I/32647/2023

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 सोलहवीं बैठक का कार्यवृत - के सम्बन्ध में।

Subject: Minutes of the 16th Meeting of National Committee on Transmission (NCT) – regarding.

महोदया (Madam) / महोदय (Sir),

The 16th meeting of the "National Committee on Transmission" (NCT) was held on 30th November, 2023. The minutes of the meeting are enclosed herewith.

भवदीय/Yours faithfully,

Rakesh Goyal 1/12/2023

(राकेश गोयल / Rakesh Goyal)
मुख्य अभियन्ता एवं सदस्य सचिव,एन.सी.टी.
/ Chief Engineer & 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 System), 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. Ajay Yadav, Joint Secretary Room no 403, 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

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Minutes of the 16th meeting of National Committee on Transmission

1 Confirmation of the minutes of the 15th meeting of National Committee on Transmission.

1.1 The minutes of the 15th meeting of NCT held on 25.08.2023 were issued vide CEA letter no CEA-PS-12-13/3/2019-PSPA-II dated 18.09.2023.

1.2 CTUIL had requested the amendment in para 3.9.4 of the minutes of 15th NCT meeting for clarity. Accordingly, it was proposed to replace the table under para 3.9.4 as under:

Sl. No.	*Original Scope*	*Revised Scope*
1.	*Replacement of old OPGW and terminal equipment on existing 400 kV Agra – Ballabhgarh line (181 km) with new OPGW and terminal equipment*	*Supply & Installation of OPGW alongwith terminal equipment on existing 400 kV Agra – Ballabhgarh line (181 km)*
2.	*Replacement of old OPGW alongwith terminal equipment on 400 kV KishenpurWagoora line with new OPGW (183 km) except LILO portion at New Wanpoh (3 km) and terminal equipment*	*Supply & Installation of OPGW alongwith terminal equipment on existing 400 kV Kishenpur – Wagoora line (183 km) except LILO portion at New Wanpoh (3 kms)*

1.3 Members confirmed the minutes with above amendment.

2 Status of the transmission schemes noted/approved/recommended in the 15th 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	MoP approval	BPC
1.	North Eastern Region Generation Scheme-I (NERGS-I)	Approved	TBCB	Notified vide Gazette dated 26.10.2023	RECPDCL
2.	Transmission Scheme for integration of Tumkur-II REZ in Karnataka	Recommended	TBCB	Would be taken up for approval after completion of survey by BPC	RECPDCL
3.	Transmission system strengthening for interconnections of	Recommended	TBCB	Notified vide Gazette dated 07.11.2023	PFCCL

Sr. No	Name of the Transmission Scheme	Noted/ Recommended / Approved	Mode of Implementation	MoP approval	BPC
	Bhadla-III & Bikaner-III complex.				
4.	Network Expansion scheme in Gujarat for drawl of about 3.6 GW load under Phase-I in Jamnagar area.	Recommended	TBCB	Notified vide Gazette dated 07.11.2023	PFCCL
5.	Implementation of Unified Network Management System (UNMS) in the Western Region	Approved	RTM	Not applicable	Not applicable

2.2 Status of transmission schemes where modifications were recommended:

Sl. No.	Scheme where modifications was suggested	MoP Approval
1.	De linking of augmentation of 765/400 kV, 1500 MVA transformer at Bhiwani S/s from Transmission System for evacuation of RE power from renewable energy parks in Leh (5 GW Leh- Kaithal HVDC Transmission corridor)	OM dated 06.11.2023
2.	Transmission System for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part D-Phase II	OM dated 06.11.2023
3.	Transmission System for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part D-Phase I	Notified vide Gazette dated 07.11.2023
4.	Transmission System for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part I (Modified Scope of the Scheme: Revised commissioning schedule is 48 months for Bipole-I and 54 months for Bipole-2	Notified vide Gazette dated 07.11.2023
5.	Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-B) in Karnataka Modified Scope of the Scheme: Implementation schedule of Transmission Scheme is reduced from 36 months to 24 months.	Notified vide Gazette dated 07.11.2023

3 Modifications in the earlier approved/notified transmission schemes:

3.1 Transmission System for Evacuation of power from potential renewable energy zone in Khavda area of Gujarat under Phase-IV (7 GW): Part B scheme

3.1.1 Chief Engineer (PSPA-I), CEA, stated that Transmission System for Evacuation of power from potential renewable energy zone in Khavda area of Gujarat under Phase-IV (7 GW): Part B was recommended to be implemented under TBCB with BPC being PFCCL in the 14th meeting of NCT.

3.1.2 Representative of CTUIL stated that M/s AMNS vide letter dated 26.09.2023 & e-mail dated 07.10.2023 has requested that the LILO of Gandhar – Hazira 400 kV D/c line at South

Olpad (GIS) may be carried out using twin HTLS conductor with minimum capacity of 2100 MVA per ckt at nominal voltage instead of 1700 MVA per ckt at nominal voltage in view of expansion of their Hazira steel facility for which they are anticipating to draw upto 2000 MW power by 2030.

RIL had proposed to draw power from 220 kV level of South Olpad S/s for which 400/220 kV ICTs had been planned. However, M/s RIL vide e-mail dated 16.11.2023 had informed that they will surrender the connectivity of 50 MW which had been granted at 220 kV at Dahej from proposed South Olpad ISTS substation. Accordingly, based on request of applicant, the application shall be closed and hence, the 2x500 MVA, 400/220 kV ICTs would not be required at present. The same would be taken up later based on requirement.

In view of the above, following changes are proposed in the scheme:

i. Deletion of 2x500 MVA, 400/220 kV ICTs at South Olpad GIS S/s,
ii. Change in minimum capacity of twin HTLS conductor from 1700 MVA to 2100 MVA for LILO of Gandhar-Hazira 400 kV D/c line at South Olpad (GIS)

3.1.3 After deliberations, NCT approved the modifications in the scope of Transmission System for Evacuation of power from potential renewable energy zone in Khavda area of Gujarat under Phase-IV (7 GW): Part B as detailed under:

Original Scope		**Revised Scope**	
Scope of the Transmission Scheme	**Capacity/ Route length**	**Scope of the Transmission Scheme**	**Capacity/ Route length**
Establishment of 2x1500 MVA, 765/400 kV & 2x500 MVA, 400/220 kV GIS S/s at a suitable location South of Olpad (between Olpad and Ichhapore) with 2x330 MVAR, 765 kV & 1x125 MVAR, 420 kV bus reactors **Future Provisions**: Space for • 765/400 kV ICT along with bays- 4 Nos. • 765 kV line bays along with	765/400 kV, 1x1500 MVA ICT-2 Nos. (7x500 MVA single phase units including one spare unit) 400/220 kV, 500 MVA ICT – 2 Nos. 765 kV ICT bays- 2 Nos. 400 kV ICT bays- 4 Nos. 220 kV ICT bays- 2 Nos. 220 kV BC bay – 1 No.	Establishment of 2x1500 MVA, 765/400 kV GIS S/s at a suitable location South of Olpad (between Olpad and Ichhapore) with 2x330 MVAR, 765 kV & 1x125 MVAR, 420 kV bus reactors **Future Provisions**: Space for • 765/400 kV ICT along with bays- 4 Nos. • 765 kV line bays along with	• 765/400 kV, 1x1500 MVA ICT- 2 Nos. (7x500 MVA single phase units including one spare unit) • 765 kV ICT bays- 2 Nos. • 400 kV ICT bays- 2 Nos. • 330 MVAR, 765 kV bus reactor-2 Nos. • 125 MVAR, 420 kV bus reactor-1 No. • 765 kV reactor bay- 2 Nos. • 765 kV line bay- 4 Nos.

switchable line reactors – 8 Nos. • 765 kV Bus Reactor along with bay: 2 Nos. • 765 kV Sectionaliser bay: 1 - set • 400 kV line bays along with switchable line reactor – 8 Nos. • 400/220 kV ICT along with bays - 8 Nos. • 420 kV Bus Reactor along with bay: 3 Nos. • 400 kV Sectionalization bay: 1- set • 220 kV line bays: 18 Nos. • 220 kV Sectionalization bay: 1 set • 220 kV BC: 1 Nos. • Establishment of 2500 MW, ± 500 kV South Olpad (HVDC) [VSC] terminal station (2x1250 MW)	330 MVAR, 765 kV bus reactor-2 Nos. 125 MVAR, 420 kV bus reactor-1 No. 765 kV reactor bay- 2 Nos. 765 kV line bay- 4 Nos. 400 kV reactor bay- 1 No. 400 kV line bay- 4 Nos. 110 MVAR, 765 kV, 1-ph reactor (spare unit for line/bus reactor)-1 No.	switchable line reactors – 8 Nos. • 765 kV Bus Reactor along with bay: 2 Nos. • 765 kV Sectionaliser bay: 1 set • 400 kV line bays along with switchable line reactor – 8 Nos. • 400/220 kV ICT along with bays - 10 Nos. • 420 kV Bus Reactor along with bay: 3 Nos. • 400 kV Sectionalization bay: 1- set • 220 kV line bays: 18 Nos. • 220 kV Sectionalization bay: 1 set • 220 kV BC: 1 Nos. • Establishment of 2500 MW, ± 500 kV South Olpad (HVDC) [VSC] terminal station (2x1250 MW)	• 400 kV reactor bay- 1 No. • 400 kV line bay- 4 Nos. • 110 MVAR, 765 kV, 1-ph reactor (spare unit for line/bus reactor)- 1 No.
Vadodara (GIS) – South Olpad (GIS) 765 kV D/C line	Route length: 140 km	Vadodara (GIS) – South Olpad (GIS) 765 kV D/C line	Route length: 140 km
240 MVAR switchable line reactors on each ckt at Vadodara(GIS) end of Vadodara(GIS) – South Olpad (GIS) 765 kV D/C line (with NGR bypass arrangement)	• 240 MVAR, 765 kV switchable line reactor- 2 Nos. • Switching equipment for 765 kV line reactor- 2 Nos. • 1x80 MVAR spare bus reactor available at Vadodara (GIS)	240 MVAR switchable line reactors on each ckt at Vadodara (GIS) end of Vadodara (GIS) –South Olpad (GIS) 765 kV D/C line (with NGR bypass arrangement)	• 240 MVAR, 765 kV switchable line reactor- 2 Nos. • Switching equipment for 765 kV line reactor- 2 Nos. • 1x80 MVAR spare bus reactor available at Vadodara (GIS) to be used as spare

	to be used as spare		
2 Nos. of 765 kV line bays at Vadodara (GIS) for Vadodara(GIS) – South Olpad (GIS) 765 kV D/C line	• 765 kV line bays (GIS) – 2 Nos. (at Vadodara end)	2 Nos. of 765 kV line bays at Vadodara (GIS) for Vadodara (GIS) – South Olpad (GIS) 765 kV D/C line	• 765 kV line bays (GIS) – 2 Nos. (at Vadodara end)
LILO of Gandhar – Hazira 400 kV D/c line at South Olpad (GIS) using twin HTLS conductor with minimum capacity of 1700 MVA per ckt at nominal voltage	LILO route length ~ 10 km.	LILO of Gandhar – Hazira 400 kV D/c line at South Olpad (GIS) using twin HTLS conductor with minimum capacity of **2100 MVA** per ckt at nominal voltage	LILO route length ~ 10 km.
Ahmedabad – South Olpad (GIS) 765 kV D/c line	Route length: 250 km	Ahmedabad – South Olpad (GIS) 765 kV D/c line	Route length: 250 km
240 MVAR switchable line reactors on each ckt at Ahmedabad & South Olpad (GIS) end of Ahmedabad – South Olpad (GIS) 765 kV D/c line (with NGR bypass arrangement)	• 240 MVAR, 765 kV switchable line reactor- 4 Nos. [2 for Ahmedabad end and 2 for South Olpad (GIS) end] • Switching equipment for 765 kV line reactor- 4 Nos. [2 for Ahmedabad end and 2 for South Olpad (GIS) end] • 1x80 MVAR, 765 kV 1-ph spare line reactor – 1 No. (for South Olpad end) • 1x80 MVAR, 765 kV 1-ph spare line reactor being implemented for Lakadia –	240 MVAR switchable line reactors on each ckt at Ahmedabad & South Olpad (GIS) end of Ahmedabad – South Olpad (GIS) 765 kV D/c line (with NGR bypass arrangement)	• 240 MVAR, 765 kV switchable line reactor- 4 Nos. [2 for Ahmedabad end and 2 for South Olpad (GIS) end] • Switching equipment for 765 kV line reactor- 4 Nos. [2 for Ahmedabad end and 2 for South Olpad (GIS) end] • 1x80 MVAR, 765 kV 1-ph spare line reactor – 1 No. (for South Olpad end) • 1x80 MVAR, 765 kV 1-ph spare line reactor being implemented for Lakadia – Ahmedabad line (under Khavda

	Ahmedabad line (under Khavda Ph-II Part B scheme) at Ahmedabad S/s to be used as spare		Ph-II Part B scheme) at Ahmedabad S/s to be used as spare
2 Nos. of 765 kV line bays at Ahmedabad S/s for Ahmedabad – South Olpad (GIS) 765 kV D/c line	• 765 kV line bays (AIS) – 2 Nos. (at Ahmedabad end)	2 Nos. of 765 kV line bays at Ahmedabad S/s for Ahmedabad – South Olpad (GIS) 765 kV D/c line	• 765 kV line bays (AIS) – 2 Nos. (at Ahmedabad end)

3.2 Transmission scheme for drawal of 4000 MW power by MPSEZ Utilities Limited (MUL)

3.2.1 Chief Engineer (PSPA-I), CEA stated that the Transmission scheme for drawal of 4000 MW power by MPSEZ Utilities Limited (MUL) was recommended to be implemented through TBCB route in the 11th meeting of NCT with tentative cost of Rs. 2200 crore. However, the scheme was deliberated and deferred in the 12th NCT meeting held on 24.03.2023 in the absence of any firm commitment from MUL.

3.2.2 Representative of CTUIL stated that GNA applications have been received from following entities in Mundra area:

Sl. No.	Application ID	Name of the Applicant	Submission Date	Nature of applicant	GNA within Region (MW)	GNA outside Region (MW)	Total Quantum (MW) of GNA Required
1.	2200000129	Kutch Copper Limited	24-06-2023	Bulk consumer seeking to connect to ISTS	115.0	0.0	115
2.	2200000122	MPSEZ Utilities Limited	28-06-2023	Distribution licensee seeking to connect to ISTS	495.0	0.0	495
3.	2200000064	MPSEZ Utilities Limited	28-06-2023	Distribution licensee seeking to connect to ISTS	642.0	658.0	1300
4.	2200000124	Mundra Petrochem Limited (MPL)	28-06-2023	Bulk consumer seeking to connect to ISTS	1140.0	0.0	1140

CTUIL further stated that MNRE vide OM dated 01.11.2023 has shared the consolidated information received from various green hydrogen/green ammonia manufacturers and their power drawal requirement at respective locations, which includes 22 GW drawal plan of M/s Adani from Navinal (Mundra) area by 2030 and also mentions that the overall plan is for 40 GW capacity by end of 2032.

Accordingly, implementation of the transmission scheme deferred by the NCT in 12th meeting should be taken up to serve the drawal requirement of bulk consumers as well as for meeting the requirement of green hydrogen/ammonia manufacturers. The updated cost of the scheme will be Rs. 2,383 Crs. He also proposed that scheme should be renamed as "Network Expansion Scheme in Navinal (Mundra) area of Gujarat for

drawal of power in the area" as it would cater to multiple drawee utilities in Mundra area as well as Green Hydrogen/Ammonia manufacturers in the area.

3.2.3 CMD, Grid-India stated that 400/220 kV MUL substation is getting constructed by MPSEZ Utilities Limited which is a distribution licensee. Kutch Copper Limited is getting connected to this 400/220 kV MUL substation instead of direct connection to the ISTS point i.e. 765/400 kV Navinal station. This aspect of shared connectivity of Kutch Copper Limited to the ISTS (through S/s of distribution licensee) may be clarified to avoid any issues at later stage.

He also enquired about the technical requirements being mentioned by CTUIL in the connection agreement while granting connectivity to the bulk consumers. He further emphasized on the need of timely specifying the ride through requirement, reactive power support and other important technical requirements for these bulk consumers especially electrolyzers.

3.2.4 CTU clarified that provisions for sharing the terminal bays at ISTS substation allocated to one Distribution Licensee/Bulk consumer entity (under Reg. 17.1(iii)) by another such entity is allowed as per Reg. 17.3 of GNA Regulations, 2022.

3.2.5 After deliberations, the transmission scheme "Network Expansion Scheme in Navinal (Mundra) area of Gujarat for drawal of power in the area" was recommended to MoP for implementation under TBCB route with BPC being PFCCL.

3.2.6 Summary of the scheme is given below:

Sl. No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crores)	Remarks
1.	Network Expansion Scheme in Navinal (Mundra) area of Gujarat for drawal of power in the area Tentative Implementation timeframe: 21 months	2,383	Recommended under TBCB route with PFCCL as the BPC.

3.2.7 Detailed scope of the scheme is given below:

Sl. No.	***Scope of the Transmission Scheme***	***Capacity /km***
1.	Establishment of 4x1500 MVA, 765/400 kV Navinal (Mundra) S/s (GIS) with 2x330 MVAR, 765 kV & 1x125MVAr, 420 kV bus reactors **Future provision (space for):**	765/400 kV, 1500 MVA ICT – 4 Nos. (13x500 MVA single phase units including one spare ICT Unit) 765 kV ICT bays – 4 Nos. 400 kV ICT bays – 4 Nos. 765 kV Line bays – 4 Nos.

	➢ 765/400 kV ICT along with bays- 2 Nos. ➢ 765 kV line bays along with switchable line reactors – 4 Nos. ➢ 765 kV Bus Reactor along with bay: 2 Nos. ➢ 765 kV Sectionaliser: 1 -set ➢ 400 kV line bays along with switchable line reactors– 6 Nos. *(in addition to 4 nos. bays for MUL – Navinal (Mundra) (GIS) 400 kV 2xD/c line mentioned under Note)* ➢ 400/220 kV ICT along with bays -6 Nos. ➢ 400 kV Bus Reactor along with bays: 3 Nos. ➢ 400 kV Sectionalization bay: 1- set ➢ 220 kV line bays: 10 Nos. ➢ 220 kV Sectionalization bay: 1 set ➢ 220 kV BC and TBC: 2 Nos. ➢ STATCOM (±300 MVAR) along with MSC (2x125 MVAr) & MSR (1x125 MVAr) and associated 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- 1 Nos. 400 kV Reactor bay- 1 No.
2.	LILO of Bhuj-II – Lakadia 765 kV D/c line at Navinal(Mundra) (GIS) S/s with associated bays at Navinal (Mundra) (GIS) S/s	LILO Route length: 70 km (280 ckm)
3.	Installation of 1x330 MVAr switchable line reactor on each ckt at Navinal end of Lakadia – Navinal 765 kV D/c line (formed after above LILO)	1x330 MVAr, 765 kV switchable line reactor – 2 Nos. Switching equipment for 765 kV line reactor – 2 Nos.

Note:

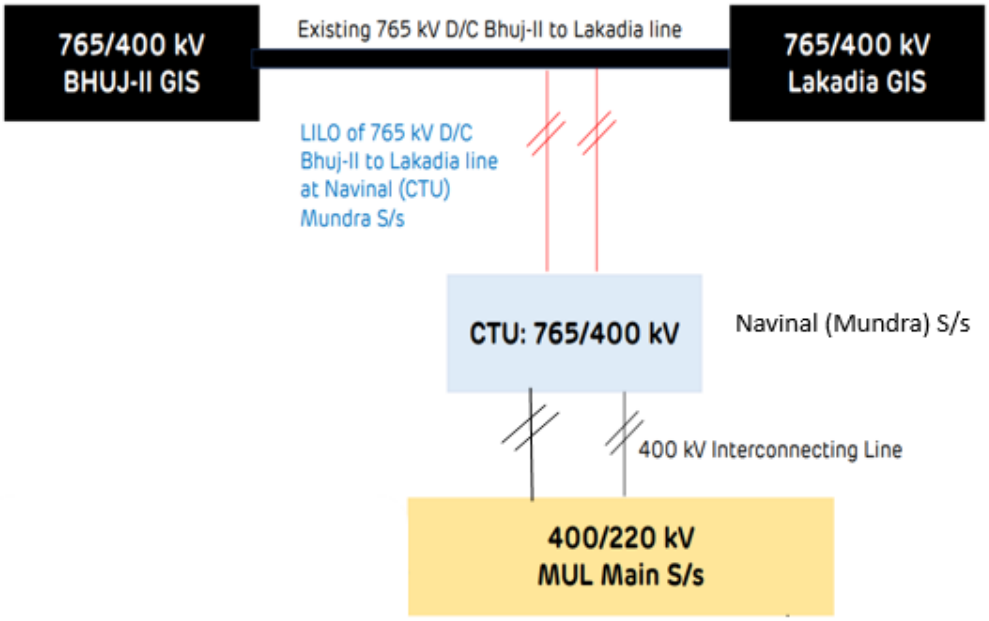
(1) Bay(s) required for completion of diameter (GIS) in one-and-half breaker scheme shall also be executed by the TSP.

(2) The TSP shall implement five complete diameters at 765 kV level of Navinal (Mundra) (GIS) consisting of 2 Main Bays & 1 Tie Bay required for completion of diameter (GIS) in one-and-half breaker scheme. (4 ICT bays + 4 Line Bays+2 Bus Reactor Bays).

(3) Further, the TSP shall also implement four complete diameters at 400 kV level of Navinal (Mundra) (GIS) consisting of 2 Main Bays & 1 Tie Bay required for completion of diameter (GIS) in one-and-half breaker scheme. (4 ICT bays +1 Bus Reactor Bay + 3 for dia completion).

(4) The following scope of works for interconnection of 400/220 kV MUL (Distribution Licensee) S/s with Navinal (Mundra) S/s (GIS) is under the scope of MUL and is required to be implemented in the same time frame

- MUL – Navinal (Mundra) (GIS) 400 kV 2xD/c (Twin HTLS - Quad Moose equivalent) (shall be constructed and maintained by a licensee at the cost of such entity) & KCL, MPL shall get interconnected with 400/220 kV Substation of MUL for drawal of power.
- MUL shall implement one complete diameter (GIS) consisting of 2 main bays & 1 Tie bay in one and half breaker scheme at Navinal end as 3 line bays can be terminated in spare bays being implemented by TSP for completion of dia.
- 4 no. 400kV Line bays at the Dist. Licensee MUL end



3.3 **Additional 1x500 MVA 400/220 kV (9th) ICT, for injection from any additional RE project (other than 4000 MW injection under SECI bids upto Tranche IV) at Bhuj PS**

3.3.1 Representative of CTUIL stated that additional 1x500 MVA, 400/220 kV (9^{th}) ICT at Bhuj PS (along with associated ICT bays) was planned for injection of power from any additional RE project (other than 4000 MW injection under SECI bids upto Tranche IV) at Bhuj PS and was allocated for implementation to POWERGRID under RTM route as per MoP OM dated 30.01.2019. As per the OM, the 9^{th} ICT is to be taken up for injection requirement beyond 4,000 MW at 220 kV level of Bhuj PS. However, in the 11^{th} meeting of NCT, it was decided to defer the scheme and the same would be taken up upon visibility of additional RE generation at Bhuj PS.

3.3.2 He added that presently, the total connectivity under GNA at Bhuj PS has reached 3,546 MW. Considering full dispatch from RE under GNA, to ensure 'N-1' compliance of ICTs at Bhuj PS, implementation of the 9^{th} ICT at Bhuj PS shall be required. Also, Government of Gujarat vide letter dated 21.09.2023 has allowed setting up of ISTS /In-STS connected RE projects in the State.

3.3.3 After deliberations, it was decided to take up implementation of additional 1x500 MVA 400/220 kV (9^{th}) ICT at Bhuj PS already allocated to POWERGRID under RTM as per the above MOP OM in order to meet the 'n-1' criteria as well as to facilitate additional RE injection. Timeframe: 18 months from intimation to POWERGRID for taking up implementation of the ICT.

3.4 **Transmission system for evacuation of power from Shongtong Karcham HEP (450 MW) and Tidong HEP (150 MW)**

3.4.1 Chief Engineer, CEA, stated that the transmission scheme Transmission system for evacuation of power from Shongtong Karcham HEP (450 MW) and Tidong HEP (150 MW) was recommended in the 11^{th} meeting of NCT with RECPDCL as the BPC. Scheme has been notified vide Gazette notification dated 13.04.2023.

Subsequently, HPPCL had intimated that the commissioning date of Shongtong Karcham HEP (STKHEP) had been revised (preponed) from July'26 to July'25 and requested to review the timelines of the transmission system for evacuation of power from Shongtong Karcham HEP (STKHEP) in Himachal Pradesh due to the revised timeline of commissioning of STKHEP.

3.4.2 Further, the matter was discussed in the 14^{th} NCT meeting held on 09.06.23, wherein, CTUIL informed that based on the preliminary survey report for 400 kV Wangtoo-Panchkula D/c line, conductor in certain portion of the transmission line may need to be of different configuration (due to very high altitude encountered in certain sections) in order to avoid Corona inception gradient. In view of this, CTUIL was requested to confirm change in conductor configuration, if any, along with revised cost of the scheme based on the survey report.

3.4.3 Subsequently, HPPCL vide letter dated 24.08.2023 informed that the commissioning of July'2025 for Shongtong Karcham would not be feasible to achieve and the transmission system would be required as per the original schedule of July'2026.

3.4.4 In the 15^{th} meeting of NCT held on 25.08.2023, CTUIL informed that from survey report, it is observed that line shall be traversing high altitudes upto 2700 m and around 49% (85 km) of the line would be between 2000 m and 2700 m altitude, based on which various options for conductor selection were evaluated. CTUIL also informed that during walkover survey, it emerged that line length of 400 kV Wangtoo -Panchkula D/c line is reduced to 175 km from 210 km in earlier approved proposal. CTUIL Cost committee revised the cost of transmission scheme considering Quad Moose configuration with revised length of 175 km. In the meeting, it was agreed that a separate meeting would be convened to decide the conductor specification and estimated revised cost of the scheme.

3.4.5 Subsequently, a meeting under the chairmanship of Member (Power Systems), CEA, was held on 03.11.2023 to discuss the issue, wherein, Quad AL59 conductor was recommended for the complete line length of Wangtoo-Panchkula 400 kV D/c transmission line.

3.4.6 Considering the earlier approved transmission scheme w.r.t original time frame of STK HEP i.e. July'26 and change in conductor configuration (Quad) & line length as 175 km

instead of 210 km (considered in the initial estimate for 400 kV Wangtoo-Panchkula line), the revised cost of the scheme comes out to be Rs. 2,712 Crs. which is a change of about 18.63% in the estimated cost.

3.4.7 CMD, Grid-India stated that the entire Wagtoo-Panchkula transmission line may not need Quad AL-59 conductor and feasibility of different conductor for the sections below 2000 m elevation level may be explored to economize the cost of the scheme.

3.4.8 Accordingly, it was decided that CTUIL would estimate the Wangtoo-Panchkula line length which is lying at an altitude of more than 2000 m based on the survey report and examine the possibility of different conductors in the portion of transmission line lying in low elevation area and rework the cost estimates. The scheme will be taken up for discussion in the next meeting of NCT.

3.5 Spare Reactor (1-ph, 1x80 MVAr) unit at 765/400 kV Beawar S/s under Rajasthan REZ Ph-IV (Part-2: 5.5 GW) (Jaisalmer/ Barmer Complex): Part D scheme

3.5.1 Chief Engineer, CEA, stated that "Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-2:5.5 GW) (Jaisalmer/ Barmer Complex): Part D" was recommended for implementation through Tariff Based Competitive Bidding (TBCB) route with following scope

a) Beawar- Mandsaur PS 765 kV D/c line along with 240 MVAR switchable line reactor for each circuit at each end
b) 2 No. of 765 kV line bays each at Beawar S/s & Mandsaur S/s

The scheme has been notified vide Gazette notification dated 04.09.2023 with PFCCL as the BPC. Presently, the scheme is under RFP preparation stage.

3.5.2 It was deliberated that 765/400 kV Beawar substation is being established under Phase-III: Part F scheme along with associated 330 MVAR line & bus reactor(s) & 110 MVAr spare reactor unit (1-ph). In Ph-IV Part-D scheme, 765 kV Beawar- Mandsaur PS D/c line along with 240 MVAR switchable line reactor was approved. As there is no 80 MVAr spare Reactor (1-ph) available at Beawar substation in Ph-III Part-F scheme, it is proposed that scope for 1x80 MVAR (1-ph) spare Reactor unit may be kept at Beawar S/s under Rajasthan REZ Ph-IV (Part-2): Part-D scheme. Further, CTUIL clarified that wherever single-phase unit is being provided for ICTs or Reactors (at 765 kV or 400 kV level), the units are hot spares.

3.5.3 The original cost of Part-D package is Rs 2,227 Cr. With above addition of scope (1x80 MVAr (1-ph) spare Reactor unit at Beawar S/s), cost shall increase by Rs 10.18 Cr which is less than (-) 0.5 % of original cost of package.

3.5.4 After deliberations, NCT approved the incorporation of 1x80 MVAr (1-ph) spare Reactor unit at Beawar S/s, in the transmission scheme: "Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-2: 5.5 GW) (Jaisalmer/ Barmer Complex): Part D".

3.6 **Change in Scope of Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-1: Bikaner Complex)- Part-A package**

3.6.1 Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-1) (Bikaner Complex) Part A was recommended in the 9th NCT meeting held on 28.09.2022. Subsequently, the scheme was approved by MoP vide Gazette dated 13.01.2023. The scheme involves establishment of 6x1500 MVA, 765/400 kV & 5x500 MVA 400/220 kV Bikaner-III Pooling Station at a suitable location near Bikaner along with 6 no. of 220 kV line bays for RE connectivity. Bid submission for the scheme has already been done. LoI/LoA is to be issued.

3.6.2 Connectivity of 3,917 MW was agreed to be granted at Bikaner-III PS. Out of this, 2400 MW was agreed to be granted at 400 kV level (3 nos. 400 kV bays). Balance 1,517 MW was agreed to be granted at 220 kV level through 5 Nos. of 220 kV line bays. Therefore, margin for 83 MW enhancement is available at 220 kV level, thus makes the total connectivity quantum to 4000 MW (400 kV: 2400 MW, 220 kV: 1600 MW) in line with planned evacuation capacity at Bikaner-III PS.

Bikaner-III PS was planned for connectivity of 7 GW Solar & 3 GW BESS and evacuation capacity of 7.7 GW in Bikaner complex (3.7 GW of Bikaner-II PS & 4 GW at Bikaner-III PS). However, no connectivity of BESS has been received at Bikaner-III PS. Considering the total grant of connectivity agreed at Bikaner-III PS (3,917 MW), no additional connectivity can be granted at Bikaner-III PS beyond this quantum (except enhancement margin of 83 MW available at 220 kV bays).

As total connectivity granted at 220 kV level is 1,517 MW (excluding 83 MW enhancement quantum) through 5 no. of 220 kV line bays (out of 6 no. approved), 1 no. of 220 kV line bay which is part of the Part-A package of the above scheme shall remain unutilised.

In view of the above, 1 No. of 220 kV line bay at Bikaner-III PS is not required in the Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part1) (Bikaner Complex)- Part-A package.

3.6.3 The original cost of Part-A package is Rs 4,741 Cr. With above deletion of scope, cost shall reduce only by Rs 5.8 Cr which is about (-) 0.12 % of original cost of package. Further, as the scheme was under bidding, the change in scope of the scheme had already been incorporated in the RfP Document.

3.6.4 NCT concurred the following change of scope in the Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-1: Bikaner Complex)- Part-A package.

	Part A- package

Sl. No.	**Original scope of the transmission scheme**	**Revised scope of the transmission scheme**
	Establishment of 6x1500 MVA (along with one spare unit of 500 MVA), 765/400 kV &5x500 MVA 400/220 kV Bikaner-III Pooling Station along with 2x330 MVAr (765kV) Bus Reactor (along with one spare unit of 110 MVAr) & 2x125 MVAr (420kV) Bus Reactor at a suitable location near Bikaner • 765/400kV 1500 MVA ICTs: 6 nos (19x500 MVA including one spare unit) • 765 kV ICT bays – 6 nos. • 765 kV line bays- 2 nos. • 330 MVAr Bus Reactor-2 nos. (7x110 MVAr, including one spare unit) • 765 kV reactor bays- 2 nos. • 400/220 kV, 500 MVA ICTs – 5 nos • 400 kV ICT bays – 11 nos. • 420 kV reactor bays - 2 nos. • 125 MVAr, 420kV bus reactor - 2 nos. • 400 kV line bays - 6 nos.(4 nos. for LILO of Bikaner-Bikaner-II D/c line & 2 nos. for Bikaner-II D/c line) • 220 kV ICT bays - 5 nos. • 220 kV line bays – **6 Nos** (for RE connectivity) • 220 kV BC (2 no.) and 220 kV TBC (2 no.) • 220kV Sectionalisation bay: 1 set **Future provisions: Space for** • 765 kV line bays along with switchable line reactors – 6 nos. • 765kV Bus Reactor along with bay: 1 no. • 400 kV line bays along with switchable line reactor –4 nos. • 400 kV line bays–4 nos. • 400/220kV ICT along with bays -5 nos. • 400 kV Bus Reactor along with bay: 1 no.	Establishment of 6x1500 MVA (along with one spare unit of 500 MVA), 765/400 kV & 5x500 MVA 400/220 kV Bikaner-III Pooling Station along with 2x330 MVAr (765kV) Bus Reactor (along with one spare unit of 110 MVAr) & 2x125 MVAr (420kV) Bus Reactor at a suitable location near Bikaner • 765/400 kV 1500 MVA ICTs: 6 Nos (19x500 MVA including one spare unit) • 765 kV ICT bays – 6 Nos. • 765 kV line bays- 2 Nos. • 330 MVAr Bus Reactor-2 Nos. (7x110 MVAr, including one spare unit) • 765 kV reactor bays- 2 Nos. • 400/220 kV, 500 MVA ICTs – 5 Nos. • 400 kV ICT bays - 11 Nos. • 420 kV reactor bays - 2 Nos. • 125 MVAr, 420kV bus reactor - 2 Nos. • 400 kV line bays - 6 Nos. (4 nos. for LILO of Bikaner-Bikaner-II D/c line & 2 nos. for Bikaner-II D/c line) • 220 kV ICT bays - 5 Nos. • 220 kV line bays – **5 Nos.** (for RE connectivity) • 220 kV BC (2 Nos.) and 220 kV TBC (2 Nos.) • 220 kV Sectionalisation bay: 1 set **Future Provisions: Space for** • 765 kV line bays along with switchable line reactors – 6 Nos. • 765 kV Bus Reactor along with bay: 1 No. • 400 kV line bays along with switchable line reactor –4 Nos. • 400 kV line bays–4 Nos. • 400/220 kV ICT along with bays -5 nos. • 400 kV Bus Reactor along with bay: 1 No. • 400 kV Sectionalization bay: 2 sets

	• 400kV Sectionalization bay: 2 sets • 220 kV line bays for connectivity of RE Applications -8 nos. • 220kV Sectionalization bay: 2 sets • 220 kV BC (2 no.) and 220 kV TBC (2 no.) • STATCOM (2x±300MVAr) along with MSC (4x125 MVAr) & MSR (2x125 MVAr)	• 220 kV line bays for connectivity of RE Applications -8 Nos. • 220 kV Sectionalization bay: 2 sets • 220 kV BC (2 No.) and 220 kV TBC (2 No.) • STATCOM (2x±300 MVAr) along with MSC (4x125 MVAr) & MSR (2x125 MVAr)

4 New Transmission Schemes:

4.1 **Augmentation of transformation capacity at 765/400 kV Indore S/s in Madhya Pradesh**

4.1.1 Representative of CTUIL stated that for enabling compliance of loading limits under 'N-1' contingency criteria in 2027-28 time-frame, augmentation of Transformation capacity at 765/400 kV Indore S/s by 1x1500 MVA ICT (3rd) [terminated on 400 kV Bus Section A with Indore & Khandwa 400 kV D/c lines] is required.

4.1.2 NCT approved the augmentation of transformation capacity at 765/400 kV Indore S/s in Madhya Pradesh by 1x1500 MVA ICT (3rd) for implementation through RTM mode with tentative implementation timeframe of 18 months.

4.1.3 Summary of the scheme is given below:

SI No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crores)	Remarks
1.	Augmentation of transformation capacity at 765/400 kV Indore S/s in Madhya Pradesh. Tentative Implementation timeframe: 18 months	126	Approved under RTM by owner of existing substation

4.1.4 Detailed scope of the scheme is given below:

Sl. No.	***Scope of the Transmission Scheme***	***Capacity /km***
1.	Augmentation of Transformation capacity at 765/400 kV Indore S/s by 1x1500 MVA ICT (3rd) [terminated on 400kV Bus section	765/400 kV, 1x1500 MVA ICT – 1 No. 765 kV bay – 1 No. 400 kV bay – 1 No. (on bus section-A)

Sl. No.	*Scope of the Transmission Scheme*	*Capacity /km*
	A with Indore & Khandwa 400kV D/c lines]	765 kV GIS duct (1ph) – 150 m. (approx.)* 400 kV GIS duct (1ph) – 750 m. (approx.)* 132 kV cable – 1 km. (approx.)*

**As per e-mail from POWERGRID dated 28.08.2023, the 765 kV GIS Bus Duct & 132 kV Cable are required for connection to existing 765/400 kV Spare ICT with proposed ICT in Section A. Further, 400 kV GIS duct is required for termination in 400 kV Bay.*

4.2 **Augmentation of transformation capacity at Bhuj-II PS**

4.2.1 Representative of CTUIL stated that till September, 2023, applications for connectivity from RE generators to the tune of 2,426.5 MW has been received at Bhuj-II PS. For enabling evacuation of power and to meet the 'N-1' contingency criteria, augmentation of transformation capacity at Bhuj-II PS (GIS) by 2x500 MVA, 400/220 kV ICT (5^{th} & 6^{th}) and by 1x1500 MVA, 765/400 kV ICT (3^{rd}) is required.

4.2.2 After deliberations, the transmission scheme: Augmentation of transformation capacity at Bhuj-II PS was approved to be implemented through TBCB mode as given below:

4.2.3 Summary of the scheme is given below:

SI No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crores)	Remarks
1.	Augmentation of transformation capacity at Bhuj-II PS (GIS) Tentative Implementation timeframe: 21 months	428	Approved under TBCB with BPC being PFCCL

4.2.4 Detailed scope of the scheme is given below:

Sl.	*Scope of the Transmission Scheme*	*Capacity /km*
1.	Creation of New 220kV Bus Section-II at Bhuj-II PS	220kV Bus sectionaliser bay - 1 Set *(to be kept normally CLOSED and may be opened based on system requirement)* 220 kV BC – 1 No.

Sl.	*Scope of the Transmission Scheme*	*Capacity /km*
2.	Augmentation of transformation capacity at Bhuj-II PS (GIS) by 2x500 MVA, 400/220 kV ICT (5^{th} & 6^{th}) (Terminated at New 220 kV Bus Section-II) and by 1x1500 MVA, 765/400kV ICT (3^{rd})	500 MVA, 400/220 kV ICTs: 2 Nos. 1500 MVA, 765/400 kV ICTs: 1 No. 765 kV ICT bay: 2 No. [1 No. for ICT & 1 No. for Dia. completion (with provision of Switchable LR)] 400 kV ICT bays: 4 Nos. [3 Nos. for ICT termination and 1 No. for Dia. completion (with provision of Switchable LR)] 220 kV ICT bays: 2 Nos. **GIB Duct length for 1x1500 MVA, 765/400 kV ICT:** 1 Ph. 765 kV GIB Duct -600 m (approx.) 1 Ph. 400 kV GIB Duct – 625 m. (approx.) **GIB Duct length for 2x500 MVA, 400/220 kV ICTs:** 1 Ph. 400 kV GIB – 300 m (approx.) 1 Ph. 220 kV GIB – 750 m (approx.)
3.	Implementation of 220 kV GIS line bay at Bhuj-II PS for ABREL (RJ) Projects Limited (Terminated at New 220 kV Bus Section-II)	220 kV line bay – 1 No. (GIS) **GIB Duct length:** 1 Ph. 220 kV GIB – 150 m (approx.)

Note:

- Wherever required, TSP shall implement complete Dia consisting of 2 Main Bays & 1 Tie Bay required for completion of diameter (GIS) in one-and-half breaker scheme.
- GIB Bus Duct lengths are as communicated by TSP of Bhuj-II PS.
- TSP of Bhuj-II PS shall provide space for execution of above works

4.3 **Transmission System for integration of Nizamabad REZ (1 GW) and Transmission System for integration of Medak REZ (1 GW) in Telangana**

4.3.1 Representative of CTUIL stated that out of the identified (86 GW) RE Potential in Southern Region, 13 GW has been identified in the State of Telangana.

4.3.2 For optimal utilization of transmission system, power from other RE Zones in Telangana viz. Medak, Rangareddy and Karimnagar area would be pooled at Nizamabad-II PS at 765 kV voltage level. Further, out of 3.5 GW RE potential in Medak and Rangareddy, 1.5 GW each has been phased out for implementation under Phase-I. Medak and Rangareddy REZs are being integrated with Nizamabad-II PS through Medak PS – Nizamabad-II PS 400 kV (Quad ACSR moose) D/c line and Rangareddy PS – Nizamabad-II PS 400kV (Quad ACSR moose) D/c line.

4.3.3 The scheme was discussed in the 46th SRPC meeting held on 31.05.2023 and SRPC has forwarded the views of Southern region constituents and communicated that consensus has not been arrived for the above schemes. Southern region constituents suggested to utilize the existing transmission system for evacuation of RE power and transmission scheme may be implemented at 400 kV level at the initial stage at Nizamabad. Southern region constituents requested to take up the schemes in phased manner depending on the visibility of RE generation.

4.3.4 Considering the view of the Southern region constituents and SECI RE bids, a meeting was held in CEA on 06.10.2023 to decide upon the pooling stations in Telangana for evacuation of RE power in the initial phase. In the meeting, SECI informed that they have invited bids for 500 MW RE generation in Telangana state and requested that two number of pooling stations must be taken up for bidding/development in the State. Hence, the transmission schemes: (i) Transmission System for integration of Nizamabad REZ (1 GW) under Phase-I and (ii) Transmission System for integration of Medak REZ (1 GW) were agreed for implementation in Phase-I.

4.3.5 Representative of CTUIL stated that for proper planning of transmission system, the exact location of pooling stations both at Nizamabad and Medak has to be provided by SECI.

4.3.6 NCT directed SECI to provide the exact location of pooling stations at Nizamabad and Medak to CEA/CTUIL. The proposed schemes after incorporating inputs from SECI, would be taken up for discussion in next meeting of NCT.

4.4 **Augmentation of transformation capacity by 1x1500 MVA (3rd), 765/400 kV ICT at Kurnool New substation in Andhra Pradesh**

4.4.1 Representative of CTUIL stated that presently Kurnool New 765/400 kV Substation is under operation with 2x1500 MVA, 765/400 kV ICTs. Connectivity of 1,725 MW has been granted / agreed for grant at 400 kV level. Further, it was agreed to grant connectivity for 989 MW to M/s AM Green Energy Pvt. Ltd. at Kurnool New S/s with 1x1500 MVA, 765/400 kV (3rd ICT). He stated that augmentation of transformation capacity by 1x1500 MVA, 765/400 kV (3rd) ICT at Kurnool New S/s is required.

4.4.2 NCT approved implementation of 1x1500 MVA 765/400 kV ICT (3rd) at Kurnool New S/s under RTM route with tentative implementation timeframe of 21 months (18 months on best effort).

4.4.3 Summary of the scheme is given below:

SI No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crores)	Remarks
1.	Augmentation of 1x1500 MVA (3rd), 765/400 kV transformation capacity at Kurnool New S/s. Tentative Implementation timeframe: 21 months (18 months on best effort basis)	162	Approved under RTM by owner of existing substation

4.4.4 Detailed scope of the scheme is given below:

Sl. No.	***Scope of the Transmission Scheme***	***Capacity /km***
1.	Augmentation of 1x1500 MVA (3rd), 765/400 kV transformation capacity at Kurnool New S/s	• 765/400 kV, 1500 MVA ICT – 1 No. (4x500 MVA including one spare unit) • 765 kV ICT bays – 1 No. (New bay is to be terminated in existing diameter) • 400 kV ICT bays – 1 No. (New bay is to be terminated in new diameter along with associated tie bay) • 400 kV GIS duct – 1550 m • 420 kV, SF6/Air Bushing for connecting GIS to AIS – 6 Nos.

4.5 **ISTS Network Expansion scheme "Reconductoring of Raichur – Veltoor (Mahabubnagar) 400 kV S/c line with HTLS conductor"**

4.5.1 Representative of CTUIL stated that the high loading on Raichur – Veltoor (Mehaboobnagar) 400 kV S/c line was highlighted by SRLDC and TSTRANSCO in the Joint Study meeting of Southern Region Constituents held on 30th June – 2nd July, 2022, at SRPC, Bengaluru. During the meeting, SRLDC informed that during Peak wind season in Southern Region, the flow on Raichur – Veltoor (Mehaboobnagar) 400 kV S/c line is as high as 700 MW. TSTRANSCO informed that on account of high loading on the Raichur – Veltoor (Mehaboobnagar) 400 kV S/c line, TTC of Telangana is restricted.

4.5.2 After deliberations, Reconductoring of Raichur – Veltoor (Mahabubnagar) 400 kV S/c line with HTLS conductor, was approved to be implemented through RTM route with tentative implementation timeframe of 24 months.

4.5.3 Summary of the scheme is given below:

SI No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crores)	Remarks
1.	Reconductoring of Raichur – Veltoor (Mahabubnagar) 400 kV S/c line with HTLS conductor Tentative Implementation timeframe: 24 months	164	Approved under RTM by owner of existing transmission line

4.5.4 Detailed scope of the scheme is given below:

Sl. No.	***Scope of the Transmission Scheme***	***Capacity /km***
1.	Reconductoring of Raichur – Veltoor (Mahabubnagar) 400 kV S/c line with HTLS conductor	Route length – 73.68 km
2.	Upgradation of 400 kV bay equipments at Veltoor (Mahabubnagar) end	
3.	Upgradation of 400 kV bay equipments at Raichur end	

4.5.5 Chairperson, CEA, opined that a comprehensive study needs to be carried out for potential reconductoring of transmission lines in a holistic manner in the country.

4.6 **Eastern Region Expansion Scheme-XXXIX (ERES-XXXIX)**

4.6.1 Govt. of Odisha had requested to establish ISTS sub-station in Gopalpur to meet the electricity requirement of upcoming Green Hydrogen and Green Ammonia plants/industries in Gopalpur, Odisha, with cumulative demand of about 3 GW by 2025-26.

4.6.2 Representative of CTUIL stated that as per inputs from Odisha STU there is a requirement of ISTS corridor to supply RE power from outside Odisha to such industries, to meet their RPO. Thus, keeping in view critical nature of large industrial demand and quantum of power requirement it is essential that Gopalpur S/s is feed reliably from ISTS and with high capacity lines. Accordingly, Angul – Gopalpur 765kV D/c line along with new 765/400kV GIS substation has been planned at Gopalpur.

4.6.3 ERPC in its 50th meeting held on 11-08-2023 had recommended the scheme and mentioned that implementation of the scheme may be taken up delinking it with the receipt of Connectivity / GNA applications from the industries

4.6.4 After deliberations, the scheme was recommended by NCT to be implemented through TBCB mode with tentative implementation timeframe of 30-06-2026.

4.6.5 Summary of the scheme is given below:

SI No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crores)	Remarks
1.	Eastern Region Expansion Scheme-XXXIX (ERES-XXXIX) Tentative Implementation timeframe: 30-06-2026	2898	Recommended Under TBCB route with RECPDCL as the BPC.

4.6.6 Detailed scope of the scheme is given below:

Sl. No.	**Scope of the Transmission Scheme**	**Capacity (MVA) / Line length (km)/ Nos.**
1.	Establishment of new 765/400kV, 2x1500MVA GIS substation at Gopalpur in Odisha **Additional space for future expansion**: - 765/400kV, 4x1500MVA ICTs (12x500MVA single phase	765/400 kV, 1500MVA ICTs: 2 Nos. (7x500 MVA single phase units including one spare) 765 kV ICT bays: 2 Nos. 400 kV ICT bays: 2 Nos.

Sl. No.	Scope of the Transmission Scheme	Capacity (MVA) / Line length (km)/ Nos.
	units) along with associated ICT bays at both voltage levels - 400/220kV, 4x500MVA ICTs along with associated ICT bays at both voltage levels - 765kV, 2x330MVAr (6x110MVAr single phase units) bus reactor along with associated bays - 420kV, 2x125MVAr bus reactor along with associated bays - 8 nos. of 765kV line bays (along with space for switchable line reactor) for future lines - 10 nos. of 400kV line bays (along with space for switchable line reactor) for future lines - 12 nos. of 220kV line bays for future lines - 765kV bus sectionaliser bay: 1 set - 400kV bus sectionaliser bay: 1 set - 220kV bus sectionaliser bay :1 set - 220kV bus coupler bay: 2 no.	765 kV, 330 MVAr Bus reactor: 2 Nos. (7x110 MVAr single phase units including one spare unit for both bus and line reactors) 765 kV Bus reactor bays: 2 Nos. 420 kV, 125 MVAr Bus reactor: 2 Nos. 400 kV Bus reactor bays: 2 Nos. 765 kV line bays: 2 Nos. [for termination of Angul (POWERGRID) – Gopalpur 765 kV D/c line along with 765 kV, 1x330 MVAr switchable line reactor at Gopalpur end in both circuits] 400 kV line bays: 2 Nos. [for termination of Gopalpur – Gopalpur (OPTCL) 400 kV D/c (Quad) line] 765 kV, 330 MVAr (3x110 MVAr single phase units) switchable line reactor along with associated bay and 500 ohm NGR (with NGR bypass arrangement) *[at Gopalpur end in both circuits of Angul (POWERGRID) – Gopalpur 765 kV D/c line]*: 2 Nos.
2.	Angul – Gopalpur 765 kV D/c line	Route length: 205 km
3.	Extension at 765kV level at Angul (POWERGRID) S/s including bus extension in GIS	765 kV GIS/Hybrid line bays (along with space for future switchable line reactor): 2 nos. *[for termination of Angul (POWERGRID) – Gopalpur 765kV D/c line]* including bus extension in GIS of about 3000 m

Sl. No.	Scope of the Transmission Scheme	Capacity (MVA) / Line length (km)/ Nos.
4.	Gopalpur – Gopalpur (OPTCL) 400kV D/c (Quad) line[@]	Route length: 20 km (approx.)
5.	Extension at 400kV level at [#]Gopalpur (OPTCL) GIS S/s	400 kV GIS line bays: 2 nos. *[for termination of Gopalpur – Gopalpur (OPTCL) 400kV D/c (Quad) line]* + [#]2 nos. for diameter completion

Note:

(a) *[@]Gopalpur (OPTCL) is being taken up for implementation and is expected to be awarded by Mar 2024. As per OPTCL's input, 20 km line length has been considered between 765/400kV (ISTS) and 400/220kV (Intra-state) substations at Gopalpur.*

(b) *[#]The bus scheme of 400kV level at Gopalpur (OPTCL) GIS S/s shall be one and half breaker scheme, 2 nos. full diameter i.e. 4 nos. of GIS bays needs to be implemented in the scheme for requirement of 2 nos. GIS bays for termination of Gopalpur (OPTCL) – Gopalpur 400kV D/c (Quad) line in two different diameters. Utilisation of other 2 nos. GIS bays of these diameters shall be identified in future.*

(c) *OPTCL shall provide space at under implementation Gopalpur (OPTCL) 400/220kV GIS S/s for implementation of 2 nos. of 400kV GIS line bays for termination of Gopalpur (ISTS) – Gopalpur (OPTCL) 400kV D/c (Quad) line. 2 nos. full diameter i.e. 4 nos. GIS bays shall be established.*

(d) *POWERGRID shall provide space at Angul (POWERGRID) 765/400kV S/s for implementation of 2 nos. of 765kV line bays (along with space for future switchable line reactor) along with bus extension in GIS for termination Angul (POWERGRID) – Gopalpur 765kV D/c line.*

4.7 Eastern Region Generation Scheme-I (ERGS-I)

4.7.1 Representative of CTUIL stated that ISTS Connectivity of 2000 MW has been provided to M/s NLC India Limited for its upcoming Talabira (3x800 MW) generation project through LILO of both circuits of Angul – Sundargarh (Jharsuguda) 765 kV 2xS/c lines at NLC-Talabira generation switchyard. Tentative implementation timeframe is 01.05.2027.

4.7.2 NCT approved implementation of Eastern Region Generation Scheme-I (ERGS-I) with details given below to be implemented through TBCB mode.

4.7.3 Summary of the scheme is given below:

SI No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crores)	Remarks

1.	Eastern Region Generation Scheme-I (ERGS-I) Tentative Implementation timeframe: 01-05-2027	413.16	Approved under TBCB with BPC being PFCCL

4.7.4 Detailed scope of the scheme is given below:

Sl. No.	Scope of the Transmission Scheme	Capacity (MVA) / Line length (km)/ Nos.
1.	LILO of both circuits of Angul – Sundargarh (Jharsuguda) 765 kV 2xS/c lines at NLC-Talabira generation switchyard	50 km (25 km Loop in and 25 km Loop out)

Note: *NLC India Ltd. shall provide following at 765kV level its Talabira generation switchyard:*

a. 2 no. 765 kV GIS line bays with PIR in different diameters for termination of Talabira – Sundargarh (Jharsuguda) 765 kV D/c line.

b. 2 no. of 765kV GIS line bays with PIR in different diameters for termination of Talabira –Angul 765kV D/c line, each with 765kV, 1x240MVAr (3x80MVAr single phase units) switchable line reactor along with 400ohm NGR (with NGR bypass arrangement). There shall be total 7x80MVAr single phase units against 2x240MVAr line reactors and the 7th 1- phase unit shall be spare as hot stand by. The spare 1-phase shunt reactor unit shall be placed and connected in such a way that the spare unit can be utilized without its physical movement. Further, the connection arrangement of switchable line reactors shall be such that it can be used as line reactor as well as bus reactor with suitable NGR bypass arrangement.

4.8 North Eastern Region Expansion Scheme-XXI Part-B

4.8.1 Representative of CTUIL stated that the existing 132 kV Badarpur (POWERGRID) switching station was commissioned in 1999 and shall be completing 25 years in service by 2024. POWERGRID, the owner of the substation has informed that they are facing issues in O&M of the switching station and to improve the reliability it would be prudent to upgrade the switching station from single main and transfer bus scheme to double main transfer bus scheme by converting from AIS to Green GIS. Further, in a meeting held under chairpersonship of Member (Power Systems), CEA, it was agreed that upgradation of Badarpur (POWERGRID) 132 kV switching station from Single Main and Transfer Bus scheme to Double Main Bus scheme may be taken up by converting from AIS to Green GIS as a pilot project

4.8.2 CMD, Grid-India stated that adoption of new technology like Green GIS shall be encouraged by taking up small pilot projects like upgradation of 132 kV Badarpur S/s.

4.8.3 On the query of urgency, CTUIL stated that there is no immediate requirement of upgradation.

4.8.4 After deliberations, it was felt prudent that additional discussions are essential on the new technology such as major benefits of Green GIS, availability of Green GIS vendors in India, additional cost implication (conventional GIS vis-à-vis Green GIS) etc. Accordingly, it was decided to defer the scheme at present and take it up after additional discussions.

4.9 OPGW installation on existing line 765/400 kV Pune (PG) (GIS) – 400 kV Parli (PG) line which is to be LILOed at Kallam Substations under TBCB project.

4.9.1 Representative of CTUIL stated that as there is no OPGW on existing line 765/400 kV Pune (PG) (GIS) – 400 kV Parli (PG) line and without OPGW availability on the main line, redundancy of data communication of the new Kallam substation to RLDC cannot be maintained. Further OPGW installation on above line shall create one more intra-state ISTS communication paths. Thus, OPGW needs to be provided by replacing one earthwire on the main D/C existing line and integrating it with OPGW of the upcoming LILO section.

4.9.2 The scheme was deliberated in the 46th & 47th TCC/ WRPC meeting held on 2-3 Feb & 14-15 June 2023 respectively. After deliberations, WRPC concurred the proposal of "Supply and Installation of OPGW on existing line which is to be LILOed at Kallam Substation under TBCB project" at estimated cost of Rs 14 Cr excluding taxes.

4.9.3 NCT approved the scheme for OPGW installation on existing line 765/400 kV Pune (PG) (GIS) – 400 kV Parli (PG) line which is to be LILOed at Kallam Substations under TBCB project for implementation through RTM mode with tentative implementation timeframe of 24 months.

4.9.4 Summary of the scheme is given below:

SI No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crores)	Remarks
1.	Supply and Installation of OPGW on existing line 765/400kV Pune (PG) (GIS) – 400kV Parli (PG) line which is to be LILOed at Kallam Substation under TBCB project namely "Transmission system for evacuation of power from RE projects in Osmanabad area (1 GW) in Maharashtra" Tentative Implementation timeframe: 24 months	14	Through M/s Western Transmission Power Ltd. (M/s Adani) on RTM mode.

4.9.5 Detailed scope of the scheme is given below:

Sl. No.	Scope of the Transmission Scheme
1.	The OPGW Supply and installation alongwith accessories on the following line by replacing the existing one no. earthwire by Live Line installation: ➢ 765/400kV Pune (PG) (GIS) – 400kV Parli (PG) line
2.	STM-16, 3 MSP (FOTEs of requisite configuration at Pune, Parli for establishing the communication in between Pune-Kallam-Parli.

4.10 **OPGW installation on Itarsi-Dhule Transmission Line**

4.10.1 Representative of CTUIL stated that the OPGW on main line i.e. Itarsi-Dhule line installed by POWERGRID in 2003 is at the end of useful life and the link is an important connectivity to send data of sub-stations of MP locations to WRLDC.

4.10.2 The proposal was deliberated in 46th & 47th TCC/ WRPC meeting held on 2-3 Feb & 14-15 June 2023 respectively WRPC agreed to the installation of OPGW on 400kV Itarsi-Dhule (403 Km) to be installed on the 2nd peak of transmission line under ongoing WRCSS project for an estimated cost of Rs 16 Crores Excluding taxes.

4.10.3 NCT approved OPGW installation on Itarsi-Dhule Transmission Line through RTM mode with tentative implementation timeframe of 24 months.

4.10.4 Summary of the scheme is given below:

SI No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crores)	Remarks
1.	OPGW installation on Itarsi-Dhule Transmission Line Tentative Implementation timeframe: 24 months	15.4	Through POWERGRID on RTM mode

4.10.5 Detailed scope of the scheme is given below:

SI No.	Name of the scheme	Scope of the scheme
1.	OPGW installation on Itarsi-Dhule Transmission Line	1. Supply and installation of 24F OPGW for 403km. 2. STM-16, 5 MSP FOTE for Dhule S/s and repeater station. 3. Repeater Shelter including all shelter items/ Equipment i.e. telecom repeater

		equipment, auxiliary infrastructure like DG, SMPS, battery bank etc. in between Dhule-Khandwa section as the line length is approx. 263 kM. Repeater location may be finalized by transmission licensee preferably in existing ISTS/STU substations for optimizing operation & maintenance of repeater.

4.11 **Additional FOTE at AGC locations for Redundancy in NER region**

4.11.1 Representative of CTUIL stated that additional FOTE at all AGC operated generating stations in North Eastern region is required in view of resource disjoint and criticality of AGC operation for grid operation purpose as failure of single equipment may lead to disruption in AGC operation. Further, at many locations redundant ethernet port are not available as per NLDC requirement.

4.11.2 This scheme was approved by the NERPC in its 24th meeting.

4.11.3 NCT approved implementation of Additional FOTE at Loktak and Bongaigaon AGC locations in NER region, under RTM mode with tentative implementation timeframe of 06 months.

4.11.4 Summary of the scheme is given below:

SI No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crores)	Remarks
1.	Additional FOTE at Loktak and Bongaigaon AGC locations in NER region Tentative Implementation timeframe: 06 months	0.4	Through POWERGRID on RTM mode.

4.11.5 Detailed scope of the scheme is given below

SI No.	**Name of the scheme**	**Scope of the scheme**
1.	Additional FOTE at Loktak and Bongaigaon AGC locations in NER region.	One no. of FOTE STM-16 at Loktak and One no of FOTE STM-16 at Bongaigaon is proposed.

Summary of the deliberations of the 16th meeting of NCT held on 30th November, 2023

I. Modification in the earlier approved/notified transmission schemes:

1. **Transmission System for Evacuation of power from potential renewable energy zone in Khavda area of Gujarat under Phase-IV (7 GW): Part B**

   The following changes were approved in the scheme:

   i. Deletion of 2x500 MVA, 400/220 kV ICTs at South Olpad GIS S/s,

   ii. Change in minimum capacity of twin HTLS conductor from 1700 MVA to 2100 MVA for LILO of Gandhar-Hazira 400 kV D/c line at South Olpad (GIS)

2. **Additional 1x500 MVA 400/220 kV (9th) ICT, for injection from any additional RE project (other than 4000 MW injection under SECI bids upto Tranche IV) at Bhuj PS**

   The implementation of Additional 1x500 MVA 400/220 kV (9th) ICT at Bhuj PS was agreed to be implemented under RTM by POWERGRID. The scheme had already been awarded to POWERGRID under RTM vide MoP OM dated 30.01.2019. The scheme is now required to ensure reliable evacuation of power.

3. **Spare Reactor (1-ph, 1x80 MVAr) unit at 765/400 kV Beawar S/s under Rajasthan REZ Ph-IV (Part-2: 5.5 GW) (Jaisalmer/ Barmer Complex): Part D scheme**

   Incorporation of 1x80 MVAr (1-ph) spare Reactor unit at Beawar S/s, under the transmission scheme: "Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-2:5.5 GW) (Jaisalmer/ Barmer Complex): Part D".

4. **Change in Scope of Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-1: Bikaner Complex)- Part-A package**

   Concurred deletion 1 no. of 220 kV line bay at Bikaner-III PS from Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part1) (Bikaner Complex)-Part-A.

II. ISTS Transmission schemes, costing between Rs 100 Crore to Rs 500 Crore, approved by NCT:

a) The transmission schemes approved by NCT under RTM route is given below:

Sl. No.	Name of Transmission Scheme	Implementation Mode	Tentative Implementation timeframe	Allocated to	Estimated Cost (Rs. Crs)
1.	Augmentation of transformation capacity at 765/400 kV Indore S/s in Madhya Pradesh.	RTM	18 months	POWERGRID	126

2.	Augmentation of 1x1500 MVA (3rd), 765/400 kV transformation capacity at Kurnool New S/s.	RTM	21 months (18 months on best effort basis)	POWERGRID	162
3.	Reconductoring of Raichur – Veltoor (Mahabubnagar) 400 kV S/c line with HTLS conductor	RTM	24 months	POWERGRID	164

b) The transmission schemes approved by NCT under TBCB route is given below:

Sl. No.	Name of Transmission Scheme	Implementation Mode	Tentative Implementation timeframe	BPC	Estimated Cost (Rs. Crs)
1.	Augmentation of transformation capacity at Bhuj-II PS (GIS)	TBCB	21 months	PFCCL	428
2.	Eastern Region Generation Scheme-I (ERGS-I)	TBCB	01.05.2027	PFCCL	413.16

The broad scope of above ISTS scheme, approved by NCT for implementation through TBCB route to be notified in Gazette of India is as given below:

Sl. No.	Name of Scheme & Tentative implementation timeframe	Broad Scope	Bid Process Coordinator
1.	Augmentation of transformation capacity at Bhuj-II PS (GIS) 21 months	i. Augmentation of transformation capacity at Bhuj-II PS (GIS) by 2x500MVA, 400/220kV ICT (5th& 6th) and by 1x1500MVA, 765/400kV ICT (3rd) ii. Implementation of 220 kV GIS line bay at Bhuj-II PS for ABREL (RJ) Projects Limited **(Detailed scope as approved by 16th NCT and subsequent amendments thereof)**	PFCCL
2.	Eastern Region Generation Scheme-I (ERGS-I) 01.05.2027	i. LILO of both circuits of Angul – Sundargarh (Jharsuguda) 765kV 2xS/c lines at NLC-Talabira generation switchyard **(Detailed scope as approved by 16th NCT and subsequent amendments thereof)**	PFCCL

III. ISTS Transmission schemes, costing greater than Rs 500 Crore, recommended by NCT to MoP:

The ISTS transmission schemes recommended by NCT to MoP are given below:

Sl. No.	Name of Transmission Scheme	Implementation Mode	Tentative Implementation timeframe	BPC	Estimated Cost (Rs. Crs)
1.	Network Expansion Scheme in Navinal (Mundra) area of Gujarat for drawal of power in the area	TBCB	21 months	PFCCL	2,383
2.	Eastern Region Expansion Scheme-XXXIX (ERES-XXXIX)	TBCB	30-06-2026	RECPDCL	2,898

The broad scope of ISTS schemes, recommended by NCT to MoP for implementation through TBCB mode, to be notified in Gazette of India is as given below:

Sl. No.	Name of Scheme & Tentative implementation timeframe	Broad Scope	Bid Process Coordinator
1.	Network Expansion Scheme in Navinal (Mundra) area of Gujarat for drawal of power in the area 21 months	i. Establishment of 4x1500 MVA, 765/400 kV Navinal(Mundra) S/s (GIS) with 2x330 MVAR, 765 kV & 1x125MVAr, 420 kV bus reactors ii. LILO of Bhuj-II – Lakadia 765 kV D/c line at Navinal(Mundra) (GIS) S/s with associated bays at Navinal (Mundra) (GIS) S/s iii. Installation of 1x330 MVAr switchable line reactor on each ckt at Navinal end of Lakadia – Navinal 765 kV D/c line (formed after above LILO) **(Detailed scope as approved by 16th NCT and subsequent amendments thereof)**	PFCCL
2.	Eastern Region Expansion Scheme-XXXIX (ERES-XXXIX) 30-06-2026	i. Establishment of new 765/400kV, 2x1500MVA GIS substation at Gopalpur in Odisha ii. Angul – Gopalpur 765kV D/c line iii. Extension at 765kV level at Angul (POWERGRID) S/s including bus extension in GIS iv. Gopalpur – Gopalpur (OPTCL) 400kV D/c (Quad) line v. Extension at 400kV level at Gopalpur (OPTCL) GIS S/s **(Detailed scope as approved by 16th NCT and subsequent amendments thereof)**	RECPDCL

IV. ISTS communication schemes approved by NCT:

Sl. No.	Name of Communication Scheme	Implementation Mode	Tentative implementation timeframe	Implementing Agency	Estimated Cost (Rs Cr)
1.	Supply and Installation of OPGW on existing line 765/400kV Pune (PG) (GIS) – 400kV Parli (PG) line which is to be LILOed at Kallam Substation under TBCB project namely "Transmission system for evacuation of power from RE projects in Osmanabad area (1 GW) in Maharashtra"	RTM	24 months	M/s Western Transmission Power Ltd. (M/s Adani)	14
2.	OPGW installation on Itarsi-Dhule Transmission Line	RTM	24 months	POWER GRID	15.4
3.	Additional FOTE at Loktak and Bongaigaon AGC locations in NER region	RTM	06 months	POWER GRID	0.4

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Annexure

List of participants of the 16th meeting of NCT

CEA:

1. Sh. Ghanshyam Prasad, Chairperson, CEA & Chairman, NCT
2. Sh. Ajay Talegaonkar, Member (E&C)
3. Sh. Ishan Sharan, Chief Engineer (PSPA-I)
4. Sh. B.S. Bairwa, Director (PSPA-II)
5. Sh. LEN J.B, Director (PCD)
6. Sh. Ganeshwara Rao, Deputy Director (PSPA-I)
7. Sh. Deepanshu Rastogi, Deputy Director (PSPA-II)
8. Sh. Pranay Garg, Deputy Director (PSPA-II)
9. Sh. Ajay Malav, Assistant Director (PSPA-II)
10. Sh. Prateek Jadaun, Assistant Director (PSPA-II)
11. Sh. Manish Kumar Verma, Assistant Director (PSPA-II)

MoP:

1. Om Kant Shukla, Director (Trans.)

MNRE:

1. Sh. Tarun Singh, Scientist D

SECI:

1. Sh. R.K. Agarwal, Consultant

NITI Aayog:

1. Sh. Manoj Kr. Upadhyay, Deputy Adviser

CTUIL:

1. Sh. P.C Garg, COO
2. Sh. Ashok Pal, Deputy COO
3. Sh. P.S Das, Sr GM
4. Sh. V. Thiagarajan, Sr GM
5. Sh. Anil Kr. Meena, GM
6. Sh. Sandeep Kumawat, DGM
7. Sh. Abhijit Jha, CM
8. Sh. Kunal Sagar, CM
9. Sh. Pratyush Singh, Chief Manager
10. Sh. Manish Ranjan Keshari, Chief Manager
11. Sh. Shashank, Manager
12. Sh. Abhilash Thakur, Engineer

GRID India:

1. Sh. S.R. Narasimhan, CMD
2. Sh. Surajit Banarjee, CGM
3. Sh. Vivek Pandey, GM

4. Sh. Rahul Shukla, CM
5. Sh. Priyam Jain, Manager
6. Sh. Gaurab Dash, AM

RECPDCL

1. Sh. P.S Hariharan, CGM (Transmission)

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