



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 अड़तीसवी बैठक का कार्यवृत्त ।

Subject: Minutes of the 38th Meeting of the National Committee on Transmission (NCT)-reg.

महोदया (Madam) / महोदय (Sir),

The 38th meeting of the National Committee on Transmission (NCT) was held on 25th February 2026 at New Delhi. The minutes of the meeting are enclosed herewith.

भवदीय / Yours faithfully

Digitally signed by

Bhagwan Sahay Bairwa

Date: 09-03-2026

19:14:44

(बी.एस.बैरवा / B.S. Bairwa)

मुख्य अभियन्ता एवं सदस्य सचिव,(एन.सी.टी.)/
Chief Engineer & Member Secretary (NCT)

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.	Additional Secretary (Trans), Ministry of Power Shram Shakti Bhawan, New Delhi-110001.
5.	Sh Abhay Bakre, Mission Director/ Shri Rajesh Kulhari, Joint Secretary, MNRE Atal Akshay Urja Bhawan Opposite CGO Complex gate No. 2, Lodhi Road, New Delhi – 110003	6.	Chief Operating Officer, CTUIL, Floors Nos. 5-10, Tower 1, Plot Nos. 16, IRCON International Tower, Institutional Area, Sector 32, Gurugram, Haryana - 122001.
7.	Sh. Rajnath Ram, Adviser (Energy), NITI Aayog, Parliament Street, New Delhi – 110 001.	8.	CMD, Grid Controller of India, B-9 (1st Floor), Qutub Institutional Area, Katwaria Sarai, New Delhi – 110016
9.	Sh. Abhay Choudhary Expert Member	10.	Managing Director, Jammu Power Distribution Corporation Limited (JPDCL) Gladni Narwal, Jammu, Jammu & Kashmir, India - 180006
11.	Sh. S.R Narasimhan Expert Member	12.	Shri. Shivdas S, Director (Transmission & System Operation) Vydyuthi Bhavanam, Pattom, Thiruvananthapuram, Kerala- 695004
13.	Sh. Sabyasachi Roy, Director (Operations), WBSETCL	14.	Chairperson, North Eastern Region Power Committee Hon'ble Minister of Power, Govt. of Assam, Guwahati – 781 006
15.	Chairperson, Western Region Power Committee 2nd Floor, Vidyut Seva Bhavan, P.O. Sunder Nagar, Danganiya, Raipur: 492 013		

Special Invitee

- i) Chief Engineer (PCD), CEA
- ii) Chief Engineer (PSETD), CEA
- iii) CEO, RECPDCL
- iv) CEO, PFCCL

Table of Minutes

1. Confirmation of the minutes of the 37 th meeting of National Committee on Transmission	4
2. Status of the transmission schemes noted/approved/recommended to MoP in the 37 th meeting of NCT:.....	4
3. New Transmission Schemes.....	5
4. Communication Schemes.....	26
5. Evaluation of functioning of National Grid.....	32
6. Status of the bids under process by BPCs.....	36
7. Any other matter.....	36

Minutes of the 38th meeting of National Committee on Transmission (NCT)

1. Confirmation of the minutes of the 37th meeting of National Committee on Transmission

- 1.1. The minutes of the 37th meeting of NCT held on 19.01.2026 were issued on 30.01.2026 vide CEA letter No. CEA-PS-12-13/3/2019-PSPA-II Division/I/59828/2026.
- 1.2. No comments were received on the minutes
- 1.3. Members confirmed the minutes.

2. Status of the transmission schemes noted/approved/recommended to MoP in the 37th meeting of NCT:

2.1. Status of 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 Integration of Power from RE Projects in Jam Khambhaliya REZ in Gujarat - Phase II (5500MW) and Jamnagar Phase-I (1000 MW)	Recommended	TBCB	PFCL	Notified in Gazette by MoP on 11.02.2026
2.	Transmission system for Integration of Power from RE Projects in Lakadia REZ in Gujarat-Phase II (7500MW)	Recommended	TBCB	RECPDCL	
3.	Common Transmission System for evacuation of power from Lakadia (Phase-II: 7.5GW), Jam Khambhaliya (Phase-II: 5.5GW) and Jamnagar (Phase-I: 1GW)-Part A	Recommended	TBCB	PFCL	
4.	Common Transmission System for evacuation of power from Lakadia (Phase-II: 7.5GW), Jam Khambhaliya (Phase-II: 5.5GW) and Jamnagar (Phase-I: 1GW)-Part B	Recommended	TBCB	RECPDCL	
5.	Common Transmission System for evacuation of power from Lakadia	Recommended	TBCB	PFCL	

Sr. No	Name of the Transmission Scheme	Noted/ Recommended/ Approved	Mode of Implementation	BPC	Award/ Gazette notification
	(Phase-II: 7.5GW), Jam Khambhaliya (Phase-II: 5.5GW) and Jamnagar (Phase-I: 1GW)-Part C				
6.	Augmentation at Bhadla-III, Ramgarh PS and Kanpur (PG)	Recommended	TBCB	RECPDCL	

2.2. Status of transmission schemes where modifications were suggested/approved in 37th NCT meeting:

S. Nos.	Scheme where modifications were suggested	Status
1.	Modification in Configuration of Proposed Siot Substation from AIS to GIS	RfP with amendment issued. Survey to be reconducted.
2.	Modification of completion schedule of WR-ER Inter-Regional Network Expansion Scheme-Part C	RfP with amendment issued by REC.
3.	Addition of 220kV bus coupler in NorthEastern Region Generation Scheme-III Siang Basin (NERGS-III Siang Basin)	RfP with amendment issued.
4.	Transmission System for integration of Ananthapuram-III REZ	Survey as per revised scope under progress.

1. New Transmission Schemes

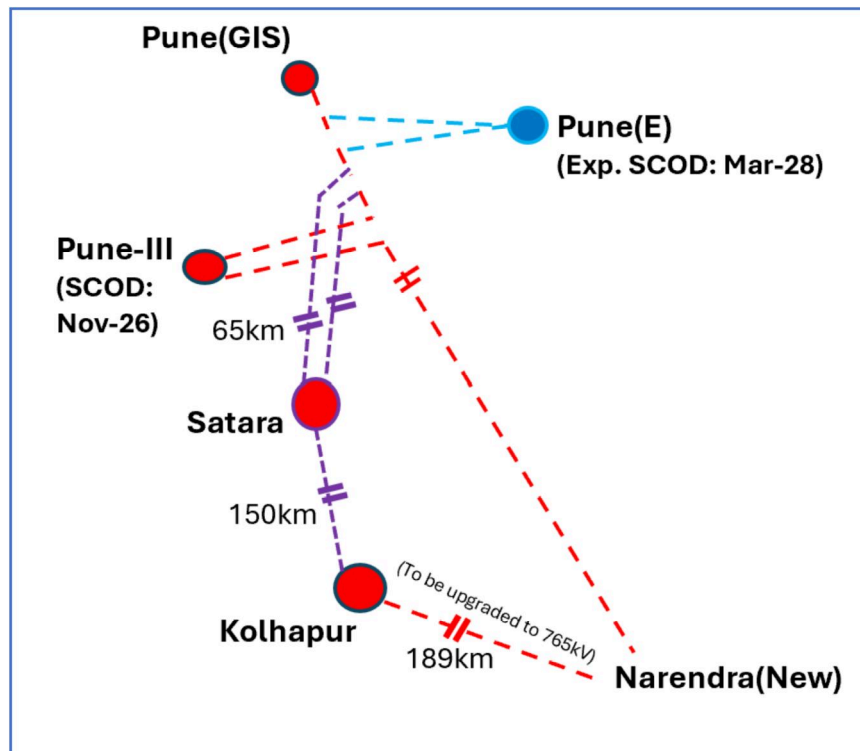
1.1. Transmission Network Expansion Scheme in Western Region to cater to pumped storage potential near Satara (up to 4500 MW)

- 1.1.1.** Representative of CTUIL stated that a meeting was held under the Chairperson, CEA, on 28.05.2024 to deliberate on planning of the transmission system for the evacuation of power from Pumped Storage Projects (PSPs). During the meeting, it was informed that transmission system augmentation for multiple developers of PSPs coming in proximity may be considered as a common augmentation for multiple users. Further, it was decided that while granting connectivity to PSPs, CTUIL should specify that PSPs should not operate in generating mode during high RE generation period (i.e., solar hours). However, PSPs may inject power during such periods depending upon the available margin in the transmission system.
- 1.1.2.** He mentioned that applications for ISTS connectivity in the Satara area were received from M/s Adani Renewable Energy One Ltd. (AREOL) – 1800 MW Tarali PSP (August 2024) and Adani Saur Urja (KA) Limited – 1800 MW Nivakane PSP (November 2024).
- 1.1.3.** It was further informed that the connectivity granted to M/s Adani Renewable Energy One Ltd. (AREOL) for the 1800 MW Tarali PSP was revoked in October 2025 due to non-submission of Bank Guarantees (BGs). The developer has re-applied in January 2026 with a revised start date of 31.03.2029, and the application is presently under

process.

Regarding the 1800 MW Nivakane PSP of Adani Saur Urja (KA) Limited, the start date is 31.12.2029, and intimation for in-principle grant of connectivity was issued on 02.09.2025.

- 1.1.4.** CTUIL informed that the 765/400kV Pune III substation is presently under implementation through LILO of Narendra (New) (existing) – Pune (GIS) (Shikrapur) (existing) 765 kV D/c line, under the ISTS transmission scheme “Transmission System for Evacuation of Power from potential REZ in Khavda area of Gujarat under Phase-IV (7GW): Part D” by Pune-III Transmission Ltd. (a 100% subsidiary of Adani Energy Solutions Ltd.), with a SCOD of 24 months from the effective date, i.e., by 19.11.2026.
- 1.1.5.** The Pune (GIS) (Shikrapur) (existing) – Pune III (GIS) (under construction) 765kV D/c line, thus formed, is being LILOed at 765/400kV Pune (East) substation under the Intra-STS transmission scheme “Network Expansion Scheme in Maharashtra for Removal of Transmission Constraints in Pune Region-I (765/400kV Pune East)” by NES Pune East New Transmission Ltd. (a 100% subsidiary of POWERGRID), with a SCOD of 24 months from the effective date.
- 1.1.6.** Further, the Pune-III – Pune (East) 765kV D/c line, thus formed, is proposed to be LILO at the Satara substation planned for integration of PSP projects in the Satara area. The detailed schematic diagram in this regard is given below:



- 1.1.7.** On query, PFCCCL informed that the Letter of Intent (LoI) for the above Intra-STS transmission scheme has been issued to POWERGRID, the successful bidder, and SPV transfer and TSA execution are expected by March 2026.
- 1.1.8.** CTUIL proposed a transmission scheme to facilitate drawl of power under pumping

mode as well as injection of power under generating mode for 1800MW Tarali PSP (AREOL) and 1800MW Nivakane PSP (ASU(KA)L). Further, the proposed system can cater to the injection/drawal requirement of pumped storage potential (up to 4500MW) near Satara, including the above projects.

1.1.9. He further stated that the transmission scheme would provide the following benefits to the Western Region ISTS grid:

- Enabling integration of up to 4500 MW PSP projects in Satara area of Maharashtra.
- Creation of an additional 765kV Inter-regional corridor between SR and WR Grids (Narendra – Kolhapur – Satara – Pune-III / Pune (East) 765kV corridor)
- Facilitation of additional evacuation of RE power from Karnataka towards PSP projects in Satara area and further load centres in Pune and MMR areas of Maharashtra.

1.1.10. The scheme was recommended in the 56th WRPC meeting held on 27.09.2025 and the 56th SRPC meeting held on 15.11.2025.

1.1.11. Member Secretary (SRPC) stated that since Narendra is high generation area and Pune & Kolhapur are load centres, in most scenarios the power flow may be from SR to WR through Narendra (New) - Kolhapur and Narendra (New) - Pune 765kV lines. Further, PSPs may not operate in generating mode during periods of high RE generation, depending on the margin available in the system. He also suggested that adequate reactive power compensation should be planned at the Satara Generation Complex (PSP) to ensure voltage stability and efficient grid operation, preferably through synchronous condenser mode to provide dynamic reactive support.

1.1.12. CTUIL mentioned that these aspects have already been considered in the studies.

1.1.13. It was mentioned that out of the two PSPs, Tarali PSP is at an advanced stage, and as per the connectivity application, the start date is March 2029. Accordingly, the transmission system may be phased as under:

Phase-I - planned for 1800MW capacity with a schedule of March 2029 (subject to a minimum implementation schedule of 30 months), consisting of:

- Upgradation of the Narendra – Kolhapur to 765kV level
- Establishment of 765/400kV Satara Substation
- LILO of Pune-III – Pune (East) 765kV D/c line at Satara

Phase-II - planned for balance capacity up to 4500MW with schedule of December 2029 (subject to minimum implementation schedule of 36 months).

Further, reorientation of the existing Narendra (New) – Kolhapur (PG) 765kV D/c line (presently charged at 400kV) and its termination into 765kV bays along with all associated works required for charging the line at 765kV level may be segregated as Part B.

1.1.14. After detailed deliberations, the transmission scheme “Network Expansion Scheme in Western Region to cater to pumped storage potential near Satara (up to 4500 MW)” was recommended by NCT for implementation through TBCB mode for Part-A and through RTM for Part-B, as detailed below:

Sl. No.	Name of Scheme & Tentative Implementation Timeframe	Estimated Cost (₹ Crore)	Remarks
1.	Network Expansion Scheme in Western Region to cater to pumped storage potential near Satara (up to 4500MW) - Part A Implementation timeframe: <ul style="list-style-type: none"> Phase-I: 31.03.2029 (subject to minimum implementation schedule of 30 months) Phase-II: 31/12/2029 (subject to minimum implementation schedule of 36 months) 	4710.17Cr. Phase-I: 3130.36Cr. Phase-II: 1579.80Cr.	Recommended under TBCB route through PFCCL as BPC
2.	Network Expansion Scheme in Western Region to cater to pumped storage potential near Satara (up to 4500MW) - Part B	22.60 Cr.	Recommended under RTM route through POWERGRID (Existing TSP)

1.1.15. Detailed scope is as follows:

Network Expansion Scheme in Western Region to cater to pumped storage potential near Satara (up to 4500MW)

Sl. No.	Scope of works	Capacity /km	Implementation Time-frame
Part: A			
Phase-I (Cumulative 1800MW)			
1.	Creation of 765kV level at Kolhapur (PG) GIS with installation of 2x1500 MVA, 765/400 kV ICTs at Kolhapur (PG) S/s along with upgradation of Kolhapur (PG) S/s to 765kV level	<ul style="list-style-type: none"> 765/400 kV, 1500 MVA ICT – 2 Nos. (7x500MVA single phase ICTs including 1x500MVA spare ICT) 765 kV ICT bays – 2 Nos. (GIS) 400 kV ICT bays – 2 Nos. (GIS) 	Phase-I: 31/03/2029 (subject to minimum implementation schedule of 30 months)
2.	Installation of 765 kV, 2x330 MVAR bus reactors at Kolhapur (PG) S/s.	<ul style="list-style-type: none"> 765 kV 330 MVAR bus reactor – 2 Nos. (7x110 MVAR single-phase Reactors, including one 	

Sl. No.	Scope of works	Capacity /km	Implementation Time-frame
		spare unit for bus/line reactor) <ul style="list-style-type: none"> 765 kV Bus reactor bay – 2 Nos. (GIS) 	
3.	Bay Works required for upgradation of Narendra (New) – Kolhapur (PG) 765 kV D/c line (presently charged at 400kV) to 765kV level.	<ul style="list-style-type: none"> 765kV line bays at Narendra (New) – 2 Nos. (GIS) 765kV line bays at Kolhapur (PG) – 2 Nos. (GIS) 	
4.	Installation of 765kV, 330MVA switchable line reactors on each circuit at Kolhapur (PG) end of Narendra (New) – Kolhapur (PG) 765kV D/c line	<ul style="list-style-type: none"> 765 kV, 330 MVA Switchable Line Reactor–2 Nos. (6x110 MVAR single-phase Reactors) 765 kV Switchable Line Reactor Bay– 2 Nos. 765kV, 110 MVA spare single-phase reactor provided at sl. no. 2 above at Kolhapur (PG) to be utilized for the above Switchable Line Reactor. 	
5.	Establishment of 765/400 kV Satara Substation with 765/400 kV 3x1500 MVA ICTs, 765kV 2x330 MVAR bus reactors and 400 kV 1x125 MVAR bus reactor Future Provision (Space Only) (in addition to scope of work given under Sl. 5 & 7): <ul style="list-style-type: none"> 765/400 kV, 1500MVA ICT along with bays – 2 Nos. (on Bus Section-II) 765 kV line bays along with Switchable Line Reactors – 6 Nos. (2 Nos. on Bus Section-I & 4 Nos. on Bus Section-II) 765 kV, 330MVA Bus Reactor along with bay – 2 Nos. (1 on Bus Section-I & 1 on Bus Section-II) 400/220 kV, 500 MVA ICT along with bays – 6 Nos. (3 	<ul style="list-style-type: none"> 765/400 kV, 1500 MVA ICT – 3 Nos. (10x500 MVA single-phase units, including one spare ICT unit) 765 kV ICT bays – 3 Nos. on Bus Section-I 400 kV ICT bays –3 Nos. on Bus Section-I 765 kV Line bays – 4 Nos. (2 Nos. on Bus Section-I for Pune (East) D/c lines and 2 Nos. on Bus Section-II for Pune-III D/c lines) 330 MVA, 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. (1 on Bus Section-I & 1 on Bus Section-II) 420 kV, 125 MVA Bus reactor – 1 No. 	

Sl. No.	Scope of works	Capacity /km	Implementation Time-frame
	<ul style="list-style-type: none"> on Bus Section-I & 3 on Bus Section-II) • 400 kV line bays along with switchable line reactors – 12 Nos. (6 on Bus Section-I & 6 on Bus Section-II) • 420 kV, 125MVA_r Bus Reactor along with bays – 2 Nos. (1 on Bus Section-I & 1 on Bus Section-II) • 220 kV Sectionalizer bay – 1 set • 220 kV TBC – 2 Nos. • 220 kV BC – 2 Nos. • 220 kV line bays – 12 Nos. (6 on each Bus Section). 	<ul style="list-style-type: none"> • 400 kV Bus Reactor Bay – 1 No. (on Bus Section-I) • 400 kV line bays – 2 Nos. (on Bus Section-I) for PSP Interconnection • 765 kV Sectionalizer bay – 1 set 	
6.	LILO of Pune-III – Pune (East) 765kV D/c line at Satara.	<ul style="list-style-type: none"> • LILO route length 65 km (260 ckm) 	
	Phase-II (Cumulative 4500MW)		
7.	Creation of 400 kV Bus Section-II and augmentation of transformation capacity at 765/400 kV Satara S/s by 765/400 kV, 1x1500 MVA ICT (4 th) along with 1x125 MVAR 400 kV bus reactor (on Bus Section-II)	<ul style="list-style-type: none"> • 400 kV Sectionalizer bay – 1 set • 400 kV line bays – 2 Nos. (on Bus Section-II) for PSP Interconnection • 765/400 kV, 1500 MVA ICT – 1 No. (3x500 MVA single-phase units utilizing spare ICT at Sl. 5) • 765 kV ICT bays – 1 No. on Bus Section-II • 400 kV ICT bays –1 No. on Bus Section-II • 420 kV, 125 MVA_r Bus reactor – 1 No. • 400 kV Bus Reactor Bay – 1 No. (on Bus Section-II) 	Phase-II: 31/12/2029 (subject to minimum implementation schedule of 36 months)
8.	Kolhapur (PG) – Satara 765kV D/c line	150 km (300 ckm)	
9.	765 kV line bays for Kolhapur (PG) – Satara 765kV D/c line	<ul style="list-style-type: none"> • 765 kV line bays – 2 Nos. (GIS) at Kolhapur 	

Sl. No.	Scope of works	Capacity /km	Implementation Time-frame
		<ul style="list-style-type: none"> 765 kV Line bays – 2 Nos. (AIS) at Satara on Bus Section-I 	
10.	765kV, 240MVA _r switchable line reactors on each circuit at Satara end of Kolhapur (PG) – Satara 765kV D/c line	<ul style="list-style-type: none"> 240 MVA_r, 765 kV Switchable Line Reactor–2 Nos. (7x80 MVAR single-phase Reactors) 765 kV Switchable Line Reactor Bay–2 Nos. 	
Part: B			
11.	Reorientation of existing Narendra (New) – Kolhapur (PG) 765kV D/c line (presently charged at 400kV) and its termination into 765kV bays, including all associated works required for charging the line at 765kV level	Line length – ~1 to 2 kms on both ends	Matching with Part A, Phase-I scheme

Note:

1. The 765/400kV Pune (East) substation is being implemented through LILO of both circuits of the 765kV Pune (GIS) (Shikrapur) (existing) – Pune III (GIS) (under construction) line, under the Intra-STS transmission scheme “Network Expansion Scheme in Maharashtra for Removal of Transmission Constraints in Pune Region-I (765/400kV Pune East)” by NES Pune East New Transmission Ltd. (a 100% subsidiary of POWERGRID), with a SCOD of 24 months from effective date.
2. Bay(s) required for completion of diameter (GIS) under the one-and-half breaker scheme shall also be executed by the TSP.
3. POWERGRID, being the TSP of Kolhapur (PG) S/s and Narendra (New) S/s, shall space for the above scope of works free of cost.

1.2. ERES-47: Nawada – Durgapur – Jeerat (New) 765kV corridor

- 1.2.1. Representative of CTUIL stated that a 765 kV ring was planned in ER from Ranchi (New) – Medinipur – Jeerat (New) – Gokarna – Banka – Gaya and Ranchi – Gaya through 400kV D/c (Quad) line. Ranchi (New) – Medinipur – Jeerat (New) 765kV D/c line has already been implemented. In order to improve reliability in the Eastern Region particularly in Kolkata area, a need for implementation of balance portion of the ring came up as per operational feedback.
- 1.2.2. He further added, the matter was discussed in the joint study meeting held on 25-09-2025, wherein a new corridor option viz. Nawada – Durgapur – Jeerat (New) 765 kV corridor was agreed to be taken up for strengthening 765kV interconnection to Kolkata area. This link can also be utilized for grant of 1200MW ISTS Connectivity to NTPC

for its Nabinagar STPP Stage-II generation plant (3x800MW).

- 1.2.3.** The subject scheme was deliberated in the 55th TCC & ERPC meeting held on 16th & 17th Dec 2025 wherein the scheme was in-principally agreed. MS (ERPC) stated that this scheme may be considered in tandem with RE evacuation scheme for Rajasthan REZ-IV since it is anticipated that RE power from Northern states shall flow up to the load centres of West Bengal. Accordingly, this comprehensive scheme may be treated as National Component-RE.
- 1.2.4.** NCT opined that the scheme is primarily meant for system strengthening and shall also facilitate evacuation of power from Nabinagar STPP Stage-II power station, accordingly , the scheme shall not be treated as National component-RE.
- 1.2.5.** Representatives from PGCIL stated that Durgapur S/S operated by them is under lease and as per the agreement further sub-lease or selling of land to other utilities is not legally permissible. Hence extension works like construction of bay and other substation equipment will be carried out by POWERGRID under RTM mode to avoid any complicity.
- 1.2.6.** It was opined that to avoid possible land issue in existing sub-station, the proposed switching station may be implemented at Durgapur at separate location.
- 1.2.7.** After detailed deliberations, the following transmission scheme was recommended by NCT for implementation through TBCB mode:

Sl. No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crore)	Remarks
1.	ERES-47: Nawada – Durgapur – Jeerat (New) 765kV corridor Implementation timeframe: 31-03-2029	5270.09	Recommended under TBCB route through RECPDCL as BPC

- 1.2.8.** Detailed scope is as below:

Sl. No.	Scope of works	Capacity (MVA) / Line length (km)/ Nos.	₹ Crores
1.	Establishment of new 765/400/220kV S/s at Nawada in Bihar Additional space for future expansion: <ul style="list-style-type: none"> • 765kV bus sectionaliser bay: 1 set (to establish Sec-II) • 400kV bus sectionaliser bay :1 set (to establish Sec-II) • 220kV bus sectionaliser 	<ul style="list-style-type: none"> • 765/400kV, 2x1500MVA ICT (7x500MVA single phase units including one spare unit) • 765kV, 2x330MVA bus reactor (7x110MVA single phase units including one spare unit) • 400/220kV, 2x500MVA ICT • 420kV, 125MVA bus reactor: 2 nos. 	952.80

Sl. No.	Scope of works	Capacity (MVA) / Line length (km)/ Nos.	₹ Crores
	<p>bay: 1 set (to establish Sec-II)</p> <ul style="list-style-type: none"> • 220kV bus coupler bay: 1 No. on bus Sec-II • 220kV transfer bus coupler bay: 1 No. on bus Sec-II • 765/400kV, 4x1500MVA (12x500MVA single phase units) ICTs along with associated ICT bays at both voltage levels <ul style="list-style-type: none"> o 765kV side: - 1 No. on Bus Sec-I & 3 Nos. on Bus Sec-II) o 400kV side: - 1 Nos. on Bus Sec-I & 3 Nos. on Bus Sec-II) • 400/220kV, 4x500MVA ICTs along with associated ICT bays at both voltage levels <ul style="list-style-type: none"> o 400kV side: - 1 No. on Bus Sec-I & 3 Nos. on Bus Sec-II) o 220kV side: - 1 Nos. on Bus Sec-I & 3 Nos. on Bus Sec-II) • 765kV, 2x330MVA (6x110MVA single phase units) bus reactor along with associated bay (on Bus Sec-II) • 420kV, 2x125MVA bus reactor along with associated bay (on Bus Sec-II) • 765kV line bays (along with space for switchable line reactor) for future lines: 8 Nos. (2 Nos. on Bus Sec-I and 6 on Bus Sec-II) • 400kV line bays (along 	<ul style="list-style-type: none"> • 765kV ICT bays: 2 nos. • 765kV Bus reactor bays: 2 nos. • 400kV ICT bays: 4 nos. • 400kV Bus reactor bays: 2 nos. • 220kV ICT bays: 2 nos. • 765kV line bays: 4 nos. (2 nos. for Nawada – Durgapur (New) 765kV D/c line and 2 nos. for LILO of Gaya – Ballia 765kV S/c line) • 765kV, 240MVA (3x80MVA single phase units) switchable line reactor along with associated switching equipment in both circuits of Nawada – Durgapur (New) 765kV D/c line at Nawada end • 765kV, 240MVA (3x80MVA single phase units) switchable line reactor along with associated switching equipment in Nawada – Ballia 765kV S/c line section at Nawada end formed after LILO of Ballia – Gaya 765kV S/c line at Nawada • 765kV, 1x80MVA (single phase unit) spare reactor: 1 no. • 400kV line bays: 2 nos. [for Nabinagar-II Stage-II – Nawada (ISTS) 400kV D/c (Quad) line viz. DTL, under the scope of NTPC Ltd.] • 220kV line bays: 2 nos. [for Nawada (ISTS) – Guraru 220kV D/c line – line under scope of 	

Sl. No.	Scope of works	Capacity (MVA) / Line length (km)/ Nos.	₹ Crores
	<p>with space for switchable line reactor) for future lines: 10 Nos. (4 Nos. on Bus Sec-I and 6 on Bus Sec-II)</p> <ul style="list-style-type: none"> 220kV line bays for future lines: 10 Nos. (4 Nos. on Bus Sec-I and 6 on Bus Sec-II) 	<p>BSPTCL]</p> <ul style="list-style-type: none"> 220kV bus coupler bay: 1 No. on bus Sec-I 220kV transfer bus coupler bay: 1 No. on bus Sec-I 	
2.	<p>Establishment of new 765kV Switching station at Durgapur in West Bengal with provision for establishment of 765/400kV level in future</p> <p>Additional space for future expansion:</p> <ul style="list-style-type: none"> 765kV line bays (along with space for switchable line reactor) for future lines: 6 nos. 765/400kV, 5x1500MVA ICT (16x500MVA single phase units including one spare unit) along with associated bays at both levels 765kV, 330MVA bus reactor (3x110MVA single phase units) along with associated bay: 1 no. 400kV line bays (along with switchable line reactor): 10 nos. 420kV, 2x125MVA bus reactor along with associated bay 	<ul style="list-style-type: none"> 765kV, 2x330MVA bus reactor (7x110MVA single phase units including one spare unit) 765kV Bus reactor bays: 2 nos. 765kV line bays: 4 nos. (2 nos. for Nawada – Durgapur (New) 765kV D/c line and 2 nos. for Durgapur (New) – Jeerat (New) 765kV D/c line) 765kV, 240MVA (3x80MVA single phase units) switchable line reactor along with associated switching equipment in both circuits of Nawada – Durgapur (New) 765kV D/c line at Durgapur (New) end 765kV, 1x80MVA (single phase unit) spare reactor: 1 no. 	440.82
3.	LILO of Gaya – Ballia 765kV S/c line at Nawada S/s	Loop in 82km Loop out 82km	615.25
4.	Nawada – Durgapur (New) 765kV D/c line	258km	1876.35
5.	Durgapur (New) – Jeerat	152km	1226.02

Sl. No.	Scope of works	Capacity (MVA) / Line length (km)/ Nos.	₹ Crores
	(New) 765kV D/c line		
6.	Extension at Jeerat (New) 765/400kV S/s	<ul style="list-style-type: none"> • 765kV line bays: 2 Nos. (for Durgapur (New) – Jeerat (New) 765kV D/c line) • 765kV, 240MVA (3x80MVA single phase units) switchable line reactor in Durgapur (New) – Jeerat (New) 765kV D/c line – 2 Nos. • Switching equipment for line reactors – 2 Nos. • Provision for utilization of existing 765kV, 1x80MVA single phase spare reactor to be made for the above 2x240MVA (6x80MVA single phase units) switchable line reactor to be installed at Jeerat (New) end in Durgapur (New) – Jeerat (New) 765kV D/c line 	158.85

Note:

1. BSPTCL shall take up implementation of Nawada (ISTS) – Guraru 220kV D/c line along with Guraru 220/132kV substation and other associated 220kV & 132kV lines in matching time-frame of Nawada (ISTS) S/s.
2. M/s POWERGRID Medinipur Jeerat Transmission Limited (PMJTL) shall provide space for above scope of work at the existing Jeerat (New) S/s free of cost.
3. TPS shall terminate 765kV D/c lines at Durgapur (New) S/s such that one circuit of Nawada – Durgapur (New) 765kV D/c line and one circuit of Durgapur (New) – Jeerat (New) 765kV D/c line are terminated in same diameter. Similarly, second circuit of both lines may also be terminated in bays of the same diameter.
4. Line lengths mentioned above are tentative. Exact line length shall be ascertained after detailed survey.

1.3. Implementation time lines of transmission schemes

1.3.1. Representative of CTUIL stated that in the past to facilitate development of ISTS projects in matching timeframe of RE generation projects, implementation timeframe of about 24 months was considered. This was done looking into the short gestation period of RE generation projects. Under certain cases i.e. difficult terrain/hilly areas, 30-36 months timeframe was also considered. However, looking into the delay in

implementation of large nos. of transmission schemes due to uncertainties like land acquisition and severe RoW issues, difficult terrain etc. results in multiple increase in commissioning timelines. In past, various ISTS projects i.e. Narela S/s, Khetri – Narela 765kV D/c line, Fatehgarh-IV PS, Fatehgarh-IV – Fatehgarh-III 400kV D/c line, Ahmedabad S/s and Ahmedabad – Navsari 765kV D/c line have faced severe ROW and land acquisition problems. Further, various ISTS Projects namely Narendra – Pune 765kV D/c line, Udupi – Kasargode 400kV D/c line, Navsari – Padghe 765kV D/c line, Navsari – Kala 400kV D/c line, Merta-II S/s, Neemrana-II S/s, Bikaner-III – Neemrana-II 765kV D/c line, LILO of Pirana (PG) – Pirana (Torrent) 400kV D/c at Ahmedabad S/s, North Karanpura – Gaya 400kV D/c line are also facing severe RoW and land acquisition problems impacted the commissioning of transmission elements.

- 1.3.2.** He further mentioned that realistic implementation timeline would provide the clarity to the generators so that they can incorporate flexibility in the implementation timeframe of their generation projects to match the SCoD of the evacuation schemes. This will further facilitate the commissioning of transmission schemes within the stipulated timelines. CTUIL proposed to benchmark the general implementation schedule of ISTS projects.
- 1.3.3.** NCT opined those issues like ROW, land acquisition, difficult terrain etc. are different for different schemes and very difficult to generalize, and need to be seen on case to case basis.
- 1.3.4.** Representative of CTUIL stated also that a meeting was held on 09.02.2026 under the chairmanship of Chairperson, CEA to discuss the issues related to processing the connectivity applications received from RE Developers. During the meeting, underbidding transmission schemes are also deliberated, wherein it was suggested to review the time lines of under bidding schemes and time lines may be extended considering the realistic implementation schedules.
- 1.3.5.** He informed that various transmission schemes are under implementation with implementation schedule of 24 / 30 months. However, the transmission schemes couldn't be completed within the scheduled time frame. Considering the above, it is proposed to revise the implementation schedule of these under-bidding transmission schemes.
- 1.3.6.** Representative from MNRE stated that as per the scheduled commissioning timeline of the Green Hydrogen / Green Ammonia projects in Kakinada area, GNA will be required by March 28. MNRE objected for extension of timeline for Transmission system for proposed Green Hydrogen / Green Ammonia projects in Kakinada area, Andhra Pradesh (Phase-I) from 24 Months to 36 Months; as any delay in time lines prior to the award of bid is not desirable and in case of delay on account of justifiable reasons, an extension may be considered.
- 1.3.7.** After detailed deliberations, NCT revised the implementation schedule of the following under-bidding transmission schemes as per details given below:

Sl. No.	Transmission Scheme	Estimated cost (Cr.)	NCT meeting	BPC	Implementation schedule (Months)		Remarks
					Approved in NCT	Revised schedule	
Transmission schemes for integration of RE							
1.	Transmission system strengthening at Tumkur-II for integration of additional RE potential (2.7 GW)	1221	33 rd	PFCCCL	24	36	Scheme includes Tumkur-II – Madhugiri 400kV (quad) D/c line. RoW issues are envisaged near Madhugiri area.
2.	Transmission System for integration of Kurnool-IV Phase-II #	3235	28 th	PFCCCL	30	36	Scheme includes establishment of 765/400kV GIS substation at Shadnagar. Scheme also includes 2 nos. of 765kV & 2 nos. 400kV D/c lines.
3.	Transmission System for integration of Krishnagiri REZ Phase-I	7627	35 th	PFCCCL	30	36	Scheme includes 3 nos. of 765kV & 1 no. 400kV D/c lines
Transmission schemes for Green Hydrogen projects							
4.	Transmission system for proposed Green Hydrogen / Green Ammonia projects in Kakinada area, Andhra Pradesh (Phase-I)	1618	25 th	PFCCCL	24	May be revised based on the location	Scheme includes establishment of 765/400kV GIS substation at Kakinada.
Transmission schemes for Hydro project							
5.	NERGS-III Siang Basin	2009.23	32 nd , 34 th , 37 th	PFCCCL	28-02-2029	30-09-2029	CEA in its letter dated 09-02-2026 to the BPC has mentioned that as per information available with them, the commissioning timelines of Heo and Tato-I HEPs is September 2029. Since, NERGS-III Siang Basin scheme is

Sl. No.	Transmission Scheme	Estimated cost (Cr.)	NCT meeting	BPC	Implementation schedule (Months)		Remarks
					Approved in NCT	Revised schedule	
							primarily for evacuation of power from Heo and Tato-I HEPs, it is suggested that SCoD of the scheme may be revised to 30 th September 2029 to avoid mismatch between transmission and generation.

1.4. Approval of ISTS Schemes Costing up to Rs.100 Crore by CTUIL with intimation to NCT

1.4.1. Representative of CTUIL informed that following ISTS schemes have been approved by CTUIL costing less than or equal to Rs.100 crores.

SI No	Name of Scheme	Implementing Agency	Estimated Cost (Crs)
1.	Implementation of 2 nos. of 220 kV Bus Sectionalizers at 220 kV level of Gadag-II 400/220 KV	POWERGRID Koppal Gadag Transmission Ltd	30.59
2.	Implementation of 1 no. of 230kV line bay at Tuticorin-II GIS for providing Connectivity to M/s Indianoil NTPC Green Energy Pvt. Lt	PGCIL	8.27
3.	Eastern Region Expansion Scheme-49: Jeypore Bus Reactor	PGCIL	29.53
4.	Eastern Region Bay Scheme III: Maithon bays for Dendua line	PGCIL	11.45

1.4.2. Members noted the same.

1.5. Transmission scheme for evacuation of power from Sunni Dam HEP (382MW) & Luhri Stage-I (210MW)

1.5.1. Representative of CTUIL stated that Transmission system for evacuation of power from Luhri Stage-I HEP was discussed and agreed in the 8th NCT meeting held on 25.03.2022. Scheme was notified by CEA vide Gazette dated 02.06.2022 and RECPDCL was appointed as the BPC of the transmission scheme. Further in the CEA meeting held on 26.08.22 for finalization of location of pooling station near Nange,

location of the pooling station was agreed in Ogli (Tehsil Sunni). The timeframe of the above transmission scheme was revised to 31st August 2026 in the 14th NCT meeting held on 09.06.2023

- 1.5.2.** He further mentioned that in 20th meeting of NCT held on 25.06.2024, the location of pooling station was revised from Nange GIS to near Koldam GIS. Further, considering new proposed location near Bilaspur (Brahampukhar), revised proposal was agreed in 22nd NCT meeting held on 23.08.2024. Bidding of Transmission scheme was kept on hold due to uncertainty of commissioning schedule of generation projects.
- 1.5.3.** Subsequently, SJVN vide letter 15.01.26 to MOP requested for reconsideration of Ogli as pooling station for evacuation of power from 210MW Luhri Stage-I HEP (LHEP-I) and 382MW Sunni Dam HEP (SDHEP). In the same letter, SJVN again revised the SCODs of 382 MW SDHEP and 210 MW LHEP-I as under:

Sr. No.	Project	Date of 1 st Unit SCOD of Project	Date of SCOD of Project
1	382 MW SDHEP	15.10.2029	15.12.2029
2	210 MW LHEP-I	01.11.2029	31.12.2029

- 1.5.4.** In the letter, SJVN highlighted the benefits of the shifting of ISTS Pooling Station from Brahampukhar to Ogli (Nange) as below:
- The 220 kV transmission line length will considerably reduce from 94 km to 44 km for evacuation of power of both Projects.
 - Twin Moose conductor from Sunni Dam HEP to Ogli (10 km) in place of Twin Bersimis Conductor from Sunni Dam HEP to Brahampukhar (50Km).
 - Lower RoW & Forest Clearance issues.
 - There will be no requirement of Pot Head Yard-II at Sunni HEP along with associated GIS Bays.
 - There will be no by pass arrangement of Transmission Line in case SCOD of LHEP1 come first.
 - Reduction in implementation time & construction challenges in difficult terrain.
- 1.5.5.** He further mentioned that based on the request of SJVN, a joint study meeting was held on 05.02.26 among CEA, CTU, Grid-India, RECPDCL, PSTCL, SJVN & NTPC to deliberate and finalize the Transmission scheme for evacuation of power from Sunni Dam HEP (382MW) & Luhri Stage-I (210MW). In the Joint study meeting, proposal was re-examined and agreed with additional ICT augmentation at Nange PS w.r.t. approved scheme in 8th NCT meeting with revised timelines.
- 1.5.6.** Further a meeting was held under the Chairmanship of Member (Power System) on 19.02.26 wherein it was decided that Considering the reduction in length of dedicated lines and based on the commitment provided by SJVN for timely completion of road widening, bridge strengthening, etc. works; the earlier finalized location of Ogli village is to be considered for establishment of proposed 400/220 kV Pooling Station. SJVN to complete all the works related to road widening, bridge strengthening etc., that are required to mitigate the logistics constraints, at least one year before the SCoD of transmission scheme.

- 1.5.7.** As the generation schedule of SDHEP and LHEP-I is progressively from Oct'29 (upto Dec'29), transmission scheme would be required from Oct'29 (15.10.29) matching with generation schedule.
- 1.5.8.** It was opined that earlier the scheme was of less than Rs. 500 crore and notified by CEA on behalf of NCT. As the scope and cost of scheme has changed to more than Rs. 500 crore, the scheme needs approval of MoP. Accordingly, it has to be denotified by CEA.
- 1.5.9.** After detailed deliberations, the transmission scheme "Transmission system for evacuation of power from Sunni Dam HEP and Luhri Stage-I HEP" was recommended by NCT for implementation as mentioned below:

Sl. No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crore)	Remarks
1.	<p>Transmission system for evacuation of power from Sunni Dam HEP (SDHEP) & Luhri Stage-I HEP (LHEP-I)</p> <p>Implementation timeframe: 15.10.2029 (in matching with schedule of hydro generation projects (SDHEP/LHEP-I))</p>	Rs 839.55 Cr.	Recommended under TBCB route through RECPDCL as BPC

- 1.5.10.** Detailed scope is as below:

S. No.	Scope	Capacity (Ckm/MVA)
1	<p>Establishment of 10x105 MVA,400/220kV Nange Pooling Station (GIS) along with 125 MVAR (420kV) Bus Reactor (1-Ph units along with one spare unit)</p> <p>Future provisions: Space for</p> <ul style="list-style-type: none"> • 400/220kV ICTs (315 MVA with single phase units) along with associated bays: 2 Nos. • 400 kV line bays along with switchable line reactor: 2 Nos. • 400 kV line bays: 2 Nos. • 220 kV line bays: 10 Nos. • 220kV bus sectionalizer: 1 set • 220kV Bus coupler- 1 no. 	<ul style="list-style-type: none"> • 315MVA, 400/220 kV ICT: 3 Nos. (10x105 MVA including 1 spare ICT) • 400kV ICT bays: 3 Nos. • 220 kV ICT bays: 3 Nos. • 420 kV, 125 MVAR Bus Reactor – 1 No.(4x41.67 MVAR including 1 spare Reactor) • 400 kV Bus Reactor bay- 1 No. • 400 kV Line Bays- 2 Nos. • 220kV Bus coupler- 1No.
2	Nange (GIS) Pooling Station –	• Line length -50 km (Triple snowbird)

S. No.	Scope	Capacity (Ckm/MVA)
	Koldam 400 kV D/C line (Triple snowbird) (only one circuit is to be terminated at Koldam while second circuit would be connected to bypassed circuit of Koldam – Ropar/Ludhiana 400kV D/C line)	
3	1 no. of 400kV line bay at Koldam S/S for termination of Nange (GIS) Pooling Station – Koldam 400 kV line along with 125 MVAR (420kV) Bus Reactor at Koldam S/s (1-Ph units along with one spare unit)	<ul style="list-style-type: none"> • 125 MVAR 420kV Bus Reactor – 1 no. (4x41.67 MVA including 1 spare Reactor) • 400kV Bus Reactor bay – 1 no. (To be terminated in existing line bay at Koldam, which would be available due to bypassing of one circuit of Koldam-Ropar/Ludhiana 400kV D/C line at Koldam s/s) • 400 kV Line Bay- 1 No.
4.	Bypassing one ckt of Koldam – Ropar/Ludhiana 400kV D/C line (Triple snowbird) at Koldam and connecting it with one of the circuit of Nange-Koldam 400kV D/C line (Triple snowbird), thus forming Nange- Ropar/ Ludhiana one line (Triple snowbird)	
5.	1x50 MVAR switchable line reactor at Ropar end of Nange-Ropar 400kV line	<ul style="list-style-type: none"> • 400 kV, 50MVA Line Reactor- 1 no. • 400 kV Reactor Bay- 1 no

1.6. Modification in scope of Transmission System for Integration of Power from RE Projects in Lakadia REZ in Gujarat - Phase II (7500MW)

1.6.1. Representative of CTUIL stated that the transmission scheme for integration of power from RE Projects in Lakadia area in Gujarat for a capacity of 7.5GW, namely “Transmission System for Integration of Power from RE Projects in Lakadia REZ in Gujarat - Phase II (7500MW)”, was deliberated in the 37th NCT meeting held on 19.01.2026, with an implementation timeframe of 36 months.

1.6.2. The scheme involved Lakadia-II – Ahmedabad 765kV D/c line (190km.) along with 765kV, 330MVA switchable line reactors on each circuit at Ahmedabad end of Lakadia-II – Ahmedabad 765kV D/c line. It was also mentioned that a 110MVA spare single-phase reactor is already available at Ahmedabad S/s, which was proposed to be utilized for the above switchable line reactor.

1.6.3. He further mentioned that POWERGRID, vide e-mail dated 13.02.2026, informed CTUIL that extension of HV & Neutral bus of the existing 110 MVAR spare reactor at Ahmedabad S/s to connect with the 765kV Lakadia-II switchable line reactor bays, as envisaged under the 37th NCT, is not feasible due to layout constraints at Ahmedabad S/S. Accordingly, CTUIL proposed to install the switchable line reactors on each circuit at Lakadia-II end of the Lakadia-II – Ahmedabad 765kV D/c line, instead of Ahmedabad end. Further, a 110MVAR spare single-phase reactor is already available at Lakadia-II S/s, which shall also be utilized for the above switchable line reactor requirement.

1.6.4. After deliberations, NCT approved the following modification in the scope of the scheme “Transmission System for Integration of Power from RE Projects in Lakadia REZ in Gujarat-Phase II (7500MW)”, as given below:

Sl. No.	Earlier approved in 37th NCT		Modified scheme	
	Scope of Works	Capacity /km	Scope of Works	Capacity /km
1.	<p>Establishment of 765/400 kV, 6x1500MVA & 10x500MVA, 400/220kV Lakadia-II (Near Chitrod) with 2x330 MVAR 765kV bus reactor and 2x125 MVAR 400kV bus reactor. [765kV, 400kV & 220kV levels to be established in two sections with Sectionaliser arrangement. The 220kV Sectionaliser shall be kept normally open and may be closed under contingency condition. The 400kV and 765kV Sectionaliser shall be kept normally closed. The bus operation may be reviewed after proposed HVDC implementation as per requirement of Grid operator. (3x1500MVA 765/400kV ICTs, 5x500MVA 400/220kV ICTs, 1x330MVA 765kV BR & 1x125MVAR 420kV BR shall be on Sec-I & 3x1500MVA 765/400kV ICTs, 5x500MVA 400/220kV ICTs, 1x330MVA 765kV BR & 1x125MVAR 420kV BR shall be on Sec-II)]</p> <p>Future provision (space for):</p> <ul style="list-style-type: none"> 765 kV line bays along 	<ul style="list-style-type: none"> 765/400 kV, 1500 MVA ICT – 6 Nos. (19x500 MVA single phase units including one spare ICT Unit) 400/220 kV ICTs - 10 Nos. (5 on Sec-I & 5 on Sec-II) 765 kV ICT bays – 6 Nos. 400 kV ICT bays – 16 Nos. 220kV ICT bays – 10 Nos. 1x330 MVAR, 765 kV bus reactor- 2 Nos. (7x110 MVAR single phase Reactors including one spare Unit for bus /line reactor) (1 on Sec-I & 1 on Sec-II) 765 kV Bus reactor bay – 2 Nos. 765kV line bays: 8 nos. (4 Nos. on Sec-I (2 for Halvad D/c & 2 for Ahmedabad D/c) and 4 Nos. on Sec-II (2 for Kandla D/c and 2 for Vataman)) 	No Change	No change

Sl. No.	Earlier approved in 37th NCT		Modified scheme	
	Scope of Works	Capacity /km	Scope of Works	Capacity /km
	<p>with switchable line reactors – 6 Nos. (2 Nos. on Sec-I & 4 Nos. on Sec-II)</p> <ul style="list-style-type: none"> • 765 kV Bus Reactor along with bay: 2 Nos. (1 on Sec-I & 1 on Sec-II) • 400 kV line bays along with switchable line reactors– 7 Nos. (3 on Sec-I & 4 on Sec-II) + 4 Nos. 400kV bays (2 nos. on each section) for HVDC Interconnection • 420 kV, 125MVA Bus Reactor along with bays: 2 Nos. (1 on Sec-I & 1 on Sec-II) • 220 kV line bays: 2 No. on Sec-I & 1 Nos. on Section-II • Establishment of 6000 MW, \pm 800 kV Lakadia-II (HVDC) [LCC] terminal station (4x1500 MW) along with associated interconnections with 400 kV HVAC Switchyard & all associated equipment (incl. filters)/bus extension, etc. (2x1500MW poles on each 400kV section) • Synchronous Condenser (+300/-200MVA) along with 400kV bay – 2 Nos. (1 on Sec-I & 1 on Sec-II) 			
2.	<p>Installation of Synchronous Condenser (+300/-200MVA) (Minimum) & Short circuit contribution at PCC of 1200MVA (Minimum) at Lakadia-II – 2 Nos. Value of Inertia (MW-s) shall be defined in RfP</p>	<p>Synchronous Condenser along with associated 400kV Bay-2 Nos. (one each on Sec-I & II)</p>	No Change	No change

Sl. No.	Earlier approved in 37th NCT		Modified scheme	
	Scope of Works	Capacity /km	Scope of Works	Capacity /km
	document.			
3.	LILO of Halvad – Kandla 765kV D/c line at Lakadia-II	LILO route length ~22km. (88ckm)	No Change	No change
4.	Lakadia-II – Ahmedabad 765kV D/c line	190 km (380 ckm)	No Change	No change
5.	2 Nos. 765 kV line bays at Ahmedabad S/s for Lakadia-II – Ahmedabad 765kV D/c line	765 kV line bays – 2 Nos. (AIS)	No Change	No change
6.	765kV, 330MVA _r Switchable line reactors on each circuit at Ahmedabad end of Lakadia-II – Ahmedabad 765kV D/c line	<ul style="list-style-type: none"> 330 MVA_r, 765 kV switchable line reactor- 2 Nos. 765 kV Switchable Line Reactor Bay - 2 Nos. 110MVA_r spare single phase reactor at Ahmedabad S/s is already available and same shall be used for subject Sw LR. 	765kV, 330MVA_r Switchable line reactors on each circuit at Lakadia-II end of Lakadia-II – Ahmedabad 765kV D/c line	<ul style="list-style-type: none"> 330 MVA_r, 765 kV Switchable Line Reactor- 2 Nos. 765 kV Switchable Line Reactor bay - 2 Nos. 110MVA_r spare single phase reactor at Lakadia-II S/s is already provided in scope of work above and same shall be used for subject Switchable Line Reactor.
7.	Lakadia-II – Vataman 765kV D/c line (220km.)	220 km (440 ckm)	No Change	No change
8.	2 Nos. 765 kV line bays at Vataman S/s for Lakadia-II – Vataman 765kV D/c line	765 kV line bays – 2 Nos. (AIS)	No Change	No change
9.	765kV, 240MVA _r Switchable line reactors on each circuit at both ends of Lakadia-II – Vataman 765kV D/c line	<ul style="list-style-type: none"> 240 MVA_r, 765 kV switchable line reactor- 4 Nos. (2 for Lakadia-II end and 2 for Vataman end) 765 kV switchable Line Reactor Bay - 4 Nos (2 for Lakadia-II end and 2 for Vataman end) 80MVA_r spare single-phase reactor 	No Change	No change

Sl. No.	Earlier approved in 37th NCT		Modified scheme	
	Scope of Works	Capacity /km	Scope of Works	Capacity /km
		at Lakadia-II for above 240MVAR Sw LR. • 80MVAR spare single-phase reactor at Vataman S/s is already available and same shall be used for subject Sw LR.		

Note:

- a) TSPs of Ahmedabad S/s & Vataman S/s shall provide space for the above scope of work in their respective substations (free of cost).
- b) The above synchronous condensers (at Sl. No. 2) shall be considered as 'transmission asset', similar to STATCOM & SVC, for the purpose of tariff determination..

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

- 1.7.1. Representative of RECPDCL stated that the transmission scheme "Transmission system for evacuation of power from Shongtong Karcham HEP (450 MW) and Tidong HEP (150 MW)" is presently under bidding. National Committee on Transmission (NCT) in its 28th meeting has decided that the interim arrangement (LILO of one ckt. of 400 kV Karcham Wangtoo – Baspa D/c line at generation switch-yard of Shongtong HEP) to be implemented by the State (HPPTCL). The cost for the common portion which can be utilized later will be communicated by HPPTCL. The bidding to continue as per original scope, however, the cost for the common portion should be included in the RfP. HPPTCL would recover the same from the successful bidder.
- 1.7.2. He further stated that HPPTCL vide letter dated 18.07.2025 had intimated the estimated Cost of the common portion as Rs. 79.48 crores. The cost for the common portion proposed by HPPTCL is to be included in the RfP and be recovered from the successful bidder (bidders would add that cost in their quoted tariff). The cost intimated by HPPTCL, amounting to Rs. 79.48 crore, shall remain fixed irrespective of the actual expenditure incurred for the common portion, and the same shall be considered for the purpose of bidding, as clarified in the 34th meeting of the NCT.
- 1.7.3. He further mentioned that a quadripartite agreement is to be executed among HPPCL, HPPTCL, CTUIL & TSP, regarding the modalities with respect to utilization of the interim transmission arrangement, transfer of ownership of the common portion, reimbursement of cost and associated timelines, etc.
- 1.7.4. It was informed that to resolve few issues in the interim scheme and quadripartite agreement, a meeting was held Member (Power System), CEA was held on 09.02.2026, wherein it was agreed that:

- The interim portion (LILO of one ckt. of 400 kV KarchamWangtoo – Baspa D/c line at generation switch-yard of Shongtong HEP) to be hand over to TSP by HPPCL after completion of remaining portion, i.e. Jhangi PS – Wangtoo (HPPTCL) 400 kV D/c line, by TSP.
 - The O&M of the interim portion to be done by Himachal Pradesh (HPPCL/HPPTCL) till the handover of the portion to the TSP.
- 1.7.5.** Representative of HPPCL stated that the O&M charges of the interim portion, after successful completion and utilization, till its handover to TSP to be reimbursed to HPPCL and same to be mentioned in the quadripartite agreement.
- 1.7.6.** After deliberations, NCT decided that the interim arrangement is proposed to provide benefit to Himachal Pradesh. O&M of the interim portion till the handover of the portion to the TSP shall be borne by Himachal Pradesh and it will be non-reimbursable. NCT advised HPPCL/HPPTCL to sign the agreement as soon as possible. In case HP does not agree to sign the agreement, BPC to continue the bidding as per original scope without interim arrangement.

2. Communication Schemes

2.1. Scheme for Installation of OPGW & associated communication systems on the existing ISTS lines in ER Region

- 2.1.1.** Representative of CTUIL stated that CEA has intimated vide letter dtd. 22.05.2024 that all the transmission lines of 110 kV and above shall have Optical Ground Wire (OPGW) along with necessary terminal equipment. Accordingly, CTUIL prepared a comprehensive agenda for installation of OPGW on all those transmission lines of 110kV and above which don't have OPGW on pan-India basis.
- 2.1.2.** It was further informed that based on the inputs received from the TSPs and deliberations held in various meetings with TSPs and constituents in ER region, ISTS lines without OPGW have been identified. Further, FOTE requirement for commissioning of the said OPGW links has been sought from Regional UNMS and respective TSPs and the same was deliberated and confirmed with the concerned TSPs.
- 2.1.3.** The scheme for OPGW laying on existing ISTS lines which aren't having OPGW in ER region was put up for review of TCC & ERPC forum in the 55th TCC & ERPC meeting held on 16.12.2025 and 17.12.2025 respectively wherein TCC and ERPC forum concurred for the scheme
- 2.1.4.** After deliberations, the communication scheme “Scheme for Installation of OPGW & associated communication systems on the existing ISTS lines in ER Region” was approved for implementation under RTM route as mentioned below:

A. Summary of the Scheme:

Sl. No.	Scope of the scheme
1	Supply and installation of OPGW (48F/96F) along with required accessories, approach cables, required Fiber Optic Terminal Equipment (FOTE) and required

Sl. No.	Scope of the scheme				
	amplifiers/optical interfaces/repeater stations etc. for commissioning of optical fibre links on ISTS lines which is as follows:				
Sl.No	Owner of the Line	48F OPGW (Length in Km)	96F OPGW (Length in Km)	STM-64 FOTE (Nos.)	STM-16 FOTE (Nos.)
A.1	POWERGRID	2262.15	35	8	19
A.2	POWERLINKS*	314	-	-	-
A.3	ENICL*	218.78	-	-	-
A.4	PKTCL*	161.67	-	-	1
<p>The FOTE configuration shall support all required directions. However, the FOTE should support minimum 5 directions.</p> <p>Note: a) The OPGW laid under the scheme shall be terminated in existing/proposed FOTE by IA/ Implementing Agency & integrate it with existing ISTS Communication Network. IA shall place FOTE under this scheme to cater all the required existing & upcoming directions, configure all the required power system services including Tele- Protection and integrate it with existing ISTS communication network for seamless data transmission to respective load dispatch centres. STM-16 FOTE provided under the scope of this scheme should be upgradable to STM-64.</p> <p>*PKTCL: Purulia Kharagpur Transmission Company Limited *ENICL: East-North Interconnection Company Limited *POWERLINKS: JV of POWERGRID & TATA Power</p>					

B. Details of the scheme are as under:

Scope	Implementing Agency	Implementation Mode	Cost Estimate (Approx.) in Crs	Implementation Timeline
For Scope A.1	POWERGRID	RTM	144.04	30 months from the date of allocation. Note: Implementation schedule of OPGW installation on 400kV Varanasi – Biharsharif D/c shall be in the matching timeframe of Transmission Scheme "Transmission Scheme for Rajasthan REZ Ph-IV (Part-6: 6GW) (Bikaner Complex)" which consists of LILO of 400kV Varanasi – Biharsharif D/c at upcoming ISTS S/s Asana or 30 months, whichever is earlier.
For Scope	POWERLINK		17.27	30 months from the date of

Scope	Implementing Agency	Implementation Mode	Cost Estimate (Approx.) in Crs	Implementation Timeline
A.2				allocation
For Scope A.3	ENICL (Indigrid)		12.03	Matching time frame with NERES-XXV (part A) or 30 months from the date of allocation whichever is earlier.
For Scope A.4	PKTCL (Indigrid)		9.51	24 months from the date of allocation
Total Cost of the scheme				182.88 Crs.

*Note: The detailed OPGW/FOTE requirement of the scheme is enclosed as **Annexure 4.1** separately.*

2.2. Installation of OPGW & associated communication systems on the existing lines of ISTS in NER region

2.2.1. Representative of CTUIL stated that in NER region, it has been found that 400kV P K Bari-Silchar line, 400kV Binaguri (PG) – Alipurduar -Bongaigaon (PG) line and 220kV Kathalguri-Mariani (AEGCL) ISTS lines don't have OPGW. This agenda was further discussed in 8th NER CPM meeting held on 28.07.2025 wherein members agreed for laying the OPGW in NER region for the ISTS lines not having OPGW. Further, Alipurduar–Bongaigaon line is planned to be bypassed at Bongaigaon S/s under NERES-XXV Part-A scheme and to be integrated with upcoming Bornagar-Bongaigaon line (upto Bypass point) with 24F OPGW to form Bornagar- Alipurduar line. Proposal for OPGW laying on Binaguri-Alipurduar-Bongaigaon (upto bypass point) excluding LILO portion has been taken up in ER region (as this is inter-regional line).

2.2.2. The scheme for OPGW laying on existing ISTS lines which aren't having OPGW in NER region was put up for review of NERPC forum in the 30th TCC & NERPC meeting held on 13.11.2025 and 14.11.2025 respectively wherein TCC and NERPC forum recommended for the scheme.

2.2.3. After deliberations, communication scheme “Installation of OPGW & associated communication systems on the existing lines of ISTS in NER region” was approved by NCT for implementation under RTM route as mentioned below:

A. Summary of the scheme is given below:

Sl. No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crore)	Remarks
1.	Installation of OPGW & associated communication systems on the existing lines	17.81	Approved under RTM through

	of ISTS in NER region implementation timeframe: 30 months from the date of allocation		POWERGRID
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B. Detailed scope of the scheme is given below:

Sl. No.	Scope of the scheme
1	<p>A. Supply and Installation of OPGW (48F) on 400kV PK Bari (Indigrid) - Silchar (POWERGRID) line (approx. 127km, line owned by POWERGRID).</p> <p>B. Supply and Installation of OPGW (48F) on 220kV Kathalguri (NEEPCO)-Mariani (AEGCL) line (approx. 163 km, line owned by POWERGRID)</p> <p>C. Supply and Installation of required FOTE STM-16 and optical interfaces for the commissioning of above mentioned fiber optic links.</p>

*Note: The FOTE configuration shall support all the required directions. However, the FOTE should support minimum 5 directions. The detailed OPGW/FOTE requirement of the scheme is enclosed as **Annexure 4.2** separately.*

2.3. Proposed Scheme for Installation of OPGW & associated communication systems on the existing ISTS lines in WR Region

- 2.3.1.** Representative of CTUIL stated that the agenda was discussed in 16th NPC dtd 04.07.2025 wherein NPC suggested that the proposal for installation of OPGW on the existing lines of ISTS may be put in upcoming RPCs/NCT meeting for deliberation.
- 2.3.2.** It was further mentioned that CTUIL prepared the list of ISTS lines on which OPGW do not exist in coordination with TSPs, RLDCs after deliberations held in various meetings with TSPs and constituents of WR region. FOTE requirement for commissioning of the said OPGW links has also been sought from respective TSPs and the same was deliberated and confirmed with the concerned TSPs.
- 2.3.3.** The scheme was discussed and approved in 57th TCC/WRPC meeting dtd. 23rd & 24th Jan 2026.
- 2.3.4.** After deliberation, communication scheme “Installation of OPGW & associated communication systems on the existing ISTS lines in WR Region” was approved for implementation under RTM route as mentioned below:
- A. Scope of Works: Supply and installation of OPGW (48F) along with required accessories, approach cables, required Fiber Optic Terminal Equipment (FOTE), required repeater stations, required NMS and amplifiers/optical interfaces etc. for commissioning of optical fibre links on ISTS lines which are as follows:

Sl.No.	Owner of the Line	48F OPGW (Length in Km)	STM-16 FOTE (Nos.)	STM-64 FOTE (Nos.)	Repeater Station
A.1	POWERGRID	4807.35	30	5	11
A.2	CWRTL/Adani*	175	1	0	0
A.3	ATIL/Adani*	433	3	0	1
A.4	STL/Adani*	24	1	0	0
A.5	WTGL/Adani*	346	2	0	1
A.6	WTPL/Adani*	376	2	0	1
A.7	JTCL/Indigrid*	514.75	4	0	2

B. Details of the scheme

Scope	Implementing Agency	Implementation Mode	Cost Estimate (Approx.) in Crs	Implementation Timeline
For Scope A.1	POWERGRID	RTM	292.415	30 months from the date of allocation.
For Scope A.2	CWRTL/Adani*		10.245	24 months from the date of allocation.
For Scope A.3	ATIL/Adani*		26.194	30 months from the date of allocation.
For Scope A.4	STL/Adani*		1.94	24 months from the date of allocation.
For Scope A.5	WTGL/Adani*		20.789	30 months from the date of allocation.
For Scope A.6	WTPL/Adani*		22.439	30 months from the date of allocation.
For Scope A.7	JTCL/Indigrid*		31.829	30 months from the date of allocation.
Total Cost of the scheme				Crs. 405.852 (Four hundred five crores eighty-five lakhs and twenty thousand only)

*CWRTL: Chhattisgarh WR Transmission Ltd.

*ATIL: Adani Transmission (India) Ltd.

*STL: Sipat Transmission Ltd.

*WTGL: Western Transmission Gujarat Ltd.

*WTPL: Western Transmission Power Ltd.

*JTCL: Jabalpur Transmission Company Ltd.

Note: a) The proposed OPGW under the scheme shall be terminated in existing/proposed FOTE by IA/ Implementing Agency & shall integrate it with existing ISTS Communication Network. IA shall place FOTE under this scheme to cater all the required existing & upcoming directions, configure all the required power system services including Tele- Protection and integrate it with existing ISTS communication network for seamless data transmission to respective load dispatch centres. STM-16 FOTE provided under the scope of this scheme should be upgradable to STM-64.

b) The FOTE configuration shall support all required directions. However, the FOTE should support minimum 5 directions.

c) The detailed OPGW/FOTE requirement of the scheme is enclosed as **Annexure 4.3** separately.

2.4. FOTE and Approach cable/FODP installation at Kudus (MSETCL) and Padghe (PG) S/s for OPGW link connectivity of Kudus (MSETCL) - Padghe (PG).

2.4.1. Representative of CTUIL stated that at present, Kudus (MSETCL) S/s is not connected over OPGW link. 24F OPGW is available on Kudus (MSETCL)-Padghe (PG) section but not terminated inside the Kudus (MSETCL) S/s. The owner of this Kala- Kudus (MSETCL)- Padghe (PG) line is POWERGRID and owner of Kudus substation is MSETCL. It is proposed to supply & install FOTE and Approach cable/FODP at Kudus(MSETCL) and Padghe (PG) S/s to facilitate the SCADA, PMU data communication of Kudus (MSETCL) S/s upto WRLDC over OPGW link.

2.4.2. The scheme was discussed and approved in 57th TCC/WRPC meeting 23rd & 24th Jan 2026.

2.4.3. After deliberations, communication scheme “FOTE and Approach cable/FODP installation at Kudus(MSETCL) and Padghe (PG) S/s for OPGW link connectivity of Kudus (MSETCL) - Padghe (PG)” was approved by NCT for implementation under RTM route as mentioned below:

A. Summary of the scheme is given below:

Sl. No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crore)	Remarks
1.	FOTE and Approach cable/FODP installation at Kudus(MSETCL) and Padghe (PG) S/s for OPGW link connectivity of Kudus (MSETCL) - Padghe (PG)	1.45 cr	Approved under RTM through POWERGRID

	Implementation timeframe: 12 months from the date of allocation		
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B. Detailed scope of the scheme is given below:

Sl. No.	Scope of the scheme
1.	<p>1. Supply and installation of 2 Nos, STM-16 FOTE (5MSP) at Kudus (MSETCL) & Padghe (PG) S/s.</p> <p>2. Supply and installation of 24F Approach cable /FODP along with associated accessories at Kudus (MSETCL) S/s and establishment of Kudus (MSETCL) – Padghe(PG) link connectivity over OPGW.</p>

3. Evaluation of functioning of National Grid.

3.1. GRID-INDIA delivered the presentation on grid performance. Following major points were covered by GRID-INDIA in the presentation:

(i). Low SCR Issues in Northern and Western Region ISTS RE Complexes

- GRID-INDIA informed that fault level / short circuit ratio (SCR) at some of the ISTS RE pooling buses in Northern Region (Rajasthan RE complex) and Western Region (especially Khavda and Pachora complex) is on the lower side. Along with conventional SCR, interaction factor-based SCR assessment (SCR-IF) also indicates very low system strength at multiple pooling stations.
- In the Rajasthan RE complex, oscillations are being observed on a daily basis due to high RE penetration and inadequate system strength. Similar oscillatory behaviour linked to low SCR has also been observed in the Khavda RE complex.
- Commissioning of additional transmission lines is not expected to significantly improve the fault level, and therefore SCR is expected to reduce further in the near future with addition of new RE generation.

(ii). Oscillation Case Studies

- GRID-INDIA informed that primarily four types of oscillations have been observed in the ISTS-connected RE complexes:

S. No.	Type of Oscillation	Frequency Range	Antecedent System Condition	Operational Observations
1	Low-Frequency Voltage Oscillations	0.1 – 0.2 Hz	High RE penetration + low SCR + RE Plants in voltage control	<p>Generally low amplitude oscillations.</p> <p>Differing PPC response time of RE plants operating in voltage control mode is one of the major reasons for these oscillations.</p> <p>PPC standardization is important to address this issue.</p>
2	High-Frequency Voltage Oscillations	3.5 – 7 Hz	High RE generation + Low SCR + STATCOM Gain Reduction	Low amplitude oscillations of > 4 Hz due to operation of RE plants in low SCR conditions.

S. No.	Type of Oscillation	Frequency Range	Antecedent System Condition	Operational Observations
				Amplification of these low frequency oscillations due to gain reduction of STATCOM. Interim solution was implemented by STATCOM OEM in all 05 STATCOMs in Rajasthan on 4 th Feb 2026. The impact of the interim solution is discussed in case study-2 in the subsequent section.
3	Sub-Synchronous Oscillations	~8 – 20 Hz	During very low SCR due to transmission line outages. Observed even during very low RE generation.	~16–20 Hz oscillations observed in Rajasthan RE complex while facilitating outage of 400 kV Bikaner PG – Bikaner-II D/C; ~8.3 Hz oscillations observed in WR Pachora pooling station while facilitating outage of 400 kV Pachora – Bhopal line.
4	Large voltage dips (80-90 kV)	System-wide impact (Not cyclic)	High RE generation + Low SCR + No dynamic support from all the STATCOMs	Observed when all STATCOMs in Rajasthan are either in Fixed-Q mode or in voltage dead-band control mode. System-wide hunting observed in synchronous generators on 4 Feb 2026 oscillation event.

b) GRID-INDIA further informed that low fault level/SCR, improper tuning of RE plant and STATCOM controllers is one the major reasons for these oscillations.

c) Following case studies were presented by GRID-INDIA on recent oscillations:

1) Case Study-1: Multiple Line Tripping in Rajasthan RE Complex due to Kite Flying (14 January 2026)

- Multiple EHV transmission lines (total 09 no. 765 kV and 400 kV lines) tripped in Rajasthan ISTS RE complex within 30 minutes during peak solar hours due to fault (kite flying) and over-voltage
- Tripping of these lines led to reduced fault level at RE pooling stations
- Oscillations started with reduction in fault level
- STATCOM stability controller reduced the gain of STATCOM upon hunting detection
- Magnitude of oscillation amplified with gain reduction
- Oscillations subsided after mode of STATCOMs at Bhadla-II and Fatehgarh-II was changed to Fixed-Q mode.

2) Case Study-2: Inter-Area Oscillation Event / Large Voltage Dip Event / Interim Solution for STATCOM Issue (4 Feb 2026)

- The interim solution proposed by the STATCOM OEM to address the gain reduction and oscillation amplitude amplification was implemented in all 05 STATCOMs in Rajasthan RE complex (02 nos. – Fatehgarh-II, 02 nos. – Bhadla-II, 01 no. – Bikaner-II) by 4th Feb 2026 morning. In the interim solution, the STATCOMs remains unresponsive within the specified dead-band but provide fast reactive power support whenever the voltage crosses dead-band.

- On 4th Feb 2026, during peak solar hours, all STATCOMs were kept in dead-band control mode as per the interim solution. Though this interim measure helped in addressing the amplification of low magnitude oscillations, the same also resulted in reduction in dynamic reactive power support.
 - Large voltage dips up to 80-90 kV were observed due to maloperation of controller of certain RE plants. With reduction in dynamic reactive power support due to STATCOM dead-band, it was challenging to address these dips.
 - The inter-area oscillations and voltage dips propagated across regions and far-away located synchronous generators also reported hunting.
 - As the RE generation reduction had to be implemented as an operational measure to control the oscillations. Keeping RE plants in voltage control mode does not help in these situations either, as the support from the power plant controller (PPC) is typically received within a timeframe of 500 ms to 1 second or longer.
 - Since 4th Feb 2026, at least STATCOM in Rajasthan RE complex (preferably Bikaner-II) is being kept in voltage control mode without any dead-band to provide adequate dynamic reactive power support in the complex.
 - Permanent solution to STATCOM gain reduction issue needs to be expedited so that all the STATCOMs in the complex can be reliably kept in voltage control mode without any dead-band.
- 3) Case Study-3: Tripping of Bikaner-II STATCOM (12th Feb 2026)**
- On 12th Feb 2026, STATCOM at Bikaner-II which was being kept in voltage control mode without any dead-band to provide dynamic reactive power support tripped.
 - After tripping of STATCOM, large voltage dips similar to 4th Feb 2026 were observed in Rajasthan ISTS RE complex. Immediately, STATCOMs at Bhadla-II were shifted to single V_{ref} mode (no dead-band) to provide dynamic reactive power support which helped in arresting the voltage dips. However, later this mode of STATCOM operation led to amplification of low amplitude oscillations due to which STATCOMs shifted to Fixed 'Q' mode.
 - The event highlights the low system strength issues in the complex along with urgent need for dynamic reactive power compensation.
- 4) Case Study-4: Western Region Oscillation — Pachora Pooling Station (16th Feb 2026)**
- 400kV Pachora-Bhopal ckt-1 was under planned shutdown from 09:03 hrs of 16th Feb 2026. Due to planned outage, the SCR at Pachora reduced from ~4.5 to ~2.9.
 - At around 11:27 hrs, all the plants experienced fluctuations in active power, reactive power, voltage and frequency. The triggering event was the tripping of the 220 kV transmission line within the Pachora RE complex.
 - The oscillations were observed at a dominant frequency of approximately 8.33 Hz in frequency. The oscillations persisted for approximately two hours until the restoration of the 400kV Pachora-Bhopal ckt-1 at 13:13 hrs / 16.02.2026.
 - The event highlights the low system strength issues in other RE complexes also along with Rajasthan and Khavda RE complex
- 5) Case Study-4: Complete Outage of Bikaner-II Pooling Station (22nd Feb 2026)**
- Shutdown of 400 kV Bikaner(PG)-Bikaner-II D/C line was approved in 240th OCC meeting for the LILO of the aforementioned line at upcoming 400 kV Bikaner-III S/s.
 - After the outage of 400 kV Bikaner(PG)-Bikaner-II D/C, the fault level at 400 kV Bikaner-II is reducing from 17134 MVA and 4.42 to 6870 MVA and 1.77.
 - While facilitating the outage of 400 kV Bikaner (PG)-Bikaner-II D/C line from 22nd Feb to 23rd Feb 2026, severe oscillations (~20 Hz) in frequency and voltage were observed. Multiple combinations such as STATCOM mode changes, disconnection of certain RE plants with oscillatory behaviour, STATCOM switching, HVDC Balia-

Bhiwadi switching etc. were attempted during this period to identify the root cause of oscillations during this period. However, the oscillations persisted till at least one circuit was taken back in service.

- Even when, the generation at Bikaner-II was very less, oscillations were observed after opening of 400 kV Bikaner(PG)-Bikaner-II D/C indicating stability issues of inverters to even remain connected in low fault level conditions.

(iii). Low SCR Issues in RE complexes in future

- GRID-INDIA stated that commissioning of additional transmission lines is not expected to significantly improve the fault level in major RE complexes, and therefore, SCR is expected to reduce further in the near future with addition of new RE generation. Major weak nodes would be – Fatehgarh-II, Fatehgarh-III, Bhadla PG, Bikaner-II, Ramgarh PG (ISTS), Bhadla-III in Northern region, Khavda and Pachora complex in Western region and Koppal in Southern region.
- With further reduction in SCR, oscillations and other stability issues are likely to increase till timely remedial measures are taken.
- GRID-INDIA also stated that till the commissioning of 400 kV Bhadla-III – Fatehgarh-III D/C, 765/400 kV Ramgarh ISTS and 765/400 kV Bhadla-III substations would remain radially connected via ~500 km long 765 kV Ramgarh ISTS – Bhadla-III – Sikar-II D/C corridor. The evacuation of RE generation through this low system strength, radial corridor would result in various stability issues. Therefore, the commissioning of 400 kV Bhadla-III – Fatehgarh-III D/C shall be expedited on priority.

(iv). Remedial Measures: GRID-INDIA suggested the following remedial measures for ensuring the stability of RE complexes:

- a) Planning and commissioning of Synchronous Condensers or any other suitable device for improvement in fault level and dynamic reactive power support on priority
- b) Expeditious commissioning of planned transmission system for RE evacuation
- c) Root Cause Analysis & tuning of controllers of RE plants and STATCOM (Required data has already been shared with STATCOM OEM and RE Developers)
- d) Deployment of grid-forming inverters on pilot basis at locations where stability issues are being observed
- e) Provisions for standardization of Power Plant Controllers (PPC) to be notified
- f) Augmentative in reactive compensation capability and intrastate transmission system of Rajasthan

3.2. Sh. S.R Narasimhan (Expert Member) suggested that pending a formal revision of CEA Standards to factor ‘Grid Forming Inverters (GFMs), a common set of functional requirements from inverters could be finalised by CEA, CTU and Grid-India and bid documents could specify that at least 10-15% of the inverters at solar plants could have these features. This would enable a better understanding and testing the behaviour in practice.

3.3. CTUIL was directed to plan suitable measures for improvement in fault level on

priority. He also directed to convene a meeting with grid forming inverter OEMs to explore the possibility of deploying the same on pilot basis.

4. Status of the bids under process by BPCs

4.1. The BPCs (RECPDCL and PFCCL) have made presentations on the status of under bidding schemes. Summary of the same is given below:

S.No.	Status	RECPDCL	PFCCL
1.	Bidding Concluded	1	0
2.	Bids under Evaluation	0	1
3.	RfP issued & bids being submitted	6	7
4.	RfP to be issued	3	4
5.	RfP kept on hold	1	1
	Total	11	13

4.2. Members noted the status of the schemes under bidding.

5. Any other matter

5.1. HVDC terminal (LCC) at Alepheta

5.1.1. Sh. S.R Narasimhan (Expert Member) stated that in the last meeting, provision for land for HVDC terminal (LCC) at Alepheta substation was approved. He suggested that future HVDC terminal here would need to be evaluated as it is just about 50 kms from the HVDC terminal already approved at Kalamb. Any delayed fault clearance close to these terminals may lead to outage of both the 6 GW HVDCs due to commutation failure in HVDC.

5.1.2. NCT opined that the same would be duly considered at the time of planning for HVDC.

5.2. Linking of RE evacuation with Green Hydrogen

5.2.1. Representative of MNRE stated that in the previous meeting, NCT directed CTUIL that transmission system for Khavda Phase-VI and Phase-VII may be taken up upon receipt of inputs from MNRE regarding visibility on Green Hydrogen/Green Ammonia applications to the tune of 9-10 GW in Mundra and Kandla areas of Gujarat.

5.2.2. He mentioned that RE potential declaration in these areas have been done in close consultation with the states. The demand for RE power is not necessarily restricted to the Green Hydrogen/Green Ammonia capacity in the Kandla and Mundra areas only. Similarly, Khavda Phase VI& VII need not necessarily be tied up with withdrawal at Mundra and Kandla. As such, while planning the ISTS, connectivity applications from

RE developers should be delinked with specific location of GNA applications from the Green Hydrogen/Green Ammonia developers, as the RE developer who applied in Khavda could have other tie ups for withdrawal of Power. However, MNRE will provide necessary inputs regarding visibility on Green Hydrogen/Green Ammonia applications in next 5 years.

- 5.2.3.** CTUIL stated that presently the scheme has been formulated considering Khavda Phase-VI and Phase-VII generation with Green Hydrogen/Green Ammonia demand in Gujrat. In case of less demand in that area, huge transmission system need to be planned for evacuation of power to other states.
- 5.2.4.** It was opined that transmission system need to be optimized based on the visibility of generation and demand. CTUIL may examine after receipt of inputs from MNRE.

List of participants of the 38th meeting of NCT

CEA:

1. Sh. Ghanshyam Prasad, Chairperson, CEA & Chairman, NCT
2. Sh. V. K. Singh, Member (PS)
3. Sh. B S Bairwa, Chief Engineer (PSPA-II)
4. Ms. Ammi R Toppo, Chief Engineer (PSPA-I)
5. Sh. S.K. Maharana, Chief Engineer (PCD)
6. Sh. Farooque Iqbal, Director (PSPA-II)
7. Sh. Bhanwar Singh Meena, Director (PSPA-I)
8. Sh. Ganeshwara Rao Jada, Director,(PSPA-I)
9. Sh. M. Srikanth Reddy, Deputy Director (PCD division)
10. Sh. Pranay Garg, Deputy Director (PSPA-II)
11. Sh. Manish Kumar Verma, Assistant Director (PSPA-II)

MoP:

1. Sh. Sai Baba, Additional Secretary (Trans.)

RPCs:

1. Sh. N.S. Mondal, MS(ERPC)
2. Sh. Asit Singh, MS(SRPC)
3. Sh. P D Lone, SE, WRPC
4. Director (T&SO), KSEBL
5. Sh. Maneesh Mahajan, Director€, HPPCL
6. MD, JKPTCL
7. MD, HPPTCL

MNRE:

1. Sh. Rajesh Kulhari, Joint Secretary
2. Sh. Prasad Chaphekar, Director
3. Sh. Tarun Singh, Scientist E
4. Sh. Shafiqur Rahman, DGM (Trans)

SECI:

- 1.
2. Sh. Vineet Kumar, DGM
3. Sh. R. K. Agarwal, Consultant

CTUIL:

1. Sh. K.K. Gupta , COO
2. Sh. Kishore Kr Sarkar, Sr. GM
3. Smt. Nutan Mishra, Sr. GM
4. Sh. Anil Kumar Meena, GM
5. Sh. Shiv Kumar Gupta, Sr. DGM
6. Sh. Sandeep Kumawat, DGM
7. Sh. Bhaskar Wagh, DGM
8. Sh. Ajay Dahiya, DGM
9. Sh. Pratyush Singh, Chief Manager

10. Sh. Manish Ranjan Keshari, Chief Manager
11. Sh. Kaushal Suman, Chief Manager
12. Sh. Rahul Shakya, Engineer

GRID India:

1. Sh. S.C. Saxena, CMD
2. Sh. Rajiv Porwal, Director (SO)
3. Sh. Priyam Jain, Chief Manager

Expert Member

1. Sh. S. R. Narasimhan
2. Sh. Abhay Choudhary

POWERGRID:

1. R. N. Gupta, Chief GM
2. Beni Madhav, DGM

RECPDCL

1. Sh. Vijay Kulkarni, Sr. GM
2. Sh. Anil Kumar Parela, Chief Manager
3. Sh. Ashwani Kumar. Ex Engineer

PFCCL

1. Sh. Naveen Phougat, GM
2. Smt. H.K. Madhulika Murthy , DM

Annexure 4.1

I. List of ISTS lines without OPGW in ER Region

SI No	Voltage level	Name of the Line	IA for OPGW laying/Line Ownership	Length (km)	FOTE requirement at Node A	FOTE requirement at Node B	Remarks
1	132	ARA-ARA (BSPTCL)-1	POWERGRID	1.70	1 No. (STM-16)	1 No. (STM-16)	
2	132	ARA (PG)-DUMRAON - 1(BSPTCL)	POWERGRID	1.70	No	1 No. (STM-16)	
3	220	ARA(PG)-Pusauli(PG) <ul style="list-style-type: none"> • Ara(PG)-Dumraon(BSPTCL) -30.68km • Dumraon(BSPTCL)- Pusauli BSPTCL(Nadokhar)- 80.68 km • Nadokhar-Pusauli (PG)- 1.75 km 	POWERGRID	112.20	No	1 No. (STM-16) at Nadokhar	Including LILO portion for 220kV Dumraon (BSPTCL) S/s & Nadokhar S/s that belongs to BSPTCL. However, OPGW laying work is to be done by POWERGRID.
4	400	BIHARSHARIF VARANASI	POWERGRID	321.00	1 No. (STM-64)	1 No. (STM-64)	
5	132	DEHRI-KUDRA -1	POWERGRID	62.00	1 No. (STM-16)	1 No. (STM-16)	
6	220	DEHRI(BSPTCL)-SASARAM(BSPTCL) - 1(LILO)	POWERGRID	4.88	No	1 No. (STM-16)	
7	765	GAYA BALIA -1	POWERGRID	237.70	1 No. (STM-64)	1 No (STM-64)	
8	220	GAYA-BODHGAYA (BSPTCL) -2 (LILO PART.)	POWERGRID	12.70	No	1 No. (STM-16)	Main line is from Gaya-Dehri and got LILOed at Bodhgaya and Chandauti (PG).
9	220	Chandauti-DEHRI -2	POWERGRID	15.90	No	No	

SI No	Voltage level	Name of the Line	IA for OPGW laying/Line Ownership	Length (km)	FOTE requirement at Node A	FOTE requirement at Node B	Remarks
							LILO portions at Bodhgaya belongs to BSPTCL. However, OPGW laying work is to be done by POWERGRID. Main line and LILO at Chandauti belongs to POWERGRID. OPGW is present on the main line Gaya-Chandauti PG section). OPGW to be laid from Chandauti to Dehri Section & Gaya-Bodhgaya -2 (BSPTCL) only LILO Section.
10	400	GAYA-MAITHON	POWERGRID	276.0	No	No	
11	400	JAMSHEDPUR-TISCO-2	POWERGRID	32.71	No	1 No. (STM-16)	
12	400	KODERMA-GAYA	POWERGRID	125.00	1 No. (STM-16)	No	
13	132	KUDRA-SASARAM	POWERGRID	10.84	No	No	
14	132	MOHANIA-KARMANASHA	POWERGRID	16.74	1 No. (STM-16)	1 No. (STM-16)	
15	132	PURNEA-PURNEA(BSEB)-1 LILO part	POWERGRID	0.50	No	1 No. (STM-16)	
16	400	RANCHI-RAGHUNATHPUR-1	POWERGRID	155.79	1 No. (STM-64)	1 No. (STM-16)	Main line (Maithon - Ranchi II) belongs to

SI No	Voltage level	Name of the Line	IA for OPGW laying/Line Ownership	Length (km)	FOTE requirement at Node A	FOTE requirement at Node B	Remarks
		(LILO of Maithon-Ranchi -II at Raghunathpur)					POWERGRID & LILO at Raghunathpur belongs to DVC. However, OPGW laying work is to be done by POWERGRID
17	220	SASARAM-ARA-1	POWERGRID	112.14	No	No	
18	132	SASARAM-MOHANIA	POWERGRID	13.26	No	No	
19	220	SASARAM-SAHUPURI-1	POWERGRID	4.88	No	1 No. (STM-16)	
20	400	TISCO -BARIPADA-2	POWERGRID	140.28	1 No. (STM-16)	No	
21	400	TALCHER - MERAMUNDALI-2	POWERGRID	51.00	No	1 No. (STM-16)	
22	400	ANDAL-JAMSHEDPUR	POWERGRID	156.76	1 No. (STM-16)	1 No. (STM-64)	Andal is DSTPS (DVC)
23	400	MAITHON -MEJIA-1	POWERGRID	59.18	1 No. (STM-64)	No	
24	400	MAITHON-MEJIA-3	POWERGRID	83.74	No	No	
25	400	MERAMUNDALI-ANGUL-1	POWERGRID	25.34	No	No	
26	400	Maithon-Jamshedpur-1(Including LILO Part at Mejia)	POWERGRID	167.74	1 No. STM-64 at Mejia	No	OPGW available in both peak upto 35km from Jamshedpur (Repeater connectivity of 765kV Medinipur-New Ranchi) Replacement of 24F with 96F for 35km

SI No	Voltage level	Name of the Line	IA for OPGW laying/Line Ownership	Length (km)	FOTE requirement at Node A	FOTE requirement at Node B	Remarks
							(From Jamshedpur S/s to Crossing point of 765kV Ranchi Medinipur) on one peak. 48F for remaining part including LILO (132.74km) on one peak. All the sections belong to POWERGRID.
27	132	RANGIT-RAMMAM-1	POWERGRID	27.15	No	1 No. (STM-16)	
28	400	TALCHAR-ANGUL-2	POWERGRID	68.35	No	No	
29	400	Kishanganj-Purnea	POWERLINKS	71(main line)+5 (LILO part at Kishanganj)	No	No	LILO part at Kishanganj belongs to POWERGRID. However, OPGW laying work is to be done by POWERLINK as agreed in 8th ER CPM.
30	400	Purnea-Muzaffarpur	POWERLINKS	238	No	No	
31	400	Bongaigaon -Alipurduar-Siliguri (upto by pass point of Bongaigaon S/s and excluding LILO at Alipurduar)	ENICL/INDIGRID	218.78	No	No	OPGW to be integrated with upcoming OPGW from bypass point for Bongaigaon S/s and also to be integrated with

SI No	Voltage level	Name of the Line	IA for OPGW laying/Line Ownership	Length (km)	FOTE requirement at Node A	FOTE requirement at Node B	Remarks
							existing OPGW in LILO Section to form Alipurdwar-Bornagar link. Main line belongs to ENICL & LILO belongs to POWERGRID.
32	400	Kharagpur - Chaibasa	PKTCL/INDIGR ID	161.67	1 No. (STM-16)	No	
Total Length (Km)		2992(Approx.)					

Note:

Wherever end stations belong to state constituents power supply and space shall be provided by the states for installation of FOTE.

II. Summary of ISTS lines Constructed under RTM and not having OPGW

Sl.No	TOTAL Length of OPGW to be laid(km)	Total No of FOTE required	Implementing Agency	Total cost estimate in Crs.
1	2297.18	STM-64: 8 Nos. STM-16: 19 Nos.	POWERGRID	144.04
2	314	Nil	POWERLINK	17.27
Total	2611.18			161.31

III. Summary of Scheme for OPGW Laying on ISTS Transmission lines in ER Region Constructed under TBCB and not having OPGW

Sl.No	TOTAL Length of OPGW to be laid(km)	Total No of FOTE required	Implementing Agency	Total cost estimate in Crs.
1	161.67	STM-16: 1 Nos.	PKTCL	9.51
2	218.78	Nil	ENICL	12.03
Total	380.45			21.54

Annexure- 4.2

Sl. No.	Name of the line	Length	Voltage Level	Requirement of STM-16 FOTE at End A(in No.)	Requirement of STM-16 FOTE at End B (in No.)	IA for OPGW laying/Line Ownership	Remarks
1	400 kV PK bari-Silchar	127	400	1	0	POWERGRID	Required Optical Interfaces shall also to be provided by TSP at both the ends for commissioning of the FO link
2	220 kV Kathalguri-Mariani (Aegcl)	163	220	1	1	POWERGRID	(a)Required Optical Interfaces shall also to be provided by TSP at both the ends for commissioning of the FO link. (b)One no. STM 16 FOTE has been considered at Kathalguri end as only one unused port is available in existing STM 16 FOTE.

Annexure- 4.3

I.List of ISTS lines along with associated Communication system considered under the scheme

Sl.No	Voltage level(kV)	Name of the Line	IA for OPGW laying/Line Ownership	Length (km)	FOTE requirement at Node A	FOTE requirement at Node B	Repeater along with required FOTE
1.	220	Korba (East) (CSPTCL)- Buddhipadar III(Odisha)	POWERGRID	184	1 No. (STM-64)	1 No. (STM-64)	
2.	400	Aurangabad (PG) -Akola (MSETCL)	POWERGRID	289.966	Considered in Sl.No.8	1 No. (STM-16)	1 No. (STM-16)
3.	400	Aurangabad (PG) – Aurangabad (MSETCL)	POWERGRID	52.563	Considered in Sl.No.8	1 No. (STM-16)	
4.	400	Raipur (PG) – Wardha (PG)	POWERGRID	370.565	Not Required	Not Required	1 No. (STM-16)
5.	400	Ranchi (PG) – Sipat I (NTPC)	POWERGRID	405.772	1 No. (STM-64)	1 No. (STM-64)	1 No. (STM-64)
6.	400	LILO part of Satpura (MP) – Seoni (PG)	POWERGRID	1.503	1 No. (STM-16)	1 No. (STM-16)	
7.	400	Wardha (PG) -Akola I (MSETCL)	POWERGRID	161.865	Not Required	Considered in Sl.No.2	

8.	765	Aurangabad (PG) - Solapur (PG)	POWERGRID	279.57	1 No. (STM-16)	Not Required	1 No. (STM-16)
9.	765	D'jaigarh (PG) - Jharsuguda III (PG)	POWERGRID	149.4	Not Required	Not Required	
10.	765	D'jaigarh (PG) - Ranchi II (PG)	POWERGRID	354	Not Required	Considered in Sl. No.5	1 No. (STM-16)
11.	765	Durg PS (PG) - Champa_1 (PG)	POWERGRID	149.03	1 No. (STM-16)	1 No. (STM-16)	
12.	765	Kotra PS (PG) - Durg PS (PG)	POWERGRID	239.843	1 No. (STM-16)	Not Required	1 No. (STM-16)
13.	765	Seoni (PG) - Bilaspur I (PG)	POWERGRID	337.046	Considered in Sl. No.6	1 No. (STM-16)	1 No. (STM-16)
14.	400	Aurangabad (PG) - Boisar (PG)	POWERGRID	344.87	Considered in Sl. No.8	1 No. (STM-16)	1 No. (STM-16)
15.	400	Bhachau (PG) - Limbdi (GETCO)	POWERGRID	219.6	1 No. (STM-16)	1 No. (STM-16)	
16.	400	Dehgam (PG) - Nicol (Torrent Power)	POWERGRID	13.28	Considered in Sl. No.25	1 No. (STM-16)	
17.	400	Halvad (GETCO) - Limbdi I (GETCO)	POWERGRID	92.13	1 No. (STM-16)	Considered in Sl. No.15	
18.	400	Kala (PG) - Kudus (MSETCL)	POWERGRID	83.14	1 No. (STM-16)	1 No. (STM-16)	
19.	400	Khandwa (PG) - Indore (PG)	POWERGRID	168.8	1 No. (STM-16)	1 No. (STM-16)	
20.	400	Nicol (Torrent Power) - Pirana (PG)	POWERGRID	33.37	Considered in Sl.No.16	1 No. (STM-16)	
21.	400	Seoni (PG) - Khandwa (PG)	POWERGRID	351.73	Considered in Sl.No.6	Considered in Sl. No.19	1 No. (STM-16)
22.	400	Vindhyachal (NTPC) - Satna (PG)	POWERGRID	267	1 No. (STM-16)	1 No. (STM-16)	1 No. (STM-16)

23.	400	Vindhyachal (NTPC) - Satna III (PG)	POWERGRID	258.31	Considered in Sl.No.22	Not Required	1 No. (STM-16)	
24.	400	Vindhyachal-IV(NTPC)- Vindhyachal PS (PG)	CWRTL/Adani	27	Not Required	1 No. (STM-16)		
25.	400	Mundra (APMul) – Sami (ATIL) - Dehgam(PG)	ATIL/Adani	433	1 No. (STM-16)	1 No. (STM-16)	1 No. (STM-16)	
26.	765	Raigarh (PG) – Champa (PG)	CWRTL/Adani	97	Not Required	Not Required		
27.	765	Champa (PG) – Dharmajaygarh (PG)	CWRTL/Adani	51	Not Required	Not Required		
28.	765	Sipat (NTPC) – Bilaspur (PG)	STL/Adani	24	Not Required	Considered in Sl.No.13		
29.	400	Limbdi (GETCO) - Vadavi (GETCO)	WTGL/Adani	103	Considered in Sl. No.15,17	Not Required		
30.	400	Rajgarh (PG) – Karamsad (GETCO)	WTGL/Adani	243	Not Required	1 No. (STM-16)	1 No. (STM-16)	
31.	400	Pune (PG) - Aurangabad (MSETCL)	WTPL/Adani	261	1 No. (STM-16)	Considered in Sl.No.3	1 No. (STM-16)	
32.	400	LILO of Solapur (MSETCL) – Karad (MSETCL) at Solapur PG	WTPL/Adani	115	Not Required	Not Required		
33.	765	Jabalpur (PG) – Bina (PG)	JTCL/Indigrid	235.11	1 No. (STM-16)	1 No. (STM-16)	1 No. (STM-16)	
34.	765	Jabalpur (PG) - Dharamjaygarh (PG)	JTCL/Indigrid	279.64	Considered in Sl. No.33	Not Required	1 No. (STM-16)	
Total Length (Km)		6676.1 Km						

Note:

Wherever end stations belong to state constituents power supply, and space shall be provided by the states for installation of FOTE.

II. Summary of ISTS lines Constructed under RTM and not having OPGW

Sl.No.	TOTAL Length of OPGW to be laid(km)	Total No of FOTE required including repeater FOTE	Required Repeater Stations	Implementing Agency	Total cost estimate in Crs.
1	4807.35	STM-16: 30 Nos STM-64: 5 Nos.	11	POWERGRID	292.415
Total	4807.35				292.415

III. Summary of lines Constructed under TBCB and not having OPGW

Sl.No.	TOTAL Length of OPGW to be laid(km)	Total No of FOTE required including repeater FOTE	Required Repeater Station	Implementing Agency	Total cost estimate in Crs.
1	175	STM-16: 1 Nos.	0	CWRTL/Adani	10.245
2	433	STM-16: 3 Nos.	1	ATIL/Adani	26.194
3	24	STM-16: 1 Nos.	0	STL/Adani	1.94
4	346	STM-16: 2 Nos.	1	WTGL/Adani	20.789
5	376	STM-16: 2 Nos.	1	WTPL/Adani	22.439
6	514.75	STM-16: 4 Nos.	2	JTCL/Indigrid	31.829
Total	1868.75				113.436