सेंट्रल ट्रांसमिशन यूटिलिटी ऑफ इंडिया लिमिटेड

(पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड के स्वामित्व में)

(भारत सरकार का उद्यम)

CENTRAL TRANSMISSION UTILITY OF INDIA LTD.

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

(A Government of India Enterprise)

संदर्भ/Ref: CTU/E/00/7th CMETS-ER

दिनांक/Date: 26-05-2022

वितरण सूची के अनुसार/ As per distribution list

विषय/Subject: पूर्वी क्षेत्र में पारेषण योजनाओं के विकास के लिए 7वीं परामर्श बैठक की कार्यावली (सीएमईटीएस-ईआर) / Agenda for 7th Consultation Meeting for Evolving Transmission Schemes in Eastern Region (CMETS-ER)

महोदय /महोदया /Sir /Ma'am.

आईएसटीएस योजना और ओपन एक्सेस आवेदन प्रसंस्करण के लिए पूर्वी क्षेत्र में पारेषण योजनाओं के विकास के लिए **7वीं** परामर्श बैठक (सीएमईटीएस-ईआर) **31 मई, 2022 (मंगलवार)** को वीडियो कॉन्फ्रेंसिंग के माध्यम से नीचे दिए गए विवरण के अनुसार आयोजित होने वाली है:

The **7th** Consultation Meeting for Evolving Transmission Schemes in Eastern Region (CMETS-ER) for ISTS planning and open access applications processing is scheduled to be held on **31th May, 2022 (Tuesday)** through video conferencing as per details below:

विषय/Topic	:	7th CMETS-ER
दिनांक/Date & समय/Time	:	31th May 2022 at 03:00 PM
बैठक लिंक/ Meeting Link	:	MS-Teams (in email)

इस संबंध में, कृपया बैठक की कार्यावली (संलग्न), जो सीटीयू वेबसाइट (*www.ctuil.in >> ISTS Planning and Coordination >> Consultation Meetings for ISTS >> ER*) पर भी उपलब्ध है, प्राप्त करे । कृपया उपरोक्त लिंक के माध्यम से बैठक में शामिल होने और रिटर्न मेल के माध्यम से इस संबंध में भागीदार होने की पुष्टि करे।

In this regard, please find enclosed agenda of the meeting which is also available on CTU website (*www.ctuil.in >> ISTS Planning and Coordination >> Consultation Meetings for ISTS >> ER*).

It is requested to join the meeting through the above link and send confirmation of participation in this regard through return mail.

धन्यवाद/Thanking you,

भवदीय / Yours faithfully,

राजेश कुमार
26/05/2022

(राजेश कुमार) / (Rajesh Kumar)
महाप्रबंधक/ General Manager

A. वितरण सूची के अनुसार/ Distribution List:

1.	**Chief Engineer (PSP&A-II)** Central Electricity Authority Sewa Bhawan, R.K.Puram New Delhi-110066	**2.**	**Member Secretary** Eastern Regional Power Committee 14, Golf Club Road, Tollygunge Kolkata-700033
3.	**Director (SO)** Power System Operation Corporation Ltd. (POSOCO) 9th Floor, IFCI Towers, 61, Nehru Place, New Delhi-110016	**4.**	**Executive Director** Eastern Regional Load Despatch Centre 14, Golf Club Road, Jubilee Park, Golf Gardens, Tollygunge, Kolkata, West Bengal - 700095
5.	**CMD** Damodar Valley Corporation DVC Towers, VIP Road Kolkata-700054	**6.**	**CMD** Odisha Power Transmission Corporation Ltd. (OPTCL) Bhoinagar Post Office, Jan path Bhubaneshwar-751022
7.	**CMD** Bihar State Power Transmission Company Ltd. (BSPTCL) Vidyut Bhavan, 4th floor, Bailey Road Patna-800021	**8.**	**CMD** Jharkhand Urja Sancharan Nigam Limited (JUSNL) Engineering Building, HEC, Dhurwa Ranchi -834004
9.	**Principal Chief Engineer cum Secretary** Power Department Government of Sikkim Gangtok, Sikkim	**10.**	**Managing Director** West Bengal State Electricity Transmission Company Ltd. (WBSETCL) Vidyut Bhavan, 8th Floor, A-Block Salt Lake City, Kolkata-700091

B. विशेष आमंत्रित /Special invitee:

1.	**Director (Projects)** Power Grid Corporation of India Ltd. "Saudamini", Plot No. 2, Sec-29, Gurugram Haryana-122001	**2.**	**Managing Director** West Bengal Power Development Corporation Limited (WBPDCL) Bidyut Unnyan Bhaban, Plot– 3/C LA-Block, Sector-III, Salt Lake City Kolkata-700106

C. आवेदक /Applicant(s)

1.	**Sh. Alok Garg** Deputy General Manager Jindal Power Limited Tower-B, 3rd floor Jindal Centre, Plot no.2 Sector-32, Gurugram - 122001	**2.**	**Sh. Anish Pasrija** DGM – Business Development Greenko AP01 IREP Private Limited 15th Floor, Hindustan Times House, 18-20 KG Marg New Delhi - 110001

Agenda for 7th Consultation Meeting for Evolving Transmission Schemes in Eastern Region (CMETS-ER)

1. Confirmation of minutes of the previous meeting

The minutes of the 6th meeting of CMETS-ER held on 29-04-2022 were issued vide letter dated 25-05-2022. As no comments have been received, the minutes may be confirmed.

2. Presentation by states on intra-state network for 2026-27 time-frame

As agreed in the previous meeting, JUSNL may give presentation on load-generation balance and upcoming intra-state schemes of Jharkhand for 2026-27 time-frame.

A. Application related matters in Eastern Region (ER)

3. LTA applications with injection in another region and drawl in ER

3.1. Following LTA application has been received from generation developer in SR with drawl in ER in the month of Apr 2022:

Sl. No.	Application No.	Applicant Name	Application Date	Quantum of LTA	Location of Generating Station	Type of Fuel	Start Date	End Date	Drawl Point
1	1200003664	Greenko AP01 IREP Private Limited	30-04-2022	900 MW (PSA without NoC)	Kurnool, Andhra Pradesh. Injection at 765/400 kV Kurnool New S/s, Andhra Pradesh	Hybrid	30-09-2023	30-09-2048	Rajasthan Urja Vikas Nigam Ltd. (RUVNL), NR: 490MW DVC, ER: 200MW Target (ER): 210MW

3.2. Application has been submitted along with PPA, signed between SECI & M/s Greenko AP01 IREP Pvt. Ltd., and PSA, signed between SECI & DVC and SECI & RUVNL, but without NoC from respective STUs. Validity of PPAs is upto 01.08.2048 and validity of PSA, signed between SECI & DVC and SECI & RUVNL is upto 18.02.2048 & 23.07.2048 respectively.

3.3. Regarding availability of transmission system for evacuation of power from Kurnool New S/s, it is to mention that M/s Greenko AP01 IREP Pvt. Ltd. has already been granted Stage-II Connectivity for 900MW at Kurnool New S/s, Andhra Pradesh against application no. 1200002672. For export & supply of power from generation in SR to it beneficiaries in NR, the transmission scheme of *"ISTS Network Expansion scheme between Western Region & Southern Region for export of surplus power during high RE scenario in Southern Region",* which includes Narendra New – Pune 765kV D/c line, is required which is expected by June, 2024 (tentative commissioning schedule). Further for supply of power for the generation to beneficiaries in ER, existing / under implementation transmission system is expected to be adequate. The details

system studies have been carried wherein it is observed that loadings are generally in order. Study results are enclosed as detailed below:

- With instant 900MW LTA: Exhibit-1A & 1B

3.4. The above LTA is proposed to be granted with transmission system expansion in WR & SR for power transfer towards NR, and through existing / under implementation transmission system for power transfer towards ER.

3.5. In this regard, request for NoC to DVC from CTU has already been sent on 04-05-2022. However, response of DVC is awaited. Accordingly, DVC may intimate their views regarding the issuance of STU NoC for the above LTA.

3.6. Matter may be agreed.

4. MTOA applications with injection in another region and drawl in ER

4.1. Following MTOA application has been received from generation developer in WR with drawl in ER in the month of Apr 2022:

Sl. No.	Application No.	Applicant Name	Application Date	Quantum of MTOA	Location of Generating Station	Type of Fuel	Start Date	End Date	Drawl Point
1	1200003855	Jindal Power Limited (JPL) (4x250 MW)	12-04-2022	72MW	JPL Stage-1, 400kV PGCIL S/s at Raipur (WR)	Thermal	01-10-2022	31-08-2025	South Eastern Railway, Jharkhand (ER)

4.2. Quantum of PPA is 70MW, however, MTOA has been sought for 72MW. In this regard, applicant has clarified that they have applied MTOA considering transmission losses of 2.78% to deliver contracted capacity of 70MW at the delivery point.

4.3. Presently, 75MW LTA and 297.3MW MTOA (total 372.3MW) is already granted from M/s JPL. The subject MTOA involves transfer of 72MW additional power from M/s JPL, WR to ER. From the system studies, it has been observed that power flows are generally in order, including on inter-regional lines. Study results are enclosed as detailed below:

- Base Case (without instant 72MW MTOA): Exhibit-2A & 2B
- With instant 72MW MTOA: Exhibit-2C & 2D

4.4. In view of the above, it is proposed to grant MTOA of 72MW to M/s JPL, WR for transfer of power to South Eastern Railway, Jharkhand, ER with existing / under implementation transmission system w.e.f. 01-10-2022 till 31-08-2025.

B. ISTS expansion schemes in Eastern Region

5. Reconductoring of Rourkela – Jharsuguda 400kV 2xD/c lines

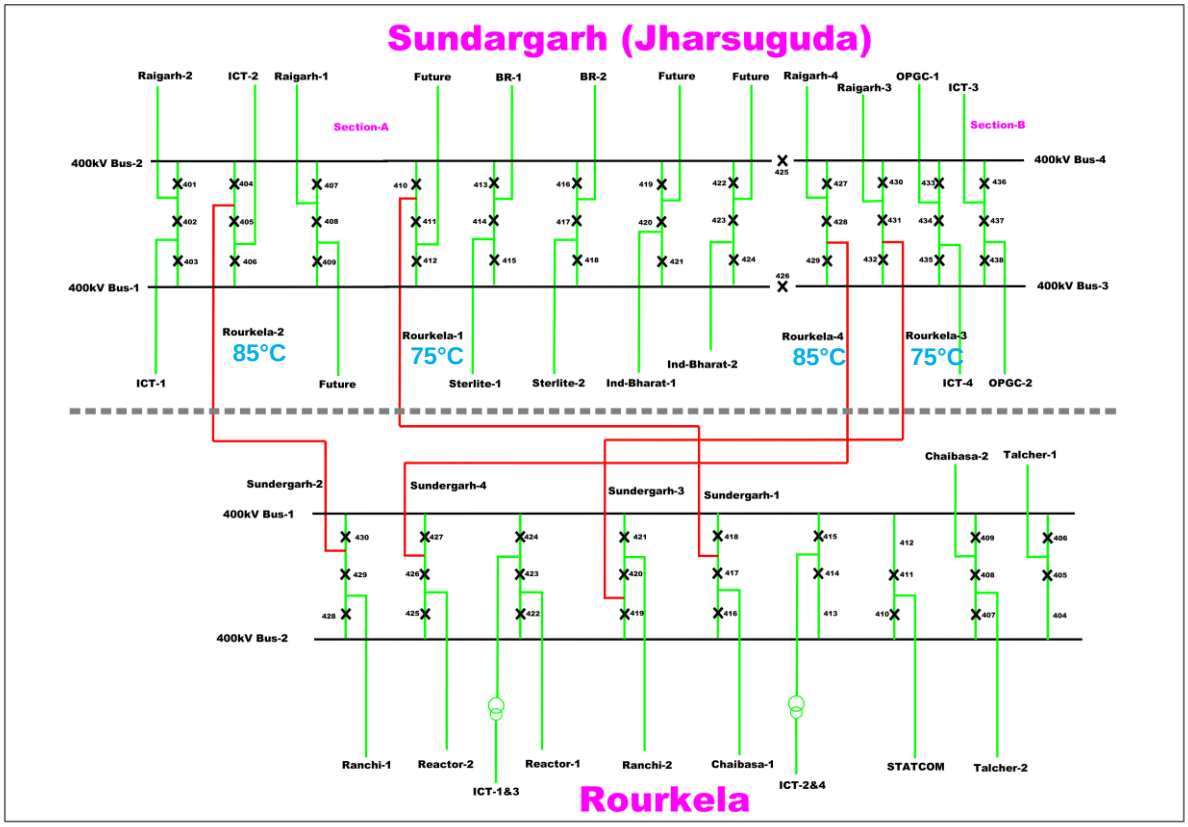
5.1. In the 6th CMETS-ER held on 29-04-2022, reconductoring of Rourkela – Jharsuguda 400kV 2xD/c lines was in-principally agreed in view of

establishment of new 400/220kV substation at Joda New by OPTCL. In the meeting it was also decided that exact scope of works with regard to proposed reconductoring would be finalised in the next meeting, after inputs from POWERGRID.

5.2. Now, POWERGRID vide email dated 20-05-2022 has informed the following:

(i) Circuit I & III of Rourkela-Jharsuguda 400kV D/c line are designed for 75°C max. conductor temperature and Circuit II & IV are designed for and 85°C max. conductor temperature.

(ii) For 400kV transmission lines designed for 75°C & 85°C max. conductor temperature, ampacity of 1228 Amperes & 1400 Amperes (per conductor) respectively may be possible for re-conductoring purpose considering techno-commercial solution.



5.3. Split bus arrangement has been implemented at Jharsuguda at 400kV level. As per inputs from POWERGRID, one circuit (ckt-1) of Rourkela-Jharsuguda on Section-A is designed for 75°C max. conductor temperature and other circuit (ckt-2) is designed for 85°C max. conductor temperature. Similar is the case for Section-B. Accordingly, to have equitable rating for both circuits on Section-A and Section-B it is proposed that all four circuits of Rourkela-Jharsuguda may be reconductored with HTLS of 1228A rating.

5.4. In view of the above, following scope of works is proposed to be implemented under ISTS scheme namely Eastern Region Expansion Scheme-XXIX (ERES-

XXIX) with implementation time-frame of 24 months from date of allocation with following scope of works:

a) Reconductoring of Jharsuguda/Sundargarh (POWERGRID) – Rourkela (POWERGRID) 400kV 2xD/c Twin Moose line with Twin HTLS conductor (with ampacity Single HTLS as 1228A at nominal voltage)

b) Bay upgradation at Rourkela (POWERGRID) end for 3150A rating – 04 nos. diameters in one and half breaker scheme *(except 09 nos. existing circuit breakers which are of minimum 3150 A rating)*.

Note: *No upgradation in line bays is envisaged at Jharsuguda/Sundargarh (POWERGRID) S/s as the existing line bays are rated for 3150A.*

6. Augmentation of power transfer capacity in Rourkela – Tarkera 220kV D/c line corridor – Agenda by OPTCL

6.1. In the 1st CMETS-ER, space for implementation of 2 nos. 220kV lines bays were provided at Rourkela (POWERGRID) 400/220kV ISTS S/s for termination of Rourkela (POWERGRID) – Tarkera 220kV D/c new intra-state line (2nd) to be constructed by OPTCL under intra-state scheme to augment the power transfer capacity in Rourkela – Tarkera 220kV D/c line corridor.

6.2. Now, OPTCL vide letter dated 27-04-2022 (copy enclosed at **Annexure-III)** has informed that during survey for another two circuits, Right of Way (Row) issues and corridor constraints like infringing the Rourkela Steel Plant (RSP) area, river crossings, power line crossings etc. will be encountered, which may delay the project. Accordingly, OPTCL has proposed for reconductoring of existing ACSR Zebra line with HTLS as an interim measure and they will proceed in resolving the RoW issues for another two circuits. Rating of HTLS has been informed as 1179A at 120°C.

6.3. It has been observed that after reconductoring of Rourkela – Tarkera 220kV D/c (1st) ACSR Zebra line with Single HTLS of 1179A, N-1 shall be fulfilled. Once the line is reconductored it cannot be an interim arrangement, it shall be permanent. Further, in order to effectively utilize the capacity of HTLS line, it is necessary that 2nd D/c line is also built with conductor of similar rating and preferably HTLS so that both D/c lines are equitably loaded. Space for implementation of 2 nos. of 220kV lines bays at Rourkela (POWERGRID) 400/220kV ISTS S/s end as agreed in the 1st CMETS-ER shall be utilized for termination of this 2nd 220kV D/c HTLS line.

6.4. POWERGRID and OPTCL needs to inform rating of line bays at Rourkela (POWERGRID) and Tarkera (OPTCL) ends respectively so that the need for upgradation of corresponding bay equipment, if any, along with reconductoring works can also be identified.

6.5. OPTCL may also inform about timeline (month & year) for implementation of reconductoring of Rourkela – Tarkera 220kV D/c (1st) ACSR Zebra line with Single HTLS.

7. 2 no. of 220kV line bays at Maithon (POWERGRID) S/s for connecting Maithon (POWERGRID) – Asansol (WBSETCL) 220kV D/c line – Agenda by WBSETCL

7.1. In the 5th CMETS-ER held on 30-03-2022, the proposal regarding implementation of new Maithon (POWERGRID) – Asansol (WBSETCL) 220kV D/c line was deliberated and following was agreed:

(a) Within one-month WBSETCL will confirm regarding availability of space at Asansol for implementation of Maithon (POWERGRID) – Asansol 220kV D/c line.

(b) If space is not available at Asansol, WBSETCL will provide the details such as line length of – new sections formed after LILO of Santaldih TPS – Asansol 220kV D/c line at Koylapur, Koylapur – Maithon etc. for carrying out revised system studies.

(c) The scheme would be again taken up for deliberation in CMETS-ER after receipt of inputs from WBSETCL and revised studies.

7.2. Now, WBSETCL has informed following vide emails dated 28-04-2022 and 20-05-2022:

(a) Space is available at Asansol (WBSETCL) S/s for termination of new Maithon (POWERGRID) – Asansol (WBSETCL) 220kV D/c line

(b) The Maithon (POWERGRID) – Asansol (WBSETCL) 220kV D/c line will be implemented with Single HTLS (1200A Drake or equivalent) along with line bays at both ends.

(c) As proposed in the 5th CMETS-ER, Asansol – Mongalpur and Asansol – JK Nagar 220kV line sections shall be reconductored by WBSETCL with Single HTLS (1200A Drake or equivalent) along with necessary upgradation in line bay equipment at both ends.

7.3. In view of the above, following is proposed:

(a) Space allocation at Maithon (POWERGRID) ISTS S/s to WBSETCL: Space for implementation of 2 no. 220kV line bays would be provided at Maithon (POWERGRID) ISTS S/s for termination of Maithon (POWERGRID) – Asansol (WBSETCL) 220kV D/c intra-state line with Single HTLS (1200A Drake or equivalent) of WBSETCL.

(b) WBSETCL will take up reconductoring of Asansol – Mongalpur and Asansol – JK Nagar 220kV line sections with Single HTLS (1200A Drake or equivalent) along with necessary upgradation in line bay equipment at both ends.

8. Revised connectivity for establishment of New Laxmikantpur 400/132kV S/s by WBSETCL – Agenda by WBSETCL, and Augmentation of transformation capacity in and around Kolkata area

8.1. Establishment of New Laxmikantpur 400/132kV, 2x315MVA GIS substation through LILO of both circuits of Haldia (CESC) – Subhasgram (POWERGRID) 400kV D/c line at New Laxmikantpur was agreed for implementation under intra-state scheme by WBSETCL in the 2nd meeting of erstwhile ERSCT held on 05-07-2019.

8.2. Now, WBSETCL vide letter dated 20-05-2022 (copy enclosed at **Annexure-IV**) has submitted that they are proposing establishment of New Laxmikantpur S/s through LILO of one circuit of under construction Jeerat New (POWERGRID) – Subhasgram (POWERGRID) 400kV D/c (Quad) line and LILO of one circuit of existing Haldia (CESC) – Subhasgram (POWERGRID) 400kV D/c line, in view of anticipated more reliability and stronger source at Jeerat New 765kV.

8.3. The above proposal was deliberated in the joint study meeting of ER held on 24-05-2022 among CTU, ERPC, ERLDC, WBSETCL and CESC, wherein following was decided:

- WBSETCL and CESC will once again deliberate along with M/s Haldia Energy Limited (HEL) and workout modalities for implementation of LILO of Haldia – Subhasgram 400kV D/c line at New Laxmikantpur, as the same is most suitable technical and economical alternative for providing connection to New Laxmikantpur S/s.
- With implementation of New Laxmikantpur 400/132kV, 2x315MVA substation, loading on Laxmikantpur 220/132kV ICTs reduces drastically as major power requirement in the area meets from New Laxmikantpur S/s. Accordingly, it is necessary to implement split bus arrangement at Laxmikantpur S/s at 132kV level, so that some loads are fed from Subhasgram through 220kV D/c line and balance from New Laxmikantpur. This shall enable effective utilisation of ICTs at Laxmikantpur, New Laxmikantpur, and Subhasgram. Accordingly, WBSETCL needs to plan suitable bus split arrangement at Laxmikantpur S/s.
- With growth in demand in and around Kolkata area necessity of augmentation of transformation capacity at Jeerat (WBSETCL), Jeerat-New (POWERGRID) and Subhasgram (POWERGRID) is observed. ICTs at Jeerat are found to be critically loaded in base case itself. Accordingly, it was decided that following new ICTs may be installed in ISTS:
  (i) New 765/400kV, 1500MVA (3x500MVA single phase units) ICT at Jeerat New (POWERGRID) S/s along with associated ICT bays – ***to be finalised based on loading details to be provide by ERDLC***
  (ii) New 400/220kV, 500MVA ICT at Subhasgram (POWERGRID) S/s along with associated ICT bays

- Further, ERLDC highlighted the issue of augmentation of transformation capacity at Sagardighi TPS and Gokarna. WBSETCL informed that they are planning to install 3rd 400/220kV ICT at Gokarna, whose capacity they will confirm in the CMETS-ER. WBSETCL was also requested that they may discuss with WBPDCL regarding augmentation of transformation capacity at Sagardighi TPS, as presently there is only one 400/220kV, 315MVA ICT.
- WBSETCL will review the loads modelled at substations in Kolkata area for 2026-27 time-frame PSSE file.

8.4. Subsequently, it has been observed that N-1 of ICTs is not being fulfilled at Kolaghat, Chanditala, and Kharagpur substations also in 2026-27 time-frame. Accordingly, WBSETCL may share plan for augmentation of transformation capacity at these substations.

8.5. In view of the above, following may be updated by WBSETCL:

(a) Outcome of deliberation with CESC and HEL for implementation of New Laxmiknatpur S/s through LILO of both circuits of Haldia (HEL) – Subhasgram (POWERGRID) 400kV D/c line.

(b) Split bus arrangement at Laxmikantpur with implementation of New Laxmikantpur S/s.

(c) Capacity of 3rd 400/220kV ICT at Gokarna.

(d) Feasibility for installation of new 400/220kV ICT at Sagardighi TPS (inputs may be arranged in consultation with WBPDCL)

(e) Plan for augmentation of transformation capacity at Jeerat, Kolaghat, Chanditala, and Kharagpur substations.

8.6. Following scope of works is proposed to be implemented under ISTS scheme namely Eastern Region Expansion Scheme-XXX (ERES-XXX) with implementation time-frame of 24 months from date of allocation:

(a) New 765/400kV, 1500MVA (3x500MVA single phase units) ICT at Jeerat New (POWERGRID) S/s along with associated ICT bays – ***to be finalised based on loading details to be provide by ERDLC***

(b) Installation of new 400/220kV, 500MVA ICT (6th) at Subhasgram (POWERGRID) S/s along with associated ICT bays in AIS and 220kV, 1200sqmm XLPE (single phase) cable (approx. 1.5km) for connection of 220kV side of ICT to 220kV ICT bay

9. Augmentation of 132/66kV transformation capacity at Gangtok (POWERGRID) S/s – Agenda by ERPC

9.1. ERPC has informed that, presently 132/66kV Gangtok S/s is having 2x50MVA ICTs in service. Going by the loading profile in last winter (From Dec-21 to Feb-22) it is observed that due to huge load growth around Gangtok, both ICT's are

loaded around 90% of the rated capacity. Further, in downstream 66kV feeders, most of the feeders are reconductored in recent past with enhanced power transfer capacity, but loading is mostly restricted due to limitation of ICT capacity. Synopsis of loading of both ICT's are given below:

Date	ICT-I Peak Load	ICT-II Peak Load	Remarks
27.01.2022	44 MW	45 MW	Almost 90 % Loading during peak load
28.01.2022	43 MW	44 MW	Almost 90 % Loading during peak load
29.01.2022	44 MW	45 MW	Almost 90 % Loading during peak load
30.01.2022	42 MW	43 MW	Almost 90 % Loading during peak load
31.01.2022	44 MW	45 MW	Almost 90 % Loading during peak load

9.2. From the above, it is evident that N-1 reliability is not met at Gangtok S/s during peak load condition. Outage of any ICT during peak load condition might lead to cascaded tripping leading to large scale power outage. To mitigate the issue, it is essential to expeditiously install 3rd 50MVA, 132/66kV ICT at Gangtok S/s.

9.3. Presently, 01 no. of spare 50MVA, 132/66kV ICT is available at Rangpo (POWERGRID) S/s. To install the same as 3rd 50MVA, 132/66kV ICT at Gangtok (POWERGRID) S/s, following is proposed as per inputs from POWERGRID:

a) Against non-availability of space for new bays, existing Transfer Bus Coupler Bays at 132kV & 66kV switchyards shall be used for connection of new 50MVA, 132/66kV ICT, so as to commission the ICT on urgent basis.

b) Adjacent land may be acquired by POWERGRID with help of Sikkim Govt. for reconstruction of Transfer Bus Coupler Bays at 132kV & 66kV switchyards.

c) Till commissioning of b) above, Transfer Bus Coupler Bays at 132kV & 66kV switchyards shall not be available.

d) New 132/66kV, 50MVA ICT shall be procured to replenish the spare ICT at Rangpo (POWERGRID) S/s

9.4. Following scope of works is proposed to be implemented under ISTS scheme namely Eastern Region Expansion Scheme-XXXI (ERES-XXXI) with implementation time-frame of 18 months from date of allocation:

(a) Installation of 132/66kV, 50MVA spare ICT available at Rangpo (POWERGRID) S/s as 3rd 132/66kV, 50MVA ICT at Gangtok (POWERGRID) S/s through Transfer Bus Coupler Bays at 132kV & 66kV switchyards

(b) Reconstruction of Transfer Bus Coupler Bays at 132kV & 66kV switchyards at Gangtok (POWERGRID) S/s

(c) New 132/66kV, 50MVA ICT to replenish the spare ICT at Rangpo (POWERGRID) S/s

10. Status of downstream 220kV or 132kV network by STUs from the various commissioned and under-construction ISTS substations in ER

10.1. Numbers of ISTS sub-stations have been commissioned and some are under construction for which the downstream system is being implemented by the STUs. Based on the information provided by the states, updated information on planned/under-construction downstream system is given at **Annexure-I**.

10.2. STUs may update the status of downstream system given at **Annexure-I** prior to the meeting for further deliberations in the meeting, if any.

11. Status of 400kV substations being implemented by STUs in ER under intra-state schemes to be connected through ISTS

11.1. Various 400kV substations have been approved in the intra-state strengthening schemes in ER having interconnection with ISTS grid involving LILO of ISTS lines or direct connection to ISTS substations. Status of such intra-sate substations as per available information is given at **Annexure-II**.

11.2. STUs may update the status of the transmission system given at **Annexure-II** prior to the meeting for further deliberations in the meeting, if any.

Annexure-I

Status of Downstream Transmission Network in ER

Sl. No.	ISTS S/s	State	Voltage ratio, Trans. Cap	Downstream Voltage level (kV)	Unutilised bays	Status of ISTS bay	STU lines for unutilised bays	Status of Lines	
								Date of Award	Completion schedule
1.	Chaibasa	Jharkhand	400/220kV, 2x315MVA	220	2	Existing bay	Chaibasa (POWERGRID) – Jadugoda (JUSNL) 220kV D/c		Will be taken up in future. No firm plan as of now.
2.	Daltonganj	Jharkhand	400/220/132kV, 2x315MVA+ 2x160MVA	132	2	Existing bay	Daltonganj (POWERGRID) – Chatarpur 132kV D/c	22-10-2019	Expected by 31-03-2023.
3.	Dhanbad	Jharkhand	400/220kV	220	4	Existing bay	LILO of 1st circuit of 220kV Dumka – Govindpur D/c line at Dhanbad (23km)	Bid has been opened.	Dec 2023
							LILO of 2nd circuit of 220kV Dumka – Govindpur D/c line at Dhanbad	Survey and estimation are being taken up. Thereafter, funding will be tied up.	
4.	Bolangir	Odisha	400/220kV, 2x315MVA	220	2	Existing bay	LILO of one ckt. of Sadeipalli – Kesinga 220kV D/c at Bolangir		Charged on 5th Mar'22.
5.	Keonjhar	Odisha	400/220kV, 2x315MVA	220	2	Existing bay	Keonjhar (POWERGRID) – Turumunga (OPTCL) 220kV D/c		Expected by Dec'22.
6.	Pandiabil	Odisha	400/220kV, 2x500MVA	220	2	Existing bay	Pratapsasan (OPTCL) – Pandiabil (POWERGRID) 220kV D/c		Expected by 1st week of May'22.
7.	Subashgram	West Bengal	400/220kV, 3x315MVA	220	2	Existing bay	Subashgram (POWERGRID) – Baraipur 220kV D/c line		Testing is going on. Expected by 10th may'22.
8.	Rajarhat	West Bengal	400/220kV, 2x500MVA	220	4	Existing bay	Rajarhat (POWERGRID) – New Town AA2C 220kV D/c		Severe ROW (12km) in cable laying. Expected by Oct 2022.
							Rajarhat (POWERGRID) – Barasat/Jeerat 220kV D/c		Charged from Barasat end
9.	Sitamarhi (New)	Bihar	400/220/132kV, 2x500MVA + 2x200MVA	132	2	Existing bay	LILO of Benipatti - Pupri 132kV S/c at Sitamarhi (New)		Expected by june'22.

Sl. No.	ISTS S/s	State	Voltage ratio, Trans. Cap	Downstream Voltage level (kV)	Unutilised bays	Status of ISTS bay	STU lines for unutilised bays	Status of Lines	
								Date of Award	Completion schedule
10.	Saharsa (New)	Bihar	400/220/132kV, 2x500MVA + 2x200MVA	220	4	Existing bay	Saharsa (New) - Khagaria 220kV D/c line		Charged on 11th april'22
							Saharsa (New) - Begusarai 220kV D/c line		Expected by May'22.
				132	2-ISTS (addln.4 by state)		Saharsa (New) - Saharsa 132kV D/c line formed by LILO of Saharsa - Banmankhi and Saharsa - Uda Kishanganj 132kV S/c line		04 nos. of bays are under construction by BSPTCL at Saharsa (New). Expected by Aug'22.
11.	Banka	Bihar	400/220/132kV, 2x500MVA + 2x200 & 1x315MVA	220	2	Under Bidding	Banka (POWERGRID) – Goradih (Sabour New) 220kV D/c line	Funds tied up. Tendering is expected shortly.	18 months from award.

Annexure-II

Status of 400kV substations being implemented by STUs in ER under intra-state schemes to be connected to ISTS

Sl. No.	Substation/Location	Transformation Capacity/ Element	Date of Award	Completion Schedule
A	**Bihar (to be implemented by BSPTCL/BGCL)**			
I	**Naubatpur GIS**	400/220/132/33kV, 2x500MVA + 2x160MVA + 2x80MVA	26.04.2018	Charged on 17th Mar 2022.
a)	LILO of circuits 3 & 4 of Patna (PG)-Balia 400 kV D/c (Quad) line at Naubatpur 400 kV 2x D/C	400kV 2x D/C	26.04.2018	Charged on 17th Mar 2022.
b)	LILO of both circuits of Ara (PG) – Khagaul (BSPTCL) line at Naubatpur (New) 220 kV 2xD/C	220kV 2xD/C	26.04.2018	Expected in May'22.
II	**Bakhtiyarpur GIS**	400/220/132kV, 2x500MVA + 2x160MVA	26.11.2019	Progressively from Aug'22 to Dec'22.
a)	LILO of both circuits of Barh – Patna (PG) 400kV D/c (Quad) line-1 at Bakhtiyarpur 400 kV 2xD/C	400kV 2xD/c	26.11.2019	Line ready to be charged matching with Bakhtiyarpur S/s.
III	**Jakkanpur GIS**	400/220/132/33kV, 2x500MVA + 3x160MVA + 4x80MVA	26.04.2018	Expected in May'22.
a)	LILO of both circuits of Nabinagar-II – Patna (PG) 400kV D/c at Jakkanpur	400kV 2xD/c	26.04.2018	Charged
IV	**Chappra (New)**	400/220/132kV, 2x500MVA + 2x200MVA	Funds not yet tied up	State Govt approval under process.
a)	LILO of 400 kV Barh (NTPC) - Motihari (DMTCL) D/C (Quad) transmission line at Chappra	400kV 2xD/c	Funds not yet tied up	State Govt approval under process.
B	**Odisha (to be implemented by OPTCL)**			
I	**Meramundali-B**	400/220kV, 2x500MVA	-	ICT-1 charged & ICT-2 on 23rd Mar'22.
II	**Digapahandi**	400/220kV, 2x500MVA	Survey in progress	2025-26
a)	Digapahandi – Therubali – Jeypore 400kV D/c line	400kV D/c	Survey in progress	2025-26
III	**Therubali**	400kV switching station along with 420kV, 1x125MVAr bus reactor	Survey in progress	2025-26
IV	**Bhadrak**	400/220kV, 2x500MVA	Tendering in progress	2024-25
a)	LILO of Baripada – Duburi and Baripada – Pandiabili 400kV line sections at Bhadrak	400kV D/c	Tendering in progress	2024-25

Sl. No.	Substation/Location	Transformation Capacity/ Element	Date of Award	Completion Schedule
V	**Paradeep***			
a)	Paradeep	400kV	Line package awarded and substation awarded in May'22	24 months
b)	Paradeep	765kV		2025-26
c)	Angul (POWERGRID) – Paradeep (OPTCL) 765kV D/c line	765kV D/c	Survey in progress	2025-26
VI	**Begunia**	765/400kV, 2x1500MVA	Kept in abeyance	Kept in abeyance
a)	Angul – Begunia 765kV D/c line	765kV D/c	Kept in abeyance	Kept in abeyance
b)	LILO of Pandiabil – Digapahandi 400kV D/c line at Begunia	400kV D/c	Kept in abeyance	Kept in abeyance
C	**Jharkhand (to be implemented by JUSNL)**			
I	**Jasidih**	400/220kV, 2x500MVA	-	No firm plan now. To be taken up in future.
II	**Chandil (New)**	400/220kV, 2x500MVA	NIT has been floated on 05-03-2022. Bid opening in 5th may'22.	24 months
a)	Chandil – Chaibasa (POWERGRID) 400kV D/c line	400kV D/c		
III	**Koderma**	400/220/132/33kV, 2x500MVA + 2x200MVA + 2x80MVA		
IV	**Mander**	400/220kV, 2x500MVA	-	No firm plan now. To be taken up in future.
a)	LILO of Patratu – Ranchi (New) 400kV D/c line at Mander	400kV 2xD/c	-	No firm plan now. To be taken up in future.
V	**Dumka (New)**	400/220kV, 2x500MVA	-	No firm plan now. To be taken up in future.
a)	Dumka (New) – Dhanbad (ISTS) 400kV D/c line	400kV D/c	-	No firm plan now. To be taken up in future.
D	**West Bengal (to be implemented by WBSETCL)**			
I	**Laxmikantpur GIS#**	400/132kV, 2x315MVA	Land identified. In process of acquisition. Expected by Dec 2024	
a)	LILO of Haldia – Subhasgram 400kV D/c line at Laxmikantpur	400kV D/c	-	Expected by Dec 2024

** OPTCL informed that Paradeep 765/400kV is different that of already under-construction Paradeep 400/220kV S/s, accordingly, they are planning 400kV 2xD/c line between two substations.*

Annexure-III

ଓଡ଼ିଶା ବିଦ୍ୟୁତ ଶକ୍ତି ସଂଚାରଣ ନିଗମ ଲିଃ.

ODISHA POWER TRANSMISSION CORPORATION LIMITED
(A Government of Odisha Undertaking)
Regd.Office: Janpath: Bhubaneswar
CORPORATE IDENTITY NUMBER (CIN) U40102OR2004GC007553
Telephone: (0674)(2543807), Fax: (0674)(2541897),e mail id:dir.project@optcl.co.in
Connect us Facebook/optcl.odisha - Twitter/optcl odisha

File No: Director (Projects) – 274 / Dated: 27.04.2022

To,

Deputy CEO
Central Transmission Utility of India Limited,
" Soudamini", 1st floor, Plot No.2, Sectror-29,
Gurugram-12201

Sub: Request for according In-principle approval for converting ACSR Zebra to HTLS in 220kV Bisra-Tarkera line as an interim measure in addition 2 nos. additional circuits 4to from Bisra (PGCIL) to Tarkera (220kV) at 220kV already approved earlier

Sir,

With reference to the above mentioned subject the following is placed for your kind consideration.

- 2 nos. of 220kV bays at Bisra was approved for additional two circuits from Bisra to Tarkera to mitigate the line loading in steady state as well as in n-1 contigency.
- However, during survey for another two circuits there were Right of way issues and corridor constraints like infringing the RSP area, river crossings, power line crossings etc will be encountered which may delay the project.
- In view of the above, OPTCL will go for converting ACSR Zebra to HTLS as an interim measure and will proceed in resolving the RoW issues for another two circuits from Bisra to Tarkera as a long term measure as approved earlier.

This may be placed as an Agenda Item in the forthcoming Standing Committee meeting to be held on 29th April 2022.

Yours faithfully,

27/4/22

Director (Projects)

CC: (1) Managing Director, OPTCL for kind information.
(2) Director (Operation) for information.
(3) CGM (CP) for information and necessary action

Annexure-IV

West Bengal State Electricity Transmission Company Ltd.

(A West Bengal Government Enterprise)
CIN : U40101WB2007SGC113474

Office of the Chief Engineer
Central Planning Department

FAX : 0332359-1955
Telephones :033 2359-2652, 033 2319-7359
E-Mail : cpd@wbsetcl.in ;cpd.wbsetcl@gmail.com

VidyutBhavan (9th Floor)
Block - DJ, Sector - II
Bidhannagar, Kolkata - 700 091

Ref No. : CE/CPD/ 157

Date : 20/05/2022

To
The Dy. C.E.O.
Central Transmission Utility of India Ltd.
PGCIL
Kendriya Karyalaya
Gurgaon-122001
Haryana

Sub : Proposal 400KV D/Ckt connectivity to proposed New Laxmikantapur 400/132KV Sub-station of WBSETCL through S/Ckt LILO of under construction New Jeerat (PG)-Subhasgram (PG) 400KV D/Ckt line

Dear Sir,

I would request you to kindly refer to our enclosed communications addressed to the Chief Engineer (PSP&A-II), CEA proposing 400KV D/Ckt connectivity to proposed New Laxmikantapur 400/132KV Sub-station of WBSETCL through S/Ckt LILO of under construction New Jeerat (PG)-Subhasgram (PG) 400KV D/Ckt line.

Since the proposed connectivity is with ISTS you are requested to kindly conduct relevant system study as necessary & put up the 400KV connectivity proposal before the CMETS-ER for their appraisal & approval in this regard.

Thanking you,

Enclo : As stated

Yours Faithfully,

20/05/2022

(D.Chaki)
Chief Engineer (CPD)

West Bengal State Electricity Transmission Company Ltd.

(A Government of West Bengal Enterprise)
CIN : U40101WB2007SGC113474

Office of the Chief Engineer
Central Planning Department

FAX : 033-23591955
Telephones : 033-23592652, 033-23197359
E-Mail : cpd.wbsetcl@gmail.com

Vidyut Bhavan (9th Floor)
Block - DJ, Sector - II
Bidhannagar, Kolkata - 700091

Ref. No. : CE/CPD/CEA/ 119

Date : 26/04/2022

To
The Chief Engineer (PSP&A-II)
Central Electricity Authority
Power System Planning & Appraisal Division-II
Sewa Bhawan, R.K.Puram-I
New Delhi-110066

Subject : Proposal for 400KV D/C connectivity to proposed New Laxmikantapur 400/132KV sub-station of WBSETCL through S/C LILO of under construction New Jeerat (PG)-Subhasgram (PG) 400KV D/C line

Dear Sir,

The State Transmission System of West Bengal in South 24 Parganas District is under considerable stress & is facing system constraints as the demand of power due to load growth in this district & as well as in its adjacent district viz. North 24 Parganas has been observed to have grown to a maximum as compared to other Districts. The main source of power supply in the district is Laxmikantapur 220/132/33KV sub-station which is presently feeding Kakdwip, Serakol & Falta 132/33KV sub-station besides its own load. Another 02(two) nos of 132KV sub-stations viz. Ramganga & Gordwani are coming up in the district shortly, load of which are also required to be catered. The installed 220/132KV transformation capacity of Laxmikanatapur 220KV sub-station is (3x160)MVA with a recorded maximum demand of 430MVA so far. This 220KV sub-station is fed through 220KV D/C from Subhasgram 220KV sub-station of WBSETCL which in turn is connected to Subhasgram 400KV sub-station of PGCIL. There is no N-1 contingency for the lines & in case of outage of any of the mentioned 220KV lines the entire southern part of 24 Parganas(S) district may remain without power for a prolonged duration.

Considering the present & future load demand of the above stated area one 400KV connectivity for its proposed New Laxmikanatapur 400KV sub-station was put up by WBSETCL for reliable operation of the grid with N-1 contingency. Accordingly the scheme for establishment of New Laxmikantapur 400KV sub-station with D/C LILO of Haldia (HEL)-Subhasgram (PG) 400KV D/C line was placed & was agreed to in the 2nd Meeting of Eastern Region Standing Committee on Transmission (ERSCT), CEA.

In the mean time the construction of 400KV D/C line (Quad Moose) between New Jeerat (PG) 765KV sub-station & Subhasgram (PG) 400KV sub-station is in progress & scheduled to be completed early. In view of getting a very strong connectivity for ensuring reliability in power supply with N-1 contingency one proposal for "Establishment of 400KV D/C connectivity at proposed New Laxmikantapur 400KV sub-station through S/C LILO of under construction New Jeerat (PG)-Subhasgram (PG) 400KV D/C line (Approx RL=52Km) by WBSETCL" is herby submitted for approval please.

The detailed proposal is being enclosed for kind perusal please.

Enclo : (i) Proposal
(ii) Annexure-I
(iii) Annexure-II

Yours Faithfully,
26/04/2022
(D.Chaki)
Chief Engineer (CPD)

Proposal for S/C LILO of under construction New Jeerat(PG)-Subhasgram(PG) 400 KV D/C line at proposed New Laxmikantapur 400/132 KV SS of WBSETCL.

In the state of West Bengal, demand of power as well as load growth of the two 24 Parganas Districts (North & South) are maximum compared to other districts. Out of the two, the demand of power in the district of 24 Pargana(South) is growing very rapidly. Looking into the southern part of the district, the main source of supply is Laxmikantapur 220/132/33 KV SS presently feeding existing Kakdwip, Falta & Sirakol 132/33 KV sub-station and will be the source of two upcoming 132 KV SS namely Ramganga and Gordwani. The installed 220/132 KV transformation capacity of Laxmikantapur 220 KV SS is (3X160)MVA with a recorded maximum demand of 430 MVA which is again fed through 220 KV D/C from Subhasgram 220 KV SS of WBSETCL. There is no N-1 contingency for the lines and in case of outage of any one, the entire southern part of the district may be out of power for prolonged time.

Hence, considering the present and future load of that area, for reliable operation of the grid in compliance with N-1 contingency, one 400 KV connectivity was proposed by WBSETCL and put up to CEA. For establishment of 400 KV SS near Laxmikantapur, 400 KV D/C LILO of Haldia(HEL)-Subhasgram(PG) 400 KV D/C Line had been proposed which is passing nearby. Accordingly, the scheme had been agreed in the 2nd Meeting of Eastern Region Standing Committee on Transmission (ERSCT), CEA held on 5th July 2019 at Siliguri. The detailed scheme is attached herewith as Annexure-I.

Afterwards, a committee was formed to assess technical feasibility for establishment of New Laxmikantapur 400 kV GIS with D/C LILO of HEL–Subhasgram (PG) 400 kV D/C line comprising of members from WBSETCL, WBSEDCL and CESC.

From the joint meetings of the committee it is found that reliability and quality of power supply in 24 Paraganas (S) district would be increased with the proposed scheme. With LILO of HEL–Subhasgram(PG) 400 kV D/C , benefit could be achieved with minimum CAPEX and with minimum time as per STU.

Also, from studies conducted by STU it is also observed that there would be improvement of voltage in remote areas of 24 Parahanas (S) district after establishment of New Laxmikantapur 400 kV GIS.

26/11/2022

In view of above, private land at Laxmikantapur beside the 400 kV line has been finalized and is under process for direct purchase from the land owner. Around 500mtr. length of the line would be increased for the proposed LILO.

However, as decided in the last meeting of the committee, further load flow studies are required based upon the projection of the 20th EPS, the state revised plan and the commercial aspects involved.

Since establishment of the 400 KV sub-station at Laxmikantapur is extremely necessary at the earliest for reliable operation of the grid and to supply un-interrupted quality power supply to the district, WBSETCL is proposing for establishment of S/C LILO of under construction New Jeerat(PG)-Subhasgram(PG) 400 KV D/C line (Quad Moose) (approximate RL=52 km) at proposed New Laxmikantapur 400/132 KV SS of WBSETCL. This will be a stronger source compared to the proposed Haldia(HEL)-Subhasgram(PG) 400 KV line and will be more reliable from the network operation point of view. Under the newly proposed scheme, we may consider S/C LILO of Haldia(HEL)-Subhasgram(PG) 400 KV D/C line at proposed New Laxmikantapur 400 KV SS. The detailed scheme as proposed is attached herewith as Annexure-II.

Study conducted by STU shows that the proposed scheme will fulfill N-1 contingency criteria for 400 KV and 220 KV networks and reliability and quality of supply will be enhanced to great extent.

The entire work will be executed by WBSETCL at its own cost.

The matter is therefore placed to the Standing Committee for Eastern Region for consideration and approval.

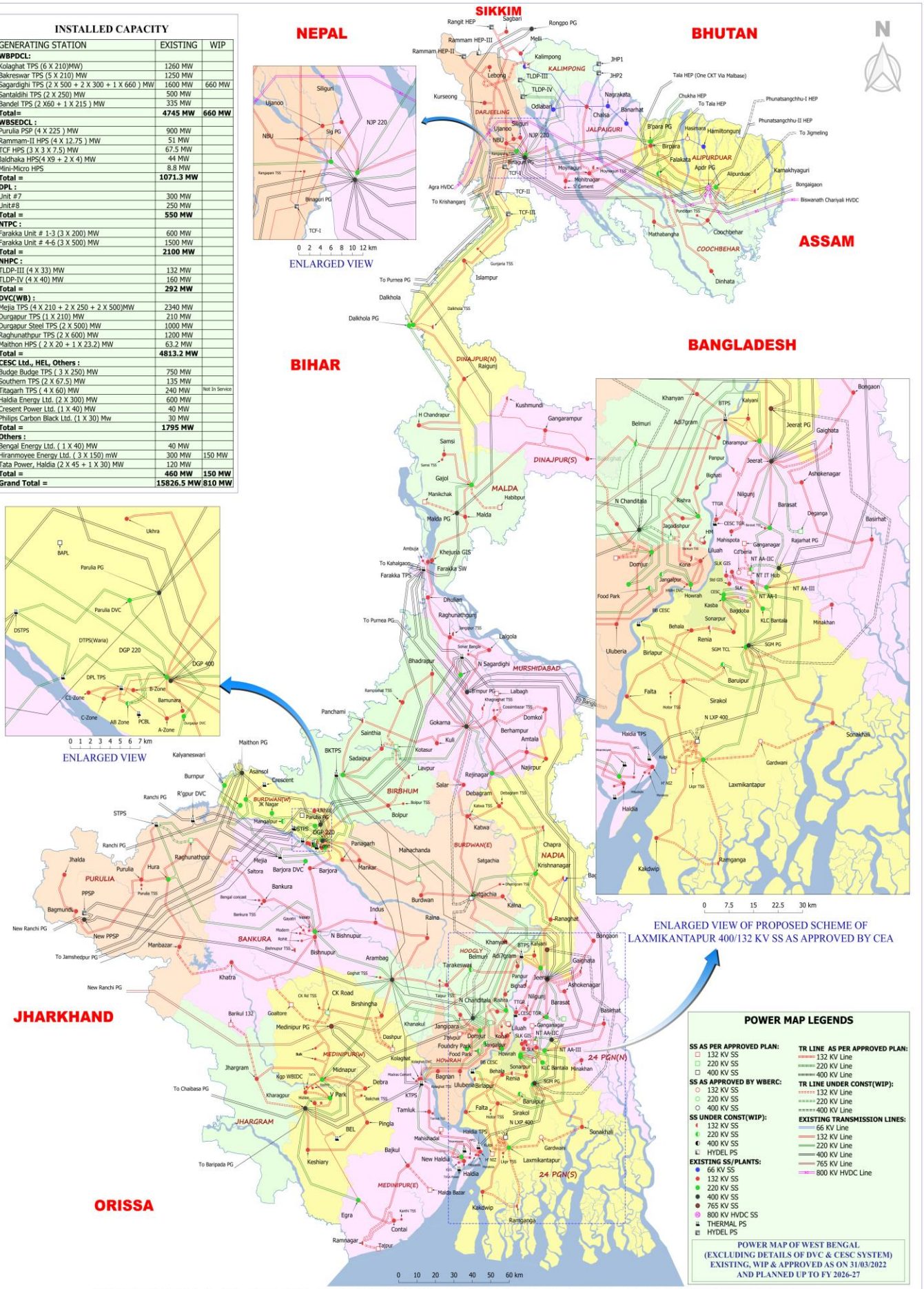
26/04/2022

Chief Engineer
Central Planning Dept. WBSETCL

ANNEXURE-I: APPROVED PROPOSED SCHEME OF LAXMIKANTAPUR 400/132 KV SS

INSTALLED CAPACITY

GENERATING STATION	EXISTING	WIP
WBPDCL:		
Kolaghat TPS (6 X 210)MW)	1260 MW	
Bakreswar TPS (5 X 210) MW	1250 MW	
Sagardighi TPS (2 X 500 + 2 X 300 + 1 X 660) MW	1600 MW	660 MW
Santaldihi TPS (2 X 250) MW	500 MW	
Bandel TPS (2 X60 + 1 X 215) MW	335 MW	
Total=	**4745 MW**	**660 MW**
WBSEDCL :		
Purulia PSP (4 X 225) MW	900 MW	
Rammam-II HPS (4 X 12.75) MW	51 MW	
TCF HPS (3 X 3 X 7.5) MW	67.5 MW	
Jaldhaka HPS(4 X9 + 2 X 4) MW	44 MW	
Mini-Micro HPS	8.8 MW	
Total =	**1071.3 MW**	
DPL :		
Unit #7	300 MW	
Unit#8	250 MW	
Total =	**550 MW**	
NTPC :		
Farakka Unit # 1-3 (3 X 200) MW	600 MW	
Farakka Unit # 4-6 (3 X 500) MW	1500 MW	
Total =	**2100 MW**	
NHPC :		
TLDP-III (4 X 33) MW	132 MW	
TLDP-IV (4 X 40) MW	160 MW	
Total =	**292 MW**	
DVC(WB) :		
Mejia TPS (4 X 210 + 2 X 250 + 2 X 500)MW	2340 MW	
Durgapur TPS (1 X 210) MW	210 MW	
Durgapur Steel TPS (2 X 500) MW	1000 MW	
Raghunathpur TPS (2 X 600) MW	1200 MW	
Maithon HPS (2 X 20 + 1 X 23.2) MW	63.2 MW	
Total =	**4813.2 MW**	
CESC Ltd., HEL, Others :		
Budge Budge TPS (3 X 250) MW	750 MW	
Southern TPS (2 X 67.5) MW	135 MW	
Titagarh TPS (4 X 60) MW	240 MW	Not In Service
Haldia Energy Ltd. (2 X 300) MW	600 MW	
Cresent Power Ltd. (1 X 40) MW	40 MW	
Philips Carbon Black Ltd. (1 X 30) Mw	30 MW	
Total =	**1795 MW**	
Others :		
Bengal Energy Ltd. (1 X 40) MW	40 MW	
Hiranmoyee Energy Ltd. (3 X 150) mW	300 MW	150 MW
Tata Power, Haldia (2 X 45 + 1 X 30) MW	120 MW	
Total =	**460 MW**	**150 MW**
Grand Total =	**15826.5 MW**	**810 MW**



WEST BENGAL STATE ELECTRICITY TRANSMISSION COMPANY LIMITED

ANNEXURE-II: NEW PROPOSED SCHEME OF LAXMIKANTAPUR 400/132 KV SS

INSTALLED CAPACITY

GENERATING STATION	EXISTING	WIP
WBPDCL:		
Kolaghat TPS (6 X 210)MW)	1260 MW	
Bakreswar TPS (5 X 210) MW	1250 MW	
Sagardighi TPS (2 X 500 + 2 X 300 + 1 X 660) MW	1600 MW	660 MW
Santaldihi TPS (2 X 250) MW	500 MW	
Bandel TPS (2 X60 + 1 X 215) MW	335 MW	
Total=	**4745 MW**	**660 MW**
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Purulia PSP (4 X 225) MW	900 MW	
Rammam-II HPS (4 X 12.75) MW	51 MW	
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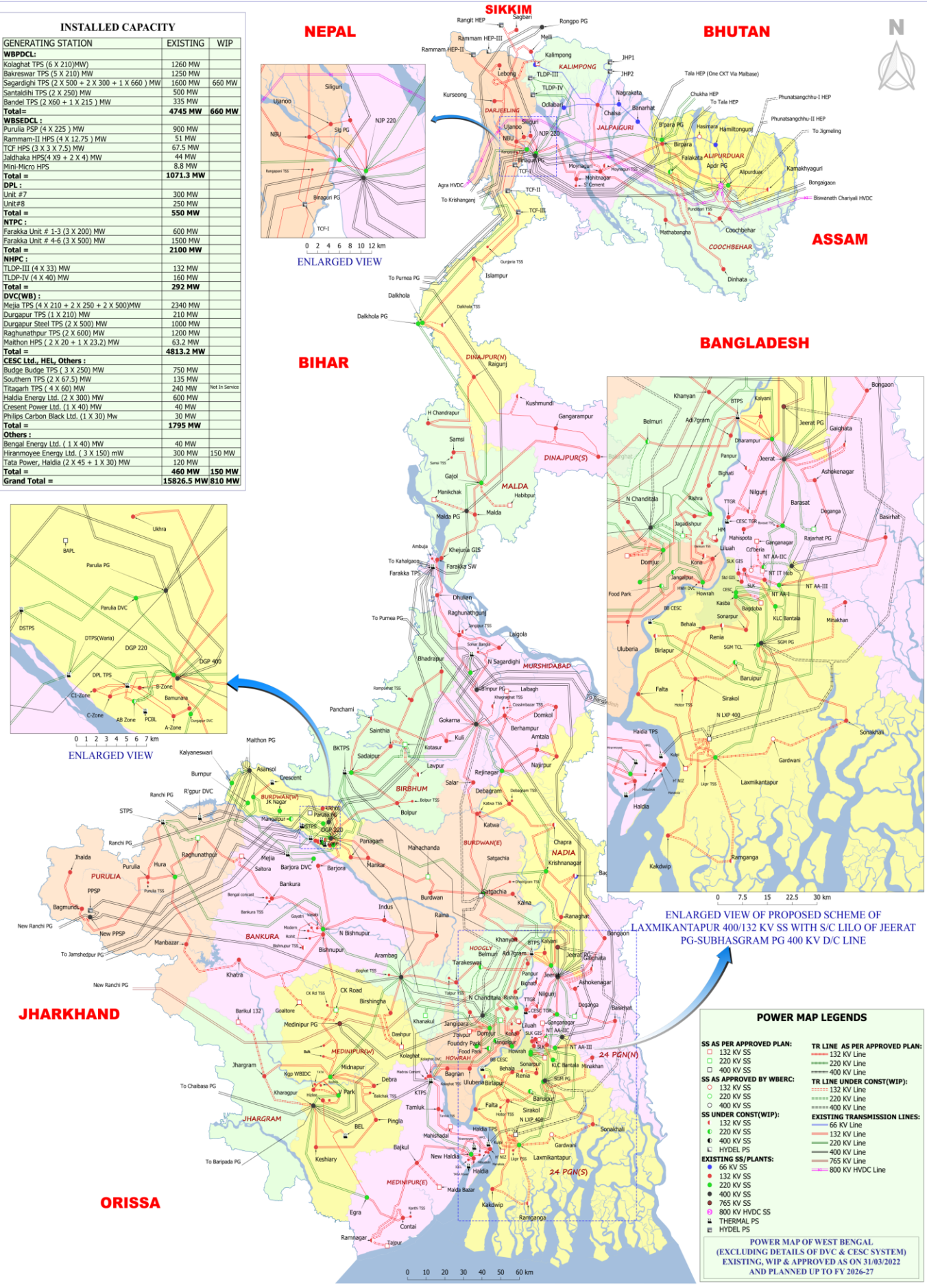
Jaldhaka HPS(4 X9 + 2 X 4) MW	44 MW	
Mini-Micro HPS	8.8 MW	
Total =	**1071.3 MW**	
DPL :		
Unit #7	300 MW	
Unit#8	250 MW	
Total =	**550 MW**	
NTPC :		
Farakka Unit # 1-3 (3 X 200) MW	600 MW	
Farakka Unit # 4-6 (3 X 500) MW	1500 MW	
Total =	**2100 MW**	
NHPC :		
TLDP-III (4 X 33) MW	132 MW	
TLDP-IV (4 X 40) MW	160 MW	
Total =	**292 MW**	
DVC(WB) :		
Mejia TPS (4 X 210 + 2 X 250 + 2 X 500)MW	2340 MW	
Durgapur TPS (1 X 210) MW	210 MW	
Durgapur Steel TPS (2 X 500) MW	1000 MW	
Raghunathpur TPS (2 X 600) MW	1200 MW	
Maithon HPS (2 X 20 + 1 X 23.2) MW	63.2 MW	
Total =	**4813.2 MW**	
CESC Ltd., HEL, Others :		
Budge Budge TPS (3 X 250) MW	750 MW	
Southern TPS (2 X 67.5) MW	135 MW	
Titagarh TPS (4 X 60) MW	240 MW	Not In Service
Haldia Energy Ltd. (2 X 300) MW	600 MW	
Cresent Power Ltd. (1 X 40) MW	40 MW	
Philips Carbon Black Ltd. (1 X 30) Mw	30 MW	
Total =	**1795 MW**	
Others :		
Bengal Energy Ltd. (1 X 40) MW	40 MW	
Hiranmoyee Energy Ltd. (3 X 150) mW	300 MW	150 MW
Tata Power, Haldia (2 X 45 + 1 X 30) MW	120 MW	
Total =	**460 MW**	**150 MW**
Grand Total =	**15826.5 MW**	**810 MW**



WEST BENGAL STATE ELECTRICITY TRANSMISSION COMPANY LIMITED

System Studies for grant of LTA

EXHIBIT-1A

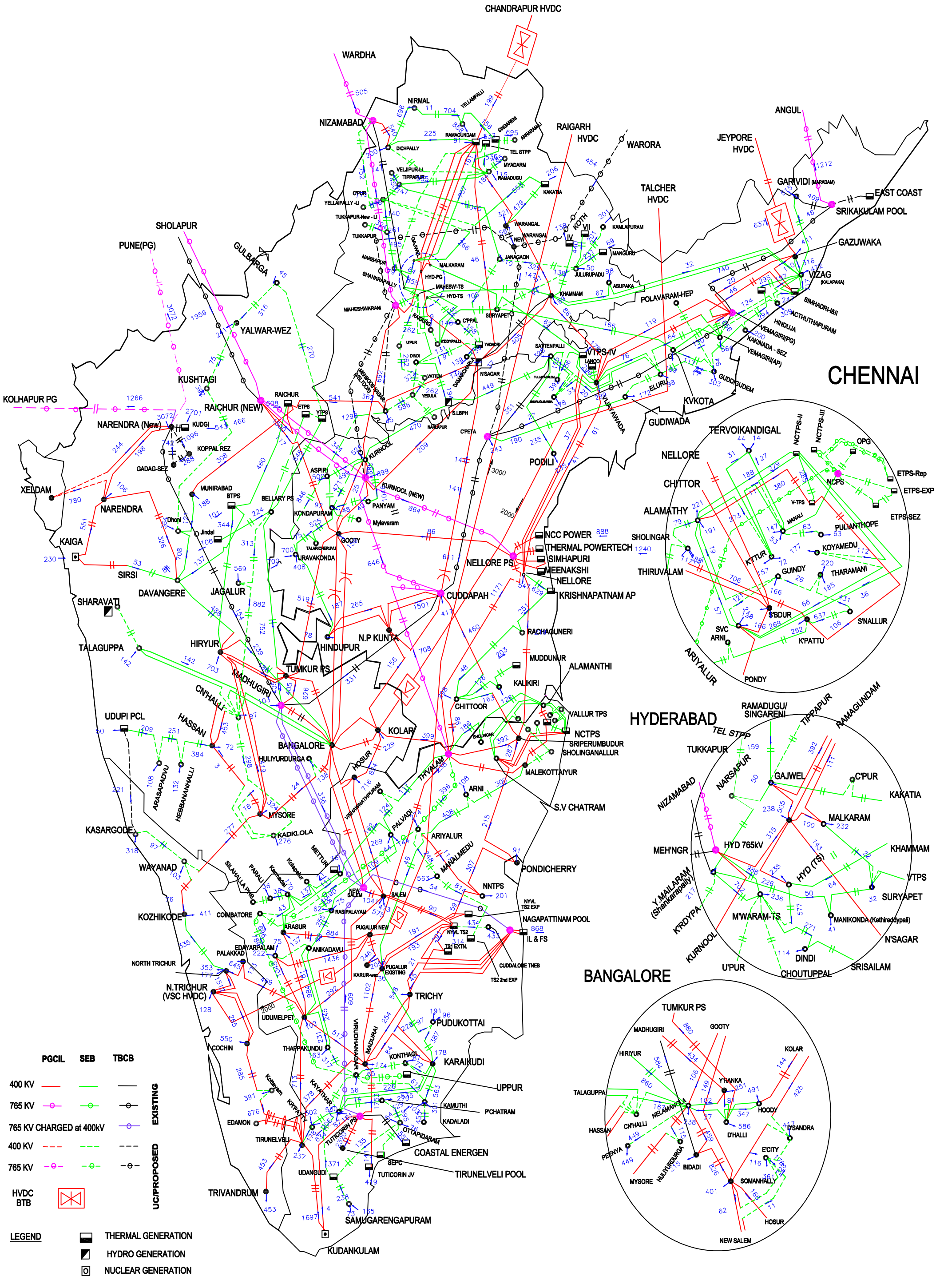
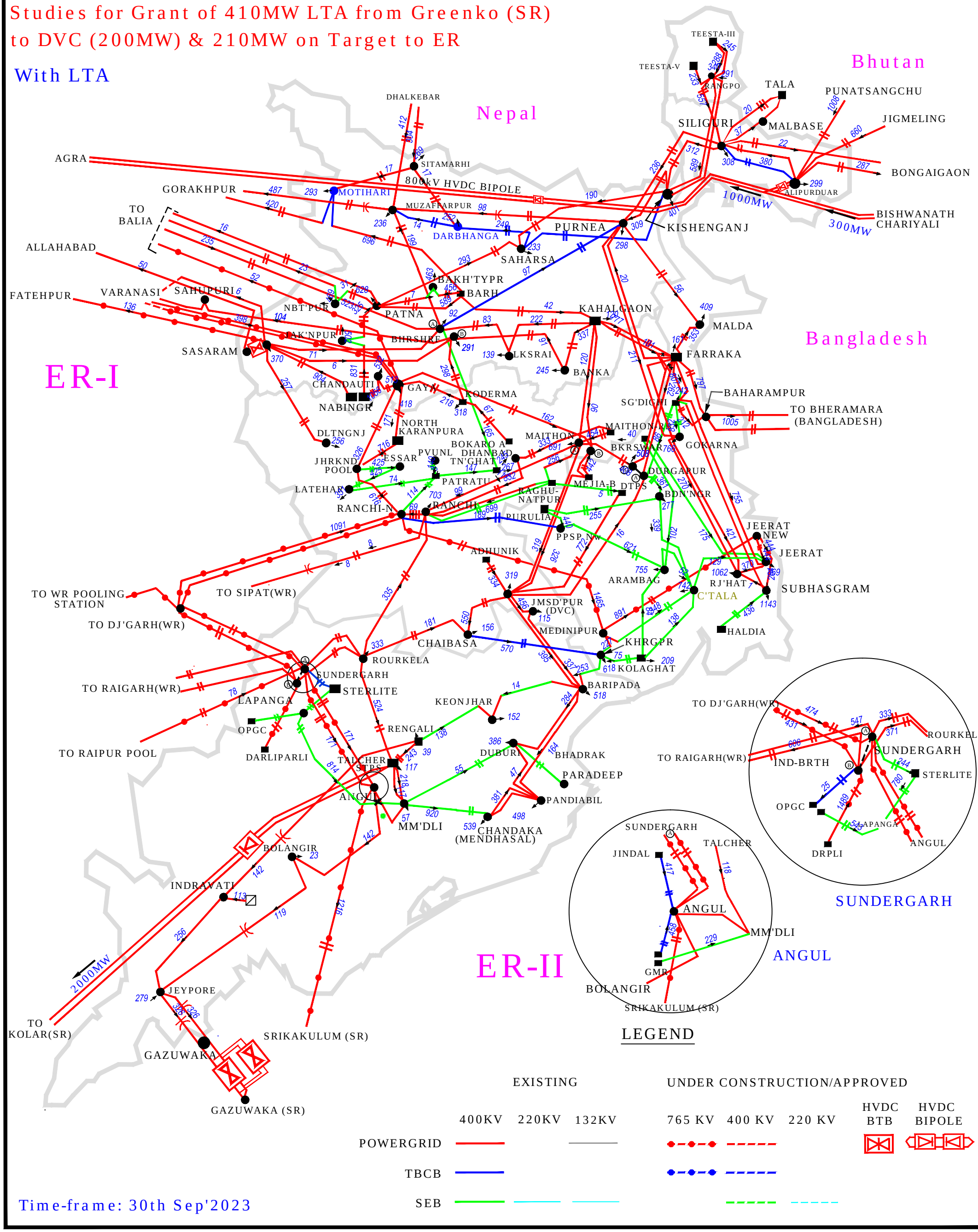


EXHIBIT-1B

POWER MAP OF EASTERN REGION

Studies for Grant of 410MW LTA from Greenko (SR) to DVC (200MW) & 210MW on Target to ER

With LTA



LEGEND

	EXISTING			UNDER CONSTRUCTION/APPROVED				
	400KV	220KV	132KV	765 KV	400 KV	220 KV	HVDC BTB	HVDC BIPOLE
POWERGRID								
TBCB								
SEB								

Time-frame: 30th Sep'2023

POWER MAP OF WESTERN REGION

EXHIBIT-2A : BASE CASE (WR)

WRTS-II

WRTS-I

RAJASTHAN

GUJARAT

MAHARASHTRA

M.P.

UTTAR PRADESH

CHHATTISGARH

JHARKHAND

ODISHA

TELANGANA

KARNATAKA

MAHENDRAGARH (HARYANA)

KANKROLI

CHITTORGARH

BHINMAL

JAIPUR

AGRA

MORENA

ALIGARH

GWALIOR

ORAI

KURUKSHETRA (HARYANA)

VARANASI

RAPP

BANASKANTHA

ZERDA

RADHANESDA

BHUJ-II

BHUJ PS

SANKHARI

SOJA

PRANTIJ

BHACHUNDA

CHARANKA SOLAR PARK

RANCHODPURA (VADAVI)

SAMI

SANAND

CGPL-MUNDRA(UMPP) (5x800)

DACHAU

LAKADIA

DEHGAM

MUNDRA ADANI (4x330+5x660)

VARSANA

NICOL TORRENT

WANAKBORI

PIRANA-PG

PIRANA-T

KASOR

ESSAR

HALVAD

CHORANIA

KALAVAD

SHAPAR

HADALA

JAM KHAMBHALIYA

BHOGAT

JETPUR

AMRELI

FEDRA

ASOJ

SARDAR SAROVAR

RAJGARH

VADODARA

GANDHAR GEB

HAZIRA

GANDHAR NTPC

Uno Sugen

KOSAMBA

SUGEN

KAKRAPAR

DGEN

VAV

NAVSARI

MAGARWADA

VAPI

KALA

TARAPUR

BOISAR

SINNAR TPP

BABHLESHWAR

A'BAD-III (EKTONI)

A'BAD-II (TAPITIANDA)

A'BAD-I (WALUJ)

A'BAD(PG)

R-INFRA BOISAR

KUDUS

PADGHE-PG

KALWA

PADGHE

PUNE(AIS)

PUNE(GIS)

KHARGHAR

VIKHROLI

NM

CHAKAN

LONIKAND-II

NAVIMUMBAI

GHATKOPAR

AMBERNATH

LONIKAND-I

RETWADI

NAGOTHANE

HINJEWADI

PARLI(N)

NANDED

PARLI(PG)

PARLI

DHABOL (RGPPL)

KESURDI

JEJURI

SOLAPUR

SOLAPUR STPP

KOYNA &

NEW KOYNA

JAIGAD

KARAD

SOLAPUR(PG)

ALKUD

KOLHAPUR

KOLHAPUR-PG

MAPUSA

XELDAM

NARENDRA NEW

NARENDRA

RAICHUR

NIZAMABAD

WARANGAL

TO RAMAGUNDAM

MANDSAUR

NAGDA

UJJAIN

INDORE(PG)

INDORE

Pithampur

MALWA

CHEGAON

JULWANIA

DHULE(BDTCL)

DHULE

BHUSAWAL-I

BHUSAWAL-II

AKOLA-II

AKOLA-I

WARDHA

A'BAD-III (EKTONI)

BINA TPS

BINA

BINA-MP

SHUJALPUR

BHOPAL

BHOPAL(BDTCL)

ASHTA

ITARSI

NARMADA SAGAR

KHARGONE

BETUL

KHANDWA POOL

KHANDWA

AMRAVATI TPP

N'PETH

MAUDA

IEPL

WARORA

WARORA POOL

BARETHI TPS

CHHATAPUR

SATNA

SASAN (6x660)

RIHAND-III (2x500)

DAMOH

SAGAR

NIGRI

KATNI

RUMS (3x250)

REWA POOL

VIND'POOL

VIN-IV&V (3x500)

SINGRAULI

VIN-I,II&III (6x210+4x500)

JABALPUR POOL

JABALPUR

GADARWARA

BIRSINGHPUR

ESSAR MAHAN (2x600)

BILASPUR POOL

DHARAMJAYGARH

RANCHI

RANCHI

GENERATIONS AT SUNDERGARH

OPGC (2x660MW)

DARLIPALI (2x800MW) B

STERLITE (4x600MW)

SUNDERGARH

IND-BHARATH (2x350MW)

SEONI

KORADI-III

TIRODA ADANI

KORADI-I

KORADI-II

KHAPARKHEDA

BHILAI

BHATAPARA

SIPAT

CHAMPA

KORBA(W)

KORBA STPS (3x200+ 4x500)

JINDAL

LARA

RAIGARH

RAIGARH (TAMNAR)

RAIGARH(KOTRA)

TO BUDHIPADAR

ROURKELA

SUNDERGARH

NSPCL

RAIPUR

RAJNANDG'N

RAIPUR POOL

GMR

DHAMTARI

BHDRAVATI

EMCO

DHARIWAL

CH'PR-II

CH'PR-I

JAGDALPUR

Pugalur (TAMIL NADU)

GENERATIONS AT RAIGARH KOTRA

ATHENA (2x600MW)

VISA POWER (2x600MW)

RKM (4x360MW)

KOTRA-A

KOTRA-B

SKS (4x300MW)

KWPCL (1x600MW)

LARA (2X800)

DB POWER (2x600MW)

CHAMPA POOL-B

GENERATIONS AT CHAMPA POOL

LANCO AMARKANTAK (2x660MW)

KPCL (2x800MW)

MB POWER (2x660MW)

CHAMPA POOL-B

CHAMPAPOOL-A

RAIGARH-KOTRA

KSK MAHANADI (6x600MW)

LARA (2X800)

GENERATIONS AT RAIGARH TAMNAR

TRN ENERGY (2x300MW)

SARDA ENERGY (1x350MW)

RAIGARH TAMNAR

JINDAL POWER (4x600MW)

GENERATIONS AT WR POOL (BILASPUR)

VIND

ESSAR MAHAN (2x600MW)

ACBIL (2x135+60MW)

KORBA

WR POOL

MCCPL (1x300MW)

LANCO (PATHADI) (2x300MW)

GENERATIONS AT JABALPUR POOL

MB POWER(MP) (2x600MW)

JABALPUR POOL

JHABUA (2x600MW)

GENERATIONS AT DHARAMJAYGARH

BALCO (4x300MW)

DHARAMJAYGARH

VANDANA (2x135+1x270MW)

RADHANESDA SOLARPARK 700MW

BANASKANTHA

SAMI

ADANI GREEN 300MW

A

JABALPUR POOL

DHARAMJAYGARH

RANCHI

RANCHI NEW

KORBA(W)

KORBA STPS

SIPAT

SEONI

BILASPUR

CHAMPA POOL

RAIGARH TAMNAR

RAIGARH KOTRA

LARA

JINDAL

BHILAI

RAIPUR

RAIPUR POOL

RAJNANDGAON

NSPCL

WARDHA

WARORA POOL

BHDRAWATI

GMR

JHARSUGUDA

ROURKELA

ANGUL-A

ANGUL-B

LEGEND

	Existing	UC/Approved
765kV Line		
400kV Line		
HVDC BTB		
HVDC Bipole		
SEB 400kV		
SEB 220kV		
220 kV Line		
1200kV Line		

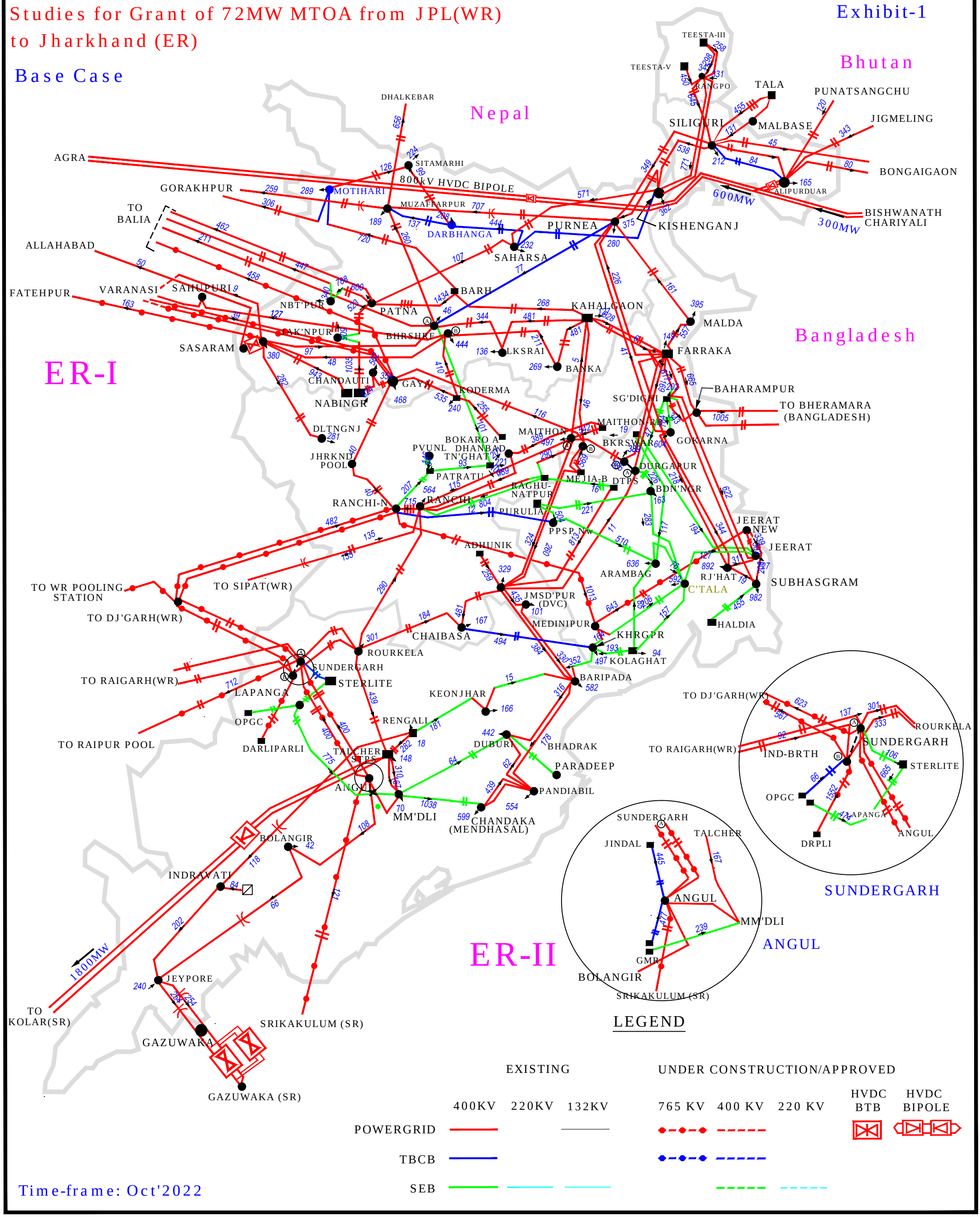
EXHIBIT-2B

POWER MAP OF EASTERN REGION

Studies for Grant of 72MW MTOA from JPL(WR) to Jharkhand (ER)

Exhibit-1

Base Case



LEGEND

	EXISTING			UNDER CONSTRUCTION/APPROVED				
	400KV	220KV	132KV	765 KV	400 KV	220 KV	HVDC BTB	HVDC BIPOLE
POWERGRID								
TBCB								
SEB								

Time-frame: Oct'2022

POWER MAP OF WESTERN REGION

EXHIBIT- 2C

WITH MTOA(WR)

WRTS-II

WRTS-I

RAJASTHAN

GUJARAT

MAHARASHTRA

M.P.

UTTAR PRADESH

JHARKHAND

ODISHA

CHHATTISGARH

TELANGANA

KARNATAKA

JAIPUR
AGRA
ALIGARH
MORENA
GWALIOR
ORAI
KURUKSHETRA (HARYANA)
VARANASI
MAHENDRAGARH (HARYANA)
KANKROLI
CHITTORGARH
BHINMAL
RAPP
BARETHI TPS
CHHATARPUR
SATNA
SASAN (6x660)
RIHAND-III (2x500)
VIND'POOL
VIN-IV&V (3x500)
SINGRAULI
BINA TPS
BINA
BINA-MP
SAGAR
DAMOH
NIGRI
KATNI
RUMS (3x660)
REWA POOL
VIN-I,II&III (6x210+4x500)
RANCHI
MANDSAUR
NAGDA
UJJAIN
SHUJALPUR
INDORE(PG)
BHOPAL
JABALPUR POOL
BIRSINGHPUR
ESSAR MAHAN (2x600)
DHARAMJAYGARH
BILASPUR POOL
BHOPAL(BDTCL)
ASHTA
INDORE
JABALPUR
ITARSI
GADARWARA
Pithampur
RAJGARH
NARMADA SAGAR
KHARGONE
MALWA
CHEGAON
BETUL
SATPURA
SEONI
SIPAT
KORBA STPS (3x200+ 4x500)
RAIGARH (TAMNAR)
CHAMPA
JINDAL
RAIGARH(KOTRA)
KORADI-III
TIRODA ADANI
BHILAI
MARWA
LARA
RAIGARH
TO BUDHIPADAR
ROURKELA
KORADI-I
NSPCL
RAIPUR
SUNDERGARH
KORADI-II
KHAPARKHEDA
RAJNANDG'N
RAIPUR POOL
GMR
DHAMTARI
BHDRAVATI
EMCO
CH'PR-II
CH'PR-I
DHARIWAL
JAGDALPUR
WARORA POOL
WARORA
WARANGAL
NIZAMABAD
TO RAMAGUNDAM
Pugalur (TAMIL NADU)
JULWANIA
KHANDWA
DHULE(BDTCL)
BHUSAWAL-I
BHUSAWAL-II
AMRAVATI TPP
N'PETH
MAUDA
AKOLA-II
AKOLA-I
DHULE
WARDHA
IEPL
A'BAD-III (EKTONI)
A'BAD-II (TAPITIANDA)
A'BAD-I (WALUJ)
A'BAD(PG)
SINNAR TPP
BABHLESHWAR
PADGHE-PG
PADGHE
PUNE(AIS)
PUNE(GIS)
CHAKAN
LONIKAND-II
RETWADI
LONIKAND-I
AMBERNATH
GHATKOPAR
KHARGHAR
VIKHROLI
NM
NAVIMUMBAI
NAGOTHANE
HINJEWADI
PARLI(N)
NANDED
PARLI(PG)
PARLI
SOLAPUR
SOLAPUR STPP
SOLAPUR(PG)
KESURDI
JEJURI
DHABOL (RGPPL)
KOYNA &
NEW KOYNA
JAIGAD
KARAD
ALKUD
KOLHAPUR
KOLHAPUR-PG
MAPUSA
XELDAM
NARENDRA NEW
NARENDRA
RAICHUR
TARAPUR
BOISAR
R-INFRA BOISAR
KALWA
KUDUS
LOKHANDWALA
MUMBAI
MUNDRA ADANI (4x330+5x660)
CGPL-MUNDRA(UMPP) (5x800)
BHACHUNDA
BHUJ-II
BHUJ PS
RADHANESDA
BANASKANTHA
ZERDA
SANKHARI
CHARANKA SOLAR PARK
SAMI
RANCHODPURA (VADAVI)
SOJA
PRANTIJ
SANAND
DEHGAM
LAKADIA
CHARAKHA
VARSANA
WANAKBORI
PIRANA-PG
PIRANA-T
NICOL TORRENT
KASOR
ASOJ
ESSAR
JAM KHAMBHALIYA
HALVAD
KALAVAD
CHORANIA
SHAPAR
HADALA
BHOGAT
JETPUR
AMRELI
FEDRA
SARDAR SAROVAR
HAZIRA
VADODARA
GANDHAR GEB
GANDHAR NTPC
Uno Sugen
KOSAMBA
SUGEN
UTRAN
KAKRAPAR
DGEN
VAV
NAVSARI
MAGARWADA
VAPI
KALA
RADHANESDA SOLARPARK 700MW
BANASKANTHA
SAMI
ADANI GREEN 300MW
A
JABALPUR POOL
DHARAMJAYGARH
KORBA(W)
KORBA STPS
RANCHI
RANCHI NEW
SIPAT
SEONI
BILASPUR
CHAMPA POOL
RAIGARH TAMNAR
RAIGARH KOTRA
LARA
JINDAL
BHILAI
RAIPUR
RAIPUR POOL
RAJNANDGAON
WARDHA
WARORA POOL
BHDRAWATI
GMR
JHARSUGUDA
ROURKELA
ANGUL-A
ANGUL-B
GENERATIONS AT SUNDERGARH
OPGC (2x660MW)
DARLIPALI (2x800MW) B
STERLITE (4x600MW)
SUNDERGARH
IND-BHARATH (2x350MW)
GENERATIONS AT RAIGARH KOTRA
ATHENA (2x600MW)
VISA POWER (2x600MW)
RKM (4x360MW)
KOTRA-A
KOTRA-B
SKS (4x300MW)
DB POWER (2x600MW)
KWPCL (1x600MW)
LARA (2X800)
CHAMPA POOL-B
GENERATIONS AT CHAMPA POOL
LANCO AMARKANTAK (2x660MW)
MB POWER (2x660MW)
KPCL (2x800MW)
CHAMPA POOL-B
CHAMPAPOOL-A
RAIGARH-KOTRA
KSK MAHANADI (6x600MW)
LARA (2X800)
GENERATIONS AT RAIGARH TAMNAR
TRN ENERGY (2x300MW)
SARDA ENERGY (1x350MW)
RAIGARH TAMNAR
JINDAL POWER (4x600MW)
GENERATIONS AT WR POOL (BILASPUR)
VIND
ESSAR MAHAN (2x600MW)
KORBA
ACBIL (2x135+60MW)
WR POOL
MCCPL (1x300MW)
LANCO (PATHADI) (2x300MW)
GENERATIONS AT JABALPUR POOL
MB POWER(MP) (2x600MW)
JABALPUR POOL
JHABUA (2x600MW)
GENERATIONS AT DHARAMJAYGARH
BALCO (4x300MW)
DHARAMJAYGARH
VANDANA (2x135+1x270MW)

LEGEND	Existing	UC/Approved
765kV Line		
400kV Line		
HVDC BTB		
HVDC Bipole		
SEB 400kV		
SEB 220kV		
220 kV Line		
1200kV Line		

POWER MAP OF EASTERN REGION

Studies for Grant of 72MW MTOA from JPL(WR) to Jharkhand (ER)

EXHIBIT-2D

MTOA

Bhutan

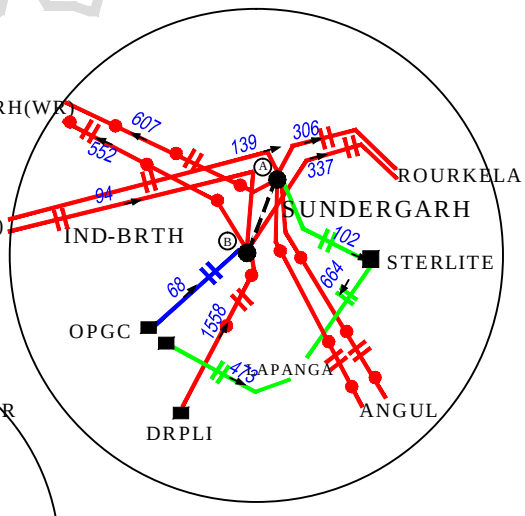
Nepal

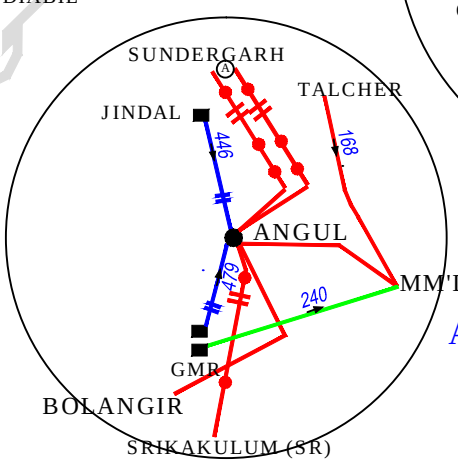
Bangladesh

ER-I

ER-II

TEESTA-III
TEESTA-V
RANGPO
TALA
PUNATSANGCHU
JIGMELING
SILIGURI
MALBASE
BONGAIGAON
ALIPURDUAR
BISHWANATH CHARIYALI
600MW
300MW
DHALKEBAR
SITAMARHI
800kV HVDC BIPOLE
AGRA
GORAKHPUR
MOTIHARI
MUZAFFARPUR
DARBHANGA
PURNEA
KISHENGANJ
TO BALIA
ALLAHABAD
FATEHPUR
VARANASI
SAHUPURI
NBT'PUR
PATNA
BARH
SAHARSA
KAHALGAON
MALDA
FARRAKA
BAHARAMPUR
TO BHERAMARA (BANGLADESH)
SASARAM
JAK'NPUR
BIHRSHRF
LKSRAI
BANKA
CHANDAUTI
GAYA
NABINGR
FODERMA
SG'DIGHI
MAITHON-RB
MAITHON
BKRSWAR
GOKARNA
DLTNGNJ
BOKARO A
PVUNL
DHANBAD
TN'GHAT
JHRKND POOL
PATRATU
DURGAPUR
MEJIA-B
DTPS
BDN'NGR
RAGHU-NATPUR
RANCHI-N
RANCHI
PURULIA
PPSP NW
JEERAT NEW
JEERAT
SUBHASGRAM
ADHUNIK
ARAMBAG
RJ'HAT
C'TALA
HALDIA
TO WR POOLING STATION
TO SIPAT(WR)
TO DJ'GARH(WR)
JMSD'PUR (DVC)
MEDINIPUR
KHRGPR
KOLAGHAT
CHAIBASA
ROURKELA
SUNDERGARH
STERLITE
TO RAIGARH(WR)
LAPANGA
BARIPADA
KEONJHAR
OPGC
RENGALI
TO RAIPUR POOL
DARLIPARLI
TALCHER STPS
DUBURI
BHADRAK
PARADEEP
ANGUL
PANDIABIL
MM'DLI
CHANDAKA (MENDHASAL)
BOLANGIR
INDRAVATI
1800MW
JEYPORE
TO KOLAR(SR)
GAZUWAKA
SRIKAKULUM (SR)
GAZUWAKA (SR)





SUNDERGARH

ANGUL

LEGEND

	EXISTING			UNDER CONSTRUCTION/APPROVED				
	400KV	220KV	132KV	765 KV	400 KV	220 KV	HVDC BTB	HVDC BIPOLE
POWERGRID								
TBCB								
SEB								

Time-frame: Oct'2022