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भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली योजना एवं मूल्यांकन-I प्रभाग
Power System Planning & Appraisal-I Division

सेवा में / To

-As per enclosed list-

विषय: "ट्रांसमिशन पर राष्ट्रीय समिति" (एनसीटी) की 5th बैठक - मिटिंग नोटिस

Subject: Meeting Notice and Agenda for 5th Meeting of "National Committee on Transmission" (NCT)

महोदय / Sir,

The 5th meeting of the "National Committee on Transmission" (NCT) is scheduled to be held on at on **25.08.2021 (Wednesday) at 3.00 PM** under the Chairmanship of Chairperson, CEA & Chairman, NCT, through Video Conferencing (Microsoft Teams). The agenda for the meeting is enclosed herewith. The link to join the meeting would be intimated in due course.

Kindly make it convenient to attend the meeting.

भवदीय,

(ईशान शरण/ Ishan Sharan)

मुख्य अभियन्ता एवं सदस्य सचिव/
Chief Engineer & Member Secretary (NCT)

Copy to:

- (i) Joint Secretary (Trans), Ministry of Power, Shram Shakti Bhawan, New Delhi-110001.

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List of addressees:

1.	Chairperson, Central Electricity Authority Sewa Bhawan, R.K. Puram, New Delhi – 110 066.	2.	Member (Power System), Central Electricity Authority Sewa Bhawan, R.K. Puram, New Delhi – 110 066.
3.	Member (E & C), Central Electricity Authority Sewa Bhawan, R.K. Puram, New Delhi – 110 066.	4.	Director (Trans), Ministry of Power Shram Shakti Bhawan, New Delhi-110001.
5.	Sh. Dilip Nigam, Scientist ‘G’, MNRE, Block no. 14, CGO Complex, Lodhi Road, New Delhi – 110003	6.	CMD (POSOCO), B-9, Qutub, Institutional Area, Katwaria Sarai, New Delhi
7.	Sh. Rajnath Ram, Adviser (Energy), NITI Aayog, Parliament Street, New Delhi – 110 001.	8.	Chief Operating Officer, CTUIL, Sudamini, Plot No. 2, Sector-29, Gurgaon – 122 001.
9.	Dr. Radheshyam Saha, Ex. Chief Engineer, Central Electricity Authority	10	Shri Sushanta Kumar Ray Mohapatra, Ex. Chief Engineer, Central Electricity Authority

Agenda of the 5th meeting of National Committee on Transmission (NCT)

1. Confirmation of the minutes of the 4th NCT meeting held on 20.01.2021 and 28.01.2021.

1.1. The two sittings of the 4th meeting of the "National Committee on Transmission" (NCT) were held on 20.01.2021 and 28.01.2021. Subsequently, the minutes of the meeting were issued vide CEA letter No. File No. CEA-PS-11-15(11)/1/2020-PSPA-I Division dated 22.03.2021.

1.2. CTUIL vide email dated 26 .03.2021 had conveyed the following observation on the Minutes of the Meeting:

In the minutes of the 4th NCT meeting under para 7.2.1, 5 nos. 400 kV bays were proposed to be implemented for RE generators at Bhadla-II PS (3 nos), Fatehgarh-II (1 no.), & Fatehgarh-III (1 no) (erstwhile Ramgarh-II) PS under ISTS. However, the same has been recorded as 6 nos. 400 kV bays [Bhadla-II PS (3 nos), Fatehgarh-II (2 no.) & Fatehgarh-III (1 no)] under the concluding para 7.2.11.

CTU has requested for issuing corrigendum to the minutes of the meeting.

1.3. Accordingly, minutes of the meeting may please be confirmed.

2. Amendments in the Terms of Reference of the National Committee on Transmission vide MoP OM dated 20.05.2021.

2.1. MoP vide OM no. 15/03/2017 (Trans) dated 04.11.2019 had constituted the National Committee on Transmission (attached as Annexure IA). MoP vide its OM no 15/03/2018-Trans Pt(5) dated 20/05/2021 (attached as Annexure IB) has issued the following amendments in the Terms of Reference and constitution of the NCT:

“

a) *CMD, POSOCO will be a member of NCT*

b) *The following functions would be added to the Terms of Reference of NCT:*

(i) *To formulate the packages for the Transmission Schemes for their implementation and to recommend their mode of implementation i.e. Tariff Based Competitive Bidding (TBCB)/Regulated Tariff Mechanism (RTM), as per the existing Tariff Policy, to Ministry of Power*

(ii) *To examine the cost of the Transmission Schemes*

(iii) *To allocate the task of carrying out survey amongst CTU, RECTPCL and PFCCCL by maintaining a roster.*

Further, NCT while considering the Transmission Planning shall also keep in mind the following aspects:

(i) *Regional Power Committees (Transmission Planning) cannot decide on transfers across region.*

(ii) *Growth of Renewable Energy, being the national Mission, areas with high RE potential needs to be identified and connected to bulk power evacuation systems.*

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”

- 2.2. Subsequent to the issuance of the aforesaid amendments, in order to facilitate NCT in achieving the task of “*Examination of Cost of the Transmission Schemes*”, Member (Power System), CEA vide letter no CEA-PS-11-16(11)/1/2018 PSPA-I/I/15799 dated 02/06/2021 (attached as Annexure IC) formulated the Cost Committee with the approval of Chairperson, CEA, and Chairman of the NCT. The composition of this Cost Committee is as follows:

1.	Chief Engineer (PSPA-I), CEA	Chairman
2.	Director (PSPA-I), CEA	Member & Convener
3.	Director (PSETD), CEA	Member
4.	Director (F&CA), CEA	Member
5.	Representative from CTUIL	Member
7.	Representative from Cost Engg. Dept, PGCIL	Member
8.	Representative from PFCCL	Member
9.	Representative from RECDPCL	Member
10.	Chief Engineer from STU/SEB/Electricity Department of concerned State in which transmission scheme lies	Member

- 2.3. Further, CEA vide letter dated 09/06/2021 sought the nominations of members as listed in the composition to convene the meeting of the Cost Committee for estimation of cost of the Transmission Schemes whose bid submission are due in August’ 2021 (The nominations received are enclosed as Annexure ID). The first meeting of this Cost Committee was held on 22.07.2021 wherein cost estimation of two schemes were done based on the Cost Matrix of March’2020 Price Level provided by POWERGRID alongwith inputs from other members.

- 2.4. In compliance of the amendments issued by MoP, the Agenda for this NCT incorporates the tentative packages formulated for the Transmission Schemes approved in the Regional Power Committees (Transmission Planning) alongwith the estimated Cost of the packages. For estimating the cost of the transmission schemes, PGCIL’s cost matrix of March’2020 Price Level has been referred. Approximate line lengths have been considered as the exact length shall be obtained after the detailed survey.

- 2.5. NCT may deliberate on the amendments made in the ToR of the NCT and suggest the way forward to be adopted for examining the cost of the Transmission Schemes.

3. Status of earlier schemes recommended by NCT.

A. Status of schemes recommended in the 4th NCT meeting

Sl. No	Name of the Transmission Scheme	MoP Approval	BPC
1	Transmission system for evacuation of power from RE projects in Rajgarh (1500 MW) SEZ in Madhya Pradesh: Phase-I	MoP Gazette Notification dated 19.07.2021	RECPDCL
2	Transmission system for	Referred back to NCT. NCT	

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Sl. No	Name of the Transmission Scheme	MoP Approval	BPC
	evacuation of power from RE projects in Rajgarh (1000 MW) SEZ in Madhya Pradesh: Phase- II	to recommend the same to MoP as and when there is certainty of RE generation.	
3	Transmission Scheme for Solar Energy Zone in Gadag (1000 MW), Karnataka: Phase-I.	MoP Gazette Notification dated 19.07.2021	RECPDCL
4	Transmission Scheme for Solar Energy Zone in Gadag (1500 MW), Karnataka: Phase-II	Referred back to NCT. NCT to recommend the same to MoP as and when there is certainty of RE generation.	
5	Transmission Scheme for Evacuation of power from RE sources in Karur/Tirrupur Wind Energy Zone (Tamil Nadu) (1000 MW)- Phase I	MoP Gazette Notification dated 19.07.2021	PFCCCL
6	Transmission Scheme for Evacuation of power from RE sources in Karur/Tirrupur Wind Energy Zone (Tamil Nadu) (1500 MW): Phase II	Referred back to NCT. NCT to recommend the same to MoP as and when there is certainty of RE generation.	
7	Transmission system for evacuation of power from Chhatarpur SEZ (1500 MW	MoP Gazette Notification dated 19-07.2021	PFCCCL
8	ICT Augmentation at 2x315 MVA, 400/220 kV Shujalpur (PG) substation	MoP OM No.15/3/2018-Trans - Part(1) dated 16.07. 2021	RTM (PGCIL)
9	Transmission scheme for providing connectivity and LTA to M/s SBESS for its 325 MW Wind Project in Dhar, Madhya Pradesh to be implemented under ISTS	MoP OM dated 13.04.2021	RTM (PGCIL)
10	Implementation of 400kV bays for RE generators at Bhadla-II PS, Fatehgarh-II.	MoP OM No.15/3/2018-Trans - Part(1) dated 16.07. 2021	RTM (PGCIL)
11	Implementation of 400kV bay for RE generators at Fatehgarh-III (erstwhile Ramgarh-II) PS	MoP OM No.15/3/2018-Trans - Part(1) dated 16.07. 2021	RTM (Powergrid Ramgarh Trans. Ltd., subsidiary of PGCIL)
12	Implementation of 220 kV bay at Shahjahanpur 400/220 substation (PGCIL)	MoP OM No.15/3/2018-Trans - Part(1) dated 16.07. 2021	RTM (PGCIL)
13	Implementation of 1x80 MVAR, 765kV Spare Reactor at Bhadla-II	MoP OM No.15/3/2018-Trans - Part(1) dated	RTM (PGCIL)

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Sl. No	Name of the Transmission Scheme	MoP Approval	BPC
	S/s	16.07. 2021	
14	Implementation of the 1x500 MVA, 400/220kV ICT (8th) at Bhadla Pooling Station	MoP OM No.15/3/2018-Trans - Part(1) dated 16.07. 2021	RTM (PGCIL)
15	Regional System Strengthening scheme to mitigate the overloading of 400 kV NP Kunta-Kolar S/C line	MoP OM No.15/3/2018-Trans - Part(1) dated 16.07. 2021	RTM (PGCIL)
16	Augmentation of transformation capacity at existing Hiriyur and Kochi S/stns	MoP OM No.15/3/2018-Trans - Part(1) dated 16.07. 2021	RTM (PGCIL)
17	Restoring of one circuit of Kudankulam – Tuticorin PS 400 kV (quad) D/c line at Tirunelveli to control loadings/un-balancing on Kudankulam – Tirunelveli 400 kV (quad) lines.	MoP OM No.15/3/2018-Trans - Part(1) dated 16.07. 2021	RTM (PGCIL)
18	Implementation of 1 no. of 230 kV bay at Tuticorin-II GIS PS	MoP OM No.15/3/2018-Trans - Part(1) dated 16.07. 2021	RTM (PGCIL)
19	Transmission system for connectivity to Teesta-IV HEP (520 MW)	Referred back to NCT. The project is likely to be commissioned in 2026-27. NCT to send its recommendation to MoP at appropriate time to avoid creation of stranded asset.	
20	System Strengthening Scheme for Eastern and North Eastern Regions: A: Eastern Region Strengthening Scheme-XXV (ERSS-XXV) B. North Eastern Region Strengthening Scheme-XV (NERSS-XV)	MoP Gazette Notification dated 19-07.2021.	RECPDCL
21	Transmission system for evacuation of power from Pakaldul HEP in Chenab Valley HEPs -Connectivity System Scheme already notified vide Gazette of India dated 25.09.2020.	MoP Gazette Notification dated 19-07.2021 modified the scope of transmission scheme.	PFCCCL

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Sl. No	Name of the Transmission Scheme	MoP Approval	BPC
22	Transmission system for evacuation of power from RE projects in Osmanabad area (1 GW) in Maharashtra Scheme already notified vide Gazette notification dated 24.01.2020.	MoP Gazette Notification dated 19-07.2021 modified the scope of transmission scheme.	RECTPCL
23	Transmission scheme for evacuation of 3 GW RE injection at Khavda P.S. under Phase-I Scheme already notified vide Gazette Notification dated 25.09.2020.	MoP Gazette Notification dated 19-07.2021 modified the scope of transmission scheme.	PFCCCL
24	Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under PhaseII- Part F Scheme already notified vide Gazette notification dated 24.01.2020.	MoP Gazette Notification dated 19-07.2021 modified the scope of transmission scheme.	PFCCCL
25	Reconductoring of ISTS lines of POWERGRID. Already notified vide MoP OM dated 25.09.2020.	MoP OM No.15/3/2018-Trans – Part (1) dated 16.07.2021 modified the scope of transmission scheme	RTM (PGCIL)

B. Bidding status of other transmission schemes recommended by NCT.

Summary of number of projects presently under bidding by BPCs

Sl. No.	BPC	No. of projects under bidding	Bidding on hold	Bidding yet to start	Total
1	RECPDCL	3	1	6	10
2	PFCCCL	5	3	1	9

As per the details furnished by BPC's (PFCCCL & RECPDCL), the current status of transmission schemes which are under bidding is attached as Annexure-II.

4. Evaluation of the functioning of the National Grid on quarterly basis.

POSOCO to present.

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5. New Transmission schemes recommended by RPC(TP)

(i) Based on recommendations of NCT, transmission schemes are notified in the Gazette/ allotted by MoP for implementation through TBCB/ RTM route. However, some transmission schemes have been put on hold after MoP order/Gazette notification. This has been due to various reasons like non-receipt of LTA and adequate land not being available for setting up RE generation projects.

MoP is of the view that once the project is notified/allotted by MoP, the project should not be kept on hold.

To avoid such situation NCT may also assess the likely implementation schedule of transmission schemes based on inputs from MNRE/ SECI/CTUIL/POSOCO etc., before recommending the same to MoP.

(ii) Further, MoP vide letter dated 02.08.2021, has directed to explore different options for maximizing transmission capacity utilization including BESS. Update from MNRE/SECI would be required regarding BESS planned in different RE potential areas in order to optimize the transmission system.

Members may suggest the way forward and deliberate on the new schemes keeping in view the above observations of MoP.

A. Schemes agreed in Western Regional Power Committee (Transmission Planning)**5.1. Transmission system for evacuation of power from Neemuch SEZ (1000 MW):**

5.1.1. MNRE vide letter dated 15.04.2020 inter-alia granted approval for 1000 MW RE potential zones at Neemuch (500 MW RfP already issued by MP in Singoli tehsil). In 3rd meeting of WRPC(TP), the following scheme was agreed for evacuation of power from Neemuch SEZ (1000 MW):

A. Transmission system for providing connectivity and LTA.

- (i) Establishment of 2x500 MVA, 400/220 kV Pooling Station at Neemuch with 1x125 MVAr Bus Reactor
- (ii) Neemuch PS – Chhittorgarh (PG) S/s 400 kV D/C line (conductor with minimum capacity of 2100 MVA/Ckt at nominal voltage).

B. Transmission system strengthening in matching timeframe of Neemuch SEZ.

- (i) Neemuch PS- Mandsaur S/stn 400 kV D/c line (conductor with minimum capacity of 2100 MVA/Ckt at nominal voltage).

Transmission system for evacuation of power from Neemuch SEZ

Sl. No	Scope of the Transmission Scheme	Capacity /km
1	Establishment of 2x500 MVA, 400/220 kV Pooling Station at Neemuch with 1x125 MVAr Bus Reactor Future provisions: Space for 400/220 kV ICTs along with bays: 2 nos.	400/220 kV, 500 MVA ICT –2 nos. 400 kV ICT bays – 2 nos. 220 kV ICT bays – 2 nos. 400 kV line bays –4 (2 each for Chittorgarh & Mandsaur lines)

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Sl. No	Scope of the Transmission Scheme	Capacity /km
	400 kV line bays: 6 nos. 220 kV line bays: 5 nos. 420kV bus reactor along with bays:	220 kV line bays – <i>As per connectivity granted to RE developer. (2 no. of bays considered at present corresponding to 500 MW)</i> 125 MVA, 420 kV reactor-1 no. 420 kV reactor bay – 1 no.
2	Neemuch PS – Chhittorgarh (PG) S/s 400 kV D/C line (conductor with minimum capacity of 2100 MVA/Ckt at nominal voltage)	Length ~ 130 km
3	2 nos. of 400 kV line bays at Chhittorgarh (PG) 400 kV S/s for Neemuch PS – Chhittorgarh (PG) S/s 400 kV D/C line (conductor with minimum capacity of 2100 MVA/Ckt at nominal voltage)	400 kV line bays – 2 nos. at Chhittorgarh (PG) end
4	Neemuch PS- Mandsaur S/stn 400 kV D/c line (conductor with minimum capacity of 2100 MVA/Ckt at nominal voltage)	Length ~120 km
5	2 no. of 400 kV line bays at Mandsaur 400 kV S/s for Neemuch PS- Mandsaur S/stn 400 kV D/c line (conductor with minimum capacity of 2100 MVA/Ckt at nominal voltage)	400 kV line bays – 2 nos. at Neemuch End
Approximate cost		Rs. 547 Crs

Note:

- (i) Powergrid to provide space for 2 no. of 400 kV line bays at Chhittorgarh (PG) 400 kV S/s for termination of Neemuch PS – Chhittorgarh (PG) 400 kV D/c line.
- (ii) MPPTCL to provide space for 2 no. of 400 kV line bays at Mandsaur 400 kV S/s for termination of Neemuch PS – Mandsaur 400 kV D/c line.

5.1.2. Members may deliberate.

5.2. Transmission scheme for evacuation of power from Dholera UMSP:

5.2.1. In the 2nd meeting of WRPC(TP) held on 04.09.2020, GETCO had requested to review the Transmission system for evacuation of power from Dholera UMSP (Phase I – 2GW) that had been already approved in the 1st meeting of WRPC (TP) held on 11.01.2020. GETCO had informed that 1 GW capacity out of the 5 GW Dholera UMSP being developed by GPCL has already been awarded. With award of this 1 GW capacity, it appears that the entire potential of 5 GW Dholera UMSP would materialise in near future. GETCO requested to plan a 765/400 kV pooling station at Dholera along with 765 kV outlet upto planned Ahmedabad S/stn. This would result in an optimal system to cater to the total evacuation requirement of 4 GW under ISTS, which is being developed in two phases with 2 GW in each phase.

5.2.2. Subsequently, following system was agreed in 3rd meeting of WRPC(TP) for evacuation of power from Dholera UMSP:

Transmission system for evacuation of power from Dholera UMSP (2 GW in Phase-I):

- (i) Establishment of 3x1500 MVA, 765/400 kV Dholera Pooling Station with 1x330 MVA, 765 kV bus reactor & 1x125 MVA 400 kV bus reactor.

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- (ii) Dholera PS – Vataman switching station 765 kV D/C line – 40 km.
- (iii) 400 kV line bays for termination of lines from solar park.

The above system would be adequate for evacuation of additional 2 GW (of Phase-II) from Dholera Solar Park. Additional transmission system strengthening, if any, would be planned after firming up of time-frame of implementation of Dholera UMSP.

Transmission system for evacuation of power from Dholera UMSP (2 GW) Phase-I:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1	Establishment of 3x1500 MVA, 765/400 kV Dholera Pooling Station (GIS) with 1x330 MVA _r , 765 kV bus reactor & 1x125 MVA _r 400 kV bus reactor. Future provisions: Space for 765/400 kV ICTs along with bays: 3 nos. 765 kV line bays: 4 nos. 400 kV line bays: 6 nos. 400/220 kV ICT's- 4 nos. 220 kV line bays- 9 nos.	1500 MVA, 765/400 kV ICT- 3 nos. (10x500) 765 kV ICT bays – 3 nos. 400 kV ICT bays – 3 nos. 765 kV line bays – 2 400 kV line bays – 3. Further bays to be considered as <i>per connectivity granted to RE developer</i> . 1x330 MVA _r , 765 kV bus reactor-1 (4x110) 765 kV reactor bay – 1 1x125 MVA _r 400 kV bus reactor-1 400 kV reactor bay – 1
2	Dholera PS – Vataman switching station 765 kV D/C line.	Length- 40 km
3	2 no. of 765 kV line bays at Vataman switching station for Dholera PS – Vataman switching station 765 kV D/C line	765 kV line bays – 2 nos. at Vataman end
Approximate cost		Rs. 747 Crs

Note:

- (i) Developer of Vataman switching station to provide space for 2 no. of 765 kV line bays at Vataman switching station for termination of Dholera PS – Vataman switching station 765 kV D/C line.
- (ii) Scheme implementation to be taken up after grant of LTA to RE developers.

5.2.3. Clarity regarding the implementation time frame of RE generators at Dholera (both Phase I: 2GW & Phase II: 2 GW) is not there at present. In case of time gap between the two phases, phasing of the scheme would be required.

5.2.4. Members may deliberate.

5.3. System Strengthening in Gujarat associated with integration of RE projects from Khavda potential REZ:

5.3.1. In the 1st meeting of WRPC (TP) held on 11.01.2020, evacuation system for 10 GW of RE power from Khavda RE park was planned. In the meeting, it was also agreed that appropriate ISTS network strengthening as a part of RE integration needs to be planned at later stage matching with actual RE growth. Accordingly, deliberations were held in 2nd and 3rd WRPC (TP) meeting regarding issue of high loading on several Intra-state and ISTS transmission lines in Gujarat with integration of 16 GW RE capacity (10.5 GW at Khavda, 2 GW at Lakadia, 2 GW at Bhuj-II and 1.5 GW at Jam Khambaliya) in Gujarat. In the 3rd meeting of WRPC(TP) held on 14.06.2021, following transmission system was agreed for System Strengthening in Gujarat associated with integration of RE projects from Khavda potential REZ:

- (i) Banaskantha – Ahmedabad 765 kV D/c line (~200 km length) with 330 MVar, 765 kV Switchable line reactor on each ckt at Ahmedabad S/s end.
- (ii) Establishment of 2x1500 MVA, 765/400 kV & 2x500 MVA, 400/220 kV Kosamba S/s with 2x330 MVar 765 kV and 1x125 MVar 400 kV Bus reactor. [with 110MVar & 80 MVar, 765 kV single phase reactor units (spare units for bus/line reactor) and 1x500 MVA, 765/400 kV single phase spare transformer].
- (iii) Kosamba - Kala (GIS) 400 kV D/c line (conductor with minimum capacity of 2100 MVA/Ckt at nominal voltage) (~180 km length) with 50 MVar switchable line reactors on each ckt at both ends.
- (iv) Kosamba – Magarwada (GIS) 400 kV D/c line (conductor with minimum capacity of 2100 MVA/Ckt at nominal voltage) (~140 km length) with 63 MVar switchable line reactors on each ckt at Magarwada end.
- (v) Kosamba – Padghe (GIS) 765 kV D/c line (~270-280 km length) with 330 MVar, 765 kV Switchable line reactor on each ckt at Kosamba S/s end and 240 MVar, 765 kV Switchable line reactor on each ckt at Padghe (GIS) S/s end.
- (vi) Augmentation of transformation capacity at Padghe (GIS) 765/400 kV substation by 1x1500 MVA ICT.
- (vii) Augmentation of transformation capacity at Banaskantha 765/400 kV S/ s by 1x1500 MVA ICT.
- (viii) Banaskantha – Sankhari 400 kV 2nd D/c line.

Note:

- *As Kala and Magarwada are located close to each other, majority of common stretch of Kosamba – Kala and Kosamba – Magarwada 400 kV D/ c line may be constructed using Multi-circuit towers in order to save RoW and hence both the 400 kV lines may be kept part of the same package.*
- *Implementation of item no. (vii) & (viii) to be done in matching time frame of establishment of Prantij 400/220 kV and Sankhari- Prantij 400 kV D/C line by GETCO.*
- *Implementation of 4 nos. of 220 kV outlets from Kosamba 765/400/220 kV s/s to be implemented by GETCO in matching time frame of Kosamba 765/400/220 kV substation (with 4 nos. 220 kV line bays for 220 kV outlets)*
- *The above scheme needs to be implemented in the matching time frame of Transmission scheme for evacuation of 8 GW RE power from Khavda RE park (Phase-A).*

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5.3.2. For implementation purpose the above transmission system is proposed to be implemented through following transmission schemes:

Sl. No.	Transmission scheme	Estimated cost (Rs. Crs.)
1.	System Strengthening in Gujarat associated with integration of RE projects from Khavda potential REZ- Part A	2294
2.	System Strengthening in Gujarat associated with integration of RE projects from Khavda potential REZ- Part B	1283
3.	System Strengthening in Gujarat associated with integration of RE projects from Khavda potential REZ- Part C	78
4.	System Strengthening in Gujarat associated with integration of RE projects from Khavda potential REZ- Part D	94
5.	System Strengthening in Gujarat associated with integration of RE projects from Khavda potential REZ- Part E	70

The detailed scope under the above scheme is enclosed as Annexure-III.

5.3.3. Members may deliberate.

5.4. Modification in the already agreed Transmission system for evacuation of 8 GW RE from Khavda RE park

5.4.1. With Govt. of Gujarat decision to allocate land to RE projects beyond SECI IV wind ISTS bids in Khavda area, the transmission system for evacuation of 10 GW solar capacity from potential REZs identified in Western Region was reviewed and new scheme was evolved with pooling station in Khavda Region. NCT in its 3rd meeting approved the Transmission Scheme for evacuation of 8 GW RE power from potential RE zones in Khavda region to be implemented in two phases i.e Phase I catering to evacuation of 3 GW and Phase-II for evacuation of 4.5 GW RE injection at Khavda. Accordingly, MoP vide Gazette Notification dated 23.09.2020 notified the following transmission packages for the transmission scheme approved by NCT for implementation through TBCB route:

Sl.No.	Name of Transmission scheme	Broad Scope
1.	Transmission scheme for evacuation of 3 GW RE injection at Khavda P.S. under Phase-I	<ul style="list-style-type: none"> Establishment of Khavda pooling station (GIS), 3x1500 MVA 765/400 kV and 2x500 MVA 400/220 kV. Khavda PS (GIS) – Bhuj PS 765 kV D/c line.
2.	Transmission scheme for evacuation of 4.5 GW RE injection at Khavda P.S. under Phase-II – Part A	<ul style="list-style-type: none"> Augmentation of Khavda PS by 4x1500 MVA, 765/400 kV and 2x500 MVA, 400/220 kV. Khavda PS (GIS) – Lakadia PS 765 kV D/c line
3.	Transmission scheme for evacuation of 4.5 GW RE injection at Khavda P.S. under	<ul style="list-style-type: none"> Lakadia PS – Ahmedabad 765 kV D/c line

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Sl.No.	Name of Transmission scheme	Broad Scope
	Phase-II – Part B	
4.	Transmission scheme for evacuation of 4.5 GW RE injection at Khavda P.S. under Phase-II – Part C	<ul style="list-style-type: none"> Establishment of 2x1500 MVA, 765/400 kV Ahmedabad substation. Ahmedabad – Vadodara 765 kV D/c line
5.	Transmission scheme for evacuation of 4.5 GW RE injection at Khavda P.S. under Phase-II – Part D	<ul style="list-style-type: none"> LILO of Pirana (PG) – Pirana (T) 400 kV D/c line at Ahmedabad S/s
6.	Transmission scheme for evacuation of 4.5 GW RE injection at Khavda P.S. under Phase-II – Part E	<ul style="list-style-type: none"> Ahmedabad – Indore 765 kV D/c line

5.4.2. Status of the bidding of the aforesaid schemes notified by MoP: Transmission scheme for evacuation of 3 GW RE injection at Khavda PS under Phase-I is currently under bidding and bidding for the balance five schemes would be taken up on receipt of LTA beyond 3 GW from RE developers in Khavda RE park.

5.4.3. Subsequent Development: Govt. of Gujarat has allocated approx. 50,000 acres of land to a mix of private and public sector project developers for development of renewable energy projects in the Renewable Energy Park at Khavda for evacuation of appx 30 GW RE from Khavda. As per layout of Khavda RE park as finalized by GPCL, pooling of RE power from all the RE park developers at one pooling station is not feasible and GPCL identified the location of three ISTS Pooling stations in Khavda RE park to pool RE power for further evacuation.

5.4.4. In view of above developments, WRPC(TP) in its 3rd meeting approved the Transmission scheme for evacuation of 15 GW RE power from Khavda RE Park (expected to come up by 2024-25) which interalia involves modification in some of the packages that have already been notified by MoP vide Gazette notification dated 23.09.2020 for Transmission scheme for evacuation of 4.5 GW RE injection at Khavda P.S. under Phase-II.

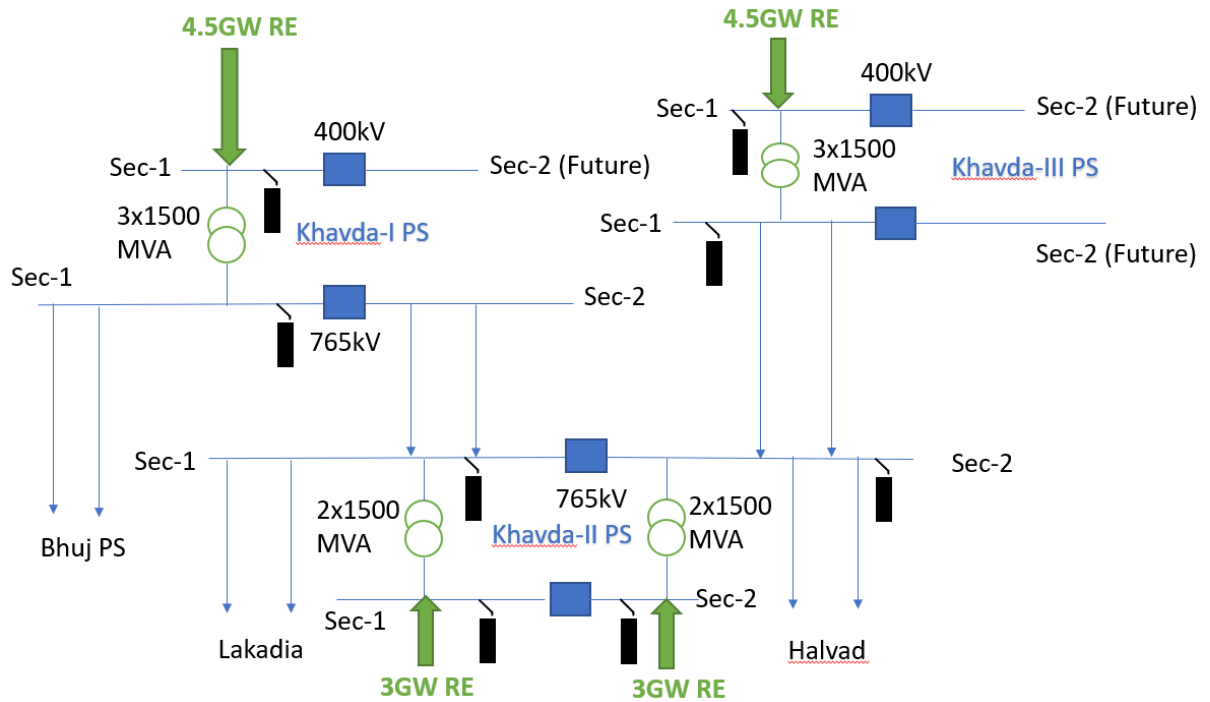
5.4.5. The following modifications have been approved in the 3rd meeting of WRPC(TP) in respect of “Transmission scheme for evacuation of 4.5 GW RE injection at Khavda P.S. under Phase-II”

- Establishment of 3 nos. of pooling stations namely, Khavda pooling station 1 (KPS1), Khavda pooling station 2 (KPS2) and Khavda pooling station 3 (KPS3) instead of single Khavda pooling station.

Establishment of pooling stations to be taken up only after receipt of LTA applications from RE developers. The evacuation of RE power upto 3 GW (total of LTA granted at KPS1, KPS2 and KPS3) from Khavda RE park would take place through KPS1- Bhuj 765 kV D/C line. On receipt of LTA at KPS2, KPS2 would be

established through LILO of one ckt of KPS1-Bhuj 765 kV D/C line at KPS2. On receipt of LTA at KPS3, KPS3 would be established along with KPS3 - KPS2 765 kV D/C line.

Khavda PS- I, II & III Schematic Diagram



There is no change in the scope of works at Khavda pooling station 1 (KPS1) (erstwhile Khavda pooling station). The detailed scope of the other two pooling stations namely, Khavda pooling station 2 (KPS2) and Khavda pooling station 3 (KPS3) is enclosed at Annexure-IV

- ii) Splitting of Transmission scheme for evacuation of 4.5 GW RE injection at Khavda P.S. under Phase-II – Part A into two parts and modification in the Transmission scheme for evacuation of 4.5 GW RE injection at Khavda P.S. under Phase-II – Part C.

Sl. No.	Earlier Notified Transmission Scheme	Scope of works of earlier notified Transmission scheme	Modified Transmission Scheme approved in 3 rd meeting of WRPC (TP)
1.	Transmission scheme for evacuation of 4.5 GW RE injection at Khavda PS under Phase-II Part A	<ul style="list-style-type: none"> Augmentation of Khavda PS by 4x1500 MVA, 765/400 kV and 2x500 MVA, 400/220 kV Khavda PS (GIS) – Lakadia PS 765 kV D/c line 	Scheme split into two parts: Part –I : Transmission Scheme for evacuation of 4.5 GW RE injection at Khavda P.S. under Phase-II Part A: <ul style="list-style-type: none"> KPS2 (GIS) – Lakadia 765 kV D/C line with 330 MVA_r switchable line

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Sl. No.	Earlier Notified Transmission Scheme	Scope of works of earlier notified Transmission scheme	Modified Transmission Scheme approved in 3 rd meeting of WRPC (TP)
			<p>reactor at Khavda end.</p> <ul style="list-style-type: none"> • 2 nos. of 765 kV line bays each at Lakadia PS & KPS2 (GIS) for Khavda PS2 (GIS) – Lakadia PS 765 kV D/c line <p>Part-II: Transmission scheme for injection beyond 3GW RE power at Khavda PS1:</p> <p>a) Augmentation of Khavda PS1 Augmentation of Khavda PS1 by 765/400 kV transformation capacity * (max. upto 4x1500 MVA) with 1x330 MVAR 765 kV bus reactor and 1x125 MVAR 420 kV bus reactor on 2nd 765 kV and 400 kV bus respectively</p> <p>b) KPS1-Khavda PS GIS (KPS2) 765 kV D/C line (to be established with bypassing of LILO of one ckt. of KPS1-Bhuj at KPS2 and utilisation of LILO section)</p> <p><i>* Actual no. of ICTs may be decided based on LTA requirement.</i></p>
2.	Transmission scheme for evacuation of 4.5 GW RE injection at Khavda P.S. under Phase-II – Part C	<p>Establishment of 2x1500 MVA, 765/400 kV, Ahmedabad S/s with 1x330 MVAR 765 kV bus reactor and 1x125 MVAR 420 kV bus reactor.</p> <p>Ahmedabad – Vadodara 765 kV D/c line</p> <p>2 nos. of 765 kV line</p>	<p>Establishment of 3x1500 MVA, 765/400 kV Ahmedabad S/s with 1x330 MVAR 765 kV bus reactor and 1x125 MVAR 420 kV bus reactor</p> <p>Ahmedabad – Kosamba 765 kV D/c line with 240 MVAR switchable line reactor at both ends (~line length 220 km)</p> <p>To be deleted</p>

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Sl. No.	Earlier Notified Transmission Scheme	Scope of works of earlier notified Transmission scheme	Modified Transmission Scheme approved in 3 rd meeting of WRPC (TP)
		bays each at Vadodara for Ahmedabad – Vadodara 765kV D/c line	

(iii) No change is envisaged in the Part B, Part D of the earlier notified scheme.

(iv) **Review of Part E of the scheme (Ahmedabad- Indore 765 kV D/c line):** Part E of the scheme would be reviewed subsequently while planning for evacuation beyond 15 GW RE power at Khavda, considering the storage capacity planned at Khavda. Hence, implementation of the same may be deferred at present and its requirement would be reviewed subsequently based on storage capacity planned at Khavda.

The detailed scope of the above scheme is enclosed at Annexure-V.

NCT may deliberate and approve the modification in the scope.

5.5. Transmission system for evacuation of additional 7 GW RE power from Khavda RE park Phase-B:

5.5.1. In the 3rd meeting of WRPC(TP) held on 14.06.2021, the following transmission system was agreed for evacuation of additional 7 GW RE power from Khavda RE park:

Transmission system for evacuation of additional 7 GW RE power from Khavda RE park: Phase-B

- (i) Establishment of 765 kV Halvad switching station with 765 kV, 2x330 MVAR bus reactors (with 110 MVAR & 80 MVAR 765kV single phase reactor (spare unit for bus/line reactors at Halvad)
- (ii) KPS2- Halvad 765 kV D/c line (~220 km length) with 240 MVAR switchable line reactor at both ends and 80 MVAR single phase spare reactor unit at KPS2 end.
- (iii) LILO of Lakadia – Ahmedabad 765 kV D/c line at Halvad (LILO length~50 km)
- (iv) 240 MVAR 765 kV switchable line reactor on each ckt at Halvad end of Halvad – Ahmedabad 765 kV D/c line (~220 km length)
- (v) Halvad – Vataman 765 kV D/c line (~170 km length) with 1x330 MVAR switchable line reactor at Vatman end on each ckt.
- (vi) Establishment of 765 kV switching station near Vataman with 2x330 MVAR, 765 kV bus reactor (with 110 MVAR 765 kV single phase reactor (spare unit for bus/line reactor)
- (vii) LILO of Lakadia – Vadodara 765 kV D/c line at Vataman 765 kV switching station (~10 km LILO length).

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- (viii) Vataman switching station – Kosamba 765 kV D/c line (~200 km length) with 330 MVAR switchable line reactors on each ckt at Kosamba end.
- (ix) Conversion of 240 MVAR 765 kV switchable line reactor on each ckt at Lakadia end of Lakadia – Ahmedabad 765 kV D/c line (being LILOed at Halvad) into bus reactors with NGR bypassing arrangement.
- (x) Conversion of 330 MVAR 765 kV switchable line reactor on each ckt at Vadodara end of Lakadia – Vadodara 765 kV D/c line (being LILOed at Vataman) into bus reactors with NGR bypassing arrangement.

5.5.2. For implementation purpose the above transmission system is proposed to be implemented through following transmission schemes:

Sl. No.	Transmission scheme	Estimated cost (Rs. Crs.)
1.	Transmission system for evacuation of additional 7 GW RE power from Khavda RE park Phase-B Part:A	1980
2.	Transmission system for evacuation of additional 7 GW RE power from Khavda RE park (Phase-B) Part:B	2020
3.	Transmission system for evacuation of additional 7 GW RE power from Khavda RE park Phase-B Part-A1	40
4.	Transmission system for evacuation of additional 7 GW RE power from Khavda RE park Phase-B Part-B1	40

The detailed scope under the above scheme is enclosed as Annexure-VI

5.5.3. Members may deliberate.

5.6. Transmission system strengthening beyond Kolhapur for export of power from Solar & Wind Energy Zones in Southern Region- Re-conductoring of Kolhapur (PG) – Kolhapur 400 kV D/c line.

5.6.1. In the 4th meeting of NCT held on 20th & 28th January, 2021, it was agreed that Strengthening of Kolhapur (PG) - Kolhapur (MSETCL) 400 kV section may be deliberated in RPC(TP) based on the operational constraint reported by POSOCO. The issue was deliberated in the 3rd meeting of WRPC(TP) held on 14.06.2021 wherein the following scheme was agreed:

Re-conductoring of Kolhapur (PG) – Kolhapur 400 kV D/c line

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1.	Re-conductoring of Kolhapur (PG) – Kolhapur 400 kV D/c line with conductor of minimum capacity of 2100 MVA/Ckt at nominal voltage along with bay up-gradation work at Kolhapur (MSETCL).	Re-conductoring length – 60 km approx.
	Approximate cost (Rs. Cr.)	54

5.6.2. Members may deliberate.

5.7. Scheme to control fault level at Indore S/s:

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5.7.1. Indore 765/400/220 kV S/s in MP acts as a node for transfer of power from generation projects in MP and Gujarat to load centres in MP through high capacity 400 kV and 765 kV networks. A large number of RE generation projects are coming up in Gujarat whose power is getting dispersed through various substations (at 765 kV level) including Indore (PG) for onward transfer of power to other parts of the grid resulting in high short circuit levels of interconnected grid. As per system studies, it was observed that short circuit level at Indore (PG) 400 kV substation in 2022-2023 time-frame crosses 50 kA as against designed rating of 40 kA. The issue was deliberated in the 3rd meeting of WRPC(TP) held on 14.06.2021 and the following scheme was agreed:

400 kV Bus Splitting of 765/400/220 kV Indore substation into two sections A&B and shifting of 765/400 kV, 1x1500 MVA ICT from section A to Section B (through jumpering arrangement)

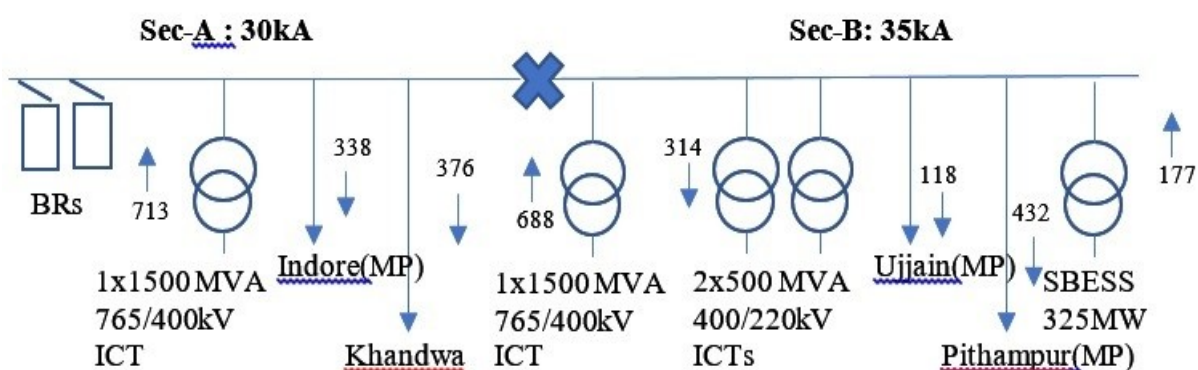
Transmission elements on 400 kV Bus Section A:

- (i) 1 no. of 765/400 kV 1x1500MVA ICT
- (ii) Indore (MP) 400 kV D/C line
- (iii) Khandwa 400 kV D/C line
- (iv) 2x125 MVA Bus reactors.

Transmission elements on 400 kV Bus Section B:

- (i) 1 no. of 765/400 kV 1500MVA ICT
- (ii) 2 nos. of 400/220 kV, 500MVA ICT
- (iii) Ujjain (MP) 400 kV D/C line
- (iv) Pithampur (MP) 400 kV D/C line.
- (v) 1 no. of 400/220 kV 500MVA ICT associated with M/s SBESS

The schematic of the 400 kV section after bus splitting is as given below:



Members

may

deliberate.

5.8. Scheme for fault level control at Dehgam (PG) & Ranchhodpura (GETCO) S/s

5.8.1. In the system studies for 2022-23 time frame, high fault level was observed in Gujarat system namely at 400 kV Dehgam (PG), Ranchhodpura (GETCO), Asoj (GETCO) & Vadodara(PG) substations. For reducing the short circuit level at Dehgam and

Ranchhodpura, the following transmission scheme was agreed under ISTS in the 3rd WRPCTP meeting held on 14.06.2021:

Scheme for fault level control at Dehgam (PG) & Ranchhodpura (GETCO) S/s

- Bypassing of Ranchhodpura(GETCO) – Dehgam(PG) 400 kV D/c line at Dehgam(PG) S/s and connecting it with Dehgam(PG) – Pirana 400 kV D/c line (one circuit via Nicol) so as to form Ranchhodpura(GETCO) – Pirana(PG) 400 kV D/c line (one circuit via Nicol).

Note:

- 400 kV D/c Dehgam-Ranchhodpura line is crossing with 400 kV Dehgam-Pirana D/c line near boundary wall of sub station premises (tower 2 & 3 of Ranchhodpura line and tower 3 & 4 of Pirana line from Dehgam SS end). It is possible to disconnect both the lines towards Dehgam end and join with each other so that 400 kV D/c Ranchhodpura-Pirana line shall be established.
- With above bypassing, 4 nos. bays at Dehgam S/s shall become vacant.
- After the implementation of above scheme, fault level at 400 kV buses at Dehgam S/s (PG) & Ranchhodpura S/s (GETCO) is observed to reach about 31 kA & 38 kA respectively (within limits).
- Length of Ranchhodpura - Dehgam 400 kV D/c line (twin) is 62 km, length of Dehgam – Pirana and Dehgam – Nicol 400 kV lines are 56 km & 26 km respectively.

5.9. Augmentation of 1x500 MVA, 400/220 kV ICT at Bhatapara (PG)

5.9.1. CSPTCL vide its letter dated 03.12.2020 has inter-alia intimated regarding requirement of 3rd 400/220 kV ICT at Bhatapara. The same was also observed in the operational feedback of NLDC during the high demand of Chhattisgarh. To overcome the same, augmentation of 1x500 MVA, 400/220 kV ICT at Bhatapara (PG) was agreed in 3rd meeting of WRPC(TP).

In addition to that the loading on the Bhatapara (PG) – Bhatapara (CSPTCL) 220 kV S/c line is high in present scenario even with the existing 2x315 MVA, 400/220 kV ICTs at Bhatapara(PG) substation. With additional ICT at Bhatapara(PG), the loading on Bhatapara (PG) – Bhatapara (CSPTCL) 220 kV S/c line would further increase. Therefore, LILO of one circuit of Bhatapara (PG) – Suhela 220 kV T/c line at Bhatapara (CSPTCL) is also agreed to be implemented in matching time-frame of implementation of 1x500 MVA, 400/220 kV ICT at Bhatapara (PG).

Augmentation of 1x500 MVA, 400/220 kV ICT (3rd) at Bhatapara (PG)

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1.	Augmentation of 1x500 MVA, 400/220 kV ICT (3 rd) at Bhatapara (PG)	400/220 kV, 500 MVA ICT –1 nos. 400 kV ICT bays – 1 nos. 220 kV ICT bays – 1 nos.
Approximate cost (Rs. Cr)		29

Note: To be implemented in the timeframe of implementation of LILO of one circuit of Bhatapara (PG) – Suhela 220 kV T/c line at Bhatapara (CSPTCL) under intra-state

B. Schemes agreed in Northern Regional Power Committees (Transmission Planning)

5.10. Transmission System requirement for additional 20 GW REZ in Northern Region (Phase-III)

5.10.1. The transmission system for evacuation of power from potential RE zones in Rajasthan has been evolved in phases. Transmission system for evacuation for 8.9 GW under Phase-I and 8.1 GW under Phase-II had been agreed and presently under implementation. Subsequently, SECI had requested to plan the transmission system for additional 20 GW SEZs envisaged in Rajasthan & proposed to be connected to the ISTS network in Bhadla, Fatehgarh and Ramgarh area. The locations of generation were identified by SECI based on the feedback of developers looking into the availability of land for setting up generation projects and proper access to these areas. Further, these locations have the potential of both solar and wind generation. Considering it, load flow studies were carried out and discussed in NR constituents in various meetings. Two options were explored one with HVAC system and another with HVAC+HVDC system. All the constituents of NRPC(TP) were in agreement with implementation of HVDC +HVAC option. Based on the deliberations, transmission system for additional 20 GW REZ in Northern Region (Phase-III) was agreed in the 3rd NRPC (TP) meeting held on 19.02.2021:

Transmission System requirement for additional 20GW REZ in Northern Region (Phase-III):

- i) Establishment of 5x500 MVA 400/220 kV pooling station at Fatehgarh-4 along with 2x125 MVAr Bus Reactor
- ii) Establishment of 2x1500 MVA 765/400kV & 10x500 MVA 400/220 kV pooling station at Bhadla-3 along with 2x330 MVAr (765kV) Bus Reactor & 2x125 MVAr (420kV) Bus Reactor
- iii) Establishment of 3x1500 MVA 765/400kV & 2x500 MVA 400/220 kV pooling station at Ramgarh along with 2x240 MVAr (765kV) Bus Reactor & 2x125 MVAr (420kV) Bus reactor
- iv) Fatehgarh-2 – Bhadla-3 400kV D/c line (Quad) along with 50 MVAr Switchable line reactor for each circuit at both ends of Fatehgarh 2- Bhadla-3 400kV D/c line (200 km)
- v) Fatehgarh-4- Fatehgarh-3 400 kV 2xD/c twin HLTS line (50 km)
- vi) Fatehgarh 3- Bhadla-3 400kV D/c line(Quad) along with 50 MVAr Switchable line reactor for each circuit at both ends of Fatehgarh 3- Bhadla-3 400kV D/c line (200 km)
- vii) Ramgarh – Bhadla-3 765kV D/c line(180 km) along with 240 MVAr line reactor at each circuit at Ramgarh end of Ramgarh – Bhadla-3 765kV D/c line
- viii) Bhadla-3 – Sikar-II 765 kV D/c line (380 km) along with 330 MVAr Switchable line reactor for each circuit at each end of Bhadla-3 – Sikar-II 765 kV D/c line

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- ix) Sikar-II – Khetri 765 kV D/c line (90 Km)
- x) Sikar-II – Narela 765 kV D/c line (260 Km) along with 240 MVAR Switchable line reactor for each circuit at each end of Sikar-II – Narela 765 kV D/c line
- xi) Augmentation of 1x1500 MVA ICT (3rd), 765/400kV ICT at Jhatikara Substation (Bamnoli/Dwarka section)
- xii) Augmentation with 400/220kV, 1x500MVA Transformer (10th) at Fatehgarh-II PS
- xiii) Augmentation with 765/400kV, 1x1500MVA Transformer (5th) at Bhadla-II PS
- xiv) Augmentation with 765/400kV, 1x1500MVA Transformer (3rd) at Bikaner (PG)
- xv) Jhatikara – Dwarka 400kV D/c line (Quad) (20km)
- xvi) Establishment of 6x1500 MVA 765/400kV & 5x500 MVA 400/220 kV pooling station at Fatehgarh-3 (new section*) (In addition to 4x500 MVA ICT proposed under Rajasthan SEZ Ph-II-of Section-1) along with 2x330 MVAR,765kV & 2x125 MVAR, 420kV Bus Reactors
- xvii) Augmentation of 1x500 MVA ICT (5th), 400/220kV ICT at Fatehgarh-3 Substation (section-1*)
- xviii) Establishment of 2x1500MVA 765/400kV Substation at suitable location near Beawar along with 2x330 MVAR, 765 kV Bus Reactor & 2x125 MVAR, 420 kV Bus Reactor
- xix) Fatehgarh-3– Beawar 765 kV 2xD/c (350 km) along with 330 MVAR Switchable line reactor for each circuit at each end of Fatehgarh-3– Beawar 765 kV D/c line
- xx) LILO of both circuit of Ajmer-Chittorgarh 765 kV D/c at Beawar (45 km)
- xxi) LILO of 400kV Kota –Merta line at Beawar (20 km)
- xxii) Establishment of 2x1500 MVA 765/400kV substation at suitable location near Dausa along with 2x330 MVAR 765 kV Bus Reactor & 2x125 MVAR, 420 kV Bus Reactor
- xxiii) Beawar – Dausa 765 kV D/c line (240 km) along with 240 MVAR Switchable line reactor for each circuit at each end
- xxiv) LILO of both circuits of Jaipur(Phagi)-Gwalior 765 kV D/c at Dausa (40km) along with 240 MVAR Switchable line reactor for each circuit at Dausa end of Dausa – Gwalior 765 kV D/c line
- xxv) LILO of both circuits of Agra – Jaipur(south) 400kV D/c at Dausa (30km) along with 50 MVAR Switchable line reactor for each circuit at Dausa end of Dausa – Agra 400kV D/c line
- xxvi) 6000MW, ± 800 KV HVDC terminal at Bhadla-3 substation
- xxvii) 6000MW, ± 800 KV HVDC terminal station at suitable location near Fatehpur (UP)
- xxviii) Establishment of 5x1500MVA, 765/400KV ICT at pooling station at suitable location near Fatehpur along with 2x330MVAR (765kV) bus reactor
- xxix) ± 800 KV HVDC line (Hexa lapwing) between Bhadla-3 & Fatehpur (950km)
- xxx) LILO of both ckts of 765kV Varanasi – Kanpur (GIS) D/c at Fatehpur(30km)
- xxxi) Augmentation of 1x1500MVA ICT at 765/400kV Kanpur(GIS) substation
- xxxii) STATCOM :
- Fatehgarh – III S/s : STATCOM : ± 600 MVAR, 4x125 MVAR MSC, 2x125 MVAR MSR
 - Ramgarh S/s : STATCOM : ± 600 MVAR, 4x125 MVAR MSC, 2x125 MVAR MSR

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7.	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part D	1680
8.	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part E1	930
9.	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part E2	170
10.	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part F	2255
11.	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part G	1530
12.	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part H	1870
13.	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part I	12700
14.	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part J	320

The detailed scope of the above transmission scheme is enclosed as Annexure-VII

5.10.3. The transmission lines envisaged in the 20 GW scheme would be passing through the GIB (Great Indian Bustard) potential zone as per the area marked in the Hon'ble Supreme Court of India Order dated 19.04.2021 in Writ Petition No. 838 of 2019 regarding GIB case. Further, in the aforesaid order, Hon'ble Supreme Court has constituted a committee for the specific purpose of assessing the feasibility of laying the transmission line after taking into consideration all technical details. Hon'ble Supreme Court has directed that for all future cases of installing transmission lines in the potential zone, feasibility for the lines to be laid underground is to be assessed. Wherever feasible, the transmission line had to be laid underground. If overhead line alone is feasible and the same is ratified by the Committee, in such event the installation of bird divertors shall also be a condition.

5.10.4. In view of above decision of NCT is sought on how to proceed. At present, CEA is not granting prior approval under Section 68 of Electricity Act, 2003 and is requesting the developers to either install cables wherever feasible or approach the Committee constituted by Hon'ble Supreme Court.

5.10.5. Members may deliberate.

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5.11. Name of Scheme: Creation of 400/220 kV, 2x315 MVA S/S at Siot, Jammu & Kashmir

5.11.1. In the 3rd meeting of NRPC (TP) held on 19.02.2021, JKPTCL stated that they are in urgent requirement of a 400 kV substation at Siot as they are facing shortfall of transmission capacity in the areas of Jammu, Rajouri and Poonch district. Presently, due to very long length of 220 kV transmission lines in these areas, there are issues of low voltage. The proposed 400 kV substation will strengthen the transmission system. 220 kV interconnection to Rajouri S/s would feed the areas of Rajouri & Poonch districts presently having restricted load of around 300 MVA. The Siot substation would feed the areas near Akhnoor and Jammu region and the interconnection with Katra-II would also improve reliability of supply, considering the importance of Katra being a holy town with lots of visiting pilgrims. The substation would also provide relief from the low voltage issues at Draba/Chandak. The following scheme was agreed:

- (a) Creation of 400/220 kV, 2x315 MVA S/S at Siot (AIS) under ISTS as a system strengthening scheme with following scope of works:
- (i) Establishment of 2x315 MVA, 400/220 kV Siot S/s with 1x125 MVAR bus reactors, 4 nos. of 400kV line bays and 6 nos. of 220 kV line bays
- (ii) LILO of 400 kV D/c Amargarh (Kunzer)- Samba line at 400/220 kV Siot S/s

Timeline for the implementation of the above transmission works to be considered as March 2024.

Sl.No.	Scope of the Transmission Scheme	Capacity /km
1.	Establishment of 2x315MVA, 400/220kV Siot S/s with 1x125 MVAR (420 kV) bus reactors <i>Future provisions: Space for</i> <i>400/220kV ICTs along with bays: 2 nos.</i> <i>400 kV line bays along with switchable line reactor: 2nos.</i> <i>220 kV line bays: 4 nos.</i> <i>220kV sectionalization bay: 1 nos.</i>	400/220 kV, 315 MVA ICT – 2 nos. 400 kV ICT bays - 2 nos. 220 kV ICT bays - 2 nos. 400 kV line bays - 4 nos. 220kV line bays - 6 nos. 125 MVAR,420kV bus reactor - 1 nos. 420 kV reactor bay - 1 nos.
2.	LILO of 400 kV D/c Amargarh (Kunzer)-Samba line at 400/220 kV Siot S/s	Length – 15 km
	Total Estimated Cost (Rs Crores)	270

Members may deliberate

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5.12. Implementation of 400 kV D/c Khandukhal(Srinagar)-Rampura (Kashipur) line to be taken up under central sector as an ISTS scheme

- 5.12.1. Uttarakhand Integrated Transmission Project (UITP) scheme is under implementation by PTCUL. CERC vide order dated 31.01.2013 had declared the scheme as a deemed ISTS scheme. The scheme comprises of transmission system for evacuation of power from proposed HEP's in various river basins of Uttarakhand. There are certain deemed Inter-State Transmission System (deemed ISTS) elements of UITP, where PTCUL had not been able to achieve the targeted timeline (deadlines). Amongst these are the 400 kV D/C Srinagar (Khandukhal) – Kashipur (Rampura) Transmission line which was required to evacuate power from upcoming projects in the Alaknanda basin (Vishnugad Pipalkoti HEP of THDC and Tapovan Vishnugad HEP of NTPC), and the 220 kV D/C Mori-Dehradun line which was proposed to evacuate power from proposed generators in Yamuna basin. M/s PTCUL vide letter dated 12.01.2021 conveyed that Board of Directors of PTCUL had accorded approval for handing over of construction of 400 kV Khandukhal-Rampura Transmission Line to Central Sector.
- 5.12.2. The matter was deliberated in the 3rd meeting of NRPC (TP), wherein implementation of 400 kV D/c Khandukhal(Srinagar)-Rampura (Kashipur) line was agreed to be taken up under central sector as an ISTS scheme with the matching time frame of commissioning of Vishnugad Pipalkoti HEP of THDC or Tapovan Vishnugad HEP of NTPC, whichever is earlier.

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1.	400 kV D/c Khandukhal(Srinagar)-Rampura (Kashipur) line	Length – 195 km
2.	2 nos. of 400 KV bays both at Khandukhal Srinagar) & Rampura(Kashipur) S/s	400 kV line bays -4
	Total Estimated Cost (Rs Crores)	450

Note:

- (i) The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey
- (ii) PTCUL to provide space for 2 nos. of 400kV bays each at Rampura (Kashipur) & Khandukhal(Srinagar) S/s respectively.

The timeline to be considered as matching time frame of commissioning of Vishnugad Pipalkoti HEP of THDC or Tapovan Vishnugad HEP of NTPC whichever is earlier (June, 2023).

Members may deliberate.

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5.13. System Strengthening scheme for Reconductoring of portion of Dulhasti-Kishtwar- Kishenpur 400 kV (Quad) S/c:

5.13.1. Ratle HEP (690 MW) was planned to be developed in the downstream of Dulhasti HEP and it was agreed that Dulhasti-Kishenpur D/c Quad (S/c strung) would be LILOed at Ratle HEP and 2nd quad circuit shall be strung from Kishenpur and terminated at Ratle matching with the commissioning of Ratle HEP. Further, it was also agreed during 35th SCPSPNR meeting held on 03.11.2014 that as outlet beyond Dulhasti is Dulhasti-Kishenpur 400kV line which is a single circuit line, the amount of power that can be exported/imported is limited. Hence, Dulhasti-Ratle section would be optimized to the extent possible.

Based on above considerations, POWERGRID implemented Dulhasti-Kishenpur 400kV S/c line (Quad) with Twin Moose conductor till Ratle LILO point. Beyond Ratle LILO point, line was implemented with Quad Moose conductor. However, LTA & Connectivity application for Ratle HEP was revoked at later stage due to non-signing of requisite agreements.

5.13.2. For connectivity of Pakaldul HEP (1000 MW), LILO of one circuit of Dulhasti - Kishenpur 400 kV line (quad) has been agreed at Kishtwar Pooling station. However, as location of proposed Kishtwar S/s is above Ratle location and towards Dulhasti, portion of Dulhasti-Ratle LILO tap Point of Dulhasti (TW loc 10 indicated at Fig-1) - Kishenpur 400 kV line (TW loc 49-indicated at Fig-1) (approx. 13 kms) implemented through twin moose conductor, needs to be re-conducted with Quad moose conductor. This reconductoring of approx. 13 km section (LILO tap Point of Dulhasti - Kishenpur 400 kV line) would be needed to cater to power transfer requirement from hydro projects (Pakaldul, Kiru & Kwar) including LTA of Pakaldul (1000 MW) HEP. An exhibit depicting above arrangement is at Fig-1.

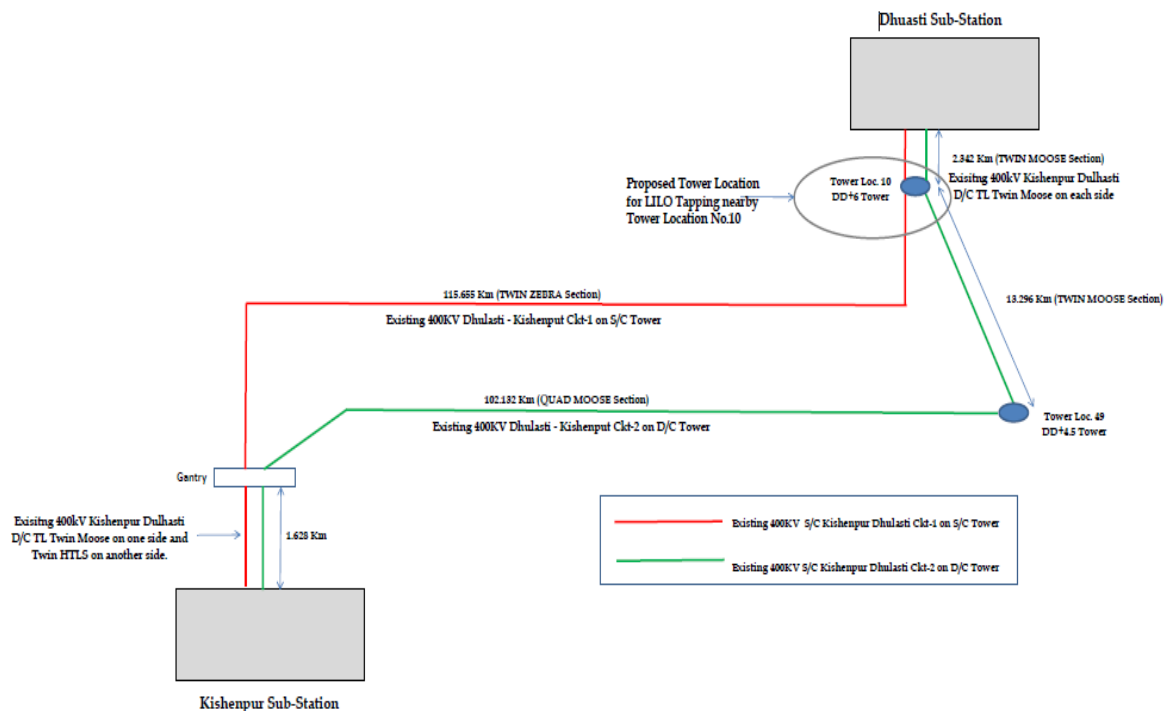


Fig-1

5.13.3. The matter was deliberated in 3rd meeting of NRPC (TP) held on 19.02.2021 wherein reconductoring of Dulhasti-Ratle LILO tap Point of Dulhasti - Kishenpur 400 kV line (approx. 13 kms) implemented through twin moose conductor with Quad moose conductor in matching time frame of Pakaldul HEP generation was agreed.

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1.	Reconductoring of Dulhasti-Ratle LILO tap Point of Dulhasti - Kishenpur 400 kV line (approx. 13 kms) implemented through twin moose conductor, with Quad moose conductor in matching time frame of Pakaldul HEP generation.	Length – 13 km
	Approximate cost (Rs. Cr.)	13

Members may deliberate.

5.14. Grant of 400 kV & 220 kV bays to RE generators at Fatehgarh-III (erstwhile Ramgarh-II) PS under ISTS:

5.14.1. Establishment of 4x500MVA, 400/220kV Fatehgarh-III PS Ramgarh-II Pooling Station was agreed in the 5th meeting of NRSCT held on 13.09.2019 under “Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part A”. The Transmission scheme is currently under bidding through TBCB.

5.14.2. At Fatehgarh –III PS, implementation of 7 nos. of 220 kV bays are currently under bidding (Phase-II-Part A scheme) and all the above bays have already been allocated to RE generators. Space provision for future 15 nos. of 220 kV bays and 10 nos. of 400 kV bays has also been kept at Fatehgarh-III (erstwhile Ramgarh-II).

5.14.3. In the 3rd meeting of NRPC (TP) held on 19.02.2021, CTU intimated that several Stage-II Connectivity applications have been received at Fatehgarh-III PS at various voltage levels i.e. 400kV & 220kV level for which 6 nos. of 220kV bays and 3 nos. of 400kV bays are required at Fatehgarh-III PS and proposed that bays may be implemented under ISTS matching with RE generators.

5.14.4. Accordingly, as per the detailed procedure for grant of connectivity to RE generators, it was agreed that 6 nos. of 220kV bays and 3 nos. of 400kV bays at Fatehgarh-III PS may be implemented under ISTS matching with RE generators.

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Sl. No.	Scope of the Transmission Scheme	Capacity /km
1.	6 nos. of 220 kV bays and 3 nos. of 400 kV bays along with bus extension of 220 kV & 400 kV bus as well as bus sectionaliser arrangement between both the levels i.e 400 kV new section and 220 kV new section with under implementation section at Fatehgarh-III PS	400 kV line bays - 3 nos. 220kV line bays - 6 nos.
	Total Estimated Cost (Rs Crores)	50

5.15. Addition of new 1x315 MVA, 400/220kV ICT at Amargarh, J&K:

5.15.1. JKPDD had submitted DPRs for Jammu Region & Kashmir region for strengthening of the transmission network of J & K considering a load of around 4800 MW by 2026-27. Considering the same, system studies were carried out by CEA and as per the system studies, it emerged that 2x315MVA, 400/220kV ICTs at Amargarh (Kunzar) are 'N-1' non complaint in 2025-26 scenario.

5.15.2. Matter was deliberated in the 3rd meeting of NRPC (TP) held on 19.02.2021 wherein addition of new 1x315 MVA, 400/220kV ICT at Amargarh was agreed to be taken up under ISTS with the time frame of March 2026.

Sl.No.	Scope of the Transmission Scheme	Capacity /km
1	Augmentation with 400/220kV, 1x315MVA Transformer (3 rd) at Amargarh, J&K	400/220kV 315 MVA ICT: 1 no 400 kV ICT bays – 1 nos. 220 kV ICT bays – 1 nos.
	Total Estimated Cost (Rs Crores)	40

Time frame as per NRPC(TP) – March, 2026

5.16. Establishment of 400/220kV Nange Pooling Station for proposed SJVN Hydro Power Plant Luhri Stage-I, II & Sunni Dam:

5.16.1. In the 2nd NRSCT meeting held on 13.11.18, transmission system for connectivity to Luhri-I (210 MW), Luhri-II (172 MW) & Sunni Dam (382 MW) HEP were agreed. It was decided that power from all the three stages of Luhri HEP would be evacuated at 220 kV level and would be pooled at 400/220 kV proposed ISTS Nange pooling station located near Luhri-II HEP and further evacuated to Koldam through 400 kV D/c line.

5.16.2. Matter was further deliberated in the 3rd meeting of NRPC (TP) held on 19.02.2021, wherein SJVNL intimated that commissioning schedules for Luhri Stage-I (210 MW), Sunni Dam (382 MW) and Luhri Stage -II (172 MW) are April 2025, January 2027 and October 2027 respectively. Accordingly, 2x315 MVA ICT capacity at Nange Pooling station shall be required in the time frame of Luhri Stage-I HEP (210 MW).

5.16.3. After deliberations, it was agreed that following transmission system may be taken up for implementation with the time frame of Luhri-I HEP (April 2025):

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- (i) Establishment of 7x105 MVA, 400/220kV Nange GIS Pooling Station
- (ii) Nange GIS Pooling Station – Koldam 400kV D/c line along with associated bays at both ends (GIS bays at Koldam).
- (iii) 125 MVAR Bus Reactor at Nange GIS PS.

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1.	Establishment of 7x105 MVA, 400/220kV Nange GIS Pooling Station <i>Future provisions: Space for 400/220kV ICTs along with bays: 2 nos. 400 kV line bays along with switchable line reactor: 2nos. 220 kV line bays: 10 nos.</i>	400/220 kV 105 MVA ICT - 7nos. 400 kV ICT bays - 2 nos. 220 kV ICT bays - 2 nos. 400 kV line bays - 2 nos. 125 MVAR,420kV bus reactor – 1 no. 420 kV reactor bay - 1no.
2.	Nange GIS Pooling Station – Koldam 400 kV D/c line	Length – 50 km
3.	2 nos. of 400kV GIS line bays at Koldam	400 kV line bays (GIS) - 2 nos
	Total Estimated Cost (Rs Crores)	330

Note:

- (i) Developer of Koldam S/s to provide space for 2 nos. of 400 kV line bays at Koldam S/s
- (ii) The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey

The above transmission system would also be utilized for connectivity of Sunni Dam and Luhri-II HEPs of M/s SJVNL. Time frame as per NRPC (TP)- April, 2025.

Members may discuss.

5.17. 1x500 MVA, 400/220 kV ICT augmentation (3rd) at Sohawal (PG) under system strengthening.

5.17.1. In the 3rd meeting of NRPC (TP) held on 19.02.2021, UPPTCL intimated that 2x315 MVA ICTs at Sohawal(PG) have been observed to be 'N-1' non-compliant under peak load conditions and requested for its augmentation. Accordingly, 1x500 MVA, 400/220 kV ICT augmentation (3rd) at Sohawal (PG) was agreed under system strengthening.

Sl.No.	Scope of the Transmission Scheme	Capacity /km
1	Augmentation with 400/220kV, 1x500 MVA Transformer (3 rd) at Sohawal (PG)	400/220kV 500 MVA ICT: 1 no 400 kV ICT bays – 1 nos.

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		220 kV ICT bays – 1 nos.
	Total Estimated Cost (Rs Crores)	30

UPPTCL has requested to implement the ICT at the earliest.
Members may discuss.

5.18. One no of 220 kV bay at Chamera Pooling point for 2nd Circuit stringing of 220 kV Karian – Chamera Pool line under implementation by HPPTCL with time fame of December 21.

5.18.1. Construction of 220/33 kV substation at Karian in Ravi Basin had been approved in 29th meeting of SCPSPNR held on 29.12.2010. Accordingly, 2 No. of 220 kV Bays were approved for termination of 220 kV D/C line from Karian at 400/220 kV, 2x315 MVA Chamera Pooling station of PGCIL at Rajera. Subsequently, in the 30th SCPSPNR meeting held on 19.12.2011, HPPTCL had informed that one bay would be required in first instance. Accordingly following elements were commissioned and charged:

- 220/33 kV, 50 MVA Karian Substation.
- 220 kV S/C line on D/C towers from Karian to Chamera

Subsequently, in order to strengthen the intra-state transmission system, HPPTCL has planned 2nd circuit stringing of 220 kV Karian to Chamera transmission line, for which 220 kV bay is required to be implemented at Chamera Pool and the same was approved in 3rd meeting of NRPC(TP).

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1	One no of 220kV bay at Chamera Pooling point (PG) for 2 nd Circuit stringing of 220 kV Karian – Chamera Pool line	220 kV line bay -1 no
	Total Estimated Cost (Rs Crores)	4

HPPTCL had requested that the implementation of the above scheme may be carried out by December 2021.

Members may discuss.

5.19. 220 kV bays at 400 kV substation PGCIL Khatkar (Jind) & Naggal (Panchkula) substation:

5.19.1. Following 220kV bays have been agreed in the 3rd meeting of NRPC(TP):

- For LILO of both circuits of 220 kV Jind HVPNL to PTPS D/C line at 400 kV substation PGCIL Khatkar (Jind), 4 nos. of bays are required, out of which 2 nos. of bays are already existing. Therefore, implementation of 2 nos. of bays has been agreed. HVPNL has indicated the timeframe for implementation of the above 2 bays as July 2023.

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- For termination of 220 kV D/C line from 400 kV PGCIL Naggal (Panchkula) to proposed 220 kV substation Sadhaura, 2 nos. of 2 nos. of bays has been agreed. HVPNL has indicated the timeframe for implementation of the 2 bays at 400 kV PGCIL Naggal as September, 2023.

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1	220 kV bays at 400 kV substation PGCIL Khatkar (Jind) for LILO of both circuits of 220 kV Jind HVPNL to PTPS D/C line at 400 kV substation PGCIL Khatkar (Jind)	220 kV line bays -2nos
2	220 kV bays at 400 kV PGCIL Naggal (Panchkula) substation for 220 kV D/C line from 400 kV PGCIL Naggal (Panchkula) to proposed 220 kV substation Sadhaura	220 kV line bays -2 nos
Total Estimated Cost (Rs Crores)		16

Members may discuss.

5.20. Strengthening of 220 kV Alusteng (Srinagar)- Leh Transmission System:

5.20.1. Powergrid vide letter dated 25.02.2021 has submitted a proposal for strengthening of 220 kV Alusteng (Srinagar)- Leh Transmission System with following elements with total estimated cost of Rs 226 Crores:

- Laying of cable for about 15km between Minamarg and Zojila Top section of Alusteng –Drass 220kV section.
- Installation of 2x25 MVAR, 220kV bus reactors at 220/66kV Drass S/s
- Installation of 1x25 MVAR, 220kV bus reactors at 220/66kV Alusteng S/s

Srinagar- Leh 220 kV S/c transmission line has become an ISTS line after bifurcation of state of J&K into UT of J&K and UT of Ladakh and the transmission line has been transferred to POWERGRID by MoP vide letter dated 23.03.2021. MoP has directed CEA to take up the proposal of POWERGRID in the NCT meeting for taking decision regarding its implementation under RTM (copy enclosed at Annexure-VIII). The detailed scope is as under:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1	Laying of cable about 15km provided between Minamarg and Zojila Top section of Alusteng –Drass 220kV section	Length- 15 km
2	2x25 MVAR, 220kV bus reactors at 220/66kV Drass S/s	25 MVA _r , 220kV bus reactor – 2 nos. 220 kV reactor bay – 2 nos.
3	1x25 MVAR, 220kV bus reactors at 220/66kV Alusteng S/s	25 MVA _r , 220kV bus reactor – 1 no.

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		220 kV reactor bay – 1 no.
	Estimated Cost (Rs. Crore) (as provided by Powergrid)	226

Members may discuss.

6. Quarterly assessment of Transmission scheme requirement under ISTS by CTU.
Presentation by CTU

7. Allocation of transmission scheme for carrying out survey amongst CTU, RECTPCL and PFCCL.

Members may deliberate on the methodology to be adopted for allocation of transmission scheme for carrying out survey.

8. Recommendation of NCT: Mode of implementation of transmission schemes, cost of schemes, agency responsible for carrying out survey, time line

8.1. The proposed transmission schemes in WR and NR is summarized in the table given below. Members may deliberate and finalize the mode of implementation, cost, agency for carrying out preliminary survey and timeline of the schemes.

Sl. No.	Transmission scheme	Implementation mode (TBCB/RTM)	Surveying agency (CTUIL/ RECTPCL/ PFCCL)	Timeline	Estimated cost (Rs. Crs.)
1	Transmission system for evacuation of power from Neemuch SEZ (1000 MW)				547
2	Transmission system for evacuation of power from Dholera UMSP (2 GW) Phase-I				747
3	System Strengthening in Gujarat associated with integration of RE projects from Khavda potential REZ- Part A				2294
4	System Strengthening in Gujarat associated with integration of RE projects from Khavda potential REZ- Part B				1283
5	System Strengthening in Gujarat associated with integration of RE projects from Khavda potential REZ- Part C				78
6	System Strengthening in Gujarat associated with integration of RE projects from Khavda potential REZ- Part D				94
7	System Strengthening in Gujarat associated with integration of RE projects from Khavda potential REZ- Part E				70

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Sl. No.	Transmission scheme	Implementation mode (TBCB/RTM)	Surveying agency (CTUIL/ RECTPCL/ PFCCCL)	Timeline	Estimated cost (Rs. Crs.)
8	Establishment of Khavda Pooling Station-2 (KPS2) in Khavda RE Park				789
9	Establishment of Khavda Pooling Station-3 (KPS3) in Khavda RE Park				624
10	Transmission scheme for evacuation of 4.5 GW RE injection at Khavda P.S. under Phase-II – Part A				862
11	Transmission scheme for injection beyond 3 GW RE power at Khavda PS1 (KPS1)				475
12	Transmission scheme for evacuation of 4.5 GW RE injection at Khavda P.S. under Phase-II – Part C				1449
13	Transmission system for evacuation of additional 7 GW RE power from Khavda RE park Phase-B Part:A				1980
14	Transmission system for evacuation of additional 7 GW RE power from Khavda RE park (Phase-B) Part:B				2020
15	Transmission system for evacuation of additional 7 GW RE power from Khavda RE park Phase-B Part-A1				40
16	Transmission system for evacuation of additional 7 GW RE power from Khavda RE park Phase-B Part-B1				40
17	Transmission system strengthening beyond Kolhapur for export of power from Solar & Wind Energy Zones in Southern Region- Re-conductoring of Kolhapur (PG) – Kolhapur 400 kV D/c line				54
18	Scheme to control fault level at Indore S/s				
19	Scheme for fault level control at Dehgam (PG) & Ranchhodpura (GETCO) S/s				
20	Augmentation of 1x500 MVA, 400/220 kV ICT (3rd) at Bhatapara (PG)				29
21	Transmission system for				660

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Sl. No.	Transmission scheme	Implementation mode (TBCB/RTM)	Surveying agency (CTUIL/ RECTPCL/ PFCCCL)	Timeline	Estimated cost (Rs. Crs.)
	evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part A1				
22	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part A2				80
23	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part B1				2540
24	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part B2				205
25	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part C1				1440
26	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part C2				85
27	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part D				1680
28	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part E1				930
29	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part E2				170
30	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part F				2255
31	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part G				1530
32	Transmission system for evacuation of power from REZ				1870

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Sl. No.	Transmission scheme	Implementation mode (TBCB/RTM)	Surveying agency (CTUIL/ RECTPCL/ PFCCCL)	Timeline	Estimated cost (Rs. Crs.)
	in Rajasthan (20GW) under Phase-III Part H				
33	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part I				12700
34	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part J				320
35	Creation of 400/220 kV, 2x315 MVA S/S at Siot , Jammu & Kashmir				270
36	Implementation of 400 kV D/c Khandukhal(Srinagar)-Rampura (Kashipur) line to be taken up under central sector as an ISTS scheme				450
37	System Strengthening scheme for Reconductoring of portion of Dulhasti-Kishtwar-Kishenpur 400 kV (Quad) S/c				13
38	Grant of 400kV & 220kV bays to RE generators at Fatehgarh-III (erstwhile Ramgarh-II) PS under ISTS				50
39	Addition of new 1x315 MVA, 400/220kV ICT at Amargarh J&K				40
40	Establishment of 400/220kV Nange Pooling Station for proposed SJVN Hydro Power Plant Luhri Stage-I, II & Sunni Dam				330
41	1x500 MVA, 400/220 kV ICT augmentation (3rd) at Sohawal (PG)) under system strengthening				30
42	One no of 220kV bay at Chamera Pooling point for 2 nd Circuit stringing of 220 kV Karian – Chamera Pool line under implementation by HPPTCL				4
43	220 kV bays at 400 kV				16

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Sl. No.	Transmission scheme	Implementation mode (TBCB/RTM)	Surveying agency (CTUIL/ RECTPCL/ PFCCCL)	Timeline	Estimated cost (Rs. Crs.)
	substation PGCIL Khatkar (Jind)&Naggal (Panchkula) substation				
44	Strengthening of 220 kV Alusteng (Srinagar)- Leh Transmission System				226