – Xeldem (existing) 220 kV HTLS D/C line (ampacity equivalent to twin moose conductor)

d) Establishment of 400/220 kV substation at Xeldem

400 kV

- ICTs: 2x500 MVA, 400/220 kV
- ICT bays: 2 nos
- Line bays: 4 nos (2no. for Xeldem – Mapusa 400 kV D/C (quad) line & 2 nos for LILO of one ckt of Narendra (existing) – Narendra (New) 400 kV D/C quad line at Xeldem)
- Bus Reactor: 1x125 MVAR
- Bus Reactor Bay: 1 no
- Space for 2x500 MVA, 400/220 kV ICTs (future)
- Space for ICT bays (future): 2 nos
- Space for Line bays along with Line Reactors (future): 4 nos
- 1x63 MVAR switchable line reactor along with 500 Ohms NGR and its auxiliaries (for Narendra (existing) – Xeldem 400 kV line formed after LILO of one ckt of Narendra (existing) – Narendra (New) 400kV D/C quad line) at Xeldem)
- 1x80 MVAR switchable line reactor along with 500 Ohms NGR and its auxiliaries (for Narendra (New) –Xeldem 400 kV (quad) line formed after LILO of one ckt of Narendra (existing) – Narendra (New) 400 kV D/C quad line) at Xeldem

220 kV

- ICT bays: 2 nos
- Line bays: 6 nos
- Space for ICT bays (future): 2 nos
- Space for Line bays (future): 6 nos

B. Additional System for Power Evacuation from Generation Projects pooled at Raigarh (Tamnar) Pool

a) Dharamjaygarh Pool Section B - Raigarh (Tamnar) Pool 765 kV D/C line

23.2 Establishment of 400/220 kV substation at Xeldem under ISTS by M/s GTTPL also includes 6 nos. of 220 kV line bays. These 6 nos. of 220 kV bays are being implemented for termination of following 220 kV lines at Xeldem:

(a) Xeldem - Xeldem (existing) 220 kV HTLS D/C line. The 220 kV line and 220 kV bays at Xeldem 400 kV S/s are under the scope of M/s GTTPL and 2 nos. of 220 kV line bays at Xeldem (existing) S/s are under the scope of GED.

(b) LILO of 2nd circuit of Ambewadi - Ponda 220 kV D/C line at Xeldem - under the scope of GED

(c) Xeldem - Verna 220 kV D/C line - under the scope of GED

23.3 The zero date of the project is 14.03.2018 and the project implementation timeline, as per the Transmission Service Agreement of the transmission scheme, is as indicated below:

Sl. No.	Name of the Transmission Element	Scheduled COD from Effective Date 14.03.2018	Percentage of Quoted Transmission Charges recoverable on Scheduled COD of the Element of the Project	Element(s) which are pre-required for declaring the commercial operation (COD) of the respective Element
a) Additional 400kV feed to Goa				
1	LILO of one ckt. of Narendra (existing) – Narendra (New) 400kV D/c quad line at Xeldem	44 months 14.11.2021	33.14%	*COD of elements marked at Sl. 1 & 2 is linked with availability of element marked at Sl. 3. Hence, either elements 1 & 3 may be commissioned simultaneously or elements 2 & 3 may be commissioned simultaneously. Further, none of the elements can be commissioned independently as their utilisation is dependent on each other as mentioned above.*
2	Xeldem – Mapusa400kV D/c (quad) line	38 months 14.03.2021	9.73%	
3	Establishment of 2x500MVA, 400/220kV substation at Xeldem	38 months 14.03.2021	25.96%	
b) Additional System for Power Evacuation from Generation Projects pooled at Raigarh (Tamnar) Pool				
1	Dharamjaygarh Pool Section B – Raigarh (Tamnar) Pool 765kV D/c line	40 Months 14.05.2021	31.17%	NIL

23.4 Inclusion of LILO of both circuits Ambewadi – Ponda 220 kV D/C line at New 400/220 kV Substation of GTTPL under the scope of M/s GTTPL: proposal by Electricity Department, Goa

23.4.1 The LILO of 1st circuit of Ambewadi - Ponda 220 kV D/C line is already done at Xeldem (existing), further implementation of LILO of 2nd circuit of Ambewadi - Ponda 220 kV D/C line at Xeldem (ISTS) is under the scope of GED.

23.4.2 Electricity Department of Goa vide letter dated 14.01.2019, has requested for inclusion of LILO of 220 kV Ambewadi - Ponda Line at Dharbhandora (Xeldem (New)) substation in the scope of works of M/s Goa Tamnar Transmission Projects Limited (copy enclosed as **Annexure 13**).

23.4.3 As the scheme is already under implementation through TBCB route, inclusion of additional scope of works in the scheme being implemented by M/S GTTPL is not possible. The scheduled commissioning date of the Xeldam 400/220 kV substation is 14.03.2021 therefore, GED needs to implement the downstream network in matching time frame. GED may furnish the status of implementation of the associated schemes under their scope. POWERGRID may furnish the status of implementation of the associated schemes under their scope

23.4.4 Members may deliberate.

23.5 Request for Early commissioning of the transmission scheme by M/s GTTPL

23.5.1 M/s GTTPL vide letters dated 20.06.2018 & 22.04.19 has informed that they intend to commission following elements under the transmission scheme " Additional 400 kV Feed to Goa and Additional System for Power Evacuation from Generation Projects pooled at Raigarh (Tamnar) Pool" by 20.06.2020:

(i) Establishment of 2 x 500 MVA, 400/220 kV S/s at Xeldem

(ii) Xeldem – Mapusa 400 kV D/c Quad line

(iii) Dharamjaygarh Pool Section B – Raigarh Tamnar Pool 765 kV D/c line

23.5.2 M/s GTTPL has stated that early commissioning of the above elements would provide addition feed to Goa to meet their power demand with reliability. Further, Dharamjaygarh Pool Section B – Raigarh Tamnar Pool 765 kV D/c line would provide additional corridor to evacuate power from Raigarh (Tamnar).

23.5.3 NLDC in their operational feedback has reported voltage above 420kV for 35% of the time in this quarter October-December 2018). Almost every day one ckt of 400kV Kolhapur-Mapusa is kept out on HV which affects the N-1 security of Goa supply. Also in some occasions, HV resulted in blackout of Goa system.

23.5.4 Members may deliberate the early commissioning proposal of M/s GTTPL.

24 Operational Feedback of NLDC

The operational feedback of NLDC for the period from October' 2018 to December' 2018 is as follows:

Transmission Line Constraints

S. No	Corridor Season/ Antecedent Conditions	Description of the constraints
1.	400kV Kudus-Kala D/c corridor. Maharashtra Demand 18500-22000 MW, Nil SSP Generation, Less Gen. at TAPS	**Constraints:** 400 kV Kudus-Kala D/c lines carrying more than 500 MW each and the corridor is N-1 non-compliant. In Oct'18 & Nov'18, the corridor was N-1 non-compliant for 5% & 10% of the time respectively.
		Remedial Actions: Commissioning of 400kV Padghe (GIS) –Khargar and Padghe (GIS)-Ghatkopar would relieve Kudus-Kala D/C. 220kV outlets from Kudus would give some relief on Kudus-Kala D/C. At present 2x500MVA 400/220kV Kudus ICTs are idle charged in the absence of 220kV outlets. **43rd SCM:** 400 kV Bableshwar-Kudus D/C would be commissioned by May'19 and downstream network from Kudus would be commissioned by Mar'19. MSETCL to update
2	Transmission system for Koradi St-II (3x660MW) and IEPL (1x270 MW) Koradi-II station is connected with 400 kV Koradi II-Koradi III D/C, 220 kV Koradi II-Kaulewada D/C and LILO of 400 kV Wardha-Warora one circuit (Interim arrangement).	**Constraints:** At present Koradi-II units (3 X 660 MW) are commissioned and managed with SPS. System is N-1 non- compliant and there is no generation at IEPL. Also high loading of 400kV Warora-Wardha S/C is observed resulting in restricted operation of Bhadarwati HVDC & Chandrapur-Padghe Bipole.
		Remedial Actions: The Evacuation plan for APML, Tirora (5x660 MW) Rattan India, Amravati (5x270 MW), Chandrapur st-2 (2x500 MW), IEPL (2x270MW) and Dhariwal (1x300 MW) need to be studied by the STU in order to check whether the existing plan and available network will provide secure evacuation under various n-1 contingencies. HVDC Bhadrawati is operated at maximum. **1st WRSCT:** - LILO of Chandrapur-I – Parli 400 kV S/c line at Warora (M) has been already planned as a part of Intra state transmission and is under implementation. MSETCL is yet to review the CTU/CEA proposal before finalization to decide LILO of one circuit of Warora PS – Parli (PG) D/c line at Warora (M) or Warora (M) – Warora Pool 400 kV D/c line. MSETCL to update.
3	400 kV Bina-Shujalpur D/c	**Constraints:** High loading above 600 MW/ckt observed on most of the

S. No	Corridor Season/ Antecedent Conditions	Description of the constraints
		time in Q3 (17-18). No constraint observed in this quarter.
	N-1 insecure operation of Bina -Shujalpur D/C after commissioning of Shujalpur – RAPS D/C coupled with high Demand in MP of above 12000 MW.	**Remedial Actions:** **Present Status:** With the commissioning of Bipole of Champa-Kurukshetra, loading on Bina-Shujalpur D/C has reduced slightly. Commissioning of RAPS 7&8 generation would relieve the loading. **43rd SCM:** CEA suggested Shujalpur 400 kV S/s may be interconnected with another source like Indore or Bhopal to address the high loadings on Bina– Shujalpur 400 kV D/C. Interconnection of Shujalpur and Bhopal being proposed as a part of RE scheme
4	400kV Padghe Kalwa-D/c High loading is observed in general during High demand in Mumbai system.	**Constraint:** The corridor becomes N-1 non compliant when total loading is above 1100 MW. Many times Chandrapur-Padghe Bipole flow is restricted to control the loading on these lines. Also facilitating outage in this corridor on week days is difficult. Outages are being planned only on Saturday/Sundays with planned load shedding.
		Remedial Action: Commissioning of 400kV Ghatkopar S/S and Padghe (GIS)-Khargar, Padghe—Navi Mumbai-Ghatkopar and Khargar-Ghatkopar would give additional infeed to Mumbai and relieve loading of Padghe-Kalwa D/C. ISTS scheme is likely to be awarded in May 2019. MSETCL may update of Vikroli project.
5	220 kV Navsari (PG) - Navsari (GETCO) D/c Most of the time	**Constraints:** These lines are loaded above 150MW/ckt most of the time and the system is N-1 non compliant (considering N-1 loading as 250MW). Non compliant observed for 70%, 5% & 30% of the time in month of Oct'18, Nov'18 & Dec'18 respectively.
		Remedial Actions: Commissioning of 400kV Vav (II) S/s is planned by Gujarat by making LILO of 400kV Jhanor-Navsari one ckt & Ukai-Kosamba one ckt and may relieve loading on 220kV Navsari (PG)-Navsari ckts. 220kV Navsari-Bhesthan (Popada) D/C was to be implemented by DGENTPL under TBCB which is dropped at present. **43rd SCM:** M/s DGENTPL has intimated that they are

S. No	Corridor Season/ Antecedent Conditions	Description of the constraints
		not developing the scheme. As agreed in a meeting held on 23.01.18 among CTU, GETCO and NLDC, CTU and GETCO may study and plan the transmission scheme to reduce the over-loading of 220kV Vav-Popadiya, Vav-Navsari, and Navsari-Navsari (PG). GETCO has proposed to take the up scheme separately.
6	220kV Boisar-Boisar T/C With high demand of Mumbai and less generation at 220kV Tarapur, Trombay and Dahanu	**Constraint:** Non compliance observed for 58%(avg) of the time during this quarter.The ckts are mostly loaded above 200MW each and managed with load trimming scheme implemented by MSETCL. With commissioning of 4th ICT at Boisar, the loading on ckts has further increased. One ckt of 400kV Aurangabad-Boisar D/C and one ICT is kept open to control the loading on 220kV Boisar-Boisar ckts.
		Remedial Actions: **43rd SCM:** MSETCL stated that additional (4th) Ckt. between Boisar (PG)–Boisar (M) (LILO of Boisar–Borivali at Boisar (PG)) is scheduled for June, 2018. MSETCL to update.
7	220kV Jhanor(NTPC)-Haldarwa-D/c Almost most of the time with Jhanor gen. above 300MW.	**Constraint:** When the lines are carrying more than 150MW/ckt, the system is N-1 non compliant. 15% & 5% of the time lines were N-1 non compliant in the month of Oct'18 & Dec'18. Many reliability measures like bus split at Jhanor, and generation reduction had to be taken to facilitate the shutdown of one line.
		Remedial Actions: LILO of 220kV Haldarwa-Jagadia S/C line at Jhanor would relieve the loading. The LILO has been agreed in 36th SCM of WR. **35th WRPC &TCC discussions:** In the 35th WRPC meeting GETCO had intimated that the works associated with line have been already completed. However, the 220 kV bays at Jhanor are expected by Sept 2018, therefore the LILO of 220 kV Haldarwa–Jagadia S/C line at Jhanor S/s would be completed by Sept, 2018. GETCO to update.
8	220kV Amreli-Sawarkundla D/c	**Constriant:** When total loading on lines is equal or above 300MW, the system becomes N-1 non compliant (N-1 loading considered as 250MW). 55% of the time,

S. No	Corridor Season/ Antecedent Conditions	Description of the constraints
	High loading during Rabi season and when generation at Padva BECL and GPPC is not available in Gujarat system.	lines were N-1 non compliant during this quarter. **Remedial Action:** **Gujarat STU Plan (17-18):** LILO of one circuit of 220 KV D/C Amreli – Dhasa line at Botad. GETCO to update
9	220kV Ukai-Mota D/c When Ukai generation is high at 220kV side.	**Constraint:** When total loading on these lines is equal or above 340MW, the corridor becomes N-1 non compliant. **Remedial Action:** Commissioning of 400kV Vav S/s planned by Gujarat by making LILO of 400kV Jhanor-Navsari one ckt & Ukai-Kosamba one ckt would help in relieving the contraint. **43rd SCM:** GETCO stated that 400 kV Vav S/s would be commissioned by March, 2019. GETCO may update.
10.	220kV Pune PG-Talegaon D/c All the time	**Constraint:** 83 %(avg) of the time lines were N-1 non compliant during the quarter with total loading of more than 250MW. Further **o**ne ICT at Pune PG is kept out to control the line loading. **Remedial Action-** **43rd SCM:** 220kV Talegaon (PG)–Talegaon (M)–Urse–Chinchwad 220 kV D/C is planned & under implementation and this line has been completed up to Urse S/s. Thus, Pune (PG) and Talegaon(M) have 4 no. of 220 kV lines. Hhowever, 2 no. of Talegaon (PG) – Talegaon (M) are kept open to restrict the loading on 220kV Urse–Chinchwad. It was intimated that Urse–Chinchwad 220 kV D/C and Pune (PG)–Hingewadi 220 kV D/C would be completed by Dec, 2018. **Present Status:** Lines have not yet commissioned. MSETCL may update.
11.	220kV DSPM-Korba(E) With full generation in DSPM and less generation in Korba East and Budhipadar	**Constraint:** DSPM (2x250 MW) generation was planned with LILO of exisiting 220kV Korba West-Korba East one ckt and 220kV Suhela-Banari line. No addiional lines were planned for DSPM evacuation. This has resulted in overloading of 220kV DSPM-Korba East line when the power flow is towards Budhipadar end. SLDC CSPTCL raised concerns of forced backing down at DSPM even when they were overdrawing from the grid. For more than 55% (Avg) of the time line was loaded above 200MW during the quarter. **Remedial Action:** Additional 220 kV lines to be planned

S. No	Corridor Season/ Antecedent Conditions	Description of the constraints
		for DSPM generation and strengthen the interconnection between K(E) and DSPM. **43rd SCM:** CSPTCL stated that LILO of 220 kV Siltara – Korba (E) S/C at DSPM is under implementation, which would be completed by Aug, 2018. However, the 2 no. of 220 kV bays at DSPM have to be provided by M/s CSPGCL, which are expected to be ready by December, 2019. CSPTCL may update.
12	400kV Chandrapur-Chandrapur(II) D/C When generation at Chandrapur is less and Chandrapur(II) is high	**Constraint:** Less generation at Chandrapur is leading to critical loading on these lines. Chandrapur-Padghe HVDC flow had to be restricted to ensure N-1 security of these lines, which reduced the operational flexibility with HVDC and also caused low voltages at Parli, Lonikhand & Padghe area. **Remedial Action** **1st WRSCT:** LILO of one circuit of Chandrapur-I – Bhadravati 400 kV 2xD/c line at Chandrapur-II. MSETCL to update
13	400kV Tarapur-Boisar D/C With full generation of Tarapur	**Constraint:** 400kV TAPS-Boisar D/C (20.88km each) lines are shorter lines compared to TAPS-Padghe D/c (91km each) lines and Boisar being load centre, the power flows are not uniform and higher on shorter lines. The power flow further increases with the outage of Aurangabad-Boisar one ckt. TAPS-Boisar D/C being short lines, on tripping of one ckt, 80% of total power flows on the other line. It is difficult to provide shutdown of the lines and NPCIL is always writing to WRLDC to maintain uniform flow on all lines from TAPS and also to control the flow on TAPS-Boisar lines whenever the flow is more than 500MW. HVDC Chandrapur-Padghe maximisation is restricted with constraints at Sl No. 12.
14	220kV Gwalior PG-Mahalgaon D/c lines During Rabi crop season, when demand above 11000MW	**Constraint:** The lines were carrying more than 260MW for 60% of the time and were N-1 non-compliant during the quarter.
15	220kV Itarsi PG-Itarsi D/c lines During Rabi crop season, when demand	**Constraint:** More than 90% of the time, the lines were carrying above 260MW (total) and was N-1 non compliant in month of Oct'18 & for more than 20% of the time during Nov'18 & Dec'18.

S. No	Corridor Season/ Antecedent Conditions	Description of the constraints
	above 11000MW	
16	400kV Parli PG-Parli MS D/c loading High demand of Maharashtra	When total loading on lines is equal or above 900MW, the system becomes N-1 non compliant. More than 65%, 30% & 15% of the time, the system was N-1 non compliant in the month of Oct'18, Nov'18 & Dec'18 respectively. **Remedial Action:** 2x500MVA ICTs and bays at Parli (PG) are commissioned in July'18. **43rd SCM:** The LILO of 220 kV Parli–Harangul S/c at Parli (PG) was expected to be Commissioned by Dec, 2018. LILO of Osmanabad (M)–Parli 220 kV S/c at Parli (PG) just completed on 18.1.19 and relieved the loading on Parli-(PG)-Parli (MS) lines considerably.

ICT Constraints

S. No.	ICT	Season/ Antecedent Conditions	Description of the constraints
1	2 x 315 MVA 400/220 kV Chakan ICTs	All time	**Constraints:** The system is not N-1 compliant with each ICT carrying more than 220MW. MSETCL has implemented load trimming scheme to take care of overloading.
			Remedial Actions: **43rd SCM:** MSETCL intimated that LoI has been placed for additional 400/220 kV, 315 MVA ICT at Chakan S/s and the same is expected to be commissioned by March,2019.
2	(2x315+1x 500MVA) 400/220kV Parli(MS) ICTs	Demand of Maharashtra 22000MW & Drawl of 8000MW. Low Parli generation	**Constraints:** During the quarter, ICTs were n-1 non-compliant (N-1 of 500MVA ICT) for 13% of time in Oct'18 and 23% of the time in Nov'18. The ICT loading increases further if the generation is less at Parli. MSETCL has implemented load trimming scheme to take care of overloading under contingencies.
			Remedial Actions: 2x500MVA ICTs and bays at Parli (PG) are commissioned in July'18. **43rd SCM**: The LILO of 220 kV Parli–Harangul S/c at Parli (PG) was expected to be Commissioned by Dec, 2018 and LILO of Osmanabad (M)–Parli 220 kV S/c at Parli (PG) was expected by Sep, 2018. **Present Status**: LILO of Osmanabad (M)–Parli 220 kV S/c at Parli (PG) just completed on 18.1.19.
3	2x315+ 1x500MVA 400/220kV Kolhapur (MS) ICTs	Demand of Maharashtra 22000MW & Drawl of 8000MW. Low Wind generation in Southern part.	**Constraints:** The ICTs are N-1 non-compliant when wind generation is very low in Southern Maharashtra. In April 2017, two blackouts have occurred at Karad and Kolhapur S/s causing load loss of more than 1800 MW. MSETCL thereafter planned and implemented load trimming scheme.
			Remedial Actions:

S. No.	ICT	Season/ Antecedent Conditions	Description of the constraints
			43rd SCM: LILO of 220 kV Vita-Miraj S/C line at Alkud S/s by Sep'18. 220 kV Jet–Mhaisal S/c line at Alkud S/s by Mar'19. Replacement of one 315 MVA ICT by 500 MVA at Kolhapur MS. Operationalization of 220kV Kolhapur-Chikkodi & 220kV Mudsungi-Chikkodi would relieve the loading on ICTs and improve reliability of supply in Kolhapur area. **Present Status:** Vita-Miraj LILO at Alkud completed on 1-Oct-18.
4	2x500MVA 400/220kV Sholapur (MS) ICTs	With Demand in Maharshtra system above 22000 MW & Drawl of 8000MW.	**Constraints:** It is observed that the ICTs are highly loaded and N-1 non-compliant. MSETCL has implemented load trimming scheme to take care of overloading. No constraint observed in this quarter.
			Remedial Actions: To control overloading, load has to be shifted from Lamboti ICTs to Sholapur (PG) ICTs which are underutilised. As an intrim arrangement 400kV Solapur PG-Karad S/c line is being used as 220kV Solapur PG-Jeur S/c line which relieved the loading on Solapur MS ICT's. **43rd SCM:** ICT-3(500 MVA) is proposed at Solapur (MS) & expected by Mar'19. **Present Status:** With the COD of Unit-1 at Solapur NTPC, constraints were observed in the 400kV Solapur –Kolhapur & 400kV Solapur-Alkud lines under N-1 contigency. Restoration of 400kV Solapur-Karad to be done on priority basis.
6.	2x500MVA +1x600MVA 400/220kV Kalwa ICTs	Maharshtra system above 22000 MW (Mumbai 2900 MW) & Drawl of 8000MW.	**Constraints:** With increased demand and low network augmentation in the area, the system is not N-1 compliant. For about 35% and 15% of the time, the ICTs were N-1 non compliant in the month of Oct'18 & Nov'18.
			Remedial Actions:

S. No.	ICT	Season/ Antecedent Conditions	Description of the constraints
			The Navi Mumbai substation need to be utilized with 220 kV network augmentation. 400kV Ghatkopar S/s and 400kV Navi Mumbai to be expedited along with commissioning of 400kV Padghe GIS-Kharghar-Ghatkopar & 400kV Padghe GIS-Navi Mumbai-Ghatkopar lines. **As per 42nd SCM:** MSETCL intimated that 4th 400/220 kV 500 MVA ICT at Kalwa S/S is expected to be commissioned by June 2018. **Present Status:** Fourth ICT is not yet commissioned.
7	315MVA+ 500MVA 400/220kV Itarsi ICTs	Madhya Pradesh Demand above 12000MW	**Constraint :** System is not N-1 compliant for tripping of 500MVA ICT. For about 20% of the time ICTs were N-1 non compliant in month of Oct'18. **Remedial Actions:** Load trimming scheme to be planned by SLDC, MP/MPPTCL for contingency of 500 MVA ICT. **43rd SCM**: MP has planned 220kV Itarsi-Budhini D/C which would carry 100MVA load. Therefore, instead of replacing the 315MVA ICT with 500MVA ICT, 3rd 500 MVA, 400/220kV ICT at Itarsi S/s is approved in 1st WRSCT meeting.
8	2x315MVA 400/220kV Kala ICTs	With commissioning of 765kV Aurangabad PG-Padghe D/c, 400kV Padghe-Kudus -Kala D/c corridor and increased load of DNH	**Constraint:** It is observed that ICTs are loaded above 250MW and are N-1 non-compliant. One ckt of 765kV Aurangabad-Padghe is opened to control Kala ICT loading. **Remedial Actions:** **43rd SCM:** 3rd ICT of 500 MVA is planned and expected in Sep'18. **Present Status:** Kala ICT-3(500 MVA) charged on 21-Nov-18. ICT loadings are relieved however constraint shifted from ICTs to 400kV Kudus-Kala D/c lines.
9	2x315MVA ICTs at Raita	With Demand 4000MW & drawl & above 1300 MW in	**Constraint:** When total loading of ICTs is above 450MW, it becomes N-1 non-compliant & for about 20% of the time ICTs were N-1 non-compliant in month of Oct'18.

S. No.	ICT	Season/ Antecedent Conditions	Description of the constraints
		Chhattisgarh	
10	2x315MVA ICTs at Akola-MS	Demand of Maharashtra above 21000MW & Drwal of 7500MW	**Constriant:** Akola ICTs becomes N-1 non compliant when total loading is above 420MW. In the month of Oct'18 & Nov'18 more than 20% of the time, ICTs were N-1 non compliant. **Remedial Action:** Maharashtra has implemented load trimming scheme for ICT overloading. Additional ICT may be planned at Akola.
11	2x315MVA ICTs at Wardha-PG	Demand of Maharashtra above 22000MW & Drwal of 8000MW	**Constriant:** ICTs becomes N-1 non-compliant when total loading is above 440MW. More than 40% and 20% of the time, ICTs were N-1 non compliant in month of Oct'18 & Nov'18. **Remedial Action:** After implementation of scheme to control fault level at Wardha S/s, the ICT loading is expected to significantly reduce.
12	2x315MVA ICTs at Bhatapara-PG	Demand of Chhattisgarh above 4000MW with 1300MW drawl	**Constriant:** ICTs becomes N-1 non compliant when total loading above 430MW. More than 40% of the time ICTs were N-1 non compliant in the month of Oct'18.
13	2x315MVA ICTs at Raigarh PG	Demand of Chhattisgarh above 4000MW with 1300MW drawl	**Constriant:** ICTs becomes N-1 non compliant when total loading is above 400MW. More than 80% of the time ICTs were N-1 non compliant in the month of Oct'18 and about 5% of the time in the month of Nov'18.
14	2x1500MVA ICTs at Ektuni	When ICTs loaded above 900MW & High generation at Tirora & Koradi(II)	**Constraint:** When total loading on ICTs crosses above 1800MW, ICTs becomes N-1 non compliant (N-1 loading considered as 1617MW i.e 110% of rating). For about 5% of the time ICTs were N-1 non compliant in month of Oct'18 & Nov'18. Further loading on these ICTs are sensitive to generation at APML Tirora (18%) & Koradi (II) (13%).
15	3x315MVA ICTs at Bina MPPTCL	MP demand of about 11000MW and above	**Constriant:** ICTs becomes N-1 non compliant when total loading is above 750MW. For about 10% & 20% of the time ICTs were N-1 non compliant in the month

S. No.	ICT	Season/ Antecedent Conditions	Description of the constraints
			of Nov'18 % Dec'18. **Remedial Action:** To control the loading, 220kV Bina-Shivpuri and 220kV Bina-Datia lines were opened in some of the instances by MP.
16	2x315MVA ICTs at Morena (CWRTL)	MP demand of 12000MW, Drawl of about 6500MW during Ravi Crop Season	**Constriant:** ICTs becomes N-1 non compliant when total loading is above 440MW. For about 10% of the time ICTs were N-1 non compliant in the month of Dec'18. **1st WRSCT:** 220kV Morena-Bhind D/c planned for meeting the load of around 100MW in Bhind area that would further increase the loading of these ICTs.
17	2x315MVA ICTs at Pitampura	MP demand 11000MW, Drawl 6500MW.	**Constriant:** ICTs becomes N-1 non compliant when total loading is above 440MW. For about 20%, 30% & 10% of the time ICTs were N-1 non compliant in the month of Oct'18, Nov'18 & Dec'18 respectively.
18	2x315,1x500 MVA ICTs at Satna-PG	MP demand 11000MW, Drawl 6500MW.	**Constriant:** ICTs becomes N-1 non compliant when total loading is above 730MW. For about 30% of the time ICTs were N-1 non compliant in the month of Oct'18, Nov'18 & about 8% of the time in Dec'18. 220kV Satna PG-Maihar line was kept open to control the ICTs loading by SLDC MP.
19	2x315 MVA ICTs at Seoni-PG	MP demand 11000MW	**Constraint:** ICTs becomes N-1 non compliant when total loading is above 380MW. Loading was more due to prolonged outage of ICT at Satpura from 19th April 2018. This ICT will be disconnected from Grid as intimated by SLDC MP in 514th OCCM of WR. Outage on Seoni ICT could not be facilitated in day time and allowed only after 2000hrs.

Nodes Experiencing Low Voltage

S. No	Nodes	Season/ Antecedent Conditions	Description of the constraints
1	400 kV Padghe MSETCL	Peak hours	**Constraints:** Voltage was below 380kV for 11% of the time. **Remedial Actions:** Load Trimming scheme is installed at Padghe. However, proper coordination and monitoring of capacitor bank switching at lower voltage level alongwith network augmentation at 220 kV level is very much required. Shifting of Padghe load at Kudus (2 nos of 400/220kV ICTs are idle charged) would help in improving the voltage profile at Padghe. Also Commissioning of 400kV Padghe GIS-Kharghar-Ghatkopar & 400kV Padghe GIS-Navi Mumbai-Ghatkopar line would further improve the scenario.
2	400kV Jetpur	Morning Hours, During agricultural load (Ravi Crop Season)	**Constraint:** When the agricultural loads are picked up, very low voltages are observed in Jetpur area of Gujarat. The fixed line reactors of 400kV CGPL-Jetpur D/c lines at Jetpur end are opened many times to improve the voltage profile, but affects reliability as the lines have to be opened one by one to take out reactors. **Remedial Actions:** Capacitor banks at 220kV level may be planned to avoid switching off of non switchable line reactors of long (334kM) 400kV CGPL-Jetpur D/c.
3	400kV Jejuri MSETCL	Morning Hours, When Demand is more than 22000 MW	**Constraints:** Very low voltages are being observed when Maharashtra is drawing about 8500MW from the grid during morning hours. The 400kV Lonikhand-Karad S/c line LILO at Jejuri and commissioning of 400/220/33kV Hinjewadi S/s by LILO of Jejuri-Lonikhand at Hinjewadi has been already planned by STU. Commissioning of these lines on priority basis would help in improving the voltage profile in Jejuri area.

Nodes Experiencing High Voltage

S. No.	Nodes	Season/ Antecedent Conditions	Description of the Constraints
1	400kV Kalwa MSETCL	During off peak hours	Voltage beyond IEGC limit ie. >420kV for 46% of the time during this quarter. No reactive compensation is available at Kalwa. During off peak hours to control the voltages at Kalwa, HVDC Chandrapur-Padghe Bipole is being reduced & some times it is being blocked. **Remedial Action:** Dynamic Reactive compensation is to be planned either at Kalwa or Padghe MS.
2	400kV Aurangabad(Waluj)	During off peak hours	Voltage above 420kV for 43% of the time. High Voltage results in opening of transmission lines. **42nd SCM:** 240 MVAR Additonal Bus Reactor planned at 765kV Aurangabad PG.
3	400kV Chandrapur II	All Time	Voltage was above 420kV for 73% of the time. **Remedial Actions**: Additional Bus Reactors and better filter coordination of HVDC Chandrapur Padghe Bipole at Chandrapur end is required. **42nd SCM:** 125MVAR Bus Reactor planned at Chandrapur (II) end.
4	400 kV Dhule MSETCL	All Time	Voltage above 420kV for 56% of the time. One ckt of 400 kV SSP-Dhule D/C and one ckt of 400kV Dhule-Khandwa D/C is opened to control the voltages. This weakens Madhya Pradesh-Maharashtra Interconnection. Also 765kV Dhule-Vadodara is being opened on daily basis & its LR is being used as BR at Dhule BDTCL end. **Remedial Actions**: 2x50 MVAR Line Reactors of SSP-Dhule lines at Dhule end are out of service since Apr'15 and Dec'16 and the same is to be revived urgently. **42nd SCM**: 125 MVAR Bus Reactor is

S. No.	Nodes	Season/ Antecedent Conditions	Description of the Constraints
			planned.
5	400 kV Mapusa PG	During Off Peak hours	Voltage above 420kV for 35% of the time in this quarter. Almost everyday one ckt of 400kV Kolhapur-Mapusa is kept out on HV which affects the N-1 security of Goa supply. Also in some occasions, HV resulted in blackout of Goa system. **Remedial Actions**: Proper co-ordination of switching of capacitor banks is required at 132 kV and below by Goa. Additional bus reactor may be planned. At present voltage grading done in Kolhapur-Mapusa D/C lines to avoid opening on high voltage.
6	400 kV Rajgarh PG	All time	Voltage above 420kV for 44% of the time. One ckt of 400 kV Rajgarh-SSP D/c, One Ckt of 400 kV Nagda-Rajgarh D/c or Khandwa-Rajgarh is kept open most of the time to control the voltages. Also FSC of Rajgarh-Kasor D/c lines is being kept out. **42nd SCM:** 125 MVAR bus Reactor planned.
7	400kV Raigarh PG	Almost all the time	Voltage above 420kV for 45% of the time.
8	765kV Solapur PG	During off peak hours	Voltages above 800kV were observed for 11% of the time even after opening of one 765kV New parli-Solapur and 765kV Pune GIS-Solapur S/c (LR as BR at both ends) **42nd SCM:** Additional 240 MVAR Bus reactor planned at Solapur PG.
9	400kV Seoni PG	Most of the time	Voltage above 420kV for 75% of the time. **Remedial Action**: FSC of Khandwa-Seoni line is being opened to control the voltages.
10	400kV Dehgam PG & 400kV Sami	Most of the time	Voltage above 420kV for 74% & 59% of the time.
11	400kV GPEC	Most of the time	Voltage above 420kV for 68% of the time.
12	400kV Koradi MSETCL &	Most of the time	Voltage above 420kV for 52% & 57% of the time. HV resulted in tripping of 400kV lines from Khaparkheda in the absence of adequate

S. No.	Nodes	Season/ Antecedent Conditions	Description of the Constraints
	400kV Khaparkheda MSETCL		reactive compensation at Khaparkheda. **Remedial Action**: 42nd SCM- 125 MVAR reactor planned by MSETCL at Khaparkheda to be expedited.
13	400kV Nanded MSETCL	Most of the time	Voltage above 420kV for 42% of the time even after opening of 400kV Nanded-Chandrapur (II) one line. No reactive compensation was planned at the time of commissioning. Also there is no LR at Nanded end on 400kV ChandrapurII-Nanded D/c lines. **42nd SCM**- 125MVAR Bus reactor is planned by MSETCL and to be expedited.
14	400kV Akola MSETCL	During off peak hours	**Voltage** above 420kV observed for 32% of the time. **42nd SCM:** 125 MVAR bus reactor planned at Akola by MSETCL to be expedited.
15	400kV Korba West, 400kV Marwa & 400kV Raita	During less demand period	Voltage above 420kV for 56%, 95% & 47% of the time in Oct, Nov and Dec'18. No Bus reactors available at Raita, Marwa & Bhilai. **Remedial Action**: Reactive compensation may be planned at Raita/Marwa/Bhilai.
16	400kV Essar Vadinar	Most of the time	Voltage above 420kV for 69% of the time. Generation normally not scheduled at Vadinar. **Remedial Action:** One line is being opened on regular basis on high voltage.
17	400kV Ukai	Most of the time	Voltage above 420kV for 74% of the time. No reactive compensation planned at Ukai. Further 400kV SSP-Dhule D/c LR are out at Dhule end since Apr'15 and Dec'16.
18	400kV New Koyna	Most of the time	Voltage above 420kV for 67% of the time.
19	400kV Julwania	During off peak hours	Voltage above 420kV for 52% of the time. To control the voltages, 400kV Julwania-Singaji or Julwania-Chegaon line is being opened on regular basis.
20	400kV Uno-sugen	During off	Voltage above 420kV for 51% of the time.

S. No.	Nodes	Season/ Antecedent Conditions	Description of the Constraints
		peak	Bus Reactor (80MVAr) at Unosugen is under outage since 11th July 2018.
21	400kV GMR Chhattisgarh	During off peak hours	Voltage above 420kV for 42% of the time.
22	400kV Kakrapar 3&4	During off peak hours	Voltage above 420kV for 43% of the time.
23	765kV New Parli & 765kV Warora PS	During off peak hours	Voltage above 800kV for 5% & 10% of the time during the quarter. One circuit of 765kV New Parli-Solapur, one ckt of 765kV Warora PS-New Parli & 765kV Pune-Solapur S/c are kept out to control HV.
24	765kV Padghe GIS	During off peak hours	Voltage above 800kV for 7% of the time during the quarter. One circuit of 765kV Aurangabad-Padghe is normally kept to control HV.

25 Transmission System for evacuation of Power from potential solar and wind energy zones (17.5 GW) in Western Region [12.5 GW Solar + 5 GW Wind])

25.1 Govt. of India had set a target for establishing 175 GW renewable capacity by 2022, which includes 100 GW Solar, 60 GW Wind generation capacity. MNRE vide its order dated 08.06.2018 had constituted a Sub-Committee to identify ISTS connectivity for renewable energy projects from potential solar energy zones (SEZs) and potential wind energy zones (WEZs) of about 50 GW and 16.5 GW respectively. SEZs and WEZs envisaged in 7 RE rich states (Tamil Nadu, Andhra Pradesh, Karnataka, Gujarat, Rajasthan, Maharashtra and Madhya Pradesh) were identified by SECI in association with MNRE in consultation with RE power developers.

To ease implementation of transmission infrastructure, it was proposed to bifurcate these requirements in two phases. A total of 20GW solar & 9 GW wind projects has been planned in Phase-I (up to Dec'2020) and 30 GW solar & 7.5 GW wind has been planned for Phase-II (Dec '2021). For Western Region the same translates into a requirement of 7.5GW solar and 3GW wind [10.5GW] in Phase-I (up to Dec'2020) and 12.5GW solar and 5GW wind [17.5GW] in Phase-II (Dec '2021) totalling to 28GW. The details of SEZs & WEZs in Western Region are given below:

State/District	Solar Energy Zones			Wind Energy Zones			Total (Solar + Wind)		
	Ph-1 (GW)	Ph-2 (GW)	Total	Ph-1 (GW)	Ph-2 (GW)	Total	Ph-1 (GW)	Ph-2 (GW)	Total
	2020	2021		2020	2021		2020	2021	
Gujarat									
Kutch (S: Rapar; W: Bhuj & Lakadia)	3	2	5	2	2	4	5	4	9
Banaskantha (S: Vav / Tharad)	0	2.5	2.5	0	0	0	0	2.5	2.5
Jamnagar (S: Lalpur)	1	1.5	2.5	0	0	0	1	1.5	2.5
Dwarka (W)	0	0	0	1	1	2	1	1	2
Subtotal	**4**	**6**	**10**	**3**	**3**	**6**	**7**	**9**	**16**
Maharashtra									
Osmanabad	0	0	0	0	2	2	0	2	2
Solapur	1	1.5	2.5	0	0	0	1	1.5	2.5
Wardha	0	2.5	2.5	0	0	0	0	2.5	2.5
Subtotal	**1**	**4**	**5**	**0**	**2**	**2**	**1**	**6**	**7**
Madhya Pradesh									
Rajgarh	2.5	0	2.5	0	0	0	2.5	0	2.5
Khandwa	0	2.5	2.5	0	0	0	0	2.5	2.5
Subtotal	**2.5**	**2.5**	**5**	**0**	**0**	**0**	**2.5**	**2.5**	**5**
Total	**7.5**	**12.5**	**20**	**3**	**5**	**8**	**10.5**	**17.5**	**28**

25.2 The transmission schemes for evacuation of power from potential solar and wind energy zones for **10.5 GW (7.5 GW wind + 3 GW solar)** under Phase-I were agreed in the 1st meeting of Western Region Standing Committee on Transmission (WRSCT) held on 5.9.2018. The schemes were further deliberated in the 2nd NCT meeting held on 04.12.2018 & 3rd ECT meeting held on 21.12.2018. The transmission scheme associated with potential RE projects in Western Region along with recommendation of 2nd NCT and 3rd ECT regarding its implementation is as given below:

S. No.	Name of Scheme:	Estd cost (Rs. Cr.)	ECT Recomd.	Allocated to BPC
1.	Additional 1x500MVA 400/220kV (9th) ICT, for injection from any additional RE project (other than 4000MW injection under SECI bids upto Tranche IV) at Bhuj PS	56.3	RTM (POWERGRID) -	
2.	WRSS-21 Part-A (TBCB)- "Transmission System strengthening for relieving over loadings observed in Gujarat Intra-state system due to RE injections in Bhuj PS	856	TBCB	REC
3.	WRSS-21 Part-A (RTM) - Conversion of existing 2x63MVAR line reactors at Bhachau end of Bhachau – EPGL 400kV D/c line to switchable line reactors	19	RTM (POWERGRID)	
4.	WRSS-21 Part-B- Transmission System strengthening for relieving over loadings observed in Gujarat Intra-state system due to RE injections in Bhuj PS:	1865	TBCB	PFC
5.	Transmission system associated with RE generations at Bhuj–II, Dwarka & Lakadia	1075	TBCB	REC
6.	Transmission System for providing connectivity to RE projects at Bhuj-II (2000MW) in Gujarat	645	TBCB	PFC
7.	Jam Khambhaliya Pooling Station and Interconnection of Jam Khambhaliya Pooling Station for providing connectivity to RE projects (1500 MW)in Dwarka (Gujarat)and installation of 400/220 kV ICT along with associated bays at M/s CGPL Switchyard	435 (229+169+ 37)	TBCB	REC
8.	400kV line bay at Solapur PS for St-II connectivity to M/s Toramba	10	RTM (POWERGRID)	
9.	Transmission System for providing connectivity to RE projects in Gujarat [Lakadia (2000MW)]*	196	Proposed for potential basis based on the LTA applications of SECI	
10.	Transmission system associated with RE generations from potential wind energy zones in Osmanabad area of Maharashtra*	301		
11.	Transmission system associated with RE generations from potential Solar Energy Zone in Maharashtra (1000 MW under Ph-I)*	220		

* The schemes to be taken up for implementation after receipt of connectivity/LTA applications from RE generation developers / LTA applications from SECI

25.3 Transmission system associated with RE generations (10.5 GW) in Western Region, interalia, included creation of pooling stations in **Gujarat [Wind: Bhuj II (2000 MW), Lakadia (2000 MW) & Dwarka (1500 MW); Solar: Lakadia (2000 MW)] and Maharashtra [Wind: Osmanabad (2000 MW) & Solar: Solapur (1000 MW)]** and associated transmission lines as given below:

i) Bhuj PS – Lakadia PS 765 kV D/c line

ii) LILO of Bhachau – EPGL 400 kV D/c (triple) line at Lakadia PS

iii) Lakadia – Vadodara 765 kV D/c line

iv) Lakadia PS – Banaskantha PS 765 kV D/c line

v) Reconfiguration of Bhuj PS – Lakadia PS 765kV D/c line so as to establish Bhuj II – Lakadia 765 kV D/c line as well as Bhuj – Bhuj II 765kV D/c line

vi) Extension of Essar – Lakadia/Bhachau 400kV D/c (triple) line up to Jam Khambhaliya PS

vii) LILO of both circuits of Parli(PG) – Pune(GIS) 400kV D/c line at Kallam PS

viii) Solapur pooling point – Solapur (PG) 400 kV D/c line (twin HTLS)

The detailed scope of works with respect to the above schemes is given under **Annexure-14.**

25.4 The status of RE Stage-II connectivity & LTA received/granted by CTU in Western Region is as follows (as on 31.03.2019):

Sl.	Location	Stage-II Conn. Quantum (MW)	LTA applied/granted (MW)
1	Bhuj PS	5089.5	3939.5
2	Jam Khambhaliya PS	600.6	250
3	Bhachau S/s	700	650
4	Solapur S/s	300	0
5	Bhuj - II PS	1100	1050
	Total	**0**	**0**

25.5 Out of total 28GW REZ [20GW Solar + 8GW Wind], transmission system for 10.5GW REZ [3GW Solar + 7.5GW Wind] has already been planned. For the balance 17.5GW [12.5GW Solar + 5.0 GW Wind], joint study meetings amongst CEA, CTU and POSOCO were held on 24.04.2019 and 25.04.2019 in order to identify the broad transmission schemes to cater to the balance REZs in WR.

25.6 The state-wise transmission systems deliberated and proposed for integration of 17.5 GW RE potential in WR is summarized below:

1. Transmission scheme for Solar & Wind Energy Zone in Gujarat (7500 MW)

(a) Kutch (Rapar) SEZ 5000 MW (3000MW near Rapar and 2000MW near Lakadia) & Banskantha SEZ 2500 MW

Alternative-1

i) Establishment of 400/220 kV 10x500 MVA Kutch Pooling Point (near Rapar)

ii) Establishment of 400/220 kV, 5x500 MVA Banaskantha Pooling Point

iii) Establishment of 400 kV switching station at Patan

iv) Establishment of 765/400/220 kV, 3x1500 MVA & 3x500 MVA at suitable location near Ahmedabad

v) Kutch PP- Lakadiya 400 KV D/c line (Twin HTLS)

vi) Kutch PP- Patan 400 kV 2xD/c line (Twin HTLS-multi circuit)

vii) Banaskantha PP - Patan 400 kV D/c line (Twin HTLS)

viii) Banaskantha PP - Sankhari 400 kV D/c line (Twin HTLS)

ix) Patan - Sami 400 kV D/c line (Twin HTLS)

x) Patan - Ahmedabad 400 kV 2xD/c line-Twin HTLS M/c

xi) LILO of Pirana(T) – Pirana(PG) 400kV D/c line at Ahmedabad with twin HTLS along with reconductoring of Pirana – Pirana(T) line with twin HTLS conductor

xii) Ahmedabad – Indore 765 kV D/c line

xiii) Ahmedabad – Vadodara 400 kV D/c line –Twin HTLS

xiv) Vadodara - Dhule 765 kV D/c line

xv) 220 kV line bays for interconnection of solar projects(25 nos)

xvi) Associated Reactive Compensation (Line + Bus)

Alternative-2

i) Establishment of 765/400 kV 3x1500 MVA & 400/220kV, 6x500MVA Kutch Pooling Point (near Rapar)

ii) Establishment of 765/400/220 kV, 2x1500 MVA at suitable location near Ahmedabad

iii) Augmentation of transformation capacity at Radhanesda PS by 5x500 MVA

iv) Radhanesda PS - Sankhari 400 kV D/c line (Twin HTLS)

Or

Radhenesda PS – Banaskantha – Sankhari 400kV D/c corridor (AL59 conductor)

v) Kutch PP (near Rapar) - Ahmedabad 765kV D/c line

vi) LILO of Lakadia – Banaskantha 765kV D/c line at Kutch PP (near Rapar)

vii) LILO of Pirana(T) – Pirana(PG) 400kV D/c line at Ahmedabad with twin HTLS along with reconductoring of Pirana – Pirana(T) line with twin HTLS conductor

viii) Ahmedabad – Indore 765 kV D/c line

ix) Augmentation of transformation capacity at Lakadia PS by 1X1500 MVA

x) 220 kV line bays for interconnection of solar projects(25 nos)

xi) Associated Reactive Compensation (Line + Bus)

(b) **Jamnagar SEZ 2500 MW**

Alternative-1

i) Establishment of 400/220 kV, 5x500 MVA at Lalpur (Jamnagar) PS

ii) Establishment of 400/220 kV, 2x500 MVA at Jasdan

iii) Lalpur (Jamnagar) Pooling station - Jasdan PS 400 kV D/c line (Twin HTLS)

iv) Lalpur (Jamnagar) Pooling station – Kalavad (GETCO) 400 kV D/c line (Twin HTLS)

v) Lalpur (Jamnagar) Pooling station – Jam Khmabliya 400 kV D/c line (Twin HTLS)

vi) Jasdan- Hadala (GETCO) 400kV D/c (Twin HTLS)

vii) Jasdan – Vadodara 400 kV D/c line (Twin HTLS)

viii) 220 kV line bays for interconnection of solar projects (8 nos)

ix) Associated Reactive Compensation (Line + Bus)

Alternative-2

i) Establishment of 400/220 kV, 5x500 MVA at Lalpur (Jamnagar) PS

ii) Establishment of 400/220 kV, 2x500 MVA at Jasdan

iii) Lalpur (Jamnagar) Pooling station - Jasdan PS 400 kV D/c line (Twin HTLS)

iv) Lalpur (Jamnagar) Pooling station – Jam Khamabliya 400 kV D/c line (Twin HTLS)

v) LILO of CGPL- Jetpur 400 kV D/C(triple) at Jasdan

vi) Jasdan – Ahmedabad 400 kV D/c line (Twin HTLS)

vii) 220 kV line bays for interconnection of solar projects (8 nos)

viii) Associated Reactive Compensation (Line + Bus)

2. Transmission scheme for Solar & Wind Energy Zone in Maharshtra(4000 MW)

(a) Solapur SEZ 2500 MW (Phase-I (1000MW) + Phase-II (1500MW) under ISTS)

Phase-I (1000MW)

i) Toramba – Solapur (PG) 400kV S/c line (dedicated line, of M/s TREPL with St-I connectivity of 900MW & St-II connectivity of 300MW)

Phase-II (1500MW) (under ISTS)

i) Establishment of 400/220 kV, 2x500 MVA at Solapur PS*

ii) Augmentation of 400/220 kV, Solapur PS with 1x500MVA, 400/220kV transformer

iii) Solapur PS – Solapur(PG) 400 kV D/c line (Twin HTLS)*

iv) 220 kV line bays for interconnection of solar projects(8 nos)

v) 1x125 MVAR, 420 kV Bus Reactor at Solapur PP*

*Already agreed in the 1st WRSCT

Parli(PG) - Parli(MSETCL) 400kV D/c line overloading to be reviewed. ISTS line reconductoring may also be considered.

(b) Wardha SEZ 2500 MW

Alternative-1

i) Establishment of 400/220 kV, 5x500 MVA at Wardha PP

ii) Wardha PP - Warora Pool 400 kV D/c line (Twin HTLS)

iii) Wardha PP - Warora (MSETCL) 400 kV D/c line (Twin HTLS)

iv) 220 kV line bays for interconnection of Solar projects (8 nos)

v) 1x125MVAr bus reactor at Wardha PS

Alternative-2

i) Establishment of 400/220 kV, 5x500 MVA at Wardha PP

ii) LILO of Wardha PS - Warora Pool 400 kV D/c (Quad) line at Wardha PP

iii) 220 kV line bays for interconnection of Solar projects (8 nos)

iv) 1x125MVAr bus reactor at Wardha PP

3. Transmission scheme for Solar & Wind Energy Zone in Madhya Pradesh (5000 MW)

(a) Rajgarh 2500 MW

i) Establishment of 400/220 kV, 5x500 MVA at Rajgarh PP

ii) Rajgarh PP -Bhopal 400 kV D/c line (HTLS)

iii) Rajgarh PP –Shujalpur 400 kV D/c line (HTLS)

iv) 220 kV line bays for interconnection of solar & wind projects (8 nos)

v) 1x125 MVAR, 420 kV Bus Reactor at Rajgarh PP

* Shujalpur (PG) – Shujalpur (MPPTCL) 220kV D/c line overloading to be reviewed.

(b) Khandwa SEZ: 2500 MW

Alternative-1

i) Establishment of 400/220 kV, 5X500 MVA at Khandawa PP

ii) Khandwa PS - Khandwa Pool D/c line (Twin HTLS)

iii) Khandwa PS - Chegaon (MPPTCL) D/c line (Twin HTLS)

iv) 220 kV line bays for interconnection of solar projects (8 nos)

v) Associated Reactive Compensation

Alternative-2

i) Establishment of 400/220 kV, 5X500 MVA at Khandawa PP

ii) Khandwa PP - Khandwa Pool 2XD/c line (Twin HTLS)

iii) Augmentation of 1X1500 MVA 765/400kV ICT at Khandwa Pool(Sterlite)

iv) 220 kV line bays for interconnection of solar projects (8 nos)

v) Associated Reactive Compensation

25.7 The additional agenda notes for this item including assumptions / power flow study results with the above-proposed transmission schemes along with other details would be made available shortly.

25.8 Members may deliberate.

26 38th meeting of WR constituents regarding connectivity / open access applications.

26.1 The 38th meeting of WR constituents regarding connectivity / open access applications would be held after WRSCT meeting. The agenda for the meeting would be circulated by CTU separately.

26.2 The summary of Stage-II connectivity and LTA agreed for grant to RE projects in the 30th to 37th WR Connectivity / LTA meetings held between 05.09.2018 and 25.04.2019 is enclosed as **Annexure-15.**

27 Other Agenda Items with the permission of the chair.

--------X-------

Annexure – 1A

Status of TBCB Transmission Projects - Western Region

S.No.	Name of the Project	BPC /Implementing Agency / Milestones	Scope of works	Current Status
1	System Strengthening in NR for import of power from North Karanpura and other projects outside NR and System Strengthening in WR for import of power from North Karanpura and other projects outside Western Region and also for projects within Western Region. Estimated Cost Rs. 2700 Cr	REC NKTCL (Reliance Power Transmission Company Ltd) **Milestones:** (i) SPV acquired by Reliance on 20-05-2010 (ii) Approval u/s 164 received on 12.08.2013.	(i) Sipat/Korba (Pooling) - Seoni 400 kV D/C line (ii) Lucknow - Bareilly 765 kV D/C line (iii) Bareilly - Meerut 765 kV D/C line (iv) Agra - Gurgaon(ITP) 400 kV D/C line (v) Gurgaon (ITP) - Gurgaon (PG) 400 kV D/C line (vi) Gurgaon (ITP) 400/220 kV GIS Substation	Matter was in CERC for revision of tariff and extension of date of commissioning. NKTCL filed an appeal in appellate tribunal challenging CERC order of 9.5.2013. Appellate Tribunal has given final judgment on 2.12.13 setting aside CERC order and allowing the appeal. NKTCL is initiating steps for implementing of order. The judgment of Appellate Tribunal accepts delay in clearance under section-164 as force majeure. According NKTCL have requested MoP to extend the validity of section 68 clearance vide their letter dated 14.1.2014. Beneficiaries have appealed SC. SC on 12th August has disposed of the appeal and directed ATE to decide on the appeal. APTEL in its hearing dated 01st Feb 19 disposed off the case directing to go back to CERC for a fresh treatment - including (but not limited

S.No.	Name of the Project	BPC /Implementing Agency / Milestones	Scope of works	Current Status
				to) the aspect of the very necessity of NK and TT transmission system. A petition has been filed with a stay application in CERC for redressal of grievances. Hearing was expected in April'19. **Work Yet to start.**
2	Transmission System Associated with Krishnapattnam UMPP-Synchronous interconnection between SR and WR (Part-B) Estimated Cost Rs. 440 Cr	REC RSTCL (Consortium of Patel-Simplex- BS Transcomm) **Milestones:** (i) LoI placed on 16.12.2010 (ii) SPV acquired on 07.01.2011 (iii) Trans. license received on 24.08.2011 (iv) Approval u/s 164 received on 29.08.2011 (v) Tariff adoption on 12.8.2011	(i) Raichur - Sholapur 765 kV S/C line-1 (208 ckm)	**Commissioned in 06/2014**
3	System strengthening common for WR and NR	PFC	(i) Dhramjaygarh - Jabalpur 765 kV D/C (ii) Jabalpur - Bina 765 kV S/C line	**Line commissioned in 09/2015** **Line commissioned in 06/2015**

S.No.	Name of the Project	BPC /Implementing Agency / Milestones	Scope of works	Current Status
	Estimated Cost Rs. 1720 Cr	Jabalpur Transmission Company Limited (Sterlite Grid) **Milestones:** (i) LOI placed on 31.01.2011 (ii) Special Purpose Vehicle acquired on 31.03.2011 (iii) Scheduled Completion Date is 31.03.2014. (iv) Transmission License granted on 12.10.2011. (v) Tariff adoption approval on 28.10.2011 (vi) Clearance under Section 164 : received on 12.07.13		
4	System strengthening for WR Estimated Cost Rs. 2900 Cr	PFC BDTCL(Sterlite Grid) **Milestones:** (i) LoI placed on 19.1.2011 (ii) SPV acquired on 31.3.2011 (iii) Trans. license received on 12.10.2011	(i) Jabalpur-Bhopal 765 kV S/C line (ii) Bhopal-Indore 765 kV S/C line (iii) 2x1500 MVA 765/400 kV substation at Bhopal (iv) Bhopal-Bhopal (MPPTCL) 400 kV D/c quad line.	**Line commissioned in 06/2015** **Line commissioned in 10/2014** **Commissioned in 07/2014** **Line Commissioned in 07/2014**

S.No.	Name of the Project	BPC /Implementing Agency / Milestones	Scope of works	Current Status
		(iv) Approval u/s 164 received on 29.01.2013 (v) Tariff adoption on 28.10.2011 (vi) Original COD : Mar2014	(v) Aurangabad-Dhule 765 kV S/C line (vi) Dhule-Vadodara 765 kV S/C line (vii) 2x1500 MVA, 765/400 kV substation at Dhule (viii) Dhule-Dhule (Msetcl) 400 kV D/C Line	**Line commissioned in 10/2014** **Line commissioned in 10/2015** **Commissioned in 11/2014** **Line Commissioned in 11/2014**
5	Transmission System associated with DGEN TPS (1200 MW) of Torrent Power Ltd. Estimated Cost Rs. 275 Cr	PFC M/s Instalaciones Inabensa, S.A. Spain **Milestones:** (i) LoI issued on 19.05.2014 (ii) Approval under section 68 on 30.01.2014. (iii) Approval under Sec 164 of EA,2003 on 24.04.2016	(i) DGEN TPS – Vadodara 400 kV D/C, Twin Moose line. (ii) Navsari – Bhestan 220 kV D/C line	Project authority had not started construction activity as per execution plan. Matter was taken up with the project authority and notice served in August/Sept 2016 but project authority did not respond. Member (PS), CEA took a meeting on 26.04.2017 to review the progress of Tr. project wherein project authority informed to close the project due to financial constraints in parent company. CEA vide letter dated 14.06.2017 informed CERC to take appropriate action. **Completion Target was May 2018**

S.No.	Name of the Project	BPC /Implementing Agency / Milestones	Scope of works	Current Status
6	Transmission System associated with Gadarwara STPS (2x800 MW) of NTPC (Part-A) Estimated Cost Rs. 256 Cr	REC Powergrid Warora Transmisson Limited (A subsidiary of PGCIL) **Milestones:** (i) LoI issued on 11.03.2015 (ii) Approval under section 68 on 26.11.2014 (iii) Approval under Sec 164 of EA,2003 on 24.04.2017	(i) Gadarwara STPS - Jabalpur Pool 765kV D/C line (ii) Gadarwara STPS - Warora P.S. (New) 765 kV D/C line (iii)LILO of both Ckts. Of Wardha-Parli 400 kV D/C at Warora P.S. (2xD/C) (iv) Warora 765/400 kV Pooling Station (2x1500 MVA).	**Commissioned in July, 2018**
7	Transmission System associated with Gadarwara STPS (2x800 MW) of NTPC (Part-B). Estimated Cost Rs. 275 Cr	REC Powergrid Parli Transmisson Limited (A subsidiary of PGCIL) **Milestones:** (i) LoI issued on 11.03.2015 (ii) Approval under section 68 on 10.12.2014 (iii) Approval under Sec 164 of EA,2003 on 28.06.2017	(i) Warora P.S.- Parli (New) 765 kV D/C line (ii) Parli (New) - Solapur 765 kV D/c line (iii)Parli (New) - Parli (PG) 400 kV D/C (Quad) line (iv) 765/400 kV Parli (New) Sub-station (2x1500 MVA)	**Commissioned in June, 2018**

S.No.	Name of the Project	BPC /Implementing Agency / Milestones	Scope of works	Current Status
8	Transmission System Strengthening associated with Vindhyachal- V Estimated Cost Rs. 211 Cr	REC Powergrid Jabalpur Transmisson Limited (A subsidiary of PGCIL) **Milestones:** (i) LoI issued on 10.02.2015 (ii) SPV has been acquired by the successful bidder on 26.02.2015 (iii) Approval u/s 164 of EA,2003 on 19.09.2016	(i) Vindhyachal P. S- Jabalpur P. S. 765 kV D/C line.	**Commissioned in December, 2018**
9	System strengthening for IPPs in Chhattisgarh and other generation projects in Western Region Estimated Cost Rs. 823 Cr	PFC Chhattisgarh - WR Transmission Ltd. (A subsidiary of Adani Power Limited) **Milestones:** (i) LoI issued on 28.07.2015 (ii) SPV acquisition on 23.11.2015 (iii) Approval u/s 68 of EA,2003 on 24.04.2015 (iv) Approval u/s 164 of EA,2003 on 20.10.2016	(i) Gwalior 765/400 kV – Morena 400 kV D/C line 400 kV D/C Length- 50 km (ii) Establishment of 400/220 kV S/s at Morena, 2X315 MVA (iii) Vindhyachal-IV & V– Vindhyachal Pool 400 kV D/C (Quad) line Length-15 km (iv) Sasan UMPP – Vindhyachal Pooling station 765 kV S/C (Q) line 7 Length-8 km	**Commissioned in May, 2018** **Commissioned in May, 2018** **Commissioned in March, 2018** **Commissioned in April, 2018**

S.No.	Name of the Project	BPC /Implementing Agency / Milestones	Scope of works	Current Status
			(v) LILO of one circuit of Aurangabad – Padghe 765 kV D/C line at Pune Length-50 km (vi) Raigarh (Kotra) – Champa (Pool) 765kV S/C (Q) line (vii) Champa (Pool) – Dharamjaygarh 765kV S/C (Q) line	**Anticipated Date of Completion: March, 2019 (Severe RoW issues)** **Commissioned in August, 2018** **Commissioned in July, 2018**
10	Additional System Strengthening for Sipat STPS Estimated Cost Rs. 867 Cr	PFC Sipat Transmission Ltd (A subsidiary of Adani Power Limited) **Milestones:** (i) SPV acquisition on 23.11.2015 (ii) LoI issued on 28.07.2015 (iii) Approval u/s 164 of EA,2003 on 05.08.2016	(i) Sipat – Bilaspur Pooling Station765 kV S/C line Length-25 km (ii) Bilaspur PS – Rajnandgaon 765 kV D/C line Length-180 km	**Commissioned in August, 2018** **Connection agreement signed on 28.06.2018. Project is ready for commissioning**
11	Additional System Strengthening Scheme for Chhattisgarh IPPs – Part B	PFC Raipur - Rajnandgaon - Warora Transmission Ltd (A subsidiary of Adani Power Limited)	(i) Raipur (Pool) – Rajnandgaon 765 kV D/C line Length - 60 KM	**Commissioned in Mar'19** **Commissioned in Mar'19.**

S.No.	Name of the Project	BPC /Implementing Agency / Milestones	Scope of works	Current Status
	Estimated Cost Rs. 823 Cr	**Milestones:** (i) SPV acquisition on 23.11.2015 (ii) LoI issued on 28.07.2015 (iii) Approval u/s 164 of EA,2003 on 15.06.2016	(ii) Rajnandgaon – New Pooling station near Warora 765 kV D/C line Length - 270 KM (iii) Establishment of new 765/400 kV substation near Rajnandgaon 2x1500 MVA	**Commissioned in Mar'19.**
12	Additional inter-Regional AC link for import into Southern Region i.e. Warora – Warangal and Chilakaluripeta - Hyderabad - Kurnool 765 kV link Estimated Cost Rs. 4805 Cr	PFC Warora Kurnool Transmission Ltd (A subsidiary of Essel Infraprojects Limited) **Milestones:** (i) LoI issued on 29.02.2016 (ii) SPV acquisition on 06.07.2016 (iii) Approval u/s 164 of EA,2003 on 27.06.2017	(i) Establishment of 765/400 kV S/s at Warangal (New) with 2x1500 MVA ICTs and 2x240 MVAR bus reactors (ii) Warora Pool – Warangal (New) 765kV D/c line with 240 MVAR switchable line reactor at both ends Length - 350 KM (iii) Warangal (New) – Hyderabad 765 kV D/c line with 330 MVAR switchable line reactor at Warangal end Length- 160 KM (iv) Warangal (New) – Warangal (existing) 400 kV (quad) D/c line Length-10 KM (v) Hyderabad – Kurnool 765 kV D/c line with 240 MVAR switchable line reactor at Kurnool end	**Scheduled Date of Completion : November 2019**

S.No.	Name of the Project	BPC /Implementing Agency / Milestones	Scope of works	Current Status
			Length- 170 KM (vi) Warangal (New) – Chilakaluripeta 765kV D/c line with 240 MVAR switchable line reactor at both ends Length – 250 KM (vii) Cuddapah – Hoodi 400kV (quad) D/c line with 63 MVAR switchable line reactor at both ends Length-200 KM	
13	Common Transmission System for Phase-II Generation Projects in Odisha and Immediate Evacuation System for OPGC (1320 MW) Project in Odisha Estimated Cost Rs. 2736 Cr	PFC Orissa Generation Phase-II Transmission Limited (A subsidiary of Sterlite Grid Limited) **Milestones:** (i) LoI issued on 06.01.2016 (ii) SPV acquisition on 08.04.2016 (iii) Approval u/s 164 of EA,2003 on 07.03.2017	(i) OPGC (IB TPS) – Jharsuguda (Sundargarh) 400 kV D/C line with Triple Snowbird Conductor Length - 50 KM (ii) Jharsuguda (Sundargarh) – Raipur Pool 765 kV D/C line Length - 350 KM	**Commissioned in December 2017** **Scheduled Date of Completion: August 2019** **Line is ready for charging.**

S.No.	Name of the Project	BPC /Implementing Agency / Milestones	Scope of works	Current Status
14.	Transmission System Strengthening in WR associated with Khargone TPP (1320 MW) Estimated Cost Rs. 2137 Cr	REC Khargone Transmission Limited (Sterlite Grid Ltd.) **Milestones:** (i) LoI issued on 26.05.2016 (ii) SPV acquisition on 22.08.2016 (iii) Approval u/s 164 of EA,2003 on 05.07.2017	**A. Connectivity system for Khargone TPP** (i) LILO of one ckt of Rajgarh - Khandwa 400 kV D/C line at Khargone TPP (ii) Khargone TPP Switchyard – Khandwa pool 400 kV D/C (Quad) line **B. System strengthening in WR in time frame of Khargone TPP** (i) Khandwa Pool – Indore 765 kV D/C line. (ii) Khandwa Pool – Dhule 765 kV D/C line. (iii) Establishment of 765/400 kV, 2x1500 MVA pooling station at Khandwa pool	**Line Commissioned in Feb, 2018.** **Scheduled Date of Completion: July 2019**
15.	New WR- NR 765 kV Inter-regional corridor Estimated Cost Rs. 916 Cr	REC Powergrid Varanasi Transmission System Limited (POWERGRID) **Milestones:** (i) LoI issued on 01.03.2018 (ii) SPV acquisition on 27.03.2018 (iii) Approval u/s 164 of EA,2003 on 15.03.2019	(i) Vindhyanchal Pooling Station- Varanasi 765 kV D/C line	**Scheduled Date of Completion: July 2021**

S.No.	Name of the Project	BPC /Implementing Agency / Milestones	Scope of works	Current Status
16.	A. Additional 400 kV feed to Goa B. Additional System for Power Evacuation from Generation projects pooled at Raigarh (Tamnar) Pool Estimated Cost Rs. 863 Cr	PFC **Milestones:** (i) LoI issued on 30.11.2017 (ii) SPV acquisition on 14.03.2018 (iii) Approval u/s 164 of EA,2003 on 29.11.2018	**A. Additional 400kV feed to Goa** (i) LILO of one ckt. of Narendra (existing) – Narendra (New) 400 kV D/c quad line at Xeldem (ii) Xeldem – Mapusa 400 kV D/c (Q) line (iii) Establishment of 2x500MVA, 400/220kV substation at Xeldem **B. Additional System for Power Evacuation from Generation Projects pooled at Raigarh (Tamnar) Pool** (i) Dharamjaygarh Pool section B - Raigarh (Tamnar) Pool 765 kV D/c line	**Scheduled Date of Completion: November 2021** **Anticipated Date of Completion : June 2020**
17.	A. Connectivity System for Lanco Vidarbha Thermal Power Ltd. (LVTPL) B. Inter State Transmission system strengthening in Chhatarpur area in Madhya Pradesh	PFC **Milestones:** (i) MoP vide Gazette Notification dated 28.10.2016 appointed PFCCL as BPC	**A. Connectivity System for Lanco Vidarbha Thermal Power Ltd. (LVTPL)** (i) LVTPL TPS switchyard – Warora Pool 765kV D/c line **B. Inter State Transmission system strengthening in Chhatarpur area in Madhya Pradesh**	**Bidding process kept in abeyance.**

S.No.	Name of the Project	BPC /Implementing Agency / Milestones	Scope of works	Current Status
			(i) LILO of both circuits of Satna – Bina 400kV (1st) D/c line at Bijawar. (ii) Establishment of 2x500MVA, 400/220kV substation at Bijawar	
18.	WRSS -21 Part-A (TBCB) - Transmission System strengthening for relieving over loadings observed in Gujarat Intra-state system due to RE injections in Bhuj PS	REC Milestones: (i) RfQ stage concluded (ii) REC has applied for approval u/section 68	(i) Establishment of 2x1500 MVA, 765/400kV Lakadia PS with 765kV (1x330MVAR) & 400kV (125 MVAR) bus reactor along with future provisions. (ii) LILO of Bhachau – EPGL 400kV D/c (triple) line at Lakadia PS (iii) Bhuj PS – Lakadia PS 765kV D/c line (iv) 2 nos of 765kV bays at Bhuj PS for Bhuj PS – Lakadia PS 765kV D/c line	
19.	WRSS -21 Part-B- Transmission System strengthening for relieving over loadings observed in Gujarat Intra-state system due to RE injections in Bhuj PS	PFC Milestones: (i) RfQ stage concluded	(i) Lakadia – Vadodara 765 kV D/c line (ii) 330MVAr switchable line reactors at both ends of Lakadia – Vadodara 765 kV D/c line (iii) 2 nos of 765 kV bays at	

S.No.	Name of the Project	BPC /Implementing Agency / Milestones	Scope of works	Current Status
		(ii) PFC has applied for approval u/section 68	both Vadodara and Lakadia S/Ss for Lakadia – Vadodara 765 kV D/c line	
20.	Transmission system associated with RE generations at Bhuj –II, Dwarka & Lakadia	REC Milestones: (i) RfQ stage concluded (ii) REC has applied for approval u/section 68	(i) Lakadia PS – Banaskantha PS 765 kV D/c line (ii) 765kV Bays at Lakadia and Banaskantha for Lakadia PS – Banaskantha PS 765 kV D/c line (iii) 240MVAr switchable Line reactor at Lakadia PS end of Lakadia PS – Banaskantha PS 765 kV D/c line	
21.	Transmission System for providing connectivity to RE projects at Bhuj-II (2000MW) in Gujarat	PFC Milestones: (i) RfQ stage concluded	(i) Establishment of 2x1500MVA (765/400kV), 4x500MVA(400/220kV) Bhuj-II PS (GIS) with 765kV (1x330MVAR) and 400kV (125 MVAR) bus reactor along with future provisions (ii) Reconfiguration of Bhuj PS – Lakadia PS 765kV D/c line so as to establish Bhuj-II –Lakadia 765 kV	

S.No.	Name of the Project	BPC /Implementing Agency / Milestones	Scope of works	Current Status
			D/C line as well as Bhuj-Bhuj-II 765kV D/C line	
22.	Jam Khambaliya Pooling Station and Interconnection of Jam Khambaliya Pooling Station for providing connectivity to RE projects (1500 MW) in Dwarka (Gujarat) & Installation of 400/220 kV ICT along with associated bays at M/s CGPL Switchyard	REC Milestones: (i) RfQ stage concluded	(i) Establishment of 4x500MVA, 400/220kV Jam Khambhaliya PS (GIS) alongwith 1x125MVAr, 420kV Bus reactor along with future provisions (ii) 1x125MVAr, 420kV Bus reactor at Jam Khambhaliya PS (GIS) along with reactor bay (iii) Extension of Essar–Lakadia/Bhachau 400kV D/c (triple) line up to Jam Khambhaliya PS (iv) 63MVAr switchable Line Reactor at both ends of Lakadia/Bhachau - Jam Khambhaliya 400kV D/c line (v) 2 no. 400 kV line bays at Jam Khambhaliya PS for termination of Lakadia/Bhachau - Jam Khambhaliya 400kV D/c line (vi) 1x500 MVA, 400/220 ICT at CGPL Mundra switchyard.	

Annexure 1B

STATUS OF TRANSMISSION SCHEMES COMMISSIONED BY POWERGRID IN WESTERN REGION (as on 24.04.2019)

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
1	**Western Region System Strengthening Scheme -II**	5222	20th (23.01.04)	July'06		
	Set-A: For absorbing import in eastern and central part of WR Grid (POWERGRID)	1700			Commissioned	
	Set-B: For regional strengthening in Southern Maharashtra **(100 % private)**	1050			Commissioned	
	Set-C: For regional strengthening in Gujarat **(100 % private)**	600			---	Implementation by Reliance
	a) Rajgarh – Karamsad 400kV D/c				commissioned	
	b) Limdi(Chorania) – Ranchodpura 400kV D/c				commissioned	
	c) Ranchodpura – Zerda(Kansari) 400kV D/c				commissioned	
	Set-D: For regional Strengthening in Northern Madhya Pradesh **(POWERGRID)**	1050			commissioned	
2	**Transmission system associated with Krishnapatnam (5x800 MW) (WR Portion)- now delinked from Krishnapatnam UMPP**	1928	27th (30.07.07)			
	a) Raichur – Solapur (PG) 765 kV S/c				Commissioned	

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
	b) Solapur(PG) – Pune 765 kV S/c				Commissioned	
	c) LILO of 400kV Aurangabad I (Waluj) - Pune (PG) D/c & Parli (PG) - Pune (PG) D/c lines at Pune(GIS)				Commissioned	
	d) Establishment of new 765/400 kV substations at Pune (GIS) with 2x1500 MVA transformation capacity				Commissioned	
3	**Associated transmission system of VSTPP-IV and Rihand-III**	4673	29th (10.09.09)	Mar'10		
	a) Rihand III- Vindhyachal Pool 765 kV D/c (initially to be op. at 400kV)				Commissioned	
	b) Vindhyachal IV - Vindhyachal Pool 400kV D/c(Quad)				Commissioned	
	c) Vindhyachal Pool - Satna 765 kV 2xS/c				Commissioned	
	d) Satna -Gwalior 765 kV 2xS/c				Commissioned	
	e) Gwalior – Jaipur(South) 765 kV S/c				Commissioned	
	f) Vindhyachal Pool-Sasan 765 kV S/c				Commissioned	
	g) Vindhyachal Pool-Sasan 400 kV D/c				Commissioned	
	h) Establishment of 765/400kV, 2x1500 MVA substation at Vindhyachal Pool				Commissioned	
4	**Solapur STPP(2x660MW) transmission system**	63.32	30th (08.07.10)	Oct'13		
	a) Solapur STPP – Solapur (PG) 400kV D/c (Quad)				Commissioned	Line completed in Apr'15
	b) Augmentation of 400/220kV ICT by 1x500MVA transformer (3rd) at Solapur (PG)				Commissioned	

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
5	**Solapur STPP (2x660MW) transmission system (Part-A)**	50.52	36th (29.08.13)	Mar'15		Award placed in May'15
	a) Solapur STPP – Solapur (PG) 400kV 2nd D/c (Quad)				Commissioned	
6	**Transmission system for evacuation of Kakrapar Atomic Power Project unit 3 &4 (2x700 MW)**	378.71	31st (27.12.10)	Feb'14		
	a) Kakrapar NPP – Navsari 400kV D/c – 38 km				Commissioned	Stringing commenced from Mar'16
	b) Kakrapar NPP – Vapi 400kV D/c - 104 km				Commissioned	
7	**Transmission System associated with Mauda Stage-II (2x660 MW)**	1575.3	32nd (13.05.11)	Sep'13		
	a) Mauda II – Betul 400KV D/c (Quad)-210 km				Commissioned	
	b) Betul– Khandwa 400KV D/c (Quad)-180 km				Commissioned	
	c) Khandwa – Indore(PG) 400kV D/c -215 km				Commissioned	
	d) Establishment of 400/220kV 2x315MVA substation at Betul				Commissioned	
8	**Provision of 1x315MVA ICT & Spare Converter Trf for reliable auxlliary power supply at HVDC back to back station at Bhadravati**	143	33rd (21.10.11)	-	Commissioned	ICT commissioned in Mar'15. Balance work under progress.
9	**Establishment of Pooling Station at Champa and Raigarh (Near Tamnar) for IPP Generation Projects in Chhattisagrh**	2066.85	29th (10.09.09)	May'11		

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
	a) Champa Pooling Station - Raipur Pooling Station 765kV D/c				Commissioned	
	b) Raigarh Pooling Staiton (near Kotra) - Raigarh pooling (near Tamnar) 765kV D/c				Commissioned	
	c) Champa Pooling Station - Dharamjaygarh Pooling Station 765kv S/c				Commissioned	
	d)Raigarh Pooling Staiton (near Kotra) - Champa pooling 765kV S/c				Commissioned	
	e) Establishment of 765/400kV 6x1500MVA Champa Pooling Station				Commissioned	
	f)Establishment of 765/400kV 3x1500MVA Raigarh Pooling Station (near Tamnar)				Commissioned	
10	**Transmission system strengthening in Western Part of WR for IPP generation proejcts in Chhattisgarh**	2127.51	29th (10.09.09)	Nov'11		
	a) Aurangabad(PG) – Boisar 400kV D/c (Quad)				Commissioned	
	b) Wardha - Aurangabad (PG) 765kV D/c				Commissioned	
	c) Establishement of 765/400kv 2x1500MVA auraganbad (PG) S/s				Commissioned	
	d) Augmentation of transformation capacity at Boisar by 400/220kV, 1x500MVA				Commissioned	
11	**System strengthening in North/West part of WR for IPP Projects in Chhattisgarh**	2073.26	29th (10.09.09)	Dec'11		
	a) Aurangabad (PG) – Padghe(PG) 765kV D/c				Commisisoned	

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
	b) Vadodara – Asoj 400kV D/c(Quad)				Commisisoned	
	c) Padghe – Kudus 400kV D/c (Quad)				Commisisoned	
12	**System Strengthening in Raipur-Wardha Corridor for IPP projects in Chhattisgarh (DPR-6)**	1422.85	29th (10.09.09)	Jan'12		
	a) Raipur Pooling station - Wardha 765kV 2nd D/c				Commisisoned	
13	**WR-NR HVDC interconnector for IPP Projects in Chhattisgarh**	9569.76	29th (10.09.09)/30th (08.07.10)	Mar'12	**Commisisoned**	
	a) A ± 800kV, 3000MW HVDC bipole between Champa Pooling Station-Kurukshetra (NR) (provision to upgrade to 6000MW at a latter date)				Commissioned	
	b) Kurukshetra(NR) - Jallandhar 400kV D/c(Quad) one ckt. via 400/220kV Nakodar				Commissioned	
	c) LILO of Abdullapur – Sonepat 400kV D/c(triple) at Kurukshetra				Commissioned	
	d) Establishment of 3000MW 800KV HVDC bipole terminal each at Champa Pooling station and Kurukshetra(NR) respectively: to be upgraded to 6000MW.				Commissioned	
	e) Establishment of 400/220kV 2x500 MVA S/s at Kurukshetra (GIS) 2x500MVA				Commissioned	400kV bays ready for commissioning in Dec'15. ICT-II under progress.

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
14	**Inter-regional system strengthening scheme for WR and NR-Part A**	1315.9	36th (29.08.13)	Oct'13		Completed
	a) Solapur - Aurangabad 765kV D/c				Commissioned	
15	**Transmission System Associated with Lara STPS-I (2x800MW)**	400.47	17th LTA (03.01.13)	Jun'14		
	a) Lara STPS-I – Raigarh (Kotra) Pooling Station 400 kV D/c line – 18km				Commissioned	
	b) Lara STPS-I – Champa Pooling Station 400 kV D/c (quad) line.-112km				Commissioned	Tower erection commenced in Oct'15
16	**Inter-regional system strengthening scheme for WR and NR-Part B**	6517.36		Dec'14	Apr'18	PROJECT COMPLETED
	(a) 765KV D/C Jabalpur Pooling Station - Orai line				Commissioned	
	(b) 765KV D/C Orai - Aligarh line				Commissioned	01 ckt commissioned in Mar'18 & balance commissioned in Apr'18.
	(c) 400KV D/C Orai - Orai line (Q)				Commissioned	
	(d) LILO of one ckt of Satna-Gwalior 765KV 2x S/C line at Orai				Commissioned	
	(e) LILO of Agra - Meerut 765KV S/C at Aligarh				Commissioned	
	(f) LILO of Kanpur - Jhatikara 765KV S/C at Aligarh				Commissioned	
17	**Wardha - Hyderabad 765kV Links**	3662.02		Jan'15		

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
	(a) 765KV D/C Wardha - Hyderabad line				Commissioned	
	(b) 400KV D/C Nizamabad - Dichpali line				Commissioned	
18	**GREEN ENERGY CORRIDORS:- Inter State Transmission Scheme (ISTS) - Part B**	3705.61	36 / 37th (29.08.13/05.09.14)	Apr'15	Commissioned	Project completed.
	(a) 765KV D/C Banaskanta - Chittorgarh (New) line				Commissioned	Commissioned in Feb'19.
	(b) 765KV D/C Chittorgarh (New) - Ajmer (New) line				Commissioned	
	(c) 400KV D/C Banaskanta - Sankhari line				Commissioned	Commissioned in Feb'19.
	(d) Establishment of 765/400/220kV (765/400kV - 2x1500 MVA & 400/220kV - 2x500MVA) substation at Banaskanta				Commissioned	Commissioned in Feb'19.
19	**GREEN ENERGY CORRIDORS:- Inter State Transmission Scheme (ISTS) - Part C**	2247.37	36 / 37th (29.08.13/05.09.14)	July'15	Commissioned	**PROJECT COMPLETED.**
	(a) 765KV D/C Bhuj Pool - Banaskanta line				Commissioned	Line completed in Feb'19.
	(d) Establishment of 765/400/220kV (765/400kV - 2x1500 MVA & 400/220kV - 2x500MVA) pooling station at Bhuj				Commissioned	Completed in Feb'19.
20	**Transmission System Strengthening Associated with Vindhyachal V - Part A**		34th (09.05.12)	Feb'15	Commissioned	**PROJECT COMPLETED.**
	(a) 1x1500MVA, 765/400kV ICT at Vindhyachal Pooling Station				Commissioned	

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
21	**Transmission System Strengthening Associated with Vindhyachal V - Part B**		34th (09.05.12)		Commissioned	**PROJECT COMPLETED.**
	(a) 2 nos of 765kV Line bays alongwith 2x330MVAR Line Reactor at Vindhyachal Pooling Station				Commissioned	Commissioned in Dec'18.
	(a) 2 nos of 765kV Line bays alongwith 2x330MVAR Line Reactor at Jabalpur Pooling Station				Commissioned	Commissioned in Dec'18.
22	**STATCOMs in Western Region**		36th (29.08.13)	Mar'15	Commissioned	**PROJECT COMPLETED.**
	(a) Aurangabad				Commissioned	Commissioned in Mar'18.
	(b) Gwalior				Commissioned	Commissioned in Dec'18.
	(c) Solapur				Commissioned	Commissioned in Apr'18.
	(d) Satna				Commissioned	Commissioned in Mar'18.
23	**Western Region System Strengthening Scheme XIV**	93.96	37th (05.09.14)	Jan'16	Commissioned	**PROJECT COMPLETED.**
	(a)2x500MVA, 400/220kV transformer alongwith six nos of 220kV bays at Indore (PG) 765/400kV Substation				Commissioned	Both ICT's and 220KV line bays charged in Sep'18. However down stream system of MPPTCL yet to be commissioned. Matter critical.
	(b)1x500MVA, 400/220kV transformer alongwith two nos of 220kV bays at Itarsi (PG) 400/220kV S/s				Commissioned	

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
24	**Powergrid works associated with Part-A of Transmission system for Gadarwara STPS of NTPC**		36/37th (29.08.13 / 05.09.14)	Apr'16	Commissioned	**PROJECT COMPLETED.**
	(a) 2 nos. 765 kV line bays at 765/400kV Jabalpur Pooling Station of POWERGRID {for Gadarwara STPS (NTPC) - Jabalpur PS 765 kV D/c}				Commissioned in May'17	
25	**Powergrid works associated with Part-B of Transmission system for Gadarwara STPS of NTPC i.e. WRSS XV**		36/37th (29.08.13 / 05.09.14)	Apr'16	Commissioned	**PROJECT COMPLETED**
	(a) 2 nos. 765 kV line bays at 765/400kV Solapur sub-station of POWERGRID {for Parli New (TBCB) - Solapur (PG) 765 kV D/c}				Commissioned	
	(b) 2 nos 400kV line bays at existing 400kV Parli (PG) Switching Station of POWERGRID {for Parli New (TBCB) - Parli (PG) 400kV D/c (quad)}				Commissioned	
26	**Powergrid works associated with System Strengthening for IPPs in Chhattisgarh and other generation projects in Western Region**		36th (29.08.13)	Jul'16	commissioned	**Commisisoning progressively matching with TBCB lines.**
	(a) 1 no. 765 kV line bay at 765/400kV Vindhyachal Pooling Station of POWERGRID {for Sasan UMPP - Vindhyachal PS (PG) 765 kV 2nd S/c}				Commissioned	

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
	(b) 2 no. 400 kV line bays at 765/400kV Vindhyachal Pooling Station of POWERGRID {for Vindhaychal (IV/V) STPP switchyard (NTPC) - Vindhyachal PS (PG) 400 kV 2nd D/c (quad)}				commissioned	
	(c) 2 no. 400 kV line bays at Gwalior Substation {for Gwalior - Morena 400 kV D/c (quad)}				commissioned	Commissioned in May'18.
	(d) 2 nos. 765 kV line bays at 765/400kV Pune (GIS) sub-station of POWERGRID {for LILO of one circuit of Aurangabad(PG) – Padghe(PG)765 kV D/c at Pune (GIS) (PG)}				Mar'19	Completed.
	(e) 2 nos. 765 kV line bays at 765/400kV Champa Pooling Station of POWERGRID {1for Champa PS(PG) - Raigarh (Kotra) PS(PG) 765 kV 2nd S/c, 1 for Champa PS(PG) – Dharamjaigarh(PG) 765 kV 2nd S/c}				commissioned	
	(f) 1 no. 765 kV line bay at 765/400kV Raigarh (Kotra) Pooling Station of POWERGRID {for Champa PS(PG) - Raigarh (Kotra) PS(PG) 765 kV 2nd S/c}				commissioned	
	(g) 1 no. 765 kV line bay at 765/400kV Dharamjaigarh Pooling Station of POWERGRID {for Champa PS(PG) – Dharamjaigarh(PG)765 kV 2nd S/c}				commissioned	
27	**Powergrid works associated with Additional System Strengthening Scheme Chhattisagrh IPPs Part-B**		36/37th (29.08.13 / 05.09.14)	Jul'16	commissioned	

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
	(a) 2 nos. 765 kV line bay at 765/400kV Raipur Pooling Station of POWERGRID {for Raipur PS(PG) – Rajnandgaon (TBCB) 765 kV D/c}				commissioned	
28	**Powergrid workds associated with Additional System Strengthening for Sipat STPS**		36/37th (29.08.13 / 05.09.14)	Jul'16	commissioned	**PROJECT COMPLETED.**
	(a) 3 nos. 765 kV line bays at 765/400kV Bilaspur Pooling Station of POWERGRID (1 no. for Sipat STPS(NTPC) - Bilapur PS(PG) 3rd 765kV S/c, 2 nos. for Bilaspur PS(PG)-Rajnandgaon(TBCB) 765 kV D/c)				commissioned	765KV Sipat bay at Bilaspur commissioned in Aug'18. Balance commissioned in Mar'19.
	(b) 2 nos. 240 MVAR, 765 kV switchable line reactors at 765/400kV Bilaspur PS end for Bilaspur PS(PG) - Rajnandgaon(TBCB) 765 kV D/c				commissioned	Commissioned in Mar'19
29	**Transmission System Strengthening associated with Mundra UMPP- Part A**	266.19	36th (29.08.13)	Jul'16		
	(a) LILO of both circuits of Mundra UMPP-Limbdi 400kV D/c (triple snowbird) line at Bachau				commissioned	
30	**Transmission System Strengthening associated with Mundra UMPP- Part B**		36/38th (29.08.13/17.07.2015)		commissioned	**Project Completed.**
	(a) Mundra UMPP - Bhuj Pool 400kV D/c line (triple snowbird)				commissioned	

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
31	**Bays for Transmission System Associated with DGEN Torrent Energy Ltd (1200MW)**		13/14th LTA (27.12.10/13.05.2011)	Jul'16		Execution of TBCB scheme critical
	(a) 2nos 400kV Bays at Vadodara (GIS)				Aug'18	Bay charged in Aug'18. Commissioning matching with TBCB line.
	(b) 2nos 220kV Bays at Navsari (GIS)				May'18	Bay charged in May'18. Commissioning matching with TBCB line.
32	**Western Region System Strengthening -16**		38th (17.07.15)	Jul'16	**Jan'19**	**PROJECT COMPLETED.**
	(a) Installation of 2x500MVA, 400/220kV ICTs with associated bays at Parli (PG) switching station along with provision of six nos. of 220 kV bays				Ready for commissioning	ICT's ready for commissioning in Jul'18. Availibility of down stream network by MSETCL. Critical
	(b) Provision of two nos. of 220kV bays at Mapusa (Colvale) 400/220 kV substation				Ready for commissioning	Ready for commissioning in Jul'18. Availability of down stream network by GED.
	(c) Installation of 500MVA, 400/220kV (3rd) ICT with associated bays at Satna (PG) S/s with provision of two nos. 220kV line bays				commissioned	

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
	(d) Provision of two nos. of 400 kV bays at 765/400kV Indore(PG) substation				Ready for commissioning	Charged in Jan'19. Availibility of down stream network by MPPTCL. Critical.
33	**Western Region System Strengthening -17**		39th (30.11.15)	Feb'17	**Mar'19**	**Compln Sch. : 31 month from IA.**
	1. Provision of 1x240 MVAR switchable line reactor at Pune GIS S/s end {for Aurangabad (PG) – Pune GIS 765kV S/C line, formed after LILO of one ckt of Aurangabad (PG) – Padghe (PG) 765kV D/C line at Pune GIS}.				commissioned	
	2. Conversion of followings Fixed Line Reactor into Switchable Line Reactors / BUS Reactor.					
	a. Bina (PG) – Shujalpur 400kV D/C line: 420kV 50 MVAR fixed line reactor at Shujalpur end is to be converted into switchable line reactor. The 420kV 63 MVAR line reactor installed at Bina (PG) end is already switchable.				commissioned	
	b. 1x63 MVAR BUS Reactor at Bhadravati S/s: 420kV				commissioned	
	3. Installation of ICTs along with associated bays at following substations of POWERGRID:					
	a. Khandwa 400/220kV Substation: 1x500 MVA, 400/220kV 3rd ICT.				commissioned	ICT commissioned in May'18 except 02 nos. of bays. Bay commissioned in Oct'18
	b. Boisar 400/220kV Substation: 1x500 MVA, 400/220kV 4th ICT.				commissioned	Commissioned in May'18.

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
	c. Kala 400/220kV Substation: 1x500 MVA, 400/220kV 3rd ICT.				commissioned	Commissioned in Nov'18.
	d. Dehgam 400/220kV Substation: 1x500 MVA, 400/220kV 3rd ICT.				commissioned	Commissioned in Jun'18.
34	**Transmission System for Ultra mega Solar Park in Rewa District, Madhya Pradesh .**		38th (17.07.2015)	Jan'16 / Mar'17	commissioned	**Project Completed**
	Establishment of 3x500MVA, 400/220kV substation at Rewa Pooling Station				commissioned	Sub station alongwith ICT I & II completed & charged in Mar'18. 3rd ICT charged in Feb'19
	LILO of Vindhyachal - Jabalpur 40kV D/c (both circuits) at Rewa Pooling Station				commissioned	Line completed & charged in Mar'18.
	6 nos. 220kV line bays at Rewa Pooling Station				commissioned	Sub station alongwith ICT I & II completed & charged in Mar'18. balance work under progress.

STATUS OF TRANSMISSION SCHEMES UNDER IMPLEMENTATION BY POWERGRID IN WESTERN REGION (as on 24.04.2019)

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
1	**Western Region System Strengthening -V**	722	25th (30.09.06)	Dec'07	**Apr'19**	**Matching with line.**
	a) 400 kV Vapi- Kala - Kudus D/c				Commissioned Dec' 17	Contigency arrangement to connect Vapi-Navi Mumbai with Navsari-Boisar line by passing ROW area, to from Vapi - Navsari line (24 Ckm) commissioned in Mar'13. 400KV D/C Vapi-Kala portion commissioned in Mar'14 (61 Ckm). Balance portion commissioned in Dec'17.
	b) LILO of 400 kV Lonikhand - Kalwa line at Navi Mumbai				Apr'19	Cable work in progress (2km.) Critical ROW issues
	c) Establishment of 400/220 kV, 2 x 315 MVA new S/s (GIS) at Navi Mumbai				Apr'19	Testing is under progress. State down tream system at Navi Mumbai to be implemented through TBCB. Matter critical. Balance portion (02 Kms) of line executed using under ground cable. Work affected due to water logging. Severe ROW problem encountered at Navi Mumbai end, miscreants have burnt and damaged part of laid cable.
	d) 220 kV Vapi- Khadoli D/c.				Commissioned	
2	**Tr. System of Mundra Ultra Mega Power Project (4000 MW)**	4824	26th (23.02.07)	Oct'08	**Dec'19**	
	a) Mundra – Bachchau - Ranchodpura 400 kV (Triple) D/c				Commissioned	

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
	b) Mundra – Jetpur 400 kV (Triple) D/c				Commissioned	
	c) Mundra – Limbdi 400 kV (Triple) D/c				Commissioned	
	d) Gandhar-Navsari 400 kV D/c				Commissioned	
	e) Navsari - Boisar 400 kV D/c				Commissioned	Severe ROW & Forest issue.
	f) LILO of both circuits of Kawas-Navsari 220 kV D/c at Navsari (PG)				Commissioned	
	g) Wardha-Aurangabad 400 kV(Quad) D/c (with provision to upgrade at 1200 kV at later date)				Dec'19	Contract terminated 01 out of 02 packages due to unsatisfactory performance and fresh tender taken up. The new package bifurcated into two part. Ist part awarded in Dec'14 and second part in Feb'15. Severe ROW being encountered. Due to thunderstrom and cyclone in Jun'18, about 6 fdn, 11 tower erection & approx. 9 ckm stringing damaged.
	g) Aurangabad (PG) -Aurangabad I (Waluj) 400 kV(Quad)				Commissioned	
	Substations					
	a) 40% Fixed Series Compensation each on Wardha - Aurangabad 400 kV D/c at Wardha end				Dec'19	Work under progress. Completion matching with Wardha-Aurangabad line.
	b) Establishment of new 400/220 kV, 2x315 MVA substation at Navsari & Bachchau				Commissioned	

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
	c) Establishment of new 765/400 kV, 3x1500 MVA, substation at Wardha for charging of Seoni - Wardha 2xS/c lines at 765 kV level				Commissioned	
3	**Transmission System Strengthening in WR-NR Transmission Corridor for IPPs in Chattisgarh**	5151.37	35th (03.01.13)	Jun'14	**Dec'19**	**Associated with Champa -Kurukshetra Bipole-II (upgradation) ant. by Dec'19.**
	a) Up-gradation of + 800kV, 3000MW HVDC bipole between Champa Pooling Station – Kurukshetra (NR) to 6000MW				Dec'19	**Associated with Champa -Kurukshetra Bipole-II (upgradation) ant. by Dec'19.**
	b) Kurukshetra (NR) – Jind 400kV D/c (Quad)				Commissioned	
4	**Bays for Transmission System Associated with DGEN Torrent Energy Ltd (1200MW)**		13/14th LTA (27.12.10/13.05.2011)	Jul'16		Execution of TBCB scheme critical
	(a) 2nos 400kV Bays at Vadodara (GIS)				Aug'18	Bay charged in Aug'18. Commissioning matching with TBCB line.
	(b) 2nos 220kV Bays at Navsari (GIS)				May'18	Bay charged in May'18. Commissioning matching with TBCB line.
5	**Western Region System Strengthening -16**		38th (17.07.15)	Jul'16	**Jan'19**	**PROJECT COMPLETED.**

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
	(a) Installation of 2x500MVA, 400/220kV ICTs with associated bays at Parli (PG) switching station along with provision of six nos. of 220 kV bays				Ready for commissioning	ICT's ready for commissioning in Jul'18. Availibility of down stream network by MSETCL. Critical
	(b) Provision of two nos. of 220kV bays at Mapusa (Colvale) 400/220 kV substation				Ready for commissioning	Ready for commissioning in Jul'18. Availability of down stream network by GED.
	(c) Installation of 500MVA, 400/220kV (3rd) ICT with associated bays at Satna (PG) S/s with provision of two nos. 220kV line bays				Commissioned	
	(d) Provision of two nos. of 400 kV bays at 765/400kV Indore(PG) substation				Ready for commissioning	Charged in Jan'19. Availability of down stream network by MPPTCL. Critical.
6	**Western Region System Strengthening -18**		39th (30.11.15)	Feb'17	**Feb'20**	**Compln Sch. : 36 month from IA.**
	1. Splitting of following substation along with necessary switching arrangement.					
	a. Dharamjaygarh Pool 765kV BUS				Feb'20	Award placed in Mar'17. Engg., supply, civil work & erection under progress.
	b. Raigarh Pool (Kotra) 400kV & 765kV BUS				Feb'20	Award placed in Mar'17. Engg., supply & civil work under progress.

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
	c. Champa Pool 400 kV & 765kV BUS				Feb'20	Award placed in Mar'17. Engg., supply & civil work under progress.
	2. Installation of Reactors:					
	a. 1X125 MVAR BUS Reactor at 400kV BUS Section A of Dharamjaygarh Pool.				Feb'20	
	b. 1X125 MVAR BUS Reactor at 400kV BUS Section A of Raigarh Pool (Kotra).				Feb'20	
	c. 1X240 MVAR BUS Reactor at 765kV BUS Section A of Raigarh Pool (Kotra).				Feb'20	
	d. 1X240 MVAR BUS Reactor at 765kV BUS Section A of Champa Pool.				Feb'20	
	e. 1X330 MVAR BUS Reactor at 765kV BUS Section B of Dharamjaygarh Pool.				Feb'20	
7	**PG Works associated with Transmission System for Khargone TPP**		38th & 39th (17.07.15 & 30.11.15)	Feb'17	**Jul'19**	**Compln Sch. : Feb'18 to Jul'19 matching with TBCB lines.**

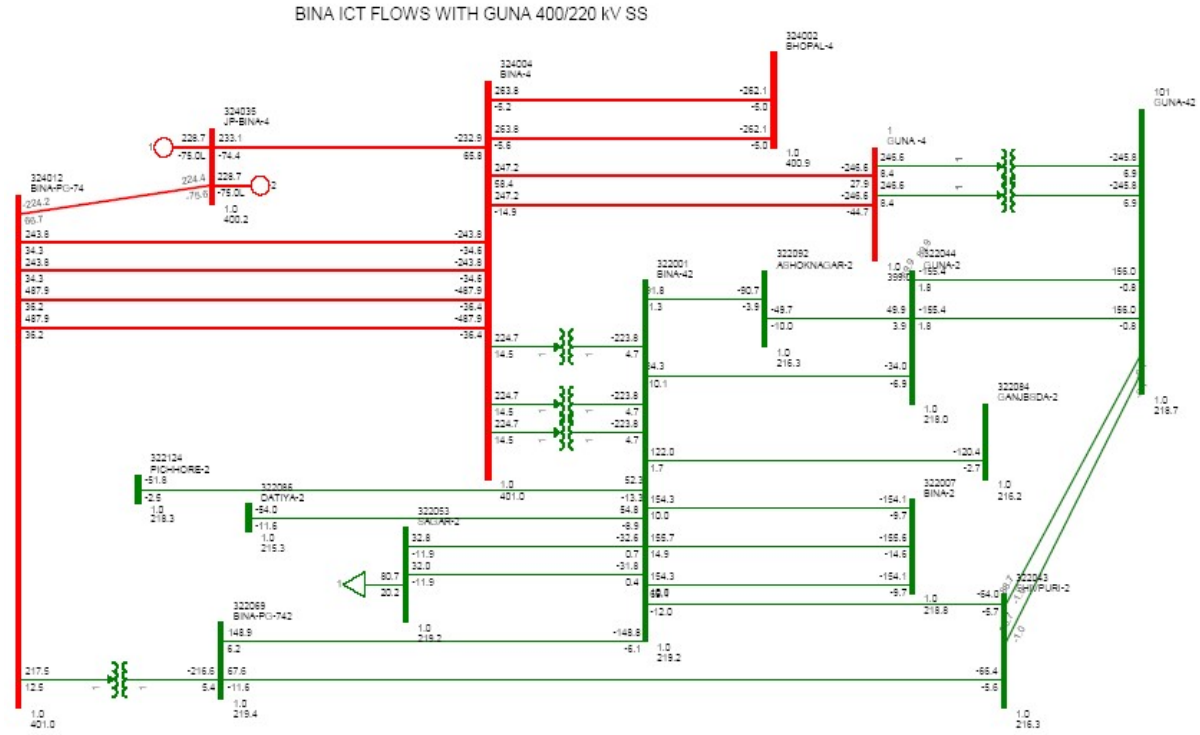
Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
	1. 63 MVAr switchable line reactor along with 500Ω NGR at Rajgarh(PG) end of Khargone TPS – Rajgarh (PG) 400kV line *{formed after LILO of one circuit of Khandwa - Rajgarh 400 kV D/C line at Khargone TPS, being implemented under TBCB}*				Jul'19	Award placed in Mar'17. Engg., supply, civil work & erection under progress.
	2. 2 nos. of 765 kV line bays at 765/400kV Indore Substation of POWERGRID *{for termination of Khandwa PS – Indore 765 kV D/C line, being implemented under TBCB }*				Feb'18	Ready for commissioning. Commisisoning matching with TBCB line.
	3. 240 MVAr Switchable Line Reactors along with 700Ω NGR at Indore (765/400kV S/s) end of each circuit of Khandwa Pool – Indore 765kV D/c line (Line being implemented under TBCB)				July'19	
8	**POWERGRID Works associated with New WR - NR 765kV Inter-regional corridor**		40th (01.06.2016)		**May'21**	
	a. 2 nos. of 765kV Line Bays at Vindhyachal 765/400 kV Pooling Station;				May'21	Awarded in Sep'18. Engg. & civil work under progress.
	b. 2 nos. of 765kV Line Bays along with 765kV, 1x330 MVAr line reactor in each bay at Varanasi 765/400 kV GIS sub-station				May'21	Awarded in Feb'19.

Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
9	**POWERGRID Works associated with Additional 400kV feed to Goa**		40th (01.06.2016) 41st (21.12.2016)		**Sep'21**	**Compln Sch. : 30-36 months from IA.**
	2 nos of 400kV line bays at Mapusa s/s for termination of Xeldem – Mapusa 400kV D/c (quad) line & 1x80MVAr LR at Narendra (New) S/s for Narendra(New) - Xeldam 400kV line				Mar'21	Awarded in Sep'18. Engg. under progress.
10	**POWERGRID Works associated with Additional System for Power Evacuation from Generation Projects pooled at Raigarh (Tamnar) Pool**		40th (01.06.2016)		**May'21**	
	2 nos. of 765kV Line Bays each at Dharamjaygarh Pool and Raigarh (Tamnar) Pool				May'21	Awarded in Sep'18. Engg. & civil works under progress.
11	**Transmission system for Ultra Mega Solar Power Park (700MW) at Banaskantha (Radhanesda), Gujarat**	118	40th (01.06.2016)	May'17	**Sep'19**	**Compln Sch. : 16 months from IA.**
	400KV D/C Banaskantha PS - Banaskantha (PG) line				Sep'19	Completion matching with Banaskantha (Radhanesda) S/stn.
	765/400kV Banasktantha (PG) 2 nos line bays				Sep'19	Work under progress. Completion matching with Banaskantha (Radhanesda) S/stn.
12	**Supplementary Transmission system for Ultra Mega Solar Power Park (700MW) at Banaskantha (Radhanesda), Gujarat**		41st (21.12.2016)		**Sep'19**	**Compln Sch. : 18 months from IA.**

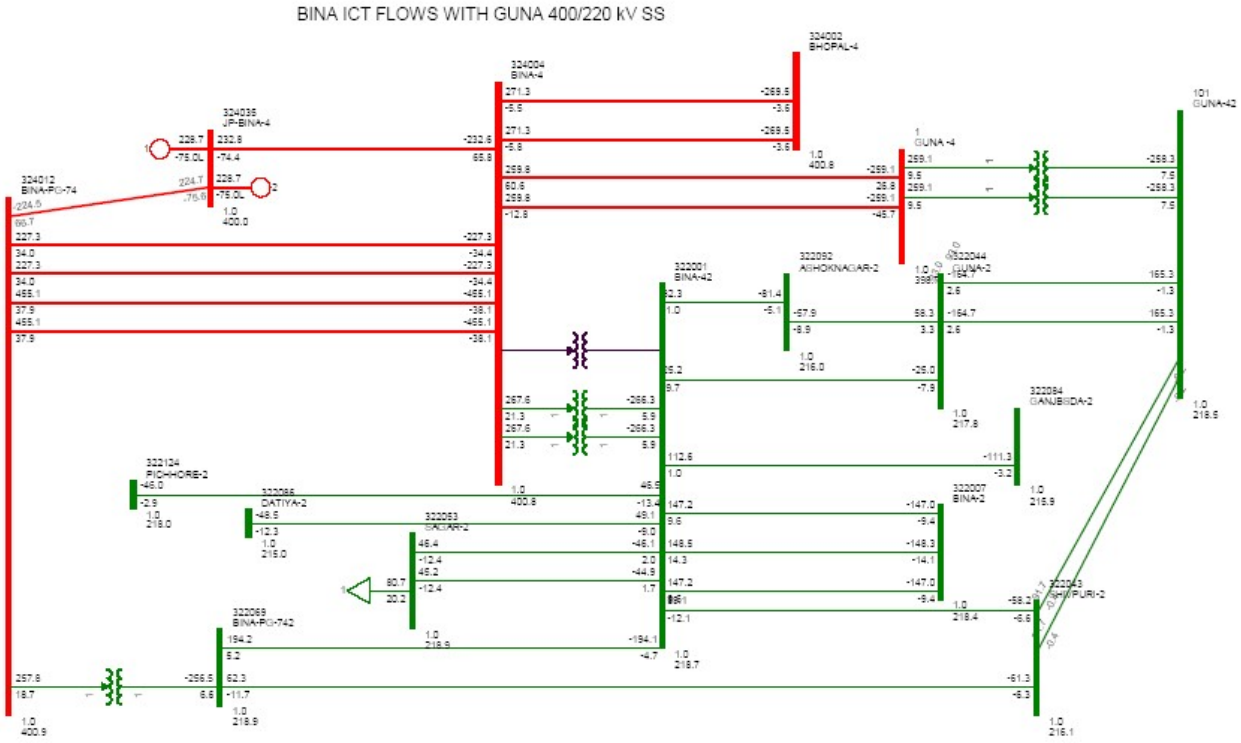
Sl. No.	Description of Scheme	Estimated Cost (Rs. Cr)	Date of firming up in WR standing committee	Date of investment approval	Target date as of now	Remarks
	Establishment of 2x500MVA, 400/220kV pooling station at Banaskantha (Radhanesda) [GIS] along with 1x125MVAr bus reactor				Sep'19	Award placed in Dec'17. Work under progress.
	4 nos. 220kV line bays at 400/220kV at Banaskantha (Radhanesda) pooling station for Solar Park Interconnection.				Sep'19	

Annexure-2

1. BINA ICT FLOWS WITH GUNA

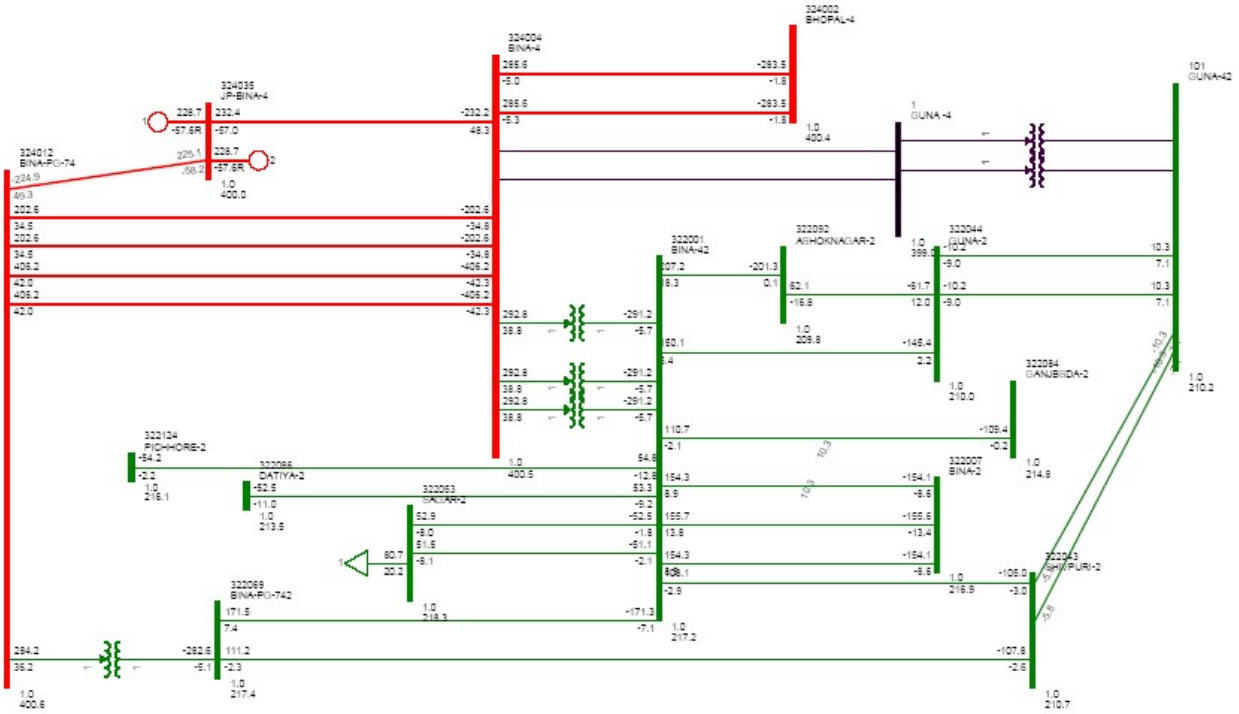


2. BINA ICT FLOWS WITH GUNA (1 ICT Out)



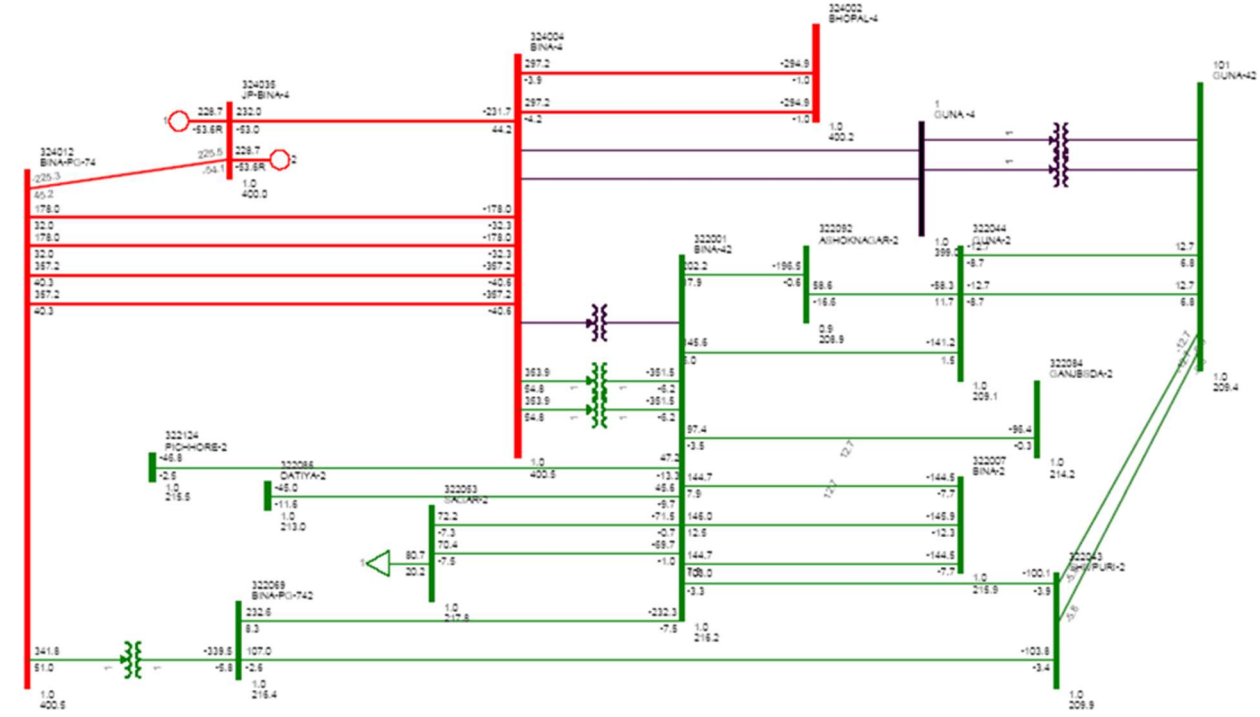
3. BINA ICT FLOWS WITHOUT GUNA

BINA ICT FLOWS WITHOUT GUNA 400/220 kV SS

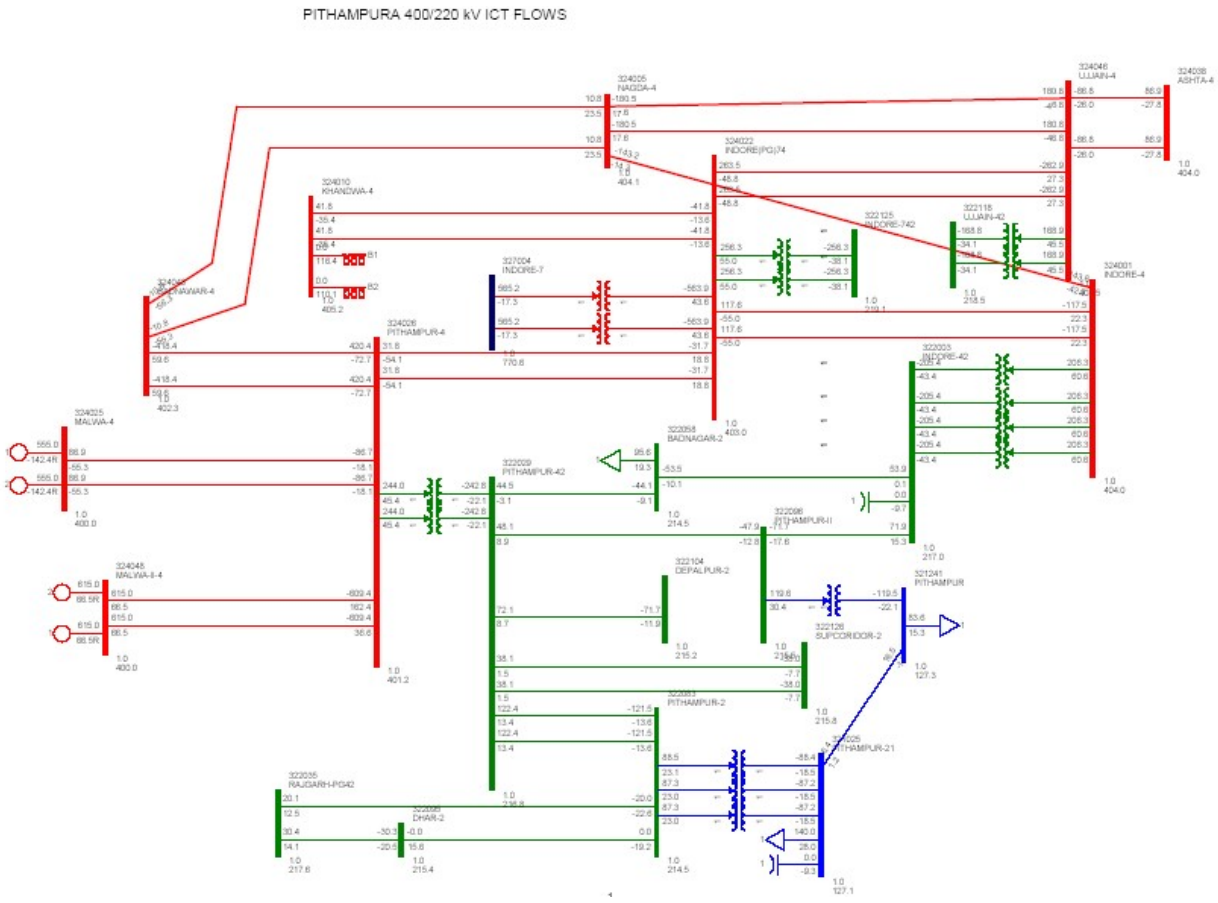


4. BINA ICT FLOWS WITHOUT GUNA (1 ICT Out)

BINA ICT FLOWS(1 ICT OUT) WITHOUT GUNA 400/220 kV SS



5. PITHAMPURA 400/220 kV ICT FLOWS



I/4092/2019 1672-1678

15 YEARS OF CELEBRATING THE MAHATMA

सत्यमेव जयते

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

सेवा में / To

1. COO, CTU, PGCIL, Saudamini, Plot No. 2, Sector - 29, Gurgaon - 122 001
2. Chief Engineer (Plg & Design), Madhya Pradesh Power Transmission Co. Ltd., Block No. 2, Shakti Bhawan, Rampur, Jabalpur (MP) - 482 008

विषय / Subject : Minutes of the meeting to discuss the proposal of MPPTCL for extension of 220 kV supply from Satna (PG) 765/400 kV substation to Kotar 220 kV S/s of MPPTCL by using existing 220 kV interconnector-IV between Satna (PG) - Satna (MPPTCL) S/s

Madam/Sir,

The minutes of the meeting held on 04.02.2019 in CEA to discuss the proposal of MPPTCL for extension of 220 kV supply from Satna (PG) 765/400 kV substation to Kotar 220 kV S/s of MPPTCL by using existing 220 kV interconnector-IV between Satna (PG) - Satna (MPPTCL) S/s are enclosed herewith.

Encl.- as above

भवदीय / Yours faithfully,

20/2/2019

(अवधेश कुमार यादव / Awdhesh Kr. Yadav)
निदेशक / Director

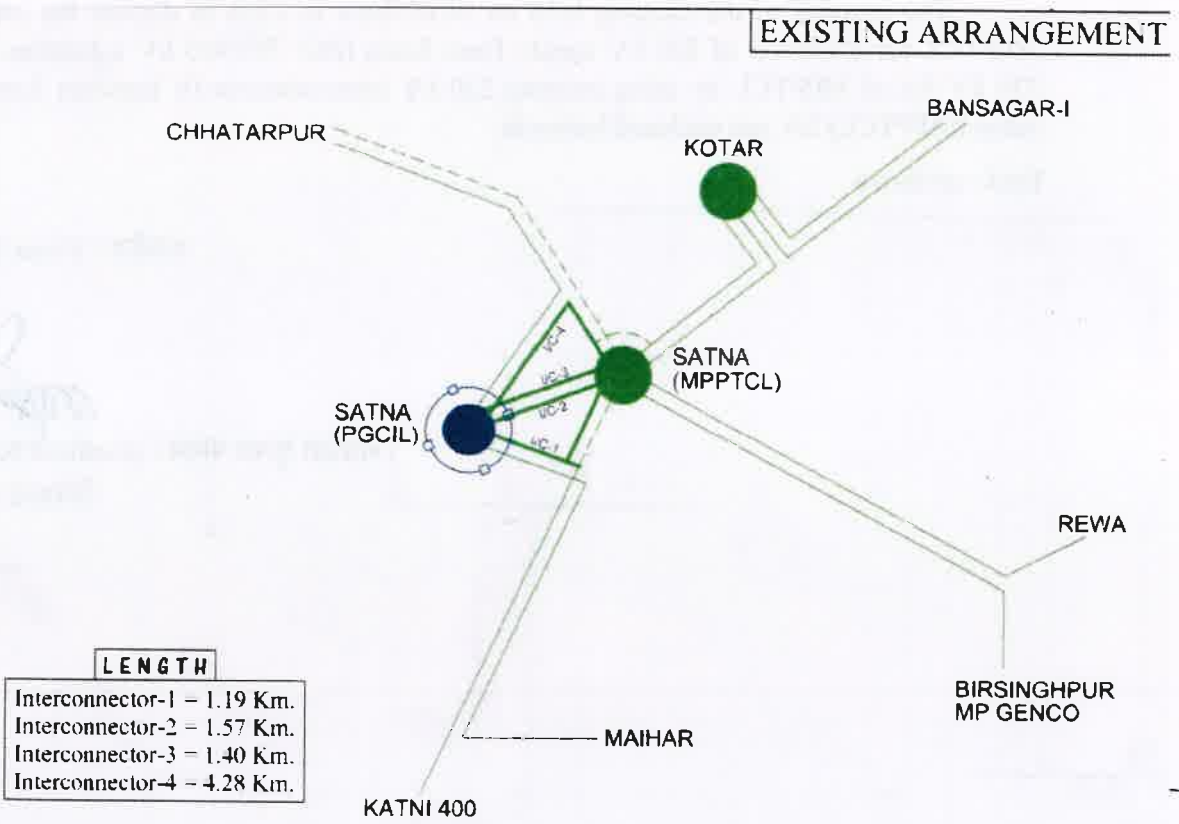
सेवा भवन, आर. के. पुरम-I, नई दिल्ली-110066 टेलीफैक्स: 011-26102045 ईमेल: cea-pspa1@gov.in वेबसाइट: www.cea.nic.in
Sewa Bhawan, R.K Puram-I, New Delhi-110066 Telefax: 011-26102045 email: cea-pspa1@gov.in Website: www.cea.nic.in

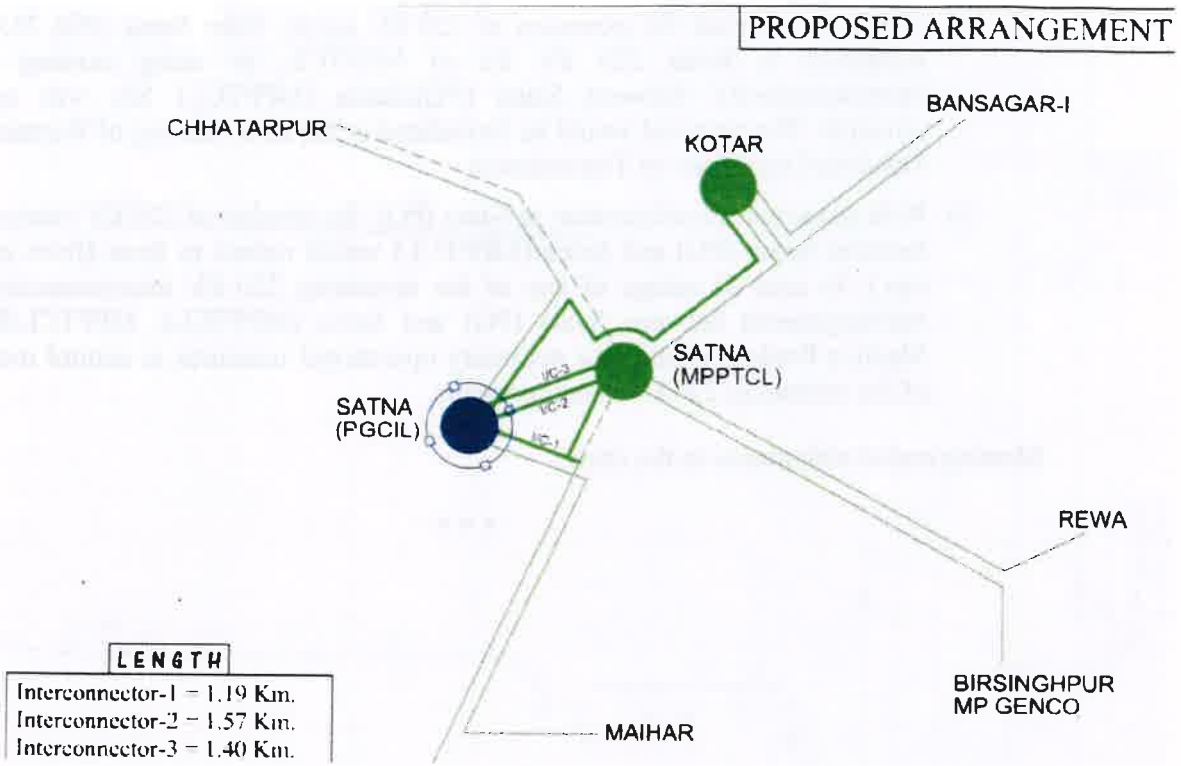
Minutes of the meeting to discuss the proposal of MPPTCL for extension of 220 kV supply from Satna (PG) 765/400 kV substation to Kotar 220 kV S/s of MPPTCL by using existing 220 kV interconnector-IV between Satna (PG) - Satna (MPPTCL) S/s

List of the participants is enclosed at Annexure-I.

1.0 Chief Engineer, PSPA-I welcomed participants to the meeting. He stated that MPPTCL has proposed extension of 220 kV supply from Satna (PG) 765/400 kV substation to Kotar (MPPTCL) 220 kV S/s, using the existing 220 kV interconnector-IV between Satna (PG) - Satna (MPPTCL) S/s and has sought approval of CEA for the same. The meeting has been convened to discuss the proposal of MPPTCL.

2.0 MPPTCL stated that Satna (MPPTCL) S/s is connected with Satna (PG) 764/400 kV S/s through 4 nos. of 220 kV interconnectors (circuits). The lengths of Interconnector I, II, III and IV are 1.19 km, 1.57 km, 1.40 km and 4.28 km respectively. Lower loading has been observed on the Interconnector-IV due to comparatively higher length of 4.28 km as compared to length of other interconnectors. Further, to cater future load growth in Satna area, installation of 3rd 1x160 MVA, 220/132 kV transformer at Satna (MPPTCL) S/s and diversion of load from this substation is also planned. Accordingly, it is proposed to extend the 220 kV supply from Satna (PGCIL) to Kotar (MPPTCL) 220 kV S/s by using the existing 220kV interconnector-IV between Satna (PG) and Satna (MPPTCL). With this, there will be balanced loading in the remaining 3 nos. of 220 kV interconnections between Satna (PG) and Satna (MPPTCL). Existing and proposed arrangement around Satna sub-station is given below:





3.0 CEA stated that with the proposed modification in network, there would be 3 nos. of 220 kV circuits between Satna (PG) and Satna (MPPTCL) substations. The proposal was studied and it was observed that in case of outage of one circuit, loading in remaining two circuits goes beyond thermal loading of the line (considering the thermal rating of 245 MVA for 220 kV line with Zebra conductor with 75°C as conductor design temperature and 40°C as ambient temperature). The observations were conveyed to MPPTCL vide CEA letter dated 08.01.2019 and MPPTCL was requested to consider additional 220 kV circuit (4th) between Satna (PG) to Satna (MPPTCL) or suitable reconfiguration of feeders along with the above proposal.

4.0 MPPTCL stated that the distance between Satna (PG) and Satna (MPPTCL) substation is only about 1.2 km and there are number of 765 kV, 400 kV, 220 kV and 132 kV transmission lines passing through this area. Also, there is a reservoir outside the 220 kV switchyard of Satna (MPPTCL) S/s. It is very difficult to lay any additional 220 kV circuit between these substations. As far as, high loading in the two 220 kV interconnectors between Satna (PG) and Satna (MPPTCL) (in case of outage of third interconnector) is concerned, the same could be managed by opening the Satna (MPPTCL)- Katni (400/220 kV) 220 kV S/c line. Power flow studies show that the flow of about 90 MW on Satna (MPPTCL)- Katni (400/220) kV 220 kV S/c line (towards Katni) in case of outage of one of the 3 nos. of 220 kV interconnections between Satna (PG) and Satna (MPPTCL). There is adequate capacity available at Katni (400/220 kV) S/s to cater the load even in case of non-availability of the feed from Satna (MPPTCL) S/s.

5.0 CTU stated that the MPPTCL proposal has been examined and the load flow studies indicate that, under n-1 situation in the present scenario, the higher loadings in the remaining interconnectors are observed but in the timeframe of 2020-21, the loadings are within design limits.

6.0 After further deliberations, the following was agreed:

a) MPPTCL proposal for extension of 220 kV supply from Satna (PG) 765/400 kV substation to Kotar 220 kV S/s of MPPTCL, by using existing 220 kV interconnector-IV between Satna (PG)-Satna (MPPTCL) S/s, was agreed in principle. The proposal would be formalized in the next meeting of Western Region Standing Committee on Transmission.

b) With proposed reconfiguration at Satna (PG), the number of 220 kV interconnectors between Satna (PG) and Satna (MPPTCL) would reduce to three (from existing 4 nos.). In case of outage of any of the remaining 220 kV interconnections (after rearrangement) between Satna (PG) and Satna (MPPTCL), MPPTCL/SLDC of Madhya Pradesh would take necessary operational measures to control overloading of the remaining 220 kV interconnectors.

Meeting ended with thanks to the chair.

* * *

Annexure-I

List of the participants of the meeting to discuss the proposal of MPPTCL for extension of 220 kV supply from Satna (PGCIL) 765/400 kV substation to Kotar 220 kV S/s of MPPTCL by using existing 220 kV interconnector-IV between Satna (PGCIL) - Satna (MPPTCL) S/s

S. No.	Name	Designation
CEA		
1	Ravinder Gupta	Chief Engineer
2	Awdhesh Kumar Yadav	Director
3	Nitin Deswal	Assistant Director
CTU		
4	P.S. Das	GM
MPPTCL		
5	Deepak Joshi	SE
6	M.M. Dhoke	EE

I/2949/2018

1240-1241

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

सेवा में / To,

COO (CTU), POWERGRID,
Saudamini, Plot no. 2, Sector -29,
Gurgaon-122 001

Sub: Minutes of the meeting held in CEA on 02.11.2018 with CTU to discuss the implementation of connectivity lines by RE project developers on D/c or M/c towers.

Sir/ Madam,

The minutes of the meeting held in CEA on 02.11.2018 with CTU to discuss the implementation of connectivity lines by RE project developers on D/c or M/c towers is enclosed herewith for further necessary action at your end.

Yours faithfully,

20/11/2018

(अवधेश कुमार यादव / Awdhesh Kumar Yadav)

निदेशक / Director (PSPA-1)

Copy to:

(i) Chief Engineer, PSPA-2, CEA

Minutes of the meeting held in CEA on 02.11.2018 with CTU to discuss the implementation of connectivity lines by RE project developers on D/c or M/c towers.

1. The developers, who have been granted Stage II connectivity by CTU, have further proposed the following tower configuration for implementation of their connectivity line:

S. No.	Applicant	Connectivity granted by CTU	Implementation of the connectivity line proposed by developer
1.	M/s ReNew Wind Energy(AP2) Private limited (ReNew)	ReNew Wind Energy (AP2) Private Limited- Bhuj PS 220 kV S/c line (with minimum capacity of 300 MW) along with associated bays at both ends)	Route length is 70 km to be implemented in 2 sections. 1. Section 1: 57 km S/c line on D/c towers. 2. Section 2: 13 km S/c line on M/c towers.
2.	M/s Tata Power Renewable Energy Limited (TPREL)	TPREL 500 MW Solar Power Project Chhayan-Bhadla 220 kV s/C line (with minimum capacity of 300 MW) along with associated bays at both ends)	Line to be implemented in 2 sections. 1. Section 1: S/c line on D/c towers. 2. Section 2: S/c towers on M/c towers.
3.	M/s Toramba Renewable Energy Private Limited	Toramba PS-Solapur(PG) 400 kV S/c line (with minimum capacity of 900 MW) along with associated line bay at Toramba PS end)	Line length is 50.84 km which would be implemented on D/c towers.
4.	M/s ACME Solar Holdings Limited	ACME Bhadla Solar Power Plant- Bhadla 220 kV S/c line (with minimum capacity of 300 MW) along with associated bays at both ends)	S/c line would be implemented on D/c towers.
5.	M/s Green Infra Wind Energy Limited	Green Infra Wind Energy Limited(GIWEL Bhuj) – Bhuj PS 220 kV S/c line (with minimum capacity of 300 MW)along with associated bays at both ends)	Route length is 63 km to be implemented in 2 sections. 1. Section 1: 32 km S/c line on D/c towers. 2. Section 2: 31 km S/c line on M/c towers.
6.	M/s Green Infra Wind Energy Limited (Prior approval of the	Green Infra Wind Energy Limited(GIWEL-Roha) – Bhuj PS 220 kV S/c line (with minimum capacity of 300 MW)along with associated bays at both	Route length is 63 km to be implemented in 2 sections. 1. Section 1: 60 km S/c line on D/c towers. 2. Section 2: 3 km S/c line on M/c

	Government of India under section 68(1) of the Electricity Act, 2003 issued.	ends)	towers.

2. Developers have made the following submissions with respect to implementation of S/c on D/c towers and S/c on M/c towers:

   (i) M/s ReNew Wind Energy(AP2) Private limited for ReNew- Bhuj PS 220 kV S/c line: line to be implemented in 2 sections-

   (a) Section 1 (57 km S/c line on D/c towers)

   (b) Section 2 (13 km S/c line on M/c towers)

   The D/c and M/c towers will be shared with other wind/solar projects developers. The matter is under discussion with developers and not yet concluded.

   (ii) M/s Tata Power Renewable Energy Limited (TPREL) for TPREL 500 MW Solar Power Project Chhayan- Bhadla 220 kV S/c line: The line to be implemented in 2 sections:

   (a) Section 1 (S/c line on D/c towers): 1st circuit would be used by TPREL and it would not string 2nd circuit without prior approval from CEA.

   (b) Section 2 (S/c line on M/c towers): TPREL would share the M/c towers with M/s ACME Solar and M/s Hero Solar Energy Limited.

   (c) Difficulty is getting tower design for 220 kV S/c line. Fabricators do not make 220 kV S/C line.

   (iii) M/s ACME Solar Holdings Limited for ACME- Bhadla 220 kV S/c line: S/c line would be implemented on D/c towers as M/s ACME is facing challenges in obtaining design and availability of S/c tower.

   (iv) M/s GIWEL for GIWEL Bhuj- Bhuj PS 220 kV S/c line: line to be implemented in 2 sections:

   (a) Section 1 (32 km S/c line on D/c towers): 1st circuit would be used by GIWEL and 2nd circuit would be used for future projects.

   (b) Section 2 (31 km S/c line on M/c towers): 1st circuit would be used by GIWEL. 2nd and 3rd circuit would be used by M/s Torrent Power Limited for its Junachay and Lakhpat wind farms. 4th circuit would be used by M/s Avikiran Power Limited for its Baranda wind farm.

3. Even though the connectivity has been granted to the developers through a single circuit line from their generation switchyard to the ISTS pooling station, some of the developers have proposed the implementation of their Single circuit line on Double Circuit towers and / or on Multi Circuit towers.

4. The above issue was deliberated with CTU in a meeting held in CEA under the chairmanship of Chairperson, CEA. List of participants is enclosed as Annexure 1.

5. As far as the implementation of Single Circuit line on Multi Circuit towers in vicinity of ISTS pooling station is concerned, the same is as per the CERC's detailed procedure for grant of connectivity to projects based on renewable sources to inter-state transmission system and is also included in the condition specified by CTU in

the intimation letter for grant of the Stage II connectivity. The intimation letter also specifies that the applicants shall coordinate among themselves for provision of M/c towers near the substation for terminating their dedicated lines.

6. Some of the developers have proposed implementation of their Single Circuit line on Multi Circuit towers beyond the vicinity of ISTS pooling station at their own cost. Some of the developers have stated challenges in obtaining design and fabrication of S/c towers as reasons for proposing construction of their dedicated Single Circuit lines on Double Circuit towers

7. It was deliberated that the capacity at Bhadla and Bhuj 765/400/220 kV ISTS pooling substations, where some of the developers have proposed their Single Circuit connectivity lines on Double Circuit towers and or on Multi Circuit towers has been fully utilized and no further expansion at these locations is feasible.

8. In the meeting, it was agreed that the proposal of various developers may be considered subject to the following condition:

   (i) Implementation of connectivity line on Double Circuit and / or on Multi Circuit towers at their own cost & risk may be considered only after receipt of such request from the developer.

   (ii) The developer/s would not make any claim for additional bay or additional quantum of injection or overriding priority at the ISTS pooling station on basis of item (i). The developer/s has / have to give an undertaking to this effect.

   (iii) CTU will include the implementation details of the connectivity line on Double Circuit towers or on Multi Circuit towers or any other configuration in the connectivity intimation, if requested by applicant.

   (iv) All issues related to sharing of the Double Circuit and / or Multi Circuit towers has to be coordinated among the developers themselves under intimation to CEA / CTU before taking up implementation.

The meeting ended with thanks to the chair.

List of participants the meeting held in CEA on 02.11.2018 with CTU to discuss the implementation of connectivity lines by RE project developers on D/c or M/c towers.

1. P S Mhaske, Chairperson, CEA - In Chair
2. Pardeep Jindal, Chief Engineer (PSPA-2), CEA
3. Ravinder Gupta, Chief Engineer (PSPA-1), CEA
4. Awdhesh Kumar Yadav, Director (PSPA-1), CEA
5. B S Bairwa, Director (PSPA-2), CEA
6. Subir Sen, COO (CTU)
7. Mukesh Khanna, GM (CTU)
8. Anil Kumar Meena, CTU

Annexure- 5

Summary of revised Stage-II connectivity intimation to RE developers

S.no	Applicant	Initial Connectivity granted by CTU	Revised Connectivity Transmission System
1.	M/s Torrent Power Limited for its 199.50 MW Junachay and 115 MW Nakhatrana wind farms in Kutch, Gujarat	Torrent Power Ltd. (TPL Nakhatrana Bhuj) - Bhuj PS 220 kV S/c line (high capacity conductor enabling at least 400MW power transfer at nominal voltage) along-with associated bays at generation end. Torrent Power Ltd. (TPL Junachay Bhuj) - Bhuj PS 220kV S/c line along-with associated bays at generation end	TPL(Junachay) - TPL(Nakhatrana) - Bhuj PS 220 kV S/c line [TPL(Nakhatrana) - Bhuj PS 220 kV S/c line would be of minimum 315 MW capacity at nominal voltage] along with associated bays at Bhuj PS and generation switchyard.* * The line TPL(Junachay) - TPL(Nakhatrana) - Bhuj PS would be implemented as follows: a) section 2: 3 km D/c line on D/c tower by M/s TPL (both circuits would be strung and bundled at TPL Junachay end) b) section 3: 28 km D/c line would be strung on M/c towers of M/s TPL (2 circuits would be strung and bundled at M/c tower ending point) c) section 4: 4 km S/c line would be strung on M/c towers of M/s Avikiran Solar India Pvt Ltd (ASIPL) d) section 5: 30 km D/c line on D/c tower by M/s TPL (two circuits would be strung to establish LILO of TPL (Junachay) - Bhuj 220kV S/c line at TPL Nakhatrana) e) section 6/7: 29-30 km S/c line would be strung on M/c towers of M/s Green Infra Wind Energy Limited (GIWEL)
2.	M/s Torrent Power Limited for 300 MW Lakhpat wind farm in Kutch, Gujarat	Torrent Power Ltd.(TPL- Lakhpat Bhuj) - Bhuj PS 220kV S/c line along-with associated bays at both ends	TPL (Lakhpat) - Bhuj PS 220 kV S/c line (with minimum capacity of 300 MW) along with associated bays at Bhuj PS and generation switchyard.*

			* The line from TPL switchyard upto Bhuj PS would be implemented as follows: a) section 1: 45 km D/c line on D/c tower by M/s TPL (both circuits would be strung and bundled at TPL Lakhpat end) b) section 3: 28 km D/c line on M/c towers by M/s TPL (2 circuits would be strung) c) section 4: 4 km D/c line would be strung on M/c towers of M/s Avikiran Solar India Pvt Ltd (two circuits would be strung and bundled at M/c tower ending point) d) section 6/7: 29-30 km S/c line would be strung on M/c towers of M/s Green Infra Wind Energy Limited (GIWEL)
3.	M/s Avikiran Solar India Private Limited for its 285 MW wind farms in Kutch, Gujarat	Avikiran Solar India Private Limited (ASIPL-Nadapar) - Bhuj PS 220kV S/c line along-with associated bays at generation end	Avikiran Solar India Private Limited - Bhuj PS 220kV S/c line (with minimum capacity of 300 MW) along with associated bays at Bhuj PS and generation switchyard. * * Line length is approx. 82 km which would be implemented in 4 sections from ASIPL switchyard to Bhuj PS: (a) section 1: 48 km D/c line on D/c tower (both circuits would be strung and bundled at both ends) by ASIPL. (b) section 2: 4 km S/c line would be strung on M/c towers of M/s Torrent Power Limited. (c) section 3: 26 km S/c line would be strung on M/c towers of M/s Green Infra Wind Energy Limited (GIWEL). (d) section 4: 3-4 km S/c line on D/c or M/c towers by ASIPL
4.	M/s Toramba Renewable Energy Private Ltd. for its proposed 300 MW Wind farms in Horti, Osmanabad	Toramba PS-Solapur(PG) 400 kV S/c line (with minimum capacity of 900 MW) along with associated line bay at Toramba PS end)	Toramba PS-Solapur(PG) 400 kV S/c line (with minimum capacity of 900 MW at nominal voltage) * * Line length is approx. 50.84 km which would be implemented on D/c towers with Triple Snow Bird Conductor.

5.	M/s ReNew Wind Energy (AP2) Private Ltd. (ReNew) for its 300 MW Wind Power Project in Kutch, Gujarat	ReNew Wind Energy (AP2) Private Limited- Bhuj PS 220 kV S/c line (with minimum capacity of 300 MW) along with associated bays at both ends)	ReNew Wind Energy (AP2) Private Ltd – Bhuj P.S. 220 kV S/c line (with minimum capacity of 300 MW) along with associated bays at Bhuj PS and generation switchyard. * * Line length is approx. 70 km out of which 68 km will be on S/c on D/c towers and remaining will be S/c line on M/c towers (4 circuits)
6.	M/s Green Infra Wind Energy Ltd. for 250 MW Wind farms in Kutch, Gujarat	Green Infra Wind Energy Limited(GIWEL Bhuj) – Bhuj PS 220 kV S/c line (with minimum capacity of 300 MW)along with associated bays at both ends)	Green Infra Wind energy Ltd (GIWEL-Bhuj) – Bhuj PS 220 kV S/c line (with minimum capacity of 300 MW) along with associated bays at Bhuj PS and generation switchyard* * Line length is approx. 63 km out of which first section of appx. 32 km would be on D/c towers (S/c on D/c) and balance appx. 31 km would be on M/c towers with provision for 4 circuits.
7.	M/s Green Infra Wind Energy Ltd. for 300 MW Wind farms in Kutch, Gujarat	Green Infra Wind Energy Limited(GIWEL-Roha) – Bhuj PS 220 kV S/c line (with minimum capacity of 300 MW)along with associated bays at both ends)	Green Infra Wind energy Ltd (GIWEL-Roha) – Bhuj PS 220 kV S/c line on D/c tower (with minimum capacity of 300 MW) along with associated bays at Bhuj PS and generation switchyard* * Line length is approx. 63 km out of which 60 km would be on S/c on D/c tower and balance 3 km would be on S/c on M/c towers (4 circuits) towards the entry of bhuj Pooling station.

8.	M/s Srijan Energy Pvt Ltd. for its 600 MW (300 MW +300 MW) wind farms in Kutch, Gujarat	SESPL switchyard - Bhuj PS 220 kV D/c line along with line bays at both ends - to be developed by SESPL	SESPL switchyard - Bhuj PS 220 kV D/c line along with line bays at both ends* - to be developed by SESPL * The line from SESPL switchyard upto Bhuj PS would be implemented in sections as follows: (a) section 1(a): 22 km S/c line on D/c tower by M/s SESPL (Srijan-1 to Common Point) (b) section 1(b): 12 km S/c line on D/c tower by M/s SESPL (Srijan-2 to Common Point) (c) section 2: 30 km D/c line on D/c towers by M/s SESPL (Common Point to M/c tower starting point) (d) section 3: 2 km D/c line would be strung on M/c towers of M/s INOX Wind Ltd (M/c tower point to Bhuj PS)

Annexure-6

Intra-state transmission schemes being implemented by GETCO under GEC-I

Package No.	Package Details
(A)	**Projects under KfW**
1	220 KV Babara substation (Dist. Amreli)
	(1) 220/132 KV, 2 X 150 MVA,
	(2) 220/66 KV, 3 X 160 MVA,
	(3) 6 Nos. 220 KV, 4 Nos. of 132 KV & 6 Nos. 66 KV feeder bays.
2	220 kV Kalavad GIS substation (Dis. Jamnagar)
	(1) 220/66 kV, 3x160 MVA
	(2) 10 Nos. of 220 kV & 10 Nos. of 66 kV feeder bays
3	220 KV Moti Gop substation (Dist. Jamnagar)
	(1) 220/66 KV, 3 X 160 MVA
	(2) 8 Nos. of 220 KV & 6 Nos. of 66 KV feeder bays
4	Up-gradation of 132 KV Wankaner substation to 220 KV level (Dist. Rajkot) - Hybrid / GIS technology
	(1) 220/66 KV, 3 X 160 MVA, 220/132 KV 2X150 MVA
	(2) 4 Nos. of 220 KV & 6 Nos. of 66 KV feeder bays
5	400 KV Bhachunda GIS substation (Dist. Kutch) (220/66 KV scheme is already approved)
	(1) 400/220 KV, 3 X 500 MVA
	(2) 4 Nos. of 400 KV feeder bays
	(3) 400 KV, 1 x 125 MVAR Reactor with bay
6	400/220/66 KV Bhogat GIS substation (Dist. Jamnagar)
	(1) 400/220 KV, 2 X 500 MVA
	(2) 220/66 KV, 2 X 160 MVA
	(3) 2 Nos. of 400 KV feeder bays
	(4) 400 KV, 1 x 125 MVAR Reactor with bay
	(5) 6 Nos. of 220 KV & 6 Nos. of 66 KV feeder bays
7	400 KV D/C Shapar – Pachham (Fedra) line (Twin AL-59)
8	220 kV D/C Amreli-Babara line (AL-59)
9	220 kV D/C Shapar-Babara line (AL-59)
10	220 KV, 1 x 50 / 1 x 25 MVAR Bus Reactors each at 220 KV Moti Paneli, Bhatia, Nakhatrana, Bhachau & Deodar substations
(B)	**Projects under NCEF**
11	220 KV Bhachunda GIS substation (Dis. Kutch)
	(1) 220/66 KV, 2 X 160 MVA
	(2) 6 Nos. of 220 KV & 6 Nos. of 66 KV feeder bays
12	400 KV D/C Bhogat – Kalavad line (Twin AL-59)
13	400 KV Hadala – Shapar line (Twin AL-59)
14	LILO of both circuits of 220 KV D/C Jamanvada – Varsana line at 220 KV Bhachunda (AL-59) M/C line

Package No.	Package Details
15	LILO of one circuit of 220 KV D/C Akrimota – Nakhatrana line at Bhachunda
16	220 KV D/C Bhatia - Bhogat line (AL-59)
17	220 KV D/C Bhogat - Ranavav line (AL-59)
18	LILO of one circuit of 220 KV D/C Gandhinagar TPS – Chhatral line at Vadavi (AL-59)
19	220 KV D/C Chorania – Salejada line (AL-59)
20	220 KV D/C Radhanpur – Sankhari line (AL-59)
21	LILO of one Circuit of 220 KV D/C Hadala - Sartanpar at 220 KV Wankaner (AL-59)
22	LILO on 220 KV S/C Lalpar - Sartanpar line at 220 KV Wankaner (M/C tower by replacement of existing 132KV towers) (AL-59)
23	220 KV D/C Bhogat – Moti Gop line (AL-59)
24	LILO of both circuits of 220 KV D/C Tebhda – Nyara line at Moti Gop substation (M/C line : AL-59)
25	400 kV D/C Bhachunda – Varsana line (Twin AL-59)
26	LILO of both circuits of 132 KV D/C Sitac WF - Jasdan line at Babara (M/C line)
27	400 kV Shapar GIS substation (Dist. Surendranagar)
	(1) 400/220 kV, 3x500 MVA Transformer with bay
	(2) 220/66 kV, 3x160 MVA Transformer wwith bay
	(3) 10 Nos. of 400 kV feeder bays
	(4) 10 Nos. of 220 kV line bays
	(5) 400 kV, 1x125 MVAR reactor bay
	12 nos. of 66 kV Bays
28	1 No. of 220 KV Reactor bay each at MotiPaneli, Bhatia, Nakhatrana, Bhachau and Deodar substations
29	Transformer Package (All the substation and reactor bay packages are without transformer and Reactor)

Annexure-7

Schemes under Intra-State Transmission schemes for Gujarat State under GEC-II

(A) Substations:

Sr. No.	Name of Element	Quantum	Unit Rate in Rs. Lacs	Amount in Rs. Lacs
1	400/220/66 KV Keshod GIS substation (Dist. Junagadh)	2 x 500 MVA + 2 x 160 MVA	21085	21085
	(1) 400/220 KV, 2 X 500 MVA			
	(2) 220/66 KV, 2 X 160 MVA			
	(3) 6 Nos. of 400 KV feeder bays			
	(4) 400 KV, 1 x 125 MVAR Reactor with bay			
	(5) 8 Nos. of 220 KV & 8 Nos. of 66 KV feeder bays			
2	400/220/66 KV Kalavad GIS substation (Dist. Jamnagar)	2 x 500 MVA	14163	14163
	(1) 400/220 KV, 2 X 500 MVA			
	(2) 8 Nos. of 400 KV feeder bays			
	(3) 400 KV, 1 x 125 MVAR Reactor with bay			
3	400/220/66 KV Shivlakha GIS substation (Dist. Kutch)	2 x 500 MVA + 2 x 160 MVA	21085	21085
	(1) 400/220 KV, 2 X 500 MVA			
	(2) 220/66 KV, 2 X 160 MVA			
	(3) 6 Nos. of 400 KV feeder bays			
	(4) 400 KV, 1 x 125 MVAR Reactor with bay			
	(5) 8 Nos. of 220 KV & 8 Nos. of 66 KV feeder bays			
4	220 KV Dhama substation (Dist. Surendranagar)	2 x 160 MVA	4480	4480
	(1) 220/66 KV, 2 X 160 MVA,			
	(2) 8 Nos. 220 KV, 6 Nos. 66 KV feeder bays.			
5	220 KV Nichi Mandal (Vankda) / Shapar (Dist. Morbi)		4164	4164

	(1) 220/66 KV, 2 X 160 MVA, (2) 6 Nos. 220 KV, 6 Nos. 66 KV feeder bays.	2 x 160 MVA		
6	220 KV Khambhalia substation (Dist. Jamnagar) (1) 220/66 KV, 2 X 160 MVA, (2) 6 Nos. 220 KV, 6 Nos. 66 KV feeder bays.	2 x 160 MVA	4164	4164
7	220 KV Kamlapur substation (Dist. Rajkot) (1) 220/66 KV, 2 X 160 MVA, (2) 8 Nos. 220 KV, 6 Nos. 66 KV feeder bays.	2 x 160 MVA	4480	4480
8	220 KV Talaja substation (Dist. Bhavnagar) (1) 220/66 KV, 2 X 160 MVA, (2) 6 Nos. 220 KV, 6 Nos. 66 KV feeder bays.	2 x 160 MVA	4164	4164
9	220 KV Giyavad substation (Dist. Morbi) (1) 220/66 KV, 2 X 160 MVA, (2) 8 Nos. 220 KV, 6 Nos. 66 KV feeder bays.	2 x 160 MVA	4480	4480
10	220 KV Gomta substation (Dist. Rajkot) (1) 220/66 KV, 2 X 160 MVA, (2) 6 Nos. 220 KV, 6 Nos. 66 KV feeder bays.	2 x 160 MVA	4164	4164
		Total (A)…	86429	86429
(B)	**Transmission Lines:**			
Sr. No.	**Name of Element**	**Quantum (RKM)**	**Unit Rate in Rs. Lacs**	**Amount in Rs. Lacs**
1	400 KV D/C Kalvad - Keshod line (Twin AL-59)	120	165	19800
2	400 KV D/C Keshod - Shapar line (Twin AL-59)	190	165	31350
3	400 KV D/C Shapar – Chharodi line (Twin AL-59)	90	165	14850
4	400 KV D/C Bhachunda – Shivlakha line (Twin AL-59)	210	165	34650
5	400 KV D/C Shivlakha - Veloda (Sankhari) line (Twin AL-59)	245	165	40425
6	400 KV D/C Veloda (Sankhari) - Prantij line (Twin AL-59)	150	165	24750

7	LILO of one circuit of 400 KV D/C Soja – Zerda line at Veloda (Sankhari) substation	50	165	8250
8	LILO of 400 KV S/C Chorania - Asoj line at 400 KV Pachham (Fedra) substation	25	165	4125
9	LILO of both circuit of 220 KV D/C Visavadar - Timbdi at 400 KV Keshod substation	12	160	1920
10	220 KV D/C (400KV) Keshod - Keshod line	25	70	1750
11	220 KV D/C Mansar (Halvad) - Dhama line (AL-59)	110	70	7700
12	220 KV D/C Dhama - Bechraji line (AL-59)	45	70	3150
13	220 KV D/C Dhama - Chharodi line (AL-59)	100	70	7000
14	LILO of 220 KV S/C Bala (SSNNL) - Dhanki (SSNNL) at 220 KV Sarla (GETCO) substation (AL-59)	45	70	3150
15	LILO of both circuits of 220 KV D/C Bhimasar - Charadava line at 220 KV Nichimandal (Vankda) substation (M/C tower AL-59)	10	160	1600
16	220 KV D/C Nichimandal – Shapar (400 KV S/S) line (AL-59)	85	70	5950
17	220 KV D/C Tappar - Radhanpur line (AL-59)	170	70	11900
18	LILO of both circuit of 220 KV D/C Tappar – Shivlakha line at Shivlakha (400 KV) substation (M/C tower AL-59)	25	160	4000
19	LILO of both circuit of 220 KV D/C Bhatia – Kalavad line at Khambhalia substation (M/C tower AL-59)	20	160	3200
20	LILO of both circuits of 220 KV D/C Shapar - Babara line at 220 KV Kamlapur substation (AL-59)	15	70	1050
21	220 KV D/C Kamlapur - Bagodara line (AL-59)	110	70	7700
22	220 KV D/C Bagodara - Mogar line (AL-59)	110	70	7700
23	220 KV D/C Moti Gop - Gomta line (AL-59)	125	70	8750
24	220 KV D/C Gomta - Kamlapur line (AL-59)	75	70	5250
25	220 KV D/C Ghiyavad - Shapar (400 KV s/s) line (AL-59)	50	70	3500
26	LILO of one circuit of 220 KV D/C Hadala - Sartanpur line at 220 KV Ghiyavad substation (AL-59)	10	70	700

27	LILO of both circuit of 220 KV D/C Otha – Sagapara line at Talaja substation (M/C tower AL-59)	20	160	3200
28	220 KV D/C Talaja - Maglana line (AL-59)	60	70	4200
29	LILO of both circuits of 220 KV D/C Jambuva - Karamsad line at Dhuvaran CCPP (by using existing LILO portions and through 220 KV D/C Pachham - Kasor line)	40	160	6400
30	220 KV D/C Maglana - Pachchham line (AL-59)	100	70	7000
		Total (B)…		284970
(C)	**Reactive Power Compensation:**			
Sr. No.	**Name of Element**	**Quantum**	**Unit Rate in Rs. Lacs**	**Amount in Rs. Lacs**
1	400 KV, 50 MVAR line Reactor for 400 KV D/C Bhachunda - Shivlakha & Shivlakha - Veloda lines : 50 MVAR line rector for each circuits at both the ends	8 Nos.	500	2500
		Total (C)…		2500
	400 KV (14 Nos.) & 220 KV (30 Nos.) line bays at far end GETCO substations will be executed through inhouse sources, for smooth execution under loose packages.			
		Grand Total….Total(A)+Total(B)+Total(C)…..		373899

Annexure 8

भारत सरकार / Government of India
विद्युत मंत्रालय / Ministry of Power
केन्द्रीय विद्युत प्राधिकरण / Central Electricity Authority
प्रणाली योजना एवं परियोजना मूल्यांकन प्रभाग
Power System Planning & Project Appraisal Division -I
सेवा भवन, आर. के. पुरम, नई दिल्ली –110066
Sewa Bhawan, R. K. Puram, New Delhi-110066 [ISO: 9001:2008]
वेबसाइट / Website: www.cea.nic.in

No.27/1/2016/ PSP&PA -I/ - 186 Dated 15.02.2016

To
Joint Secretary
Government of India,
Ministry of New and Renewable Energy
Block -14, C.G.O Complex, Lodi Road,
New Delhi – 110003, Fax no: 011 – 24361298.

Sub: Approval of implementation of schemes proposed under green energy corridors.

Ref:
(i) MSETCL letter no. MSETCL/CO/P&D/Green Energy corridor/No.7180 dated 30.05.2015 received via email dated 07.08.2015
(ii) CEA letter no. 29/1/2014/PSP &PA -1/130 dated 09.09.2015
(iii) MSETCL letter no. MSETCL/CO/Proj – Scheme/ S&C–II/GEC–I/13850 dated 28.10.2015.
(iv) CEA's email dated 18.12.2015
(iv) MSETCL letter no. MSETCL/CO/Proj. – Scheme/Scheme-II/GEC-I/289 dated 13.01.2016.

Sir,

MSETCL vide their letter under reference (i) has submitted a DPR for Green Energy Corridor project for approval and its recommendation to MNRE and MoP.

Our comments on proposal of MSETCL are as given below:

(i) The DPR submitted by MSETCL includes 27 no. of transmission elements (190 ckm of transmission line at 220 kV level, 783.36 ckm of transmission line at 132 kV level, 9 no. of 220kV bays, 48 no. of 132kV bays and 1 X 25 MVAR bus shunt reactor at 220kV Dhule S/s) at an estimate cost of Rs. 367 crores, to be implemented under Green Energy Corridors (GEC) Tranche – II (236.12 Cr) & III (130.89 Cr). The intra state transmission has been targeted to be completed within four financial years i.e. 2018-19 (starting from 2015 -16). The details are enclosed at Annexure-I.

(ii) The transmission scheme has been proposed to facilitate evacuation of existing 1500 MW of wind generation projects and to provide additional margin for evacuation of proposed 3500 MW of wind generation project. MSETCL has issued grid connectivity to various wind power projects. The construction of evacuation system up to the STU network is the responsibility of the wind project developer.

(iii) MSETCL has intimated that the PPA (Power Purchase Agreements) is executed with wind projects after their commissioning. As on date Maharashtra is having PPA with the all existing wind generators. Therefore as on date it is not clear that how much power from the proposed additional 3500 MW wind generation projects would be absorbed within Maharashtra and how much power would be exported outside Maharashtra.

(iv) For exporting power outside of Maharashtra the wind generation projects need to take LTA (Long Term Access) / MTOA (Medium Term Open Access) / STOA (Short Term Open Access) in the Inter State Transmission System. In case of availability of margin in the existing (ISTS) transmission system, wind generators can avail LTA, MTOA and STOA in ISTS depending on the period for which open access is sought. But in case of non-availability of margins in the ISTS, based on the LTA application of the wind developers, additional transmission system need to be planned and implemented before the grant of LTA. Therefore, MSETCL may advise the wind developers to seek open access in ISTS for exporting power outside Maharashtra.

(v) Out of 27 no. of intra state intra state transmission elements proposed under Green Energy Corridors (GEC) Tranche – II & III by MSETCL, 24 no. of elements were already agreed in the 36th Standing Committee on Power System Planning of Western Region held on 29.08.2013. Three nos. of additional transmission elements have been included in the proposal.

(vi) The intrastate transmission scheme proposed by MSETCL for absorption of power from wind generation is technically in order. For export of power outside Maharashtra from the wind generation project, if any, transmission scheme needs to be evolved as and when they apply for open access in Inter State Transmission System.

(vii) The total estimated cost of the 27 no. of intra state transmission elements to be implemented under Green Energy Corridors (GEC) Tranche – II & III by MSETCL is 367 Crores including IDC component. The assumptions made for estimating the cost of the scheme is generally in order.

(viii) The Renewable energy based generation projects should meet the connectivity standards applicable to wind generating stations and generating stations using inverters specified in the Central Electricity Authority (Technical Standards for Connectivity with the Grid) Amendment Regulations 2013.

Yours faithfully,

K K Arya

(K.K Arya)
Chief Engineer, PSP&PA - I

Annexure-I

S. No.	Name of line proposed for strengthening	District	Length (ckm.)	Amount Rs. Lakhs	FY
1	132 kV Kadegaon - Kirloskarwadi DCDC	Sangli	28	1023.02	2015-16
2	132 kV Kavthemahankal - Jath D/C	Sangli	64	1691.11	2015-16
3	2nd ckt strining of 220kv Miraj - Ichalkaranji SCDC line	Kolhapur	30	1118.62	2015-16
4	LILO of 132 kV Lonand - Phaltan S/C at Phaltan MIDC	Satara	6.2	839.05	2015-16
5	LILO on 132 kV Ozar - Chandwad S/C at 220/132 kV Pimpalgaon S/s.	Nashik	10	633.56	2015-16
6	LILO of 132kv Mayni - Dighanchi S/C line at Mhaswad S/s is proposed 10kms	Satara	10	587.93	2015-16
7	2nd ckt. stringing of 132 kV Manmad - Yeola SCDC	Nashik	30	668.61	2015-16
8	1X25MVAR Bus reactors at 220kv Dhule S/s	Dhule		577.16	2015-16
9	132 kV D/C line from 220 kV Sawantwadi - Kudal	Sindhudurg	50	1935.65	2015-16
10	2nd ckt. stringing of 132 kV Nandurbar - Visarwadi D/C	Nandurbar	44	763.53	2015-16
		Subtotal		**9838.24**	
11	132 kV Kavthemahankal - Savlaj SCDC	Kolhapur	25	1265	2016-17
12	2nd ckt. stringing of 132 kV Georai - Beed SCDC	Beed	45	726	2016-17
13	132kv Ahmednagar - Supa D/C line using existing RoW has been proposed	Ahmednagar	47	1938	2016-17
14	2nd ckt. stringing of 132 kV Shevgaon - Bhenda D/C	Ahmednagar	26	567	2016-17
15	2nd ckt. stringing of 132 kV Shevgaon - Pathardi D/C	Ahmednagar	23	512	2016-17
16	132 kV Ahmednagar - Ahmednagar MIDC SCDC	Ahmednagar	28.16	1219	2016-17
17	2nd ckt. stringing of 220 kV Valve - Jamde SCDC line has been proposed	Nandurbar	30	1025	2016-17
18	2nd ckt. stringing of 132 kV Kale (T) - Warna SCDC	Satara	20	484	2016-17
19	220kv D/C line from M/s Vish Wind S/s - Bhenda	Ahmednagar	120	5610.22	2016-17
20	132 kV Kharda - Ashti D/C parly on M/C	Beed	91	3005	2016-17
		Subtotal		**16351.22**	
21	LILO of one ckt of 220kV Beed - Patoda D/C line has been proposed	Beed	10	372.9	2017-18

22	M/C line to connect 132kv Khaparale - Sangammer line to 220kv Sinnar (Musalgaon) S/s	Ahmednagar	20	544.89	2017-18
23	132 kV Babhaleshwar- Rahuri - Ahmednagar MIDC line has been proposed	Ahmednagar	120	3539.24	2017-18
24	LILO of 132 kV Sawangi - Pishor at 220 kV Phulambri S/s.	Aurangabad	13	660.75	2017-18
25	LILO of 132 kV Padegaon - Sillod S/C at 220 kV Phulambri S/s.	Aurangabad	13	660.75	2017-18
		Subtotal		5778.53	
26	2nd ckt. stringing of 132 kV Aundh - Dahiwadi SCDC	Satara	30	676.22	2018-19
27	2nd ckt. stringing of 132 kV Shevgaon - Ghodegaon SCDC	Ahmednagar	40	699.13	2018-19
		Subtotal		1375.35	
		A+B+C+D =		33343.34	
		IDC		3357	
		Total		36700.34	

Annexure-9

Revised list of intra- state transmission elements being implemented by MSETCL under GEC-I

S.no	Revised list of the transmission elements	No. of bays
1	2nd ckt stringing of 220 kV Miraj- Ichalkaranji SCDC line with bays	2 no 220 kV bays
2	2nd ckt. stringing of 132 kV Aundh - Dahiwadi SCDC line with bays	2 no. of 132 kV bays
3	132 kV Ahmednagar - Supa DC. Line using existing Corridor line with bay	2 no of 132 kV bays
4	2nd ckt stringing of 220 kV Valve - Jamde SCDC line	2 no. of 220 kV bays
5	2nd ckt. stringing of 132 kV Nandurbar - Visarwadi D/C line with bays	2 no of 132 kV bays
6	132 KV D/C Babhaleshwar - Rahuri - Ahmednagar MIDC line with bays	3 no of 132 kV bays
7	2nd ckt. stringing of 132 kV Shevgaon - Ghodegaon SCDC line with bays	2 no of 132 kV bays
8	2nd ckt. stringing of 132 kV Shevgaon - Pathardi D/C line with bays	2 no of 132 kV bays
9	220 kV D/C line from M/s.Vish Wind S/s. - Bhenda line with bays	4 no. of 220 kV bays
10	2nd ckt. stringing of 132 kV Shevgaon - Bhenda D/C line with bays	2 no of 132 kV bays
11	2nd ckt. stringing of 132 kV Manmad - Yeola SCDC line with bays	2 no of 132 kV bays
12	132 kV Kharda - Ashti D/C partly on M/C tower line with bays	4 no of 132 kV bays
13	2nd ckt. stringing of 132 kV Georai - Beed SCDC line with bays	2 no of 132 kV bays
14	132 kV Kavthemahankal - Savlaj SCDC line with bays	2 no of 132 kV bays
15	132 kV Kadegaon - Kirloskarwadi DCDC line with bays	2 no of 132 kV bays
16	132 kV Kavthemahankal - Jath D/C line	No bays
17	LILO on 132 kV Ozar - Chandwad S/C line at 220/132 kV Pimpalgaon S/s. with bays	2 no of 132 kV bays
18	1 x 25 MVAR Bus reactors at 220 kV Dhule s/s.	
19	LILO of one ckt of 220 kV Beed - Patoda D/C line at 220KV Manjarsumbha s/s	No bays

I/4560/2019 | 1855-1858

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

सेवा में / To,

1. COO (CTU), PGCIL Saudamini, Plot No. 2, Sector 29, Gurgaon-122001.
2. CEO, POSOCO, B-9, Qutub Institutional Area, Katwaria Sarai, New Delhi-110016
3. Director, Electrical Engineering (Power Supply), Ministry of Railways (Railway Board), Rail Bhawan, New Delhi.
4. Managing Director, CSPTCL, Dangania, Raipur (CG) - 492013 Fax - 0771 - 2574246/ 4066566

विषय/**Subject : Minutes of meeting held on 20.03.2019 regarding establishment of 50 MW Solar plant by M/s SEC Railways – Connectivity / evacuation.**

Sir,

Please find enclosed herewith minutes of meeting held on 20.03.2019 regarding establishment of 50 MW Solar plant by M/s SEC Railways – Connectivity / evacuation.

Encl: As above.

Yours faithfully,

10/04/2019

(Nitin Deswal)
Assistant Director

I/4560/2019

Minutes of meeting held on 20.03.2019 in CEA regarding establishment of 50 MW Solar plant through Solar Power Developer by M/s SEC Railways – Connectivity / evacuation.

Railway Board vide its letter dated 22.01.2019 has requested CEA to include, the issue of connectivity of 50 MW solar park being established by South East Central (SEC) Railways for meeting its RPO obligations as a distribution licensee and change of its connectivity agreed at Raipur (Kumhari) 400/220 kV PGCIL substation from bulk consumer to Licensee, as an agenda in the Western Region Standing Committee on Transmission. To deliberate on the issue,two meetings (on 28.02.2019 and 20.03.2019) were held at CEA, New Delhi under the Chairmanship of Chief Engineer (PSPA1), CEA. The list of participants of the meeting held on 20.03.2019 is enclosed at **Annexure–I.**

The deliberations of the meetings are summarized below:

1. **Change of connectivity from Bulk Consumer to Licensee.**

1.1. The connectivity to Railways at Raipur (Kumhari-POWERGRID) 400/220 kV substation at 220 kV level was agreed in the 29th meeting of Standing Committee on Power System Planning of Western Region held on 10.09.2009. The connectivity line along with the two nos. of 220 kV bays at Raipur 400/220 kV substation of POWERGRID was agreed to be implemented by Railways and CTU has already granted connectivity for a quantum of 100MW to SEC Railways as a Bulk Consumer at Raipur (Kumhari-POWERGRID) vide intimation dated 29.05.2012.

1.2. The issue of reconfirmation of connectivity of SEC Railway 220/132 kV substation at Bhilai in Chhattisgarh to Raipur (Kumhari) 400/220 kV PGCIL substation along with additional connectivity to Railways at Raigarh and Bhatpara was also deliberated in the 42nd meeting of Standing Committee on Power System Planning of Western Region held on 17.11.2017. In the meeting Railways had confirmed that connectivity at Raipur (Kumhari) 400/220 kV PGCIL S/s was as a bulk consumer, whereas the new connectivity at Raigarh and Bhatpara, was being sought as a Licensee.

1.3. Railways request of changing the already granted connectivity at Raipur (Kumhari) 400/220 kV PGCIL S/s as a bulk consumer to that of a Licensee would be deliberated in the 2nd meeting of Western Regional Standing Committee on Transmission.

2. **Connectivity of 50 MW Solar Plant at 220 KV GSS of Railways**

2.1. Railway stated that they are carrying out electrification of its entire broad gauge network. In addition dedicated freight corridors and high speed network are also being executed. Railways has planned to procure its power requirement through open access in the ISTS. Indian Railways has planned for construction of transmission line to cover the entire DLI-HWH route and on Golden Quadrilateral routes of Indian Railways between DLI-Mumbai & HWH-Chennai. Railways is constructing dedicated line along the Allahabad-Mugalsarai-Sonnagar (about 290 km) and Raigarh - Paniyajob (480 km) route. The Raigarh - Paniyajob route consists of 12 TSS. For feeding these TSSs from ISTS, Railways has been granted connectivity at Raipur and in principle approval of connectivity from Raigarh and Bhatapara ISTS points (80MW-100MW from each ISTS substation). The 220 kV D/C line from Raipur (Kumhari) 400/220 kV substation would

be terminated at Railways (Southern Eastern Central Railway) Kumhari 220/132 kV GSS.

2.2. Railway has now proposed to establish a 50 MW Solar Plant in the vacant land in the vicinity of Railway Kumhari 220/132 kV GSS through a Solar Power Developer. The Solar Power Developer (SPD) shall own, operate and maintain the solar plant on the Railways land and sell power to Railways at 220 kV level for 'Railways Work' spread across the country including the host state of Chhattisgarh. The implementation of the solar plant would be through tariff based competitive bidding route. They have already invited bids for setting up the Solar Plants under 'Developer Route' and are ready for placement of award. However, the process has been put on hold due to connectivity related issue including control area, metering and scheduling. They propose to connect the 50 MW solar plant at their 220/132 kV Kumhari GSS. The power from the solar plant would be evacuated through a 5.3 km 33 kV D/C line and two nos. of 33/220 kV step up transformer at the Railways Kumhari 220/132 kV sub-station. The proposed schematic is enclosed at **Annexure-2**.

2.3. CEA state that with the proposed arrangement the solar park is not getting directly connected with the ISTS network. It gets connected to the ISTS network through Railways network i.e. the solar plant would be an embedded entity of Railways. For establishing, a direct connectivity with the ISTS network, the solar plant developer may implement a separate 220 kV dedicated line, which would require an additional 220 kV bay at 400/220 kV (Kumhari) Raipur substation of POWERGRID. The other option for direct ISTS connection of the solar plant with POWERGRID Kumhari S/S would be to use one of the two nos. of 220 kV bays allocated to Railways for ISTS connectivity of the solar power plant and other for connecting their Kumhari 220/132 kV TSS as bulk consumer.

2.4. Railway stated that in case of first option, the Solar Power Developer has to establish 33/220 kV sub-station at its premises. In addition, there are space constraints at Raipur 400/220 kV substation for additional 220 kV bay and there would be RoW constraints in implementation of additional 220 kV line. All these would increase the cost of solar generation. In case of second option, reliability of supply of power (through a 220 kV S/C line) to their TSS would be compromised. Therefore, the configuration proposed for the connectivity of the solar plant at Railways 220/132kV Kumhari GSS may be agreed. The power from the solar park would be used by Railways to meets its RPO obligation for energy consumption across the country.

2.5. CEA stated that technically, the arrangement proposed by Railways for drawl of power from ISTS and injection of power from the 50 MW solar plant at Railways 220/132kV Kumhari GSS is optimum from transmission planning point of view. However, the connectivity point is neither an ISTS point of CTU nor an Intra State point of STU.

2.6. POSOCO stated that as per present regulations, the jurisdiction of POSOCO for scheduling, metering and energy accounting is restricted to ISTS sub-stations and therefore, it would not be possible for the POSOCO to take responsibility of meters installed at Railway GSS. This is a unique case with no precedence, where a generator

meant for inter-state power flow is neither connected to ISTS directly nor to the state grid. For granting the connectivity as envisaged above, the 220 kV bus of Railways GSS and the 220 kV line from Railways GSS to Kumhari (PG) needs to be as ISTS. After which, SPD may approach CTU for grant of connectivity and scheduling can be done by concerned RLDC.

2.7. Railways pointed out that in case of M/s Meenakashi Energy Private Limited; the Appellate Tribunal for Electricity (ATE) has extended the jurisdiction of SRLDC beyond ISTS network and has enabled scheduling, dispatch and energy accounting based on the meters installed at the Generator side bus. Railways further argued that the present situation is similar to that of Meenakashi case and scheduling, dispatch and energy accounting by WRLDC based on meter reading installed at Railways Kumhari GSS may be agreed. POSOCO stated that the decision in Meenakashi case was case specific and cannot be taken as precedence in general. For effecting above, Railways may approach CERC for directions.

2.8. Railways stated that the SPD will make an application for availing open access in the ISTS, as and when needed. The application will include details such as quantum of power, its injection point and drawl points. At present, the connectivity proposed for the 50 MW solar plant may kindly be concurred.

2.9. On a specific enquiry of CSPTCL, it was informed that the present arrangement for drawl of power through state network shall continue and Railways (SECR) shall separately interact with the distribution company for progressive disconnection from state network

2.10. After further deliberations, the following was agreed:

i) Railways request of changing the already granted connectivity at Raipur (Kumhari) 400/220 kV PGCIL S/s as a bulk consumer to that of a Licensee would be deliberated in the next i.e. 2nd meeting of Western Regional Standing Committee on Transmission.

ii) Technically, the connectivity of 50 MW Solar Plant with the 220/132 kV Kumhari GSS of Railway is an optimal solution. But the Railways GSS is neither an ISTS point nor an Intra state point.

iii) No separate grant of connectivity is required for the SPD, if the SPD is connected with Railways 220/132kV Kumhari GSS, as in that case, the solar plant would be embedded in the Railways system. However, the SPD would be required to apply to CTU for availing the LTA/MTOA through ISTS.

iv) Railways to take directions from CERC regarding scheduling, dispatch and energy accounting by WRLDC, based on meters installed at Railways 220/132 kV Kumhari GSS.

v) The connectivity proposal would also put for discussion in the 2nd meeting of WRSCT.

I/4560/2019/1855-1858

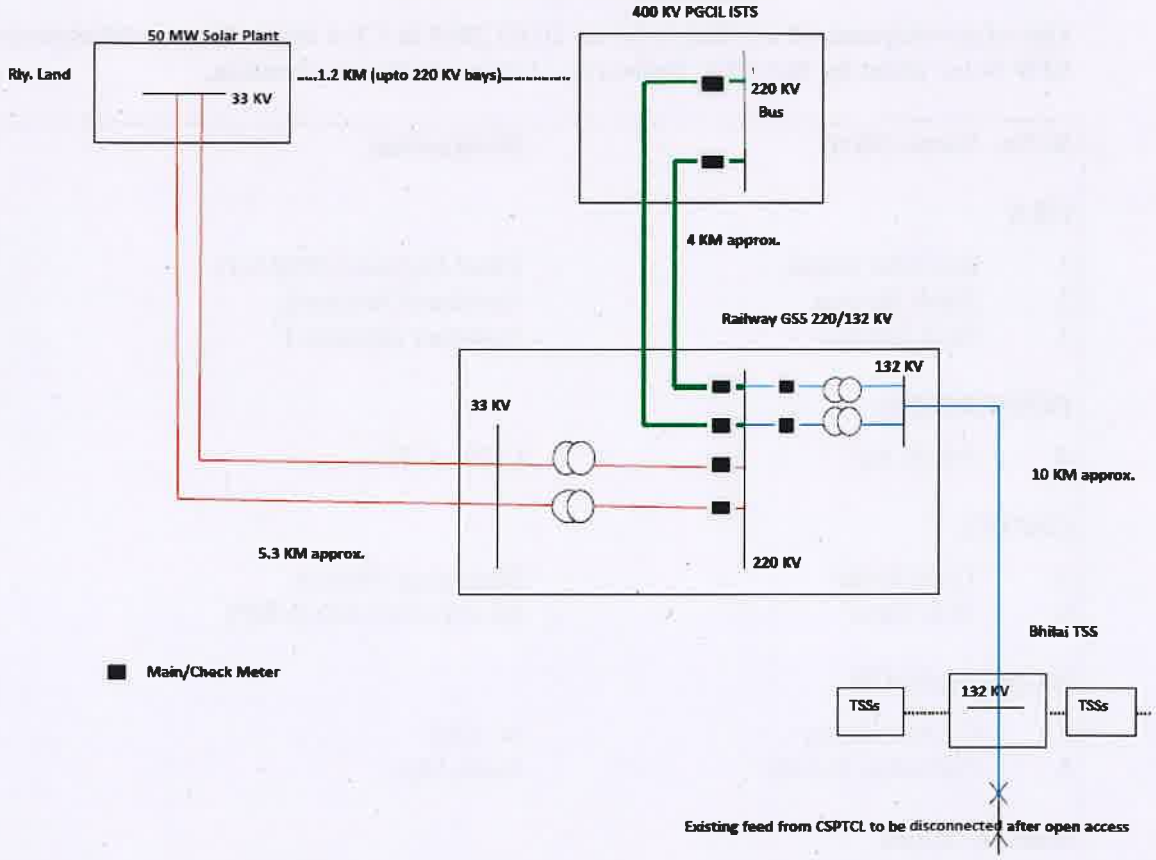
Annexure I

List of participants of meeting held on 20.03.2019 in CEA regarding establishment of 50 MW Solar plant by M/s SEC Railways – Connectivity / evacuation.

S. No.	Name (Shri)	Designation
CEA		
1	Ravinder Gupta	Chief Engineer (PSPA-I)
2	Jitesh Shrivas	Assistant Director-I
3	Nitin Deswal	Assistant Director-I
POWERGRID		
4	Ashok Pal	CGM (CTU)
CSPTCL		
5	Tripti Sinha	Managing Director
6	D K Dave	SE (PL) O/O ED (C&P)
NLDC POSOCO		
7	G Chakraborty	Sr. GM
8	Prabhakar Porwal	Asstt. Mgr.
Railway Board		
9	Maj. Shobhit Gupta	Director Elect. Engg.(PS), Railway Board
10	R.K. Sahu	Dy. CEE/TRD/BSP/SECR
REMCL		
11	S.K. Saxena	CEO
12	Rupesh Kumar	GM
13	N.S. Saxena	Expert
14	A.K. Rampal	Expert

Annexure-2

Schematic of Railway GSS with Meters



महापारेषण

MAHARASHTRA STATE ELECTRICITY TRANSMISSION COMPANY LIMITED
(CIN NO U40109MH2005SGC153646)

Name of Office: Office of the Chief Engineer (STU)	**To,**
Office Address: Prakashganga, 4th floor / 'A' Wing, Plot C -19, E - block, BKC, Bandra (E), Mumbai: - 400051.	**Chief Engineer (SP&PA),** Central Electricity Authority, Sevabhavan, R.K.Puram, New Delhi-110066 Fax – 011 26102045.
(022) 2659 5176 (O)	(022) 2659 5175 (P)
E-Mail Id: cestu@mahatransco.in	(022)2659 1222

NO/MSETCL/CO/STU/ No 00961 **Date:** 31 JAN 2019

Kind attention: Shri. Awadhesh Kumar Yadav (Director)

Sub: - STU connectivity of M/s GWEL (ISGS)
Ref:-1) CERC order in case No.245/MP/2016
2) Meeting held on 19/07/2018 at CEA, New Delhi

Sir,

With reference to the above subject, the Hon'ble CERC in case No.245/MP/2016 Dtd:27th March 2018 has held that an Generator can be allowed connectivity to both InSTS and ISTS network for supply of powers to beneficiaries within and outside State. Accordingly, the CEA vide ref (2) has held a meeting with representatives of STU, CTU (PGCIL), POSOCO, GMR & MSEDCL and carried out joint studies with various options for evacuation of power (share of MSEDCL) from M/s GWEL, Warora.

CEA suggested the option of creation of 220 kV level at M/s GWEL premises through 400/220 kV, 1 X 315 MVA ICT's and its interconnection with 220 kV Intra State Transmission Network. The issue was also discussed as an agenda item of 1st meeting of WRSCT held on 05.09.2018, wherein CEA has in principally approved for the evacuation of power at 220 kV level on InSTS.

Considering the suggestion of CEA, scheme for the evacuation of share of MSEDCL power from M/s GSWEL power plant is studied by STU and found acceptable.

This if for your kind information and further needful please.

Thanking you.

Yours faithfully

(S. S. Jewalikar)
Chief Engineer (STU)

Copy S. w. rs. to:
1) Chairman & Managing Director, MSETCL
2) Director (Projects), MSETCL / Director (Commercial) MSEDCL

Copy fw cs to:
1) General Manager, CTU (PGCIL), Gurgaon
2) Head Transmission GMR Warora Energy Ltd., Delhi

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

सेवा में / To,

1. COO, CTU, PGCIL, Saudamini, Plot No. 2, Sector - 29, Gurgaon - 122 001
2. The Managing Director, GETCO, Sardar Patel Vidyut Bhawan, Race Course, Vadodara -390 007
3. Chief Engineer (STU), MSETCL, Prakashganga, 4th Floor, Plot No. C-19, E-Block, Bandra Kurla Complex, Bandra (E), Mumbai - 400 051
4. AVP, PFC Consulting Ltd., First Floor,"Urjanidhi",1, Barakhamba lane, Connaught Place, New Delhi – 110 001

विषय/Subject: Minutes of the meeting to discuss issues related to the project "Western Region System Strengthening Scheme XIX (WRSS-XIX) and North Eastern Region Strengthening Scheme-IX (NERSS-IX)"-reg

Madam/Sir,

The minutes of the meeting held on 08.01.2019 in CEA to discuss the issues related to the project "Western Region System Strengthening Scheme XIX (WRSS-XIX) and North Eastern Region Strengthening Scheme-IX (NERSS-IX)" are enclosed herewith.

Encl.- as above

भवदीय / Yours Faithfully,

18/1/2019

(अवधेश कुमार यादव / Awdhesh Kr. Yadav)
निदेशक / Director

Minutes of the meeting to discuss issues related to the transmission project "Western Region System Strengthening Scheme XIX (WRSS-XIX) and North Eastern Region Strengthening Scheme-IX (NERSS-IX)"

Chief Engineer, PSPA-I welcomed all the participants to the meeting. He stated that this meeting has been convened to resolve the issues raised by the bidders in pre-bid meeting of the transmission project "Western Region System Strengthening Scheme XIX (WRSS-XIX) and North Eastern Region Strengthening Scheme-IX (NERSS-IX)" held on 20.12.2018. The list of participants is enclosed as Annexure-I.

Issues deliberated in the meeting are as given below:

1.0 Implementation of Vapi-II/Ambethi 400kV S/s as GIS to reduce/optimize land requirement

1.1 Representative from PFCCL stated that approx. 40 acres of land is required for establishment of AIS substation in Ambethi area. In the pre-bid meeting, the bidders have stated that Ambethi area is densely populated and land in this area is owned by tribal people.There are restrictions for sale of land under local land laws. Accordingly, bidders have suggested for establishment of GIS substation instead of AIS to reduce the land requirement of the substation.

1.2 Representative from GETCO stated that for establishment of substation, GETCO normally opts for Government land. He added that there may be issues in getting about 40 acres of contiguous land in the area for establishment of AIS.

1.3 After further deliberations, in view of non-availability of about 40 acres of contiguous land, it was agreed that Vapi-II 400/220 kV substation may be establised as GIS substation.

2.0 Location of Vapi-II 400kV substation

2.1 Representative from PFCCL stated that in the survey report, 3 nos. of locations have been identified for establishment of this substation. Out of these 3 locations, one location has been recommended for establishment of substation, which is near to a proposed 220 kV substation of GETCO.

2.2 Regarding the proposed 220 kV substation, representative from GETCO stated that identification of the land for establishing of the substation (in future) is under process but its connectivity with the grid is yet to be finalized. He added that 220 kV outlets that have been planned for Vapi-II 400/220 kV S/s are as given below:

(i) LILO of Chikli (GETCO) – Vapi (GETCO) 220 kV S/C line at Vapi-II 400/220 kV S/s

(ii) Vapi-II 400/220 kV – Atul (GETCO) 220 kV D/C line

2.3 CEA stated that in addition to the above 220 kV outlets (to be implemented by GETCO) from Vapi-II 400/220 kV S/s, Vapi-II to Sayali 220 kV D/C line is also to be implemented as a part of this scheme under ISTS. Vapi-II 400/220 kV S/s needs to be established at a location that is optimal considering the lengths of 220 kV outlets from this substation.

2.4 After further deliberations, it was agreed that Vapi-II 400/220 kV S/s is to be established on West side of Kakrapar – Vapi 400 kV D/C line (existing line which is to be LILO at Vapi-II 400/220 kV) and North side of existing Vapi 400/220 kV substation. CTU to give RfP inputs accordingly.

3.0 Revision of time line for commissioning of Padghe (PG) – Kharghar 400 kV line and the LILO portion of Padghe (PG) – Ghatkopar line from 38 months to 48 months

3.1 Representative from PFCCL stated that as per survey report, the Padghe – Kharghar 400 kV line will pass through mangrove area, therefore the bidders had requested for revision of the implementation schedule from 38 months to 48 months as obtaining necessary clearances would take more time.

3.2 Representative from CTU stated that Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 specifies implementation time of 38 months for 400 kV Quad transmission line in plain areas. Accordingly, implementation time of 38 months for the above transmission lines has been specified by CTU in the RfP document. He added that, as per CERC Regulation, the implementation time for 400 kV Quad transmission line is 44 months and 48 months for hilly and very difficult terrain respectively. These aspects need to be looked into while increasing the implementation time beyond 38 months.

3.3 CEA stated that the project under implementation by M/s Goa Tamnar Transmission Limited through TBCB route includes LILO of one ckt. of Narendra (existing) – Narendra (new) at 400 kV D/c quad line at Xeldem. The route length of this line is about 100 km, it crosses Western Ghats, passes through forest area (about 45 km) and wildlife sanctuary (about 10 km). This line has been awarded with an implementation schedule of 44 months.

As per the route survey report of the project "WRSS-XIX and NERSS-IX", the route length of Padghe (PG) – Kharghar 400 kV Quad line is about 56 km (about 5 km under forest) and the length of LILO portion of Padghe (PG) – Ghatkopar line is about 21 km (about 8.5 km under forest). Considering the quantum of works involved, implementation period of 38 months appears to be adequate for both these transmission lines even considering the involvement of mangrove land along its route.

3.4 BPC stated that the line route passes through Mangroove area and there are many RoW issues involved. All this would require substantial time, therefore, implementation time may be increased from 38 months

3.5 Subsequently inputs were taken from MSETCL regarding the time required for CRZ clearance. MSETCL vide their email dated 18.01.2019 has informed that the time taken for CRZ clearance for mangrove areas is 09 to 12 Months and if Mangroove cutting is involved the time period is 12 to 15 month. Based on the above the time period the completion scheduled may be decided.

3.6 In view of above, implementation time of 42 months was agreed for the Padghe (PG) – Kharghar 400 kV line and the LILO portion of Padghe (PG) – Ghatkopar line.

Meeting ended with thanks to the chair.

* * *

Annexure-I

List of the Participants of the meeting to discuss issues related to the transmission scheme "Western Region System Strengthening Scheme XIX (WRSS-XIX) and North Eastern Region Strengthening Scheme-IX (NERSS-IX)"

S.No.	Name (Smt/Shri)	Designation
	CEA	
1	Ravinder Gupta	Chief Engineer (PSPA-I)
2	Awdhesh Kumar Yadav	Director
3	Manjari Chaturvedi	Director
4	Nitin Deswal	Assistant Director
	CTU/POWERGRID	
5	P.S. Das	GM
	GETCO	
6	Dipak. H. Patel	Dy. Engineer
	PFCCL	
7	Nirmala Meena	DM
8	Kumar Ritu Raj	Coordinator
	GDS	
9	Maheshwar Sharma	Project Manager

Annexure 13

स्वच्छ भारत
एक कदम स्वच्छता की ओर

OFFICE OF THE CHIEF ELECTRICAL ENGINEER GOVERNMENT OF GOA ELECTRICITY DEPARTMENT 3RD FLOOR, VIDYUT BHAVAN, PANAJI – GOA

150 YEARS OF CELEBRATING THE MAHATMA

Phone No: (0832)2224680 Fax No :(0832)2426986 email id:cee-elec.goa@nic.in

No. CEE/Tech/EHV(Tamnar)/ 1743 Date:-14 /01/2019

To,
The Chief Engineer (SP&PA)
Central Electricity Authority
RK Puram
New Delhi -110066

Sub: Inclusion of LILO of 220KV Ambewadi – Ponda at New 400/220KV Sub Station of GTTPL.

Ref: Report on filed visit to ascertain problems in transmission lines feeding Goa from Karnataka in Southern region vide memo no SRPC/SE- III/SPM/ 2015/2615-624 dated 23-04-2015.

Sir,

Kindly refer to the above-mentioned Report, based on inspection of Transmission lines feeding Goa conducted in the year 2015. As already mentioned in the report the 220KV Ambewadi Ponda line is not being used to its full potential as the First circuit of the line (AP-1) is currently not in use and is kept in open condition.

In order to make the first circuit fully functional, we need to implement a switching scheme between MP-1 and MP-2 at the earliest. The same is difficult to be implemented at Ponda Sub-station due to technical difficulties. However the switching can be achieved outside Ponda Sub-station at the proposed 400 KV Dharbandora Sub station by doing LILO of both circuits of the line being in the close vicinity of the line.

In view of above you are requested to kindly intervene and include "LILO of 220KV Ambewadi Ponda Line" in the scope of works of M/s Goa Tamnar Transmission Project Limited.

Yours faithfully,

Reshma Mathew
(Chief Electrical Engineer)

Copy:-

1) The Project Manager, M/s Goa Tamnar Transmission Projects Limited, A2/2, New Horizons D. B. Marg, Miramar, Panaji. 403001.
2) The Nodal Officer (Tamnar), & Executive Engineer -III, 220/ 110/ 33KV, Sub station Curti-Ponda.....for necessary action.
3) The Executive Engineer (Planning), O/o Chief Electrical Engineer, Panaji .....for information.

Annexure-14

1. **Additional 1x500MVA 400/220kV (9th) ICT, for injection from any additional RE project (other than 4000MW injection under SECI bids upto Tranche IV) at Bhuj PS:**

Sl. No.	Scope of the Transmission Scheme	Capacity /ckm	Estimated Cost (Rs.) Cr.
1.	Additional 1x500MVA 400/220kV (9th) ICT, for injection from any additional RE project (other than 4000MW injection under SECI bids upto Tranche IV) in existing Bhuj PS with associated 400 kV GIS bay and 220kV AIS bay.	1x500MVA, 400/22 400kV ICT bay-1 230kV ICT bay-1	37
2.	3 nos. of 220kV line bays(hybrid/MTS) for termination of dedicated lines of RE developers with Stage-II connectivity	220kV bays -3	19.3
	Total Rs (in Crore)		**56.3**

Implementation time frame is November 2019 - March 2020

2. **WRSS -21 Part-A - Transmission System strengthening for relieving over loadings observed in Gujarat Intra-state system due to RE injections in Bhuj PS:**

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (Rs.) Cr.
	Establishment of 2x1500 MVA, 765/400kV Lakadia PS with 765kV (1x330MVAR) & 400kV (125 MVAR) bus reactor Future provisions: Space for 765/400kV ICTs along with bays: 2 nos. 400/220kV ICTs along with bays : 8 nos. 765kV line bays:4 nos. 400kV line bays: 6 nos. 220kV line bays: 16 nos 765kV bus reactor along with bays : 1no 400kV bus reactor along with bays: 1no	2x1500MVA, 765/400kV 400kV ICT bay-2 765kV ICT bay-2 400kV line bay-4 765kV line bay-2 1x330MVAr, 765 kV, 1x125MVAr, 420 kV 765kV Reactor bay- 1 400kV Reactor bay -1	319
2	LILO of Bhachau – EPGL 400kV D/c (triple) line at Lakadia PS	10km	37
5	Bhuj PS – Lakadia PS 765kV D/c line	100km	463
6	2 nos of 765kV bays at Bhuj PS for Bhuj PS – Lakadia PS 765kV D/c line	765kV line bay-2	37
	Total Rs (in Crore)		**856**

Note:

a. *POWERGRID to provide space for 2 nos of 765kV bays at Bhuj PS for Bhuj PS – Lakadia PS 765kV D/c line*

Implementation time frame i.e. December 2020. BPCs to complete the bidding process in 140 days.

3. WRSS -21 Part-A (RTM)- Conversion of existing 2x63MVAR line reactors at Bhachau end of Bhachau – EPGL 400kV D/c line to switchable line reactors

Sl. No.	Scope of the Transmission Scheme	Capacity /ckm	Estimated Cost (Rs.) Cr.
	Conversion of existing 2x63MVAR line reactors at Bhachau end of Bhachau – EPGL 400kV D/c line to switchable line reactors	400kV Reactor bay - 2	19

POWERGRID to provide space for Conversion of existing 2x63MVAR line reactors at Bhachau end of Bhachau – EPGL 400kV D/c line to switchable line reactors

Implementation time frame is December 2020

4. WRSS -21 Part-B- Transmission System strengthening for relieving over loadings observed in Gujarat Intra-state system due to RE injections in Bhuj PS:

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (Rs.) Cr.
1.	Lakadia – Vadodara 765kV D/c line	350km	1619
2.	330MVAr switchable line reactors at both ends of Lakadia – Vadodara 765kV D/c line	330 MVAR line reactor -4 no. 765kV Reactor bay -4 no.	172
3.	2 nos of 765kV bays at both Vadodara and Lakadia S/Ss for Lakadia – Vadodara 765kV D/c line	765kV line bays- 4	74
		Total Rs (in Crore)	**1865**

Note:

a. *POWERGRID to provide space for 2 nos of 765kV bays and space for 2 nos. of 330MVAr switchable line reactors at Vadodara for Lakadia – Vadodara 765kV D/c line*

b. *Developer of Lakadia S/s to provide space for 2 nos of 765kV bays and space for 2 nos. of 330MVAr switchable line reactors at Lakadia for Lakadia – Vadodara 765kV D/c line*

Implementation time frame is December 2020. BPCs to complete the bidding process in 140 days.

5. Transmission system associated with RE generations at Bhuj –II, Dwarka & Lakadia:

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (Rs.) Cr.
1.	Lakadia PS – Banaskantha PS 765kV D/c line	200km	925
2.	765kV Bays at Lakadia and Banaskantha for Lakadia PS – Banaskantha PS 765kV D/c line	4 nos. 765kV Bays	74
3.	240MVAr switchable Line reactor at Lakadia PS end of Lakadia PS – Banaskantha PS 765kV D/c line	2x240 MVAR 765kV reactor Bays -2	76
		Total Rs (in Crore)	**1075**

Note:

a. *POWERGRID to provide space for 2 nos of 765kV bays at Banaskantha S/s for Lakadia – Banaskantha 765kV D/c line*

b. *Developer of Lakadia S/s to provide space for 2 nos of 765kV bays and space for 2 nos. of 240MVAr switchable line reactors at Lakadia for Lakadia – Banaskantha 765kV D/c line*

Implementation time frame is June 2021 or as per the progress of connectivity/LTA applications of RE projects from WEZ in Gujarat.

6. Transmission System for providing connectivity to RE projects at Bhuj-II (2000MW) in Gujarat:

Sl. No.	Scope of the Transmission Scheme	Capacity /ckm	Estimated Cost (Rs.) Cr.
1	Establishment of 2x1500MVA (765/400kV), 4x500MVA(400/220kV) Bhuj-II PS (GIS) with 765kV (1x330MVAR) and 400kV (125 MVAR) bus reactor Future provisions: Space for 765/400kV ICTs along with bays: 2 nos. 400/220kV ICTs along with bays: 5 nos. 765kV line bays: 4 nos. 400kV line bays: 6 nos. 220kV line bays: 9 nos 765kV bus reactor along with bays: 1no	2x1500MVA, 765/400kV, 4x500MVA (400/220kV) 400kV ICT bay-6 765kV ICT bay-2 220kV ICT bay- 4 765kV line bay-4 220kV line bays -7 1x330MVAr, 765kV, 1x125MVAr, 420kV 765kV reactor Bays -1 400kV reactor Bays -1	552

	400kV bus reactor along with bays: 1no		
2	Reconfiguration of Bhuj PS – Lakadia PS 765kV D/c line so as to establish Bhuj-II –Lakadia 765 kV D/C line as well as Bhuj-Bhuj-II 765kV D/C line	20 km	93
		Total Rs (in Crore)	**645**

Implementation time frame is December 2020 or as per the progress of connectivity/LTA applications of RE projects at Bhuj-II

7. Jam Khambaliya Pooling Station and Interconnection of Jam Khambaliya Pooling Station for providing connectivity to RE projects (1500 MW) in Dwarka (Gujarat) & Installation of 400/220 kV ICT along with associated bays at M/s CGPL Switchyard

Sl. No.	Scope of the Transmission Scheme	Capacity /ckm	Estimated Cost (Rs.) Cr.
	Jam Khambaliya Pooling Station		
1.	Establishment of 4x500MVA, 400/220kV Jam Khambhaliya PS (GIS) alongwith 1x125MVAr, 420kV Bus reactor Future provisions: Space for 400/220kV ICTs along with bays: 4 nos. 400kV line bays: 8 nos. 220kV line bays: 9 nos 400kV bus reactor along with bays: 1no	4x500MVA, 400/220kV 400kV ICT bay-4 220kV ICT bay- 4 400kV line bay-1 220kV line bay-7	209
2.	1 no 400kV line bay for M/s Vaayu 1 no of 220kV bay for M/s Air power 6 nos of 220kV bay for future developers		
3.	1x125MVAr, 420kV Bus reactor at Jam Khambhaliya PS (GIS) along with reactor bay	1x125MVAr, 420kV 400kV reactor Bays -1	20
		Subtotal (Rs. in Cr.)	**229**
	Interconnection of Jam Khambaliya Pooling Station for providing connectivity to RE projects (1500 MW) in Dwarka (Gujarat)		
4.	Extension of Essar–Lakadia/Bhachau 400kV D/c (triple) line up to Jam Khambhaliya PS	40km	75

5.	63MVAr switchable Line Reactor at both ends of Lakadia/Bhachau - Jam Khambhaliya 400kV D/c line	4x 63 MVAr 400kV reactor Bays -4	71
6.	2 no. 400 kV line bays at Jam Khambhaliya PS for termination of Lakadia/Bhachau - Jam Khambhaliya 400kV D/c line	400kV line bay-2	23
		Subtotal (Rs in Crore)	**169**
	Installation of 400/220 kV ICT along with associated bays at M/s CGPL Switchyard		
7.	1x500 MVA, 400/220 ICT at CGPL Mundra switchyard.	1x500 MVA, 400/220 kV 400 kV ICT bay-1 220 kV ICT bay-1	37
		Subtotal (Rs in Crore)	**37**
		Total (Rs in Crore)	**435**

Note:

a. *M/s CGPL to provide space for ICT and creation of 220kV level at CGPL Mundra UMPP switchyard.*

b. 1x500 MVA, 400/220 kV ICT at CGPL Mundra would be charged from 400 kV side and kept isolated from 220 kV side.

Implementation time frame is June 2020. BPCs to complete the bidding process in 140 days

8. Name of Scheme: 400kV line bay at Solapur PS for St-II connectivity to M/s Toramba

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (Rs.) Cr.
1.	1 nos. of 400kV bay at Solapur (PG) for St-II connectivity to M/s Toramba	400kV line bay -1	10
		Total Rs (in Crore)	**10**

Transmission schemes for providing connectivity to RE projects in potential wind energy and solar energy zones in WR [Lakadia (2000MW), Osmanabad (2000MW) & Solapur (1000 MW)]:

9. Name of Scheme: Transmission System for providing connectivity to RE projects in Gujarat [Lakadia (2000MW)]:

Sl. No.	Scope of the Transmission Scheme	Capacity /ckm	Estimated Cost (Rs.) Cr.
1.	Establishment of 4x500MVA, 400/220kV ICTs at Lakadia PS (GIS)	4x500MVA, 400/220kV 400kV ICT bay-4	196

		220kV ICT bay- 4 220kV line bays -7	
			Total Rs (in Crore) **196**

10. Name of Scheme: Transmission system associated with RE generations from potential wind energy zones in Osmanabad area of Maharashtra

Sl. No.	Scope of the Transmission Scheme	Capacity /ckm	Estimated Cost (Rs.) Cr.
1.	Establishment of 4x500MVA, 400/220kV near Kallam PS	4x500MVA, 400/220kV 400kV ICT bay-4 220kV ICT bay-4 400kV line bay-4 220kV line bay- 8	179
2.	1x125MVAr bus reactor at Kallam PS	1x125 MVAr 400kV reactor bay -1	18
3.	LILO of both circuits of Parli(PG) – Pune(GIS) 400kV D/c line at Kallam PS	10km	55
4.	Conversion of 50MVAr fixed Line Reactors on each ckt of Parli (PG) – Pune (GIS) 400kV D/c line at Parli (PG) end into switchable.	400kV Reactor bays -2	19
5.	Provision of new 50MVAr switchable line reactor at Kallam PS end of Kallam – Pune(GIS) 400kV D/c line	2x50 MVAr 400kV Reactor bays -2	30
		Total Rs (in Crore)	**301**

Note:

a. *The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey.*

b. *Powergrid to provide space at Parli (PG) for Conversion of 50MVAr fixed Line Reactors on each ckt of Parli (PG) – Pune (GIS) 400kV D/c line at Parli (PG) end into switchable.*

11. Name of Scheme: Transmission system associated with RE generations from potential Solar Energy Zone in Maharashtra (1000 MW under Ph-I)

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (Rs.) Cr.
1.	Establishment of 400/220 kV, 2x500 MVA at Solapur PP (near Mohol)	500MVA, 400/220kV ICT -2 400kV ICT bay -2 220kV ICT bay -2 400kV line bay -2	89

	Space for 8 nos. of 220 kV line bays for interconnection of wind & solar projects		
2.	Solapur pooling point - Solapur (PG) 400 kV D/c line (twin HTLS)	50km	94
3.	2 nos. of 400kV bays at Solapur PS for Solapur pooling point - Solapur (PG) 400 kV D/c line	400kV line bay -2	19
4.	1x125 MVAR, 420 kV Bus Reactor at Solapur PP	1x125 MVAR, 420kV bus reactor 420kV reactor bay	18
		Total Rs (in Crore)	**220**

Annexure-15

The summary of Stage-II connectivity and LTA agreed for grant to RE projects in the 30th to 37th WR Connectivity / LTA meetings held between 05.09.2018 and 25.04.2019

A. Applications for Stage-II Connectivity received in WR

Sl	Stage-I Application No	Name of Applicant (Organization)	Stage-I Conn Quantum (MW)	Stage-II Application No	Stage-II Conn Quantum (MW)	Date: Stage-II connectivity required	Criteria Stage II*	ISTS System for Stage-II connectivity	Dedicated Tr System for Stage-II connectivity (under scope of applicant)
1.	1200001726	Sitac Kabini Renewables Private Limited	300 (Applied)	1200001734	300	16.03.2020	A	Bhuj-II PS (GIS) (New) • Establishment of 1x1500MVA (765/400kV), 1x500MVA (400/220kV) Bhuj-II PS • Reconfiguration of Bhuj PS – Lakadia PS 765kV D/c** line so as to establish Bhuj II – Lakadia 765 kV D/c line as well as Bhuj – Bhuj II 765kV D/c line	Sitac Kabini Renewables Private Limited – Bhuj II PS 220kV S/c line along with associated line bays at generation end@
2.	1200001758	Adani Green Energy Limited	300 (Applied)	1200001759	300	01.07.2020	A		Adani Green Energy Limited – Bhuj II PS 220kV S/c line along with associated line bays at generation end@
3.	1200001128	Netra Wind Private Limited	300 (Granted)	1200001775	300	31.03.2020	A (SECI Tranche-V)		Netra Wind Private Limited - Bhuj-II PS 220kV S/c line along with associated line bays at generation end.@
4.	1200001846	Vuelta Wind Energy Private Limited	50	1200001877	50	23.11.19	A (Tranche -III)		Flutter Wind Energy Private Limited - Bhuj-II PS 220kV S/c line along with associated line bays at generation end@ Flutter Wind Energy Private Limited shall share its dedicated transmission infrastructure with Vuelta Wind Energy Private Limited, Suswind Power Private Limited, Tempest Wind Energy Private Limited. M/s Flutter Wind
5.	1200001850	Tempest Wind Energy Private Limited	50	1200001875	50	23.11.19	A (Tranche -III)		
6.	1200001848	Flutter Wind Energy Private Limited	50	1200001873	50	01.03.20	A (Tranche -IV)		
7.	1200001849	Suswind Power Private Limited	50	1200001874	50	01.03.20	A (Tranche -IV)		

Sl	Stage-I Application No	Name of Applicant (Organization)	Stage-I Conn Quantum (MW)	Stage-II Application No	Stage-II Conn Quantum (MW)	Date: Stage-II connectivity required	Criteria Stage II*	ISTS System for Stage-II connectivity	Dedicated Tr System for Stage-II connectivity (under scope of applicant)
									Energy Private Limited shall perform the duties of "Lead Generator" in terms of Connectivity Regulations and shall enter into an agreement with the other entities to undertake all operational and commercial responsibilities in line with the provisions of IEGC and other regulations of CERC.
				Bhuj-II PS Subtotal	**1100**				
1.	1200001847	Flurry Wind Energy Private Limited	50	1200001871	50	23.11.19	A (Tranche -III)	Bhuj PS (being implemented under GEC – ISTS scheme)	IWISL (Dayapar) - Bhuj PS 220kV D/c line along with associated line bays at both ends (under implementation by M/s IWISL) IWISL (Dayapar) shall share its dedicated transmission infrastructure with Flurry Wind Energy Private Limited and Aliento Wind Energy Private Limited. M/s IWISL (Dayapar) shall perform the duties of "Lead Generator" in terms of Connectivity Regulations and shall enter into an agreement with the other entities to undertake all operational and commercial responsibilities in line with the provisions of IEGC and other regulations of CERC.
2.	1200001852	Aliento Wind Energy Private Limited	50	1200001870	50	23.11.19	A (Tranche -III)		

Sl	Stage-I Application No	Name of Applicant (Organization)	Stage-I Conn Quantum (MW)	Stage-II Application No	Stage-II Conn Quantum (MW)	Date: Stage-II connectivity required	Criteria Stage II*	ISTS System for Stage-II connectivity	Dedicated Tr System for Stage-II connectivity (under scope of applicant)
				Bhuj PS Subtotal	**100**				
8.	1200000739	POWERICA Ltd.	250	1200001924	50.6	30/09/20	B	**Jam Khambhaliya PS (GIS) (New)** • Establishment of Jam Khambhaliya 400/220kV PS (GIS) along with 1x500 MVA, 400/220kV ICT • Extension of Bhachau/Lakadia - Essar 400kV D/c (triple) line upto Jam Khambhaliya PS	POWERICA Ltd. – Jam Khambhaliya PS 220kV S/c along with associated line bays at generation end@
				Jam Khambhaliya PS Subtotal	**50.6**				
9.	1200001915	Sprng Vayu Vidyut Private Limited	200	1200001936	200	30/05/20	A	**400/220kV Rajgarh Substation (existing)**	Sprng Vayu Vidyut Private Limited - Rajgarh 220kV S/c line along with associated line bays at both ends
				Rajgarh Subtotal	**200**				

Note:

**A: Selected through the tariff based competitive bidding carried out by the agency designated by the Central Government or the State Government for development of renewable generation projects including hybrid projects;*

*** Bhuj – Lakadia 765kV D/c line has been agreed to be implemented under the scheme for relieving over loadings observed in Gujarat Intra-state system in the 1st WRSCT held on 05.09.18*

@Bays at ISTS substation end shall be under the scope of transmission licensee owning the substation subject to compliance of relevant provisions of tariff policy.

B. Applications for enhancement in Stage-II Connectivity received in WR (received in Aug'18)

Sl	Stage-II Enhancement Application No	Name of Applicant (Organization)	Stage-I Conn Quantum (MW)	Stage-II Application No	Stage-II Conn Quantum (MW)	Enhancement Quantum (MW)	Date: Stage-II connectivity required	Criteria Stage II*	ISTS System for Stage-II connectivity	Dedicated Tr System for Stage-II connectivity (as agreed for original Stage-II application)
1.	1200001652	Adani Green Energy MP Limited	300 (granted)	1200001362	100 (granted)	75	01/12/19	A (MSEDCL LOA)	Bhuj PS (Under Implementation)	Common Transmission System to be shared by Dayapar/Ratadiya [1200001362 (100MW) & 1200001652 (75MW enh.)], Murchbana/Mokhra [1200001363 (250MW)] & Chhugar [1200001484 (300MW)] wind projects of M/s AGEMPL • Establishment of 220/33kV Pooling Station near Dayapar/Ratadiya • Dayapar/Ratadiya PS - Bhuj PS 220kV D/c line (with capacity of at least 725MW at nominal voltage) along with associated bays at both ends • Interconnections among pooling stations along with establishment of pooling stations • Establishment of 220/33kV Pooling Stations near Chhugar and Murchbana/Mokhra for pooling of power from respective wind projects (i.e. from 1200001484 (300MW) &

Sl	Stage-II Enhancement Application No	Name of Applicant (Organization)	Stage-I Conn Quantum (MW)	Stage-II Application No	Stage-II Conn Quantum (MW)	Enhancement Quantum (MW)	Date: Stage-II connectivity required	Criteria Stage II*	ISTS System for Stage-II connectivity	Dedicated Tr System for Stage-II connectivity (as agreed for original Stage-II application)
										1200001363 (250MW) wind projects respectively) • Chhugar PS - Dayapar/Ratadiya PS 220kV S/c line along with associated bays at both ends • Murchbana/Mokhra PS - Dayapar/Ratadiya PS 220kV S/c line along with associated bays at both ends
2.	1200001686	Srijan Energy Systems Private Limited	600 (granted)	1200000312	300 (granted)	300	31/03/20	B (Land & Fin. Closure)	Bhuj PS (Under Implementation)	• SESPL switchyard - Bhuj PS 220kV D/c line along with line bays at both ends

C. Applications for LTA:

1. Injection at Bhuj PS

Sl. No.	Stage-I Application No	Name of Applicant (Organization)	Stage-I Connectivity Quantum Granted (in MW)	Stage-II Application No	Stage-II Connectivity Details	ISTS substation for Stage-II connectivity	Seeking LTA for (MW)	Date of Receipt of App.	Date from which LTA required	Date upto which LTA required	Beneficiaries for LTA	LTA Application No
1	1200001424	Avikiran Solar India Private Limited	300	1200001423	Granted for 285 from 29/02/20 (SECI Tr-IV)	Bhuj PS	285	06/08/18	29/02/20	28/02/45	WR (Target)	1200001618

2	1200001483	Adani Green Energy (MP) Limited	300	1200001484	Granted for 300MW from 01/02/20 (SECI Tr-IV)	Bhuj PS	300	03/12/18	29/02/20	28/02/45	WR (Target): 300MW	1200001791
3	1200000778	Adani Green Energy MP Ltd. (AGEMPL-Dayapar)	300	1200001652	Granted for 75MW from 01/12/19 (MSEDCL Bid) (enhancement from 100MW already granted)	Bhuj PS	75	03/12/18	18/01/20	18/01/45	WR (Target): 75MW	1200001790
4	1200001038	Adani Green Energy MP Ltd. (AGEML-Dayapar/Ratadiya)	300	1200001363	Granted for 250MW from 01/11/19 (SECI Tr-III)	Bhuj PS	250	27/11/18	24/11/19	24/11/44	WR (Target): 150MW ER (Target): 50MW* Goa: 50MW (Firm)	1200001786
5	1200001067	Torrent Power Ltd. (TPL) - Nakhatrana Bhuj)	400	1200001569	Granted for 115 MW from 01/07/19 (SECI Tr-V)	Bhuj PS	115	28/12/18	31/03/20	24/07/45	NR (Target): 115 MW	1200001818
6	1200001852	Aliento Wind Energy Private Limited	50	1200001870	50 (Approved for grant) SECI-III	Bhuj PS	50	25/02/19	23/11/19	22/11/44	ER (Target)	1200001908
7	1200001847	Flurry Wind Energy Private Limited	50	1200001871	50 (Approved for grant) SECI-III	Bhuj PS	50	25/02/19	23/11/19	22/11/44	ER (Target)	1200001909
							1125					

**PPA/PSA submitted for transfer of 50MW power to Bihar DISCOMs, but the BSPTCL NOC is not in order. Hence, the same is being processed on Target region basis.*

Transmission System for LTA for applicant at Sl. 1:

a. Installation of 6x500MVA 400/220kV ICTs at Bhuj PS* [in addition to 2x500MVA, 400/220kV ICTs which are already under implementation]

b. Installation of 2x1500MVA 765/400kV ICTs at Bhuj PS (with 765kV AIS and 400kV GIS bays) [in addition to 2x1500MVA, 765/400kV ICTs which are already under implementation]
**3x500MVA ICTs with 400kV AIS and 220kV AIS bays and balance 3x500MVA ICTs with 400kV GIS and 220kV AIS bays*

Transmission System for LTA for applicant at Sl. 2, 3, 4, 5, 6 & 7:

Western Region Strengthening Scheme-21 (WRSS-21)

PART-A

i) Establishment of 2x1500MVA, 765/400kV Lakadia PS
ii) Bhuj PS – Lakadia PS 765kV D/c line
iii) LILO of Bhachau – EPGL 400kV D/c (triple) line at Lakadia PS

PART-B

i) Lakadia – Vadodara 765kV D/c line

Addl. transmission system strengthening for applicants at Bhuj PS:

i) Installation of additional 3x500 MVA, 400/220 kV ICTs (3rd, 4th, 5th) along with 400 kV AIS & 220 kV AIS bays at Bhuj PS
ii) Installation of additional 3x500 MVA, 400/220 kV ICTs (6th, 7th, 8th) along with 400 kV GIS & 220 kV AIS bays at Bhuj PS
iii) Installation of additional 2x1500 MVA, 765/400 kV ICTs (3rd & 4th) along with 765 kV AIS & 400 kV GIS bays at Bhuj PS

2. Injection at Bhuj-II PS

Sl. No.	Stage-I Application No	Name of Applicant (Organization)	Stage-I Connectivity Quantum Granted (in MW)	Stage-II Application No	Stage-II Connectivity Details	ISTS substation for Stage-II connectivity	Seeking LTA for (MW)	Date of Receipt of App.	Date from which LTA required	Date upto which LTA required	Beneficiaries for LTA	LTA Application No
1	1200001726	Sitac Kabini Renewables Private Limited	300	1200001734	Applied for 300MW from 16/03/20 (SECI Tr-V)	Bhuj-II PS	300	31.10.18	16/03/20	24/07/45	SR (Target): 100MW; NR (Target): 200MW	1200001763

2	1200001128	Netra Wind Pvt Ltd (NWPL)	300	1200001775	Agreed for grant of 300 MW from 31/03/20 (SECI Tr-V)	Bhuj-II PS	300	31/12/18	31/03/20*	24/07/45	NR (Target): 300 MW	1200001819
3	1200001758	Adani Green Energy Limited (AGEL)	300	1200001759	Granted for 300 MW from 01/07/20 (SECI Tr-V)	Bhuj-II PS	300	07/01/19	22/07/20	21/07/45	NR (Target): 175 MW & ER (Target): 125 MW	1200001826
3	1200001848	Flutter Wind Energy Private Limited	50	1200001873	50 (Approved for grant) SECI-IV	Bhuj II PS	50	25/02/19	01/03/20	01/03/45	WR (Target)	1200001907
4	1200001849	Suswind Power Private Limited	50	1200001874	50 (Approved for grant) SECI-IV	Bhuj II PS	50	25/02/19	01/03/20	01/03/45	WR (Target)	1200001906
5	1200001850	Tempest Wind Energy Private Limited	50	1200001875	50 (Approved for grant) SECI-III	Bhuj II PS	50	25/02/19	23/11/19	22/11/44	ER (Target)	1200001910
6	1200001846	Vuelta Wind Energy Private Limited	50	1200001877	50 SECI-III	Bhuj II PS	50	28/03/19	23/11/19	22/11/44	ER (Target)	1200001981
							1100					

** NWPL vide letter dated 06.02.2019 have informed that the start date of LTA for the 300MW SECI-V project may be considered in two phases as given below: 1st Phase (150MW): 25.03.2020, 2nd Phase (150MW): 15.07.2020*

Transmission System for LTA

Western Region Strengthening Scheme-21 (WRSS-21)

PART-A

i) Establishment of 2x1500MVA, 765/400kV Lakadia PS
ii) Bhuj PS – Lakadia PS 765kV D/c line
iii) LILO of Bhachau – EPGL 400kV D/c (triple) line at Lakadia PS

PART-B

ii) Lakadia – Vadodara 765kV D/c line

Addl. transmission system strengthening for applicants at Bhuj-II PS:

i) Establishment of 2x1500MVA (765/400kV), 4x500MVA (400/220kV) Bhuj-II PS (GIS)
ii) Reconfiguration of Bhuj PS – Lakadia PS 765kV D/c line at Bhuj-II PS so as to establish Bhuj II – Lakadia 765 kV D/c line and Bhuj PS - Bhuj II PS 765 kV D/c line.

3. Injection at Jam Khambhaliya PS

Sl. No.	Stage-I Application No	Name of Applicant (Organization)	Stage-I Connectivity Quantum Granted (in MW)	Stage-II Application No	Stage-II Connectivity Details	ISTS substation for Stage-II connectivity	Seeking LTA for (MW)	Date of Receipt of App.	Date from which LTA sought	Date upto which LTA required	Beneficiaries for LTA	LTA Application No
1	1200000850	Airpower Windfarms Pvt. Ltd. (AWPL-Jam Khambhaliya)	250	1200001554	Granted for 250MW from 01/12/19 (Non LOA route)	Jam Khambhaliya PS	250	31/01/19	31/12/20	30/12/45	NR (Target)	1200001807
							250					

Transmission System for LTA

Connectivity System for RE projects (1500 MW) in Dwarka (Gujarat)

i) Establishment of 4x500MVA, 400/220kV Jam Khambhaliya PS (GIS)
ii) Extension of Essar–Lakadia/ Bhachau 400kV D/c (triple snowbird) line upto Jam Khambhaliya PS along with 63MVAr switchable Line Reactor at both ends of Lakadia - Jam Khambhaliya 400kV D/c line

Western Region Strengthening Scheme-21 (WRSS-21)

PART-A

i) Establishment of 2x1500MVA, 765/400kV Lakadia PS
ii) Bhuj PS – Lakadia PS 765kV D/c line
iii) LILO of Bhachau – EPGL 400kV D/c (triple) line at Lakadia PS

PART-B

iii) Lakadia – Vadodara 765kV D/c line

4. Injection at Rajgarh

Sl. No.	Stage-I Application No	Name of Applicant (Organization)	Stage-I Connectivity Quantum Granted (in MW)	Stage-II Application No	Stage-II Connectivity Details	ISTS substation for Stage-II connectivity	Seeking LTA for (MW)	Date of Receipt of App.	Date from which LTA sought	Date upto which LTA required	Beneficiaries for LTA	LTA Application No
1	1200001915	Sprng Vayu Vidyut Private Limited	200	1200001936	200 NTPC LOA	Rajgarh	200	29/03/19	30/05/20	30/05/45	NR (Target)	1200002001
							200					

No additional transmission system strengthening is required for grant of LTA.