

I/25721/2023



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 ग्यारहवीं बैठक (दूसरी) की कार्यसूची – के सम्बन्ध में**

**Subject: Agenda for the 11<sup>th</sup> Meeting (02<sup>nd</sup> Sitting) of National Committee on Transmission (NCT) –regarding.**

**महोदया (Madam) / महोदय (Sir),**

The 11<sup>th</sup> meeting of the "National Committee on Transmission" (NCT) (Second Sitting) is scheduled on 17<sup>th</sup> January, 2023 at 3.00 pm as per details given below:

**Venue:** Chintan, 2<sup>nd</sup> Floor, CEA, Sewa Bhawan, R.K. Puram Sector-1, New Delhi

**Date:** 17<sup>th</sup> January, 2023 (Tuesday)

**Time:** 15.00 Hrs.

Agenda for the meeting is enclosed herewith. Kindly make it convenient to attend the meeting.

भवदीय/Yours faithfully,

(ईशान शरण/Ishan Sharan)

मुख्य अभियंता /Chief Engineer

**प्रतिलिपि / Copy to:**

संयुक्त सचिव (पारेषण), विद्युत मंत्रालय, नई दिल्ली /Joint Secretary (Trans), Ministry of Power, New Delhi

I/25721/2023

**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. Dilip Nigam, Scientist 'G', MNRE, Block no. 14, CGO Complex, 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, POSOCO, B-9, Qutub, Institutional Area, Katwaria Sarai, New Delhi – 110010
9.	Dr. Radheshyam Saha, Ex. Chief Engineer, Central Electricity Authority		

## Table of Agenda

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**Agenda points deferred in 01<sup>st</sup> sitting of 11<sup>th</sup> meeting of NCT for further discussion**

**1 Scheme for drawal of 4000 MW power by MPSEZ UTILITIES LIMITED (MUL)**

1.1 Details of the scheme is given below:

<b>S. No.</b>	<b>Items</b>	<b>Details</b>		
1.	Name of Scheme	Scheme for drawal of 4000 MW power by MPSEZ UTILITIES LIMITED (MUL)		
2.	Scope of the scheme	<b>Part A (Under ISTS):</b>		
		<b>Sl. No.</b>	<b>Scope of the Transmission Scheme</b>	<b>Capacity /km</b>
		1.	Establishment of 4x1500 MVA, 765/400 kV Navinal(Mundra) S/s (GIS) with 2x330 MVAR, 765 kV & 1x125MVar, 420 kV bus reactors [with associated ICT & reactor bays as well as 7x110 MVAR single phase including a spare unit for bus / line reactor as well as 13x500 MVA, 765/400 kV (single phase) including a spare transformer unit]	765/400 kV, 1500 MVA ICT – 4 nos. (13x500MVA (1ph) including one spare ICT Unit) 765 kV ICT bays – 4 nos. 400 kV ICT bays – 4 nos. 765 kV Line bays – 4 nos. 1x330 MVar, 765 kV bus reactor-2nos. (7x110 MVAR (1ph) Reactors including one spare Unit for bus /line reactor) 765 kV Bus reactor bay – 2 nos. 125 MVar, 420 kV reactor- 1 no. 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 (~70 km.)	Length-70 km

S. No.	Items	Details		
		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 equipments for 765 kV line reactor – 2 nos.
<b>Part B (Under MUL Scope#)</b>				
		4.	Interconnection of MUL S/s (MRSS1 & 2) with Navinal (Mundra) S/s (GIS) as given below: MUL MRSS-1 – Navinal(Mundra) 400 kV D/c (Twin HTLS - Quad Moose equivalent) line along with associated line bays Navinal end* (~1-2 km.) MUL MRSS-2 – Navinal(Mundra) 400 kV D/c (Twin HTLS - Quad Moose equivalent) line along with associated line bays Navinal end* (~1-2km.) *4 Nos. 400 kV Line bays at MUL (MRSS1 & 2) end shall be implemented by MUL	Length-4 km 400 kV line bays: 4 nos.
<i># MUL may construct the interconnecting lines either through themselves (if authorized by appropriate authority) or through an ISTS Transmission Licensee with the cost of construction of transmission line &amp; associated transmission charges (as applicable) being borne by MUL. In case the line is to be implemented through an ISTS Transmission Licensee, MUL may need to approach CERC for the same.</i>				
3.	Depiction of the scheme on Transmission Grid Map	Figure 1- Scheme for providing connectivity to MPSEZ UTILITIES LIMITED (MUL) for drawal of 4000 MW power		
4.	Upstream/downstream system associated with the scheme	NIL		

S. No.	Items	Details												
5.	Objective / Justification	<p>Connectivity application of 4000 MW from MUL has been received in the month of Jun'22 as per details given below:</p> <table border="1" data-bbox="619 331 1394 770"> <thead> <tr> <th data-bbox="619 331 778 568">Application No</th> <th data-bbox="778 331 911 568">Name of Applicant (Organization)</th> <th data-bbox="911 331 1043 568">Conn Quantum (MW)</th> <th data-bbox="1043 331 1161 568">Applicant Type</th> <th data-bbox="1161 331 1257 568">Project Location</th> <th data-bbox="1257 331 1394 568">Date from which connectivity required</th> </tr> </thead> <tbody> <tr> <td data-bbox="619 568 778 770">0030700003</td> <td data-bbox="778 568 911 770">MPSEZ UTILITIES LIMITED (MUL)</td> <td data-bbox="911 568 1043 770">4000</td> <td data-bbox="1043 568 1161 770">Distribution Licensee</td> <td data-bbox="1161 568 1257 770">Kutch, Gujarat</td> <td data-bbox="1257 568 1394 770">01.09.2024</td> </tr> </tbody> </table> <p>The above application was deliberated in the 9th Consultation Meeting for Evolving Transmission Schemes (CMETS) in Western Region held on 28.07.2022, wherein MUL projected a requirement of about 10GW drawal by 2030. MUL also stated that they shall apply for LTA to the tune of 2250 MW based on SECI tender for RTC Power which is expected to be concluded in a couple of months. Keeping in view the huge drawal requirement, it was found prudent to plan supply of power to MUL through a new 765/400 kV S/s near Navinal (Mundra) to be established through LILO of Bhuj-II – Lakadia 765 kV D/c line at Navinal(Mundra) (GIS) S/s.</p> <p>Connectivity is to be provided to MUL for two drawl points from Navinal S/s, namely MRSS-1 &amp; MRSS-2 as per the schematic given below. In 9th WR-CMETS meeting, it was decided that LILO of 2nd circuit of Bhuj-II – Lakadia 765 kV D/c line at Navinal(Mundra) (GIS) S/s and additional 765/400 kV (4<sup>th</sup>) transformer at Navinal(Mundra) (GIS) S/s shall be planned after receipt of LTA applications beyond 3000 MW at Navinal(GIS) S/s. In this regard, at present, about 3050 MW (LTA application) has already been received from MUL. Accordingly, it is proposed to establish the complete scheme which includes LILO of 2<sup>nd</sup> circuit of Bhuj-II – Lakadia 765 kV D/c line at Navinal(Mundra) (GIS) alongwith additional 765/400 kV (4<sup>th</sup>) transformer at Navinal(Mundra) (GIS) S/s.</p>	Application No	Name of Applicant (Organization)	Conn Quantum (MW)	Applicant Type	Project Location	Date from which connectivity required	0030700003	MPSEZ UTILITIES LIMITED (MUL)	4000	Distribution Licensee	Kutch, Gujarat	01.09.2024
Application No	Name of Applicant (Organization)	Conn Quantum (MW)	Applicant Type	Project Location	Date from which connectivity required									
0030700003	MPSEZ UTILITIES LIMITED (MUL)	4000	Distribution Licensee	Kutch, Gujarat	01.09.2024									
6.	Estimated Cost	Rs. 2200 Crore												
7.	Impact on the total Annual Transmission charges in % along with the existing ATC	<p>A. ATC (considering Levelized Tariff @15% of estimated cost): INR 330 Crore</p> <p>B. Present ATC: INR 43975.98Cr*</p> <p>C. A/B (%): Less than 0.75%</p>												
8.	Need of phasing, if any	Not Applicable												

S. No.	Items	Details
9.	Implementation timeframe	24 months from the date of allocation to implementing agency/SPV transfer (as case may be). Scheme to be awarded & taken up for implementation after receipt of LTA application from MUL. LTA Applications for cumulative capacity of 3050 MW has been received by CTU and the same have been agreed for grant in 13 <sup>th</sup> CMETS-WR meeting held on 08.12.2022.
10.	Inclusion of any wild life/protected area along the transmission line route	No major National Park, Wildlife Sanctuary or other protected areas observed. However, for details of forest/protected areas, survey is required to be done.
11.	Deliberations with RPC along with their comments	The scheme was deliberated in the 44 <sup>th</sup> WRPC meeting held on 27.09.2022. The scheme was agreed in principle, as per the technical requirements.
12.	System Study for evolution of the proposal	The scheme was discussed and agreed in 9 <sup>th</sup> Consultation Meeting for Evolving Transmission Schemes in Western Region (CMETS-WR) held on 28.07.2022

*\*Total YTC allowed for Sep'22, as per notification of transmission charges payable by DICs for billing month of November 2022 dated 25.10.2022 published on NLDC website (available at <https://posoco.in/transmission-pricing/notification-of-transmission-charges-for-the-dics/>.)*

1.2 *Space provisions at proposed Navinal (Mundra) S/s Scheme for drawal of 4000 MW power by MPSEZ UTILITIES LIMITED (MUL)*

**Future provisions at Navinal (Mundra) 765/400 kV S/s:**

**Space for**

- 765/400 kV ICT along with bays- 4 no.
- 765 kV line bays along with switchable line reactors – 6 nos.
- 765 kV Bus Reactor along with bay: 2 no.
- 765 kV Sectionalizer: 1 -set
- 400 kV line bays along with switchable line reactor – 8nos.
- 400/220 kV ICT along with bays -6 nos.
- 400 kV Bus Reactor along with bay: 3 no.
- 400 kV Sectionalization bay: 1- set
- 220 kV line bays: 10 nos.
- 220 kV Sectionalization bay: 1 sets
- 220 kV BC and TBC: 2nos.
- STATCOM (±300 MVAR) along with MSC (2x125 MVAR) & MSR (1x125 MVAR): 2 nos.

1.3 In the 11<sup>th</sup> meeting of NCT (First sitting) held on 28<sup>th</sup> December, 2022, representative of GRID INDIA stated that the load of 4000 MW of MUL can also be served from Mundra UMPP (CGPL) or Adani Mundra Power Plant located in vicinity. Accordingly, the scheme

may be relooked. Further, connecting the proposed high load to Mundra UMPP (CGPL) or Adani Mundra Power Plant may also help in forming islanding schemes

- 1.4 In the meeting, CTUIL was directed to re-examine the scheme based on the suggestions of GRID INDIA and the scheme would be discussed in the next NCT meeting.
- 1.5 Subsequently, CTUIL organized a meeting on 05.01.2023 (Minutes of the meeting enclosed at Annex-I) for finalization of scheme for drawal of 4000MW power by MPSEZ Utilities Limited (MUL). In the meeting, CTUIL presented 07 nos. of alternatives for evolving above scheme. Based on the outcome of the possible alternatives, establishment of Navinal (Mundra) S/s (GIS) along with LILO of BHuj-II- Lakadia 765D/c line at Navinal (Mundra) (GIS) was found to be the best option from techno-economic point of view (Minutes of the meeting at Annex I).
- 1.6 Members may please deliberate.

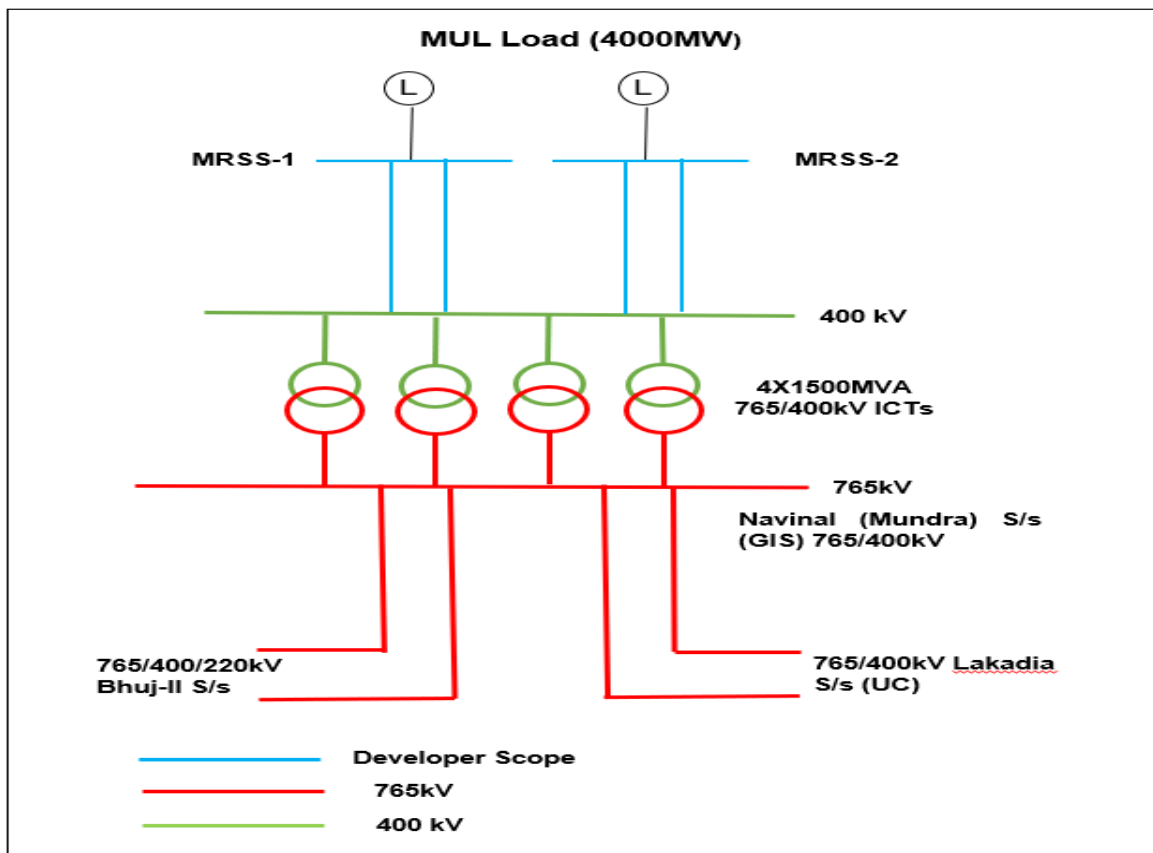


Figure 1- Scheme for providing connectivity to MPSEZ UTILITIES LIMITED (MUL) for drawal of 4000 MW power

**2 Modification in scope of work of “Transmission Network Expansion in Gujarat to increase ATC from ISTS: Part C” scheme**

2.1 The Transmission Network Expansion in Gujarat to increase its ATC from ISTS: Part C scheme was agreed in the 7<sup>th</sup> NCT meeting held on 03.12.2021 with the following scope of work:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
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1	Augmentation of transformation capacity at 765/400 kV ICT Banaskantha S/S by 1x1500MVA	765/400 kV, 1500 MVA ICT: 1 no. 765 kV ICT bay – 1no 400 kV ICT bay– 1 no
2	Banaskantha -Sankhari 400 kV 2 <sup>nd</sup> D/c line	26 km 400 kV line bays- 4 nos (2 nos at Banaskantha and 2 nos at Sankhari)

2.2 Estimated Cost of the scheme was Rs 148 Crore and Implementation Time-frame was in Matching with establishment of Prantij 400/220 kV and Sankhari- Prantij 400 kV D/C line by GETCO (presently expected by March, 2025).

2.3 The scheme is presently under implementation by POWERGRID (under RTM) as per NCT letter dated 22.12.2021. Subsequently, in meeting amongst CTUIL & GETCO on 09.11.2022, GETCO requested CTU to review the Banaskantha -Sankhari 400 kV 2<sup>nd</sup> D/c line considering the issue of high fault level at 400 kV level of Sankhari (Veloda) S/s (~45 kA in 2026-27 time-frame) as well as RE connectivity to the tune of 700-800 MW which has been granted by GETCO at 220 kV level of Sankhari S/s. Further, the matter was deliberated in meetings held on 16.11.2022 & 18.11.2022 amongst CEA, CTUIL, POSOCO & GETCO wherein following emerged:

- GETCO informed that Sankhari – Prantij 400kV D/c line along with Prantij 400/220kV S/s is currently under tendering stage with target completion by Mar'25.
- POWERGRID informed that they have already awarded the Banaskantha – Sankhari 400kV 2<sup>nd</sup> D/c line.
- To resolve the issues raised by GETCO, it was decided that instead of establishing Banaskantha –Sankhari 400 kV 2<sup>nd</sup> D/c line under ISTS and Sankhari – Prantij 400kV D/c (twin AL-59) line under Intra-state, *Banaskantha – Prantij 400kV D/c direct line (~150km.) along with 63MVA, 420kV switchable line reactors on each ckt at Prantij S/s end* may be established. This would reduce the fault level at Sankhari to below 40kA and would also help to feed load in Prantij area directly from Banaskantha (PG) S/s thereby relieving overloading issues on Banaskantha – Sankhari 400kV D/c line.
- POWERGRID and GETCO were requested to coordinate with each other and confirm the modalities of implementation of Banaskantha – Prantij 400kV D/c direct line.

2.4 In this direction, POWERGRID vide e-mail dated 25.11.2022 informed that although they have awarded transmission Line and S/s Extention packages at both sides (i.e. Banaskantha & Sankhari ends) and construction work is in progress, they are ready to implement Banaskantha – Prantij 400 kV D/c line along with 63 MVA, 420 kV switchable line reactor on each ckt at Prantij S/s end (instead of earlier scope of Banaskantha – Sankhari 400 kV 2<sup>nd</sup> D/c line).

2.5 Subsequently, GETCO vide e-mail dated 20.12.2022 informed that in order to avoid sectionalisation arrangement at Sankhari or bypassing of lines at later stage (i.e. idle bays at Sankhari substation), it would be advisable to review the planned scheme at this stage itself. In view of the same, GETCO requested that the Bansakantha - Prantij 400 kV D/c line may

be implemented under ISTS and 400 kV D/C Sankhari - Prantij line under Intra-State scheme may be dropped.

- 2.6 In view of the above, in the 11<sup>th</sup> meeting of NCT (First sitting) held on 28<sup>th</sup> December, 2022, CTUIL proposed to revise the scheme as per details given below:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1	Augmentation of transformation capacity at 765/400 kV ICT Banaskantha S/S by 1x1500MVA	765/400 kV, 1500 MVA ICT: 1 no. 765 kV ICT bay – 1no 400 kV ICT bay– 1 no
2	Banaskantha – Prantij 400kV D/c (Quad ACSR/AAAC/AL59 moose equivalent) line along with 63MVA, 420kV switchable line reactors on each ckt at Prantij S/s end	150km 400 kV line bays- 4 nos (2 nos at Banaskantha and 2 nos at Prantij) 63MVA, 420kV Switchable Line Reactors- 4 nos. (at Prantij end) along with associated switching equipment

- 2.7 The estimated Cost of revised scheme is of the order of Rs 840 Cr. As per March, 2022 price level and implementation time-frame matching with establishment of Prantij 400/220 kV (presently expected by March, 2025: As informed by GETCO vide e-mail dated 22.12.2022, Prantij S/s is planned to be awarded by March-2023 with an execution time of 24 months.)
- 2.8 It was discussed that revised scheme proposed by CTU will have huge change from original scheme in terms of expenditure. It may also necessitate change in implementation mode.
- 2.9 In the meeting, it was decided that the proposed scheme would be reviewed and would be discussed in next meeting of NCT.
- 2.10 Subsequently, a meeting was held on 05.01.2023 (minutes of the meeting enclosed at **Annex-II**) under the chairmanship of Chairperson, CEA to discuss the modifications. In the meeting, the following was agreed:
- Banaskantha-Sankhari 400kV 2<sup>nd</sup> D/c line (being implemented by POWERGRID under RTM) may not be terminated at Sankhari S/s, instead it may be terminated on the tower outside Sankhari S/s.
  - GETCO to implement the Prantij-Saankhari 400kV D/c line and connect it with Banaskantha- Sankhari 400kV 2<sup>nd</sup> D/c line being implemented by POWERGRID.
  - 2 Nos. of 400kV bays at Sankhari S/s may be deleted from the scope of POWERGRID.

POWERGRID and GETCO alongwith CTUIL would finalize the type of conductor and tower configuration within two weeks to ensure compatibility of the transmission lines being implemented by them.

POWERGRID and GETCO would implement the complete scope of work in matching timeframe so that no asset remains unutilized.

2.11 As such, the modified scope of work of “Transmission Network Expansion in Gujarat to increase ATC from ISTS: Part C” scheme being implemented by POWERGRID under RTM route is given below:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1	Augmentation of transformation capacity at 765/400 kV ICT Banaskantha S/S by 1x1500 MVA	765/400 kV, 1500 MVA ICT: 1 No. 765 kV ICT bay – 1 No. 400 kV ICT bay– 1 no.
2	Banaskantha - Sankhari 400 kV D/c line (2 <sup>nd</sup> ) along with line bays only at Banaskantha end	26 km (approx.) 400 kV line bays- 2 Nos. (at Banaskantha S/s)

**Implementation Time-frame:** Matching with establishment of Prantij 400/220 kV S/s and Prantij - Sankhari 400 kV D/c line (presently expected by March, 2025)

2.12 The scope of work in intra-state to be implemented by GETCO is given below:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
2	Sankhari – Prantij 400 kV D/c line along with line bays and 63 MVAR, 420 kV switchable line reactors on each ckt at Prantij S/s end	125 km (approx.) 400 kV line bays- 2 Nos. (at Prantij S/s) 63 MVAR, 420 kV Switchable Line Reactors- 2 Nos. at Prantij end along with associated switching equipment

**Implementation Time-frame:** Presently expected by March, 2025.

2.13 Members may deliberate.

### 3 Evaluation of functioning of National Grid.

POSOCO may make the requisite presentation apprising NCT of the performance of national Grid.

### 4 Comprehensive presentation by CTU apprising NCT of measures taken for ensuring development of an efficient, co-ordinated and economical ISTS for smooth flow of electricity.

CTU may present

### 5 Five-year rolling plan for ISTS capacity addition.

- As per the amended ToR of the NCT, CTU shall prepare a five-year rolling plan for ISTS capacity addition every year. The Annual Plan shall be put up to the NCT six months in advance.
- CTU may present

- Members may please deliberate

**6 Any other issues, with permission of chair**

सेंद्रल ट्रांसमिशन यूटिलिटी ऑफ इंडिया लिमिटेड

(पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड के स्वामित्व में)

(भारत सरकार का उदयम)

**CENTRAL TRANSMISSION UTILITY OF INDIA LTD.**

(A wholly owned subsidiary of Power Grid Corporation of India Limited)

(A Government of India Enterprise)

**Ref: CTU/W/07/MUL**

12<sup>th</sup> Jan, 2023

**As per Distribution List**

**Sub: Minutes of Joint study meeting held on 05.01.2023 over VC regarding finalization of Scheme for drawal of 4000MW power by MPSEZ UTILITIES LIMITED (MUL) – reg.**

Sir,

Please find enclosed the minutes of meeting held amongst CEA, CTU, GRID-INDIA (erstwhile POSOCO), GETCO, MUL & APL on 05.01.2023 regarding finalization of Scheme for drawal of 4000MW power by MPSEZ UTILITIES LIMITED (MUL).

Thanking you,

Yours faithfully,



**(Partha Sarathi Das)**  
**Sr. General Manager**

**Encl: Minutes of Meeting**

**Distribution List:**

1.	<b>Chief Engineer (PSP&amp;A - I)</b> Central Electricity Authority Sewa Bhawan, R.K.Puram New Delhi-110 066	2.	<b>Director (SO)</b> POSOCO B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi-110 016
3.	<b>Executive Director</b> Western Regional Load Despatch Centre F-3, M.I.D.C. Area, Marol, Andheri East, Mumbai-400 093	4.	<b>Managing Director</b> Gujarat Energy Transmission Corp. Ltd, Sardar Patel Vidyut Bhawan, Race Course, Vadodara -390 007
5.	<b>Director</b> MPSEZ Utilities Limited, 3rd Floor, South Wing, Adani Corporate House, Shantigram, Nr Vaishno Devi Circle, S G Highway Khodiyar, Ahmedabad, Gujarat		

## **Minutes of Joint study meeting held on 05.01.2023 over VC regarding finalization of Scheme for drawal of 4000MW power by MPSEZ UTILITIES LIMITED (MUL)**

The Joint Study Meeting on finalization of Scheme for drawal of 4000MW power by MPSEZ UTILITIES LIMITED (MUL) was held on 05.01.2023 over Video conferencing amongst CEA, CTU, GRID-INDIA (erstwhile POSOCO), GETCO, MUL & APL. List of participants is enclosed at **Annexure-I**. Sr. GM, CTUIL welcomed all the participants. Thereafter, deliberations as per the agenda commenced and the gist of deliberations are as given below.

### **i. Background:**

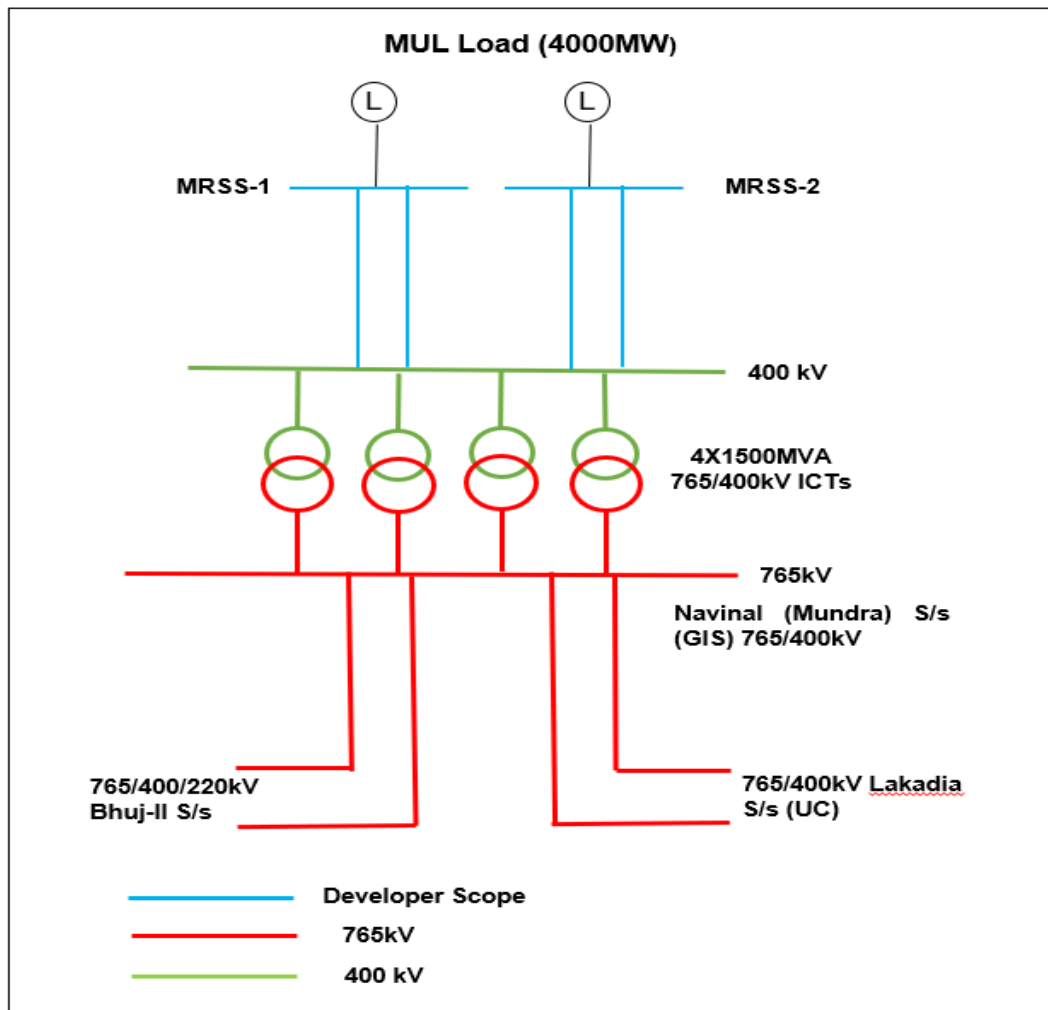
Connectivity application of 4000MW from MUL was received in the month of Jun'22 as per details given below:

Application No	Name of Applicant (Organization)	Conn Quantum (MW)	Applicant Type	Project Location	Date from which connectivity required
0030700003	MPSEZ UTILITIES LIMITED (MUL)	4000	Distribution Licensee	Kutch, Gujarat	01.09.2024

The above application was deliberated in the 9th Consultation Meeting for Evolving Transmission Schemes (CMETS) in Western Region held on 28.07.2022, wherein MUL projected a requirement of about 10GW drawal by 2030. MUL also stated that they shall apply for LTA to the tune of 2250MW based on SECI tender for RTC Power which is expected to be concluded in a couple of months. Keeping in view the huge drawal requirement, it was found prudent to plan supply of power to MUL through a new 765/400kV S/s near Navinal (Mundra) to be established through LILO of Bhuj-II – Lakadia 765kV D/c line at Navinal(Mundra) (GIS) S/s alongwith 4x1500MVA, 765/400kV ICTs at Navinal.

Connectivity is to be provided to MUL for two drawl points from Navinal S/s, namely MRSS-1 & MRSS-2 as per the schematic given below. In 9th WR-CMETS meeting, it was decided that LILO of 2nd circuit of Bhuj-II – Lakadia 765kV D/c line at Navinal(Mundra) (GIS) S/s and additional 765/400kV (4th) transformer at Navinal(Mundra) (GIS) S/s shall be planned after receipt of LTA applications beyond 3000MW at Navinal(GIS) S/s. In this regard, at present, about 3050MW (LTA application) has already been received from MUL. Accordingly, it was proposed to establish the complete scheme which includes LILO of 2nd circuit of Bhuj-II – Lakadia 765kV D/c line at Navinal(Mundra) (GIS) along with additional 765/400kV (4th) transformer at Navinal(Mundra) (GIS) S/s.

Subsequently, the above scheme was deliberated in 11th Meeting of National Committee on Transmission (NCT) held on 28th December, 2022, wherein, it was decided to re-examine the proposed scheme considering interconnection of MUL with Mundra UMPP (CGPL) or Adani Mundra Power Plant which is located in vicinity.



## ii. Deliberations and decisions taken in the meeting

Representative of MUL stated that they have drawal requirement of about 5GW from ISTS by 2026-27 and they plan to further enhance the drawal capacity from the ISTS to about 10GW by 2030 (Details attached at Annexure-II). It was further informed that existing and upcoming major industries are energy intensive requiring high reliability of power supply, and the cost of unavailability is substantial and accordingly reliable power supply is essential for their loads. MUL is engaged in the distribution of electricity for the license area in Mundra and it is already connected with grid through 220kV dedicated transmission line from Adani Power Mundra Ltd. GRID-INDIA enquired about the type of load expected to come up in future and whether captive generations are also envisaged in future. Towards this, MUL informed that loads expected to come up includes Copper Smelter, Petrochemical, PVC and electrochemical loads.

CTU representative briefed the participants that comprehensive studies have been carried out to evolve Scheme for drawal of 4000MW power by MPSEZ UTILITIES LIMITED (MUL).

CTU presented the various alternatives studied for evolving above scheme. Details of the alternatives alongwith outcomes based on studies are given below:

**Alternative1:** APL Mundra (Switchyard) – MUL 3X400kV lines (quad)

Following were deliberated w.r.t above alternative:



- SC level at APL Mundra: 3ph: 40.3kA & 1ph:42.1kA (No contribution from MUL load is considered). As the SC levels are already beyond design limits, any augmentation at APL will further lead to increase in SC level and further interconnection of MUL with other ISTS point would also not be possible.
- It was informed that with Mundra-Mohindergarh HVDC in forward mode with dispatch of 2000MW from WR to NR in evening peak scenario, about 2X455MW power flow is observed on 2X315MVA, 400/220kV ICTs and N-1 non compliant.
- Further, even with Mundra-Mohindergarh HVDC in reverse mode with dispatch of 1200MW from NR to WR, issue of overloading and N-1 non compliance of 2X315MVA ICTs at Mundra remains.
- It was also informed that space for requisite Nos. of 400kV line bays at APL switchyard for interconnection with MUL is also not available and there is no space for splitting at 400kV level.
- It was suggested to shift some load at 220kV to avoid the above overloading. It was informed that considering load growth of 5GW by 2026-27 and upto 10GW by 2029-30, shifting some load on 220kV would not be prudent. With reduction in power flow towards GETCO network, it may have negative impact on import capability of GETCO network. Under, reduced generation scenario at APL, import capability of GETCO may reduce further.
- It was further deliberated that the above configuration vide radial feed from one source would lead to less reliability w.r.t connectivity and supply of MUL loads.

Considering the above, this alternative was not found to be suitable.

**Alternative2:** MUL-Bhuj 400kV D/c line (quad) & MUL-Bhachau 400kV D/c line (quad)

Following were deliberated w.r.t above alternative:

- From the studies, it is observed that about 2x1115MW power flows on MUL-Bhuj 400kV D/c line & about 2X900MW power flows on MUL-Bhachau 400kV D/c line considering 4GW load at MUL. Hence, under n-1 contingency of one circuit of MUL-Bhuj 400kV D/c line, other circuit gets highly loaded.
- Further, with above alternative, 3Ph SC level at Bhachau is 42kA which is more than design limit even with Bhachau-Versana 400kV D/c line kept in open condition

Considering the above, this alternative was not found to be suitable.

**Alternative3:** LILO of both circuits of CGPL-Bhachau 400kV 2xD/c lines (triple) at MUL

Following were deliberated w.r.t above alternative:

- It was informed that it would be prudent to plan supply of power to M/s MUL with two different ISTS sources for supply of power with reliability, especially considering future load growth projections of MUL as well as looking into balanced power flows.
- With the proposed alternative, it was informed that about 4x1170MW power flow is observed on MUL-CGPL 400kV (triple) lines and Bhachau-MUL line is observed to be floating considering 5GW load at MUL.

- CGPL-Jetpur 400kV D/c lines and also become floating. With reduction in power flow towards GETCO network, it may have negative impact on import capability of GETCO network. Under, reduced generation scenario at CGPL, import capability of GETCO may reduce further.
- Under N-1 contingency of MUL-Bhachau 400kV (triple) line, other 3 circuits are found to be critically loaded near to its thermal limits.
- SC level at CGPL: 3ph: 44kA & 1ph:45.5kA (No contribution from MUL load is considered). With the proposed alternative, SC levels at CGPL 400kV bus are well beyond the design level. Accordingly, any further interconnection of MUL with other ISTS point would also not be possible as the fault level at CGPL would increase further.

Considering the above, this alternative was not found to be suitable.

**Alternative4:** LILO of both circuits of CGPL-Bhachau 400kV D/c lines (triple) at MUL and LILO of both circuits of CGPL-Bhuj 400kV D/c lines (triple) at MUL

Following were deliberated w.r.t above alternative:

- With the proposed alternative, it was informed that about 4x935MW power flow is observed on MUL-CGPL 400kV (triple) lines and about 2x540MW power flow is observed on MUL-Bhuj PS 400kV D/c line & Bhachau-MUL D/c line was observed to be floating considering 5GW load at MUL.
- With the proposed alternative, CGPL-Jetpur 400kV D/c lines and CGPL-Bhachau 400kV D/c lines also become floating. With reduction in power flow towards GETCO network, it may have negative impact on import capability of GETCO network. Under, reduced generation scenario at CGPL, import capability of GETCO may reduce further.
- Under N-1 contingency of MUL-Bhachau 400kV (triple) line, about 1235MW power flow is observed on remaining three circuits.
- SC level at CGPL: 3ph: 43kA & 1ph:44.6kA (No contribution from MUL load is considered). With the proposed alternative, SC levels at CGPL 400kV bus are well beyond the design level. Accordingly, any further interconnection of MUL with other ISTS point would also not be possible as the fault level at CGPL would increase further.

Considering the above, this alternative was not found to be suitable.

**Alternative5:** CGPL Mundra (Switchyard) – MUL 3X400kV lines (quad)

Following were deliberated w.r.t above alternative:

- With the proposed alternative, CGPL-Jetpur 400kV D/c lines and CGPL-Bhachau 400kV 2xD/c lines become floating. With reduction in power flow towards GETCO network, it may have negative impact on import capability of GETCO network. Under, reduced generation scenario at CGPL, import capability of GETCO may reduce further. Further, there is limited corridor available at CGPL.
- SC level at CGPL: 3ph: 44kA & 1ph:45.4kA (No contribution from MUL load is considered). With the proposed alternative, SC levels at CGPL 400kV bus are

well beyond the design level. Accordingly, any further interconnection of MUL with other ISTS point would also not be possible as the fault level at CGPL would increase further.

- It was further deliberated that the above configuration vide radial feed from one source would lead to less reliability w.r.t connectivity and supply of MUL loads.

Considering the above, this alternative was not found to be suitable.

**Alternative6:** Establishment of 765/400kV, 4x1500MVA Navinal (Mundra) S/s (GIS) alongwith LILO of Bhuj-II – Lakadia 765kV D/c line at Navinal(Mundra) (GIS) S/s

Following were deliberated w.r.t above alternative:

- It was informed that it would be prudent to plan supply of power to M/s MUL through a new 765/400kV Navinal S/s with 2 Nos. of 765kV D/c outlets (i.e. Bhuj-II PS & Lakadia) for supply of power with reliability, especially considering future load growth projections of MUL as well as looking into balanced power flows on Khavda-Bhuj / Khavda-Lakadia 765kV corridors with above proposed LILO connectivity.
- With the proposed alternative, about 2X1750MW power flow is observed on MUL-Bhuj-II 765kV D/c section and about 2X760MW power flow is observed on MUL-Lakadia 765kV D/c section considering 5GW load requirement.
- With the above alternative, under N-1 contingency of one circuit of Vataman-Navsari (New) 765kV D/c line about 3450MW power flow is observed on other circuit, whereas without the proposed system, under N-1 contingency of one circuit of Vataman- Navsari (New) 765kV D/c line about 3850MW power flow is observed on other circuit. Accordingly, without the proposed system, an additional 765kV corridor would be required for evacuation of power from Khavda REZ.
- With above alternatives, SC levels at both Bhuj-II PS and Lakadia 765kV buses are also well within design limits. The above alternative is preferable both from SC and power flow point of view.
- Also considering anticipated future load growth, additional drawl requirements of MUL can also be met via the same system.

Considering the above, this alternative was found to be suitable.

**Alternative7:** Establishment of 765/400kV, 4x1500MVA Navinal (Mundra) S/s (GIS) alongwith LILO of Bhuj– Bhuj-II 765kV D/c line at Navinal(Mundra) (GIS) S/s

Following were deliberated w.r.t above alternative:

- With the proposed alternative, about 2X2296MW power flow is observed on MUL-Bhuj 765kV D/c section and about 2X217MW power flow is observed on MUL-Bhuj-II 765kV D/c section considering 5GW load requirement in afternoon peak scenario.
- Under N-1 contingency of one circuit of MUL-Bhuj 765kV D/c section, about 3750MW power flow is observed on other circuit. Accordingly, the above alternative is not feasible due to skewed power flow via MUL-Bhuj 765kV section.

Considering the above, this alternative was not found to be suitable.

### **iii. Conclusion**

Keeping above in view, Alternative-6 [Establishment of Navinal (Mundra) S/s (GIS) alongwith LILO of Bhuj-II – Lakadia 765kV D/c line at Navinal(Mundra) (GIS) S/s] was agreed as the best option from techno-economic point of view considering distinct advantages mentioned above over other alternatives studied during the meeting:

*Meeting ended with a vote of thanks.*

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## **Annexure-I**

### **List of Participants**

#### **CEA**

1 Vikas Sachan

#### **CTUIL**

1 P.S. Das

2 Bhaskar Wagh

3 Pratyush Singh

4 Shashank Shekhar

#### **GRID-INDIA**

1 Surajit Banerjee, NLDC

2 Vivek Pandey, NLDC

3 Priyam Jain, NLDC

4 Pushpa. S, WRLDC

5 S. Usha, WRLDC

6 Venky Minnakuri, WRLDC

#### **GETCO**

1 Dipak H Patel

#### **MUL/APL**

1 Sameer Ganju

2 Mehul Rupera

# Mundra Region growth plan – Target of 5 GW by 2027 and 10 GW by 2030

Expected Commercial Operation Start date	Max demand (MW)
Oct 2023	150
Jun 2023	300
Mar 2024	200
<b>Total addition during 2023-24</b>	<b>650</b>
Nov 2024	1300
Jan 2025	280
Mar 2025	600
<b>Total addition during 2024-25</b>	<b>2180</b>
Jan 2027	400
Mar 2027	1750
<b>Total addition during 2026-27</b>	<b>2150</b>
<b>Firmed up Demand Total</b>	<b>~5 GW</b>
<b>FY 27 onwards to FY30</b>	<b>~5 GW</b>
<b>TOTAL (Estimated)</b>	<b>up to 10 GW</b>

- Existing and upcoming major industries are energy-intensive requiring high reliability of power supply, and the cost of unavailability is substantial.
- MUL is engaged in the distribution of electricity for the license area in Mundra spread over 8481 hectares.
- MUL – MRSS Sub Station (220/66/11 kV) is connected to APL Thermal Power Station bus through 220 kV dedicated transmission line



I/25625/2023



सत्यमेव जयते  
भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

केन्द्रीय विद्युत प्राधिकरण

Central Electricity Authority

विद्युत प्रणाली योजना एवं मूल्यांकन - I प्रभाग

Power System Planning & Appraisal-I Division

सेवा में / To,

- i. Member Secretary, WRPC, MIDC area, Marol, Andheri East, Mumbai – 400093
- ii. Managing Director, GETCO, Sardar Patel Vidyut Bhawan, Race Course, Vadodara – 390007
- iii. Director (Projects), PGCIL, Saudamini, Plot No. 2, Sector-29, Gurgaon – 122001
- iv. Director (SO), Grid-India, 9<sup>th</sup> Floor, IFCI Towers, 61, Nehru Place, New Delhi – 110019
- v. COO, CTUIL, Saudamini, Plot No. 2, Sector-29, Gurgaon – 122001

विषय / Subject: Minutes of the meeting to discuss the modification in scope of work of “Transmission Network Expansion in Gujarat to increase ATC from ISTS: Part C” scheme - reg

महोदया /महोदय,

A meeting was held on 05.01.2023 under the chairmanship of Chairperson, Central Electricity Authority, to discuss the modification in scope of work of “Transmission Network Expansion in Gujarat to increase ATC from ISTS: Part C” scheme. Minutes of the meeting is attached for kind information and necessary action.

भवदीय / Yours faithfully,

10.01.2023

(विकास सचान/ Vikas Sachan)

उपनिदेशक/ Deputy Director



**Minutes of the meeting held on 05.01.2023 to discuss the modification in scope of work of the transmission scheme- “Transmission Network Expansion in Gujarat to increase ATC from ISTS: Part C”**

List of participants is attached as **Annex-I**.

**Background:**

The Transmission Network Expansion in Gujarat to increase its ATC from ISTS: Part C scheme was agreed in the 7<sup>th</sup> NCT meeting held on 03.12.2021, with following scope of work:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1	Augmentation of transformation capacity at 765/400 kV ICT Banaskantha S/S by 1x1500 MVA	765/400 kV, 1500 MVA ICT: 1 No. 765 kV ICT bay – 1 No. 400 kV ICT bay– 1 No.
2	Banaskantha -Sankhari 400 kV 2 <sup>nd</sup> D/c line	26 km 400 kV line bays- 4 nos (2 Nos. at Banaskantha and 2 Nos. at Sankhari)

**Estimated Cost:** Rs 148 Crore

**Implementation Time-frame:** Matching with establishment of Prantij 400/220 kV and Sankhari- Prantij 400 kV D/C line by GETCO (presently expected by Mar’25)

The scheme is presently under implementation by POWERGRID (under RTM).

Subsequently, GETCO had requested CTUIL to review the Banaskantha -Sankhari 400 kV 2<sup>nd</sup> D/c line considering the issue of high fault level at 400 kV level of Sankhari (Veloda) S/s (~45 kA in 2026-27 time-frame) as well as RE connectivity to the tune of 700-800 MW which has been granted by GETCO at 220 kV level of Sakhari S/s.

Further, based on the request of GETCO, CTUIL in the 11<sup>th</sup> meeting of National Committee on Transmission (NCT) held on 28<sup>th</sup> December, 2022 had intimated that Banaskantha -Sankhari 400 kV (2<sup>nd</sup>) D/c line may be modified as Banaskantha – Prantij 400 kV D/c line along with 63 MVA<sub>r</sub>, 420 kV switchable line reactor on each ckt at Prantij S/s end (Prantij – Sankhari 400 kV D/c line is under the scope of GETCO).

In the 11<sup>th</sup> meeting of NCT, it had been decided to deliberate on the above modifications suggested by GETCO in a separate meeting.

**Deliberations held in the meeting:**

- Chairperson, CEA, suggested that the Banaskantha – Sankhari 400 kV 2<sup>nd</sup> D/c line (being implemented by POWERGRID under RTM) may not be terminated at Sankhari S/s, instead it may be terminated on the tower outside Sankhari S/s. GETCO should implement the Prantij-Sankhari 400 kV D/c line and connect it with the Banaskantha – Sankhari 400 kV 2<sup>nd</sup> D/c line being implemented by POWERGRID. The 2 Nos. of 400 kV bays at Sankhari S/s may be deleted from the scope of POWERGRID.
- Both POWERGRID and GETCO agreed to the proposal. POWERGRID also agreed for the deletion of 2 Nos. of 400 kV bays at Sankhari S/s from their scope.



- On the query from POWERGRID regarding tower configuration/conductor mismatch, it was suggested that POWERGRID and GETCO may coordinate among themselves and match their tower and conductor configuration at the earliest.

**Decisions taken in the meeting:**

- The modified scope of work of “Transmission Network Expansion in Gujarat to increase ATC from ISTS: Part C” scheme being implemented by POWERGRID under RTM route is given below:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1	Augmentation of transformation capacity at 765/400 kV ICT Banaskantha S/S by 1x1500 MVA	765/400 kV, 1500 MVA ICT: 1 No. 765 kV ICT bay – 1 No. 400 kV ICT bay– 1 no.
2	Banaskantha - Sankhari 400 kV D/c line (2 <sup>nd</sup> ) along with line bays only at Banaskantha end	26 km (approx.) 400 kV line bays- 2 Nos. (at Banaskantha S/s)

**Implementation Time-frame:** Matching with establishment of Prantij 400/220 kV S/s and Prantij - Sankhari 400 kV D/c line (presently expected by March, 2025)

- The scope of work in intra-state to be implemented by GETCO is given below:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
2	Sankhari – Prantij 400 kV D/c line along with line bays and 63 MVA <sub>r</sub> , 420 kV switchable line reactors on each ckt at Prantij S/s end	125 km (approx.) 400 kV line bays- 2 Nos. (at Prantij S/s) 63 MVA <sub>r</sub> , 420 kV Switchable Line Reactors- 2 Nos. at Prantij end along with associated switching equipment

**Implementation Time-frame:** Presently expected by March, 2025.

- POWERGRID and GETCO alongwith CTUIL would finalize the type of conductor and tower configuration within two weeks to ensure compatibility of the transmission lines being implemented by them.
- POWERGRID and GETCO would implement the complete scope of work in matching timeframe so that no asset remains unutilized.

**Annex-I**

**List of the participants of the meeting held on 05.01.2023 to discuss the modification in scope of work of “Transmission Network Expansion in Gujarat to increase ATC from ISTS: Part C” scheme**

<b>Sl. No.</b>	<b>Name of the Participant (Sh./Smt.) &amp; Designation</b>	<b>Organization</b>
1	Ghanshyam Prasad, Chairperson	CEA
2	Ishan Sharan, Chief Engineer	CEA
3	B.S. Bairwa, Director	CEA
4	Vikas Sachan, Deputy Director	CEA
5	Krishna Kumar T.R., ED	POWERGRID
6	Manju Gupta, Add. GM	POWERGRID
7	P. C. Garg, COO	CTUIL
8	Ashok Pal, Dy. COO	CTUIL
9	P.S. Das, Sr. GM	CTUIL
10	Bhaskar Wagh, Chief Manager	CTUIL
11	Pratyush Singh, Manager	CTUIL
12	M Venkateswara Rao, Manager	Grid-India
13	Prabhankar Porwal, Dy. Manager	Grid-India
14	Kanti Bhuva, ACE (R&C)	GETCO