सत्यमेव जयते

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

सेवा में /To

As per list of Addresses

विषय:ट्रांसमिशन पर राष्ट्रीय समिति (एनसीटी) की बीसवीं बैठक की कार्यसूची – के सम्बन्ध में ।

Subject: 20th Meeting of National Committee on Transmission (NCT) –regarding.

महोदया **(Madam)** / महोदय **(Sir),**

The 20th meeting of the "National Committee on Transmission" (NCT) has been scheduled as given below:

Date: 25.06.2024

Time: 11:00 A.M.

Venue: Chintan, 2nd Floor, CEA, Sewa Bhawan, R.K. Puram Sector-1, New Delhi

Kindly make it convenient to attend the meeting.

Signed by Bhagwan Sahay Bairwa
Date: 18-06-2024 11:51:44

(बी.एस.बैरवा / **B.S. Bairwa**)
मुख्य अभियन्ता (इंचार्ज) एवं सदस्य सचिव,एन.सी.टी.
/Chief Engineer (I/C) & Member Secretary (NCT)

प्रतिलिपि / **Copy to:**

Joint Secretary (Trans), Ministry of Power, New Delhi

List of Addresses:

1.	Chairperson, Central Electricity Authority Sewa Bhawan, R.K. Puram, New Delhi – 110 066.	2.	Member (Power Systems), Central Electricity Authority Sewa Bhawan, R.K. Puram, New Delhi – 110 066.
3.	Member (Economic & Commercial), 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. Lalit Bohra, Joint Secretary Room no 602, Atal Akshay Urja Bhawan Opposite CGO Complex gate no 2, Lodhi Road, New Delhi – 110003	6.	Chief Operating Officer, CTUIL, Saudamini, Plot No. 2, Sector-29, Gurgaon – 122 001.
7.	Sh. Rajnath Ram, Adviser (Energy), NITI Aayog, Parliament Street, New Delhi – 110 001.	8.	CMD, Grid Controller of India, B-9, Qutub, Institutional Area, Katwaria Sarai, New Delhi – 110010
9.	Sh. Ravinder Gupta Ex. Chief Engineer CEA		

Special Invitee

Chief Engineer (PCD), CEA

Table of Agenda

Agenda for the 20th meeting of National Committee on Transmission

1 Confirmation of the minutes of the 19th meeting of National Committee on Transmission.

1.1 The minutes of the 19th meeting of NCT held on 29.04.2024 were issued on 28.05.2024 vide CEA letter No. CEA-PS-12-13/3/2019-PSPA-II. No comments have been received on the minutes.

1.2 Members may confirm the minutes.

2 Status of the transmission schemes noted/approved/recommended to MoP in the 19th meeting of NCT:

2.1 Status of new transmission schemes approved/recommended:

Sr. No	Name of the Transmission Scheme	Noted/ Recommended/ Approved	Mode of Implementation	BPC	Award/ Gazette notification
1.	Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-4 :3.5 GW): Part A	Recommended	TBCB	RECPDCL	Under Process
2.	Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-4 :3.5 GW): Part B	Recommended	TBCB	RECPDCL	Under Process
3.	System strengthening at Koppal-II and Gadag-II for integration of RE generation projects	Recommended	TBCB	PFCCL	Under Process
4.	Transmission system strengthening to facilitate evacuation of power from Bhadla/Bikaner complex	Approved	TBCB	PFCCL	Under Process
5.	OPGW installation on existing 400 kV Kurukshetra - Malerkotla line alongwith FOTE at both ends Part – A	Approved		Not applicable	Informed to CTUIL vide letter dated 28.05.2024
6.	OPGW installation on existing 400 kV	Approved	RTM	Not applicable	Informed to

Sr. No	Name of the Transmission Scheme	Noted/ Recommended/ Approved	Mode of Implementation	BPC	Award/ Gazette notification
	Kurukshetra - Malerkotla line alongwith FOTE at both ends – Part-B				CTUIL vide letter dated 28.05.2024
7.	OPGW installation on existing 400 kV Kota – Merta line alongwith LILO portion at Shree Cement including FOTE at all 3 locations	Approved	RTM	Not applicable	Informed to CTUIL vide letter dated 28.05.2024
8.	OPGW installation on one circuit of existing of 765 kV Fatehpur-Agra D/c (2x S/c) Line which is to be LILOed at new Ghiror S/s (ISTS) including FOTE at Fatehpur & Agra locations (2 Nos.)	Approved	RTM	Not applicable	Informed to CTUIL vide letter dated 28.05.2024
9.	Supply and installation of OPGW on 400 kV Fatehgarh-I (Adani) - Fatehgarh-II (PG) line (6.5 kms.) upto LILO portion of Fatehgarh-II (PG).	Approved		Not applicable	Informed to CTUIL vide letter dated 28.05.2024
10.	Additional FOTE / Cards in view of resource disjoint and critical locations (12 Nos. of FOTE)	Approved	RTM	Not applicable	Informed to CTUIL vide letter dated 28.05.2024
11.	Supply and Installation of 11 Nos. FOTE at Backup SLDCs in Northern Region & Backup NRLDC (Guwahati)	Approved	RTM	Not applicable	Informed to CTUIL vide letter dated 28.05.2024

2.2 Status of transmission schemes where modifications was suggested/approved:

S. No.	Scheme where modifications was suggested	Status
1.	Implementation of Jhatikara – Dwarka 400 kV (Quad) D/c line under Rajasthan REZ Ph-III, Part-D- Ph-II Scheme	Informed to CTUIL vide letter dated 28.05.2024
2.	Delinking of EHVAC System beyond Kaithal from Transmission system for evacuation of RE power from renewable energy parks in Leh (5 GW Leh-Kaithal transmission corridor)	Informed to MoP vide letter dated 28.05.2024
3.	Change in Scope of transmission scheme "Eastern Region Expansion Scheme- XXXIV (ERES-XXXIV)"	Informed to PFCCL vide letter dated 28.05.2024
4.	Change in implementation timeframe of Eastern Region Generation Scheme-I (ERGS-I)	Informed to PFCCL vide letter dated 28.05.2024

3 Modifications in the earlier approved/notified transmission schemes

3.1 Augmentation of transformation capacity at Jam Khambhaliya PS (JKTL)- PART B.

3.1.1 Augmentation of transformation capacity at Jam Khambhaliya PS (JKTL)- PART B was approved in the 18th meeting of the "National Committee on Transmission" (NCT) held on 05th March, 2024, with cost estimate of INR 310 Cr. under TBCB route with PFCCL as the BPC as mentioned below:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1.	Creation of New 220 kV Bus Section-II at Jam Khambhaliya PS Space to be kept for 1 No. 220 kV line bay in the same GIS Hall for RE Interconnection being implemented by the RE developer (in addition to 2 Nos. bays at Sl. 4)	220 kV Bus sectionaliser bay - 1 Set (to be kept normally CLOSED and may be opened based on system requirement) 220 kV BC – 1 No.
2.	Augmentation of transformation capacity at Jam Khambhaliya PS (GIS) by 2x500 MVA, 400/220 kV ICT (5th & 6th) (terminated on New 220 kV bus section-II)	500 MVA, 400/220 kV ICTs: 2 Nos. 400 kV ICT bays: NIL* 220 kV ICT bays: 2 Nos.
3.	Augmentation of transformation capacity at Jam Khambhaliya PS (GIS) by 1x500	500 MVA, 400/220 kV ICTs: 1 No.

Sl. No.	Scope of the Transmission Scheme	Capacity /km
	MVA, 400/220 kV ICT (7th) (terminated on New 220 kV bus section-II)	400 kV ICT bay: NIL (bay being implemented under Jamnagar scheme, which is currently under tendering, with schedule of Apr/May-26). Bus duct outside GIS hall along with termination equipment shall be provided. 220 kV ICT bay: 1 No.
4.	Implementation of 220 kV GIS line bays at Jam Khambhaliya PS for RE Projects on New 220 kV bus section-II	220 kV line bay – 2 No. (GIS) (1 for ACME Sun Power Pvt Ltd and 1 for Juniper Green Energy Pvt Ltd.)
5.	Creation of New 220 kV Bus Section at Jam Khambhaliya PS (Section III) (with space for 4 Nos. 220 kV line bays: in same GIS hall. Implementation of 2 Nos. GIS bays to be taken up as per Sl.No.8 and space to be kept for future 2 Nos.)	220 kV Bus sectionaliser bay - 1 Set *(to be kept normally OPEN and may be closed based on system requirement)* 220 kV BC – 1 No.
6.	Augmentation of transformation capacity at Jam Khambhaliya PS (GIS) by 1x500 MVA, 400/220 kV ICT (8th) (terminated on New 220 kV bus section-III)	500 MVA, 400/220 kV ICT: 1 Nos. 400 kV ICT bay: NIL (bay being implemented under Jamnagar scheme, which is currently under tendering, with schedule of Apr/May-26). Bus duct outside GIS hall along with termination equipment shall be provided. 220 kV ICT bay: 1 No.
7.	Augmentation of transformation capacity at Jam Khambhaliya PS (GIS) by 1x500 MVA, 400/220 kV (9^{th}) ICT terminated on New 220 kV bus section-III	500 MVA, 400/220 kV ICTs: 1 No. 400 kV ICT bays: 1 No. (TSP to implement complete dia. in all respect with the other 400 kV bay to be utilized by EETFEL (Bulk consumer)) 220 kV ICT bays: 1 No.
8.	Implementation of 220 kV GIS line bays at Jam Khambhaliya PS for Kuvadia 220 kV D/c line	220 kV line bay – 2 Nos. (GIS) (on Bus Section-III)
Note:		

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1. *JKTL to provide space for above scope of work.* 2. *GETCO shall implement Jam Khambhaliya PS - Kuvadia 220 kV D/c line in matching time-frame*		
	**Note: Termination of the 2x500 MVA ICTs under present scope shall be in the '2' separate dia's which are being developed by POWERGRID for RIL for termination of 400 kV Jam Khambaliya - Jamnagar D/c line. TSP shall implement 400 kV side GIS Duct required for interconnection of ICT-5 & 6 at 400 kV Jam Khambaliya PS [length is approx. 350 M. (Actual length shall be finalized based upon final layout)] along with associated equipment as required*	
Tentative implementation timeframe : • For scope at Sl. No. 1: 18 months • For scope at Sl. No. 3 & 6: Matching with SCOD of 400 kV bays at Jam Khambhaliya PS(being implemented under "Network Expansion scheme in Gujarat for drawl of about 3.6 GW load under Phase-I in Jamnagar area" scheme which is currently under tendering) and subject to minimum implementation schedule of 21 months. • For scope at Sl. No. 4: 30.03.2026 and 30.06.2027 respectively (subject to minimum schedule of 21 months from date of award of balance works). • For balance scope: 21 months		

3.1.2 CTU mentioned that Mounting Renewable Pvt Ltd (MRPL) vide letter dated 07.05.2024 has informed them that the 220 kV bay which they had initially decided to implement themselves, may be implemented under ISTS in matching timeframe of implementation of the subject ISTS scheme. Hence, 1 No. 220 kV bay for M/s MRPL on Bus Section-II needs to be added to the approved scope of works. Accordingly, implementation time-frame of Creation of New 220 kV Bus Section-II at Jam Khambhaliya PS may also be kept as 21 months instead of 18 months. Further, M/s EETFEL (Bulk Consumer) has withdrawn their GNA application vide letter dated 30.04.2024. Hence, references to EETFEL in scope of work need to be removed.

3.1.3 In view of the above scope at Sl. 1, 2, 4 & 7 is proposed to be modified as below:

Sl. No.	***Scope of the Transmission Scheme***	***Capacity /km***	***Implementation Time-frame***
1	Creation of New 220 kV Bus Section-II at Jam Khambhaliya PS	220 kV Bus sectionaliser bay – 1 Set (to be kept normally CLOSED and may be	**21 months**

		opened based on system requirement) 220 kV BC – 1 No.	
2	Augmentation of transformation capacity at Jam Khambhaliya PS (GIS) by 2x500 MVA, 400/220 kV ICT (5th & 6th) (terminated on New 220 kV bus section-II)	500 MVA, 400/220 kV ICTs: 2 Nos. 400 kV ICT bays: NIL* 220 kV ICT bays: 2 Nos. Bus duct outside GIS hall along with termination equipment shall be provided.	No change
4	Implementation of 220 kV GIS line bays at Jam Khambhaliya PS for RE Projects on New 220 kV bus section-II	220 kV line bay – **3** Nos. (GIS) (1 for ACME Sun Power Pvt Ltd, 1 for Juniper Green Energy Pvt Ltd. & **1 no. for Mounting (MRPL)**	**MRPL Bay: 21 months** **ACME Bay: 21 months*** Juniper Bay: Jun-27 subject to minimum schedule of 21 months from date of award of balance works.
7	Augmentation of transformation capacity at Jam Khambhaliya PS (GIS) by 1x500 MVA, 400/220 kV (9th) ICT terminated on New 220 kV bus section-III	500 MVA, 400/220 kV ICTs: 1 No. 400 kV ICT bays: 1 No. (TSP to implement complete dia. in all respect with the other 400 kV bay to be utilized ~~by EETFEL (Bulk consumer))~~ **in future)** 220 kV ICT bays: 1 No.	No change

** Earlier schedule was specified as March-26 subject to minimum schedule of 21 months from date of award of balance works. However, considering present status, schedule of 21 months may directly be specified.*

3.1.4 The tentative cost of the original scheme was Rs. 310 Cr., however, the same has been revised to Rs. 321 Cr. based on finalised cost of original scheme. Further, with the above additional 1 No. 220 kV bay (Cost ~8 Cr.), revised cost of the scheme comes out to be Rs. 329 Cr.

3.1.5 Members may approve the proposed modifications.

3.2 **Modification in design / layout of Kurnool-III PS due to receipt of large quantum of Connectivity applications at 400 kV level**

3.2.1 Kurnool-III PS has been identified for integration of 4.5 GW RE potential from Kurnool REZ as part of 66.5 GW RE Projects. Presently, Kurnool-III 765/400/220 kV PS is under implementation by POWERGRID through RTM route and is expected to be completed by Nov'24. Additional space provision had been kept for further expansion / augmentation of the pooling station for integration of additional RE generation. Presently, for integration of RE capacity, 9 Nos. of 220 kV line and 8 Nos. of 400 kV line bays have been allocated to various RE generation developers.

3.2.2 CTU have granted/agreed connectivity for 8000 MW (2650 MW at 220 kV level & 5350 MW at 400 kV level). For injection of 2,650 MW RE power from 220 kV level, 7x500 MVA 400/220 kV ICTs are required. Due to receipt of large Nos. of Connectivity applications at 400 kV level, it was observed that under the present arrangement of Kurnool-III PS, balance 2x500 MVA 400/220 kV ICTs and 6 Nos. of 220 kV line bays may be difficult to be utilized for injection of power.

3.2.3 With the rearrangement at Kurnool-III PS, following modifications shall be required under present scope as well as future space provision:

Sl. No.	Bay Type	Present scope	Revised Present scope	Future Scope	Revised Future scope
765 kV Switchyard: No change					
400 kV switchyard					
1	Line with Reactor	0	0	10	22
2	Tie	9	10	11	12
3	400/220 kV Transformer Bay	9	9 (2 shifted to new section)	11	5
4	765/400 kV Transformer Bay	3	3	4	4
5	Bus Sectionaliser	0	0	1 set	2 set
6	Bus Reactor	1	1	-	Any Line with reactor bay may be used as Bus reactor bay
220 kV switchyard					
1	Line	15	15 (5 Nos. Shifted to new section)	11	5
2	400/220 kV Transformer Bay	9	9 (2 shifted to new section)	11	5
3	Bus Coupler	3	3	3	1
4	Transfer Bus coupler	3	3	3	1
5	Bus section	2 set	2 set	3 set	0

Additional works due to rearrangement / revised scope

Sl. No.	Items
1	Land development for additional area for 400 & 220 kV Switchyard
2	400 kV Bus works for 8 Nos. additional diameters
3	Earth mat for additional area for 400 & 220 kV Switchyard
4	Other Auxiliary items i.e. additional requirement of Power & Control Cables, illumination, VMS etc.
5	Associated civil works including dismantling of foundations already casted

3.2.4 Members may approve the proposed modifications.

3.3 Change in Implementation time-frame of Eastern Region Expansion Scheme-XXXIX (ERES-XXXIX)

3.3.1 In the 16th meeting of NCT held on 30.11.2023, the Eastern Region Expansion Scheme-XXXIX was recommended to be implemented through TBCB mode with tentative implementation timeframe of 30-06-2026 and estimated cost of Rs. 2898 crores. This scheme inter alia includes establishment of 765/400 kV ISTS substation at Gopalpur alongwith Angul (POWERGRID) – Gopalpur 765 kV D/c line & Gopalpur (ISTS) – Gopalpur (OPTCL) 400 kV D/c line in Odisha. Bidding of the scheme is under progress.

3.3.2 OPTCL vide letter no. CP/INDUSTRY DEPT/82/2023/122 dated 05-06-2024 have informed CTUIL that the expected commissioning schedule of their substation is changed from March 2026 to December 2026.

3.3.3 One GNA$_{RE}$ applicant viz. M/s Avaada has been granted 700 MW GNA$_{RE}$ w.e.f. 30-06-2026 at Gopalpur (ISTS) S/s. Subsequently, M/s Avaada vide letter dated 22-03-2024 had requested to shift the start date of GNA$_{RE}$ to Dec 2027.

3.3.4 Completion schedule of ERES-XXXIX scheme was finalized keeping in view expected schedule of Gopalpur (OPTCL) S/s and GNA$_{RE}$ requirement. Considering the present completion schedule of ERES-XXXIX i.e. 30-06-2026, no drawal arrangement at Gopalpur ISTS S/s would be available between July 2026 and Dec 2026.

3.3.5 In view of above, it is proposed that the completion schedule of ERES-XXXIX scheme may be modified to 31-12-2026 from 30-06-2026.

3.3.6 Members may deliberate.

4 New Transmission Schemes:

4.1 Network Expansion scheme in Western Region to cater to Pumped storage potential near Talegaon (Pune)

4.1.1 In Maharashtra, potential of more than 10 GW Pumped Storage Plants has been identified by MoP. Application has already been received from Tata power for Bhivpuri PSP (1150 MW). Further, TPC is also planning PSP at Shirawata (1980 MW) in the same area. Considering the huge PSP potential in the area, which are likely to tie up power for pumping mode from RE generation projects located far away, it is proposed to establish a 765/400 kV substation near South Kalamb. Further, considering huge demand, space for HVDC terminal is proposed to be kept for future use. Also, MSETCL has proposed 8 Nos. of 400 kV lines from Sec-III of South Kalamb S/s to feed demand of Mumbai area.

4.1.2 Accordingly, a transmission scheme for Network Expansion scheme in Western Region to cater to Pumped storage potential near Talegaon (Pune), with following scope is proposed (detailed agenda is enclosed at (**Annexure 4.1)**:

Sl. No.	***Scope of the Transmission Scheme***	***Capacity /km***
1.	Establishment 2x1500 MVA, 765/400 kV Substation near South of Kalamb with 2x330 MVAR, 765 kV bus reactor and 2x125 MVAR, 420 kV bus reactor **Future provision (space for):** ➢ 765/400 kV ICT along with bays- 10 Nos. (2 Nos. on Sec-I, 4 Nos. in Sec-II & 4 Nos. on Sec-III) ➢ 765 kV line bays along with switchable line reactors – 6 Nos. (4 Nos. on Sec-II & 2 Nos. on Sec-III) ➢ 765 kV Bus Reactor along with bay: 4 Nos. (2 Nos. on Sec-II & 2 No. on Sec-III) ➢ 765 kV Sectionaliser: 2 -sets ➢ 400 kV line bays along with switchable line reactors– 20 Nos. *(6 Nos. on Sec-I, 6 Nos. on Sec-II & **8 Nos**. on Sec-III)* ➢ 400/220 kV ICT along with bays -4 Nos. (on 400 kV Sec-III: 2 Nos. on 220 kV Sec-I & 2 Nos. on 220 kV Sec-II) ➢ 400 kV Bus Reactor along with bays: 4 Nos. (2 Nos. on Sec-II & 2 No. on Sec-III) ➢ 400 kV Sectionalization bay: 2- set ➢ 220 kV line bays: 8 Nos. (4 Nos. on Sec-I & 4 Nos. on Sec-II) ➢ 220 kV Sectionalization bay: 1 set ➢ 220 kV BC and TBC: 2 Nos. ➢ Establishment of 6000 MW, ± 800 kV South Kalamb (HVDC) [LCC] terminal station (4x1500 MW) along with associated interconnections with 400 kV HVAC Switchyard (2x1500 MW on 400 kV Sec-I & 2x1500 MW on 400 kV Sec-II)	765/400 kV, 1500 MVA ICT – 2 Nos. (7x500 MVA single phase units including one spare ICT Unit) 765 kV ICT bays – 2 Nos. 400 kV ICT bays – 2 Nos. 765 kV Line bays – 4 Nos. 1x330 MVAr, 765 kV bus reactor- 2 Nos. (7x110 MVAR single phase Reactors including one spare Unit for bus /line reactor) 765 kV Bus reactor bay – 2 Nos. 125 MVAr, 420 kV reactor- 2 Nos. 400 kV Reactor bay- 2 Nos. 400 kV line bays - 2 Nos. (for interconnection of TPC PSP)

	& all associated equipment (incl. filters)/bus extension, etc.	
2.	LILO of Pune-III – Boisar-II 765 kV D/c line at South Kalamb S/s with associated bays at South Kalamb S/s	• LILO Route length: 40 km (160 ckm.) • The Pune-III – Boisar-II 765 kV D/c line is of Hexa Zebra configuration and LILO shall be of similar conductor configuration
3.	Installation of 1x240 MVAr switchable line reactor on each ckt at South Kalamb end of Boisar-II – South Kalamb 765 kV D/c line (formed after above LILO)	• 1x240 MVAr, 765 kV switchable line reactor – 2 Nos. • Switching equipment for 765 kV line reactor – 2 Nos. • **Spare Reactor (1-ph, 1x80 MVAr) unit at 765/400 kV South Kalamb S/s**

4.1.3 The scheme has been deliberated and agreed in the Special meeting of WRPC held on 27th March 2024 with following views:

"Although agreeing to the proposed scheme in principle, WRPC has the view that PSP projects have a long gestation period and require several clearances before the construction commences. Pumped storage projects take around four years to be commissioned after DPR approval by CEA and Environment Clearance by MoEF; compared to this, it takes substantially lesser time for the ISTS system to be developed. Hence, to ensure optimal utilization of transmission assets, the proposed transmission scheme should be awarded only after receipt of the following:

a) Environment Clearance by the Ministry of Environment, Forest and Climate Change (MoEF&CC) under Clause 8 of the EIA Notification, 2006 issued under the Environment (Protection) Act, 1986.

b) Approval of Detailed Project Report (DPR) from the Central Electricity Authority (CEA) as per the applicable "Guidelines for Formulation of Detailed Project Reports for Pumped Storage Schemes".

The above conditions would ensure that the construction schedule of the proposed transmission scheme is in sync with the schedule of the PSP."

4.1.4 Estimated Cost of the scheme is INR 1663 Crore with Implementation timeframe of 01.01.2028 (as per start date of connectivity sought by TPC for Bhivpuri PSP). However, application from Data Centre load (50 MW) has recently been received in Mumbai area in May'24 (~40km. from South Kalamb) (with communication that the capacity shall be increased to 1.4 GW progressively) with start date of 01.01.2027. The said application is presently under process. Hence, in case grant is finalised at South Kalamb S/s, the Implementation time-frame shall be kept as 24 months or 01.01.2027 (i.e. start date of GNA), whichever is later.

4.1.5 Members may deliberate.

4.2 **Provision of ICT Augmentation and Bus Reactor at Bhuj-II PS**

4.2.1 Bhuj-II PS is an existing substation with 4x500 MVA, 400/220 kV ICTs and 2x1500 MVA, 765/400 kV ICTs. To cater to applications received beyond 2000 MW (upto 2500 MW considering N-1) at Bhuj-II PS, creation of New 220 kV Bus Section at Bhuj-II PS, installation of 2x500 MVA, 400/220 kV ICTs (5th & 6th) and 1x1500 MVA, 765/400 kV ICT (3rd) and Implementation of 220 kV GIS line bay at Bhuj-II PS for ABREL (RJ) Projects Limited (Terminated at New 220 kV Bus Section) was agreed in the 16th NCT meeting held on 30.11.2023 through TBCB route. The scheme is presently under bidding.

4.2.2 Connectivity under GNA for entire 4000 MW has been received at Bhuj-II PS. Considering the rapid pace of applications being received at Bhuj-II PS (beyond 2.5 GW), a transmission scheme for ICT Augmentation & Bus Reactor at Bhuj-II PS, with following scope is proposed (detailed agenda is enclosed at (**Annexure- 4.2)**:

Sl. No.	**Scope of the Transmission Scheme**	**Capacity /km**
1.	Augmentation of transformation capacity at Bhuj-II PS (GIS) by 3x500 MVA, 400/220 kV ICT (7^{th}, 8^{th} & 9^{th})	500 MVA, 400/220 kV ICTs: 3 No. 400 kV ICT bays: 3 No. (+ 3 Nos. for dia completion) 220 kV ICT bays: 3 No..
2.	Augmentation of transformation capacity at Bhuj-II PS (GIS) by 1x1500 MVA, 765/400 kV ICT (4^{th})	1500 MVA, 765/400 kV ICT: 1 No. 765 kV ICT bay: 1 No. (+ 1 No. for dia completion) 400 kV ICT bay: Nil. (1 No. considered at SI. No.1 above)
3.	Installation of 1x330 MVAr 765 kV Bus Reactor (2nd) along-with associated bay	330 MVAr, 765 kV Bus Reactor: 1 No. 765 kV BR bay: Nil (1 No. considered at SI. No.2 above)
4.	Implementation of 220 kV GIS line bay at Bhuj-II PS for Aditya Birla Renewables Subsidiary Limited (ABRSL) [Appln No: 2200000321(362MW)]	220 kV line bay – 1 No. (GIS) (Bus Sec-II)
5.	Implementation of 220 kV GIS line bay at Bhuj-II PS for ACME Cleantech Solutions Private Limited (ACSPL) [Appln No: 2200000382(350 MW)]	220 kV line bay – 1 No. (GIS) (Bus Sec-II)

Sl. No.	Scope of the Transmission Scheme	Capacity /km
6.	Implementation of 220 kV GIS line bay at Bhuj-II PS for ACME Cleantech Solutions Private Limited (ACSPL) [Appln No: 2200000431(50 MW)]	220 kV line bay – 1 No. (GIS) (Bus Sec-II)
7.	Implementation of 220 kV GIS line bay at Bhuj-II PS for Avaada Energy Pvt Ltd. (AEPL) [Appl. No: 2200000444(100 MW)]	220 kV line bay – 1 No. (GIS) (Bus Sec-II)
8.	Implementation of 220 kV GIS line bays at Bhuj-II PS for Adani Green Energy Thirty-Two Ltd. (AGE32L) [Appl. No: 2200000514 (260.5MW)]	220 kV line bay – 1 No. (GIS) (Bus Sec-II)
9.	Implementation of 220 kV GIS line bays at Bhuj-II PS for Adani Renewable Energy Eight Ltd. (ARE8L) [Appl. No: 2200000545 (115MW)]	220 kV line bay – 1 No. (GIS) (Bus Sec-II)

4.2.3 The scheme has been deliberated and agreed in the Special meeting of WRPC held on 27th March 2024.

4.2.4 Estimated Cost of the scheme is INR 587 Crore with Implementation timeframe of 21 months from the date of allocation to implementing agency.

4.2.5 Members may deliberate.

4.3 Transmission System for Offshore Wind Zone Phase-1 (500 MW VGF off the coast of Gujarat for Subzone B3)

4.3.1 MNRE has identified about 30 GW Offshore wind potential each off the coast of Gujarat and Tamil Nadu. Initially 5 GW Offshore wind potential each at Gujarat (CUF – 38%) and Tamil Nadu (CUF – 48%) has been prioritized for implementation..

4.3.2 The matter was deliberated in MNRE in the meeting held on 22.12.2023 for finalization of the specifications of the transmission infrastructure in which following broad decisions were taken:

- The tentative timelines for the offshore wind energy projects are as follows:
  - 500 MW VGF project off-Gujarat coast to be commissioned by March 2028. Tender for the project to be published by March 2024
  - 500 MW VGF project off-Tamil Nadu coast to be commissioned by March 2029. Tender for the project to be published by March 2025.
  - 4 GW non-VGF project off-Tamil Nadu coast to be commissioned in FY 2029-30. Tender for the projects to be published on 01.02.2024

- Non-VGF project off-Gujarat coast will be tendered based on the response for the Tamil Nadu non-VGF project

- Offshore substation and subsea transmission line will be planned for the block-edge locations presented by NIWE in order to reduce conflicts with operations of offshore wind power developers, and reduce the investment by PGCIL.
- The tentative specifications of the transmission infrastructure were agreed upon, and are as follows:
  - Operating voltage for the substation and the transmission line to be kept 220 kV.
  - Substation transformer configuration of 2 x 315 MVA to be used in order to allow for safety margins and evacuation of additional capacity if awarded capacity increases beyond 500 MW
  - 2 x 300 MVA capacity subsea cables to be used for power evacuation

4.3.3 Accordingly, a transmission scheme for Offshore Wind Zone Phase-1 (500 MW VGF on coast of Gujarat for Subzone B3), with following scope is proposed (detailed agenda is enclosed at (**Annexure 4.3**):

Sl. No.	Scope of the Transmission Scheme
A.	**Onwards Transmission System from Onshore Pooling Station** 1. Installation of 2x1500 MVA, 765/400 kV ICTs at Vataman along with 2x125 MVAr (420 kV) Bus Reactor 2. Mahuva Onshore PS (GIS) – Vataman 400 kV D/c line (190 km) (Quad Moose) with 63MVAr & 50 MVAr, 420 kV switchable line reactors on each ckt at Mahuva & Vataman ends respectively. Note: Vataman switching S/s has been planned through LILO of Lakadia-Vadodara 765 kV D/c line at Vataman under Khavda Ph-III (7 GW) and is presently under implementation by POWERGRID (under TBCB) with implementation schedule of Dec'25 (SCOD).

Sl. No.	Scope of the Transmission Scheme
B.	**Onshore Pooling Station** 1. Establishment of 2x500 MVA, 400/220 kV Mahuva Onshore Pooling Station (GIS) (Mahuva PS) alongwith 1x125 MVAR, 420 kV bus reactor (with space provision for upgradation to 765 kV level to cater to future Offshore Wind Projects adjacent to B3, B4, B5 pockets in future) 2. 2 Nos. of 220 kV line bays at Mahuva PS (GIS) for termination of B3-OSS-1 – Mahuva Onshore PS 220 kV 2xS/c (3 core) cables 3. ± 300 MVAr STATCOM at 220 kV level of Mahuva PS (GIS) with 1 No. of 220 kV bay 4. 420 kV, 1x125 MVAR Variable Bus Shunt Reactor with OLTC (control range between 50 – 125 MVAr for VSR) with 1 No. of 400 kV bay 5. 245 kV, 3x50 MVAr Bus Reactors at 220 kV level of Mahuva PS (GIS) **Future provision (space for):** • 765/400 kV ICT along with bays- 6 Nos. • 765 kV line bays along with switchable line reactors – 8 Nos. • 765 kV Bus Reactor along with bay: 2 Nos. • 765 kV Sectionaliser: 1 -set • 400 kV line bays along with switchable line reactors– 8 Nos. (in addition to 2 Nos. bays for Mahuva Onshore PS – Vataman 400 kV D/c line) • 400/220 kV ICT along with bays -8 Nos. • 400 kV Bus Reactor along with bays: 3 Nos. • 400 kV Sectionalization bay: 1- set • 220 kV line bays: 16 Nos. • 220 kV Sectionalization bay: 1 set • 220 kV BC and TBC: 1 No. • STATCOM (±300 MVAR) alongwith associated bay at 220 kV - 3 Nos. • 220kV Bus Reactor along with bays: 7 Nos. • VSR (420kV, 1x125 MVAR Variable Bus Shunt Reactor with OLTC with control range between 50 – 125 MVAr for each VSR) alongwith associated bay at 400 kV – 3 Nos.
C.	**Offshore Pooling Station** 1. Establishment of 2x315 MVA, 220/66 kV Gujarat Offshore B3 Sub-Station Station-1 (B3-OSS-1) with 66 kV line bays – 10 Nos. for RE Interconnection 2. B3-OSS-1 – Mahuva Onshore PS (GIS) 220 kV two nos. (3 core) cables (45 km*- under sea cable of about 35 km & under ground cable of about 10 km) alongwith associated line bays at both ends

Sl. No.	Scope of the Transmission Scheme
	(with capacity of 300 MVA/ckt at nominal voltage) with 1x50 MVAr switchable line reactors at B3-OSS-1 end on each cable
	Note: 1. *The no. of 220 kV Submarine Cables has been considered assuming capacity of one three core cable as 300 MVA.* 2. *Reactive compensation has been worked considering MVAr generation of about 3 MVAr/km by 220 kV Submarine Cable.* 3. ** Distance indicated is beeline length, however, it may change based on actual survey*

4.3.4 The scheme has been deliberated and agreed in the Special meeting of WRPC held on 27th March 2024 with following views:

"Although agreeing to the proposed scheme in principle, WRPC concluded that the transmission scheme should be awarded only after the signing of PPAs and submission of requisite BGs for the 500 MW VGF Offshore Wind tender to the Tender Issuing Authority, so as to ensure optimal utilization of transmission assets. However, the scheme may be initiated immediately if the time between the signing of PPA and COD is less than 3.5 years. This would ensure that the transmission scheme matches with the schedule of the 500 MW VGF Offshore Wind Projects".

4.3.5 Estimated Cost of the scheme is INR 6886 Crore {Onshore Portion: 2186, Offshore Portion: 4700}

4.3.6 Implementation timeframe: The SCOD of 500 MW Offshore Wind off coast of Gujarat is mentioned as 48 months from effective date of PPA in the draft RfS document (which is under finalization by MOP/MNRE). The above proposed transmission system needs to be matched with the associated RE generation.

4.3.7 MNRE/SECI may inform status of RfS and effective date of PPA / commissioning schedule of Offshore wind Project in Gujarat (500MW).

4.3.8 A meeting on "Offshore development" was held under chairmanship of Hon'ble Minister of Power and New & Renewable Energy on 14.06.2023, to discuss the issues related to grid connection, timelines and bidding of offshore wind energy projects under various models. During the meeting, it was decided that initially 2 GW offshore evacuation infrastructure (1 GW in Gujarat and 1 GW in Tamil Nadu) may be developed by PGCIL under RTM and further, 4 GW evacuation infrastructure will be developed under TBCB.

4.3.9 Members may deliberate.

4.4 Transmission System for 1 GW Offshore wind farm (Phase-I) in Tamil Nadu

4.4.1 MNRE has identified about 30 GW Offshore wind potential each off the coast of Gujarat and Tamil Nadu. Initially 5 GW Offshore wind potential each at Gujarat (CUF – 38%) and Tamil Nadu (CUF – 48%) has been prioritized for implementation wherein 2 GW transmission capacity (1 GW each off the coast of Gujarat and Tamil Nadu) will be developed in the 1st Phase and further 4 GW each off the coast of Gujarat and Tamil Nadu shall be developed subsequently.

4.4.2 Accordingly, a transmission System for 1 GW Offshore wind farm (Phase-I) in Tamil Nadu with following scope is proposed (detailed agenda is enclosed at (**Annexure-4.4)**:

Sl. No.	***Scope of the Transmission Scheme***	***Capacity /km***
A. Transmission System Onwards Onshore Pooling Station		
1.	Establishment of 3x500 MVA, 400/230 kV Onshore Pooling Station near Avaraikulam, Tirunelveli District in Tamil Nadu with provision of expansion upto 5 GW **Future Space Provisions:** • 400/230 kV, 500 MVA, ICTs – 9 Nos. • 400 kV ICT bays – 9 Nos. • 230 kV ICT bays – 9 Nos. • 400 kV line bays – 12 Nos. (with provision for SLR) • 230 kV line bays – 16 Nos. • 230 kV Bus Sectionalizer : 3 sets • 230 kV Bus Coupler (BC) Bay – 3 Nos. • 230 kV Transfer Bus Coupler (TBC) Bay – 3 Nos.	• 400/230 kV, 500 MVA, ICTs – 3 Nos. • 400 kV ICT bays – 3 Nos. • 220 kV ICT bays – 3 Nos. • 400 kV line bays – 2 Nos. (at Avaraikulam Onshore PS for termination of Avaraikulam Onshore PS – Tuticorin PS line) • 230 kV line bays – 4 Nos. • 230 kV Bus Coupler (BC) Bay – 1 no. • 230 kV Transfer Bus Coupler (TBC) Bay – 1 no.
2.	Avaraikulam Onshore PS – Tuticorin PS 400 kV D/c quad line	• Line length ~100 km • 400 kV line bays - 2 (at Tuticorin PS)
3.	± 300 MVAr STATCOM along with 2x125 MVAr MSR	• 400 kV bay – 1 No.
B. Transmission System for integration of Offshore Wind Farms with Onshore PS		
	Offshore Substation-1 {500 MW VGF}	
1.	Establishment of 2x315 MVA, 230/66 kV Off-Shore Substation- 1 No. with 10 Nos. of 66 kV line bays for RE integration	• 230/66 kV, 315 MVA, ICTs – 2 Nos. • 230 kV ICT bays – 2 Nos. • 66 kV ICT bays – 2 Nos. • 230 kV line bays – 2 Nos. (at Off-Shore Substation-1 for termination of Offshore substation 1 (OSS-1) – Avaraikulam Onshore PS line) • 66 kV line bays – 10 Nos.

Sl. No.	*Scope of the Transmission Scheme*	*Capacity /km*
A. Transmission System Onwards Onshore Pooling Station		
2.	Offshore substation 1 (OSS-1) – Avaraikulam Onshore PS 2 Nos. 230 kV (atleast 300 MVA capacity) Submarine cables (~35 - 40 km) with 2x50 MVAr switchable line reactors at OSS-1 end	• Cable length ~35 - 40 km • 230 kV, 50 MVAr switchable line reactors at OSS-1 end – 2 Nos.
	Offshore substation-2 {500 MW Non-VGF}	
1.	Establishment of 2x315 MVA, 230/66kV Off-Shore Substation-2 with 10 Nos. of 66kV line bays for RE integration	• 230/66kV, 315 MVA, ICTs – 2 Nos. • 230 kV ICT bays – 2 Nos. • 66kV ICT bays – 2 Nos. • 230 kV line bays – 2 Nos. (at Off-Shore Substation-2 for termination of Offshore substation 2 (OSS-2) – Avaraikulam Onshore PS line) • 66 kV line bays – 10 Nos.
2.	Offshore substation 2 (OSS-2) – Avaraikulam Onshore PS 2 Nos. 230 kV (atleast 300 MVA capacity) Submarine cables (~35 - 40 km) with 2x50 MVAr switchable line reactors at OSS-2 end	• Cable length ~35 - 40 km • 230 kV, 50 MVAr switchable line reactors at OSS-2 end – 2 Nos.

4.4.3 The scheme was discussed in the 50th SRPC meeting held on 16.03.2024. The views of SRPC are enclosed at Annex 4.4 A

4.4.4 Estimated Cost of the scheme is INR 11485 Crore {Transmission System onwards Onshore Pooling Station - Rs. 1193 Crore, Transmission System for integration of Offshore Wind Farms with Onshore PS - Rs. 10,292 Crore} with implementation timeframe of March 2029.

4.4.5 A meeting on "Offshore development" was held under chairmanship of Shri R.K. Singh, Hon'ble Minister of Power and New & Renewable Energy on 14.06.2023, to discuss the issues related to grid connection, timelines and bidding of offshore wind energy projects under various models. During the meeting, it was decided that initially 2 GW offshore evacuation infrastructure (1 GW in Gujarat and 1 GW in Tamil Nadu) may be developed by PGCIL under RTM and further, 4 GW evacuation infrastructure will be developed under TBCB.

4.4.6 Members may deliberate.

4.5 Transmission System for evacuation of power from Mahan Energen Limited Generating Station in Madhya Pradesh

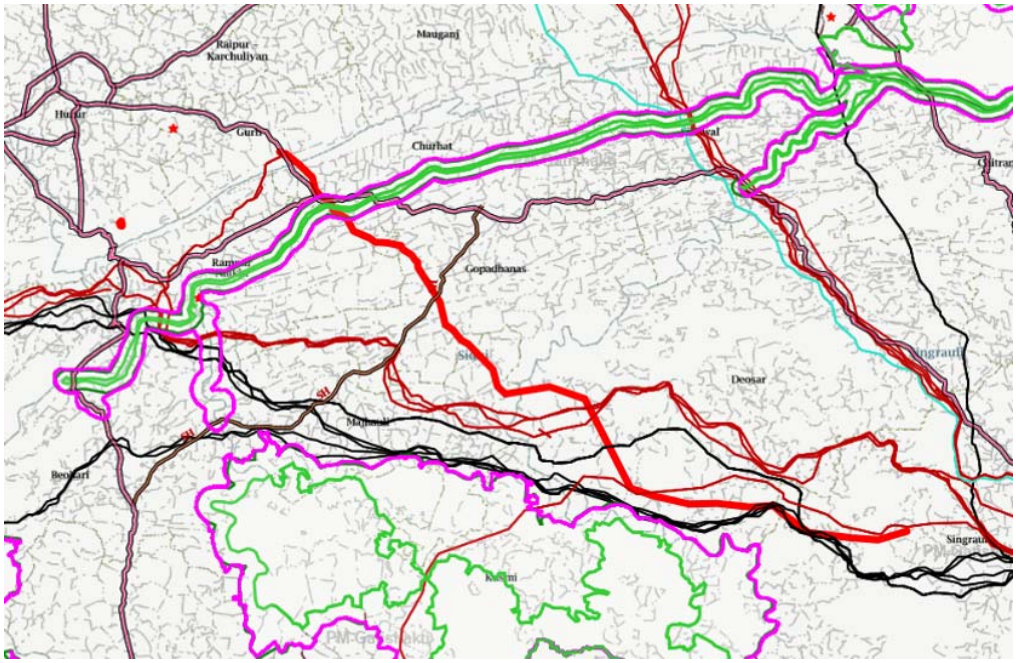
4.5.1 Transmission System for evacuation of 1200 MW of power from Mahan Energen Limited (2x600MW) Generating Station in Madhya Pradesh with following scope is proposed (detailed agenda is enclosed at (**Annexure- 4.5)**:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1.	Mahan (existing bus) – Rewa PS (PG) 400 kV D/c (quad) line	110 km.
2.	2 Nos. 400 kV bays at Rewa PS (PG) for termination of Mahan (existing bus) – Rewa PS (PG) 400 kV D/c line (quad) line	400 kV bays: 2 Nos.

Note: *2 Nos. 400 kV line bays at MEL (existing) shall be under the scope of MEL. POWERGRID to provide space at Rewa PS (PG) for scope at Sl. 2*

4.5.2 The scheme has been deliberated and agreed in the Special meeting of WRPC held on 27th March 2024.

4.5.3 The line may infringe reserved forest (Sone Crocodile Sanctuary) in the state of state of MP (refer Gati Shakti snapshot). However, for further details of forest/protected areas, survey is required to be done.



4.5.4 Estimated Cost of the scheme is INR 558 Crore with Implementation timeframe of 24 months.

4.5.5 Members may deliberate.

4.6 **Augmentation of transformation capacity at 765/400 kV Lakadia S/s (WRSS XXI(A) Transco Ltd) in Gujarat – Part B**

4.6.1 To enable evacuation of RE power from various generation projects in Lakadia REZ (Cumulative RE connectivity granted/agreed at Lakadia till date: 3,500 MW), transmission system for Augmentation of transformation capacity at 765/400 kV Lakadia S/s (WRSS XXI(A) Transco Ltd) in Gujarat – Part B with following scope is proposed (detailed agenda is enclosed at (**Annexure-4.6**).

Sl. No.	***Scope of the Transmission Scheme***	***Capacity /km***	***Time-frame***
1.	Installation of 2x500 MVA, 400/220 kV ICTs (3rd & 4th) at Lakadia PS along with associated ICT bays	• 400/220 kV, 1x500 MVA ICT – 2 Nos. • 400 kV ICT bay – 2 Nos. • 220 kV ICT bay – 2 Nos. (220 kV bus section-I)	**18 months** from date of allocation to implementing agency
2.	Implementation of 220 kV line bay at Lakadia PS for TEQ Green Power XVII Private Limited (TGPXVIIPL: 300 MW)	• 220 kV line bay – 1 no. (220 kV bus section-I)	**18 months** from date of allocation to implementing agency
3.	Implementation of 220 kV line bay at Lakadia PS for Arcelor Mittal Nippon Steel India Limited (AMNSIL: 350 MW)	• 220 kV line bay – 1 no. (220 kV bus section-I)	**18 months** from date of allocation to implementing agency
4.	Implementation of 220 kV line bay at Lakadia PS for Renew Solar (Shakti Eight) Private Limited (RS(S8)PL: 200 MW)	• 220 kV line bay – 1 no. (220 kV bus section-I)	**30.09.2026** (as per start date requested by applicant)*
5.	Creation of New 220 kV Bus Section-II at Lakadia PS along with 220 kV Sectionaliser arrangement between 220 kV Bus sec-I & Sec-II	• 220 kV Bus Sectionaliser - 1 set • BC – 1 No. • TBC – 1 No.	**18 months** from date of allocation to implementing agency
6.	Augmentation of transformation capacity at Lakadia PS by 4x500 MVA, 400/220 kV ICTs (5th 6th, 7th & 8th) terminated on new 220 kV Bus Section-II	• 500 MVA, 400/220 kV ICTs: 4 No. • 400 kV ICT bays: 4 Nos. • 220 kV ICT bays: 4 No. (New Bus Section-II)	**18 months** from date of allocation to implementing agency
7.	Implementation of 220 kV line bay at Lakadia PS for Juniper Green Energy Private Limited (JGEPL) (Appl. No. 2200000376: 300 MW)	• 220 kV line bay – 1 No. (New Bus Section-II)	**30.06.2027** (as per start date requested by applicant)*

Sl. No.	*Scope of the Transmission Scheme*	*Capacity /km*	*Time-frame*
8.	Implementation of 220 kV line bay at Lakadia PS for TEQ Green Power XVI Pvt. Ltd. (TGPXVIPL) (Appl. No. 2200000398: 76MW)	• 220 kV line bay – 1 No. (New Bus Section-II)	**30.09.2026** (as per start date requested by applicant)*
9.	Implementation of 220 kV line bay at Lakadia PS for Ganeko Solar Pvt. Ltd. (GSPL) (Appl. No. 2200000458: 290 MW)	• 220 kV line bay – 1 No. (New Bus Section-II)	**31.12.2026** (as per start date requested by applicant)*
10.	Implementation of 220 kV line bay at Lakadia PS for Juniper Green Energy Private Limited (JGEPL) (Appl. No. 2200000500: 150 MW)	• 220 kV line bay – 1 No. (New Bus Section-II)	**31.03.2027** (as per start date requested by applicant)*
11.	Implementation of 220 kV line bay at Lakadia PS for Serentica Renewables India Private Limited (SRIPL) (Appl. No. 2200000610: 200 MW)	• 220 kV line bay – 1 No. (New Bus Section-II)	**18 months** from date of allocation to implementing agency
12.	Implementation of 220 kV line bay at Lakadia PS for RDS Solar Park Private Limited (RDSSPPL) (Appl. No. 2200000639: 350 MW)	• 220 kV line bay – 1 No. (New Bus Section-II)	**18 months** from date of allocation to implementing agency
13.	Implementation of 220 kV line bay at Lakadia PS for Percentum Renewables Private Limited (PRPL) (Appl. No. 2200000673: 148 MW)	• 220 kV line bay – 1 No. (New Bus Section-II)	**18 months** from date of allocation to implementing agency
14.	Installation of 1x330 MVAr 765 kV Bus Reactor (2nd) along-with associated bay	• 330 MVAr, 765 kV Bus Reactor: 1 No. • 765 kV BR bay: 1 No.	**18 months** from date of allocation to implementing agency
15.	Augmentation of transformation capacity at Lakadia PS by 1x1500 MVA, 765/400 kV ICTs (3rd)	• 1500 MVA, 765/400 kV ICT: 1 No. • 400 kV ICT bay: 1 No. • 765 kV ICT bay: 1 No.	**18 months** from date of allocation to implementing agency

**subject to minimum schedule of 18months from from the date of allocation to implementing agency .*

Note: *TSP of Lakadia S/s (WRSS XXI(A) Transco Ltd.) shall provide space for above augmentation works at Lakadia S/s*

4.6.2 The scheme has been deliberated and agreed in the Special meeting of WRPC meeting held on 27th March 2024.

4.6.3 Estimated Cost of the scheme is INR 636 Crore. and element wise time schedule is given at para 4.6.1 above.

4.6.4 Members may deliberate.

4.7 Transmission System for evacuation of RE power from Raghanesda area of Gujarat – 3 GW under Phase-I

4.7.1 As per MNRE OM dated 26.03.2024, Raghanesda region in Banaskantha District of Gujarat is potential Renewable Energy (RE) zone with potential of 5 GW in the initial phase (i.e. related to 1 GW RE park of GPCL and 4 GW RE park of M/s Torrent for which land allocation by Government of Gujarat is under process). Out of 4 GW Solar Capacity of Torrent, 2.5 GW is under ISTS. Out of 1 GW RE park of GPCL, 0.5 GW is being considered under ISTS in 1st phase planning. Presently, connectivity under GNA has been received for 0.6GW (3x200MW from M/s Sprng) at Raghanesda PS with start date progressively from Jun-28 to Dec-29.

4.7.2 Accordingly, transmission system for evacuation of RE power from Raghanesda area of Gujarat – 3 GW under Phase-I with following scope is proposed (detailed agenda is enclosed at (**Annexure-4.7**):

Sl. No.	***Scope of the Transmission Scheme***	***Capacity /km***
1.	Establishment 3x1500 MVA, 765/400 kV Substation near Raghanesda (GIS) with 2x330 MVAR, 765 kV bus reactor and 2x125 MVAR, 420 kV bus reactor **Future provision (space for):** ➢ 765/400 kV ICT along with bays- 5 Nos. (1 No. in Sec-I & 4 Nos. on Sec-II) ➢ 765 kV line bays along with switchable line reactors – 8 Nos. (4 Nos. on Sec-I & 4 Nos. on Sec-II) ➢ 765 kV Bus Reactor along with bay: 2 Nos. (on Sec-II) ➢ 765 kV Sectionaliser: 1 -set ➢ 400 kV line bays along with switchable line reactors– 12 Nos. *(6 Nos. on Sec-I & 6 Nos. on Sec-II)* ➢ 400/220 kV ICT along with bays - 8 Nos. (4 Nos. on each 400 kV Section) ➢ 400 kV Bus Reactor along with bays: 2 Nos. (Sec-II) ➢ 400 kV Sectionalization bay: 1- set ➢ 220 kV line bays: 10 Nos. (5 Nos. on each 220 kV Section) ➢ 220 kV Sectionalization bay: 1 set	• 765/400 kV, 1500 MVA ICT – 3 Nos. (10x500 MVA single phase units including one spare ICT Unit) • 765 kV ICT bays – 3 Nos. • 400 kV ICT bays – 3 Nos. • 765 kV Line bays – 2 Nos. • 1x330 MVAr, 765 kV bus reactor- 2 Nos. (7x110 MVAR single phase Reactors including one spare Unit for bus /line reactor) • 765 kV Bus reactor bay – 2 Nos. • 125 MVAr, 420 kV reactor- 2 Nos. • 400 kV Reactor bay- 2 Nos. • 400 kV line bays - 4 Nos. (for interconnection of RE Projects)

	➢ 220 kV BC and TBC: 1 No. ➢ Establishment of 6000 MW, ± 800 kV Raghanesda (HVDC) [LCC] terminal station (4x1500 MW) along with associated interconnections with 400 kV HVAC Switchyard & all associated equipment (incl. filters)/bus extension, etc.	
2.	Raghanesda (GIS) – Banaskantha (PG) 765 kV D/c line	95 km
3.	2 Nos. 765 kV line bays at Banaskantha (PG) S/s	765 kV line bays – 2 Nos.

Note: *TSP of Banaskantha S/s (POWERGRID) shall provide space for scope at Sl. 3 above.*

4.7.3 The scheme has been deliberated and agreed in the Special meeting of WRPC held on 27th March 2024.

4.7.4 Estimated Cost of the scheme is INR 1855 Crore with Implementation timeframe of 24 months.

4.7.5 Members may deliberate.

4.8 **Transmission scheme for evacuation of power from Ratle HEP (850 MW)**

4.8.1 To grant connectivity to RHPCL for Ratle HEP (850 MW), transmission scheme for evacuation of power from Ratle HEP (850 MW) with following scope is proposed (detailed agenda is enclosed at **(Annexure-4.8)**:

Sl. No.	**Description of Transmission Element**	**Scope of work** **(Type of Substation/Conductor capacity/km/no. of bays etc.)**
1	LILO of 400 kV Kishenpur- Dulhasti line (Twin) at Kishtwar S/s along with associated bays at Kishtwar S/s	LILO Length- 3km • 400 kV Kishenpur -Kishtwar (LILO section) is on Twin HTLS (with minimum 2100 MVA capacity) configuration • 400 kV Dulhasti -Kishtwar (LILO section) is on Twin Zebra configuration • 400 kV line bays at Kishtwar – 2 Nos. (GIS) (line bays at Kishtwar S/s end shall be rated accordingly)

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
2	Reconductoring of 400 kV Kishenpur-Kishtwar section with Twin HTLS (minimum 2100 MVA capacity) (formed after LILO of Kishenpur-Dulhasti line at Kishtwar S/s) along with bay upgradation works (2000 A to 3150 A) at Kishenpur end for above line.	Length – 120km • 400 kV Bay upgradation work- 1 no. bay at Kishenpur end
3	400 kV Kishenpur-Samba D/c line (Quad) (only one circuit is to be terminated at Kishenpur utilizing 1 no. of 400 kV vacated line bay at Kishenur S/s (formed with bypassing of one ckt of 400 kV Kishtwar – Kishenpur 400 kV D/c line (Quad) at Kishenpur) while second circuit would be connected to bypassed circuit of 400 kV Kishtwar – Kishenpur line (Quad))	Length -36 km (Quad)
4	Bypassing of one ckt of 400 kV Kishtwar – Kishenpur 400 kV D/c line (Quad) at Kishenpur and connecting it with one of the circuit of Kishenpur-Samba 400 kV D/c line(Quad), thus forming **400 kV Kishtwar - Samba (Quad) direct line (one ckt)**	
5	1x80 MVAr Switchable line reactor at Samba end of 400 kV Kishtwar-Samba 400 kV line-165km (Quad) [formed after bypassing of 400 kV Kishtwar – Kishenpur line (Quad) at Kishenpur and connecting it with one of the circuit of Kishenpur-Samba 400 kV D/c line(Quad))	• 420 kV, 80 MVAr switchable line reactors at Samba S/s end– 1 Nos. • Switching equipment for 420 kV, 80 MVAr switchable line reactors at Samba S/s end – 1 no
6	Bypassing both ckts of 400 kV Kishenpur – Samba D/c line (Twin) & 400 kV Samba – Jalandhar D/c line (Twin) at Samba and connecting them together to form **400 kV Kishenpur– Jalandhar D/c direct line (Twin)** (4 Nos. of vacated 400 kV line bays at Samba S/s will be utilized for 400 kV	Length -0.5 km (Twin)

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
	Kishenpur-Samba D/c line (Quad) & 400 kV Samba- Jalandhar D/c line(Quad))	
7	Bays upgradation works (2000A to 3150A) at Samba end (4 Nos. bays vacated after bypassing of Kishenpur – Samba D/c line (Twin) & 400 kV Samba – Jalandhar D/c line (Twin))	400 kV Bay upgradation works- 4 Nos. bays
8	1x63 MVAr Switchable line reactor on each ckt at Jallandhar end of Kishenpur– Jalandhar D/c direct line -171km(Twin) (formed after bypassing both ckts of 400 kV Kishenpur – Samba D/c line (Twin) & 400 kV Samba – Jalandhar D/c line (Twin) at Samba and connecting them together to form Kishenpur– Jalandhar D/c direct line (Twin))	• 420 kV, 63 MVAr switchable line reactors at Jallandhar S/s end– 2 Nos. • Switching equipment for 420 kV, 63 MVAr switchable line reactors at Jallandhar S/s end – 2 no
9	400 kV Samba- Jalandhar D/c line(Quad) (only one circuit is to be terminated at Jalandhar utilizing 1 no. of 400 kV vacated line bay at Jalandhar S/s (formed with bypassing of 400 kV Jalandhar – Nakodar line (Quad) at Jalandhar) while second circuit would be connected to bypassed circuit of Jalandhar –Nakodar 400 kV line (Quad))	Line Length -145 km
10	1x80 MVAr Switchable line reactor at Samba end of Samba –Nakodar direct line (Quad) formed after bypassing of 400 kV Jalandhar – Nakodar line-187km (Quad) at Jalandhar and connecting it with one of the circuit of Samba-Jalandhar 400 kV D/c line(Quad Moose), thus forming Samba – Nakodar line (Quad)	• 420 kV, 80 MVAr switchable line reactors at Samba S/s end– 1 no. • Switching equipment for 420 kV, 80 MVAr switchable line reactors at Samba S/s end – 1 no.
11	Bypassing 400 kV Jalandhar – Nakodar line (Quad) at Jalandhar and connecting it with one of the circuit of Samba-Jalandhar 400 kV D/c line(Quad Moose), thus	

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
	forming **400 kV Samba –Nakodar (Quad) direct line**	

Note:

- M/s Sterlite shall provide space for 2 Nos. of 400 kV line bays (GIS) at Kishtwar S/s
- M/s POWERGRID shall provide space for 1 no. 80 MVAr Switchable line reactor (along with switching equipment) at Samba end of 400 kV Kishtwar-Samba 400 kV line
- M/s POWERGRID shall provide space for 400 kV bays upgradation works (4 Nos.) at Samba S/s end
- M/s POWERGRID shall provide space for 2 Nos. 63 MVAr Switchable line reactor (along with switching equipment) at Jallandhar end of Kishenpur– Jalandhar D/c direct line (on each ckt)
- M/s POWERGRID shall provide space for 1 no. 80 MVAr Switchable line reactor (along with switching equipment) at Samba end of Samba –Nakodar direct line
- M/s POWERGRID shall provide space for 400 kV Bay upgradation works (1 no.) at Kishenpur S/s end

4.8.2 The transmission scheme was discussed and technically approved in the 72nd NRPC meeting held on 30.03.24.

4.8.3 Estimated Cost of the scheme is INR 1402.34 Crore with Implementation timeframe of 30.09.2026 (M/s Ratle HEP informed the commissioning schedule progressively from 30.09.26)

4.8.4 Members may deliberate.

4.9 Augmentation with 400/220 kV, 1x500 MVA Transformer (10th) at Fatehgarh-2 PS

4.9.1 Augmentation with 400/220 kV, 1x500 MVA, Transformer (10th) at Fatehgarh-2 PS was agreed as part of "transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part J" in 5th NCT meeting held on 25.08.2021 and 02.09.2021. In above meeting, it was also agreed that Implementation of above ICT shall be taken up after LTA of 4490 MW at 220 kV level of Fatehgarh-2 PS. Subsequently, based on NCT recommendation, MoP vide OM dated 01.12.2021 awarded above transmission scheme to CTUIL with implementation timeframe of 15 months from MoP OM or evacuation requirement beyond 4490 MW at 220 kV level of Fatehgarh-2 PS, whichever is later. Further, CTUIL vide letter dated 02.12.2021 allocated above scheme to POWERGRID based on MoP OM dated 01.12.2021.

4.9.2 220kV level of Fatehgarh-2 PS is implemented in two sections i.e. Section-I & II. Further, both the 220kV sections are implemented in geographically opposite sides (way apart

from each other and not electrically connected) as per GA and layout of pooling station. However, 400kV & 765kV bus remained common for both the yards. At present, RE Connectivity of 2490MW under GNA is granted at Section-I and 1970MW is granted at Section-II, thus making total connectivity at Fatehgarh-2 PS as 4460MW which is less than 4490MW.

Subsequently, Manual on Transmission Planning Criteria was published by CEA in Mar'23. As per the above, 'N-1' reliability criteria may be considered for ICTs at the ISTS / STU pooling stations for renewable energy based generation of more than 1000 MW. As both the 220kV sections of Fatehgarh-2 PS are electrically isolated and have more than 1000MW RE connectivity in respective sections, 'N-1' criteria to be fulfilled at both the sections. Keeping above in view, 1x500MVA, 400/220kV ICT (6th) at Section-I was awarded which is under implementation (Jun'24).

4.9.3 With the above background, details of 400/220kV ICTs and Connectivity at Fatehgarh-2 PS are as under:

Section	Connectivity (MW)	400/220kV ICTs	Remarks
Section-I	2490	6x500MVA	5 nos. ICTs are existing. 1 no. ICT is under implementation (Jun'24), to fulfill '*N-1*' criteria
Section-II	1970	4x500MVA	4 nos. ICTs are existing. **1 No. ICT is required to fulfill '*N-1*' Criteria**
Total	**4460**	**10x500MVA**	

4.9.4 In view of above, 1x500MVA, 400/220kV ICT(now 11th ICT) at Fatehgarh-II PS as approved by MoP vide OM dated 01.12.2021 based on recommendation in 5th NCT meeting may be taken up for implementation with 18 month implementation schedule considering present timeline for ICT augmentation (instead of earlier 15 months) to fulfil 'N-1' criteria as per CEA Manual on Transmission Planning Criteria, 2023.

4.9.5 Considering requirement of ICT (in Fatehgarh-II Section-II) for N-1 compliance in Fatehgarh-II PS, transmission scheme "Augmentation with 400/220 kV, 1x500 MVA Transformer (10th) at Fatehgarh-2 PS" with following scope is proposed (detailed agenda is enclosed at (**Annexure-4.9**):

Earlier (as per MOP OM dated 01.12.21)	Amendment

Augmentation with 400/220 kV, 1x500 MVA Transformer **(10th)** at Fatehgarh-2 PS • 400/220 kV 500 MVA ICT:1 no • 400 kV ICT bays – 1 Nos. • 220 kV ICT bays - 1 Nos. **Implementation Timeframe- 15 months from MOP OM or evacuation requirement beyond 4490 MW at 220 kV level of Fatehgarh-2, whichever is later.**	Augmentation with 400/220 kV, 1x500 MVA Transformer **(11th)** at Fatehgarh-II PS (5th ICT in Fatehgarh-II section-II) • 400/220 kV 500 MVA ICT:1 no • 400 kV ICT bays – 1 no. • 220 kV ICT bays - 1 no. **Implementation Timeframe- 18 months for N-1 compliance in Fatehgarh-II PS (Section-II)**

4.9.6 Members may deliberate.

4.10 Transmission system strengthening at Kurnool-III PS for integration of additional RE generation projects

4.10.1 Presently, Kurnool-III 765/400/220 kV PS is under implementation by POWERGRID through RTM route and is expected by Nov'24. CTU have granted/agreed Connectivity for 8000 MW (2650 MW at 220 kV level & 5350 MW at 400 kV level).

4.10.2 Accordingly, for immediate integration & evacuation of power for grant of Connectivity to additional RE generation projects, scheme "Transmission system strengthening at Kurnool-III PS for integration of additional RE generation projects" with following scope is proposed (detailed agenda is enclosed at (**Annexure- 4.10**):

Package	***Scope of the Transmission Scheme***	***Capacity /km***	***Schedule***
A	Augmentation of transformation capacity by 3x1500 MVA, 765/400 kV ICTs at Kurnool-III PS	• 3x1500 MVA, 765/400 kV ICT • 765 kV ICT bay – 3 Nos. • 400 kV ICT bay – 3 Nos. • 400 kV Bus Sectionaliser – 1 Set	24 months
	Kurnool-III PS – Chilakaluripeta 765 kV D/c line with 240 MVAr switchable line reactors at both ends	~ 260 km • 765 kV line bays – 2 Nos. (at Kurnool-III PS) • 765 kV line bays – 2 Nos. (at Chilakaluripeta) • 765 kV, 240 MVAr SLR at Kurnool-III PS – 2 Nos. (6x80 MVAr units) • 765 kV, 240 MVAr SLR at Chilakaluripeta – 2 Nos. (6x80 MVAr units)	
B	2 Nos. of 400 kV line bays at Kurnool-III PS for termination of dedicated transmission line of M/s	• 400 kV line bays – 2 Nos.	30.06.26

Package	*Scope of the Transmission Scheme*	*Capacity /km*	*Schedule*
	Adani Renewable Energy Forty Two Ltd.		
	4 Nos. of 400 kV line bay at Kurnool-III PS for termination of dedicated transmission lines of M/s Indosol Solar Pvt. Ltd.	• 400 kV line bays – 1 Nos.	30.06.25
		• 400 kV line bays – 1 Nos.	24 months
		• 400 kV line bays – 2 Nos.	31.03.27
	2 Nos. of 400 kV line bays at Kurnool-III PS for termination of dedicated transmission line of M/s Adani Renewable Energy Fifty One Ltd.	• 400 kV line bays – 2 Nos.	31.12.27
C	Augmentation of 1x1500 MVA 765/400 kV ICT (7^{th}) at Kurnool-II PS	• 1x1500 MVA, 765/400 kV ICT • 765 kV ICT bay – 1 Nos. • 400 kV ICT bay – 1 Nos.	24 months

4.10.3 The scheme was discussed in the 51st SRPC meeting held on 15.05.2024. Views of SRPC are enclosed at Annex 4.10 A

4.10.4 Estimated Cost of the scheme is INR 2886 Crore {Package A - Rs. 2650 Crore, Package B - Rs. 110 Crore, Package C - Rs. 126 Crore}

4.10.5 Members may deliberate

4.11 Redundant Communication System for Dulhasti (NHPC) & Kishtwar (Sterlite) stations

4.11.1 Transmission Scheme "Redundant Communication System for Dulhasti (NHPC) & Kishtwar (Sterlite) stations" with following scope is proposed (detailed agenda is enclosed at **(Annexure- 4.11**):

S. No.	Items	Details
1.	Name of scheme	Redundant Communication system for Dulhasti (NHPC) & Kishtwar (Sterlite) stations
2.	Scope of the scheme	Supply and installation of OPGW (24F) on 400 kV Kishenpur- Dulhasti S/c line (Circuit-1) line (120 kms) and 1 FOTE each at Dulhasti & Kishenpur stations (Total 2 no. FOTE)
3.	Estimated Cost	Rs. 7.2 crore (approx.) (excluding taxes and duties)
4.	Implementation timeframe	Matching timeframe with reconductoring scheme (Work may be awarded alongwith Reconductoring scheme)

		Typical 12 months
5.	Implementation Agency	OPGW and Reconducting work may be awarded to the same Agency
6.	Deliberations in different meetings	The scheme was deliberated in the 73rd meeting of NRPC and technically agreed.

4.11.2 Members may deliberate.

4.12 **Supply and installation of 24 Fibre OPGW on PKTCL lines for providing redundant communication for Parbati Pool (Banala) (PG) S/s, Parbati-II (NHPC) & Parbati-III (NHPC) stations.**

4.12.1 Scheme has been bifurcated into two parts as below for OPGW and FOTE. (detailed agenda is enclosed at (**Annexure- 4.12**):

(a) Supply and installation of 24 Fibre OPGW on PKTCL lines for providing redundant communication for Parbati Pooling (Banala) (PG) S/s, Parbati-II (NHPC) & Parbati-III (NHPC) stations.

S. No.	Items	Details
1.	Name of scheme	Supply and installation of 24 Fibre OPGW on PKTCL lines for providing redundant communication for Parbati Pooling (Banala) (PG) S/s, Parbati-II (NHPC) & Parbati-III (NHPC) stations.
2.	Scope of the scheme	Supply and installation of OPGW (24F) on following lines owned by PKTCL: (i) Parbati-II – Parbati-III – **9.643 km** (ii) Parbati-III – Parbati Pooling (Banala) – **3.518 km** (iii) Parbati Pooling (Banala) – Koldam (NTPC) – **62.636 km** (iv) Parbati-II - Parbati Pooling (Banala) – **9.643 km** **Total km- 88.635**
3.	Estimated Cost	Rs. 5.31 Crore (approx.) (excluding taxes and duties)
4.	Implementation timeframe	18 months from the date of allocation
5.	Deliberations in different meetings	The scheme was deliberated in the 72nd meeting of NRPC.

(b) Supply and installation of 24Fibre OPGW & FOTE to providing redundant communication for Parbati Pooling (Banala) (PG) S/s , Parbati-II (NHPC) & Parbati-III (NHPC) stations.

S. No.	Items	Details
1.	Name of scheme	Supply and installation of 24 Fibre OPGW & FOTE to providing redundant communication for Parbati Pooling (Banala) (PG), Parbati-II (NHPC) & Parbati-III (NHPC) stations.
2.	Scope of the scheme	(i) Supply and installation of OPGW (24F) on Parbati Pooling (Banala) line (0.783Km) on POWERGRID portion. (ii) Supply and installation of 4 Nos. FOTE (STM-16) at Parbati Pooling (Banala), Parbati-II (NHPC), Parbati-III (NHPC) & Koldam (NTPC) stations (1 no. at each location)
3.	Estimated Cost	1.24 crore (approx.) (excluding taxes and duties)
4.	Implementation timeframe	18 months from the date of allocation (with matching schedule with Scheme A.)
5.	Deliberations in different meetings	The scheme was deliberated in the 72nd meeting of NRPC.

4.12.2 Members may deliberate

4.13 **Redundant Communication for Chamera-III (NHPC) & Budhil (GreenCo) using 3 pairs of fibers sharing from HPPTCL network.**

4.13.1 Transmission Scheme "Redundant Communication for Chamera-III (NHPC) & Budhil (GreenCo) using 3 pairs of fibers sharing from HPPTCL network" with following scope is proposed (detailed agenda is enclosed at (**Annexure-4.13**):

S. No.	Items	Details
1.	Name of Scheme	Redundant Communication for Chamera-III (NHPC) & Budhil (GreenCo) using 3 pairs of fibers sharing from HPPTCL network.
2.	Scope of the scheme	Supply and installation of 1 no. STM-16 FOTE at Lahal (HPPTCL)
3.	Estimated Cost	**Rs. 0.3 Crore (approx.) (excluding taxes and duties)**
4.	Implementation timeframe	**18 months from the date of allocation**
5.	Deliberations in different meetings	The scheme was deliberated in the 72nd meeting of NRPC.

4.13.2 Members may deliberate

4.14 **Additional FOTE requirements at AGC locations in Western Region**

4.14.1 Transmission Scheme "Additional FOTE requirements at AGC locations in Western Region" with following scope is proposed (detailed agenda is enclosed at (**Annexure-4.14**):

<table>
<tr><th>S. No.</th><th>Items</th><th>Details</th></tr>
<tr><td>1.</td><td>Name of Scheme</td><td>Additional FOTE requirements at AGC locations in Western Region.</td></tr>
<tr><td>2.</td><td>Scope of the scheme</td><td>Supply and installation of 13 Nos, 3 MSP (1+1) FOTE (STM-16 capacity) at following station:
<table>
<tr><th>S. No.</th><th>Station Name</th><th>No of FOTE required</th></tr>
<tr><td>1</td><td>VSTPS III</td><td>2</td></tr>
<tr><td>2</td><td>VSTPS V</td><td>2</td></tr>
<tr><td>3</td><td>VSTPS II</td><td>2</td></tr>
<tr><td>4</td><td>NTPC Gandhar</td><td>1</td></tr>
<tr><td>5</td><td>NTPC Khargone</td><td>2</td></tr>
<tr><td>6</td><td>Mauda</td><td>1</td></tr>
<tr><td>7</td><td>Sipat</td><td>1</td></tr>
<tr><td>8</td><td>LARA</td><td>1</td></tr>
<tr><td>9</td><td>NSPCL</td><td>1</td></tr>
</table></td></tr>
<tr><td>3.</td><td>Estimated Cost &Funding</td><td>Rs. 3.90 Cr. (approx.) excluding GST.</td></tr>
<tr><td>4.</td><td>Implementation timeframe</td><td>12 months from the date of allocation</td></tr>
<tr><td>5.</td><td>Deliberations with WRPC along with their comments</td><td>Discussed and approved in 49th TCC/WRPC meeting held on 12-13 Apr 2024.</td></tr>
</table>

4.14.2 Members may deliberate

4.15 Redundant OPGW communication path for Solapur STPP under AGC

4.15.1 Transmission Scheme "Redundant OPGW communication path for Solapur STPP under AGC" with following scope is proposed (detailed agenda is enclosed at **(Annexure-4.15)**:

S. No.	Items	Details
1.	Name of Scheme	Redundant OPGW communication path for Solapur STPP under AGC.
2.	Scope of the scheme	Supply and installation of a) 24F OPGW on 400 kV Solapur (NTPC)- Solapur (PG) ckt#1/2 (11.16km)

S. No.	Items	Details
		b) STM-16, 3 MSP FOTE at Solapur STPP and Solapur PG Station (2 Nos FOTE).
3.	Estimated Cost &Funding	Rs. 1.15 Cr. (approx.) excluding GST.
4.	Implementation timeframe	18 months from the date of allocation
5.	Deliberations with WRPC along with their comments	Discussed and approved in 49th TCC/WRPC meeting held on 12-13 Apr 2024.

4.15.2 Members may deliberate

4.16 **Redundant OPGW communication path for 500 MW plant of NSPCL, Chhattisgarh.**

4.16.1 Transmission Scheme "Redundant OPGW communication path for 500 MW plant of NSPCL, Chhattisgarh" with following scope is proposed (detailed agenda is enclosed at (**Annexure-4.16)**:

S. No.	Items	Details
1.	Name of Scheme	Redundant OPGW communication path for redundancy of 500 MW plant of NSPCL, Chhattisgarh.
2.	Scope of the scheme	Supply and installation of OPGW along with accessories by replacing the existing earth wire on one circuit by Live Line installation on the 220 kV D/C MSDS-V(BSP) – Khedamara line (approx.9KM)
3.	Estimated Cost	**Rs. 0.55 Crore (including taxes) approx.**
4.	Implementation timeframe	**18 months from the date of allocation**
5.	Deliberations	Approved in 49th TCC/WRPC meeting held on 12-13 Apr 2024.

4.16.2 Members may deliberate

5 Any other issues, with permission of chair

***

Annexure 4.1

Network Expansion scheme in Western Region to cater to Pumped storage potential near Talegaon (Pune)

<table>
<tr><th>Sl. No.</th><th>Items</th><th>Details</th></tr>
<tr><td>1.</td><td>Name of Scheme</td><td>Network Expansion scheme in Western Region to cater to Pumped storage potential near Talegaon (Pune)</td></tr>
<tr><td>2.</td><td>Scope of the scheme</td><td>
<table>
<tr><th>Sl. No.</th><th>Scope of the Transmission Scheme</th><th>Capacity /km</th></tr>
<tr><td>1.</td><td>Establishment 2x1500MVA, 765/400kV Substation near South of Kalamb with 2x330 MVAR, 765 kV bus reactor and 2x125 MVAR, 420 kV bus reactor

Future provision (space for):
➢ 765/400 kV ICT along with bays- 10 Nos. (2 Nos. on Sec-I, 4 Nos. in Sec-II & 4 Nos. on Sec-III)
➢ 765 kV line bays along with switchable line reactors – 6 Nos. (4 Nos. on Sec-II & 2 Nos. on Sec-III)
➢ 765 kV Bus Reactor along with bay: 4 Nos. (2 Nos. on Sec-II & 2 No. on Sec-III)
➢ 765 kV Sectionaliser: 2 -sets
➢ 400 kV line bays along with switchable line reactors– 20 Nos. (6 nos. on Sec-I, 6 nos. on Sec-II & 8 nos. on Sec-III)
➢ 400/220 kV ICT along with bays -4 Nos. (on 400kV Sec-III: 2 nos. on 220kV Sec-I & 2 nos. on 220kV Sec-II)
➢ 400 kV Bus Reactor along with bays: 4 Nos. (2 Nos. on Sec-II & 2 No. on Sec-III)
➢ 400 kV Sectionalization bay: 2- set
➢ 220 kV line bays: 8 Nos. (4 nos. on Sec-I & 4 nos. on Sec-II)
➢ 220 kV Sectionalization bay: 1 set
➢ 220 kV BC and TBC: 2 Nos.
➢ Establishment of 6000 MW, ± 800kV South Kalamb (HVDC) [LCC] terminal station (4x1500 MW) along with associated interconnections with 400kV HVAC Switchyard (2x1500MW on 400kV Sec-I & 2x1500MW on 400kV Sec-II) & all associated equipment (incl. filters)/bus extension, etc.</td><td>765/400 kV, 1500 MVA ICT – 2 Nos. (7x500 MVA single phase units including one spare ICT Unit)

765 kV ICT bays – 2 Nos.

400 kV ICT bays – 2 Nos.

765 kV Line bays – 4 Nos.

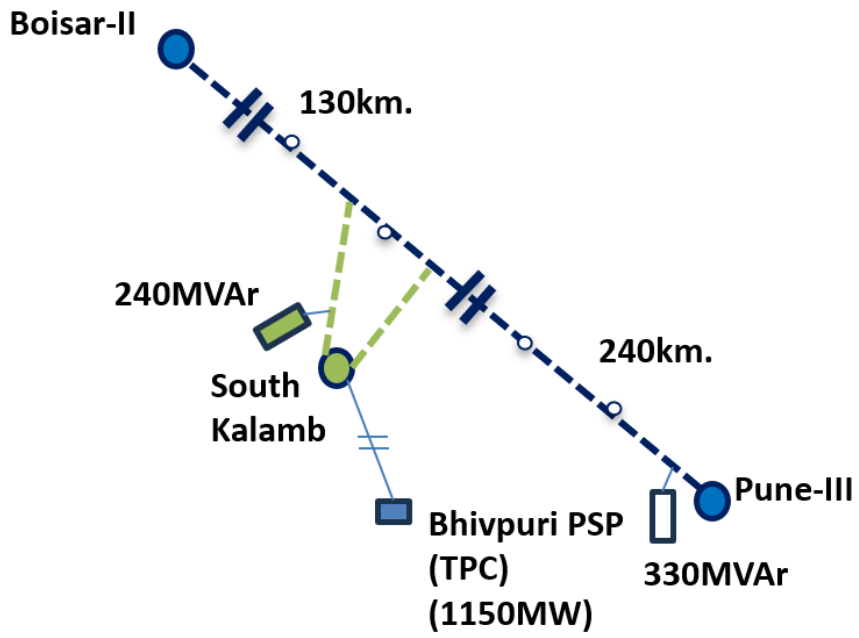
1x330 MVAr, 765 kV bus reactor- 2 Nos. (7x110 MVAR single phase Reactors including one spare Unit for bus /line reactor)

765 kV Bus reactor bay – 2 Nos.

125 MVAr, 420 kV reactor- 2 Nos.

400kV Reactor bay- 2 Nos.

400kV line bays - 2 Nos. (for interconnection of TPC PSP)</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Sl. No.</th><th>Items</th><th>Details</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>2.</td><td>LILO of Pune-III – Boisar-II 765kV D/c line at South Kalamb S/s with associated bays at South Kalamb S/s</td><td>• LILO Route length: 40 km (160 ckm.)
• The Pune-III – Boisar-II 765 kV D/c line is of Hexa Zebra configuration and LILO shall be of similar conductor configuration</td></tr>
<tr><td>3.</td><td>Installation of 1x240 MVAr switchable line reactor on each ckt at South Kalamb end of Boisar-II – South Kalamb 765 kV D/c line (formed after above LILO)</td><td>• 1x240 MVAr, 765 kV switchable line reactor – 2 nos.
• Switching equipment for 765 kV line reactor – 2 nos.
• Spare Reactor (1-ph, 1x80 MVAr) unit at 765/400 kV South Kalamb S/s</td></tr>
</table>
</td></tr>
<tr><td>3.</td><td>Depiction of the scheme on Transmission Grid Map</td><td> 
</td></tr>
<tr><td>4.</td><td>Upstream/downstream system associated with the scheme</td><td><u>Upstream</u>
• Tata Power Co. Ltd. Bhivpuri Pumped Storage Project (1150MW) (Appl. No. 2200000177): 01.01.2028
As per TPC letter dated 05.02.2024, DPR is under final stages of submission and application for Environmental and Forest clearances has been submitted.</td></tr>
</table>

Sl. No.	Items	Details
		Considering procedural delays and timelines for Environmental and Forest clearances, post receipt of all the statutory approvals, it is proposed to commence Bhivpuri PSP construction on 1st October 2024 and achieve COD on 1st January 2028.
5.	Objective / Justification	• As identified by MOP, a potential of more than 10GW is available for Pumped Storage Plants in Maharashtra in the area between Boisar, Nashik & Pune. • Application has already been received from Tata power for Bhivpuri (1150MW). Further, TPC is also planning PSP at Shirawata (1980MW) in the same area. • Hence, a new substation in vicinity of Kalamb (nearby Mumbai), which would be optimally distant from all the potential locations, has been planned to cater to the Pumped storage potential envisaged near Pune (more than 10GW). The substation shall have sufficient space for feeding local demand of Mumbai/Ambernath area. • The matter was discussed in a meeting held on 15.12.2023 amongst CEA, CTU, GRID-INDIA, MSETCL & TATA POWER as well as in the 24th CMETS-WR meeting held on 28.12.2023 wherein it was decided that the substation may be located at a suitable location in South of Kalamb so that it is located in vicinity of Neral (*where 400 kV Padghe – Nagthane D/c, 400 kV Talegaon – Kharghar line and 400 kV Talegaon – Kalwa line are crossing*), near TPC's PSPs as well as other upcoming PSPs north of Murbad (like Malshejghat PSP (1500MW) (AGEL) and Kengadi (1550MW), Jalond (2400MW) & Kalu (1150MW) PSPs of NHPC). • Further, considering the huge PSP potential in the area, which are likely to tie up power for pumping mode from RE projects located far away, space for establishment of 6000 MW, ± 800kV South Kalamb (HVDC) [LCC] terminal station (4x1500 MW) may also be kept in the substation so that an HVDC may also be planned at a future date. • As per Joint studies conducted with MSETCL on 24.04.2024 & 25.04.2024, MSETCL has proposed 8 nos. 400kV lines from Sec-III of South Kalamb S/s to feed demand of Mumbai area. Hence, the proposed change is suggested.
6.	Estimated Cost	**INR 1663 Crore**
7.	Impact on the total Annual Transmission charges (ATC) in % along with the existing ATC	A. ATC (considering levelized tariff @15% of estimated cost): about ₹249.45 Crs. B. Present ATC: ₹46024.95 Crore * C. A/B: about 0.542%
8.	Need of phasing, if any	Not Applicable

Sl. No.	Items	Details
9.	Implementation timeframe	01.01.2028 (as per start date of connectivity sought by TPC for Bhivpuri PSP) However, application from Data Centre load (50MW) has recently been received in Mumbai area in May'24 (~40km. from South Kalamb) (with communication that the capacity shall be increased to 1.4GW progressively) with start date of 01.01.2027. The said application is presently under process. Hence, in case grant is finalised at South Kalamb S/s, the Implementation time-frame shall be kept as 24 months from date of SPV transfer or 01.01.2027 (i.e. start date of GNA), whichever is later.
10.	Inclusion of any wildlife/protected area along the transmission line route	LILO of Pune-III – Boisar-II 765kV D/c line at South Kalamb S/s: Route of the line may infringe reserved forest or its buffer zone in the state of state of Maharashtra (Approx. 7.5km). However, for details of forest/protected areas, survey is required to be done.
11.	Deliberations with RPC along with their comments	The scheme has been deliberated and agreed in the Special WRPC meeting held on 27th March 2024 with following views: *"Although agreeing to the proposed scheme in principle, WRPC has the view that PSP projects have a long gestation period and require several clearances before the construction commences. Pumped storage projects take around four years to be commissioned after DPR approval by CEA and Environment Clearance by MoEF; compared to this, it takes substantially lesser time for the ISTS system to be developed. Hence, to ensure optimal utilization of transmission assets, the proposed transmission scheme should be awarded only after receipt of the following:* *a) Environment Clearance by the Ministry of Environment, Forest and Climate Change (MoEF&CC) under Clause 8 of the EIA Notification, 2006 issued under the Environment (Protection) Act, 1986.* *b) Approval of Detailed Project Report (DPR) from the Central Electricity Authority (CEA) as per the applicable "Guidelines for Formulation of Detailed Project Reports for Pumped Storage Schemes".* *The above conditions would ensure that the construction schedule of the proposed transmission scheme is in sync with the schedule of the PSP."*
12.	System Study for the evolution of the proposal	The scheme was agreed in the 24th Consultation Meeting for Evolving Transmission Schemes in Western Region held on 28.12.2023:

Sl. No.	Items	Details
		Out of various load generation scenarios, Sc-7 (PSP importing) & Sc-5 (PSP injecting) were observed to be extreme cases as far as power flow is concerned. New S/s considered at Kalamb through the LILO of Pune-III – Boisar-II 765kV D/c line is able to meet the following limits: o A drawal capacity of nearly 6000MW being N-1 compliant and without causing any over loadings, in the winter solar max scenario (Sc-7). Sc-7 has NR export scenario while all other regions are importing. In solar max (afternoon) scenario, PSPs are assumed to be importing power (pumping mode) so as to provide maximum benefits to ISTS Grid. o An injection capacity of nearly 4500MW being N-1 compliant and without causing any over loadings, in the summer evening peak scenario (Sc-5). Sc-5 has SR & WR export scenario while NR & ER are importing. In evening peak scenario, PSPs are assumed to be injecting power into the Grid to meet peak demand.

Total YTC allowed for Dec'23 as per Notification of Transmission Charges payable by DICs for Billing Month of February, 2024 dated 25.01.2024 posted on NLDC website.

Annexure 4.2

Provision of ICT Augmentation & Bus Reactor at Bhuj-II PS

<table>
<tr><th>Sl. No.</th><th>Items</th><th colspan="3">Details</th></tr>
<tr><td>1.</td><td>Name of Scheme</td><td colspan="3">Provision of ICT Augmentation & Bus Reactor at Bhuj-II PS</td></tr>
<tr><td>2.</td><td>Scope of the scheme</td><td colspan="3"><table>
<tr><th>Sl. No.</th><th>Scope of the Transmission Scheme</th><th>Capacity /km</th></tr>
<tr><td>1.</td><td>Augmentation of transformation capacity at Bhuj-II PS (GIS) by 3x500MVA, 400/220kV ICT (7th, 8th & 9th)</td><td>500MVA, 400/220kV ICTs: 3 No.

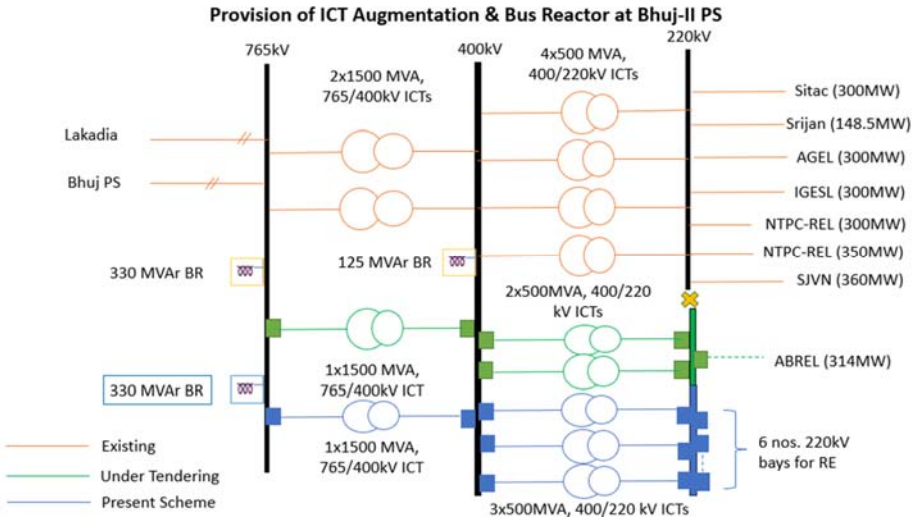
400kV ICT bays: 3 No. (+ 3 Nos. for dia completion)

220kV ICT bays: 3 No..</td></tr>
<tr><td>2.</td><td>Augmentation of transformation capacity at Bhuj-II PS (GIS) by 1x1500MVA, 765/400kV ICT (4th)</td><td>1500MVA, 765/400kV ICT: 1 No.

765kV ICT bay: 1 No. (+ 1 No. for dia completion)

400kV ICT bay: Nil. (1 No. considered at SI. No.1 above)</td></tr>
<tr><td>3.</td><td>Installation of 1x330MVAr 765kV Bus Reactor (2nd) along-with associated bay</td><td>330MVAr, 765kV Bus Reactor: 1 No.

765kV BR bay: Nil (1 No. considered at SI. No.2 above)</td></tr>
<tr><td>4.</td><td>Implementation of 220kV GIS line bay at Bhuj-II PS for Aditya Birla Renewables Subsidiary Limited (ABRSL) [Appln No: 2200000321(362MW)]</td><td>220kV line bay – 1 No. (GIS) (Bus Sec-II)</td></tr>
<tr><td>5.</td><td>Implementation of 220kV GIS line bay at Bhuj-II PS for ACME Cleantech Solutions Private Limited (ACSPL) [Appln No: 2200000382(350MW)]</td><td>220kV line bay – 1 No. (GIS) (Bus Sec-II)</td></tr>
<tr><td>6.</td><td>Implementation of 220kV GIS line bay at Bhuj-II PS for ACME Cleantech Solutions Private Limited (ACSPL) [Appln No: 2200000431(50MW)]</td><td>220kV line bay – 1 No. (GIS) (Bus Sec-II)</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Sl. No.</th><th>Items</th><th>Details</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>7.</td><td>Implementation of 220kV GIS line bay at Bhuj-II PS for Avaada Energy Pvt Ltd. (AEPL) [Appl. No: 2200000444(100MW)]</td><td>220kV line bay – 1 No. (GIS) (Bus Sec-II)</td></tr>
<tr><td>8.</td><td>Implementation of 220kV GIS line bays at Bhuj-II PS for Adani Green Energy Thirty-Two Ltd. (AGE32L) [Appl. No: 2200000514 (260.5MW)]*</td><td>220kV line bay – 1 No. (GIS) (Bus Sec-II)</td></tr>
<tr><td>9.</td><td>Implementation of 220kV GIS line bays at Bhuj-II PS for Adani Renewable Energy Eight Ltd. (ARE8L) [Appl. No: 2200000545 (115MW)]*</td><td>220kV line bay – 1 No. (GIS) (Bus Sec-II)</td></tr>
</table>
*Agreed for grant in 27th CMETS-WR meeting held on 01.04.2024
</td></tr>
<tr><td>3.</td><td>Depiction of the scheme on Transmission Grid Map</td><td> 
</td></tr>
<tr><td>4.</td><td>Upstream/downstream system associated with the scheme</td><td>Upstream generation comprises about 1500MW RE projects (beyond 2500MW) which have been granted / agreed at Bhuj-II PS.</td></tr>
<tr><td>5.</td><td>Objective / Justification</td><td>• Bhuj-II PS is an existing substation with 4x500MVA, 400/220kV ICTs and 2x1500MVA, 765/400kV ICTs. To cater to applications received beyond 2000MW (upto 2500MW considering N-1) at Bhuj-II PS, Creation of New 220kV Bus Section at Bhuj-II PS, installation of 2x500MVA, 400/220kV ICTs (5th & 6th) and 1x1500MVA, 765/400kV ICT (3rd) and Implementation of 220 kV GIS line bay at Bhuj-II PS for ABREL (RJ) Projects Limited (Terminated at New 220kV Bus Section) was agreed in the 16th NCT meeting</td></tr>
</table>

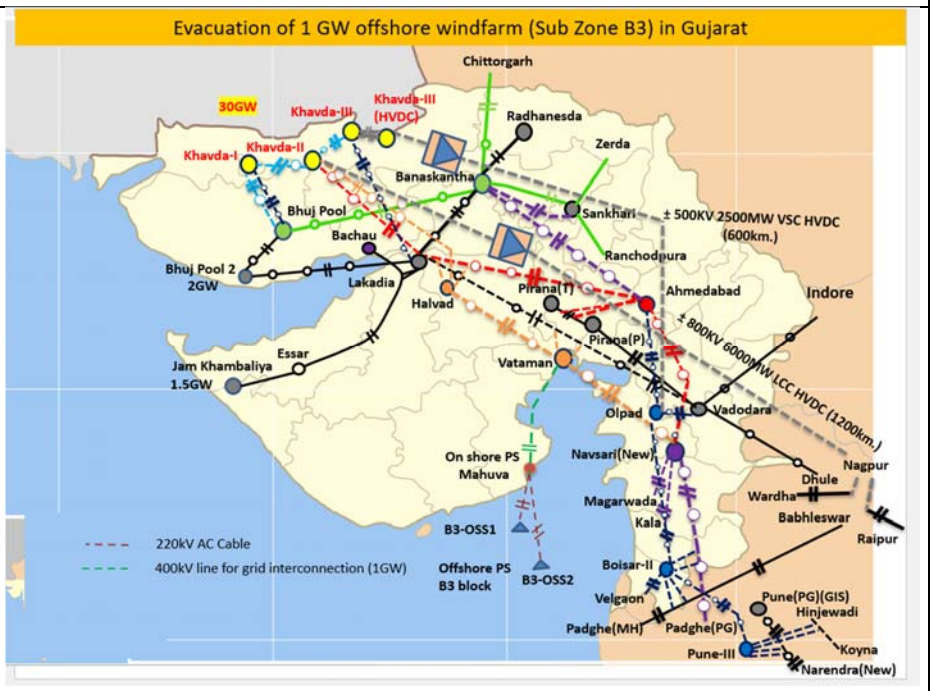
Sl. No.	Items	Details
		held on 30.11.2023 through TBCB route. The scheme is presently under tendering process. • Considering the rapid pace of applications being received at Bhuj-II PS (beyond 2.5GW), it was agreed in the 25th CMETS-WR meeting held on 29.01.2024 to install all remaining ICTs and 220kV bays at Bhuj-II PS in one go so as to minimize multiple implementation time-lines / co-ordination issues, etc. Further, Installation of 1x330MVAr 765kV Bus Reactor (2nd) was also agreed at Bhuj-II PS with increasing RE penetration, in order to control voltages at the S/s. The BR has sensitivity of 2-3kV. • Connectivity under GNA for entire 4000MW has been received at Bhuj-II PS till date.
6.	Estimated Cost	**INR 587 Crore**
7.	Impact on the total Annual Transmission charges (ATC) in % along with the existing ATC	A. ATC (considering levelized tariff @15% of estimated cost): about ₹88.05 Crs. B. Present ATC: ₹46024.95 Crore * C. A/B: about 0.191%
8.	Need of phasing, if any	Not Applicable
9.	Implementation timeframe	21 months
10.	Inclusion of any wildlife/protected area along the transmission line route	Not Applicable
11.	Deliberations with RPC along with their comments	The scheme has been deliberated and agreed for in the Special WRPC meeting held on 27th March 2024.
12.	System Study for the evolution of the proposal	The scheme was agreed in the 25th Consultation Meeting for Evolving Transmission Schemes in Western Region held on 29.01.2024.

Annexure 4.3

Transmission System for Offshore Wind Zone Phase-1 (500 MW VGF on coast of Gujarat for Subzone B3)

Sl. No.	Items	Details
1.	Name of Scheme	Transmission System for Offshore Wind Zone Phase-1 (500 MW VGF on coast of Gujarat for Subzone B3)
2.	Scope of the scheme	**A. Onwards Transmission System from Onshore Pooling Station** 3. Installation of 2x1500MVA, 765/400 kV ICTs at Vataman along with 2x125 MVAr (420kV) Bus Reactor 4. Mahuva Onshore PS (GIS) – Vataman 400 kV D/c line (190 km) (Quad Moose) with 63MVAr & 50MVAr, 420kV switchable line reactors on each ckt at Mahuva & Vataman ends respectively. Note: Vataman switching S/s has been planned through LILO of Lakadia-Vadodara 765 kV D/c line at Vataman under Khavda Ph-III (7 GW) and is presently under implementation by POWERGRID (under TBCB) with implementation schedule of Dec'25 (SCOD). **B. Onshore Pooling Station** 6. Establishment of 2x500 MVA, 400/220kV Mahuva Onshore Pooling Station (GIS) (Mahuva PS) alongwith 1x125 MVAR, 420kV bus reactor (with space provision for upgradation to 765 kV level to cater to future Offshore Wind Projects adjacent to B3, B4, B5 pockets in future) 7. 2 Nos. of 220kV line bays at Mahuva PS (GIS) for termination of B3-OSS-1 – Mahuva Onshore PS 220kV 2xS/c (3 core) cables 3. ± 300 MVAr STATCOM at 220kV level of Mahuva PS (GIS) with 1 No. of 220 kV bay 4. **420KV**, 1x125MVAR Variable Bus Shunt Reactor with OLTC **(control range between 50 – 125MVAr for VSR)** with 1 No. of 400 kV bay 5. 245kV, 3x50 MVAr Bus Reactors at 220kV level of Mahuva PS (GIS) **Future provision (space for):** • 765/400 kV ICT along with bays- 6 Nos. • 765 kV line bays along with switchable line reactors – 8 Nos. • 765 kV Bus Reactor along with bay: 2 Nos. • 765 kV Sectionaliser: 1 -set • 400 kV line bays along with switchable line reactors– 8 Nos. (in addition to 2 nos. bays for Mahuva Onshore PS – Vataman 400 kV D/c line) • 400/220 kV ICT along with bays -8 Nos.

Sl. No.	Items	Details
		• 400 kV Bus Reactor along with bays: 3 Nos. • 400 kV Sectionalization bay: 1- set • 220 kV line bays: 16 Nos. • 220 kV Sectionalization bay: 1 set • 220 kV BC and TBC: 1 No. • STATCOM (±300 MVAR) alongwith associated bay at 220kV - 3 No. • 220kV Bus Reactor along with bays: 7 Nos. • VSR (420kV, 1x125 MVAR Variable Bus Shunt Reactor with OLTC with control range between 50 – 125 MVAr for each VSR) alongwith associated bay at 400 kV – 3 Nos. **C. Offshore Pooling Station** 3. Establishment of **2x315MVA**, 220/66kV Gujarat Offshore B3 Sub-Station Station-1 (B3-OSS-1) with 66kV line bays – **10** nos. for RE Interconnection 4. B3-OSS-1 – Mahuva Onshore PS (GIS) 220kV **two nos.** (3 core) **cables (45 km*- under sea cable of about 35 km & under ground cable of about 10 km)** alongwith associated line bays at both ends (with capacity of 300MVA/ckt at nominal voltage) with 1x50MVAr switchable line reactors at B3-OSS-1 end on each cable ***Note:*** *1. The no. of 220 kV Submarine Cables has been considered assuming capacity of one three core cable as 300MVA.* *2. Reactive compensation has been worked considering MVAr generation of about 3MVAr/km by 220 kV Submarine Cable.* *3. * Distance indicated is beeline length, however, it may change based on actual survey.*
3.	Depiction of the scheme on Transmission Grid Map	

Sl. No.	Items	Details
		
4.	Upstream/downstream system associated with the scheme	500MW Offshore wind Projects (RfS, PPA, Seabed lease deed agreements under finalization by MOP)
5.	Objective / Justification	• Govt. of India has set a target of 500 GW capacity addition from non-fossil fuel based generation capacity by 2030. MNRE has identified about 30 GW Offshore wind potential each in the coast of Gujarat and Tamil Nadu. Initially 5 GW Offshore wind potential each at Gujarat (CUF – 38%) and Tamil Nadu (CUF – 48%) has been prioritized for implementation. • The Offshore wind potential may be integrated with the Onshore pooling station though Submarine cables and transmission system beyond Onshore wind has been planned as AC transmission system. The transmission system for integration of 5 GW Offshore wind potential each at Gujarat and Tamil Nadu has already been identified. • In the meeting held on 16.08.2023, between MNRE & CTUIL, following was decided: o Initial 02 GW transmission capacity (01 GW each off the coast of Gujarat and Tamil Nadu) shall be developed in the 1st Phase and further 04 GW each off the coast of Gujarat and Tamil Nadu shall be developed subsequently. o NIWE to demarcate the offshore sites of 01 GW capacity into 2 x 500 MW blocks each (500 MW for VGF Project and remaining 500 MW for Non-VGF Project) of the coast of Gujarat and Tamil Nadu and finalize the probable coordinates of the offshore pooling substations.

Sl. No.	Items	Details
		o MNRE to share with CTUIL the site details with probable coordinates of the offshore substations and commissioning timelines for the above 1GW and the balance offshore wind energy projects. • Transmission system for integration of 1GW Offshore wind in Gujarat (Subzone B3) was also deliberated in the 22nd CMETS-WR held on 23.10.2023, wherein, NIWE/MNRE were requested to provide the following inputs so that the scheme may be finalized. ▪ Providing coordinates of B3-OSS-1 for VGF site (500MW) ▪ Ampacity of 220kV export cables (1400sq. mm. or 1600 sq. mm.). ▪ Details w.r.t. reactive power compensation (onshore / offshore) Subsequently, the matter was deliberated in MNRE in the meeting held on 22.12.2023 for finalization of the specifications of the transmission infrastructure in which following broad decisions were taken: • The tentative timelines for the offshore wind energy projects are as follows: o 500 MW VGF project off-Gujarat coast to be commissioned by March 2028. Tender for the project to be published by March 2024 o 500 MW VGF project off-Tamil Nadu coast to be commissioned by March 2029. Tender for the project to be published by March 2025. o 4 GW non-VGF project off-Tamil Nadu coast to be commissioned in FY 2029-30. Tender for the projects to be published on 01.02.2024 o Non-VGF project off-Gujarat coast will be tendered based on the response for the Tamil Nadu non-VGF project • Offshore substation and subsea transmission line will be planned for the block-edge locations presented by NIWE in order to reduce conflicts with operations of offshore wind power developers, and reduce the investment by PGCIL. • The tentative specifications of the transmission infrastructure were agreed upon, and are as follows: o Operating voltage for the substation and the transmission line to be kept 220 kV. o Substation transformer configuration of 2 x 315 MVA to be used in order to allow for safety margins and evacuation of additional capacity if awarded capacity increases beyond 500 MW o 2 x 300 MVA capacity subsea cables to be used for power evacuation Based on the above inputs, the Transmission System for Offshore Wind Zone Phase-1 (500 MW VGF on coast of Gujarat for Subzone B3) was discussed and agreed in the 25th CMETS-WR meeting held on 29.01.2024.
6.	Estimated Cost	Onshore Portion: 2186

Sl. No.	Items	Details
		Offshore Portion: 4700 **INR 6886 Crore**
7.	Impact on the total Annual Transmission charges (ATC) in % along with the existing ATC	A. ATC (considering levelized tariff @15% of estimated cost): about ₹1032.9 Crs. B. Present ATC: ₹46024.95 Crore * C. A/B: about 2.24%
8.	Need of phasing, if any	Not Applicable
9.	Implementation timeframe	The SCOD of 500MW Offshore Wind off coast of Gujarat is mentioned as 48 months from effective date of PPA in the draft RfS document (which is under finalization by MOP). The above proposed transmission system needs to be matched with the associated RE generation.
10.	Inclusion of any wildlife/protected area along the transmission line route	As per POWER EVACUATION INFRASTRUCTURE STUDY report submitted by COWI to POWERGRID in Mar-24: • The Gujarat OWF development site is in the Arabian Sea at water depths ranging from 20-40 meter. • The selected Gujarat development site is not located within any environmental exclusion or restriction zone. • In respect of Marine Traffic, It is observed that majority of the traffic originating from Bhavnagar, Hazira and Porbandar port is passing through the selected sites which indicates a significant potential conflict and may require a marine traffic plan for mutual coexistence of marine traffic and Offshore Windfarms. • Further, few fishing harbours are located near Gujarat sites. Seaweed farming is predominant in the Gulf of Kutch areas and is not seen near the selected sites.
11.	Deliberations with RPC along with their comments	The scheme has been deliberated and agreed in the Special WRPC meeting held on 27th March 2024 with following views: *"Although agreeing to the proposed scheme in principle, WRPC concluded that the transmission scheme should be awarded only after the signing of PPAs and submission of requisite BGs for the 500 MW VGF Offshore Wind tender to the Tender Issuing Authority, so as to ensure optimal utilization of transmission assets.*

Sl. No.	Items	Details
		However, the scheme may be initiated immediately if the time between the signing of PPA and COD is less than 3.5 years. This would ensure that the transmission scheme matches with the schedule of the 500 MW VGF Offshore Wind Projects".
12.	System Study for the evolution of the proposal	The scheme was agreed in the 25th Consultation Meeting for Evolving Transmission Schemes in Western Region held on 29.01.2024.

Total YTC allowed for Dec'23 as per Notification of Transmission Charges payable by DICs for Billing Month of February, 2024 dated 25.01.2024 posted on NLDC website.

Annexure 4.4

Transmission System for 1 GW Offshore wind farm (Phase-I) in Tamil Nadu

<table>
<tr><th>Sl. No.</th><th>Items</th><th>Details</th></tr>
<tr><td>1.</td><td>Name of Scheme</td><td>Transmission System for 1 GW Offshore wind farm (Phase-I) in Tamil Nadu</td></tr>
<tr><td>2.</td><td>Scope of the scheme</td><td>
<table>
<tr><th>Sl. No.</th><th>Scope of the Transmission Scheme</th><th>Capacity /km</th></tr>
<tr><td colspan="3">C. Transmission System onwards Onshore Pooling Station</td></tr>
<tr><td>4.</td><td>Establishment of 3x500 MVA, 400/230 kV Onshore Pooling Station near Avaraikulam, Tirunelveli District in Tamil Nadu with provision of expansion upto 5 GW
Future Space Provisions:
• 400/230kV, 500 MVA, ICTs – 9 nos.
• 400kV ICT bays – 9 nos.
• 230kV ICT bays – 9 nos.
• 400kV line bays – 12 nos. (with provision for SLR)
• 230kV line bays – 16 nos.
• 230kV Bus Sectionalizer : 3 sets
• 230 kV Bus Coupler (BC) Bay – 3 nos.
• 230 kV Transfer Bus Coupler (TBC) Bay – 3 nos.</td><td>• 400/230kV, 500 MVA, ICTs – 3 nos.
• 400kV ICT bays – 3 nos.
• 220kV ICT bays – 3 nos.
• 400kV line bays – 2 nos. (at Avaraikulam Onshore PS for termination of Avaraikulam Onshore PS – Tuticorin PS line)
• 230kV line bays – 4 nos.
• 230 kV Bus Coupler (BC) Bay – 1 no.
• 230 kV Transfer Bus Coupler (TBC) Bay – 1 no.</td></tr>
<tr><td>5.</td><td>Avaraikulam Onshore PS – Tuticorin PS 400 kV D/c quad line</td><td>• Line length ~100 km
• 400kV line bays - 2 (at Tuticorin PS)</td></tr>
<tr><td>6.</td><td>± 300 MVAr STATCOM along with 2x125 MVAr MSR</td><td>• 400 kV bay – 1 no.</td></tr>
<tr><td colspan="3">D. Transmission System for integration of Offshore Wind Farms with Onshore PS</td></tr>
<tr><td></td><td>Offshore Substation-1 {500 MW VGF}</td><td></td></tr>
<tr><td>3.</td><td>Establishment of 2x315 MVA, 230/66kV Off-Shore Substation-1 with 10 nos. of 66kV line bays for RE integration</td><td>• 230/66kV, 315 MVA, ICTs – 2 nos.
• 230kV ICT bays – 2 nos.
• 66kV ICT bays – 2 nos.
• 230kV line bays – 2 nos. (at Off-Shore Substation-1 for</td></tr>
</table>
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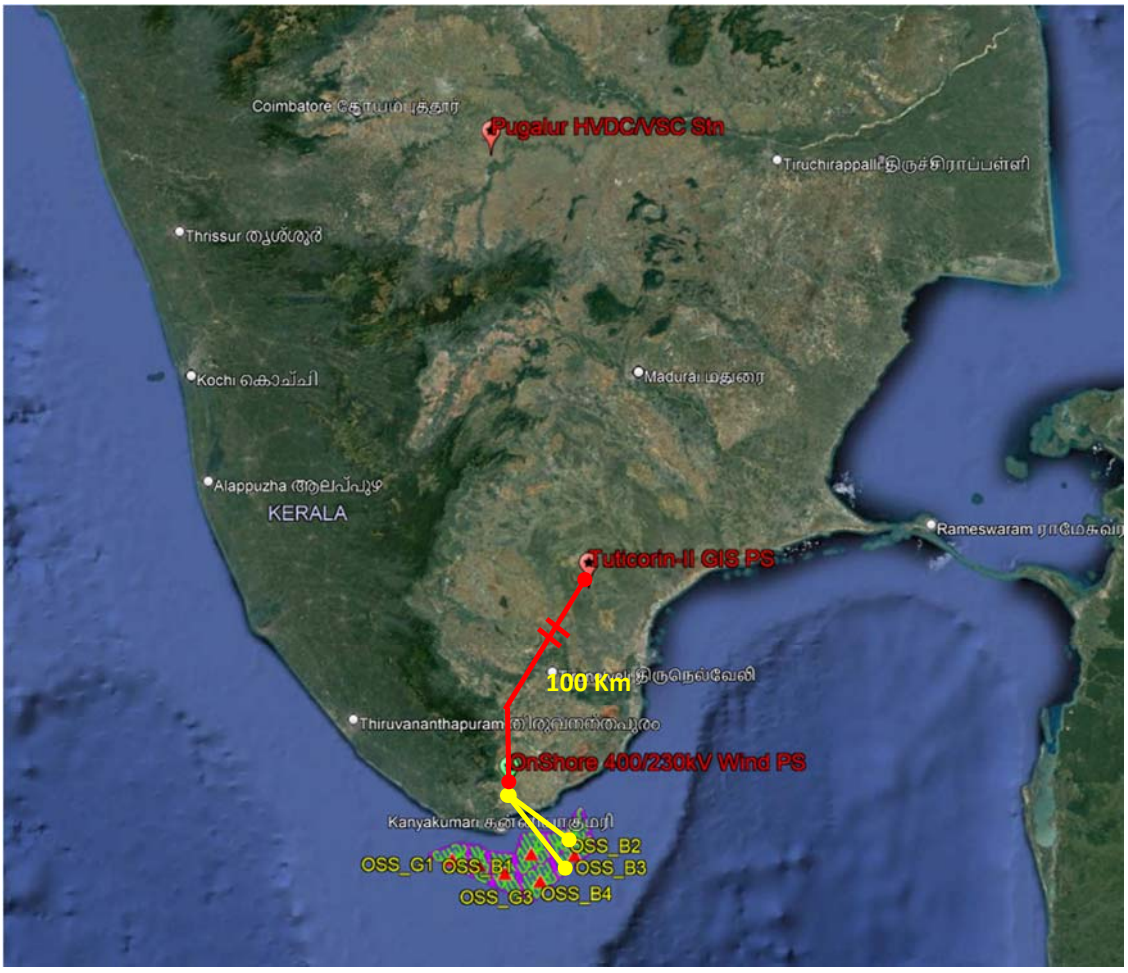
<table>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td></td><td>termination of Offshore substation 1 (OSS-1) – Avaraikulam Onshore PS line)
• 66kV line bays – 10 nos.</td></tr>
<tr><td>4.</td><td>Offshore substation 1 (OSS-1) – Avaraikulam Onshore PS 2 nos. 230kV (atleast 300 MVA capacity) Submarine cables (~35 - 40 km) with 2x50MVAr switchable line reactors at OSS-1 end</td><td>• Cable length ~35 - 40 km
• 230 kV, 50MVAr switchable line reactors at OSS-1 end – 2 nos.</td></tr>
<tr><td></td><td colspan="2">Offshore substation-2 {500 MW Non-VGF}</td></tr>
<tr><td>3.</td><td>Establishment of 2x315 MVA, 230/66kV Off-Shore Substation-2 with 10 nos. of 66kV line bays for RE integration</td><td>• 230/66kV, 315 MVA, ICTs – 2 nos.
• 230kV ICT bays – 2 nos.
• 66kV ICT bays – 2 nos.
• 230kV line bays – 2 nos. (at Off-Shore Substation-2 for termination of Offshore substation 2 (OSS-2) – Avaraikulam Onshore PS line)
• 66kV line bays – 10 nos.</td></tr>
<tr><td>4.</td><td>Offshore substation 2 (OSS-2) – Avaraikulam Onshore PS 2 nos. 230kV (atleast 300 MVA capacity) Submarine cables (~35 - 40 km) with 2x50MVAr switchable line reactors at OSS-2 end</td><td>• Cable length ~35 - 40 km
• 230 kV, 50MVAr switchable line reactors at OSS-2 end – 2 nos.</td></tr>
</table>
</td></tr>
<tr><td>3.</td><td>Depiction of the scheme on Transmission Grid Map</td><td>Figure given below</td></tr>
<tr><td>4.</td><td>Upstream/downstream system associated with the scheme</td><td>Not applicable</td></tr>
<tr><td>5.</td><td>Objective / Justification</td><td>Govt. of India has set a target of 500 GW capacity addition from non-fossil fuel based generation capacity by 2030. MNRE has identified about 30 GW Offshore wind potential each in the coast of Gujarat and Tamil Nadu. A report on Transmission System for Integration of over 500 GW RE Capacity has been published by CEA on 07.12.2022 wherein initially 5 GW Offshore wind potential each at Gujarat (CUF – 37%) and Tamil Nadu (CUF – 48%) has been prioritized for implementation by 2030.

Further, a meeting on “Offshore development” was held under chairmanship of Shri R.K. Singh, Hon’ble Minister of Power and New & Renewable Energy on 14.06.2023, to discuss the issues related to grid connection, timelines and bidding of offshore wind energy projects under various models. During the meeting, it was decided that initially 2GW offshore evacuation infrastructure (1 GW in Gujarat and</td></tr>
</table>

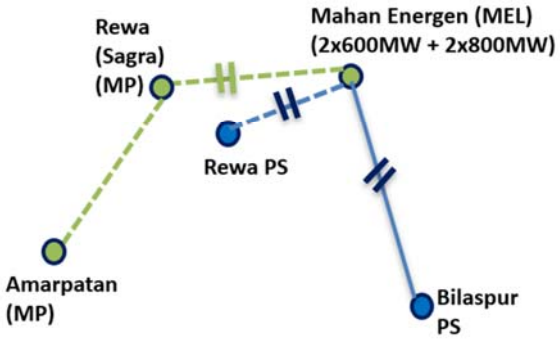
		1 GW in Tamil Nadu) may be developed by PGCIL under RTM and further, 4GW evacuation infrastructure will be developed under TBCB. Same was also decided in the meeting held on 16.08.2023 between MNRE & CTUIL. Further, in the meeting held on 22.12.2023 in MNRE for finalization of the specifications of the transmission infrastructure, it was decided that 500 MW VGF project off-Tamil Nadu coast to be commissioned by March 2029 for which tender shall be published by **March 2025**. Further, 4 GW non-VGF project off-Tamil Nadu coast to be commissioned by in FY 029-30 for which tender are to be published on **01.02.2024**. Accordingly, following transmission system for integration of initial 1 GW Offshore wind farms off the coast of Tamil Nadu may be implemented : **A. Transmission System onwards Onshore Pooling Station** • Establishment of 3x500 MVA, 400/230 kV Onshore Pooling Station near Avaraikulam, Tirunelveli District in Tamil Nadu with provision of expansion upto 5 GW. • Avaraikulam Onshore PS – Tuticorin PS 400 kV D/c quad line (approx. 100 km) • ± 300 MVAr STATCOM along with 2x125 MVAr MSR **B. Transmission System for integration of Offshore Wind Farms with Onshore PS** **Offshore Substation-1 {500 MW VGF} :** • Establishment of 2x315 MVA, 230/66kV Off-Shore Substation-1 with 10 nos. of 66kV line bays for RE integration • Offshore substation 1 (OSS-1) – Avaraikulam Onshore PS 2 nos. 230kV (atleast 300 MVA capacity) Submarine cables (~35 - 40 km) with 2x50MVAr switchable line reactors at OSS-1 end **Offshore substation-2 {500 MW Non-VGF} :** • Establishment of 2x315 MVA, 230/66kV Off-Shore Substation-2 with 10 nos. of 66kV line bays for RE integration • Offshore substation 2 (OSS-2) – Avaraikulam Onshore PS 2 nos. 230kV (atleast 300 MVA capacity) Submarine cables (~35 - 40 km) with 2x50MVAr switchable line reactors at OSS-2 end **Transmission scheme was deliberated in 28th CMETS-SR held on 29.02.2024 (Copy of MoM attached at Annexure-II).**
6.	Estimated Cost	**Transmission System onwards Onshore Pooling Station - Rs. 1193 Crore** **Transmission System for integration of Offshore Wind Farms with Onshore PS - Rs. 10292 Crore** **Total – RS. 11485 Crore**
7.	Impact on the total Annual Transmission charges in % along with the existing ATC	A. ATC (considering Levelized Tariff @15% of estimated cost): Rs. 1722.75 Crore B. Present ATC: Rs. 46062.77 Crore * C. A/B (%): 3.74 %

8.	Need of phasing, if any	Not Applicable
9.	Implementation timeframe	**March 2029**
10.	Inclusion of any wild life/protected area along the transmission line route	No major National Park, Wildlife Sanctuary or other protected areas observed. However, for details of forest/protected areas, survey is required to be done.
11.	Deliberations with RPC along with their comments	The scheme was discussed in the 50th SRPC meeting held on 16.03.2024. SRPC vide letter dated 18.04.2024 has forwarded the views on the scheme (Copy of SRPC views attached at **Annexure-4.4 A**).
12.	System Study for evolution of the proposal	Transmission System for 1 GW Offshore wind farm (Phase-I) in Tamil Nadu was evolved as a part of Transmission System for Integration of over 500 GW RE Capacity for which detailed report has been published by CEA on 07.12.2022. Further, Transmission System for 1 GW Offshore wind farm (Phase-I of 1 GW) have been deliberated in the 28th CMETS-SR held on 29.02.2024, minutes of the meeting awaited.


Coimbatore கோயம்புத்தூர்
Pugalur HVDC/VSC Stn
Tiruchirappalli திருச்சிராப்பள்ளி
Thrissur തൃശ്ശൂർ
Kochi കൊച്ചി
Madurai மதுரை
Alappuzha ആലപ്പുഴ
KERALA
Rameswaram ராமேசுவரம்
Tuticorin-II GIS PS
100 Km
திருநெல்வேலி
Thiruvananthapuram തിരുവനന്തപുരം
OnShore 400/230kV Wind PS
Kanyakumari கன்னியாகுமரி
OSS_B2
OSS_G1
OSS_B1
OSS_B3
OSS_G3
OSS_B4

Annexure 4.5

Transmission System for evacuation of power from Mahan Energen Limited Generating Station in Madhya Pradesh

<table>
<tr><th>Sl. No.</th><th>Items</th><th>Details</th></tr>
<tr><td>1.</td><td>Name of Scheme</td><td>Transmission System for evacuation of power from Mahan Energen Limited Generating Station in Madhya Pradesh</td></tr>
<tr><td>2.</td><td>Scope of the scheme</td><td>
<table>
<tr><th>Sl. No.</th><th>Scope of the Transmission Scheme</th><th>Capacity /km</th></tr>
<tr><td>3.</td><td>Mahan (existing bus) – Rewa PS (PG) 400kV D/c (quad) line</td><td>110km.</td></tr>
<tr><td>4.</td><td>2 nos. 400kV bays at Rewa PS (PG) for termination of Mahan (existing bus) – Rewa PS (PG) 400kV D/c line (quad) line</td><td>400kV bays: 2 Nos.</td></tr>
</table>
Note:
• 2 nos. 400kV line bays at MEL (existing) shall be under the scope of MEL
• POWERGRID to provide space at Rewa PS (PG) for scope at Sl. 2
</td></tr>
<tr><td>3.</td><td>Depiction of the scheme on Transmission Grid Map</td><td>Transmission System for evacuation of power from Mahan Energen Limited Generating Station in Madhya Pradesh
 
</td></tr>
<tr><td>4.</td><td>Upstream/downstream system associated with the scheme</td><td>Mahan Energen 2x600MW (Existing) + 2x800MW (Exp.) Projects</td></tr>
<tr><td>5.</td><td>Objective / Justification</td><td><u>As per CERC Regulation, 2004/2009, Connectivity has been granted to Mahan Energen Ltd. (Formerly Essar Power MP Ltd) (2x600MW) for 1100MW as per the following details:</u>
• <u>Mahan TPS – Bilaspur PS 400kV D/c (Quad ACSR Moose) line</u></td></tr>
</table>

Sl. No.	Items	Details
		• **LILO of one ckt of 400kV Vindhyachal – Korba STPP at Mahan TPS** • **4 nos. 400kV line bays at Mahan TPS.** The LILO of one ckt. of 400kV Vindhyachal – Korba STPP at Mahan TPS was disconnected as per directions in CERC order dated 01.06.2022 in I.A. No. 4/IA/2022 in Petition No. 92/MP/2021. M/s MEL has opted for conversion to GNA for 1100MW under Regulation 37.6(1) of GNA Regulations, 2022. M/s MEL has also filed an application for grant of Connectivity for balance 100MW under Regulation 4 of GNA Regulations, 2022 for its existing plant. Subsequently, a meeting was held amongst CEA, CTU, MPPTCL, CSPTCL, EPTCL & MEL on 01.09.2023, wherein, it was decided that M/s MEL was to apply for connectivity for the expansion of Bandhaura Thermal power Plant (2 x 800 MW) (Mahan Expansion project) being developed by Mahan Energen Limited (MEL). In this regard, it is to mention that MEL has filed an application to MP Power Transmission Co. Ltd (MP STU) for connectivity of 1320 MW (Gross) capacity of its Mahan Expansion project with Intra-State Transmission System & balance 280MW (Gross) capacity of the Mahan Expansion project to Inter State Transmission System under GNA. The matter was discussed in a joint study meeting amongst CEA, CTU, MPPTCL, GRID-INDIA & MEL on 11.12.2023 & 11.01.2024 wherein a number of alternatives were studied and Alternative-V [MP STU proposed system + Mahan (existing bus) – Rewa PS (PG) 400kV D/c line (quad) (Under ISTS) & Mahan - Mahan (Ext) interconnector closed] was agreed as the best option from techno-economic point of view considering distinct advantages over other alternatives studied during the meeting. The matter was discussed and finalized in the 25th CMETS-WR meeting held on 29.01.2024.
6.	Estimated Cost	**INR 558 Crore**
7.	Impact on the total Annual Transmission charges (ATC) in % along with the existing ATC	A. ATC (considering levelized tariff @15% of estimated cost): about ₹83.7 Crs. B. Present ATC: ₹46024.95 Crore * C. A/B: about 0.182%
8.	Need of phasing, if any	Not Applicable
9.	Implementation timeframe	24 months

Sl. No.	Items	Details
10.	Inclusion of any wildlife/protected area along the transmission line route	Route of the line may infringe reserved forest or its buffer zone in the state of state of MP (~49km. based on bee length). However, for details of forest/protected areas, survey is required to be done.
11.	Deliberations with RPC along with their comments	The scheme has been deliberated and agreed for in the Special WRPC meeting held on 27th March 2024.
12.	System Study for the evolution of the proposal	The scheme was agreed in the 25th Consultation Meeting for Evolving Transmission Schemes in Western Region held on 29.01.2024.

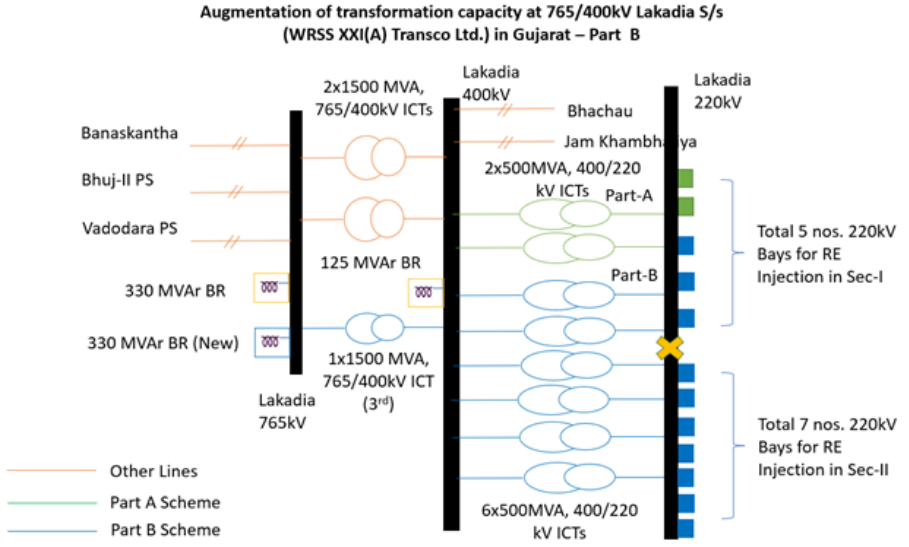
**Total YTC allowed for Dec'23 as per Notification of Transmission Charges payable by DICs for Billing Month of February, 2024 dated 25.01.2024 posted on NLDC website.*

Annexure 4.6

Augmentation of transformation capacity at 765/400kV Lakadia S/s (WRSS XXI(A) Transco Ltd) in Gujarat – Part B

Sl. No.	Items	Details		
1.	Name of Scheme	Augmentation of transformation capacity at 765/400kV Lakadia S/s (WRSS XXI(A) Transco Ltd) in Gujarat – Part B		
2.	Scope of the scheme	***Sl. No.***	***Scope of the Transmission Scheme***	***Capacity /km***
		1.	Installation of 2x500MVA, 400/220kV ICTs (3rd & 4th) at Lakadia PS along with associated ICT bays	• 400/220kV, 1x500MVA ICT – 2 No. • 400kV ICT bay – 2 No. • 220kV ICT bay – 2 No. (220kV bus section-I)
		2.	Implementation of 220kV line bay at Lakadia PS for TEQ Green Power XVII Private Limited (TGPXVIIPL: 300MW)	• 220kV line bay – 1 no. (220kV bus section-I)
		3.	Implementation of 220kV line bay at Lakadia PS for Arcelor Mittal Nippon Steel India Limited (AMNSIL: 350MW)	• 220kV line bay – 1 no. (220kV bus section-I)
		4.	Implementation of 220kV line bay at Lakadia PS for Renew Solar (Shakti Eight) Private Limited (RS(S8)PL: 200MW)	• 220kV line bay – 1 no. (220kV bus section-I)
		5.	Creation of New 220kV Bus Section-II at Lakadia PS along with 220kV Sectionaliser arrangement between 220kV Bus sec-I & Sec-II	• 220kV Bus Sectionaliser - 1 set • BC – 1 No. • TBC – 1 No.
		6.	Augmentation of transformation capacity at Lakadia PS by 4x500MVA, 400/220kV ICTs (5th 6th, 7th & 8th) terminated on new 220kV Bus Section-II	• 500MVA, 400/220kV ICTs: 4 No. • 400kV ICT bays: 4 Nos. • 220kV ICT bays: 4 No. (New Bus Section-II)
		7.	Implementation of 220kV line bay at Lakadia PS for Juniper Green Energy Private Limited (JGEPL) (Appl. No. 2200000376: 300MW)	• 220kV line bay – 1 No. (New Bus Section-II)
		8.	Implementation of 220kV line bay at Lakadia PS for TEQ Green Power XVI Pvt. Ltd. (TGPXVIPL) (Appl. No. 2200000398: 76MW)	• 220kV line bay – 1 No. (New Bus Section-II)

<table>
<tr><th>Sl. No.</th><th>Items</th><th>Details</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>9.</td><td>Implementation of 220kV line bay at Lakadia PS for Ganeko Solar Pvt. Ltd. (GSPL) (Appl. No. 2200000458: 290MW)</td><td>• 220kV line bay – 1 No. (New Bus Section-II)</td></tr>
<tr><td>10.</td><td>Implementation of 220kV line bay at Lakadia PS for Juniper Green Energy Private Limited (JGEPL) (Appl. No. 2200000500: 150MW)</td><td>• 220kV line bay – 1 No. (New Bus Section-II)</td></tr>
<tr><td>11.</td><td>Implementation of 220 kV line bay at Lakadia PS for Serentica Renewables India Private Limited (SRIPL) (Appl. No. 2200000610: 200 MW)</td><td>• 220 kV line bay – 1 No. (New Bus Section-II)</td></tr>
<tr><td>12.</td><td>Implementation of 220 kV line bay at Lakadia PS for RDS Solar Park Private Limited (RDSSPPL) (Appl. No. 2200000639: 350 MW)</td><td>• 220 kV line bay – 1 No. (New Bus Section-II)</td></tr>
<tr><td>13.</td><td>Implementation of 220 kV line bay at Lakadia PS for Percentum Renewables Private Limited (PRPL) (Appl. No. 2200000673: 148 MW)</td><td>• 220 kV line bay – 1 No. (New Bus Section-II)</td></tr>
<tr><td>14.</td><td>Installation of 1x330MVAr 765kV Bus Reactor (2nd) along-with associated bay</td><td>• 330MVAr, 765kV Bus Reactor: 1 No.
• 765kV BR bay: 1 No.</td></tr>
<tr><td>15.</td><td>Augmentation of transformation capacity at Lakadia PS by 1x1500MVA, 765/400kV ICTs (3rd)</td><td>• 1500MVA, 765/400kV ICT: 1 No.
• 400kV ICT bay: 1 No.
• 765kV ICT bay: 1 No.</td></tr>
</table>
Note:
• TSP of Lakadia S/s (WRSS XXI(A) Transco Ltd.) shall provide space for above augmentation works at Lakadia S/s
</td></tr>
</table>

Sl. No.	Items	Details
3.	Depiction of the scheme on Transmission Grid Map	
4.	Upstream/downstream system associated with the scheme	RE Generation beyond 1GW (upto 3.5GW) at Lakadia S/s
5.	Objective / Justification	• In the Meeting held under the chairmanship of Secretary(Power) on 11.01.2023, it was deliberated that Lakadia Pooling Station has been commissioned, except the 4x500MVA, 400/220kV lCTs which were envisaged for evacuation of power from 2GW REZ in the area. However, the RE Generation was yet to come. SECI had informed that due to land policy of Gujarat State Government, there is very less likelihood of RE generating coming in Lakadia and now all RE Generation is coming in Khavda areas. ln view of the above, it was decided not to go ahead with installation of 400/220kV ICTs at Lakadia PS and the RE potential of 2GW at Lakadia may be dropped. • However, later, CTU received a no. of applications at Lakadia S/s and there is growing interest from RE developers to apply at Lakadia S/s, especially after GoG's decision to allow all ISTS/In-STS connected RE projects to be set up in the state. • 2x500MVA, 400/220kV ICTs & 2 nos. 220kV bays have already been agreed in the 17th NCT meeting under the "Augmentation of transformation capacity at 765/400kV Lakadia S/s (WRSS XXI(A) Transco Ltd) in Gujarat" scheme (for implementation under RTM mode). • Further, MNRE vide letter dated 14.02.2024 has also revived the REZ potential at Lakadia. • The proposed system (6x500MVA, 400/220kV ICTs, 1x1500MVA, 765/400kV ICT and 220kV line bays for RE interconnection) shall enable evacuation of RE power from various generation projects in Lakadia REZ (Cumulative RE connectivity granted/agreed at Lakadia till date: 3500MW).

<table>
<tr><th>Sl. No.</th><th>Items</th><th colspan="3">Details</th></tr>
<tr><td>6.</td><td>Estimated Cost</td><td colspan="3">INR 636 Crore</td></tr>
<tr><td>7.</td><td>Impact on the total Annual Transmission charges (ATC) in % along with the existing ATC</td><td colspan="3">A. ATC (considering levelized tariff @15% of estimated cost): about ₹95.4 Crs.
B. Present ATC: ₹46024.95 Crore *
C. A/B: about 0.207%</td></tr>
<tr><td>8.</td><td>Need of phasing, if any</td><td colspan="3">Not Applicable</td></tr>
<tr><td>9.</td><td>Implementation timeframe</td><td colspan="3"><table>
<tr><th>Sl. No.</th><th>Scope of the Transmission Scheme</th><th>Time-frame</th></tr>
<tr><td>1.</td><td>Installation of 2x500MVA, 400/220kV ICTs (3rd & 4th) at Lakadia PS along with associated ICT bays</td><td>18 months from date of allocation to implementing agency</td></tr>
<tr><td>2.</td><td>Implementation of 220kV line bay at Lakadia PS for TEQ Green Power XVII Private Limited (TGPXVIIPL: 300MW)</td><td>31.12.2026 (as per start date requested by applicant)*</td></tr>
<tr><td>3.</td><td>Implementation of 220kV line bay at Lakadia PS for Arcelor Mittal Nippon Steel India Limited (AMNSIL: 350MW)</td><td>18 months from date of allocation to implementing agency</td></tr>
<tr><td>4.</td><td>Implementation of 220kV line bay at Lakadia PS for Renew Solar (Shakti Eight) Private Limited (RS(S8)PL: 200MW)</td><td>30.09.2026 (as per start date requested by applicant)*</td></tr>
<tr><td>5.</td><td>Creation of New 220kV Bus Section-II at Lakadia PS along with 220kV Sectionaliser arrangement between 220kV Bus sec-I & Sec-II</td><td>18 months from date of allocation to implementing agency</td></tr>
<tr><td>6.</td><td>Augmentation of transformation capacity at Lakadia PS by 4x500MVA, 400/220kV ICTs (5th 6th, 7th & 8th) terminated on new 220kV Bus Section-II</td><td>18 months from date of allocation to implementing agency</td></tr>
<tr><td>7.</td><td>Implementation of 220kV line bay at Lakadia PS for Juniper Green Energy Private Limited (JGEPL) (Appl. No. 2200000376: 300MW)</td><td>30.06.2027 (as per start date requested by applicant)*</td></tr>
</table></td></tr>
</table>

Sl. No.	Items	Details		
		8.	Implementation of 220kV line bay at Lakadia PS for TEQ Green Power XVI Pvt. Ltd. (TGPXVIPL) (Appl. No. 2200000398: 76MW)	**30.09.2026** (as per start date requested by applicant)*
		9.	Implementation of 220kV line bay at Lakadia PS for Ganeko Solar Pvt. Ltd. (GSPL) (Appl. No. 2200000458: 290MW)	**31.12.2026** (as per start date requested by applicant)*
		10.	Implementation of 220kV line bay at Lakadia PS for Juniper Green Energy Private Limited (JGEPL) (Appl. No. 2200000500: 150MW)	**31.03.2027** (as per start date requested by applicant)*
		11.	Implementation of 220 kV line bay at Lakadia PS for Serentica Renewables India Private Limited (SRIPL) (Appl. No. 2200000610: 200 MW)	**18 months** from date of allocation to implementing agency
		12.	Implementation of 220 kV line bay at Lakadia PS for RDS Solar Park Private Limited (RDSSPPL) (Appl. No. 2200000639: 350 MW)	**18 months** from date of allocation to implementing agency
		13.	Implementation of 220 kV line bay at Lakadia PS for Percentum Renewables Private Limited (PRPL) (Appl. No. 2200000673: 148 MW)	**18 months** from date of allocation to implementing agency
		14.	Installation of 1x330MVAr 765kV Bus Reactor (2nd) along-with associated bay	**18 months** from date of allocation to implementing agency
		15.	Augmentation of transformation capacity at Lakadia PS by 1x1500MVA, 765/400kV ICTs (3rd)	**18 months** from date of allocation to implementing agency
		**subject to minimum schedule of 18months from from the date of allocation to implementing agency .*		
10.	Inclusion of any wildlife/protected area along the transmission line route	Not Applicable		

Sl. No.	Items	Details
11.	Deliberations with RPC along with their comments	The scheme has been deliberated and agreed for in the Special WRPC meeting held on 27th March 2024.
12.	System Study for the evolution of the proposal	The scheme was discussed in the 25th & 26th Consultation Meeting for Evolving Transmission Schemes in Western Region held on 29.01.2024 & 28.02.2024 respectively.

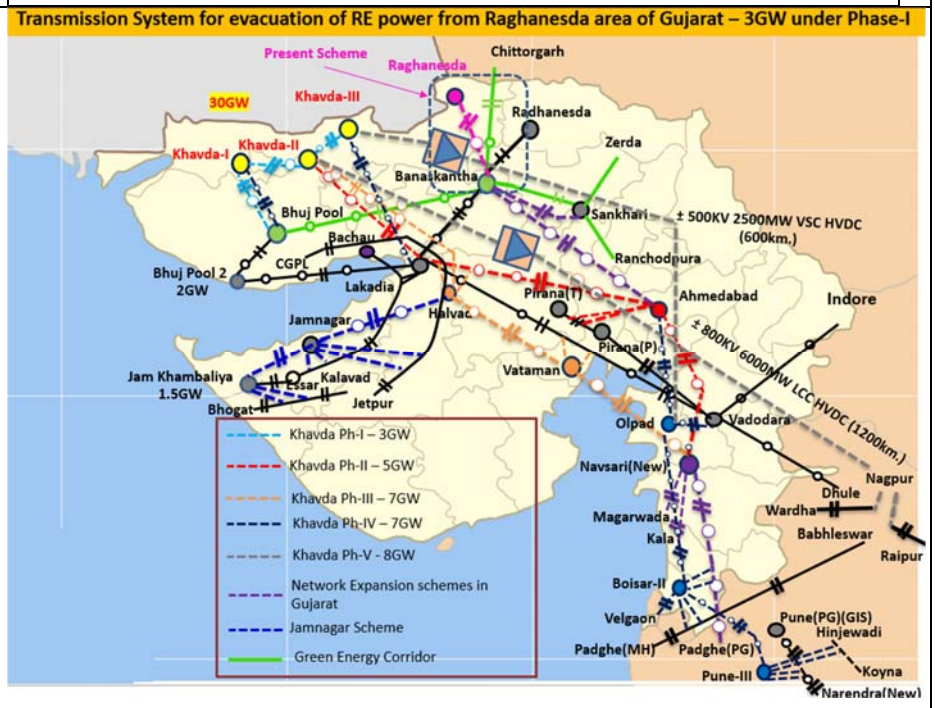
**Total YTC allowed for Dec'23 as per Notification of Transmission Charges payable by DICs for Billing Month of February, 2024 dated 25.01.2024 posted on NLDC website.*

Annexure 4.7

Transmission System for evacuation of RE power from Raghanesda area of Gujarat – 3GW under Phase-I

<table>
<tr><th>Sl. No.</th><th>Items</th><th colspan="3">Details</th></tr>
<tr><td>1.</td><td>Name of Scheme</td><td colspan="3">Transmission System for evacuation of RE power from Raghanesda area of Gujarat – 3GW under Phase-I</td></tr>
<tr><td>2.</td><td>Scope of the scheme</td><td colspan="3"><table>
<tr><th>Sl. No.</th><th>Scope of the Transmission Scheme</th><th>Capacity /km</th></tr>
<tr><td>1.</td><td>Establishment 3x1500 MVA, 765/400kV Substation near Raghanesda (GIS) with 2x330 MVAR, 765 kV bus reactor and 2x125 MVAR, 420 kV bus reactor

Future provision (space for):
➢ 765/400 kV ICT along with bays- 5 Nos. (1 No. in Sec-I & 4 Nos. on Sec-II)
➢ 765 kV line bays along with switchable line reactors – 8 Nos. (4 Nos. on Sec-I & 4 Nos. on Sec-II)
➢ 765 kV Bus Reactor along with bay: 2 Nos. (on Sec-II)
➢ 765 kV Sectionaliser: 1 -set
➢ 400 kV line bays along with switchable line reactors– 12 Nos. (6 nos. on Sec-I & 6 nos. on Sec-II)
➢ 400/220 kV ICT along with bays - 8 Nos. (4 nos. on each 400kV Section)
➢ 400 kV Bus Reactor along with bays: 2 Nos. (Sec-II)
➢ 400 kV Sectionalization bay: 1-set
➢ 220 kV line bays: 10 Nos. (5 nos. on each 220kV Section)
➢ 220 kV Sectionalization bay: 1 set
➢ 220 kV BC and TBC: 1 No.
➢ Establishment of 6000 MW, ± 800kV Raghanesda (HVDC) [LCC] terminal station (4x1500 MW) along with associated interconnections with 400kV HVAC Switchyard & all</td><td>• 765/400 kV, 1500 MVA ICT – 3 Nos. (10x500 MVA single phase units including one spare ICT Unit)
• 765 kV ICT bays – 3 Nos.
• 400 kV ICT bays – 3 Nos.
• 765 kV Line bays – 2 Nos.
• 1x330 MVAr, 765 kV bus reactor- 2 Nos. (7x110 MVAR single phase Reactors including one spare Unit for bus /line reactor)
• 765 kV Bus reactor bay – 2 Nos.
• 125 MVAr, 420 kV reactor- 2 Nos.
• 400kV Reactor bay- 2 Nos.
• 400kV line bays - 4 Nos. (for interconnection of RE Projects)</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Sl. No.</th><th>Items</th><th>Details</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td>associated equipment (incl. filters)/bus extension, etc.</td><td></td></tr>
<tr><td>2.</td><td>Raghanesda (GIS) – Banaskantha (PG) 765kV D/c line</td><td>95 km</td></tr>
<tr><td>3.</td><td>2 nos. 765kV line bays at Banaskantha (PG) S/s</td><td>765 kV line bays – 2 nos.</td></tr>
<tr><td colspan="3">Note:
• TSP of Banaskantha S/s (POWERGRID) shall provide space for scope at Sl. 3 above.</td></tr>
</table>
</td></tr>
<tr><td>3.</td><td>Depiction of the scheme on Transmission Grid Map</td><td> 
</td></tr>
<tr><td>4.</td><td>Upstream/downstream system associated with the scheme</td><td>Not Applicable</td></tr>
<tr><td>5.</td><td>Objective / Justification</td><td>• The estimated total potential of 12-15 GW in Raghanesda area has been intimated by GPCL to MOP vide letter dated 27.10.2023. Further, M/s TPL vide letter dated 09.11.2023 has requested to include their 4GW Solar capacity under Phase-I planning (2.5GW: ISTS & 1.5GW: STU) of Raghanesda REZ and has also confirmed that they shall provide about 150 acres of land for setting up ISTS Pooling Station and about 50 acres of land for setting up STU Pooling Station.</td></tr>
</table>

Sl. No.	Items	Details
		• In the Joint Study Meeting amongst CEA, CTU, GRID-INDIA, GETCO, GPCL & TPL held on 23.02.2024, GPCL informed that about 14.2GW potential exists in Raghanesda area out of which 2.2GW shall be under Intra-STS and 12GW shall be under ISTS. Further, about 3GW capacity may be considered for Phase-I planning by CTU (based on land allocation for 2.5GW to TPL & for 0.59GW to RIL). • In the above backdrop, looking at the potential in the area, Transmission System for evacuation of 3GW RE power from Raghanesda area of Gujarat under Phase-I (under ISTS) was discussed and agreed in the above joint study meeting and further in the 26th CMETS-WR meeting held on 28.02.2024. • Subsequently MNRE vide OM dated 26.03.2024 has declared Raghanesda region in Banaskantha district of Gujarat as potential Renewable Energy (RE) zone with potential of 5 GW in the initial phase (i.e. related to 1 GW RE park of GPCL and 4 GW RE park of M/s Torrent for which land allocation by Government of Gujarat is under process). • Out of 4GW Solar Capacity of Torrent, 2.5GW is under ISTS. Out of 1GW RE park of GPCL, 0.5GW is being considered under ISTS in 1st phase planning. • Presently, connectivity under GNA has been received for 0.6GW (3x200MW from M/s Sprng) at Raghanesda PS with start date progressively from Jun-28 to Dec-29.
6.	Estimated Cost	**INR 1855 Crore**
7.	Impact on the total Annual Transmission charges (ATC) in % along with the existing ATC	A. ATC (considering levelized tariff @15% of estimated cost): about ₹278.25 Crs. B. Present ATC: ₹46024.95 Crore * C. A/B: about 0.605%
8.	Need of phasing, if any	Not Applicable
9.	Implementation timeframe	24 months
10.	Inclusion of any wildlife/protected area along the transmission line route	The line (BEE line) may pass through Kachchh Desert Sanctuary or its buffer zone in the state of Gujrat. However, for details of forest/protected areas survey is required to be done.
11.	Deliberations with RPC along with their comments	The scheme has been deliberated and agreed for in the Special WRPC meeting held on 27th March 2024.

Sl. No.	Items	Details
12.	System Study for the evolution of the proposal	The scheme was agreed in the 26th Consultation Meeting for Evolving Transmission Schemes in Western Region held on 28.02.2024.

**Total YTC allowed for Dec'23 as per Notification of Transmission Charges payable by DICs for Billing Month of February, 2024 dated 25.01.2024 posted on NLDC website.*

Annexure 4.8

Transmission scheme for evacuation of power from Ratle HEP (850MW)

<table>
<tr><th>S. No.</th><th>Items</th><th colspan="3">Details</th></tr>
<tr><td>1.</td><td>Name of Scheme</td><td colspan="3">Transmission scheme for evacuation of power from Ratle HEP (850MW)</td></tr>
<tr><td>2.</td><td>Scope of the scheme</td><td colspan="3"></td></tr>
<tr><td></td><td></td><td>Sl. No.</td><td>Description of Transmission Element</td><td>Scope of work

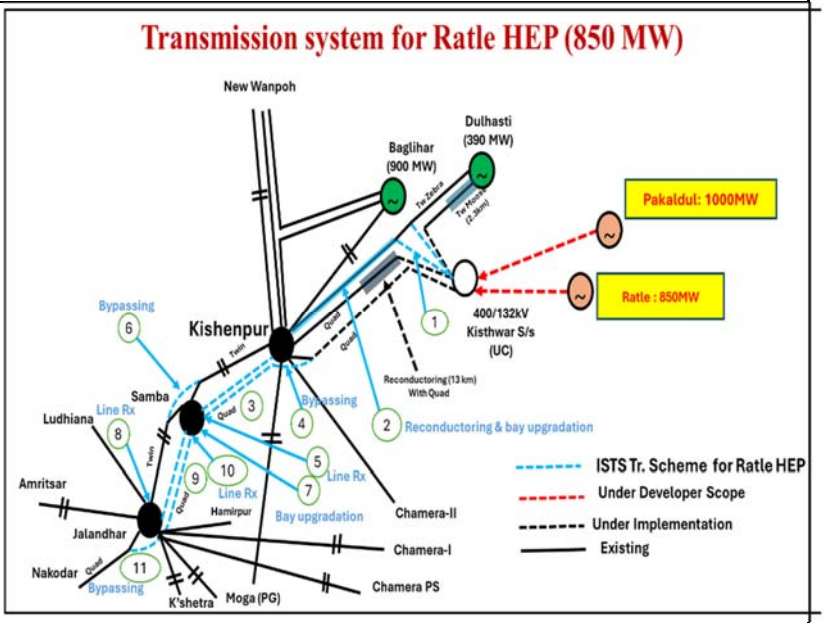
(Type of Substation/Conductor capacity/km/no. of bays etc.)</td></tr>
<tr><td></td><td></td><td>1</td><td>LILO of 400 kV Kishenpur- Dulhasti line (Twin) at Kishtwar S/s along with associated bays at Kishtwar S/s</td><td>LILO Length- 3km
• 400kV Kishenpur - Kishtwar (LILO section) is on Twin HTLS (with minimum 2100 MVA capacity) configuration
• 400kV Dulhasti - Kishtwar (LILO section) is on Twin Zebra configuration
• 400kV line bays at Kishtwar – 2 nos. (GIS) (line bays at Kishtwar S/s end shall be rated accordingly)</td></tr>
<tr><td></td><td></td><td>2</td><td>Reconductoring of 400 kV Kishenpur-Kishtwar section with Twin HTLS (minimum 2100 MVA capacity) (formed after LILO of Kishenpur-Dulhasti line at Kishtwar S/s) along with bay upgradation works (2000A to 3150A) at Kishenpur end for above line.</td><td>Length – 120km
• 400kV Bay upgradation work- 1 no. bay at Kishenpur end</td></tr>
<tr><td></td><td></td><td>3</td><td>400 kV Kishenpur-Samba D/c line (Quad)

(only one circuit is to be terminated at Kishenpur utilizing 1 no. of 400kV vacated line bay at Kishenur S/s (formed with bypassing of one ckt of 400kV Kishtwar – Kishenpur 400kV D/c line (Quad) at Kishenpur) while second circuit would be connected to bypassed circuit of 400kV Kishtwar – Kishenpur line (Quad))</td><td>Length -36 km (Quad)</td></tr>
<tr><td></td><td></td><td>4</td><td>Bypassing of one ckt of 400kV Kishtwar – Kishenpur 400kV D/c line (Quad) at Kishenpur and connecting it with one of the circuit of Kishenpur-Samba 400kV D/c line(Quad), thus forming 400kV Kishtwar - Samba (Quad) direct line (one ckt)</td><td></td></tr>
</table>

S. No.	Items	Details			
			5	1x80 MVAr Switchable line reactor at Samba end of 400kV Kishtwar-Samba 400kV line-165km (Quad) [formed after bypassing of 400kV Kishtwar – Kishenpur line (Quad) at Kishenpur and connecting it with one of the circuit of Kishenpur-Samba 400kV D/c line(Quad))	• 420 kV, 80 MVAr switchable line reactors at Samba S/s end– 1 nos. • Switching equipment for 420kV, 80 MVAr switchable line reactors at Samba S/s end – 1 no
			6	Bypassing both ckts of 400kV Kishenpur – Samba D/c line (Twin) & 400 kV Samba – Jalandhar D/c line (Twin) at Samba and connecting them together to form **400kV Kishenpur– Jalandhar D/c direct line (Twin)** (4 nos. of vacated 400kV line bays at Samba S/s will be utilized for 400 kV Kishenpur-Samba D/c line (Quad) & 400kV Samba- Jalandhar D/c line(Quad))	Length -0.5 km (Twin)
			7	Bays upgradation works (2000A to 3150A) at Samba end (4 nos. bays vacated after bypassing of Kishenpur – Samba D/c line (Twin) & 400 kV Samba – Jalandhar D/c line (Twin))	400kV Bay upgradation works- 4 nos. bays
			8	1x63 MVAr Switchable line reactor on each ckt at Jallandhar end of Kishenpur– Jalandhar D/c direct line -171km(Twin) (formed after bypassing both ckts of 400kV Kishenpur – Samba D/c line (Twin) & 400 kV Samba – Jalandhar D/c line (Twin) at Samba and connecting them together to form Kishenpur–Jalandhar D/c direct line (Twin))	• 420 kV, 63 MVAr switchable line reactors at Jallandhar S/s end– 2 nos. • Switching equipment for 420kV, 63 MVAr switchable line reactors at Jallandhar S/s end – 2 no
			9	400kV Samba- Jalandhar D/c line(Quad) (only one circuit is to be terminated at Jalandhar utilizing 1 no. of 400kV vacated line bay at Jalandhar S/s (formed with bypassing of 400kV Jalandhar – Nakodar line (Quad) at Jalandhar) while second circuit would be connected to bypassed circuit of Jalandhar –Nakodar 400kV line (Quad))	Line Length -145 km
			10	1x80 MVAr Switchable line reactor at Samba end of Samba –Nakodar direct line (Quad) formed after bypassing of 400kV Jalandhar – Nakodar line-187km (Quad) at Jalandhar and connecting it with one of the circuit of Samba-Jalandhar 400kV D/c line(Quad Moose), thus forming Samba –Nakodar line (Quad)	• 420 kV, 80 MVAr switchable line reactors at Samba S/s end– 1 no. • Switching equipment for 420kV, 80 MVAr switchable line

<table>
<tr><th>S. No.</th><th>Items</th><th>Details</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td></td><td>reactors at Samba S/s end – 1 no.</td></tr>
<tr><td>1
1</td><td>Bypassing 400kV Jalandhar – Nakodar line (Quad) at Jalandhar and connecting it with one of the circuit of Samba-Jalandhar 400kV D/c line(Quad Moose), thus forming 400kV Samba –Nakodar (Quad) direct line</td><td></td></tr>
</table>
Note:

M/s Sterlite shall provide space for 2 nos. of 400 kV line bays (GIS) at Kishtwar S/s
M/s POWERGRID shall provide space for 1 no. 80 MVAr Switchable line reactor (along with switching equipment) at Samba end of 400kV Kishtwar-Samba 400kV line
M/s POWERGRID shall provide space for 400kV bays upgradation works (4 nos.) at Samba S/s end
M/s POWERGRID shall provide space for 2 nos. 63 MVAr Switchable line reactor (along with switching equipment) at Jallandhar end of Kishenpur– Jalandhar D/c direct line (on each ckt)
M/s POWERGRID shall provide space for 1 no. 80 MVAr Switchable line reactor (along with switching equipment) at Samba end of Samba –Nakodar direct line
M/s POWERGRID shall provide space for 400kV Bay upgradation works (1 no.) at Kishenpur S/s end

</td></tr>
<tr><td>3.</td><td>Depiction of the scheme on Transmission Grid Map</td><td> 
</td></tr>
<tr><td>4.</td><td>Upstream/downstream system associated with the scheme</td><td>400/220kV Kishenpur (PG), Samba (PG) & Jalandhar (PG) S/s are existing ISTS substation of POWERGRID. 400/220kV Kishenpur S/s is interconnected with New Wanpoh, Baglihar, Dulhasti, Chamera-II, Moga & Samba S/s at 400kV level.</td></tr>
</table>

S. No.	Items	Details
		400/220kV Samba (PG) S/s is interconnected with New Wanpoh, Amargarh & Kishenpur S/s at 400kV level whereas 400/220kV Jalandhar (PG) S/s is interconnected with Amritsar, Chamera PS, Chamera-I, Nakodar, Hamirpur, Kurukshetra & Ludhiana S/s at 400kV level. 400/132kV Kishtwar S/s is under implementation by M/s Sterlite and being interconnected with Kishenpur S/s, Dulhasti S/s, Pakadul HEP at 400kV level.
5.	**Objective / Justification**	1. In the 3rd CMETS-NR meeting held on 28/01/2022, connectivity system for Ratle HEP (850MW) was deliberated. In the meeting, it was informed that the transmission system for evacuation of Ratle HEP (850 MW) was discussed and agreed during the 4th NRPC(TP) meeting held on 05/10/2021 & 12/10/2021 wherein it was deliberated that Ratle HEP (850 MW) is a Run of River scheme located on river Chenab, in Kishtwar District of Jammu & Kashmir, with design overload of 10% and its completion schedule is Feb/March 2026. 2. Further in above meeting, it was decided to grant connectivity to RHPCL for Ratle HEP (850 MW) through following transmission system for Connectivity: • Ratle HEP - Kishtwar (GIS) PS 400 kV D/c line (line suitable for carrying around 935 MW on each circuit at nominal voltage) along with 2 nos. of 400kV bays at Kishtwar S/s - To be implemented by the applicant (RHPCL) • 125 MVAR, 420 kV bus reactor at Ratle HEP - To be implemented by applicant (RHPCL) • Establishment of 400 kV Kishtwar (GIS) PS by LILO of one circuit of Kishenpur – Dulhasti 400kV D/c (Quad) line (Single Circuit Strung) and 125 MVAR Bus reactor at Kishtwar (GIS) PS– being implemented under ISTS 3. Subsequently, in the 23rd CMETS-NR meeting held on 29.08.23, application for GNA transition of M/s RHPCL (Applicant) under 37.2 of GNA regulation was deliberated. In the meeting,, the transmission system for Connectivity under GNA was proposed as below A. Transmission system for Connectivity (under scope of Applicant): • 400 kV Ratle HEP Switchyard - Kishtwar D/c line along with bays at both ends B. Common Transmission system for Connectivity under GNA (under ISTS): • 400 kV Kishenpur-Samba D/c line(Quad) (2nd) • Bypassing of one ckt of 400kV Kishtwar – Kishenpur D/c line (Quad) at Kishenpur and connecting it with one of the circuit of Samba-Kishenpur 400kV D/c line(Quad), thus forming 400kV Kishtwar-Samba (Quad) direct line (one ckt) Termination of another circuit of 400 kV Kishenpur-Samba D/c line(Quad) at Kishenpur at 400Kv bay vacated at Kishenpur

S. No.	Items	Details
		• Bypassing both ckts of 400kV Kishenpur – Samba D/c line (Twin) & 400 kV Samba – Jalandhar D/c line (Twin) at Samba and connecting them to form Kishenpur– Jalandhar D/c direct line (Twin) • 400kV Samba- Jalandhar D/c line(Quad) (only one circuit is to be terminated at Jalandhar while second circuit would be connected to bypassed circuit of Jalandhar –Nakodar 400kV D/c line) • Bypassing 400kV Jalandhar – Nakodar line (Quad) at Jalandhar and connecting it with one of the circuit of Samba-Jalandhar 400kV D/c line(Quad Moose), thus forming Samba –Nakodar line • Termination of another circuit of 400 kV Samba -Jalandhar D/c line (Quad) at Jalandhar at bay vacated at Jalandhar (After bypassing of one ckt of 400 kV Jalandhar - Nakodar at Jalandhar) • Reconductoring of remaining portion of Dulhasti-Kishtwar 400 kV D/c line with Quad conductor • Reconductoring of 400 kV Kishenpur-Dulhasti S/c line (Twin) (minimum 2100 MVA capacity) 4. Further, in the meeting it was deliberated that the scheme is tentative, which shall be finalized in the ensuing CMETS-NR meeting. The scheme along with implementation schedule shall be confirmed as part of in principle grant of connectivity. 5. As part of scheme, Reconductoring of remaining portion of Dulhasti-Kishtwar 400 kV D/c line (twin moose) and Reconductoring of 400 kV Kishenpur-Dulhasti line (twin zebra) is also required. In the 3rd NRPC-TP meeting it was also deliberated that 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. bay rating at Dulhasti is 2000A, which is further reduced to 700/800A due to reduced capacity of XLPE/OIL cable for connection of line to GIS bus at Dulhasti end. 6. In view of above a meeting was convened on 13.09.23 by CEA with NHPC in which it was decided that NHPC shall explore the feasibility for upgradation of the switchgear and cables at Dulhasti substation to rating of 3150 A. NHPC may also explore the option of replacement of cables with GIB bus duct. The same was to be intimated to CEA within one month. 7. NHPC vide mail dated 16.10.23 informed that GIS bay equipment installed at Dulhasti Power Station have a rating of 2000A. As suggested, complete replacement of GIS system would be required to accommodate requisite 3150 A. Accordingly, the existing rating of GIS busbar and associated switchgear like CB, CT, ES/ISO etc. needs to be uprated to 3150 A from 2000A.. It is envisaged that the space for the complete GIS compatible for 3150A may be required more than that of existing one and may not be feasible to accommodate within the existing underground space. 8. Further NHPC informed that there are two 400 kV cables (Line-1 is oil filled and Line-2 XLPE insulation) of 630 Sq.mm each used for Power evacuation from Dulhasti GIS which can carry approx. 700-800A. As suggested, replacement of cables with GIB bus duct may not be feasible at Dulhasti Power Station considering the constraints of cable tunnel space. Considering the above facts, the uprating of all

S. No.	Items	Details
		the above items will require significant Prolonged outages of generating units causing Generation and PAF Loss which will attract huge financial loss on account of loss of generation. Further, equipment replacement cost would also put an additional financial implication. In view of above factors, it is not possible to uprate the existing systems at Dulhasti Power station from 2000 A to 3150 A. 9. In view of above constraints, various other options were carried out and studies were reviewed. In the revised proposal, LILO of 400 kV Kishenpur- Dulhasti line (2nd ckt) at Kishtwar S/s (one ckt already LILOed as part of Pakaldul transmission system) along with Reconductoring of 400 kV Kishenpur-Kishtwar line (formed after LILO of Kishenpur- Dulhasti line at Kishtwar S/s) is proposed. In the revised scheme, there will be no requirement of space for installation of new GIS equipment and replacement of cables at Dulhasti switchyard for time being. 10. CTU vide mail dated 20.11.23 to POWERGRID requested information regarding maximum rating of the HTLS conductor suitable for Reconductoring of 400 kV Kishenpur-Kishtwar line (Twin Zebra), considering altitude and the bundle size of the line. CTU vide mail dated 26.12.23 to POWERGRID informed that the minimum Ampacity requirement is 1516A/ckt (2100MVA/ckt) for Reconductoring of 400 kV Kishenpur-Kishtwar line (Twin Zebra) and requested to provide the conductor configuration in order to avoid Corona inception gradient at high altitude. POWERGRID vide mail 26.02.24 informed that Conductor configuration shall remain the same as that of existing transmission line i.e. twin bundle of conductor diameter-28.62mm. It was also requested that POWERGRID may confirm the feasibility of the line bay upgradation requirements at Kishenpur Substation pertaining to the above line. In this regard POWERGRID vide mail 08.12.23 informed that 400 kV Kishenpur-Dulhasti line (Twin Zebra) line has bay equipment rating of 2000A (CB,CT, Isolator). In view of that bay upgradation is also required with Reconductoring of 400 kV Kishenpur-Kishtwar line (Zebra). 11. M/s Ratle HEP vide letter dated 27.12.23 informed the commissioning schedule progressively from Sep'26 (30.09.26) 12. Grid-India in the meeting as well as in mail dated 04.12.23 queried about expected timelines of other HEP in the area such as Kiru, Kawar, Kirthai-I, Kirthai-II etc. as maximum of nearly 4000MW could be evacuated through 3 outgoing lines from Kishtwar i.e. 2 lines to Kishenpur and one line to Samba. CTUIL informed that at present connectivity application received at Reoli Dugli, Purthi, Bardang and Dugar HEPs with schedule progressively from 2029, however no application is yet received from Kiru, Kawar, Kirthai-I and Kirthai-II HEPs. 13. Recently connectivity application from CVPPL for Kiru HEP(624MW) was received on 06.02.24 which is under process 14. For evacuation of power from Reoli Dugli, Purthi and Bardang HEPs, separate high capacity transmission system will be planned and based on studies, connectivity of above high capacity corridor with Kishtwar S/s (via Dugar HEP) will be finalized. Grid-India also stated that fault level at Kishtwar & Kishenpur also need to checked after the proposed interconnections. Based on the fault level assessments & transmission plan, switchgear rating may be selected. From the studies it is emerged

S. No.	Items	Details
		that with Ratle HEP, fault level of Kishtwar S/s is about 23kA (designed capacity:50KA) and Kishenpur S/s is about 37kA (designed capacity: 40kA) which is within limits. 15. Further Grid-India stated that the requirement of line reactors for lines such as 400kV Kishtwar-Kishenpur (132km) and 400kV Kishtwar-Samba (160km) may be studied given the persistent issues of high voltage in hydro complex in winter months during off-peak hours. CTU informed that requirement of line reactor will be reviewed considering space availability. Accordingly, CTU analyzed the reactive compensation requirement, however feasibility for installation of line reactors along with space confirmation from POWERGRID & Sterlite was awaited. Same was intimated to be decided in next CMETS-NR meeting. Grid-India also mentioned in mail that the bay allocation of feeders at Kishtwar station is very important & incoming and outgoing feeders need to be kept in same diameter. 16. PSTCL stated that they are planning to establish new substation at 400kV Wadala Granthian for which LILO of 400kV Jallandhar-Samba is under planning. CTU stated that at present with proposed scheme 400kV Samba-Jalandhar (Twin) (after bypassing above line will be Kishenpur-Samba (Twin)) and 400kV Samba-Jalandhar (Quad) line will be available for LILO in 2026-27 timeframe. In view of that PSTCL may carry out studies for both the alternatives and share with CEA & CTU. PSTCL agreed for the same. 17. Further based on inputs received from TSPs i.e. POWERGRID & Sterlite regarding space availability and feasibility for installation of line reactors & bay equipment rating, reactive compensation & upgradation requirement is also agreed as part of Transmission scheme for Ratle HEP (850MW) in 28th CMETS-NR Meeting held on 27.03.24 18. Considering grant of connectivity to Ratle HEP as well as for evacuation of power, transmission scheme (as per Annexure-1) was agreed in 26th & 28th CMETS-NR meeting held on 20.12.23 & 27.03.24 respectively. The transmission scheme was discussed and agreed in the 49th TCC/72nd NRPC meeting held on 29-30th Mar'24
6.	**Estimated Cost**	Rs. 1402.34 Cr.
7.	**Impact on the total Annual Transmission charges in % along with the existing ATC**	A. ATC (considering Levelized Tariff @15% of estimated cost): Rs 210.35 Cr. B. Present ATC: Rs. **46203.11 Cr.*** C. A/B (%): 0.455 %
8.	**Need of phasing, if any**	Not Applicable
9.	**Implementation timeframe**	30.09.26*
10.	**Inclusion of any wild life/protected area along the transmission line route**	Line lengths were reviewed in Gati Shakti portal w.r.t. any wildlife/protected area, airport along the transmission line route (Gati Shakti Map is enclosed in **Annexure-NIII**). Details of wild life/protected area protected areas observed on bee line of transmission line under the scheme is attached in

S. No.	Items	Details
		Annexure-NIV. However, for details of other forest/protected areas survey is required to be done.
11.	**Deliberations with RPC along with their comments**	The transmission scheme was discussed and technically approved in the 72nd NRPC meeting held on 30.03.24.
12.	**System Study for evolution of the proposal**	Studies discussed and agreed in following meeting • 26th CMETS-NR meeting held on 20.12.23 (Minutes of meeting enclosed in **Annexure-V**) • 28th CMETS-NR meeting held on 27.03.24 (Minutes of meeting enclosed in **Annexure-NVI**) • 72nd NRPC meeting held on 30.03.24 (Minutes of meeting enclosed in **Annexure-NVII**) Load flow results is attached at **Annexure-NVIII**

M/s Ratle HEP informed the commissioning schedule progressively from 30.09.26

**Total YTC allowed for Mar'24, as per notification of transmission charges payable by DICs for Billing Month of May, 2024 dated 25.04.2024 published on NLDC website (available at https://posoco.in/transmission-pricing/notification-of-transmission-charges-for-the-dics/).*

Annexure 4.9

Augmentation with 400/220kV, 1x500MVA Transformer (10th) at Fatehgarh-2 PS

1. Augmentation with 400/220kV, 1x500MVA, Transformer (10th) at Fatehgarh-2 PS was agreed as part of "transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part J" in 5th NCT meeting held on 25.08.2021 and 02.09.2021. In above meeting, it was also agreed that Implementation of above ICT shall be taken up after LTA of **4490MW at 220kV level of Fatehgarh-2 PS**. Subsequently, based on NCT recommendation, MoP vide OM dated 01.12.2021 awarded above transmission scheme to CTUIL with implementation timeframe of **15 months from MoP OM or evacuation requirement beyond 4490MW at 220kV level of Fatehgarh-2 PS, whichever is later**. Further, CTUIL vide letter dated 02.12.2021 allocated above scheme to POWERGRID based on MoP OM dated 01.12.2021.

2. 220kV level of Fatehgarh-2 PS is implemented in two sections i.e. Section-I & II. 5x500MVA, 400/220kV ICTs are implemented in Section-I as part of Rajasthan SEZ Phase-I whereas 4x500MVA, 400/220kV ICTs are implemented in Section-II as part of Rajasthan SEZ Phase-II scheme. Further, both the 220kV sections are implemented in geographically opposite sides (way apart from each other and not electrically connected) as per GA and layout of pooling station. However, 400kV & 765kV bus remained common for both the yards. At present, RE Connectivity of 2490MW under GNA is granted at Section-I and 1970MW is granted at Section-II, thus making total connectivity at Fatehgarh-2 PS as 4460MW which is less than 4490MW.

3. Subsequently, Manual on Transmission Planning Criteria was published by CEA in Mar'23. As per the above, 'N-1' reliability criteria may be considered for ICTs at the ISTS / STU pooling stations for renewable energy based generation of more than 1000 MW.

   As both the 220kV sections of Fatehgarh-2 PS are electrically isolated and have more than 1000MW RE connectivity in respective sections, '*N-1*' criteria to be fulfilled at both the sections. Keeping above in view, 1x500MVA, 400/220kV ICT (6th) at Section-I was awarded by CTU in Oct'22 to POWERGRID in line with MoP order dated 28.10.2021 which is under implementation (Jun'24).

4. With the above background, details of 400/220kV ICTs and Connectivity at Fatehgarh-2 PS are as under:

Section	Connectivity (MW)	400/220kV ICTs	Remarks
Section-I	2490	6x500MVA	5 nos. ICTs are existing. 1 no. ICT is under implementation (Jun'24), to fulfill '*N-1*' criteria

Section-II	1970	4x500MVA	4 nos. ICTs are existing. **1 No. ICT is required to fulfill '*N-1*' Criteria**
Total	**4460**	**10x500MVA**	

5. In view of above, 1x500MVA, 400/220kV ICT(now 11th ICT) at Fatehgarh-II PS as approved by MoP vide OM dated 01.12.2021 based on recommendation in 5th NCT meeting may be taken up is now proposed to be taken up for implementation with 18 month implementation schedule considering present timeline for ICT augmentation (instead of earlier 15 months) to fulfil 'N-1' criteria as per CEA Manual on Transmission Planning Criteria, 2023.

6. Considering requirement of ICT (in Fatehgarh-II Section-II) for N-1 compliance in Fatehgarh-II PS following is proposed :

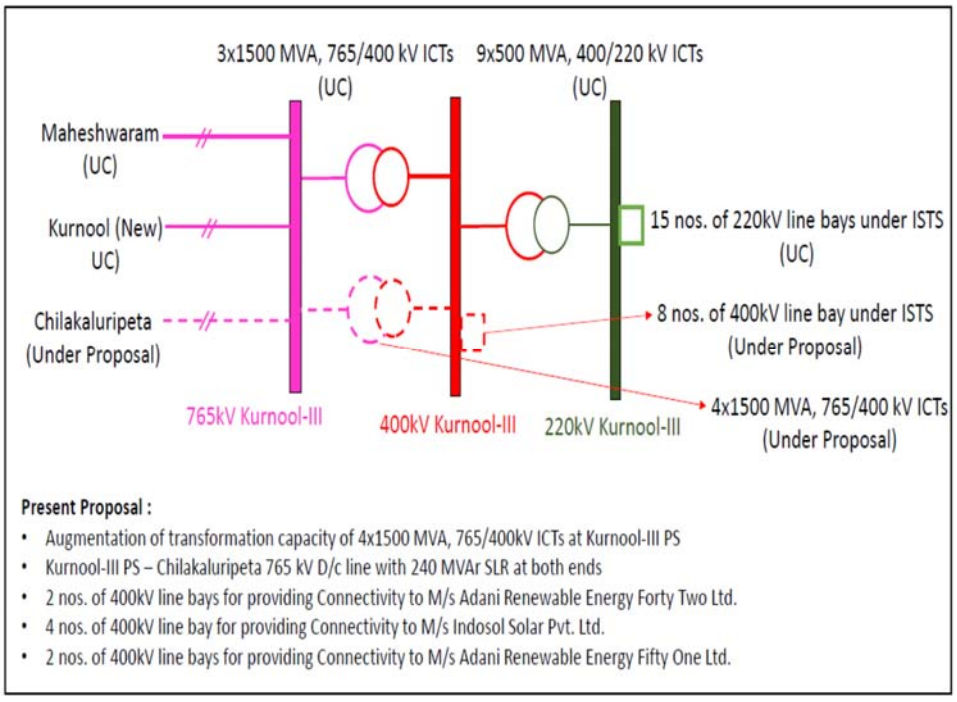
Earlier (as per MOP OM dated 01.12.21)	**Amendment**
Augmentation with 400/220kV, 1x500MVA Transformer **(10th)** at Fatehgarh-2 PS • 400/220 kV 500 MVA ICT:1 no • 400 kV ICT bays – 1 nos. • 220 kV ICT bays - 1 nos. **Implementation Timeframe- 15 months from MOP OM or evacuation requirement beyond 4490 MW at 220kV level of Fatehgarh-2, whichever is later.**	Augmentation with 400/220kV, 1x500MVA Transformer **(11th)** at Fatehgarh-II PS (5th ICT in Fatehgarh-II section-II) • 400/220 kV 500 MVA ICT:1 no • 400 kV ICT bays – 1 no. • 220 kV ICT bays - 1 no. **Implementation Timeframe- 18 months for N-1 compliance in Fatehgarh-II PS (Section-II)**

Annexure 4.10

Transmission system strengthening at Kurnool-III PS for integration of additional RE generation projects

<table>
<tr><th>Sl. No.</th><th>Items</th><th>Details</th></tr>
<tr><td>1.</td><td>Name of Scheme</td><td>Transmission system strengthening at Kurnool-III PS for integration of additional RE generation projects</td></tr>
<tr><td>2.</td><td>Scope of the scheme</td><td>
<table>
<tr><th>Package</th><th>Scope of the Transmission Scheme</th><th>Capacity /km</th><th>Schedule</th><th>CMETS-SR</th><th>Est. Cost (crs.)</th></tr>
<tr><td rowspan="2">A</td><td>Augmentation of transformation capacity of 3x1500 MVA, 765/400kV ICTs at Kurnool-III PS</td><td>• 3x1500 MVA, 765/400kV ICT
• 765kV ICT bay – 3 Nos.
• 400kV ICT bay – 3 Nos.
• 400kV Bus Sectionaliser – 1 Set</td><td rowspan="2">24 months</td><td rowspan="2">28th held on 29.02.24</td><td rowspan="2">2650</td></tr>
<tr><td>Kurnool-III PS – Chilakaluripeta 765 kV D/c line with 240 MVAr switchable line reactors at both ends</td><td>~ 260 km
• 765kV line bays – 2 nos. (at Kurnool-III PS)
• 765kV line bays – 2 nos.</td></tr>
</table>
</td></tr>
</table>

					(at Chilakaluripeta) • 765 kV, 240 MVAr SLR at Kurnool-III PS – 2 nos. (6x80 MVAr units) • 765 kV, 240 MVAr SLR at Chilakaluripeta – 2 nos. (6x80 MVAr units)				
			B	2 nos. of 400kV line bays at Kurnool-III PS for termination of dedicated transmission line of M/s Adani Renewable Energy Forty Two Ltd.	• 400kV line bays – 2 Nos.	30.06.26	23rd held on 29.09.23	110	
				4 nos. of 400kV line bay at Kurnool-III PS for termination of dedicated transmission lines of M/s Indosol Solar Pvt. Ltd.	• 400kV line bays – 1 Nos.	30.06.25	26th held on 09.12.23		
					• 400kV line bays – 1 Nos.	24 months			
					• 400kV line bays – 2 Nos.	31.03.27			
				2 nos. of 400kV line bays at Kurnool-III PS for termination of dedicated transmission line of M/s	• 400kV line bays – 2 Nos.	31.12.27	28th held on 29.02.24		

			Adani Renewable Energy Fifty One Ltd.				
		C	Augmentation of 1x1500 MVA 765/400kV ICT (7th) at Kurnool-II PS	• 1x1500 MVA, 765/400kV ICT • 765kV ICT bay – 1 Nos. • 400kV ICT bay – 1 Nos.	24 months	29th held on 28.03.24	126
			Total Cost				**2886**
3.	Depiction of the scheme on Transmission Grid Map					
4.	Upstream/downstream system associated with the scheme	Not applicable					

	Objective / Justification	Presently, Kurnool-III 765/400/220kV PS is under implementation by POWERGRID through RTM route and is expected by Nov'24. Further, for optimal utilisation of the pooling station, space provision for integration of additional 4.5 GW has been kept at Kurnool-III. The broad scheme is as below: • Establishment of 765/400/220kV 3x1500 MVA, 9x500 MVA Kurnool-III PS • Kurnool-III PS – Kurnool(new) 765 kV D/c line • Kurnool-III PS – Maheshwaram (PG) 765 kV D/c line Connectivity of about 2320 MW (1720 MW at 220kV level & 600 MW at 400kV level) have already been granted at Kurnool-III PS with the above under implementation transmission system. Further, CTU has received additional connectivity applications for 3770 MW (Solar: 3650 MW & Wind: 120 MW) seeking connectivity at Kurnool-III in the month of Nov'23. With this, the total connectivity quantum at Kurnool-III shall be about 6090 MW (1990 MW at 220kV level & 4100 MW at 400kV level). However, Kurnool-III PS is being implemented with 3x1500 MVA, 765/400kV transformation capacity. Therefore, grant of connectivity for additional 3770 MW shall require expansion of Kurnool-III PS and further transmission lines for evacuation of power from Kurnool-III PS. Accordingly, following transmission system was proposed for integration of additional 4.5 GW of RE at Kurnool-III PS in the 26th CMETS-SR held on 29.12.2023, however transmission system could not be finalised : • Augmentation of transformation capacity of 3x1500 MVA, 765/400kV ICTs at Kurnool-III PS • Kurnool-III PS – Chilakaluripeta 765 kV D/c line In the meantime, CTU received additional connectivity applications for 1650 MW (PSP: 1250 MW & Solar: 400 MW) at Kurnool-III PS in the month of Jan'24. With this, the total connectivity quantum at Kurnool-III shall be about of 7740 MW (2390 MW at 220kV level & 5350 MW at 400kV level). The transmission system was again deliberated in the 28th CMETS-SR held on 29.02.2024 (Extracts of MoM attached at **Annexure-III**) and agreed for integration of additional RE generation projects and grant of Connectivity at Kurnool-III PS under the CERC GNA Regulations : • Augmentation of transformation capacity of 3x1500 MVA, 765/400kV ICTs at Kurnool-III PS • Kurnool-III PS – Chilakaluripeta 765 kV D/c line (about 260 km) with 240 MVAr switchable line reactors at both ends CTU also received additional connectivity application for 260 MW at Kurnool-III PS in the month of Feb'24. Connectivity corresponding to 7740 MW have been granted / agreed for grant at Kurnool-III PS. However, for evacuation of additional power from Kurnool-III REZ and Ananthapuram REZ, 1x1500 MVA, 765/400 kV ICT (7th) is also

		required. Accordingly, augmentation of 1x1500 MVA 765/400kV ICT (7th) at Kurnool-III PS was proposed in the 29th CMETS-SR held on 28.03.2024 (MoM awaited). With this, the total connectivity quantum granted / agreed for grant at Kurnool-III PS shall be about of 8000 MW (2650 MW at 220kV level & 5350 MW at 400kV level). The Connectivity have been granted for 600 MW to M/s Adani Renewable Energy Forty Two Ltd. for its PSP generation project at 400kV level with 2 nos. of 400kV line bays (under ISTS scope) for termination of its dedicated transmission line in the 23rd CMETS-SR held on 29.09.2023. Similarly, Connectivity have been granted for 3500 MW (800 MW & 3x900 MW) to M/s Indosol Solar Pvt. Ltd. for its Solar Power Park at 400kV level with 4 nos. of 400kV line bays (under ISTS scope) for termination of its dedicated transmission lines in the 26th CMETS-SR held on 29.12.2023. Similarly, Connectivity have been agreed for grant for 1250 MW to M/s Adani Renewable Energy Fifty One Ltd. for its PSP generation project at 400kV level with 2 nos. of 400kV line bays (under ISTS scope) for termination of its dedicated transmission lines in the 28th CMETS-SR held on 29.02.2024. Accordingly, total 8 nos. of 400kV line bays are required to developed under ISTS for termination of dedicated transmission lines from the above generation projects.
5.	Estimated Cost	**Package A - Rs. 2650 Crore** **Package B - Rs. 110 Crore** **Package C - Rs. 126 Crore** **Total – RS. 2886 Crore**
6.	Impact on the total Annual Transmission charges in % along with the existing ATC	D. ATC (considering Levelized Tariff @15% of estimated cost): Rs. 432.9 Crore E. Present ATC: Rs. 46203.11 Crore * F. A/B (%): 0.937 %
7.	Need of phasing, if any	Not Applicable
8.	Implementation timeframe	Package A – 24 months Package B – progressively from Dec'26 to Dec'27 Packager C – 24 months
9.	Inclusion of any wild life/protected area along the transmission line route	No major National Park, Wildlife Sanctuary or other protected areas observed. However, for details of forest/protected areas, survey is required to be done.

10.	Deliberations with RPC along with their comments	The scheme was discussed in the 51st SRPC meeting held on 15.05.2024 .SRPC vide letter dated 22.05.2024 has forwarded the views on the scheme (Copy of SRPC views attached at **Annexure- 4.10 A**).
11.	System Study for evolution of the proposal	Transmission system strengthening at Kurnool-III PS was agreed for integration of additional RE generation projects and 400kV line bays at Kurnool-III PS was agreed for providing Connectivity to various RE generation projects.

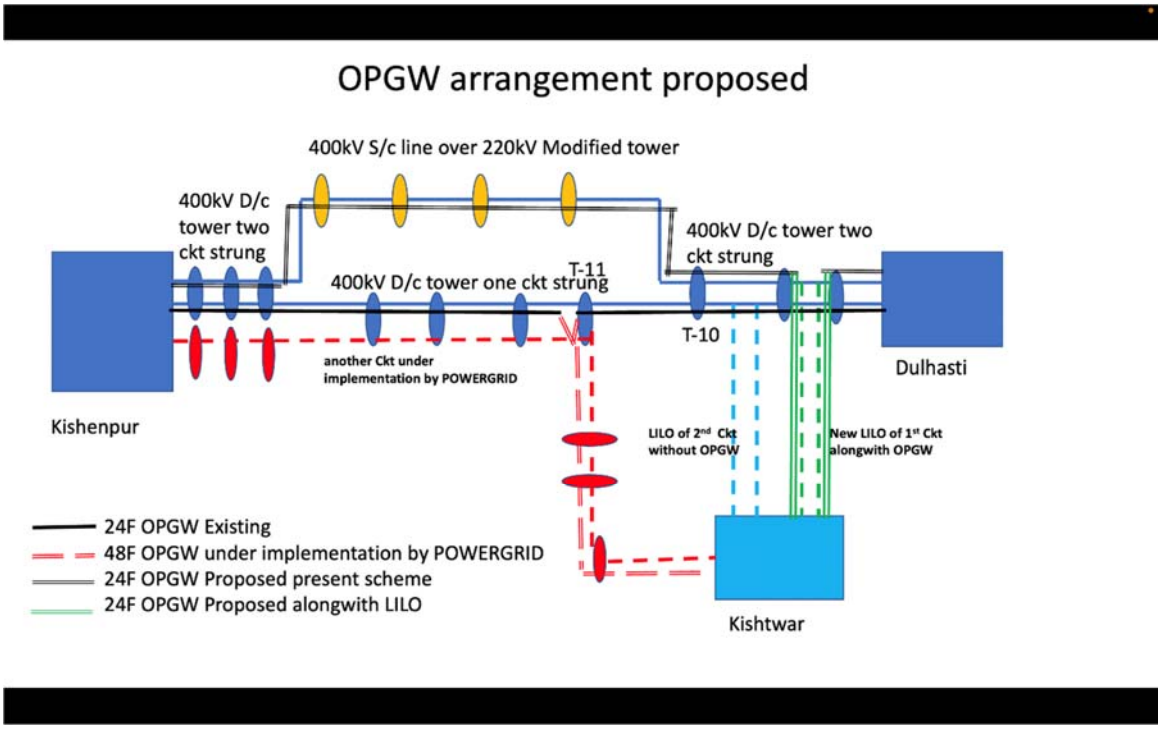
**Total YTC allowed for Mar'24, as per notification of transmission charges payable by DICs for Billing Month of May, 2024 dated 25.04.2024 published on NLDC website.*

Annexure 4.11

Redundant Communication system for Dulhasti (NHPC) & Kishtwar (Sterlite) stations

S. No.	Items	Details
1.	Name of scheme	Redundant Communication system for Dulhasti (NHPC) & Kishtwar (Sterlite) stations
2.	Scope of the scheme	Supply and installation of OPGW (24F) on 400kV Kishenpur-Dulhasti S/c line (Circuit-1) line (120 kms) and 1 FOTE each at Dulhasti & Kishenpur stations (Total 2 no. FOTE)
3.	Connectivity diagram	**Shown below this table.**
4.	Objective / Justification	Presently Dulhasti (NHPC) station is connected with single path via 400kV Kishenpur – Dulhasti D/c line with OPGW. As Dulhasti is radially connected and also on AGC operation it is proposed to provide redundant communication path for this station. Further New Kishtwar Substation is also proposed to be connected over radial path with Kishenpur. To provide redundant communication to Dulhasti & Kishtwar Stations feasibility of OPGW installation on 400kV Kishenpur-Dulhasti S/c line (Circuit-1) strung over modified 220kV towers was deliberated in the **2nd, 3rd CPM** (CTU Communication Planning Meeting) of NR, **22nd & 23rd TeST meeting of NRPC** and in **57th NRPC**. In the 23rd NRPC TeST meeting POWERGRID stated that OPGW installation is not feasible on this line due to tower strengthening issues. In 27th CMTES meeting (Abstract of MoM attached at **Annexure-CI**) POWERGRID representatives informed that as reconductoring scope is also envisaged on 400kV Kishenpur-Dulhasti S/c line (120kms.) under "*Transmission system scheme for Ratle HEP (850MW)*". POWERGRID stated that during reconductoring work OPGW can be installed on this line as sag can be suitably relaxed during installation which shall remove hindrance of tower strengthening due to OPGW installation. They further stated that it will also create diverse physical path in line with CEA Manual of Communication Planning. This scheme shall provide redundant communication to Dulhasti as well as new Kishtwar Substation.

		Moreover OPGW on LILO portion of Kishtwar shall be considered in another scheme for which RFP inputs for the Ratle Scheme alongwith 1 no. FOTE at Kishtwar. The proposed arrangement of OPGW shown below.
5.	Estimated Cost	**Rs. 7.2 crore (approx.) (excluding taxes and duties)**
6.	Implementation timeframe	Matching timeframe with reconductoring scheme (Work may be awarded alongwith Reconductoring scheme) Typical 12 months
7.	Implementation Agency	OPGW and Reconducting work may be awarded to the same Agency
8.	Deliberations in different meetings	The scheme was deliberated in the 73rd meeting of NRPC and technically agreed , (MoM are Awaited).



Annexure 4.12

Supply and installation of 24 Fibre OPGW on PKTCL lines for providing redundant communication for Parbati Pool (Banala) (PG) S/s, Parbati-II (NHPC) & Parbati-III (NHPC) stations

(a) Supply and installation of 24 Fibre OPGW on PKTCL lines for providing redundant communication for Parbati Pooling (Banala) (PG) S/s, Parbati-II (NHPC) & Parbati-III (NHPC) stations.

S. No.	Items	Details
1.	Name of scheme	Supply and installation of 24 Fibre OPGW on PKTCL lines for providing redundant communication for Parbati Pooling (Banala) (PG) S/s, Parbati-II (NHPC) & Parbati-III (NHPC) stations.
2.	Scope of the scheme	Supply and installation of OPGW (24F) on following lines owned by PKTCL: (v) Parbati-II – Parbati-III – **9.643 km** (vi) Parbati-III – Parbati Pooling (Banala) – **3.518 km** (vii) Parbati Pooling (Banala) – Koldam (NTPC) – **62.636 km** (viii) Parbati-II - Parbati Pooling (Banala) – **9.643 km** **Total km- 88.635**
3.	Connectivity diagram	At **Figure below**
4.	Objective / Justification	Presentably data of Parbati-II (NHPC), Parbati – III (NHPC) is routed to NRLDC through leased line/ PLCC. Further Parbati Pooling (Banala) ISTS station is connected over single fiber path with Hamirpur. OPGW cable installation on the following PKTCL (Indigrid) lines were envisaged under Reliable Communication Project of NR (implementing by POWERGRID) for redundant communication of Parbati-II (NHPC), Parbati – III (NHPC) & Banala (PG) stations: Parbati-II – Parbati-III Parbati-III – Parbati Pooling (Banala) Parbati Pooling (Banala) – Koldam (NTPC) However, works could not be completed due to ownership issues. The above lines were

S. No.	Items	Details
		constructed by PKTCL under RTM mode. Above lines have mixed ownership of PKTCL & POWERGRID for certain line sections. The matter discussed in the 2nd & 3rd CPM (CTU Communication Planning Meeting) meeting of Northern Region and in 23rd TeST meeting of NRPC. To address these issues a special meeting has been convened by NRPC on 22.12.23 among Indigrid, NRLDC, CTU, POWERGRID and CEA, minutes of the same was released on 21.02.24. As per minutes replacement of earthwire with OPGW was allowed to be executed by transmission licensee owning earthwire after approval of the competent authority in line with CERC order dated 27.12.2023 against petition number 94/MP/2021. It is to mention that POWERGRID already installed OPGW for their sections, for PKTCL section OPGW needs to be installed to provide fiber based redundant communication for Parbati Pooling (Banala), Parbati-II (NHPC) & Parbati-III (NHPC) stations. Details of Sections of PKTCK ownership are given below: Parbati-II (NHPC) – Parbati-III (NHPC) - **9.643 km.** Parbati-III (NHPC) – Parbati Pooling (Banala) (PG) – **3.518 km.** Parbati Pooling (Banala) (PG) – Koldam (NTPC) – **62.636 km.** Parbati-II (NHPC) - Pooling (Banala) (PG) – **12.838 km.** (for providing ring protection) **Total km - 88.635.** For Parbati-II - Parbati Pooling (Banala) line section, OPGW on POWERGRID portion of 0.783 km. is also needs to be installed for completing ring protection between Banala, Parbati-II, Parbati-III. Connectivity diagram showing proposed OPGW network is attached at **Figure below**.

S. No.	Items	Details
		During discussions in the meeting held on 22.12.2023 at NRPC, it was decided that POWERGRID shall install FOTE at Banala, Parbati-II, Parbati-III & Koldam stations. OPGW of both PKTCL & POWERGRID shall be patched to make complete fiber paths.
5.	Estimated Cost	**Rs. 5.31 Crore (approx.) (excluding taxes and duties)**
6.	Implementation timeframe	**18 months from the date of allocation**
7.	Deliberations in different meetings	The scheme was deliberated in the 72nd meeting of NRPC.

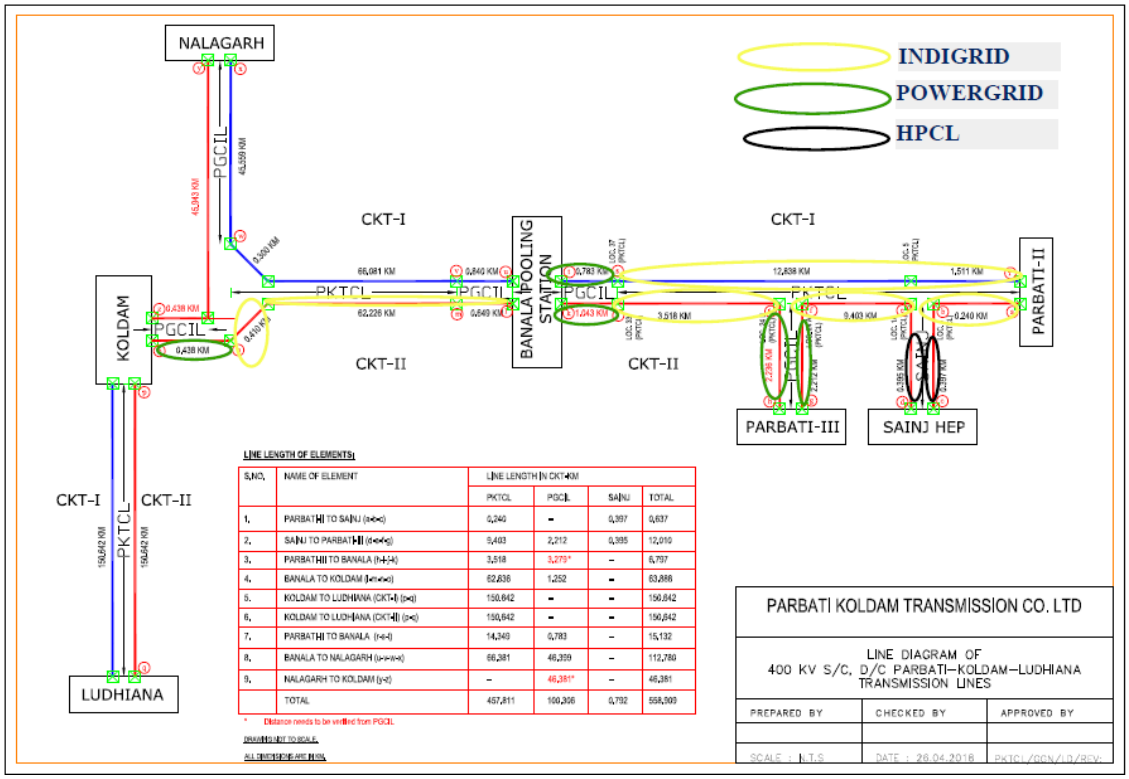
(b) Supply and installation of 24Fibre OPGW & FOTE to providing redundant communication for Parbati Pooling (Banala) (PG) S/s , Parbati-II (NHPC) & Parbati-III (NHPC) stations.

S. No.	Items	Details
1.	Name of scheme	Supply and installation of 24 Fibre OPGW & FOTE to providing redundant communication for Parbati Pooling (Banala) (PG), Parbati-II (NHPC) & Parbati-III (NHPC) stations.
2.	Scope of the scheme	(iii) Supply and installation of OPGW (24F) on Parbati Pooling (Banala) line (0.783Km) on POWERGRID portion. (iv) Supply and installation of 4 nos. FOTE (STM-16) at Parbati Pooling (Banala), Parbati-II (NHPC), Parbati-III (NHPC) & Koldam (NTPC) stations (1 no. at each location)
3.	Connectivity diagram	At **Figure below**
4.	Objective / Justification	Presentably data of Parbati-II (NHPC), Parbati – III (NHPC) is routed to NRLDC through leased line/ PLCC. Further Parbati Pooling (Banala) ISTS station is connected over single fiber path with Hamirpur. OPGW cable installation on the following PKTCL (Indigrid) lines were envisaged under Reliable Communication Project of NR (implementing by POWERGRID) for redundant communication of Parbati-II (NHPC), Parbati – III (NHPC) & Banala (PG) stations: Parbati-II – Parbati-III

S. No.	Items	Details
		Parbati-III – Parbati Pooling (Banala) Parbati Pooling (Banala) – Koldam (NTPC) However, works could not be completed due to ownership issues. The above lines were constructed by PKTCL under RTM mode. Above lines have mixed ownership of PKTCL & POWERGRID for certain line sections. The matter discussed in the 2nd & 3rd CPM (CTU Communication Planning Meeting) meeting of Northern Region and in 23rd TeST meeting of NRPC. To address these issues a special meeting has been convened by NRPC on 22.12.23 among Indigrid, NRLDC, CTU, POWERGRID and CEA, minutes of the same was released on 21.02.24. As per minutes replacement of earthwire with OPGW was allowed to be executed by transmission licensee owning earthwire after approval of the competent authority in line with CERC order dated 27.12.2023 against petition number 94/MP/2021. It is to mention that POWERGRID already installed OPGW for their sections, for PKTCL section OPGW needs to be installed to provide fiber based redundant communication for Parbati Pooling (Banala), Parbati-II (NHPC) & Parbati-III (NHPC) stations. Requirement if OPGW on PKTCL lines is included in thePart (a) of Scheme. For Parbati-II - Parbati Pooling (Banala) line section, OPGW on POWERGRID portion of **0.783 km**. is also needs to be installed for completing ring protection between Banala, Parbati-II, Parbati-III. Connectivity diagram showing proposed OPGW network is attached below. Further, during discussions in the meeting held on 22.12.2023 at NRPC, it was decided that POWERGRID shall install FOTE at Banala (PG), Parbati-II (NHPC), Parbati-III (NHPC) & Koldam (NTPC) stations. OPGW of both PKTCL & POWERGRID shall be patched to make complete fiber paths.

S. No.	Items	Details
5.	Estimated Cost	**1.24 crore (approx.) (excluding taxes and duties)**
6.	Implementation timeframe	**18 months from the date of allocation (with matching schedule with Scheme A.)**
7.	Deliberations in different meetings	The scheme was deliberated in the 72nd meeting of NRPC, relevant abstract of MoM attached at **Annexure-CIV**

Schematic of Parbati-Koldam TL



Annexure 4.13

Redundant Communication for Chamera-III (NHPC) & Budhil (GreenCo) using 3 pairs of fibers sharing from HPPTCL network

S. No.	Items	Details
1.	Name of Scheme	Redundant Communication for Chamera-III (NHPC) & Budhil (GreenCo) using 3 pairs of fibers sharing from HPPTCL network.
2.	Scope of the scheme	Supply and installation of 1 no. STM-16 FOTE at Lahal (HPPTCL)
3.	Objective / Justification	Chamera-III & Budhil stations are presently connected via single fiber path to ISTS network. Redundant communication for these stations were deliberated in the 2nd & 3rd CPM of NR, 20th, 23rd & 24th TeST Meeting of NRPC. In the 23rd TeST meeting of NRPC it was decided that to create redundant path for these stations 1 no. STM-16 FOTE is required at Lahal (HPPTCL) and 3 pairs of fibers sharing is required for the following HPPTCL links: Budhil (GreenCo) – Lahal (HP) Lahal (HP) – Chamera PS (ISTS node) HPPTCL vide letter dtd. 01.02.24 has given consent to NRPC with copy to CTU for 3 pairs of fibers sharing for ULDC data purpose (copy letter is attached at Annexure-CVI). After implementation of above scheme, Chamera-III & Budhil shall have ring protection as below: Chamera PS – Chamera-III – Budhil – Lahal - Chamera PS
4.	Estimated Cost	**Rs. 0.3 Crore (approx.) (excluding taxes and duties)**
5.	Implementation timeframe	**18 months from the date of allocation**
6.	Deliberations in different meetings	The scheme was deliberated in the 72nd meeting of NRPC.

Annexure 4.14

Additional FOTE requirements at AGC locations in Western Region

<table>
<tr><th>S. No.</th><th>Items</th><th>Details</th></tr>
<tr><td>1.</td><td>Name of Scheme</td><td>Additional FOTE requirements at AGC locations in Western Region.</td></tr>
<tr><td>2.</td><td>Scope of the scheme</td><td>Supply and installation of 13 nos, 3 MSP (1+1) FOTE (STM-16 capacity) at following station:
<table>
<tr><th>S. No.</th><th>Station Name</th><th>No of FOTE required</th></tr>
<tr><td>1</td><td>VSTPS III</td><td>2</td></tr>
<tr><td>2</td><td>VSTPS V</td><td>2</td></tr>
<tr><td>3</td><td>VSTPS II</td><td>2</td></tr>
<tr><td>4</td><td>NTPC Gandhar</td><td>1</td></tr>
<tr><td>5</td><td>NTPC Khargone</td><td>2</td></tr>
<tr><td>6</td><td>Mauda</td><td>1</td></tr>
<tr><td>7</td><td>Sipat</td><td>1</td></tr>
<tr><td>8</td><td>LARA</td><td>1</td></tr>
<tr><td>9</td><td>NSPCL</td><td>1</td></tr>
</table></td></tr>
<tr><td>3.</td><td>Depiction of the scheme on FO Map</td><td>N/A</td></tr>
<tr><td>4.</td><td>Objective / Justification</td><td>i. As per CEA, Manual of Communication Planning In Power System Operation, 2022 CTU, for high availability requirements for Power System Communication, redundancy with route diversity for critical links shall be maintained.
ii. NLDC stated that additional FOTE and redundant ethernet ports are required at all AGC operated generating stations, in view of resource disjoint and criticality of AGC operation for grid operation purpose.
iii. In view of above, additional FOTE are required at above mentioned AGC operated generating stations in western region as provided by POWERGRID.</td></tr>
<tr><td>5.</td><td>Estimated Cost &Funding</td><td>Rs. 3.90 Cr. (approx.) excluding GST.</td></tr>
<tr><td>6.</td><td>Implementation timeframe</td><td>12 months from the date of allocation</td></tr>
<tr><td>7.</td><td>Deliberations with WRPC along with their comments</td><td>The Additional FOTE requirements at AGC locations in Western Region was discussed in 3rd & 4th ISTS Communication Planning Meeting for Western Region dated 27.12.2022 & 26.07.2023 respectively. Further, this agenda was discussed and approved in 49th TCC/WRPC meeting held on 12-13 Apr 2024.</td></tr>
</table>

Annexure 4.15

Redundant OPGW communication path for Solapur STPP under AGC

<table>
<tr><th>S. No.</th><th>Items</th><th>Details</th></tr>
<tr><td>1.</td><td>Name of Scheme</td><td>Redundant OPGW communication path for Solapur STPP under AGC.</td></tr>
<tr><td>2.</td><td>Scope of the scheme</td><td>Supply and installation of

c) 24F OPGW on 400kV Solapur (NTPC)- Solapur (PG) ckt#1/2 (11.16km)
d) STM-16, 3 MSP FOTE at Solapur STPP and Solapur PG Station (2 Nos FOTE).</td></tr>
<tr><td>3.</td><td>Depiction of the scheme on FO Map</td><td>Shown in Figure-I below</td></tr>
<tr><td>4.</td><td>Objective / Justification</td><td>i. As per CEA, Manual of Communication Planning In Power System Operation, 2022 CTU, for high availability requirements for Power System Communication, redundancy with route diversity for critical links shall be maintained.
ii. NLDC stated that additional FOTE and redundant ethernet ports are required at all AGC operated generating stations, in view of resource disjoint and criticality of AGC operation for grid operation purpose.
iii. Solapur STPP is connected to Solapur (PG) through 2 nos. of 400kV D/c Line. Both lines are owned by POWERGRID. At present, OPGW is installed on one line only.

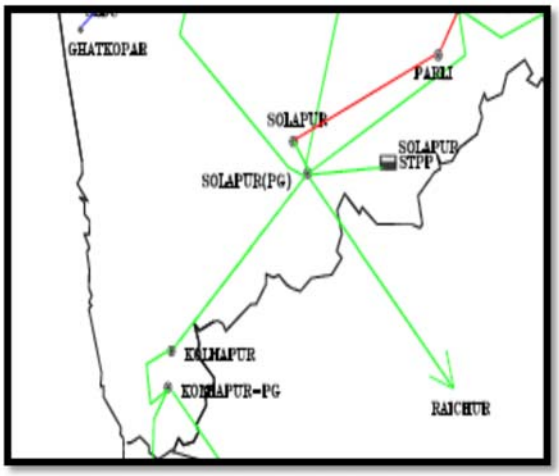
<table>
<tr><th>Sl. No</th><th>Name of Line</th><th>Route Length</th><th>Availability of OPGW</th></tr>
<tr><td>1</td><td>Solapur(NTPC)-Solapur(PG)-400KV CKT#1 & 2</td><td>11.162</td><td>Nil and proposed.</td></tr>
<tr><td>2</td><td>Solapur(NTPC)-Solapur(PG)-400KV CKT#3 & 4</td><td>12.057</td><td>Yes, on ckt 4.</td></tr>
</table>

iv. In view of above it is agreed that for redundant communication path, OPGW has to be installed on second line.</td></tr>
<tr><td>5.</td><td>Estimated Cost &Funding</td><td>Rs. 1.15 Cr. (approx.) excluding GST.</td></tr>
<tr><td>6.</td><td>Implementation timeframe</td><td>18 months from the date of allocation</td></tr>
</table>

8.	Deliberations with WRPC along with their comments	The Redundant OPGW communication path for Solapur STPP under AGC was discussed in 2nd and 3rd ISTS Communication Planning Meeting for Western Region dated 03.08.2022, 27.12.2022 respectively. Further, this agenda was discussed and approved in 49th TCC/WRPC meeting held on 12-13 Apr 2024.

Map of scheme is given below

Communication Map



Power map

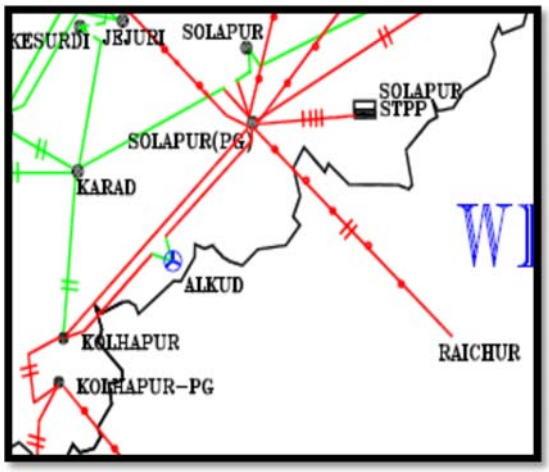


Figure-I: OPGW Communication for Sholapur STPP.

Annexure 4.16

Redundant OPGW communication path for 500MW plant of NSPCL, Chhattisgarh.

S. No.	Items	Details
1.	Name of Scheme	Redundant OPGW communication path for redundancy of 500MW plant of NSPCL, Chhattisgarh.
2.	Scope of the scheme	Supply and installation of OPGW along with accessories by replacing the existing earth wire on one circuit by Live Line installation on the 220kV D/C MSDS-V(BSP) – Khedamara line (approx.9KM)
3.	Depiction of the scheme on FO Map	Shown in **Figure below**
4.	Objective / Justification	NSPCL Generating station (500MW plant) is operating under AGC. NSPCL is connected to Raipur (PG) through 400kV D/C Line (with 24F OPGW). NSPCL plant is also connected electrically with 400kV Khedamara S/S of CSPTCL via MSDS-V of BSP. OPGW is available on NSPCL to MSDS-V (BSP) 220kV D/C line (4km). However, OPGW is not available on 220kV D/C line of CSPTCL from MSDS-V to Khedamara S/S. Connectivity diagram of the scheme is attached at **Figure below** OPGW installation on above line shall create one more OPGW path for data communication redundancy. Thus, OPGW needs to be provided by replacing one earth wire on the 220kV D/C line of CSPTCL from MSDS-V to Khedamara S/S.
5.	Estimated Cost	**Rs. 0.55 Crore (including taxes) approx.**
6.	Implementation timeframe	**18 months from the date of allocation**
8.	Deliberations	The scheme was discussed in the 3rd Communication Planning Meeting (CPM) of CTU and 7th WR Communication and SCADA meeting. The scheme was further deliberated in the 46th TCC/ WRPC meeting held on 2-3 Feb and it was decided that Since CSPTCL is already sharing deemed ISTS as well as operating them, they can procure a central licence if it is required and the

		OPGW project implementation may be carried out by CSPTCL. However, M/s CSPTCL wide their letter ref:03-02/SLDC/OPN/2677 dated 11.03.2024 gave their consent allowing M/s POWERGRID for OPGW installation 220kV D/C line of CSPTCL from MSDS-V to Khedamara S/S under ISTS . This agenda was further deliberated in 9th WR SCADA meeting and approved in 49th TCC/WRPC meeting held on 12-13 Apr 2024. Accordingly, OPGW on 220kV D/C line of CSPTCL from MSDS-V to Khedamara S/S may be installed under ISTS by POWERGRID.

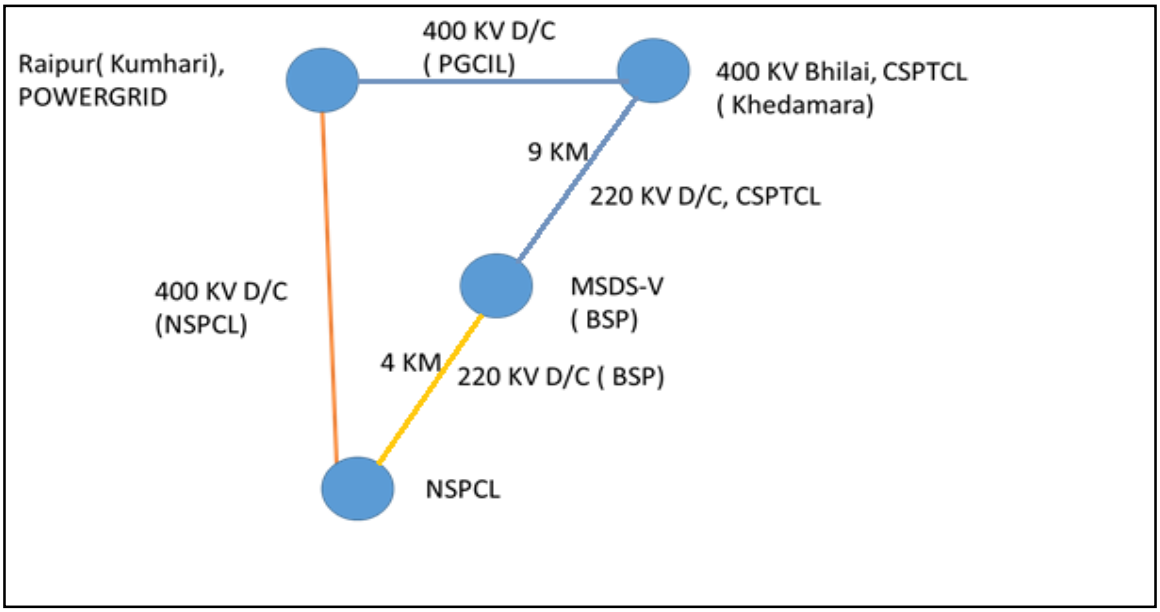


Figure: Schematic diagram for connectivity of NSPCL