I/9489/2020

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 विद्युत समिति (पारेषण योजना) (WRPCTP) की 11.01.2020 को अहमदाबाद में हुई पहली बैठक की कार्यवृत्ति

Subject: Minutes of the 1st meeting of Western Region Power Committee (Transmission Planning) (WRPCTP) held on 11.01.2020 at Ahmedabad

Sir/ Madam,

The minutes of the 1st meeting of Western Region Power Committee (Transmission Planning) (WRPCTP) held on 11.01.2020 at Ahmedabad is attached herewith. The same would also be available on CEA website (www.cea.nic.in) at the link: http://cea.nic.in/compsplanningwr.html i.e. Home page - Wings - Power Systems -PSP&A-1 - Standing Committee on Power System Planning Western Region.

Yours faithfully,

(Goutam Roy)

Chief Engineer (PSP&A-I)

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List of Addressees:

1.	Member (Power System), Central Electricity Authority, Sewa Bhawan, RK Puram, Sec-1, New Delhi - 110066	2.	Member Secretary, WRPC, F-3, MIDC Area, Andheri (East), Mumbai – 400093 Fax – 022-28370193	3.	COO (CTU) POWERGRID, Saudamini, Plot no. 2, Sector -29, Gurgaon-122 001 Fax-0124-2571809
4.	Director (System Operation), POSOCO B-9, Qutub Institutional Area, Katwaria Sarai New Delhi – 110010	5.	Chief Electrical Engineer, Vidyut Bhavan, 3rd Floor, Panaji, Goa - 403001	6.	Managing Director, GETCO, Sardar Patel Vidyut Bhawan, Race Course, Vadodara-390007
7.	Managing Director, MPPTCL, Block no -2, Shakti Bhawan, Rampur, Jabalpur – 482008 (M.P)	8.	Chairman & Managing Director, MSETCL, Prakashganga, Plot No.C-19, E-Block, Bandra-Kurla Complex, Bandra (E), Mumbai - 400051	9.	Secretary (Power), Administration of Daman & Diu (U.T.), Fort Area, Moti Daman-396220
10.	Secretary (Power), UT of Dadra & Nagar Haveli, Secretariat, Amli, Silvassa - 396230	11.	Managing Director, CSPTCL, Dangania, Raipur (CG)-492013	12.	Chairman & Managing Director (NTPC), NTPC Bhawan, SCOPE Complex, Institutional Area, Lodhi Road, New Delhi - 110003
13.	Chairman & Managing Director (NHPC), N.H.P.C Office Complex, Sector-33, Faridabad - 121003 (Haryana)	14.	Managing Director (SECI), 1st Floor, D-3, A Wing, Prius Platinum Building District Centre, Saket, New Delhi - 110017		

Copy to :

i. Shri Stephen Fernandes, Executive Engineer (IPM), Vidyut Bhavan, 3rd Floor, Panaji, Goa – 403001
ii. Chief Engineer (Planning & Design), MPPTCL, Block no -2, Shakti Bhawan, rampur, Jabalpur – 482008 (M.P)
iii. Shri Ravindra Chavan, Director (Projects), MSETCL, Prakashganga, Plot No.C-19, E-Block, Bandra-Kurla Complex, Bandra (E), Mumbai - 400051

Minutes of the 1st meeting of Western Region Power Committee (Transmission Planning) (WRPCTP) held on 11.01.2020 at Ahmedabad

The list of the participants is attached as Annexure-I.

1. Confirmation of Minutes of 2nd meeting of Western Region Standing Committee on Transmission (WRSCT)

1.1. CEA stated that the minutes of the 2nd meeting of WRSCT held on 21.05.2019 were issued vide CEA letter no. CEA-PS-11-23(19)/1/2019-PSPA-I Division/I/5728/2019 dated 29.06.2019. Subsequently, MPPTCL and GETCO vide their letter nos. 04-02/N-171/1445 dated 03.07.2019 and ACE(R&C)/STU/511/1228 dated 04.07.2019 respectively, have requested for corrigendum in the minutes of the 2nd WRSCT meeting. The corrigendum to the 2nd meeting of WRSCT was issued vide CEA letter No.CEA-PS-11-23(19)/1/2019-PSPA-I Division/I/6347/2019 dated 05.08.2019.

Members were requested to confirm the minutes of the 2nd meeting of WRSCT issued vide letter dated 29.06.2019 along with the corrigendum to the 2nd meeting of WRSCT issued vide letter dated 05.08.2019.

1.2. GETCO stated that vide their letter dated 16.08.2019 & 11.09.2019, they have raised issues related to ISTS power flow through STU network after issuance of corrigendum of minutes of 2nd WRSCT meeting. The same was also discussed in the 39th WRPC meeting held on 17.12.2019, wherein it was decided that considering GETCO objections on few elements of the scheme, MoM of 38th WRPC meeting will be amended and WRPC will recommend that the proposals were agreed in the 2nd WRSCT meeting on technical grounds except for (1) 400 KV D/C Radhanesda – Banaskantha – Zerda line and (2) LILO of CGPL – Jetpur 400 KV D/C line at Rajkot. Accordingly, the MoM of 2nd WRSCT meeting needs to be amended before its confirmation.

1.3. CEA stated that CERC vide its order dated 10.10.2019 has already granted Regulatory Approval for execution of the Transmission System for Evacuation of Power from potential Solar and Wind energy zones in Western Region – Phase I & II (REZ Phase I & II) and Transmission System for providing Immediate Connectivity to Dholera UMSP.

1.4. CTU stated that Regulatory approval has been granted by CERC after considering the submissions by all the stakeholders including Gujarat.

1.5. CEA stated that GETCO objection is for 400 KV D/C Radhanesda – Banaskantha – Zerda line and LILO of CGPL – Jetpur 400 KV D/C line at Rajkot, which has been planned as a part of Transmission System for Evacuation of Power from potential Solar and Wind energy zones in Western Region under Phase-II. The phase-II scheme is already under review and has been included as an agenda for the meeting, therefore the concerns of GETCO would be taken care while finalizing the same.

1.6. GETCO stated that their views needs to be recorded along with confirmation of the minutes of the 2nd WRSCT minutes.

1.7. CEA stated the in the 2nd WRSCT meeting CTU has proposed conversion of 50MVAr fixed line reactor at Bina (PG) end of Sagar (MP)- Bina(PG) 400kV line into switchable line reactor under ISTS. The proposal was agreed but it was not included in the concluding para 14.4 of the 2nd WRSCT Minutes. Accordingly the following modification is proposed in para14.4:

Para 14.4 :

14.4 After further deliberations, MPPTCL agreed to implement 50MVAr switchable line reactor at Sagar(MP) end of Satna(PG) - Sagar(MP) 400kV line.

Modified para 14.4:

14.4 After further deliberations, the following was agreed:

(i) 50MVAr switchable line reactor at Sagar(MP) end of Satna(PG) - Sagar(MP) 400kV line – under intra-state by MPPTCL.

(ii) Conversion of 50MVAr fixed line reactor at Bina (PG) end of Sagar (MP)- Bina(PG) 400kV line into switchable line reactor – under ISTS.

1.8. After deliberations, the minutes of the 2nd WRSCT meeting issued vide CEA letter dated 29.06.2019 along with corrigendum issued vide letter dated 05.08.2019 and modified para 14.4 as given above were confirmed except for two transmission elements (namely Radhanesda – Banaskantha – Zerda line and LILO of CGPL- Jetpur 400 kV D/C(triple) at Rajkot which were not agreed by GETCO) planned as a part of Transmission System for Evacuation of Power from potential Solar energy zones in Gujarat.

2. Constitution of Western Region Power Committee (Transmission Planning) (WRPCTP)

2.1. CEA stated that Ministry of Power vide order no. 15/3/2017-Trans dated 04.11.2019 (copy enclosed as Annexure-II) has constituted five Regional Power Committees (Transmission Planning) (RSCTPs) namely Eastern Region Power Committee (Transmission Planning) (ERPCTP), Western Region Power Committee (Transmission Planning) (WRPCTP), Northern Region Power Committee (Transmission Planning) (NRPCTP), Southern Region Power Committee (Transmission Planning) (SRPCTP) and North Eastern Region Power Committee (Transmission Planning) (NERPCTP) in supersession of MoP's order of even number dated 13.04.2018.

The Terms of Reference (ToR) of the RPCTPs are given below:

(i) Carry out quarterly review of the Transmission system in the region; assess the growth in generation capacity and demand in various parts of the region; and draw up proposals for strengthening inter-Regional transmission system. The transmission planning is required to keep in

mind the areas where the generation is likely to grow and areas where load demand will grow so that transmission system at any point of time is capable to meet the demand in every corner of the country and comply with the mandate under the Tariff Policy of developing transmission system ahead of the generation for ensuring smooth operation of the grid.

(ii) Assess the transmission system requirements in the near, medium and long term and draw up transmission schemes to meet these requirements. While doing this a perspective plan for the next 15-20 years may also kept in mind and accordingly the requisite allowance/ margin may be factored in the system during the planning process.
(iii) Examine applications for connectivity and access and ensure that these are granted speedily, provided that the requisite fees/charges are paid.
(iv) Review the upstream and downstream network associate with transmission schemes/
(v) Examine and evaluate the intra-state transmission proposals.
(vi) Review and facilitate the construction of the inter-regional grid strengthening schemes.

2.2. The Committee deliberated on the terms of reference of the newly constituted Western Region Power Committee (Transmission Planning) (WRPCTP) and the following views were expressed by the members:

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

i) CEA informed that the transmission system that has already been planned and are under implementation is already being monitored by PSPM division of CEA and also by WRPC forum.
ii) Members opined that the Committee could review the transmission system already planned up to 2-3 years based on the actual demand growth vis-a –vis projected demand growth and operational constraints and suggest the necessary modifications required, if any.
iii) POSOCO stated that there is a need to have a single All-India file on which all the RPCTP can work. As far as immediate connectivity of generation capacity is concerned, the studies for planning transmission system could be focused on individual regions. But to study the various dispatch scenarios representing seasonal variations, peak variations, generation mix variations needs to be studied on a single All India file.

iv) CEA stated that single All-India file for 23-24 condition is already been worked out for which 16 dispatch scenarios (4 seasons and 4 different dispatch scenarios in each season) would be studied.

2.2.2. *Assess the transmission system requirements in the near, medium and long term and draw up transmission schemes to meet these requirements. While doing this a perspective plan for the next 15-20 years may also kept in mind and accordingly the requisite allowance/ margin may be factored in the system during the planning process*.

The members observed that the transmission planning for next 15-20 years in the current scenario is very difficult. Earlier most of the capacity additions were through conventional generations and their locations were firmed up based on pit-head locations and hydro locations. But with focus shifting towards RE capacity additions, which have a shorter gestation period of less than 2 years, there is no firmness/visibility of RE generation capacity addition even in the next 4-5 years. However, whatever transmission system is being planned, the provisions for margins for future could be kept keeping in mind perspective Plan for 10-15 years. For example, while creating RE Pooling Stations in a potential zone, future provisions could be made corresponding to potential of that area and implementation/development could be taken up corresponding to the capacity which is firmed. Similarly while planning a substation near load centers, future provisions could be provided for a time horizon of next 10-15 years and actual development of the S/stn could be taken up depending upon the actual demand growth.

2.2.3. *Examine applications for connectivity and access and ensure that these are granted speedily, provided that the requisite fees/charges are paid.*

CTU stated that there is a regulatory timeline for processing the connectivity and LTA applications and currently monthly meetings are being done to process the connectivity/ LTA application. The frequency of the WRPCTP is every quarter, therefore examination of connectivity/LTA applications by WRPCTP, it is not possible to adhere to the specified regulatory time line.

CTU proposed that the monthly meetings for connectivity/ LTA applications could be continued and its decisions along with any issues could be put to WRPCTP for deliberations.

Members agreed with the CTU proposal.

2.2.4. *Review the upstream and downstream network associated with transmission schemes*

Member Secretary, WRPC stated that RPC forum carries out the quarterly review of the already planned transmission schemes. RPCTP being the planning forum can perform the review of the upstream and downstream network associated with transmission schemes based on actual change in

load-generation scenario and progress of the interlinked transmission schemes.

POSOCO stated that load-generation balance needs to be reviewed on regular basis.

2.2.5. Examine and Evaluate the intra-state transmission proposal

POSOCO observed that apart from examination and evaluation of intra-state transmission proposals, efforts towards aligning the similar planning model for State and ISTS should be made. The tools presently being used for performing planning studies also needs to be reviewed, wherein dispatch models can also be incorporated while planning the transmission lines.

Members observed that POSOCO can coordinate with CEA and CTU in this regard

3. Associated Transmission System for evacuation of power from Solar Parks proposed to be developed by M/s RUMS Ltd. at Agar (550MW) and Shajapur (450MW) districts of Madhya Pradesh – Agenda by MPPTCL

3.1. CEA stated that the following associated Transmission System for Solar Parks at Mandsaur, Neemuch, Agar, Rajgarh, Chhatarpur and Morena in Madhya Pradesh was discussed and approved in the 40th meeting of Standing Committee on Power System Planning of Western Region (SCPSP-WR) held on 01.06.2016:

S. No.	Solar Park	Capacity (MW)	Proposed Transmission System
1	Suwasara Distt Mandsaur considering	250	**Intra-State Scheme** **MPPTCL scope** (already under implementation by MPPTCL under Green Energy Corridor Phase-I)**:** (i) 400/220kV Sitamau (Mandsaur) substation (ii) Mandsaur - Nagda 400kV D/c line (100kM)

			SPPD scope: **Interim Arrangement** (Required due to mismatch in the Implementation schedule of 400/220kV Sitamau S/s (2018-19) and Suwasara Solar park (Mar 2017)) (i) 220kV D/c line from Solar Park Pooling station to crossing point of Bhanpura- Badod 220kV line – 13 km **Connectivity System** (i) Extension of 220kV D/c line from crossing point ofBhanpura-Badod220kVlineupto Sitamau(Mandsaur) – 37 km (ii) Associated 220kV line bays
2	Neemuch Solar Park Comprises of three solar parks: (i) Rampura Solar Park (150 MW) (ii) Singoli Solar Park (200 MW) (iii) Jeeran Solar Park (150 MW).	500	**Intra-State Scheme** **MPPTCL scope:** Already under implementation by MPPTCL under Green Energy Corridor Phase-I (i) 400/220kV Sitamau (Mandsaur) substation (ii) Mandsaur - Nagda 400kV D/c line (100kM) (iii) 220 kV Ratangarh Pooling station Additional system (may be reviewed by MPPTCL) (iv) Establishment of 1x500 MVA (3rd), 400/220 kV transformer at Sitamau (Mandsaur) **Connectivity System - SPPD Scope** (i) Rampura SP – Sitamau (Mandsaur) 220 kV D/c line - 60 km (ii) Jeeran SP - Sitamau (Mandsaur) 220 kV D/C line - 60 km (iii) Singoli SP – Ratangarh 220 kV D/C line – 30 km
3	**Agar** (250 MW), **Rajgarh** (250 MW) and **Shajapur** (Moman Badodiya 250 MW) solar parks **Agar** comprises of two solar parks: (i) Agar Solar Park (125 MW) (ii) Susner Solar Park (125 MW) **Rajgarh** comprises of two solar parks: (i) Jeerapur Solar Park (125 MW)	750	**Inter-state transmission system** **TBCB/ POWERGRID scope:** (i) Establishment of 2x500 MVA, 400/220 kV Pooling station at/near Jeerapur (ii) LILO of both circuits of RAPP –Shujalpur 400 kV D/c at Jeerapur Pooling station (iii) 1X125 Mvar, 420 kV Bus Reactor at Jeerapur Pooling station (iv) 220kV line bays (10 nos) for solar park interconnections **MPPTCL scope**: (i) Shujalpur (PG) -Shujalpur (MP) 2nd 220 kV D/C line or another 220kV outlet from Shujalpur (PG) towards Ashta/other load center **Connectivity System – SPPD scope** (i) Agar SP – Jeerapur Pooling station 220 kV D/c

	(ii) Khilchipur Solar Park (125 MW)		– 35 km (ii) Susner SP – Jeerapur Pooling station 220 kV D/c – 20 km (iii) Jeerapur SP – Jeerapur Pooling station 220 kV D/c (iv) Khilchipur SP– Jeerapur Pooling station 220 kV D/c – 20 km (v) Moman Badodiya SP – Jeerapur Pooling station 220 kV D/c – 45 km
4	Chattarpur Solar park As informed by MoP/MNRE the capacity of the solar park is 250 MW. However, as per the information given by Madhya Pradesh the solar park has potential for 500 MW capacity. Therefore, for evacuation purpose 500 MW capacity has been considered.	500	**Intra State Transmission system strengthening in Chhatarpur area in Madhya Pradesh** (i) 2nd circuit stringing of 220kV Tikamgarh – Chhatarpur line. (ii) LILO of Tikamgarh - Chhatarpur 220 kV D/c line (both circuits) at Bijawar PS (60 km) **Connectivity System – SPPD Scope** (i) Solar park to Bijawar 400/220 kV substation 220 kV lines along with the 220 kV bays.
5	Morena	250	**Intra-State Scheme** **Connectivity System – SPPD Scope** **Alternative I** (i) 220kV Morena SP - Morena S/s (MPPTCL) D/c line – 22 km **Alternative II** (i) 220kV Morena SP – Morena 400/220 substation (ISTS) D/c line – 35 km (ii) Two nos. of 220 kV bays at Morena 400/220 substation (ISTS)

Subsequently, in the 42nd meeting of Standing Committee on Power System Planning of Western Region (SCPSP-WR) held on 17.11.2017 the following was agreed:

i) Evacuation system for solar parks at Neemuch, Rajgarh, Shajapur and Agar would be reviewed after receipt of connectivity / LTA application from RUMSL.
ii) The Inter State Transmission system strengthening in Chhatarpur area in Madhya Pradesh was agreed to be put on hold till there was clarity on time-frame of requirement of Bijawar S/s from MPPTCL. Subsequently, in the 2nd meeting of WRSCT, the scheme was agreed to be dropped.

3.2. CEA further stated that M/s RUMS has applied for the grant of Stage-I connectivity for Agar SP (550 MW) and Shajapur SP (500 MW) to CTU and the issue was discussed in the 32nd meeting of WR constituents for Connectivity & LTA Applications held on 26.11.2018. In the meeting, MPPTCL had stated that implementation of GEC-I Intra state transmission corridor has been taken up by them and under the scheme, MPPTCL is establishing Ujjain 400kV S/s in the area for upcoming RE projects at Agar, Shajapur, Ujjain. MPPTCL stated that for utilization of their intrastate GEC network it is desired that the proposed projects at Agar & Shajapur may get connected to Ujjain S/s. In view of above, it was agreed to discuss the issue separately with CEA, CTU, MPPTCL and RUMS.

Accordingly, a meeting was held in CEA on 04.02.2019 to discuss the connectivity of Agar Solar Park (550 MW) and Shajapur Solar Park (450 MW) of M/s RUMS in Madhya Pradesh, wherein it was agreed that the connectivity of Agar (550 MW) and Shajapur (450 MW) solar parks would be finalized by MPPTCL in consultation with M/s RUMS and accordingly RUMS would close their Stage-I connectivity applications with the CTU. It was also agreed that MPPTCL would take up the necessary intra- state system strengthening, if any, for evacuation of the power from proposed solar parks of M/s RUMS at Agar and Shajapur.

MPPTCL vide their letter no. 04-02/N-171/2218 dated 30.10.2019 has intimated that M/s Rewa Ultra Mega Solar Ltd. (RUMSL) was planning to set up the Solar Parks in Agar (550MW) and Shajapur (450MW) districts of Madhya Pradesh (Totaling to 1000MW) for which Government of Madhya Pradesh had agreed for procurement of entire power by the state. Accordingly, MPPTCL has proposed the following transmission system, as a part of their intra-state system, for evacuation of power from upcoming solar parks in Agar (550MW) and Shajapur (450MW) districts of MP, totalling to 1000MW :

(i) Construction of 400/220kV Pooling S/s at Agar Solar Park with 3x500MVA, 400/220kV Transformer and 1x125MVAR bus reactor

(ii) 400kV D/C line (Quad Moose) from Agar 400kV Pooling S/s to Ujjain 400kV S/s (approx-60Km)

(iii) 2 Nos. 400kV Feeder Bay at Ujjain 400kV S/s

The above external power evacuation system shall be developed by MPPTCL.

The internal power evacuation arrangement from 33/220kV pooling stations at Solar parks to Agar 400/220kV Pooling S/s shall be developed by M/s Rewa Ultra Mega Solar Ltd. (RUMSL) and are as under:

(i) 220kV D/C line (Zebra ACSR) from Agar Solar Park (200MW) to Agar 400/220kV Pooling S/s.

(ii) 220kV D/C line (High Capacity Conductor) from Susner Solar Park (350MW) to Agar 400/220kV Pooling S/s.

(iii) 220kV D/C line (High Capacity Conductor) from Shajapur (Moman Badodia) Solar Park (325MW) to Agar 400/220kV Pooling S/s.

(iv) 220kV D/C line (Zebra ACSR) from South Shajapur Solar Park (125MW) to Ujjain 400/220kV S/s.

(v) 2 Nos. 220kV Feeder Bay at Ujjain 400kV S/s.

3.3. MPPTCL stated that earlier the transmission system for Solar Parks with cumulative capacity of 2250 MW was evolved and approved in advance in view of short gestation period of Solar Parks. Subsequently, the Solar Parks at Chhatarpur (500 MW) and Morena (250 MW) were dropped because of land issues. Out of the revised capacity of 1750 MW (500 MW - Neemuch, 250 MW-Suwasara and 1000 MW at Agar & Rajgarh), 250 MW Suwasara Solar Park is already commissioned. MP would procure 80% of the 1750 MW capacity and balance 20% would be procured by other states. Out of balance capacity of 1500 MW, 500 MW from Neemuch Solar Park would be evacuated through ISTS and 1000 MW from Solar Park at Agar & Rajgarh, MPPTCL was proposed to be evacuated through the following intra-state system transmission system:

i) Construction of 400/220kV Pooling S/s at Agar Solar Park with 3x500MVA, 400/220kV Transformer and 1x125MVAR bus reactor
ii) 400kV D/C line (Quad Moose) from Agar 400kV Pooling S/s to Ujjain 400kV S/s (approx-60Km)
iii) 2 Nos. 400kV Feeder Bay at Ujjain 400kV S/s

However, implementation of the above proposed system would take about 36 months' time, therefore M/s RUMS has requested to review the above proposed system so that the same could be implemented in 18 months' time. Accordingly, MPPTCL will review the above proposed system.

3.4. Chief Engineer, CEA stated that NTPC has also proposed development of Ultra Mega Renewable Energy Power Park at Barethy (Chattarpur) in MP. He requested NTPC and SECI to share its details with CTU and CEA.

3.5. NTPC stated that it has envisaged 1200 MW Ultra Mega Renewable Energy Power Park at Bareithy in MP and it has already availed land for 550 MW. It is coordinating with MP regarding land for the rest 650 MW.

3.6. CTU stated that in view of short gestation period of RE generation, NTPC, if certain about their RE park, may apply for Stage-I and Stage-II connectivity well in advance.

3.7. The committee noted the change in the Transmission System associated with Solar Parks at Mandsaur, Neemuch, Agar, Rajgarh, Chhatarpur and Morena in Madhya Pradesh. The same is summarized below:

S.no	Solar Park	Earlier Capacity (MW)	Earlier proposed transmission System	New Capacity (MW)	Updated transmission system
1.	Suwasara Distt Mandsaur	250	**Intra-State Scheme** MPPTCL scope (already under implementation by MPPTCL under Green Energy Corridor Phase-I): (i) 400/220kV Sitamau (Mandsaur) substation	250	No change in transmission system. Solar park commissioned. Evacuation is

			(ii) Mandsaur - Nagda 400kV D/c line (100kM) SPPD scope: **Interim Arrangement (Required due to mismatch in the Implementation schedule of 400/220kV Sitamau S/s (2018-19) and Suwasara Solar park (Mar 2017))** (i) 220kV D/c line from Solar Park Pooling station to crossing point of Bhanpura- Badod 220kV line –13 km **Connectivity System** (i) Extension of 220 kV D/c line from crossing point of Bhanpura - Badod 220 kV line upto Sitamau (Mandsaur) – 37 km (ii) Associated 220kV line bays		presently through the interim arrangement. Balance system under implementation by MPPTCL.
2.	Neemuch Solar Park Comprises of three solar parks: (i) Rampura Solar Park (150 MW) (ii) Singoli Solar Park (200 MW) (iii) Jeeran Solar Park (150 MW)	500	**Intra-State Scheme** MPPTCL scope: Already under implementation by MPPTCL under Green Energy Corridor Phase-I (i) 400/220kV Sitamau (Mandsaur) substation (ii) Mandsaur - Nagda 400kV D/c line (100kM) (iii) 220 kV Ratangarh Pooling station Additional system (may be reviewed by MPPTCL) (iv) Establishment of 1x500 MVA (3rd), 400/220 kV transformer at Sitamau (Mandsaur) **Connectivity System - SPPD Scope:** (i) Rampura SP – Sitamau (Mandsaur) 220 kV D/c line - 60 km (ii) Jeeran SP - Sitamau (Mandsaur) 220 kV D/C line - 60 km (iii) Singoli SP – Ratangarh 220 kV D/C line – 30 km	500	As informed by MP, 500 MW solar park would be developed at single location instead of three locations as proposed earlier. Neemuch Solar Park would be evacuated through ISTS. Accordingly, evacuation system would be reviewed after receipt of connectivity/LTA application
3.	Agar (250 MW), Rajgarh (250 MW) and Shajapur (Moman Badodiya 250 MW) solar parks Agar comprises of two solar	750	**Inter-state transmission system TBCB/ POWERGRID scope:** (i) Establishment of 2x500 MVA, 400/220 kV Pooling station at/near Jeerapur (ii) LILO of both circuits of RAPP – Shujalpur 400 kV D/c at Jeerapur Pooling station (iii) 1X125 Mvar, 420 kV Bus Reactor at Jeerapur Pooling station (iv) 220kV line bays (10 nos) for solar	1000 Agar (550MW) and Shajapur (450MW)	Transmission system under earlier agreed as ISTS would now be an intra-state transmission system.. MPPTCL is evolving the transmission system.

	parks: (i) Agar Solar Park (125 MW) (ii) Susner Solar Park (125 MW) Rajgarh comprises of two solar parks: (i) Jeerapur Solar Park (125 MW) (ii) Khilchipur Solar Park (125 MW)		park interconnections **MPPTCL scope:** (i) Shujalpur (PG) -Shujalpur (MP) 2nd 220 kV D/C line or another 220kV outlet from Shujalpur (PG) towards Ashta/other load center **Connectivity System – SPPD scope** (i) Agar SP – Jeerapur Pooling station 220 kV D– 35 km (ii) Susner SP – Jeerapur Pooling station 220 kV D/c – 20 km (iii) Jeerapur SP – Jeerapur Pooling station 220 kV D/c (iv) Khilchipur SP– Jeerapur Pooling station 220 kV D/c – 20 km (v) Moman Badodiya SP – Jeerapur Pooling station 220 kV D/c – 45 km		
4.	Chattarpur Solar park As informed by MoP/MNRE the Capacity of the solar park is 250 MW. As MP there is potential for 500 MW capacity. 500 MW capacity has been considered.	500	**Intra State Transmission system strengthening in Chhatarpur area in Madhya Pradesh** (i) 2nd circuit stringing of 220kV Tikamgarh – Chhatarpur line. (ii) LILO of Tikamgarh - Chhatarpur 220 kV D/c line (both circuits) at Bijawar PS (60 km) **Connectivity System – SPPD Scope** (i) Solar park to Bijawar 400/220 kV substation 220 kV lines along with the 220 kV bays.		Solar Park Dropped
5.	Morena	250	**Intra-State Scheme** **Connectivity System – SPPD Scope** **Alternative I** (i) 220kV Morena SP - Morena S/s (MPPTCL) D/c line – 22 km **Alternative II** (i) 220kV Morena SP – Morena 400/220 substation (ISTS) D/c line – 35 km (ii) Two nos. of 220 kV bays at Morena 400/220 substation (ISTS)		Solar Park Dropped

		2250		1750	

3.8. After deliberations , the following was agreed:

i) MPPTCL will put the revised transmission system transmission for evacuation of power of 1000 MW from Solar Park at Agar & Shajapur in the next meeting.
ii) M/s RUMS to apply for ISTS connectivity for 500 MW solar park at Neemuch.
iii) M/s NTPC to apply for ISTS connectivity for their proposed solar park at Barethi.

4. Review of the transmission system for 10 GW solar RE projects in Gujarat under Phase-II and immediate connectivity to Dholera UMSP

4.1. CEA informed that out of total 66.5 GW Renewable Energy Zones, 28 GW (20 GW Solar + 8 GW) Wind REZ was identified in Western Region. The transmission system for evacuation of power from 9.5 GW (2 GW Solar + 7.5 GW Wind) RE projects has already been planned under Phase-I. Out of 7.5 GW wind, 1 GW wind RE projects in Osmanabad WEZ would be evacuated through MSETCL intra-state network. The transmission system for evacuation of power from 18.5 GW (18 GW Solar +0.5 GW Wind) has already been planned under Phase-II along with the immediate connectivity system to Dholera UMSP (4 GW). CERC has already granted the regulatory approval the above schemes vide their order dated 10th October, 2019 in the petition No. 197/MP/2019.

4.2. Out of 28 GW potential RE zones in Western Region, 16 GW potential RE zones have been identified in Gujarat. Out of 16 GW potential RE zones, transmission system for evacuation of 5.5 GW RE projects and 10.5 GW RE projects has been planned under Phase-I and under Phase-II respectively. The transmission system planned under phase-I is under implementation for completion by December' 2020/March 2021/June 2021. Transmission Scheme for providing connectivity to RE project in Gujarat {Lakadia (2000 MW)] planned under phase-I is under hold. Bidding for transmission system planned under Phase-II is yet to be started.

The status of the transmission system planned for evacuation of power from 9.5 GW (2 GW Solar + 6.5 GW Wind + 1 GW Wind in intra state system) RE projects in phase- I is as given below:

S.No	Name of the scheme	Status
1	WRSS -21 Part-A - Transmission System strengthening for relieving over loadings observed in Gujarat Intra-state system due to RE injections in Bhuj PS	SPV acquired by M/s Adani Transmission Ltd. on 14.10.2019
2	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	Approved for implementation by PGCIL under RTM vide MoP OM dated 30.01.2019

3	WRSS -21 Part-B- Transmission System strengthening for relieving over loadings observed in Gujarat Intra-state system due to RE injections in Bhuj PS	SPV acquired by M/s Sterlite Power Trans. Limited 26.11.2019
4	Transmission system associated with RE generations at Bhuj –II, Dwarka & Lakadia	SPV acquired by M/s Adani Transmission Ltd. on 13.11.2019
5	Transmission System for providing connectivity to RE projects at Bhuj-II (2000MW) in Gujarat	SPV acquired by M/s Power Grid Corporation of India Limited on 16.10.2019
6	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	SPV acquired by M/s Adani Transmission Ltd. on 13.11.2019
7	400kV line bay at Solapur PS for St-II connectivity to M/s Toramba (1 GW solar)	Approved for implementation by PGCIL under RTM vide MoP OM dated 30.01.2019. However, the stage-II connectivity granted to M/s Toramba has subsequently been revoked vide letter dated 09.01.2020. Scheme is on hold
8	Transmission System for providing connectivity to RE projects in Gujarat [Lakadia (2000MW) WEZ]	PFCCL initiated the bidding process. However, put on hold due to change in Govt. of Gujarat land policy.
9	Transmission system associated with RE generations from potential wind energy zones in Osmanabad area of Maharashtra (1 GW)	Mode of implementation to be decided by MoP
10	Transmission system associated with RE generations from potential Solar Energy Zone in Maharashtra in Solapur (1000 MW under Ph-I)	Mode of implementation to be decided by MoP

4.3. National Committee on Transmission (NCT) in its 4th meeting held on 31.7.2019 has recommended the following packages for the transmission system planned for evacuation of power from 18.5 GW (18 GW solar + 0.5 GW Wind) RE projects in phase- II in Western Region. The package wise status of the scheme is as given below:

S. No.	**Name of Scheme**	**Status**
	Transmission System for evacuation of power from RE projects in Rapar (3000 MW) and Lakadia (2000 MW) SEZ – Part A	Under review on account of change in Govt. of Gujarat land policy.
	Transmission System for evacuation of power	

S. No.	Name of Scheme	Status
	from RE projects in Rapar (3000 MW) and Lakadia (2000 MW) SEZ– Part B	
	Transmission System for evacuation of power from RE projects in Rapar (3000 MW) and Lakadia (2000 MW) SEZ – Part C	
	Transmission System for evacuation of power from RE projects in Rapar (3000 MW) and Lakadia (2000 MW) SEZ – Part C (Ahmedabad 400 kV interconnection).	
	Augmentation of transformation capacity at Lakadia PS for providing connectivity to RE projects (2000 MW) SEZ	
	Transmission System for evacuation of power from RE projects in Banaskantha (2500 MW) REZ - Part A (Augmentation of transformation capacity at Radhanesda PS)	
	Transmission System for evacuation of power from RE projects in Banaskantha (2500 MW) REZ- Part B	
	Transmission System for evacuation of power from RE projects in at Jamnagar (2500 MW) REZ	
	Transmission system for evacuation of power from RE projects in Sholapur (1000 MW under Ph-I+ 500 MW under Ph-II) SEZ and Osmanabad area (1 GW) in Maharashtra.	Solapur SEZ has been deferred due to land issues as per meeting at MOP dated 10.12.2019.
	Transmission system for evacuation of power from RE projects in wind energy zones in Osmanabad area of Maharashtra (1 GW) - Conversion of 50MVAr fixed Line Reactors on each ckt of Parli (PG) – Pune (GIS) 400kV D/c line at Parli (PG) end into switchable line reactors	Mode of implementation to be decided by MoP.
	Transmission system for evacuation of power from RE projects in Wardha (2500 MW) SEZ in Maharastra	Deferred due to land issues as per meeting at MOP dated 10.12.2019.
	Transmission system for evacuation of power from RE projects in Rajgarh (2500 MW) SEZ in Madhya Pradesh	Mode of implementation to be decided by MoP
	Transmission system for evacuation of power from RE projects in Khandwa (2500 MW) in Madhya Pradesh	Deferred in view of uncertainty in RE project (MoP mtg dated 10.12.2019)

S. No.	Name of Scheme	Status
	Transmission system for evacuation of power from RE projects in Khandwa (2500 MW) in Madhya Pradesh – ICT augmentation at Khandwa Pool	Deferred in view of uncertainty in RE project (MoP mtg dated 10.12.2019)

4.4. In a meeting held under the chairmanship of Chairperson, CEA on 30.08.2019 regarding prioritization of transmission system associated with installation of 66.5 GW potential RE capacity envisaged in various RE resource rich states expected to be set up by 2022. In the meeting the following prioritization of RE capacity addition in WR was agreed based on the inputs provided by SECI/MNRE:

RE Capacity addition Planned as a part of		**Prioritization of RE capacity addition**		
Phase I By 2020	**Phase II By 2022**	**By 12/2020**	**By 2021**	**Beyond 2021**
Total: 9.5 **Solar : 2 GW** Solapur(ext.)- 1GW Solapur New- 1GW **Wind: 7.5 GW** Bhuj- 2 GW Dwarka- 1.5 GW Lakadia- 2 GW Osmanabad- 2* (1 GW in intra)	**Total: 18.5** **Solar : 18 GW** Lakadia- 2 Jamnagar- 2.5 Rapar – 3 Radhanesda- 2.5 Solapur- 0.5 Wardha-2.5 Rajgarh- 2.5 Khandwa-2.5 **Wind: 0.5 GW** Dwarka-0.5	**Wind: 3.5 GW** Bhuj- 2 GW Dwarka- 1.5 GW	**Total: 4.5 GW** **Wind: 2 GW** Lakadia- 2 GW **Solar : 2.5 GW** Rajgarh- 2.5	**Total : 20 GW** **Solar : 17.5 GW** Solapur(ext.)- 1GW Solapur New- 1GW Lakadia- 2 Jamnagar- 2.5 Rapar – 3 Radhanesda-2.5 Solapur- 0.5 Wardha-2.5 Khandwa-2.5 **Wind: 2.5 GW** Osmanabad- 2* (1 GW in intra) Dwarka-0.5

4.5. Govt. of Gujarat has recently proposed for allocation of land to RE projects beyond SECI IV wind ISTS bids in Khavda area, instead of near pooling stations, which has already been planned and agreed in the WRSCT and NCT. Regulatory approval of the schemes has also been obtained from CERC. As far as the transmission scheme in Gujarat is concerned, under Phase-I, transmission system for 5.5 GW (Bhuj II-2GW, Lakadia-2GW, Jam Khambhaliya-1.5GW) RE potential has already been awarded and are under implementation except for Lakadia 400/220 kV whose bidding is on hold. The rest 10 GW solar capacity (out of 10.5 GW RE) that has been planned beyond December' 2021 are likely to be allocated land in Khavda region instead of near pooling stations which has already been planned.

4.6. With implementation of schemes for 5.5 GW and Green Energy Corridor in Gujarat, evacuation of total 10 GW RE power is possible from Gujarat. Total out of 10 GW, LTA for 4375 MW has already been granted, as given below:

Pooling station	IC (MW)	LTA (MW)	Balance LTA	Pooling station
Bhuj Pool	4000	3725	275	Bhuj Pool
Bhuj II	2000	600	1400	Bhuj II
Lakadia	2000	0	2000	Lakadia
Jam Khambhaliya	2000	50.6	1950	Jam Khambhaliya
	10000	4375.6	5625	

Out of the 10 GW RE potential capacity that is likely to be shifted in Khavda region, 5.6 GW RE could be evacuated through Transmission system being implemented under Phase-I along with some additional transmission system. For balance 4.4 GW additional transmission, system needs to be evolved.

4.7. To review the transmission system for 10.5 GW RE projects in WR under Phase-II and immediate connectivity to Dholera UMSP, a joint study meeting with CTU, POSOCO and GETCO was held on 23.12.2019.

Study considerations:

i) Studies were carried out for the 2021-22 time frame

ii) All India demand is considered as per the 19th EPS of CEA (2021-22). Based on the discussions & past trends, for solar maximized scenario, demand has been considered as about 90% of the peak demand of 19th EPS for various regions except for Northern region where it is considered as about 95% of the peak demand.

iii) Considering envisaged RE (wind & solar) capacity addition and to achieve Load-generation balance, Thermal generation dispatch is reduced upto technical minimum of various generations, wherever required. At some of the locations, thermal generations are even needed to be switched off.

iv) During the joint study meetings held on 10.06.2019 and 21.06.2019 after 2nd WRSCT meeting, the following dispatch scenario was considered based on feedback from respective state utilities:

Gujarat	**Maharashtra**	**Madhya Pradesh**
• 90% Solar dispatch • 75% Wind dispatch	• 80% Solar dispatch • 75% Wind dispatch	• 80% Solar dispatch • 70% Wind dispatch

a. For Khavda region 100% solar dispatch is considered for simulating worst case scenario.

v) At present, Stage-II connectivity applications of about 1480 MW (200 MW St-II Connectivity of INOX which was closed is also considered) at Bhuj-II PS and 1500MW (500 MW St-II Connectivity of Betam and Clean Wind which was closed is also considered) at Jamkhambhaliya S/s is considered for carrying out studies. Further, RE generation of 2000 MW is considered at Bhuj-II PS. 75% wind dispatch is considered at Bhuj-II, Jam-Khambaliya

Based on the studies the following transmission System for evacuation of power from Khavda region (10 GW) is proposed whose implementation needs to be taken up in phases:

i) Establishment of Khavda 765/400kV PS
ii) Khavda PS – Bhuj PS 765kV D/c line
iii) Khavda PS – Lakadia PS 765kV D/c line
iv) Lakadia PS – Ahmedabad S/s 765kV D/c line
v) Establishment of Ahmedabad 765/400kV S/s along with associated 400kV interconnections (LILO of Pirana (PG) – Pirana (T) 400kV D/c line at Ahmedabad S/s with twin HTLS along with reconductoring of Pirana (PG) – Pirana(T) line with twin HTLS conductor)
vi) Ahmedabad S/s – Indore S/s 765kV D/c line
vii) Ahmedabad S/s– Vadodara S/s 765kV D/c line

Phase-I Option 1 (2 GW at Khavda, 2 GW at Bhuj-II # & 0.5 GW at Bhuj PS)

i. Establishment of Khavda 765/400, 3x1500MVA , 400/220kV, 4x500MVA* PS
ii. Khavda PS – Bhuj PS 765 kV D/c line

* (400/220kV, 4x500MVA substation to be taken up after the grant of connectivity/LTA at 220kV level)

(Injection of 2GW at Bhuj-II PS shall be through dedicated connectivity line of RE developers)

Evacuation of 4.5 GW power is possible through above system and the Phase-I RE system currently under implementation. Out of 4.5 GW, injection of upto 2.7 GW tentatively is possible at Bhuj-II PS considering Connectivity/LTA presently granted at Bhuj-II.

Bhuj II-Lakadia 765 kV D/c line (3340MW) and Lakadia-Vadodara 765 kV D/c line (3150MW) is critically loaded under N-1 contingency condition. Further, reconductoring of Pirana (PG) – Pirana(T) 400 kV D/c line with twin HTLS conductor is also required for evacuation of Dholera UMPS (Ph-I 2GW).

Phase-I Option 2 (4GW at Khavda, 0 GW at Bhuj-II & 0.5GW at Bhuj PS)

i) Establishment of Khavda 765/400, 4x1500MVA , 400/220kV, 8x500MVA* PS
ii) Khavda PS – Bhuj PS 765kV D/c line

(*400/220kV, 8x500MVA substation shall be taken up after the grant of connectivity/LTA at 220kV level)

Evacuation of 4.5GW power is possible through above system and the Phase-I RE system is currently under implementation.

Phase-II (5.5 GW at Khavda)

i) Khavda PS – Lakadia PS 765kV D/c line
ii) Lakadia PS – Ahmedabad 765kV D/c line
iii) Establishment of Ahmedabad 765/400kV S/s along with associated 400kV interconnections (LILO of Pirana (PG) – Pirana (T) 400kV D/c line at Ahmedabad S/s with twin HTLS along with reconductoring of Pirana (PG) – Pirana(T) line with twin HTLS conductor)
iv) Ahmedabad – Indore 765kV D/c line
v) Ahmedabad – Vadodara 765kV D/c line

vi) Augmentation of Khavda PS by 5x1500MVA, 765/400kV ICTs (two bus sections with bus sectionalizer to be created at 765kV & 400kV level with 4x1500MVA, 765/400kV ICTs in each section. Bus sectionalizer at 765kV level shall normally be closed and bus sectionalizer at 400kV level shall normally be open.)

Khavda-Lakadia 765 kV D/c line (3500 MW) and Lakadia-Ahmedabad 765 kV D/c line (3480 MW) is critically loaded under N-1 contingency condition.

Proposed Transmission system for DHOLERA UMSP:

The revised transmission system for evacuation of power from Dholera UMSP (Phase I – 2GW) is as given below:

a) Establishment of 400kV Dholera Pooling station (Injection of power from the Solar Park at 400kV level).
b) LILO of both circuits of Vadodara- Pirana (PG) 400 kV DC line (quad) at Dholera pooling station.

The above transmission system would be adequate for Phase-I (2 GW) of Dholera UMSP. Any additional transmission system under Phase II (2 GW), if required would be taken up subsequently.

4.8. SECI stated that the transmission schemes for evacuation of 10 GW RE power from Khavda (which is equivalent to the RE quantum for which RE linked transmission schemes were planned in Gujarat under Ph-II) needs to be firmed up to facilitate 66.5 GW RE integration with ISTS by Dec'22.

4.9. CEA stated that MNRE, vide its letter dated 18.12.2019 addressed to MoP, has stated that in view of the Govt. of Gujarat 's decision to allot land to RE projects beyond SECI IV ISTS wind bids in Khavda region, the work on S/stns at Bhuj-II and Jam Khambhaliya needs to be stopped until final decision is taken. The letter further mentions that the possibility of developers who have already taken LTAs at Bhuj-II and Jam-Kambhaliya may be carefully assessed. SECI was requested to provide its feedback on the conformity of the RE developers who have been granted LTA at Bhuj-II and Jam-Khambaliya and who fall under SECI tenders beyond Tranch-IV

4.10. SECI stated that in a meeting convened at CEA on 18.12.2019 to discuss the issue of land availability with LTA and Stage-II applicants at Bhuj-II, Lakadia and Jam Khambhaliya, the following observations were made:

i) RE project developers who have been granted stage-II connectivity/ LTA at Bhuj-II, are mainly seeking private land for their wind projects. RE developers have already acquired part land and acquisition of balance land is in progress.
ii) In case of the RE developers who have been granted stage-II connectivity/ LTA at Jam Khambaliya, all the developers have planned their projects on revenue land (government land). The RE developers in Jam Khambaliya area have already identified all the locations for their projects in revenue land. Some identified locations have already been acquired and others are at various stages of land acquisition.

4.11. CEA stated that implementation of transmission schemes associated with RE generation at Bhuj-II and Jam Khambaliya have already begun. Establishment of Lakadia 765/400 kV S/stn has also been bid out and its implementation has started. However, bidding for Lakadia 4X500 MVA, 400/220 kV S/stn which was under bidding has been put on hold as no RE developers have come up in that area. The Transmission system for evacuation of power from Potential RE zones in Khavda Region, as per the advise of MNRE and SECI, have been planned in such a manner so as to utilize the existing capacities of the transmission system under Ph-I which would otherwise remain stranded, along with some additional transmission system. Further, the scheme has been proposed to be implemented in phases. Also, 400/220 kV ICTs along with associated bays at the proposed Khavda 765/400 kV Pooling Station would be implemented based on RE applications received.

4.12. GETCO stated that out of the 2000 MVA, 400/220 kV transformation capacity that is under implementation there are connectivity applications for about 1300 MW and LTA applications for 600 MW only. Considering Government of Gujarat's decision to allot land near Khavda region for future RE development, not much RE capacity will come-up in vicinity of Bhuj-II pooling station. Although Bhuj-II pooling station has already been awarded through TBCB, considering that physical work was yet to be taken-up for Bhuj-II substation, the location of 765/400/220 KV Bhuj-II needs to be reviewed and may be shifted to Khavda / nearby Khavda region. The planned scope at 765/400/220 KV Bhuj-II substation also needs to be reviewed considering change Gujarat Government policy for land allocation. Alternatively, to avoid burden on other consumers and for optimum utilization of planned schemes, RE developers has to lay dedicated lines up to Bhuj-II substation. In no case, ISTS schemes shall be developed for RE connectivity to use Bhuj-II substation as per it's present location.

4.13. CTU state that land for Bhuj-II pooling station has already been identified and 1280 MW stage-II connectivity has already been granted at Bhuj-II pooling station

4.14. CEA state that change in location of 765/400/220 KV Bhuj-II pooling station was not possible at this stage keeping in view that the project has been awarded through TBCB route with an implementation schedule of December 2020 as well as the Stage-II and LTA already granted. The current scope includes establishment of 2x1500 MVA, 765/400 kV and 4x500 MVA, 400/220 kV pooling station with future provisions for another 2x1500 MVA, 765/400 kV and 4x500 MVA, 400/220 kV transformation capacity.

4.15. GETCO stated that phasing of proposed transmission scheme from Khavda region may be done in a way to have bare minimum scheme in Phase-I and shall be implemented as per LTA applications. Strengthening schemes may be bid out in next phase as per grant of LTA in future.

4.16. GETCO further stated that many 400 KV / 220 KV transmission lines surrounding North, Central & Southern Gujarat area would be getting critically loaded (as per the load flow studies results for the Khavda system) because of huge RE integration in Western Gujarat and changed load-generation scenarios. Therefore, appropriate ISTS network strengthening as a part of RE integration needs to be planned at later stage matching with actual RE growth.

4.17. POSOCO stated that the immediate evacuation system being proposed for evacuation of 10 GW RE power from Khavda is technically fine. However, if seen from long-term perspective, to achieve greater controllability and flexibility from operation point of view, evacuation through HVDC system would have been preferable. At present the studies are being performed on Regional files wherein the all-India power import and export scenario is not adequately captured. Accordingly, efforts should be directed towards creation of an All-India Study file wherein four seasons and sixteen scenarios be taken up for studies. Also, efforts towards performing Stability Studies needs to be made.

4.18. CTU stated that as far as the issue of carrying out studies on common file is concerned the same is under preparation and subsequently studies would be carried out on all India basis for the identified dispatch scenarios.

Further, even though RE capacity addition has been done in Gujarat but the overall demand of the system remains same. Therefore, to achieve load-generation balance, conventional generation has be backed down. The overloading of the 400 kV Intra-State lines in Gujarat may be because of backing down of conventional generation to achieve the achieve load-generation balance. Overloading of intra-state elements due RE capacity addition under ISTS would be taken care in future in form of system strengthening schemes.

As far as the angular stability is concerned, the increased power number of the Indian grid provides comfort and the angular stability may be studied on case to case basis. However, the voltage stability studies have to be carried on contiguous basis and adequate reactive power compensation have to be planned.

4.19. Members enquired about the estimated cost of the transmission scheme proposed at Khavda for evacuation of 10 GW RE. It was informed that the estimated cost of the 10.5 GW scheme which was agreed in the 2nd WRSCT was 6685 Crore. In place of this the estimated cost of the reviewed scheme for evacuation of 10 GW RE power Khavda region would be about Rs 7000 crores.

4.20. A site visit of Khavda region was done by CEA, CTU, POWERGRID, SECI, GETCO and GPCL on 12.01.2020 wherein corrosive nature of the atmosphere was observed and accordingly it was suggested to establish GIS pooling station.

4.21. After detailed deliberations, the following transmission system for evacuation of 10 GW RE power from potential RE zones in Khavda region and from Dholera UMSP was approved:

Transmission system for evacuation of 10 GW RE power from potential RE zones in Khavda region

Phase-I, 4.5 GW (2 GW at Khavda, 2 GW at Bhuj-II # & 0.5 GW at Bhuj PS):

(i) 500 MW at Bhuj pooling station (400/220 kV, 500 MVA 9th ICT): 500 MW capacity injection at 220 kV Bhuj pooling station through dedicated transmission lines of RE developers in Khavda.

(ii) 2000 MW at Bhuj-II pooling station (765/400/220 kV): Bhuj-II pooling station with 2x1500 MVA, 765/400 kV, 4X500 MVA, 400/220 kV capacity is currently under implementation. Bhuj-II pooling station has future provisions for another 2x1500 MVA, 765/400 kV and 4x500 MVA, 400/220 kV transformation capacity.
2000 MW capacity injection at 220/440 kV level at Bhuj-II pooling station through dedicated transmission lines of RE developers in Khavda. For LTA beyond 1500 MW at Bhuj-II pooling station, implementation of **1X765/400 kV ICT Augmentation at Bhuj-II pooling station under ISTS** to be taken up.

(iii) 2000 MW at Khavda pooling station

a) Establishment of Khavda 765/400, 3x1500MVA, 400/220kV, 4x500MVA* PS (GIS) with 1X330 MVAR 765 kV bus reactor and 1X125 MVAR 400 kV bus reactor (765/400/220 kV Khavda pooling station to be created with future provisions for pooling total 7.5 GW RE capacity. Two bus sections with bus sectionalizer to be created at 765kV & 400kV level with 4x1500MVA, 765/400kV ICTs in each section. Bus sectionalizer at 765kV level shall normally be closed and bus sectionalizer at 400kV level shall normally be open. Each 400 kV section to have RE capacity of maximum 4000 MW. The RE capacity can be directly connected at 400 kV level or at 220 kV level through 400/220 kV transformer. Two bus sections with bus sectionalizer are to be created at 220 kV level for each 400 kV Bus section with maximum RE capacity of 2000 MW in each 220 kV section. 220 kV bus sectionalizers to be normally kept open).
* (400/220kV, 4x500MVA substation to be taken up after the grant of connectivity/LTA at 220kV level. Not required if connectivity is granted at 400 kV level)
b) Khavda PS(GIS) – Bhuj PS 765 kV D/c line

Phase-II, 5.5 GW RE injection at Khavda

i) Augmentation of Khavda PS(GIS) by 5x1500MVA, 765/400kV ICTs and 12X500 MVA, 400/220 kV ICTs (400/220 kV ICTs augmentation to be taken up as per the LTA/connectivity granted at 220 kV level). Provision of 1X125 MVAR 400 kV bus reactor on second bus.
ii) Khavda PS (GIS) – Lakadia PS 765kV D/c line with 330 MVAR line reactors at Khavda end
iii) Lakadia PS – Ahmedabad 765kV D/c line with 240 MVAR line reactors on both ends
iv) Establishment of Ahmedabad 765/400kV,2X1500 MVA S/s (towards eastern side of Ahmedabad) along with associated 400kV interconnections (LILO of Pirana (PG) – Pirana (T) 400kV D/c line at Ahmedabad S/s with twin HTLS along with reconductoring of Pirana (PG) – Pirana(T) line with twin HTLS conductor)
v) Ahmedabad – Indore 765kV D/c line with 330 MVAR line reactors on both ends

vi) Ahmedabad – Vadodara 765kV D/c line
vii) 220 kV line bays for interconnection of solar projects (25 nos) implementation of which shall be taken up as per the LTA/connectivity granted at 220 kV level.
viii) Spare reactors and transformers

Proposed Transmission system for DHOLERA UMSP:

The revised transmission system for evacuation of power from Dholera UMSP (Phase I – 2GW is as given below:

i) Establishment of 400kV Dholera Pooling station (Injection of power from the Solar Park at 400kV level) along with 400kV, 1x125MVAr bus reactor
ii) LILO of both circuits of Vadodara- Pirana (PG) 400 kV DC line at Dholera pooling station.

5. Establishment of the proposed Kistampeth – Sironcha 132 kV SCDC line as ISTS – Agenda by MSETCL

5.1. CEA stated that MSETCL proposal of Establishment of 2X25 MVA, 132/33 kV substation at Sironcha along with 132 kV SCDC line from Kistampeth (Telangana State) with end bays each at Kistampeth and Sironcha S/s has been deliberated in the 1st and 2nd meeting of WRSCT held on 05.09.2018 and 21.05.2019 respectively. In the 1st WRSCT meeting the following was agreed:

(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.

In the 2nd meeting of WRSCT, MSETCL proposed to convert the Kistampeth-Sironcha 132 kV S/C line to ISTS line which would provide them flexibility to source their power and would facilitate them in energy accounting and other related issues. In the meeting, it was agreed that if MSETCL wants an ISTS scheme to feed Sironcha area, MSETCL needs to submit a detailed proposal, which needs to be studied in coordination with Telangana. The proposal needs to include existing Intra - state substations of MSETCL in vicinity of Sironcha area and difficulties in extending the supply to Sironcha area.

Accordingly, MSETCL has proposed establishment of Sironcha 132/33 kV S/s as a part of STU system and Establishment of Sironcha- Kistampeth 132 kV SCDC line as an ISTS line. It has also furnished the installed capacity and loading details of existing 66 kV Sironcha S/stn along with list of 33kV existing & proposed feeders as well as Intra-State S/s of MSETCL in vicinity of Sironcha

5.2. MSETCL stated that presently existing 66/33/11 kV Sironcha S/s was getting feed from 132/66 kV Ashti S/s (about 132 km away) via 66 kV Allapalli S/s. The entire 66 kV line from Ashti to Sironcha passes through dense forest area, therefore, it is not feasible to connect 132 kV Sironcha S/s from 132 kV Allapalli S/s. Also there is no redundant supply available and voltage profile of the area is very poor. They have planned 132/33 kV Sironcha S/s at existing 66 kV Sirocha S/s to increase the redundancy of supply and improve the voltage profile and quality of power supply. The proposal to connect 132 kV Sironcha S/s with 132 kV Kistampeth S/s of Telangana State Transmission Company Limited through 132 kV line involves only 32 km line length and is forest free terrain. Further, they have proposed declaration of this 132 kV line as ISTS to facilitate energy accounting and other related issues

5.3. Member Secretary, WRPC stated that since the proposed 132/33 kV Sironcha S/stn (Maharashtra) would be radially fed by 132 kV Kistampeth S/s (Telangana) via proposed 132 kV D/c line, Scheduling, accounting and metering would fall within the purview of SLDC, Telangana irrespective of the nature of the line. He further enquired that whether MSETCL wants to implement this ISTS line or simply wants the status of line to be designated as ISTS line.

5.4. MSETCL clarified that STU is going to take up the implementation of this line and is proposing the designation of this line as ISTS.

5.5. POSOCO stated that the proposed transmission line is a natural Inter-State line. If STU proposes to implement this line, it would have to approach CERC to get the ISTS license. In this case, the meter would be installed at the boundary of both the states and the tariff of the line would be governed as per ISTS pool.

5.6. CEA stated that in the 2nd meeting of WRSCT held on 21.05.2019, it was agreed that if MSETCL wants an ISTS scheme to feed Sironcha area, the detailed proposal needs to be studied in coordination with Telangana. In case there is requirement of any ISTS scheme in the state of Telangana in Kistampeth area or in its vicinity then schemes could be clubbed together and taken up as an ISTS scheme.

5.7. Accordingly, it was decided that a separate meeting would be convened with participation from CTU, POSOCO, PSPA-II (CEA), MSETCL and Telangana to further deliberate upon MSETCL proposal of installation of Kistampeth (Telangana State) – Sironcha (Maharastra State) 132 kV SCDC line with end bays each at Kistampeth and Sironcha S/s by MSETCL and its designation as an ISTS line.

6. Requirement of Transformer Augmentation in Western Region

6.1. CEA stated that in 2nd meeting of WRSCT, it was deliberated that as per the operational feedback report of NLDC (January, 2019), several 400/220kV ICTs in WR were critically loaded in current time frame. CTU had carried out the preliminary studies in 2022-23 time frame considering all existing and planned systems and the list of transformers with high anticipated loadings and which violate n-1 criteria was presented during the 2nd WRSCT as below:

Sl. /	TRANSFORMER		EXISTING /PLANNED TRANSFORMERS (MVA)	CURRENT TIME FRAME	2022-23 TIME FRAME	
				PEAK LOADING (MW)	PEAK LOADING (MW)	N-1 Outage loading (MW)
1	Bhatapara	400/220kV	2x315	2x215	2x200	1x290
2	Raigarh*	400/220kV	2x315	2x200	2x208	1x322
3	Morena	400/220kV	2x315	2x220	2x240	1x346
4	Seoni	400/220kV	2x315	2x190	2x220	1x345
5	Satna	765/400/220kV	2x315+1x500	2x200+1x320	2x203+1x322#	2x315 (500MVA ICT out)#
6	Padghe(GIS)	765/400kV	2x1500	2x550	2x1050	1565

**Additional outlets from Raigarh (PG) substation need to be planned by CSPTCL in addition to Raigarh(PG) – Raigarh(CSPTCL) 220kV D/c line in order to avoid overloading on this line in future*

In addition to this, POSOCO has also submitted that due to increased drawl from the Grid by Chhattisgarh, 400/220kV ICTs at Bhatapara PG, Raigarh PG, NSPCL and Raita are highly loaded and reported N-1 non-compliance.

6.2. In the 2nd meeting of WRSCT, MPPTCL stated that the loadings on the Satna ICTs get reduced after the implementation of Rewa Pooling Station – Rewa 220 kV D/c line. After the deliberations, it was decided that the issue of provision of additional ICTs may be deliberated in a separate meeting among CEA, CTU, POSOCO and STUs for finalization of additional ICTs at existing 400/220 kV substations with high loadings, wherein STU needs to intimate their future plans regarding additional 220 kV outlets associated with the additional ICT. STU also needs to intimate the schemes proposed in vicinity of the 400/220 kV substation where high loadings are observed. Accordingly, a joint study meeting was held on 11.11.2019 at CEA where only CTU has participated. In the meeting, it was decided to carry out studies in 2022-23 time frame considering evening peak scenario (30% Wind & Nil Solar) with all existing and planned systems. The studies were carried out and the list of transformers with high loadings observed in the studies is given below:

Sl. /	TRANSFORMER		EXISTING /PLANNED TRANSFORMERS (MVA)	2021-22 TIME FRAME		Constraint, if any, reported in operational feedback report
				PEAK LOADING (MW)	N-1 Outage loading (MW)	
1	Wardha	400/220kV	2x315	2x254	1x340	Oct, 2019: ICTs become N-1 non-compliant when total loading is above 420MW. For 77% of the time ICTs were N-1 non-compliant in previous quarter. However due to monsoon, loading of ICTs were above 420MW for very less time in the quarter.
2	Morena	400/220kV	2x315	2x223	1x311	Jan, 2019: ICTs become 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.
3	Seoni	400/220kV	2x315	2x200	1x307	Jan, 2019: ICTs becomes N-1 non-compliant when total loading is above 380MW.
4	Satna	765/400/220kV	2x315+1x500	2x214+1x341	2x312 (500MVA ICT out)#	Jan, 2019: 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.
5	Padghe(GIS)	765/400kV	2x1500	2x1018	1487	-
6	Bhatapara *	400/220kV	2x315	2x202	1x286	Oct, 2019: ICTs become N-1 non-compliant when total loading is above 420MW. For 28% of the time ICTs were N-1 non-compliant during the quarter.

**Loading on Bhatapara (PG) – Bhatapara (CSPTCL) 220kV S/c line is observed to be on higher side (226MW) which further would aggravate to more than 250MW with 3rd 400/220kV ICT (if proposed)*

The above loading on Satna ICTs were observed without considering the Bijawar / Chattarpur 400/220kV substation which was planned in the 40th WR SCM and subsequently put on hold in the 42nd WR SCM held on 17.11.2017 till there is clarity on time-frame of requirement of Bijawar S/s from MPPTCL.

6.3. MPPTCL stated that in cases where under (n-1) contingency, marginal overloading of transformers is observed, that too only for a cerain period of time, SPS can be used to reduce load in that area instead of investing in augmentation. He further stated that, with implementation of Rewa PS-Rewa 20 kV D/c line, loadings on Satna ICT would get reduced.

6.4. CEA observed that with implementation of additional 3rd 400/220 kV ICT at Bhatapara, over loading of 220 kV outlets from Bhatpara 400/220 kV S/stn is observed. Therefore, additional 220 kV outlets are required to be planned by the State before taking up transformer augmentation.

6.5. As there was no representation from Chattisgarh in the meeting, no deliberation was held on the issue regarding capacity augmentation of Bhatpara 400/220 kV S/stn.

6.6. After further deliberations, implementation of additional 1X500 MVA, 400/220 kV ICTs at Wardha, Morena and Seoni 400/220 kV S/stns under ISTS was agreed by the members.

7. High voltages in WR system

7.1. CEA stated that the issue of high voltages observed in WR during the off peak hours was discussed in the 2nd WRSCT meeting held on 21.05.2019 wherein it was decided to study the same separately with POSOCO. A joint study meeting was held on 11.11.2019 at CEA where only CTU has participated. In the meeting, studies were carried out for the Off-peak scenario (night) with 15% Wind and Nil Solar for 2021-22 time-frame and the high voltage nodes identified were Vadodara 765 kV, Jabalpur PS 765 kV, Khandwa New 765 kV, Indore 765 kV, Warora PS 400 kV and Shujalpur 400 kV (PSS@E case file was circulated with the agenda).

The transmission lines carrying very less power and having switchable line reactor near to the above buses are given below:

(i) Jabalpur – Dharamjaigarh_Splt 765 kV D/c line - having 1x330 MVAr switchable reactor at both ends

(ii) Ahmedabad – Indore 765 kV D/c line - having 1x330 MVAr switchable reactor at both ends

(iii) Lakadia – Vadodara 765 kV D/c line - having 1x330 MVAr switchable reactor at both ends

(iv) Rapar – Ahmedabad 765 kV D/c line - having 1x240 MVAr switchable reactor at both ends

(v) Khandwa New – Dhule 765 kV D/c line - having 1x240 MVAr switchable reactor at both ends

(vi) Warora Pool – Parli New 765 kV D/c line - having 1x330 MVAr switchable reactor at Warora Pool end and 1x330 MVAr fixed reactor at Parli New end

The studies were carried out by opening the one circuit of the above lines and taking into service the switchable line reactor as bus reactor. The improvement in voltage profile is tabulated below:

Sl. No.	Name of the Substation	Existing Bus Reactor(s) (MVAr)	Proposed Bus Reactor (MVAr)	Voltage in 2021-22 time frame (Off peak)	
				Without proposed reactor	With one ckt of the above lines opened and Line Reactor in service as Bus Reactor
1	Vadodara 765kV	1x240	1x330	804	764
2	Jabalpur PS 765kV	2x240	1x330	805	789
4	Khandwa New 765kV	1x240	1x240	812	767
5	Indore 765kV	2x240	1x240	809	769
8	Warora PS 400kV	-	1x125	419	413
9	Shujalpur 400kV	1x63+1x125	1x125	421	410

7.2. POSOCO stated that reactive power control would be major issue when all the RE generations envisaged would be commissioned. Accordingly, while planning the transmission schemes, provision of adequate reactors needs to be incorporated.

7.3. Member Secretary, WRPC stated that in the past reactors for controlling high voltage was recommended based on reactor studies carried out by them. The study involved creation of merit order of node voltage sensitivities. WRPC would like to study the reactor requirement using the same methodology and requested CTU to furnish the required data for the same.

7.4. After deliberations, it was agreed that the reactors proposal would be studied by WRPC and the data required for the same would be furnished by CTU/CEA. The outcome could be deliberated in the next meeting of WRPC (TP).

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

8.1. CEA stated that the issue of connectivity of LARA STPP Stage-II was deliberated in the 2nd meeting of WRSCT and following was agreed by the members:

I. Connectivity system for NTPC Lara STPP 2x800MW stage-II generation project:
   (A) Under ISTS
      (i) Reconductoring of Lara STPP I – Raigarh (Kotra) 400kV D/c line with HTLS conductor (Quad Moose capacity)
   (B) 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-I & Lara STPP-II buses to be kept disconnected from each other under normal operating conditions

II. Revised connectivity system for NTPC Lara STPP 2x800MW stage-I generation project:
      (i) Lara STPP I – Champa PS 400kV D/c (quad) line

Further, NTPC vide its letter dated 12.09.2019 has raised the following points:

(i). 400kV switchyards of Lara-I and II are not adjacent and are in different directions. In order shift Kotra line from Stage-I to Stage-II generation bus, a 400kV Tie Line is proposed to be constructed between stage-I and Stage-II switchyard such that shifting of Kotra line is possible within the available space inside the plant boundary. Proposed 400KV scheme for Lara-II is enclosed for reference (Annexure-III).

(ii). This Tie line arrangement has been planned in such a manner that it would enable us to draw startup from existing Lara-I 400kV switchyard.

(iii). Shifting and re-conductoring of Raigarh line is proposed to be completed before synchronization of Ist Unit of Lara-II.

(iv). However, as the connectivity for stage-II is explicitly granted through Raigarh line only it will not be possible to connect Lara-II with stage-I for drawal of startup power and re-conductoring of Raigarh line would need to be completed 15 months prior to synchronization of 1st Unit of Lara-II.

Accordingly, NTPC has requested for drawing of start up power through an interim connectivity.

8.2. CTU stated that NTPC was granted connectivity for Lara Stage-II (2X800 MW) project, with the connectivity system as agreed in the 2nd meeting of WRSCT. However NTPC defaulted in signing the Transmission agreement as per FORMAT-CON-8 within one month of grant of connectivity, nor did it furnish the

applicable Bank Guarantee (BG). In view of this, Stage II connectivity granted to NTPC for Lara STPS Stage-II (2x800 MW) has been revoked

8.3. NTPC stated that furnishing of BG within one month of grant of ISTS connectivity even before grant of investment approval for the project was not possible. Also, prior to putting up the DPR of the project for investment approval, confirmation with respect to evacuation voltage level and no. of bays is needed. Commissioning schedule for the project would be around 44 months from the date of Investment approval. He further stated that since reconductoring of Lara STPP I – Raigarh (Kotra) 400kV D/c line, identified for Connectivity for Lara stage-II generation, would take longer implementation time, NTPC may be granted interim connectivity through 400 kV tie line between Lara Stage-I and Stage-II, for drawl of startup power.

8.4. CTU stated that startup power would be required appx. 15 months before the commissioning of the 1st Unit of Lara Stage-II Generation. Only after NTPC furnishes the firm commissioning schedule of Lara Stage-II, the requirement of interim arrangement can be ascertained. Accordingly, it is advisable that NTPC may take up the investment approval from their Board of Directors for the project and apply for ISTS connectivity and LTA. Provision of providing Interim Connectivity from Lara Stage-I can be seen at the time of processing of connectivity application depending upon the commissioning schedule of the project. However, it is confirmed that the connectivity would be provided at 400 kV Voltage level. Accordingly, the evacuation voltage level would remain 400 kV and two no. of bays at the generation end would be required.

8.5. NTPC further stated that since Lara Stage I is radially connected to Champa HVDC pooling station, SSR studies for the generator is required to be done and accordingly, they have requested CTU to provide HVDC Control Model for the Champa Pooling Station.

8.6. CTU stated that such HVDC control models are proprietary models and hence are not shared by the manufacturers. Therefore, the generic models can be used by NTPC for carrying out the requisite studies.

8.7. Member, WRPC stated that in future, in the contractual agreement made with the manufacturers, the option of including the provision requiring sharing of the requisite controller model by the manufacturer may be explored. This would assist in carrying out these specialized studies.

8.8. After detailed deliberation, the following was agreed by the members:

i) NTPC would apply for ISTS connectivity and LTA for Lara Stage-II (2X800 MW) project.

ii) The broad Connectivity system for NTPC Lara STPP 2x800MW stage-II generation project would remain same as agreed in the 2nd meeting of WRSCT i.e :

Under ISTS

(i) Reconductoring of Lara STPP I – Raigarh (Kotra) 400kV D/c line with HTLS conductor (Quad Moose capacity)

Under the scope of NTPC Ltd

(iii) 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

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

iii) Provision of providing Interim Connectivity from Lara Stage-I for drawing start up power can be assessed at the time of processing of connectivity application depending upon the commissioning schedule of the project.

iv) Provision for sharing of the requisite controller models by the manufacturer in the contractual documents may be explored/included by the implementation agency. This would assist in availability of controller models for carrying out specialized studies like SSR studies, dynamic studies etc.

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

9.1. 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 line bays from various 400/220 kV ISTS substations as well as downstream network is updated in the table below :

Sl. No.	ISTS S/s	Voltage ratio, Trans. Cap	Unutilised bays	Status of ISTS bay	Lines for unutilised bays	Status of Lines
			WR			
1	Mapusa (PG)	400/220kV (3x315 MVA)	2	Existing bay	Mapusa – Cuncolin 220 kV D/c line	Anticipated DOCO Sep'20(As per WRPC held on 28.6.19)
			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 *(As per 2nd*

						WRSCT Minutes).
2	Pirana	400/220kV (2x315MVA)	2	Existing bay	Pirana – Barjadi 220 kV D/c line	December, 2020
3	Wardha	400/220 kV (2x315 MVA)	2	Existing bay	Wardha – Yavatmal 220 kV D/c line	Under construction, May 20
4	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
5	Betul GIS	400/220 kV (2x315 MVA)	2	Existing bay	LILO of Sarni - Pandhurna 220kV line at Betul GIS (PGCIL)	March, 2020
6	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 as ISTS under WRSS XIX. Comm. Sch. - 30 months from date of transfer of SPV
7	Indore (PG)	400/220 kV (2 x 500 MVA)	2	Existing bay	LILO portion of 220kV line for Indore(NZ) 220kV S/S upto Indore(PGCIL) 765kV S/s	2 years after the award of contract. Approximate award schedule is April, 2020.
8	Parli (PG)	400/220 kV (2x500 MVA)	2	Existing bay	LILO of Parli – Harangul 220 kV S/c line	March, 2020
9	Vadodara GIS	400/220 kV (2 x 500 MVA)	2	Existing bay	220 kV Jhambua – Vadodara D/C Line	April/May, 2020
10	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. Agreed to be taken up as separate ISTS scheme.
11	Rewa PS	400/220kV (3x500 MVA)	6	Existing bay	Rewa UMSPP – Rewa PS 220kV 3xD/c line	220kV 3xD/c line – completed & synchronized with Rewa PS

400 kV line bays:

S. No.	ISTS 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	May' 2020

10. 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

10.1. CEA stated that 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.

Further, in the 2nd WRSCT held on 21.05.2019, the following was concluded:

(i) Technically, the connectivity of 50 MW Solar Plant with the 220/132 kV Kumhari GSS of Railway is an optimal solution
(ii) 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 was noted by the members.
(iii) Railways' may approach appropriate forum for scheduling, dispatch and energy accounting for the proposed arrangement.

Subsequently, SEC Railways vide letter dated 23.10.2019 has intimated the following:

- REMCL has issued LOA to SPD firm M/s Refex Energy Ltd. Chennai on 09.09.2019 and it has been proposed that the solar plant may get connected directly to ISTS Grid (Raipur S/s).
- Accordingly, Sherisha Agro Pvt. Ltd. (SPV of Refex Energy Ltd.) has applied for Stage-I connectivity in the month of Sep'19 for processing by CTU and has intimated that the earlier proposed connectivity scheme of 50MW Solar power plant through Railway GSS may be dropped.
- Further, the 2 nos. 220 kV bays already allocated to Railways may be kept spare for usage of Railways and may not be used for granting the above connectivity applied by Sherisha Agro.

10.2. CTU stated that the application of Sherisha Agro Pvt. Ltd. was discussed during the 41st WR Conn/LTA meeting held on 24.10.2019 wherein the issues of grant connectivity to Sherisha Agro Pvt. Ltd. at Raipur S/s through 220 kV S/c line and allocation of bays to Railways and to Sherisha Agro Pvt. Ltd. was deliberated and it was decided that the matter would be put up in the upcoming meeting of WRSCT.

10.3. CEA enquired about the availability of space at 400/220 kV Raipur (Kumhari) S/s for the implementation of 220 kV bay for providing connectivity to Sherisha Agro Pvt. Ltd. through 220kV S/c line. CTU stated that the space is available for the 3rd bay (in addition to the 2 nos. of 220 kV bays already allocated to SEC Railways) for providing connectivity to 50 MW Solar Plant of Sherisha Agro Pvt. Ltd.

10.4. After deliberations, the following was agreed by the members:

(i) Connectivity would be granted to 50 MW Solar Plant of Sherisha Agro Pvt. Ltd. at 400/220 kV Raipur (Kumhari) S/s through 220 kV S/c line. Implementation of 220 kV bay at 400/220 kV Raipur (Kumhari) S/s along with 220 kV S/c line would be carried out by the Solar Park developer.
(ii) 2 nos. 220 kV bays already allocated to SEC Railways at 400/220 kV Raipur (Kumhari) S/s would be kept spare for usage of Railways.
(iii) Earlier proposed connectivity scheme of 50 MW Solar Power Plant through Railway GSS is dropped.

11. Augmentation of transmission system for evacuation of power from M/s Essar Power M.P. Limited (EPMPL)

11.1. CEA stated that in the 42nd WRSCM held on 17.11.2017, extension of LILO arrangement of Vindhyachal–Korba STPP 400 kV S/C line at Mahan STPS was discussed and it was informed that the LILO at Mahan STPS would be essential to take care of contingency of outage of one ckt of Mahan SPTS– Sipat (Bilaspur Pooling Station) 400 kV D/C line for reliable evacuation of power from 2x600 MW units of Mahan TPS under full dispatch. Subsequently, CTU vide response dated 26.03.2018 in respect of petition No.132/MP/2018, regarding continuation of LILO of 400 kV S/c Vindhyachal – Korba line at Mahan STPS, had submitted vide affidavit the following:

a) In the event of completion of 400kV D/c Mahan-Sipat power evacuation line by 31.03.2018, continuation of the LILO till finalization of suitable alternatives (if any) as may be identified through system studies to address the high short circuit level issue.
b) In event of disconnection of the LILO on account of non-completion of 400 kV D/c Mahan-Sipat power evacuation line by 31.03.2018, reconnection and continuation of LILO from such date as Essar Power Transmision Company Ltd (EPTCL) achieves commissioning of 400kV D/c Mahan-Sipat power evacuation line, till such time and subject to system studies as described in (a) above.

400kV D/c Mahan-Sipat has been subsequently commissioned in the month of September,2018.

11.2. CTU stated that, it has been observed in studies that in case the dedicated line up to WR Pool (Bilaspur) along with the interim arrangement of LILO of one circuit of Vindyachal-Korba D/c at Mahan TPS is kept in service, power can be reliably evacuated from both the units of Mahan TPS. However, the fault level at Vindhyachal crosses 40 kA in 2021-22 time frame, with a significant contribution from Mahan TPS. Further, in case the dedicated line upto WR Pool along-with the interim LILO of one circuit of Vindhyachal – Korba STPP 400kV D/c line at Mahan TPS, is kept in service with the Mahan TPS-Vindyachal 400kV section kept under open condition, no constraints are observed in respect of both power evacuation considering N-1 contingency conditions and stability issues. The studies carried out by CTU incorporating the various case scenarios were presented and the same are enclosed at Annexure IV.

Presently, the entire LTA quantum of 1200 MW granted to M/s EPMPL has been relinquished (i.e. LTA quantum of 750 MW has been relinquished w.e.f

12.04.2017 & 450 MW w.e.f 04.05.2018). Also, the average generation schedule of M/s EPMPL (as per WRLDC website) usually ranges between 250MW to 300MW with a maximum of around 450MW.

Accordingly, the following is proposed:

i) The LILO of one circuit of Vindhyachal – Korba STPP 400kV D/c line at Mahan TPS may usually be kept bypassed with suitable bypass arrangement. In case of high dispatch schedule for EPMPL, the dedicated line upto WR Pool along-with the LILO of one circuit of Vindhyachal – Korba STPP 400kV D/c line at Mahan TPS, may be kept in service with the Mahan TPS-Vindyachal 400kV section kept under open condition.

ii) On receipt of LTA application from M/S EPMPL, system studies would be carried out to finalize the transmission system augmentation required for enabling the LTA including re-configuration of the LILO as may be required

11.3. NTPC stated that in case the LILO of one circuit of Vindhyachal – Korba STPP 400kV D/c line at Mahan TPS is to be kept in service with Mahan TPS-Vindyachal 400 kV section kept under open condition, the line may be opened at Vindhyachal NTPC end and kept charged from Mahan STPS.

11.4. GETCO stated that Mahan STPS has withdrawn complete LTA and is selling the power on short term basis, however the transmission charges of the corridor are recovered via PoC mechanism thereby burdening the beneficiaries.

11.5. After the deliberations, the following was agreed:

(i) To control short circuit contribution from Mahan towards Vindhyachal STPS, the Vindhyachal – Essar Mahan 400kV line section (formed after LILO of one circuit of Vindhyachal – Korba STPP 400kV D/c line at Mahan TPS) shall be kept open. The same may be kept hot charged from Mahan end so that it may be used under any contingency condition by closing the breaker at Vindhyachal end. However, for operational flexibility, system operator may decide about the end from which Mahan TPS-Vindyachal 400kV line section is to be kept charged.

(ii) On receipt of LTA application from M/S EPMPL, system studies would be carried out to finalize the transmission system augmentation required for enabling the LTA including re-configuration of the LILO as may be required.

12. Summary of the connectivity and LTA granted in the connectivity and LTA meetings of WR

12.1. The details of stage-II connectivity granted to RE applicants from 30th to 43rd Connectivity & Long-term Access applications in Western Region is tabulated below:

Sr. No.	Name of Applicant(Organization)	Stage-II Application number	Stage-II Quantum(MW)	Date: Stage-II Connectivity required	LOA Details (As applicable)	Proposed location for grant of Stage-II Connectivity	Trans. System for stage-II connectivity (Under scope of applicant)

<table>
<tr><td>1</td><td>Adani Green Energy MP Limited</td><td>1200001652</td><td>75</td><td>01/12/19</td><td>MSEDC LOA</td><td>Bhuj PS</td><td>• Establishment of 220kV Pooling Stations at Dayapar/Ratadiya for pooling of power from projects from projects at Dayapar, Chhugar and Murchbana/Mokhra.
• Dayapar Pooling Station - Bhuj PS 220kV D/c line [with capacity of at least 725MW (375MW per ckt) at nominal voltage] along-with associated line bays at both ends
(To be shared with AGEMPL projects with application nos. 1200001363 & 1200001484)</td></tr>
<tr><td>2</td><td>Srijan Energy Systems Private Limited</td><td>1200001686</td><td>300</td><td>31/03/20</td><td>NA</td><td>Bhuj PS</td><td>• SESPL switchyard - Bhuj PS 220kV D/c line along with line bays at both ends - to be developed by SESPL
• The above line from SESPL switchyard upto Bhuj PS would be implemented as follows:
<table>
<tr><th>Section</th><th>Tower configuration</th><th>Approx. Line length</th></tr>
<tr><td>Srijan-1 to Common Point</td><td>D/c towers</td><td>22km</td></tr>
<tr><td>Srijan-2 to Common Point</td><td>D/c towers</td><td>12km</td></tr>
<tr><td>Common point to INOX M/c tower near Bhuj</td><td>D/c towers</td><td>30km</td></tr>
<tr><td>M/c tower stretch till respective gantry of Bays # 206 & 207 at Bhuj PS</td><td>M/c towers</td><td>2km</td></tr>
</table>
Additional Transmission system under ISTS:
• Installation of 2x500MVA (400/220kV), ICTs at Bhuj PS(Under implementation)</td></tr>
<tr><td>3</td><td>Sitac Kabini Renewables Private Limited</td><td>1200001734</td><td>300</td><td>16/03/20</td><td>A(SECI-V)</td><td>Bhuj-II PS</td><td>• Sitac Kabini Renewables Private Limited – Bhuj II PS 220kV S/c line along with associated line bays at generation end</td></tr>
</table>

							• Bays at ISTS sub-station under the scope of Transmission Licensee owing the ISTS sub-station subject to compliance of relevant provisions of the tariff policy **Additional Transmission system under ISTS:** • 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
4	Adani Green Energy Limited	1200001759	300	01/07/20	A(SECI-V)	Bhuj-II PS	• Adani Green Energy Limited – Bhuj II PS 220kV S/c line along with associated line bays at generation end(under the scope of applicant) • Bays at ISTS sub-station under the scope of Transmission Licensee owing the ISTS sub-station subject to compliance of relevant provisions of the tariff policy **Additional Transmission system under ISTS:** • 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
5	Netra Wind Private Limited	1200001775	300	31/03/20	A-(SECI-V)	Bhuj-II PS	• Netra Wind Private Limited - Bhuj-II PS 220kV S/c line along with associated line bays at generation end (under the scope of applicant). • Bays at ISTS sub-station shall be under the scope of Transmission Licensee owing the ISTS

							sub-station subject to compliance of relevant provisions of the tariff policy **Additional Transmission system under ISTS:** • 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
6	POWERICA Ltd.	1200001924	50.6	30/09/20	B	Jam Khambhaliya PS (GIS) (New)	• POWERICA Ltd. – Jam Khambhaliya PS 220kV S/c along with associated line bays at generation end (under the scope of applicant). • The above single circuit line form POWERICA switchyard upto Jam Khambhaliya PS would be implemented on double circuit towers. • Bays at ISTS sub-station under the scope of Transmission Licensee owing the ISTS sub-station subject to compliance of relevant provisions of the tariff policy **Additional Transmission system under ISTS:** • Establishment of Jam Khambhaliya PS (GIS) 400/220kV PS(GIS) alongwith 1x500MVA 400/220kV ICT • Extension of Bhachau/Lakadia-Essar 400kV D/c (Triple) line upto Jam Khambhaliya PS
7	Sprng Vayu Vidyut Private Limited	1200001936	200	30/05/20	A-NTPC LOA	400/220kV Rajgarh Substation	• Sprng Vayu Vidyut Private Limited - Rajgarh 220kV S/c line along with associated line bays at

						(existing)	both ends(under the scope of applicant)
8	Adani Green Energy Five Limited	1200002219	130	01/03/21	A(SECI-VII)	Bhuj-II PS (GIS)	• Adani Green Energy Five Limited - Bhuj-II PS 220kV S/c line along with associated line bays at generation end (under the scope of applicant). • Bays at ISTS substation end shall be under the scope of ISTS **Additional transmission system under ISTS:** • 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.
9	Adani Green Energy Three Limited	1200002217	250	01/03/21	A(SECI-VI)	Bhuj-II PS New	• Adani Green Energy Three Limited - Bhuj-II PS 220kV S/c line along with associated line bays at generation end (under the scope of applicant). • Bays at ISTS substation end shall be under the scope of ISTS. **Additional transmission system under ISTS:** • 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.
10	Sprng Vayu Vidyut Pvt. Ltd.	1200002328 (Stage-II enhancement)	100	18/04/21	A (SECI-VII)	Rajgarh S/s (PG)	The enhancement shall utilize the margins available on the dedicated transmission line of Sprng Vayu Vidyut Pvt. Ltd.(SVVPL)-Rajgarh 220kV S/c line (as identified for original application no. 1200001936 for 200MW)

10	CLP India Private Limited	1200002281	250.8	31/03/21	A (SECI-VIII)	Jam Khambhaliya PS (GIS)	• CLP India Private Limited - Jam Khambaliya PS 220kV S/c line along-with associated bays at generation end (under the scope of applicant). • Bays at ISTS substation end shall be under the scope of ISTS. **Additional transmission system to be required under ISTS:** • 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
11	SBESS SERVICES PROJECTCO TWO PVT. LTD.	1200002325	325	15/03/21	SECI Tr-VI for 324.4MW	Indore (PG) (existing)	• SBESS SERVICES PROJECTCO TWO PVT. LTD. – Indore (PG) 220kV S/c line (along with associated bays at both ends)
12	Avikiran Energy India Private Limited	1200002273	190	01/04/21	A (SECI-VIII)	Jam Khambhaliya PS (GIS)	• Avikiran Energy India Private Limited - Jam khambhaliya 220kV S/c line along-with associated bays at generation end (under the scope of applicant). • Bays at ISTS substation end shall be under the scope of ISTS. **Additional transmission system to be required under ISTS:** • 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

		Subtotal	2581.4				

12.2. The details of LTA granted to RE applicants from 30th to 43rd Connectivity & Long-term Access applications in Western Region is tabulated below:

Sr No.	Name of Applicant (Organization)	Stage-II Connectivity Quantum (MW)	LOA Quantum	Seeking LTA for (MW)	Date from which LTA required	Date upto which LTA Required	LTA Application number	LTA Processed for
1	Avikiran Solar India Private Limited	1200001423	285MW: SECI T5	285	29/02/20	28/02/45	1200001618	100MW: MSEDC 185MW: MPPMCL
2	Adani Green Energy (MP) Limited	1200001484	300MW:SECI T4	300	03/12/18	28/02/45	1200001791	300MW: MSEDCL
3	Adani Green Energy MP Ltd. (AGEMPLDayapa	1200001652	75MW:MSEDCL	75	03/12/18	18/01/45	1200001790	75MW: MSEDCL
4	Adani Green Energy MP Ltd. (AGEMLDayapar/Ratadiya)	1200001363	250MW:SECI T3	250	27/11/19	24/11/44	1200001786	150MW: WR Target 50MW: ER Target 50MW: Goa
5	Netra Wind Pvt Ltd (NWPL)	1200001775	300MW:SECI T5	300	150MW-25/03/20 150MW-15/07/20	24/07/45	1200001819	300MW: NR Target
6	Adani Green Energy Limited (AGEL)	1200001759	300MW:SECI T5	300	22/07/20	21/07/45	1200001826	175MW: NR Target 125MW: ER Target
7	Sprng Vayu Vidyut Private Limited	1200001936	200MW:NTPC	200	30/05/20	30/05/45	1200002001	200MW: NR Target
8	POWERICA Ltd.	1200001924	NA	50.6	01/03/21	28/02/46	1200002188	50.6MW: NR Target
9	Srijan Energy	1200000	Deem	125	30/11/	30/11/	1200002	125MW:

	Systems Pvt Ltd	312	ed		20	45	251	MPPTCL
				50	31/12/20	31/12/45	1200002256	50MW: UPPCL
				125	30/11/20	30/11/45	1200002257	125MW: WR Target
			Subtotal	2060.6				

Transmission System for LTA:

Sr. no. 1- Augmentation in transformation capacity at Bhuj PS (Under POWERGRID Scope):

- 6x500MVA, 400/220kV ICTs [in addition to 2x500MVA, 400/220kV ICTs which are under implementation]
- 2x1500MVA, 765/400kV ICTs [in addition to 2x1500MVA, 765/400kV ICTs which are under implementation]

Sr. no 2,3,4- Under the scope of POWERGRID

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

Under the scope of TBCB

- Establishment of 2x1500MVA, 765/400kV substation at Lakadia
- Lakadia – Vadodara 765kV D/c line
- Bhuj PS – Lakadia PS 765kV D/c line
- LILO of Bhachau – EPGL 400kV D/c (triple) line at Lakadia PS

Sr. No. 5,6 Transmission system strengthening at Bhuj-II PS (Under TBCB Scope):

- Establishment of 2x1500MVA (765/400kV), 4x500MVA (400/220kV) Bhuj-II PS (GIS)
- 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.

WRSS-21 PART-A

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

PART-B

- Lakadia – Vadodara 765kV D/c line

Sr. no. 7- LTA of 200MW was granted to Sprng Vayu Vidyut Private Limited at Rajgarh S/s with existing transmission system

Sr. No. 8- Connectivity System for RE projects (1500 MW) in Dwarka (Gujarat)

Under TBCB Scope

- Establishment of 4x500MVA, 400/220kV Jam Khambhaliya PS (GIS)
- Extension of Essar–Lakadia/ Bhachau 400kV D/c (triple snowbird) line upto Jam Khambhaliya PS

Sr. No. 9- Common Strengthening Scheme required for LTA(Common for sr. no. 8 & 9)

Under TBCB Scope

- Establishment of 2x1500MVA, 765/400kV Lakadia PS
- LILO of Bhachau – EPGL 400kV D/c (triple) line at Lakadia PS
- Bhuj PS – Lakadia PS 765kV D/c line **OR** Lakadia – Vadodara 765kV D/c line **OR** Lakadia – Banaskantha 765kV D/c line

13. Readiness of Transmission system for evacuation of power from Khargone STPS (2X660MW)

13.1. CEA stated that the following transmission system for connectivity and LTA was identified for 2x660 MW Khargone STPP**:**

Transmission system required for connectivity: (Under the scope of Khargone Transmission Limited)

i) LILO of one ckt of Khandwa - Rajgarh 400kV D/c line at Khargone STPP (Interim arrangement) - (Commissioned)**#**
ii) Khargone STPP – Khandwa Pool 400 kV D/c (Quad) line

#The LILO shall be used for startup power and commissioning activities requirement. After commissioning of balance transmission system, the LILO would be bypassed at Khargone generation switchyard and may be utilized only under contingency condition as per decision in 38th WR SCM held on 17.07.15.

Transmission system required for LTA: (Under the scope of Khargone Transmission Limited)

i) Establishment of 765/400kV, 2x1500MVA pooling station at Khandwa Pool
ii) Khandwa Pool – Indore 765kV D/c line
iii) Khandwa Pool – Dhule 765 kV D/c line

In the meeting held on 19.12.2019 at CEA to discuss the issue of readiness of Transmission system for evacuation of power from Khargone STPS (2X660MW), NTPC informed that the commissioning activities for Unit-I of Khargone STPP has been completed and the synchronization of Unit-II is

scheduled by end of December' 2019 followed by 72 hour trial run in January'2020.

Further, KTL informed that Khargone STPP – Khandwa Pool 400 kV D/c (Quad) line is expected by 1st week of Jan'20 whereas establishment of 765/400kV, 2x1500MVA pooling station at Khandwa Pool along with Khandwa Pool – Indore 765kV D/c line is expected by end of Dec'19.

After detailed deliberations, following was decided in the meeting held at CEA on 19.12.2019:

- M/s KTL to complete the above part system of the evacuation system associated with Khargone STPP [Khargone STPP – Khandwa Pool 400 kV D/c (Quad) line, establishment of 765/400kV, 2x1500MVA pooling station at Khandwa Pool & Khandwa Pool – Indore 765kV D/c line by 15th January, 2019.
- Until availability of the above transmission system, Khargone STPP unit 1 power would be evacuated through LILO of one ckt of Rajgarh - Khandwa 400kV D/C line at Khargone TPP.
- Synchronization of Unit-II of Khargone TPP through existing LILO of one ckt of Rajgarh - Khandwa 400kV D/C line at Khargone TPP may be allowed to M/s NTPC, subject to the total generation from Unit–I and Unit-II is restricted to the capacity of only one unit at Khargone TPP and furnishing a undertaking from NTPC on the same.
- After availability of the above transmission system, LILO of one ckt of Rajgarh - Khandwa 400kV D/C line at Khargone TPP would be bypassed at Khargone STPP switchyard and may be utilized only under contingency condition.

13.2. NTPC stated that power transfer on long term basis through the LILO arrangement subject to the margins available in the system, may be allowed by CTU till the originally planned system for LTA becomes available. He further stated that CERC vide its various orders have allowed LTA on LILO if LILO has been considered at the planning stage.

13.3. CTU stated that LILO of one ckt of Rajgarh - Khandwa 400kV D/c line at Khargone TPP was originally planned only for startup power and commissioning activities requirement. Accordingly, till the originally planned system for effecting LTA is not completed, transfer of power through LILO will be based on the availability of margins on short term basis. He further stated LTA on LILO may be allowed by CTU as a temporary measure provided that grant of LTA on LILO will not affect system security. But for that, NTPC has to apply for operationalization of LTA with the partial system to CTU on behalf of beneficiaries.

13.4. NTPC stated that it is not a signatory to LTA agreement. In case of NTPC, the allocation of power is by MoP and once the beneficiaries are identified, it is for them to deal with any necessary agreements with CTU/transmission licensee.

13.5. CEA requested the beneficiaries to convey their views regarding operationalization of LTA with part system.

13.6. MPPTCL and GETCO stated that they would convey their views after consulting their power procurement cell namely, MPPCL and GUVNL respectively.

13.7. After further deliberations, it was agreed that entire LTA for Khargone STPP could be operationalized with the following transmission system which is expected to be completed by January 2020:

i) Khargone STPP – Khandwa Pool 400 kV D/c (Quad) line.
ii) Establishment of 765/400kV, 2x1500MVA pooling station at Khandwa Pool
iii) Khandwa Pool – Indore 765kV D/c line

13.8. Regarding the operationalization of LTA from Unit-I through the existing system(viz. LILO of one ckt. of Rajgarh - Khandwa 400kV D/C line at Khargone TPP), it was observed that NTPC may consult the beneficiaries of Khargone TPP and convey their opinion to CTU or request CTU directly for operationalizing its LTA. CTU on receiving such request from NTPC shall operationalize the LTA from Unit-I through the existing LILO of one ckt of Rajgarh - Khandwa 400kV D/C line at Khargone TPP.

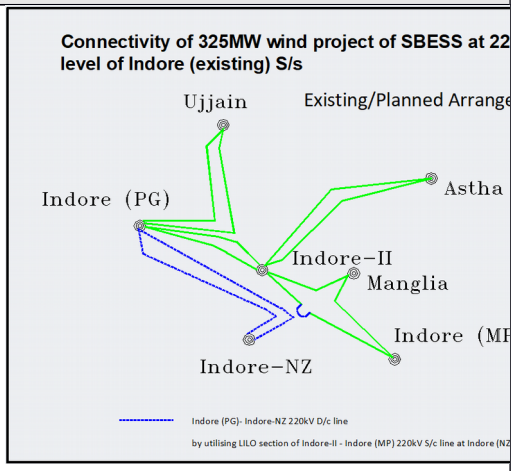
14. Connectivity of 325MW wind project of SBESS at 220kV level of Indore (existing) S/s

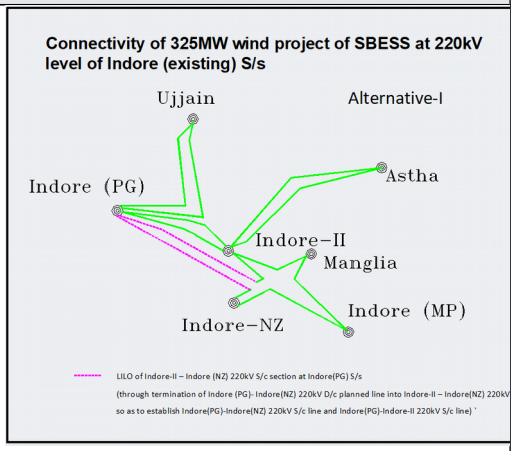
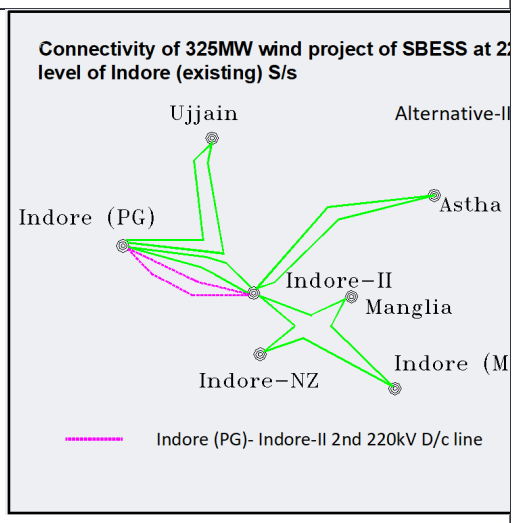
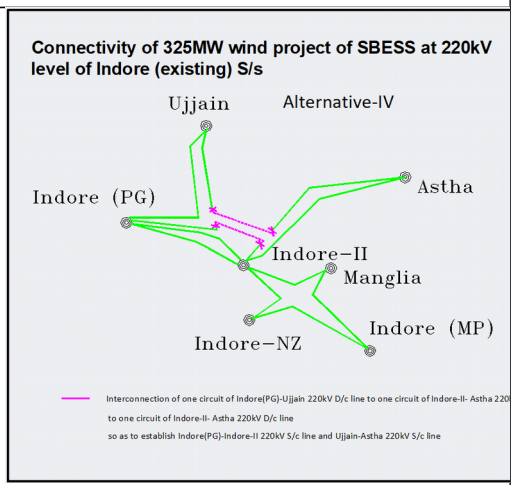
14.1. CEA stated that SBESS Services Projectco Two Pvt. Ltd. had applied for Stage-I & Stage-II connectivity for its 325MW wind project at Indore (existing) S/s of POWERGRID.

The applications were deliberated in the 42nd Western Region constituents meeting regarding Connectivity/LTA Applications held on 26.11.2019. However, MPPTCL had objected to the injection of 325MW power at 220kV level of Indore (PG) S/s as it was causing overloading of 220kV lines emanating from Indore S/s and had insisted that M/s SBESS has to pay the STU transmission charges for use the Intra State transmission system.

Subsequently, MPPTCL vide letter dated 02.12.2019 submitted that connectivity at 220kV level of Indore (PG) S/s is acceptable to them provided that technical solution with respect to overloading in 220kV corridor from Indore (PG) substation is worked out and STU transmission charges & losses are made applicable on the portion of power flowing from the generation project into the MP STU network.

Accordingly, to deliberate on the issue, a meeting amongst CEA, CTU, MPPTCL and SBESS Services Projectco Two Pvt. Ltd. was held on 20.12.2019 in which, various alternatives, to relieve overloading of 220kV lines emanating from Indore S/s after considering SBESS 325 MW wind project injection at 220kV level of Indore (PG) S/s, were discussed. The alternatives discussed are given below:

Sl. No.	Alternatives	Constraint/Remarks	Schematic
1	**Base Case** With Indore(PG) – Indore (NZ) 220kV D/c line (planned by MPPTCL) along with restoring the LILO of Indore-II – Indore(MP) 220kV line at Indore(NZ) to original configuration	In the event of outage of one circuit of Indore (PG)-Indore-II 220kV D/c line, loading of other circuit reaches around 275 MW. (N-1 non-compliant)	

Sl. No.	Alternatives	Constraint/Remarks	Schematic
2	**Alternative-I:** LILO of Indore-II – Indore (NZ) 220kV S/c section at Indore(PG) S/s (through termination of Indore (PG)- Indore(NZ) 220kV D/c planned line into Indore-II – Indore(NZ) 220kV S/c line so as to establish Indore(PG)-Indore(NZ) 220kV S/c line and Indore(PG)-Indore-II 220kV S/c line)	Power flow is in order	
3	**Alternative-II:** Indore (PG)- Indore-II 2nd 220kV D/c line	2 nos. bays at Indore(MP) required	
4	**Alternative-III:** Reconductoring of Indore (PG)- Indore-II existing 220kV D/c line	If taken up under ISTS, the line (conductor) & tower infrastructure shall be under different ownership	*Reconductoring of existing Indore (PG)-Indore-II 220kV D/c line*
5	**Alternative-IV:** Interconnection of one circuit of Indore(PG)-Ujjain 220kV D/c line to one circuit of Indore-II-Astha 220kV D/c line so as to establish Indore(PG)-Indore-II 220kV S/c line and Ujjain-Astha 220kV S/c line	-No bays are required and third ckt between Indore (PG) - Indore II gets established	

In the meeting, the following was agreed:

i) St-I and St-II connectivity to M/s SBESS would be granted at 220kV level of Indore (PG) S/s through SBESS – Indore (PG) 220 kV S/c line. The LTA application would be processed after the finalization of strengthening scheme, relieve overloading of 220kV lines emanating from Indore S/s. MPPTCL was requested to convey the feasible alternative (as suggested above) and modality of implementation of the same.

ii) Regarding MPPTCL's proposal of the applicability of the STU transmission charges and losses on the portion of power flowing from the generation project into the MP STU network, it was deliberated that the same would be governed by applicable CERC/SERC regulations.

14.2. CTU stated that the Stage-I and Stage-II has already been granted to M/s SBESS Services Projectco Two Pvt. Ltd. vide the minutes of the 42nd meeting of Western Region Constituents for Connectivity & LTA Applications issued on 03.01.2020. The LTA application of M/s SBESS has already been received on 31.12.2019. To process the LTA application, MPPTCL needs to finalize one of the above alternative or any other alternative as suggested by MPPTCL.

14.3. MPPTCL stated that Alternative-II seems to be the most feasible option and confirmed regarding availability of 220kV bays at Indore-II (MP) S/s. Further he stated that any augmentation required at 220kV level for grant of LTA to M/s SBESS would be carried out by MPPTCL and the cost of the same would be borne by the generation developer and applicant shall also have to bear the STU transmission charges for the quantum of power injected into the STU system.

14.4. CTU stated that as per the extant CERC Regulations, there is no provision of payment of STU transmission charges by the LTA grantee seeking connectivity to ISTS network. Therefore, the identified system may be taken up under ISTS.

14.5. MPPTCL again reiterated that since the 220 kV bus of ISTS substations is for feeding the state in which it is located and metering is also on high voltage side of the ICT which means 220 kV bus is a part of Intra-state network although the operation and maintenance works are done by ISTS licensees. Hence, STU charges should be applicable to M/s SBESS as decided by MPERC.

14.6. After further deliberations, it was decided that the matter regarding connectivity to M/s SBESS shall be deliberated in a separate meeting.

15. Requirement of DGEN – Vadodara 400kV D/c line for power evacuation from DGEN Power plant (3x400MW)

15.1. CEA stated that the following LTAs have been granted from Torrent Energy Ltd. (DGEN) Power plant in Dahej, Gujarat:

- 800MW: 400MW - NR (Target) & 400MW - WR (Target)
- 400MW: 400MW - Gujarat (WR) (at 400kV Nicol S/s of Ahmedabad)

The DGEN – Vadodara 400kV D/c and Navsari – Bhestan 220kV D/c lines were identified as system strengthening schemes to operationalize the subject LTAs. "Transmission system associated with DGEN TPS (1200 MW) of Torrent Power Limited", which consisted of the above elements was awarded to DGEN Transmission Company Ltd (DGENTCL) through Tariff Based Competitive Bidding (TBCB) route with commissioning schedule of May 2018. The zero date

of the project was 17.03.2015, however, M/s DGENTCL did not take up the implementation of the scheme.

Further, CERC vide order dated 11.06.19 in petition 9/SM/2018 had cancelled the transmission license of DGENTCL.

In the 2nd WRSCT held on 21.05.19, it was agreed to take up the implementation of Navsari (PG) – Bhestan 220 kV D/C line as a separate ISTS scheme, in view of consistent overloading observed on Vav-Popadiya/Sachin-Navsari (GETCO) - Navsari (PGCIL) 220 kV lines and also reported in the operation feedback by POSOCO.

15.2. CTU stated that as per the load flow studies, following flows (in MW) are observed on Navsari – Navsari (GETCO) 220kV D/c line:

	Base case	**N-1**
Without 3x400MW DGEN TPS	2x160	247
With 3x400MW DGEN TPS	2x225	346
With 3x400MW DGEN TPS along with Navsari – Bhestan line	2x177	256

Thus, it can be observed that for effecting the LTA granted from DGEN, the Navsari (PG) – Bhestan 220 kV D/C line shall be required. Further, since DGEN – Navsari 400kV D/c line is of triple conductor, DGEN – Vadodara 400kV D/c line is not required for effecting its LTA.

15.3. GETCO stated that LTA granted to Torrent Power Limited (TPL), Ahmedabad for drawal of 400MW from 1200 MW DGEN plant of Torrent Energy limited is linked with the same system as given below:

(i) TEL(DGEN) TPS – Navsari 400kV D/c (Triple/Quad) –*implementation by* gen. developer (connectivity system)
(ii) TEL (DGEN) TPS – Vadodara 400kV D/c* – to be implemented through TBCB
(iii) 220kV Navsari (PG) – Bhesthan (GETCO) D/c* – to be implemented through TBCB
(iv) Augmentation of transformation capacity of 400/220kV substation at Navsari with 1x500MVA ICT – being implemented by POWERGRID.
(v) LILO of one ckt of 400kV Dehgam – Pirana D/c line at 400/132kv Nicol (Dedicated tr. system for drawl at TPL Ahmadabad) – *to be implemented by gen. developer.*

** Bays at Vadodara substation and Navsari (PG) shall be implemented by POWERGRID and 220kV bays at Bhesthan shall be implemented by GETCO.*

GETCO stated that 400 kV Nicol S/s has already been commissioned and TPL is drawing power from the grid but their LTA was still not operationalized. In view of this LTA for the drawal of 400 MW power needs to be operationalized immediately with the existing system. The LTA for evacuation of power from DGEN Power plant (3x400MW) may be operationalized after the commissioning of Navsari (PG) – Bhesthan (GETCO) 220 kV D/c line as proposed by CTU.

15.4. After deliberations, CTU proposal for operationalization was agreed by the members:

i) 800 MW LTA granted to M/s DGEN can be operationalized with the following transmission system:
- TEL(DGEN) TPS – Navsari 400kV D/c (Triple/Quad) – Dedicated line of Gen. developer (already implemented)
- 220kV Navsari (PG) – Bhesthan (GETCO) D/c – To be implemented (Mode of implementation to be decided by MoP)
- Augmentation of transformation capacity of 400/220kV substation at Navsari with 1x500MVA ICT – already implemented by POWERGRID.

ii) Regarding operationalization of 400 MW LTA granted to M/s Torrent Power Limited (TPL), Ahmedabad with the existing system, it was decided that the matter would be taken up for deliberation in the ensuing Connectivity/LTA meeting for further decision in this regard.

16. Data requirements from STUs for Transmission Planning

16.1. CTU stated that WRPC (TP) forum has been mandated to ensure development of ISTS system after assessing the generation capacity & demand growth in various parts of the region and to review the upstream & downstream network associated with the transmission schemes.

The CERC Planning Regulations, 2018 also mandates that Regional Power Committee(s) shall assist in preparation of base case in consultation with STUs/ Distribution licensees of the region.

In the MoP Order No 15/3/2017-Trans dated 04-11-2019, the ToR of NCT states that *CTU shall also make a comprehensive presentation before the National Committee every quarter for ensuring development of an efficient, co-ordinated and economical inter-State transmission system for smooth flow of electricity.*

Accordingly, inputs are required from states for carrying out the above task. The data requirements from STUs pertain to the following broad categories:

i) Demand Projection (peak & off-peak, on quarterly & annual basis)

ii) Intra-state Generation capacity addition plans along with expected commissioning schedules.

iii) Existing and under-construction intra-state transmission network up to 220kV level except NER where data upto 132kV level shall be required.

iv) Intra state network augmentation plans of STUs along with expected commissioning schedules.

States shall be required to provide dynamic model data for state connected power system elements including generations, FACTS devices, HVDCs, etc. in PSS®E standard models.

16.2. CTU further stated that the requisite data needs to be provided in standard formats. STUs were requested to nominate primary and alternate contacts for further coordination in this regard.

~~16.3.~~ STU agreed to the furnish the required data and nominate primary and alternate members who could be contacted for further coordination on the issue. CEA/CTU stated that the data format shall be shared with the STUs separately. MS(WRPC) was requested to facilitate in the above data submission by STUs and also nominate representative of WRPC in this regard.

17. LILO of two circuits of 400 kV Bhadravati – Chandrapur-I 2xD/c line at Chandrapur-II – Agenda by MSETCL

17.1. CEA stated that in the 43rd Meeting of Standing Committee on Power System Planning of Western Region held on 11.05.2018, the issue of critical loading on 400 kV Chandrapur– Chandrapur-II D/C line was discussed. In the 1st Meeting of WRSCT held on 05.09.2018, MSETCL had proposed implementation of LILO of Chandrapur-I – Parli 400 kV S/c line at Warora(M) to overcome regarding the issue of overloading of Chandrapur-I – Chandrapur-II 400 kV D/c line during less/nil generation at Chandrapur-I complex. Since its implementation would have taken time, accordingly MSETCL had proposed LILO of one circuit of Chandrapur-I – Bhadravati 400 kV 2xD/c line at Chandrapur-II. MSETCL proposal was agreed as the scheme would be implemented in lesser time as it involved erection of one or two towers only.

Now, MSETCL vide their letter no. MSETCL/CO/STU/09587 dated 21.12.2019 has proposed LILO of two ckts. of 400 kV Chandrapur-I – Bhadravati 2xD/c line at Chandrapur-II instead of LILO of one ckt of 400 kV Chandrapur-I – Bhadravati 2xD/c line at Chandrapur-II.

17.2. CEA enquired about the status of LILO of one circuit of Warora Pool – Parli(PG) D/c line at Warora(M) or Warora (M) – Warora Pool 400 kV D/c line which was discussed in the 1st meeting of WRSCT for the evacuation of power beyond Warora(M).

17.3. MSETCL stated that the above proposal is not finalized yet.

17.4. CEA stated that with implementation of additional outlet from Warora (M) , namely (i) LILO of Chandrapur-I – Parli 400 kV S/c line at Warora(M) and (ii) LILO of one circuit of Warora Pool – Parli(PG) D/c line at Warora(M) or Warora (M) – Warora Pool 400 kV D/c line, the issue of overloading of Chandrapur-I – Chandrapur-II 400 kV D/c line during less/nil generation at Chandrapur-I complex would not be there.

17.5. After deliberations, it was agreed that the proposal of MSETCL for the LILO of both the circuits of 400 kV Chandrapur-I – Bhadravati 2xD/c line at Chandrapur-II instead of LILO of one ckt of 400 kV Chandrapur-I – Bhadravati 2xD/c line at Chandrapur-II may be studied in a Joint Study meeting along with additional outlets from Warora(M).

18. Proposal for Establishment of 132 kV Dharani – Pipalpani line by 2nd ckt stringing along with end bays at 132 Dharni S/s under MSETCL and 132 kV Pipalpani S/s under MPTRANSCO – Agenda by MSETCL

18.1. CEA stated that MSETCL has proposed to establish 2nd ckt stringing of 132 kV Dharani – Pipalpani inter-state line along with end bays at 132 Dharni S/s under MSETCL and 132 kV Pipalpani S/s under MPPTCL. Further following information has been submitted by MSETCL:

i) 132 kV Nepanagar (Madhya Pradesh) – Dharni (Maharashtra) SCDC line (Approx. 60 Kms) was charged on 09-02-2017 in radial mode from MP end. Power flow to Maharashtra State on this line has started from 16-02-2017.

ii) Subsequently, MPPTCL has submitted the proposal to MSETCL for utilization of 2nd ckt of 132 kV Nepanagar – Dharni SCDC line of MSETCL for connectivity of proposed 132 kV Pipalpani S/s, District – Burhanpur, Madhya Pradesh.MSETCL has granted in-principle approval for the same.

18.2. MPPTCL stated that issue is bilateral between MPPTCL and Maharastra and the same would be sorted out mutually.

Annexure-I

List of participants of the 1st meeting of Western Region Power Committee (Transmission Planning) held on 11.01.2020 at Ahmedabad

Sr.No	Name	Designation	Contact	Mail ID
	Central Electricity Authority			
1	Sh. PS Mhaske	Chairperson		
2	Goutam Roy	Chief Engineer	8376817933	Goutamroy.715@gmail.com
3	Awdhesh Kr. Yadav	Director	9868664087	awd.cea@gmail.com
4	Priyam Srivastava	Deputy Director	9717650473	priyam.cea@gmail.com
5	Vikas Sachan	Assistant Director	7838263649	vikas.cea@gov.in
	Western Region Power Committee			
6	Sh.Satyanarayan S	Member Secretary		
	Cetntral Transmission Utility			
7	Subir Sen	COO	9650293185	subir@powergridindia.com
8	Ashok Pal	GM	9910378105	ashok@powergridindia.com
9	P.S. Das	DGM	8826094863	psdas@powergridindia.com
10	Bhaskar Wagh	CTU	9560890352	bhaskarwagh@powergridindia.com
11	Pratyush Singh	Sr. Engr	8826094863	pratyush.singh@powergridindia.com
12	Shashank Shekhar	Engineer	9205287434	shashankshekhar@powergridindia.com
	Power System Operation Corporation			
13	S.R. Narasimhan	Director	9971117022	srnarasimhan@posoco.in
14	Rajeev Porwal	Sr. GM	9871581133	Rk.porwal@posoco.in
15	Chitrankshi G.	Manager	9869004892	chitrankshi@posoco.in
16	Pradeep Sanodiya	Sr. Engg.	8452045338	psanodiya@posoco.in
17	Prabhankar Porwal	Engineer	9971702157	pporwal@posoco.in
	POWERGRID			
18	S.D. Joshi	ED		
19	Abhinav Verma	Sr. GM		
20	S.Majumdar	GM	9910377985	
21	S.R Sharma	GM	7043484043	
22	Manoj Kumar Meena		7043230011	
	NTPC			
23	Subhash thakur	Addl.GM	9650991067	subhashthakur@ntpc.co.in
24	Rajesh Jain		9650994073	
	GETCO			
25	Mis. Alka S. Shah	SE, STU	9925208078	
26	Deepak H Patel	DE, STU	9925213237	desystem@gebmail.com
	MSETCL			
27	Shashank Jewalikar	Chief Engineer	7709561235	cestu@mahatransco.in
	MPPTCL			
28	M.M. Dhoke	EE	9425805237	ce.pnd@mptransco.nic.in

	SECI			
29	R.K. Agarwal	Consultant	9910346333	Pikabaya56@gmail.com
	GPCL			
30	Bijoy Kumar Nayak	Sr. Officer	9099043771	
31	Jagdish Patel		9978507410	

Annexure II

No.15/3/2017-Trans
Government of India
Ministry of Power
Shram Shakti Bhawan, Rafi Marg, New Delhi

Dated, the 4th November, 2019

OFFICE ORDER

Subject: Constitution of five "Regional Power Committees (Transmission Planning)" (RPCTPs) - reg.

In supersession of this Ministry's Office Orders of even number, dated 13.4.2018, constituting five Regional Standing Committees on Transmission (RSCTs) viz. Eastern Regional Standing Committee on Transmission (ERSCT), Western Regional Standing Committee on Transmission (WRSCT), Northern Regional Standing Committee on Transmission (NRSCT), Southern Regional Standing Committee on Transmission (SRSCT) and North Eastern Regional Standing Committee on Transmission (NERSCT), the undersigned is directed to state that in the light of the fact that the present transmission system is in the nature of One Nation- One Grid and the whole system as National System has to transport power seamlessly from one corner of the country to another corner of the country in the form of one single market, it has been decided to revise the existing five RSCTs by replacing the same with five new "Regional Power Committees (Transmission Planning) (RPCTPs)" with the following composition, with immediate effect:

Eastern Regional Power Committee (Transmission Planning) (ERPCTP):

1	Member(Power System), Central Electricity Authority (CEA)	Chairperson
2	Chief Operating Officer, Central Transmission Utility (POWERGRID)	Member
3	Director(System Operation), Power System Operation Corporation Ltd.	Member
4	Heads of State Transmission Utilities (STUs) of Bihar, Jharkhand, West Bengal, Odisha, Sikkim, UT of Andaman & Nicobar Islands #	Member
5	Member Secretary of Eastern Regional Power Committee	Member
6	CMD/ MD/ Chairman of NTPC, NHPC, SECI and DVC	Members
7	Chief Engineer(from Power System Wing), Central Electricity Authority *	Member Secretary

 # STUs to coordinate with their respective Distribution Companies (DISCOMs).
** To be nominated by the Central Electricity Authority.*

Western Regional Power Committee (Transmission Planning) (WRPCTP):

1	Member(Power System), Central Electricity Authority (CEA)	Chairperson
2	Chief Operating Officer, Central Transmission Utility (POWERGRID)	Member
3	Director(System Operation), Power System Operation Corporation Ltd.	Member
4	Heads of State Transmission Utilities (STUs) of Gujarat, Madhya Pradesh, Chhattisgarh, Maharashtra, Goa, UT of Daman & Diu, UT of Dadra & Nagar Haveli #	Member
5	Member Secretary of Western Regional Power Committee	Member
6	CMD/ MD/ Chairman of NTPC, NHPC and SECI	Members
7	Chief Engineer(from Power System Wing), Central Electricity Authority *	Member Secretary

 # STUs to coordinate with their respective Distribution Companies (DISCOMs).
** To be nominated by the Central Electricity Authority.*

Northern Regional Power Committee (Transmission Planning) (NRPCTP):

1	Member(Power System), Central Electricity Authority (CEA)	Chairperson
2	Chief Operating Officer, Central Transmission Utility (POWERGRID)	Member
3	Director(System Operation), Power System Operation Corporation Ltd.	Member
4	Heads of State Transmission Utilities (STUs) of UT of Jammu & Kashmir, UT of Ladakh, Himachal Pradesh, Punjab, Haryana, Rajasthan, Delhi, Uttar Pradesh, Uttarakhand, UT of Chandigarh #	Member
5	Member Secretary of Northern Regional Power Committee	Member
6	CMD/ MD/ Chairman of NTPC, NHPC and SECI	Members
7	Chief Engineer(from Power System Wing), Central Electricity Authority *	Member Secretary

 # STUs to coordinate with their respective Distribution Companies (DISCOMs).
** To be nominated by the Central Electricity Authority.*

Southern Regional Power Committee (Transmission Planning) (SRPCTP):

1	Member(Power System), Central Electricity Authority (CEA)	Chairperson
2	Chief Operating Officer, Central Transmission Utility (POWERGRID)	Member
3	Director(System Operation), Power System Operation Corporation Ltd.	Member
4	Heads of State Transmission Utilities (STUs) of Telangana, Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, UT of Puducherry, UT of Lakshadweep #	Member
5	Member Secretary of Southern Regional Power Committee	Member
6	CMD/ MD/ Chairman of NTPC, NHPC and SECI	Members
7	Chief Engineer(from Power System Wing), Central Electricity Authority *	Member Secretary

 # STUs to coordinate with their respective Distribution Companies (DISCOMs).
** To be nominated by the Central Electricity Authority.*

North Eastern Regional Power Committee (Transmission Planning) (NERPCTP):

1	Member(Power System), Central Electricity Authority (CEA)	Chairperson
2	Chief Operating Officer, Central Transmission Utility (POWERGRID)	Member
3	Director(System Operation), Power System Operation Corporation Ltd.	Member
4	Heads of State Transmission Utilities (STUs) of Assam, Meghalaya, Nagaland, Arunachal Pradesh, Tripura, Manipur, Mizoram #	Member
5	Member Secretary of North Eastern Regional Power Committee	Member
6	CMD/ MD/ Chairman of NTPC, NHPC, SECI and NEEPCO	Members
7	Chief Engineer(from Power System Wing), Central Electricity Authority *	Member Secretary

 # STUs to coordinate with their respective Distribution Companies (DISCOMs).
** To be nominated by the Central Electricity Authority.*

2. Terms of Reference (ToR) of the RPCTPs are to:

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

ii. Assess the transmission system requirements in the near, medium and long term and draw up transmission schemes to meet these requirements. While doing this a perspective plan for the next 15-20 years may also be kept in mind and accordingly the requisite allowance/margin may be factored in the system during planning process.

iii. Examine applications for connectivity and access and ensure that these are granted speedily, provided that the requisite fees/charges are paid.

iv. Review the upstream and downstream network associated with transmission schemes.

v. Examine and evaluate the intra-state transmission proposals.

vi. Review and facilitate the construction of the inter-regional grid strengthening schemes.

3. The RPCTPs shall take steps to ensure that the transmission capacity is capable of wheeling the electricity to different parts of the region and outside the region as per the demands of the market. They shall carry out the quarterly reviews and make recommendation for system strengthening and expansion keeping in mind the guidelines laid down by the Tariff Policy.

4. The RPCTPs will forward their review of the transmission systems and their recommendation for system expansion/ strengthening to the National Committee on Transmission (NCT) at the end of every quarter- by 15th July; 15th October; 15th January and 15th April. The NCT will examine the proposals and forward them to Government with their recommendations.

5. This issues with the approval of the Hon'ble Minister of State (Independent Charge) for Power and New & Renewable Energy.

4/11/2019

(Bihari Lal)
Under Secretary to the Govt. of India
Telefax: 23325242
Email: transdesk-mop@nic.in

To

1. All members of the five RPCTPs.
2. Secretary, Ministry of New & Renewable Energy, Govt. of India.
3. Chairperson, CEA, New Delhi.
4. CMDs of all CPSUs under the Ministry of Power and Ministry of New and Renewable Energy, Govt. of India.
5. Heads of all autonomous bodies under the Ministry of Power, Govt. of India.
6. Finance/ Budget Section, Ministry of Power.
7. Power/ Energy Secretaries of all States/UTs.
8. Chief Executives of all State Transmission Utilities (STUs).

Copy to:

(i) PS to Hon'ble MoSP(IC)/ PPS to Secretary(Power)/ SS&FA/ AS(Trans)/ all Joint Secretaries/ EA/ Directors/ Dy. Secretaries, Ministry of Power.

(ii) Technical Director, NIC, M/o Power, for publishing this order on the website of M/o Power.

Annexure III

एनटीपीसी NTPC

एन टी पी सी लिमिटेड
(भारत सरकार का उद्यम)
NTPC Limited
(A Govt. of India Enterprise)
(Formerly National Thermal Power Corporation Ltd.)

केन्द्रीय कार्यालय/Corporate Centre

Ref. No: CC:PEE:NTPC/CONN/LARA-II

Date: 12.09.2019

Chief General Manager (CTU),
Power Grid Corporation of India Limited,
"Saudamini", Plot No. 2, Sector-29,
Near IFFCO Chowk,
Gurgaon-122001
Fax: 0124-2571809

Kind Attention: Sh. Ashok Pal

Sub: Request for review of connectivity granted to Lara-Stage-II 2x800MW project of NTPC.

Dear Sir,

We are in receipt of CON-3 (intimation of grant of connectivity) for our Lara Stage-II (2x800MW) project. Connectivity for the project has been granted through Existing Lara stage-I – Raigarh (Kotra) 400kV D/C line along with proposal for upgrading the conductor of this line to HTLS (with quad moose capacity). Upon shifting of this line to Lara Stage-II, connectivity of stage-I shall stand revised to Lara Stage-I - Champa 400kV D/C Line. Works related to shifting of Raigarh (Kotra) line from Lara stage-I to Lara stage-II switchyards have been kept in scope of NTPC.

We request your kind attention to the following points:

1) 400kV switchyards of Lara-I and II are not adjacent and are in different directions. In order shift Kotra line from Stage-I are to Stage-II generation bus, a 400kV Tie Line is proposed to be constructed between stage-I and Stage-II switchyard such that shifting of Kotra line is possible within the available space inside the plant boundary. Proposed 400KV scheme for Lara-II is enclosed for reference.

2) This Tie line arrangement has been planned in such a manner that it would enable us to draw startup from existing Lara I 400kV switchyard.

3) Shifting and re-conductoring of Raigarh line is proposed to be completed before synchronization of Ist Unit of Lara II.

4) However, as the connectivity for stage-II is explicitly granted through Raigarh line only it will not be possible to connect Lara-II with stage-I for drawal of startup and re-conductoring of

Raigargh line would need to be completed 15 months prior to synchronization of Ist Unit of Lara II.

It is therefore requested that **interim** connectivity for Lara-II may also be granted from Lara stage-I switchyard only for drawl of startup power. Re-conductoring of Raigarh line as per final connectivity and LTA shall be required to be completed in matching time frame with synchronization of Ist Unit i.e 44 months from Investment approval. LTA on behalf of beneficiaries shall be applied after Investment approval of the project.

Thanking You.

Yours faithfully,

SUBHASH THAKUR

Digitally signed by SUBHASH THAKUR
DN: cn=SUBHASH THAKUR, c=IN, st=Uttar pradesh, o=NTPC LIMITED, ou=NTPC LIMITED
Date: 2019.09.12 19:10:09 +05'30'

(Subhash Thakur)
AGM (PE-Electrical)

LARA-I 400KV AIS SWYD

LARA-II 400KV AIS SWYD

Drawl of startup power From Lara I

400KV D/C QUAD MOOSE TIE LINE WITH REDUNDANT OPGW FOR INTERCONNECTION WITH STAGE-II AIS SWYD

NOTES:

suggestion:

1. Connectivitymay be granted at Lara I ISTS bus to allow drawl of startup power. No modification would be required in existing system till drawl of startup power.
2. Post shifting of Raigarh line to Lara II AIS, Bus section can be opened and same shall be used for trial operation and COD.
3. Bus section may be permitted to be closed under exigencies .

LARA STAGE-II AIS SWYD

EXISTING SWITCHYARD LARA STAGE-I AIS SWYD

TO CHAMPA

TO RAIGARH KOTRA

LINE#I

LINE#II

LINE#III

LINE#IV

NTPC Scope

4400pF

LARA-II BUS-III

4000A, 50kA FOR 1 SEC

3150A TYP.

3150A

LARA-I BUS-I

2000A

LARA-II BUS-IV

LARA-I BUS-II

BUS REACTOR 125 MVAR

LARA STAGE-II AIS SWYD

EXISTING SWITCHYARD LARA STAGE-I

LARA-II 400KV GIS SWYD

400KV GIS BUS-II/I

400KV GIS BUS-I/II

BUS VT

(TYP)

MIN. 4000 A

63KA FOR 1 SECOND

4400pF

ST#1

ST#2

GT#1

GT#2

LEGEND:

- CIRCUIT BREAKER
- MOTORISED DISCONNECTOR-GIS
- MOTORISED 3 POLE EARTHING SWITCH
- HIGH SPEED MOTORISED EARTH SWITCH
- BUSHING CT
- WAVE TRAP
- LIGHTNING ARESTOR
- CVT
- CT
- SF6/AIR BUSHING

** GIS BREAKER HAVING CONTROLLED SWITCHING FACILITY

#Ɛ GIS CT FOR METERING

AIS BREAKER HAVING CONTROLLED SWITCHING FACILITY

FOR TENDER PURPOSE ONLY

NTPC Limited

PROJECT: LARA SUPER THERMAL POWER PROJECT STAGE-II (2x800MW)

TITLE: SINGLE LINE DIAGRAM 400KV SWITCHYARD

REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	APPD	DATE	SIZE	SCALE	DRAWING NO.	REV. NO.
							A3	NA	9587-999-POE-J-001	C

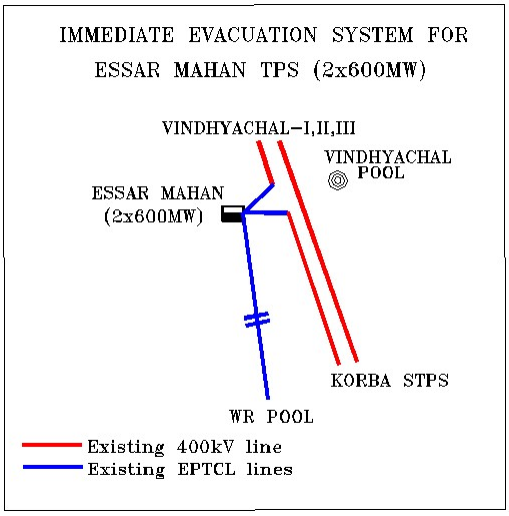
LARA-400KV-SWYD-SLD.DWG

REVIEW OF IMMEDIATE TRANSMISSION SYSTEM FOR EVACUATION OF POWER FROM ESSAR POWER MP LTD. MAHAN POWER PLANT

1st WRPC (TP) on 11.01.2020

Case-1: Existing Arrangement

- With Essar Mahan TPS – WR Pooling Station 400kV D/c (triple) line + LILO of one circuit of Vindhyachal – Korba STPP 400kV D/c line at Mahan TPS **in service**

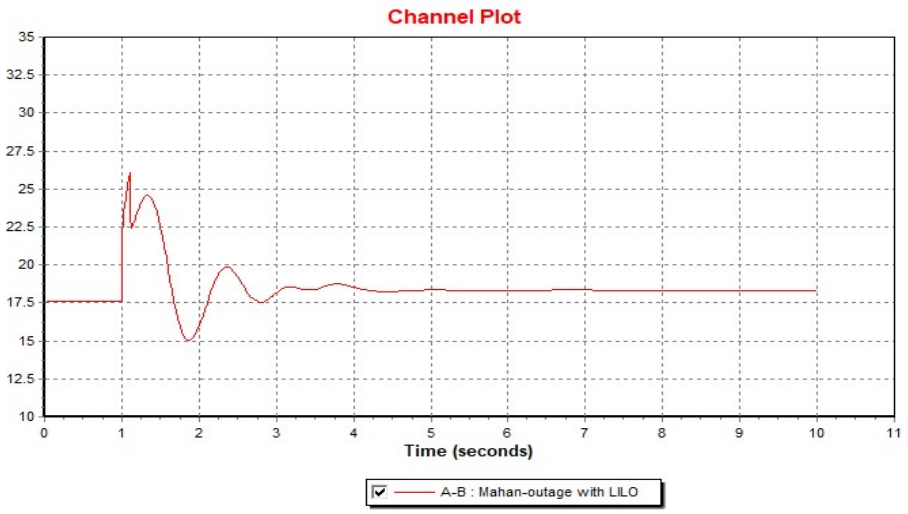


Load Flow / Stability Results

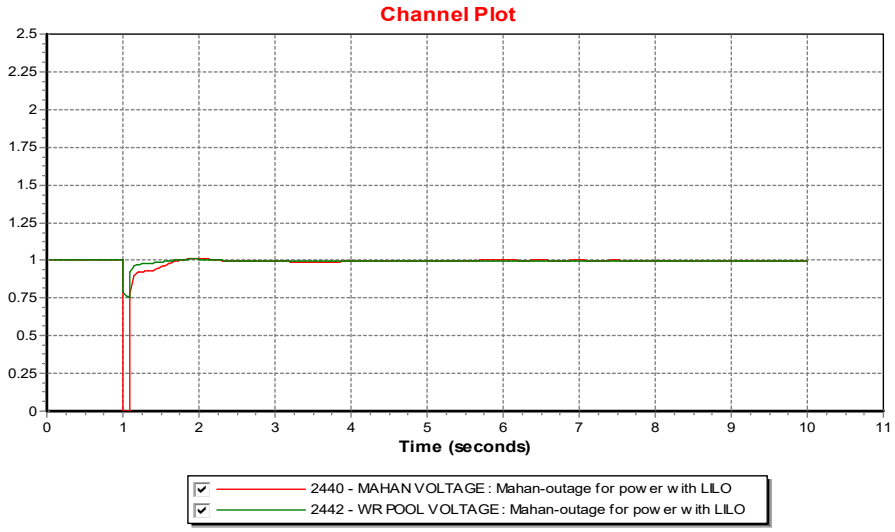
Case	Load Flow (in MW)			Stability	Short Circuit	Remarks
	Mahan TPS – WR Pool 400kV D/c	Mahan TPS – Vindhyachal 400kV S/c	Mahan TPS – Korba STPS 400kV S/c	Stable / Unstable	Fault level in kA	2 x 540MW dispatch set in all cases
Existing	2x96	671	197	**Stable** under N-1 outage of long Mahan – WR Pool line	3 Ph: 41 LG: 43	More Power tends to flow to Vindhyachal instead of WR Pool. **Fault level beyond design limit of 40kA at Vindhyachal.** **Maximum Contribution from Mahan : 7.5kA**

Load Flow Study Result **3 PH SC Study Result**

ANGLE PLOT OF ESSAR MAHAN TPS

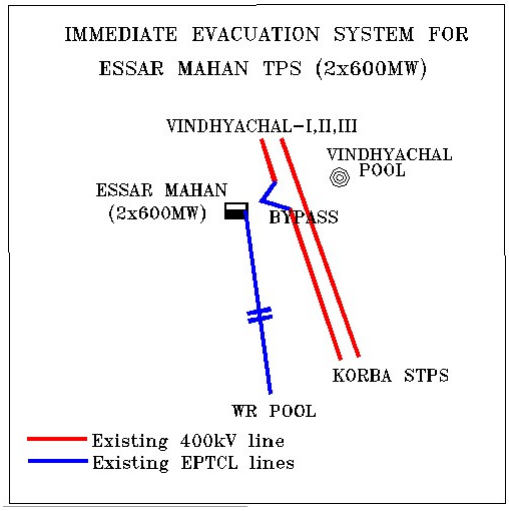


VOLTAGE PLOT OF ESSAR MAHAN TPS & WR POOL



Case-2: With Bypassing Arrangement

- With Essar Mahan TPS – WR Pooling Station 400kV D/c (triple) line + LILO of one circuit of Vindhyachal – Korba STPP 400kV D/c line at Mahan TPS **Bypassed at Mahan**



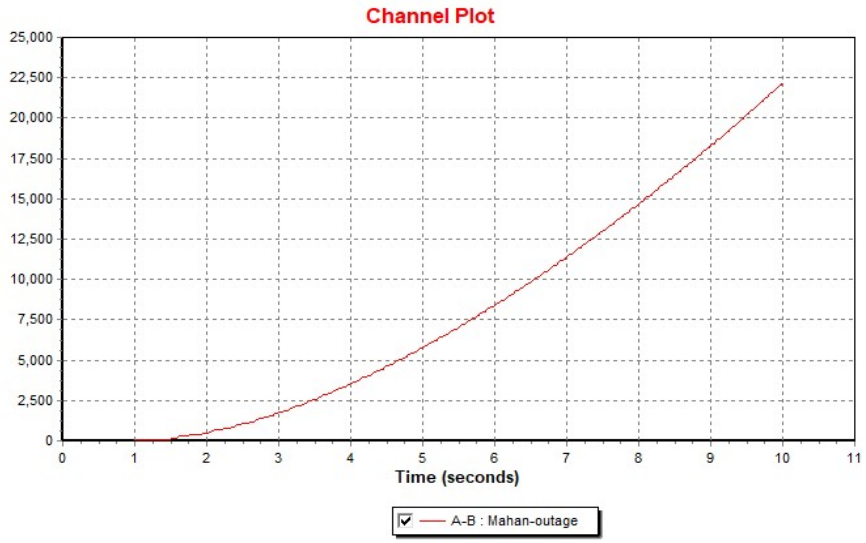
Load Flow / Stability Results

Case	Load Flow (in MW)			Stability	Short Circuit	Remarks
	Mahan TPS – WR Pool 400kV D/c	Mahan TPS – Vindhyachal 400kV S/c	Mahan TPS – Korba STPS 400kV S/c	Stable / Unstable	Fault level in kA	2 x 540MW dispatch set in all cases
Existing	2x533	-	-	**Unstable** under N-1 outage of long Mahan – WR Pool line	3 Ph: 35 LG: 38	Dynamic Instability

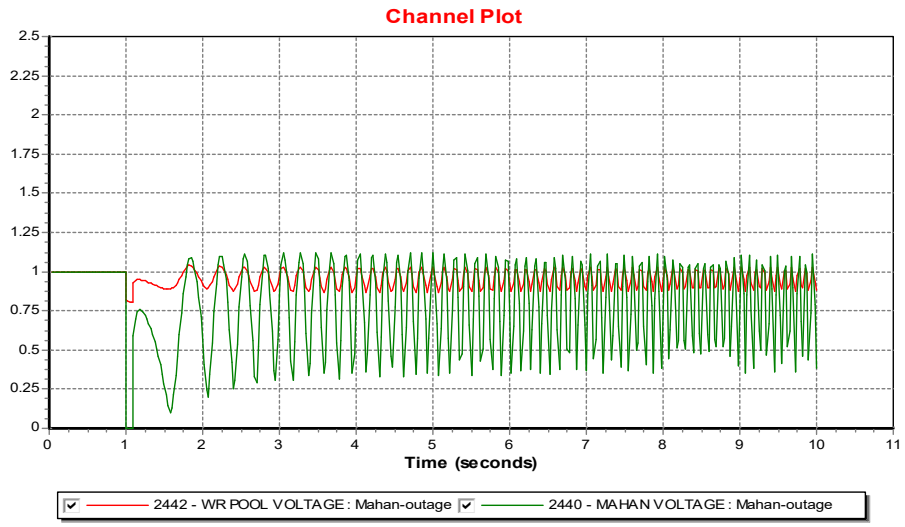
Load Flow Study Result

3 PH SC Study Result

ANGLE PLOT OF ESSAR MAHAN TPS

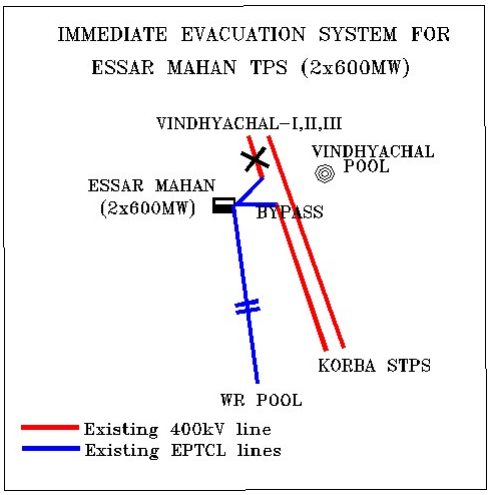


VOLTAGE PLOT OF ESSAR MAHAN TPS & WR POOL



Case-3: With Mahan – Vindhyachal line open

- With Essar Mahan TPS – WR Pooling Station 400kV D/c (triple) line + LILO of one circuit of Vindhyachal – Korba STPP 400kV D/c line at Mahan TPS **with Mahan – Vindhyachal line open**



Load Flow / Stability Results

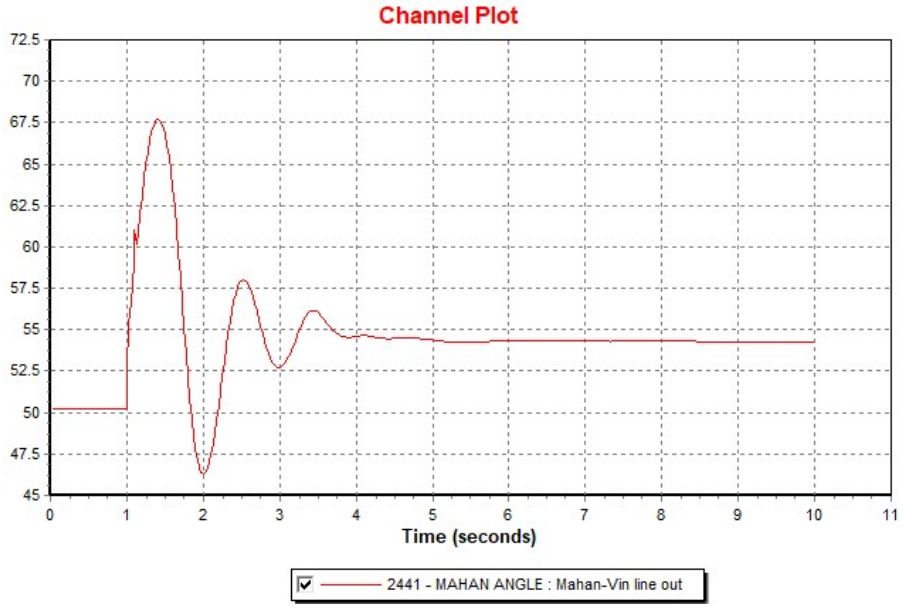
Case	Load Flow (in MW)			Stability	Short Circuit	Remarks
	Mahan TPS – WR Pool 400kV D/c	Mahan TPS – Vindhyachal 400kV S/c	Mahan TPS – Korba STPS 400kV S/c	Stable / Unstable	Fault level in kA	2 x 540MW dispatch set in all cases
Existing	2x289	OPEN	488	**Stable** under N-1 outage of long Mahan – WR Pool line	3 Ph: 33 LG: 36	*No issues in power flow as well as stability are observed*

Provision of 12 ohm series reactor on MahanTPS-Vindyachal 400kV S/C line instead of opening the same results in higher 3ph & LG SC levels as: 3ph -39kA & LG- 42kA

Load Flow Study Result

3 PH SC Study Result

ANGLE PLOT OF ESSAR MAHAN TPS



VOLTAGE PLOT OF ESSAR MAHAN TPS & WR POOL