Minutes of the meeting on 10th September, 2016 after the site visit on 09th September regarding ROW problem for termination of 400kV lines at Jeerat(WBSETCL) S/s for the ERSS-18 scheme

List of the participants is enclosed at Annexure-I.
In order to address the RoW constraint for termination of Jeerat(New)–Jeerat(WBSETCL) 400kV D/c line at Jeerat(WBSETCL) as informed by PFCCL, the Bid Process Coordinator for ERSS-18 scheme being implemented through TBCB route, a joint team of officials of WBSETCL, CEA, CTU, PFCCL, POWERGRID(ER-II) visited the Jeerat substation of WBSETCL on 09th September, 2016. This was followed by a joint meeting of the above officials on 10th September, 2016 at WBSETCL office, Kolkata.

The Director (Projects), WBSETCL welcomed the participants to the meeting. It was stated that WBSETCL participated in the site visit and meeting being the beneficiary of ERSS-15 & ERSS-18 and will extend all help and support required for expeditious execution of the schemes.

Based on the outcome of the site visit, following was discussed in the meeting:

It was noted that the following 400kV lines are existing / under construction / planned at 400/220kV substation of Jeerat(WBSETCL) :

Existing:
(i) Jeerat(WBSETCL) – Baharampur/Farakka 400kV S/c line of POWERGRID
(ii) Jeerat((WBSETCL) –Subhashgram/Rajarhaat 400kV S/c line of POWERGRID
(iii) Jeerat(WBSETCL) – Barkeshwar(WBSETCL) 400kV S/c line of WBSETCL
(iv) Jeerat(WBSETCL) – Kolaghat(WBSETCL) 400kV S/c line of WBSETCL

Under Construction:
(v) LILO of Sagardighi – Subhashgram 400kV line at Jeerat (WBSETCL) as a part of ERSS-15 –by POWERGRID

Planned:
(vi) Jeerat(New) – Jeerat(WBSETCL) 400kV D/c line (quad) as a part of ERSS-18 – to be implemented under tariff based competitive bidding route.

Note : In view of space constraint, the 4 number of bays for termination of 2 no of 400kV D/c lines under (v) and (vi) above at Jeerat(WBSETCL) has already been decided to be constructed as GIS bays.

During the site visit and the meeting, the following options were deliberated :

Option 1 : Construction of Multi-circuit Towers for termination of new lines

There is a ROW problem for termination of both the 400kV D/c lines at item (v) & (vi) above to the proposed GIS as extension of existing s/s in the Northern part of the Jeerat(WBSETCL) substation. This would involve crossing of existing 2 nos 400kV D/c lines, which can be addressed by constructing the new 2 nos. 400kV D/c lines on multi-circuit towers.

This may however involve construction of 4-5 nos. multi-circuit towers including 2 nos. of multi-circuit towers of about 90-100 meter height for crossing the existing 400kV lines. Further, there is a space constraint in termination of the new lines at the proposed GIS, which may involve dismantling of same existing buildings in the substation.

Option 2 : Shifting of existing 400kV lines to the proposed GIS

The termination of existing 2 nos. of 400kV D/c lines at Jeerat(WBSETCL) S/s may be shifted from the existing 400kV AIS to the new 400kV GIS proposed in the Northern part of existing substation and the new 400kV lines may be terminated at the existing 400kV AIS.

This would avoid the crossing of existing 400kV lines through multi-circuit towers. This would involve dismantling of some existing D/c towers and construction of new D/c towers and upgradation of 2 no of AIS bay equipment for termination of 400kV D/c line with quad conductor. This would however involve establishment of 2 number of new GIS bays by WBSETCL for termination of their Jeerat – Bakreshwar and Jeerat – Kolaghat 400kV lines.

Option 3 : GIS substation in the Eastern part of the Jeerat(WBSETCL) S/s

The new GIS may be planned in the Eastern part of Jeerat(WBSETCL) substation in place of proposed GIS in the Northern part. In this option, new 400kV lines would be terminated at the GIS in the Eastern part of the S/s.

With this there would no ROW constraints in the termination of new 400kV lines and no requirement of crossing of 400kV existing lines with multi-circuit towers. This would however involve procurement of additional land (about 5 acres) in the Eastern part of the substation.

Option 4 : GIS substation in the Northern part and termination of new lines in the Eastern part of the Jeerat(WBSETCL) S/s

The GIS extension may be planned in the existing space available in the Northern part of the Jeerat(WBSETCL) substation however the termination of new 400kV lines may be planned in the Eastern part of the substation. The interconnection between the termination gantry of the new lines and GIS may be made through GIS bus duct.

In this option there would be no ROW constraint in termination of the new lines and there would be no crossing of 400kV lines with multicircuit towers. This would however involve procurement of small land (about 1 acres) in the eastern part of the substation by WBSETCL for establishment of termination gantry for the new lines.

Option 5 : Shifting of the existing 400kV AIS bay of 4th 400/220kV 315MVA ICT to GIS, and termination of new lines utilizing the space in the Eastern part of the Jeerat(WBSETCL) S/s

The 400kV AIS bay of the 4th 400/220kV ICT at Jeerat(WBSETCL) may be dismantled and the space available may be utilized for termination of 400kV new lines in the Eastern part of the substation. This

option would require establishment of 5 nos. of GIS bays (4 for lines and 1 for transformer). The interconnection of termination gantry to GIS may be carried out through GIS bus duct.

This option would avoid the crossing of 400kV existing lines through multi-circuit tower. This would however involve establishment of 1 no. of GIS bays by WBSETCL for their 400/220kV, 315MVA ICT(4^{th}).

Recommendation :

After detailed deliberations, option – 1 was considered in view of following:

i) Difficulty in acquisition of land (option 3 & 4).
ii) Availability of space for construction of 400 kV GIS bus duct (four / five circuits) from proposed GIS to terminal gentry of new lines & ICT in the Eastern part of the Jeerat S/s (option 4 & 5).
iii) Additional cost to be borne by WBSETCL towards construction of new GIS bays due to shifting from existing AIS bays (option-2 & 5)

While deliberating option-1, it was also decided to explore the feasibility of crossing the existing 400 kV lines with 2 no. 400 kV D/C lines mentioned at (v) and (vi) above (one D/C line with twin moose and other with quad moose conductor). In this regard, it was decided that WBSETCL will conduct detailed survey for feasibility of availability of corridors for the above crossing and termination at the proposed GIS at Jeerat 400 kV sub-station end only. If required location of proposed GIS building may be shifted / reoriented. WBSETCL will complete the survey work by end September, 2016 and share the survey report along with profiles with CEA, CTU and PFCCL.

It was also decided that if required, for accommodating the corridor for two D/C lines, shifting of existing quarters may be considered in ERSS-XV/ ERSS-18.

Based on the detailed survey by WBSETCL, if it is found that corridor for the crossings with 2 no. 400 kV D/c lines is not available, then the crossing with multi circuit towers as given in option-1 would be considered. Shifting of existing quarters, if required may be considered in ERSS-XV/ ERSS-18.

10/9/16	10/9/16	10/9/16	10/09/2016	10/9/16
(Arundhati Ghosh)	(Ravinder Gupta)	(Ashok Pal)	(Sanjay Nayak)	(A.K. Maiti)
CE : CPD	Director : CEA	GM : CTU-Plg	AVP : PFCCL	GM : Projects
WBSETCL		POWERGRID		POWERGRID ER-II

Annexure-2.2

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली योजना एवं मूल्यांकन प्रभाग-2
Power System Planning & Appraisal Division-II
सेवा भवन, रा. कृ. पुरम, नयी दिल्ली -110066
Sewa Bhawan, R. K. Puram, New Delhi-110066

[ISO: 9001:2008]

No. 77/3/PSPA-II/2016-58-62 Dated 27-01-2017

To

COO(CTU-Plg), Power Grid Corp. of India Ltd. "Saudamini", Plot No.2, Sector-29, Gurgaon 122 001, Haryana. FAX : 95124-2571932	Chief Engineer, Central Planning Department, West Bengal State Electricity Trans. C. Ltd (WBSETCL), Vidyut Bhavan (9th Floor), Block-DJ, Sector-II, Bidannagar, Kolkata-700091	CEO, PFC Consulting Ltd, First Floor, Urjanidhi, 1, Barakhamba Lane, Connaught Place, New Delhi -110001 (Fax- 011-23456170)

Subject: Minutes of the meeting regarding termination of 400kV lines at Jeerat(WBSETCL) S/s under the ERSS-XV and ERSS-XVIII scheme.

Sir,

The minutes of the meeting held on 14-12-2016 at CEA, Sewa Bhawan, R K Puram, New Delhi regarding above subject is enclosed.

Yours faithfully,
27/01/2017
(Rishika Sharan)
Director (PSPA-II)

Copy to:

1 Managing Director,
WBSETCL, Vidyut Bhawan,
5th Floor, Block-D, Bidhannagar
Sector-II, Kolkata – 700091,
2 PPS to Member(PS), CEA

With request to consider and convey approval on the option No# 3, as agreed in above meeting

Minutes of the meeting regarding termination of 400kV lines at Jeerat (WBSETCL) S/s under the ERSS-XV and ERSS-XVIII scheme held on 14.12.2016 at CEA.

List of participant is enclosed at Annexure-1.

1. Chief Engineer (PSPA-II), CEA welcomed the participants. He informed that a joint team of officials of WBSETCL, CEA, CTU, PFCCL, POWERGRID(ER-II) visited the Jeerat substation of WBSETCL on 09th September, 2016 and had meeting on 10th September, 2016 to address the RoW constraint for termination of Jeerat(New)–Jeerat(WBSETCL) 400kV D/c line at Jeerat(WBSETCL). This line is to be implemented through TBCB as part of ERSS-XVIII scheme with PFCCL as BPC. He informed that WBSETCL was requested to submit the detailed survey report regarding feasibility of overhead crossing of existing lines mentioned at 2(i) to 2(iv) by two D/c lines mentioned at 2(v) & 2(vi) for termination at GIS extension of Jeerat S/s of WBSETCL.

2. Following 400kV lines are existing / under construction / planned at 400/220kV substation of Jeerat (WBSETCL) :

   Existing:

   (i) Jeerat(WBSETCL) – Baharampur/Farakka 400kV S/c line of POWERGRID

   (ii) Jeerat(WBSETCL) – Rajarhat/Subhashgram 400kV S/c line of POWERGRID

   (iii) Jeerat(WBSETCL) – Barkeshwar(WBSETCL) 400kV S/c line of WBSETCL

   (iv) Jeerat(WBSETCL) – Kolaghat(WBSETCL) 400kV S/c line of WBSETCL

   Under Construction:

   (v) LILO of Sagardighi – Subhashgram 400kV S/c line at Jeerat (WBSETCL) as a part of ERSS-XV – by POWERGRID

   Planned:

   (vi) Jeerat (New) – Jeerat (WBSETCL) 400kV D/c line (quad) as a part of ERSS-XVIII – to be implemented as ISTS under tariff based competitive bidding route.

   The map of the above is at Annexure II & III.

   The pointwise discussions held in the meeting are as follows:

3. Detailed survey report submitted by WBSETCL after site visit of Jeerat S/s on 09.09.2016.

3.1 Chief Engineer(PSPA-II) informed that WBSETCL vide its letter dated 05.10.2016 has submitted the detailed survey report for examining the possibility of overhead crossing of existing lines mentioned at 2(i) to 2(iv) by two D/c towers or Multi circuit towers mentioned at 2(v) & 2(vi) for termination at GIS extension of Jeerat S/s of WBSETCL.

3.2 Representative of WBSETCL informed that the overhead crossing of the lines either on Double circuit or Multi circuit towers is not feasible. In both the cases, the height of Double Ckt/Multi ckt towers will be in the range of 75-100 m and conductors after overhead crossing of the lines, need to be brought down at normal gantry height (20-25 m)

within the limited space of 90 meters. This configuration will violate the minimum electrical clearance required and to accommodate the lines, many structures including staff quarters would have to be dismantled at existing Jeerat S/s. He added that in the multi ckt tower, the lower ckt will be used for twin moose conductors and upper ckt will be for quad moose. This configuration will have different tensions on tower at different heights.

3.3 Alternatively, WBSETCL proposed that crossing portion of existing lines may be dismantled and the lines may be terminated to the existing AIS bays of Jeerat S/s through GIS bus duct. This arrangement may cost around Rs. 20-30 crores. WBSETCL further recommended that the expenditure for this might be booked in ERSS-XV or ERSS-XVIII i.e. as part of ISTS. This will remove the RoW constraints for the new lines and the two new separate 400kV D/c corridor can be constructed for ERSS-XV and ERSS-XVIII schemes.

3.4 On a query regarding demolishing of existing staff quarters to construct the additional towers for terminating the new lines at extended Jeerat S/s (GIS), WBSETCL stated that this option is not agreeable to their management.

4. After detailed discussions, Chief Engineer (PSPA-II), CEA expressed that the suggestion of WBSETCL i.e. dismantling the crossing portion of the existing lines (ISTS and State lines) and termination of the existing lines through GIS bus duct might be the appropriate option, as the new lines mentioned at 2(v) and 2(vi) can be directly terminated on separate double ckt towers at normal height (around 45 meters) to new GIS extension area.

Members agreed for the above.

5. Regarding booking of expenditure for above work, mentioned at 4, following was deliberated:

(i) **Option-1 (Sharing of cost between POWERGRID and WBSETCL):** It was suggested that the cost of the above arrangement may be shared equally between POWERGRID and WBSETCL as both are having 2 lines each. WBSETCL did not agree to this option. CE (WBSETCL) stated that their DISCOMS may not agree for this, because this rearrangement work is entirely on account of strengthening in the ISTS. As such, this option was dropped.

(ii) **Option-2 (Dropping of 400kV Jeerat (New) - Jeerat(WBSETCL) line under TBCB):** POWERGRID stated that the construction of LILO of Sagardighi – Subhashgram 400kV line at Jeerat (WBSETCL) under ERSS-XV does not require any tower crossing as this line could be built along null point between the existing towers. POWERGRID emphasised that the above arrangement is necessary for Jeerat(New) – Jeerat(WBSETCL) 400kV D/c line (quad) being implemented through TBCB.

Upon suggestion of dropping the Jeerat(New) – Jeerat(WBSETCL) 400kV D/c line, CE(WBSETCL) stated that this line is very much necessary for meeting the future load growth at Jeerat and should not be dropped. As such this option was also not considered further.

(iii) **Option-3 (Dismantling of dead end towers and termination through GIS Bus duct by POWERGRID under ISTS) :** Under this option, the additional work as suggested by WBSETCL and mentioned at point 4 above, would be implemented as ISTS and to be included in the scope of ERSS-XV being implemented by POWERGRID. Ownership of these works shall be of POWERGRID as ISTS scope and cost of these reconfiguration (including those for the State lines) to be recovered as tariff by POWERGRID. WBSETCL agreed to this proposal subject to approval of their management.

Thus, out of above options, the Option-3 was agreed. WBSETCL was requested to give their official communication/acceptance from their management on the proposal i.e. dismantling the crossing portion of existing line from (ISTS and State lines) and termination of the existing lines through GIS bus duct by POWERGRID and ownership of same to POWERGRID. (This is similar to LILO of a State transmission line at an ISTS S/s by POWERGRID).

6. POWERGRID clarified that ERSS-XV scheme comprising of LILO of Sagardighi-Subhasgram 400kV S/c line at Jeerat is already under implementation and the above proposed scope of works of dismantling of part of existing lines mentioned at 2 (i) to 2 (iv) and terminating the same through GIS duct to existing Jeerat S/s could be implemented by POWERGRID under ERSS-XV scheme itself.

7. After further discussions, following was agreed:
   (i) Following scope may be implemented at Jeerat S/s by POWERGRID as an additional scope under already approved ERSS-XV scheme:

   Dismantling of dead end towers and termination of existing lines mentioned at 2 (i) to 2(iv) through GIS duct to the existing 400kV Jeerat AIS S/s (WBSETCL).

   (ii) It was also agreed that the termination of the WBSETCL lines mentioned at 2 (iii) & 2(iv) through GIS duct to the existing 400kV Jeerat AIS S/s (WBSETCL) shall be implemented as ISTS and included in the approved scope of ERSS-XV being implemented by POWERGRID and cost recovered by POWERGRID as ISTS transmission tariff .
   (iii) Further, it was also acknowledged that implementation of LILO of Sagardighi-Subhasgram 400kV at Jeerat along with associated line bays shall get delayed by about one year due to addition of above mentioned GIS duct arrangement.
   (iv) The new lines mentioned at 2(v) and 2(vi) can be directly terminated on separate double ckt towers at normal height (around 45 meters) to new GIS extension area.

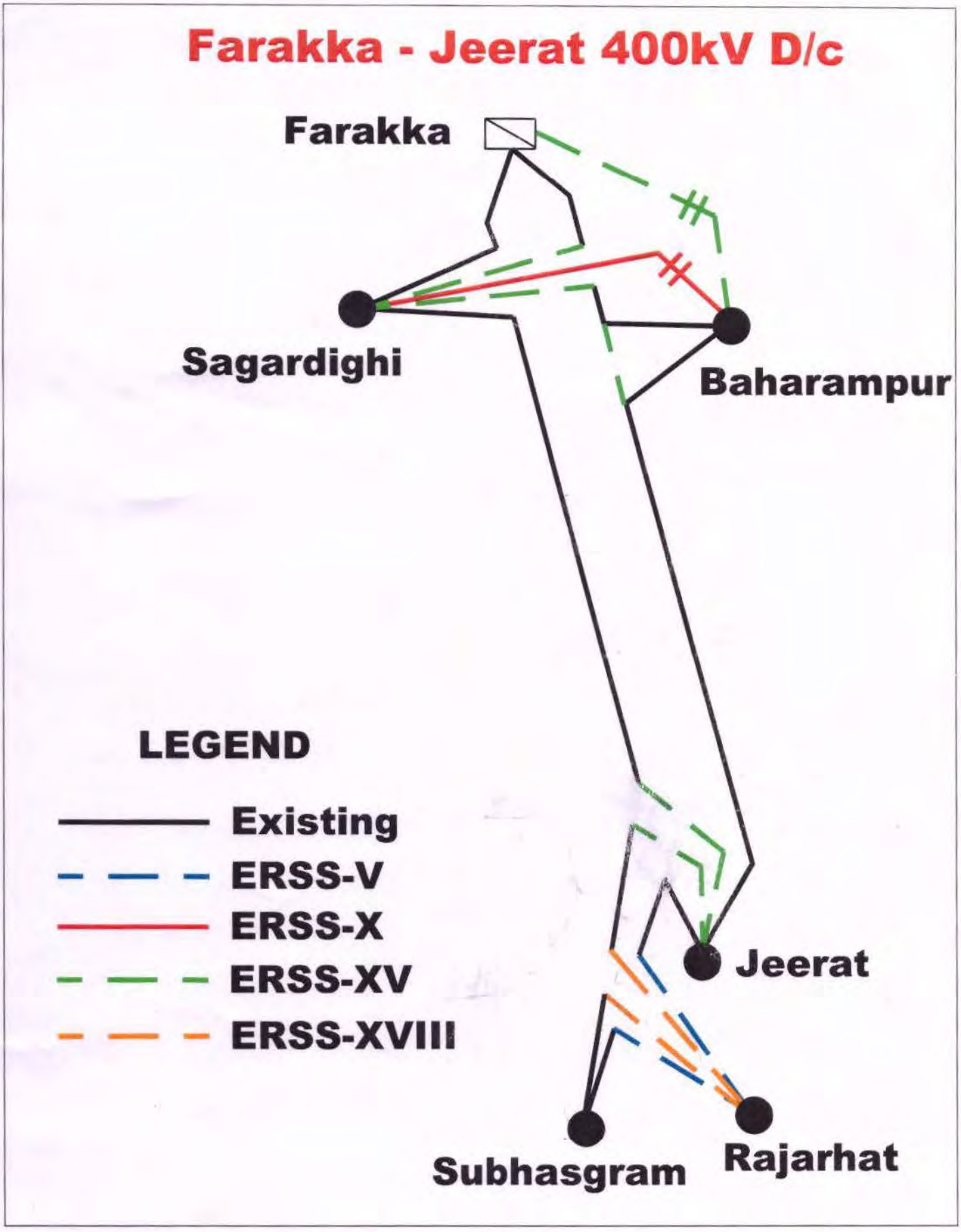
Annexure-1

List of the participants of the meeting held on 14.12.2016 at CEA

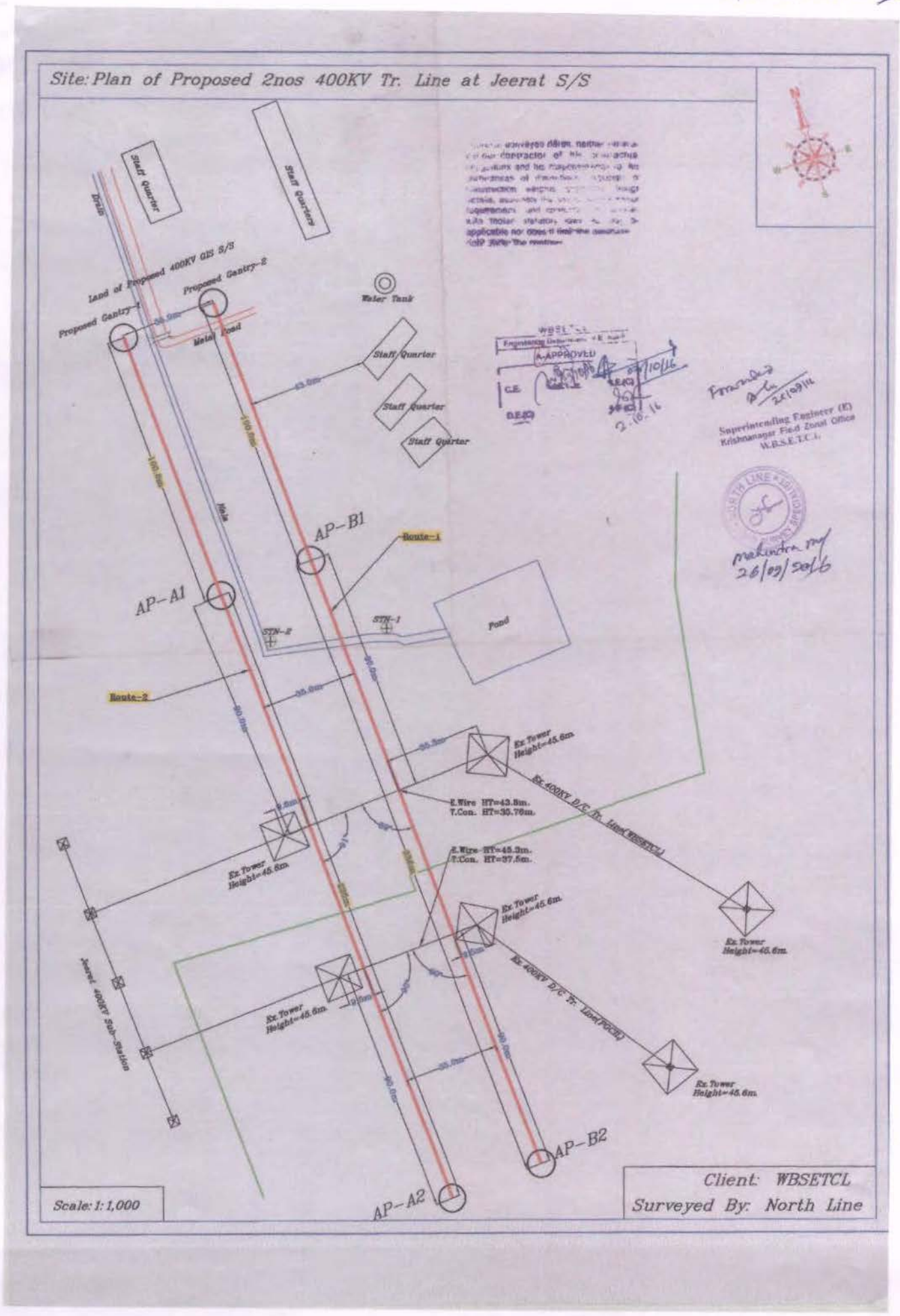
Sl. No.	Name of the Participant	Designation	Organization
1	Pardeep Jindal	Chief Engineer, (PSPA-II)	CEA
2	Ravinder Gupta	Chief Engineer	CEA
3	Rishika Sharan	Director, (PSPA-II)	CEA
4	U.M.Rao	Deputy Director, (PSPA-II)	CEA
5	R.Nagpal	GM (CMG)	POWERGRID
6	A.P.Gangadharan	AGM (Engg.-S/s)	POWERGRID
7	Ramchandra	DGM (CTU-Plg.)	POWERGRID
8	S.J.Lahiri	DGM (Engg.)	POWERGRID
9	A.Ghosh	CE (CPD)	WBSETCL
10	G.Banerje	ACE (Engg.)	WBSETCL
11	A.Kamasaur	ACE (CPD)	WBSETCL
12	Koushik Bhanmik	SE (Engg.)	WBSETCL

Annexure-II

Farakka - Jeerat 400kV D/c



Annexure – 19


Site: Plan of Proposed 2nos 400KV Tr. Line at Jeerat S/S
Staff Quarter
Staff Quarters
Land of Proposed 400KV GIS S/S
Proposed Gantry-2
Proposed Gantry-1
Metal Road
Water Tank
Staff Quarter
Staff Quarter
Staff Quarter
A-APPROVED
C.E.
S.E.(O)
Superintending Engineer (E)
Krishnanagar Field Zonal Office
W.B.S.E.T.C.L.
AP-B1
AP-A1
Route-1
Route-2
STN-2
STN-1
Pond
Ex. Tower Height=45.6m
Ex. 400KV D/C Tr. Line(WBSETCL)
Ex. Tower Height=45.6m
Ex. Tower Height=45.6m
Ex. Tower Height=45.6m
Ex. 400KV D/C Tr. Line(POWERGRID)
Ex. Tower Height=45.6m
Jeerat 400KV Sub-Station
AP-B2
AP-A2
Scale: 1: 1,000
Client: WBSETCL
Surveyed By: North Line

West Bengal State Electricity Transmission Company Ltd.

(A West Bengal Government Enterprise)
CIN : U40101WB2007SGC113474
Office of the Chief Engineer
Central Planning Department

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

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

Ref. No. : CE/CPD/CEA/1566

Date : 04/04/2017

To

The Chief Engineer (PSPA-II),

Power System Planning & Appraisal Division – II,

Central Electricity Authority,

Sewa Bhawan, RK Puram,

New Delhi – 110066.

Sub. : Termination of 400 kV lines at Jeerat (WBSETCL) 400 kV sub-station under ERSS-XV and ERSS-XVIII scheme – reg.

Ref. : Your letter no. 77/3/PSPA-II/2016, Dated -01-2017, received through e-mail dated 21/02/2017.

Dear Sir,

In response to above, this is to inform you that WBSETCL has considered and accepted the option no. 3 of the minutes of meeting held on 14/12/2016 at CEA regarding termination of 400 kV lines at existing Jeerat (WBSETCL) 400 kV sub-station.

This is for your information and further action please.

Yours faithfully,

A Ghosh
04/4/17

(Arundhati Ghosh)
Chief Engineer : CPD

Annexure-3.1

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली योजना एवं मूल्यांकन प्रभाग-2
Power System Planning & Appraisal Division-II
सेवा भवन, रा. कृ.पुरम , नयी दिल्ली -110066
Sewa Bhawan, R. K. Puram, New Delhi-110066

[ISO: 9001:2008]

No. 69/1/PSPA-II/2017-88-89 Dated 15-02-2017

To

1. Managing Director,
Bihar State Power Transmission
Co. Ltd (BSPTCL),
Vidyut Bhawan, Bailey Road,
Patna- 800021, Bihar

2. COO(CTU-Plg),
Power Grid Corp. of India Ltd.
"Saudamini", Plot No.2,
Sector-29,
Gurgaon 122 001,
Haryana.
FAX : 95124-2571932

Subject: Minutes of meeting regarding creation of 220kV level at the under construction 400/132kV Motihari (TBCB) Substation on 18th Jan 2017 at CEA

Sir,

The minutes of the meeting held on 18-01-2017 at CEA, Sewa Bhawan, R K Puram, New Delhi regarding above subject is enclosed.

Yours faithfully,

15/02/2017

(Rishika Sharan)
Director (PSPA-II)

Copy to:

PPS to Member(PS), CEA

Minutes of meeting regarding creation of 220kV level at the under construction 400/132kV Motihari (TBCB) substation on 18th Jan 2017 at CEA

List of participants is enclosed at Annexure-I

1. Chief Engineer (PSPA-II), CEA welcomed the participants. He informed that BSPTCL has requested to create 220kV level in the 400/132kV (2x200MVA) Motihari GIS substation, which is under construction through TBCB by M/s Essel Infra. BSPTCL proposed for installation of 400/220kV, 2x500MVA ICTs to avoid additional expenditure and time on creating a new 220/132kV Motihari (New) substation.
2. Representative of CTU stated that Motihari 400/132kV (TBCB) GIS substation is being established through LILO of Barh – Gorakhpur 400kV D/c (Quad Moose) line under ERSS-VI where space for 5 no. 400kV bays, 5 no. 132kV bays and 400/132kV, 1x200MVA ICT had been kept for future expansion. Out of these, 3 no. 400kV bays, 1 no. 132kV bay and ICT space would be utilized for substation extension under ERSS-XXI. The layout of substations plan of 400/132 kV-Motihari S/s is enclosed at **Annex-II.**
3. The layout of Motihari S/s was examined and the available space shown in the layout was examined in view of proposal for creation of 220 kV level at same location.
4. Representative of BSPTCL stated that they were taking up with M/s Essel Infra for creation of 220kV Voltage at 400/132kV Motihari (TBCB). However, M/s Essel infra had intimated that 220kV level could not be created due to space constraint. It was decided that CTU may consult Substation expert of POWERGRID to know the feasibility of creation of 220kV Voltage at 400/132kV Motihari (TBCB). CTU vide their email dated 02.02.2017 have informed that the request of BSPTCL to accommodate 220kV level at Motihari along with 400/220kV, 2x500MVA ICT and 2 no. 220kV line bays in the available space of Motihari 400/132kV substation was studied. It was observed that the available space in the Motihari substation is not adequate to accommodate the proposed 220kV extension of BSPTCL. It was also pointed out that creation of 220kV level with only one no. 220kV D/c outlet from 2x500MVA ICTs may not be prudent. Further, creation of 220kV level would restrict any future expansion plans at Motihari S/s.
5. Chief Engineer (PSPA-II), CEA stated that since new 220/132kV substation at Motihari was planned primarily to feed the loads of Gopalganj, Bettiah and Raxaul, it might be prudent to shift the planned 220/132kV substation towards Bettiah/Raxaul keeping the same connectivity. This would also improve the voltage profile in that area. Representative of CTU said that they would carry out system studies under various scenarios of the system.
6. CTU has provided following information vide their e-mail dated 02.02.2017 on the above subject.

i. The new 220/132kV substation at Motihari (New) was planned in consultation with BSPTCL under intra-state strengthening scheme in Bihar to meet its expected 13th plan demand by providing feed to the following:
   (a) 2nd 220kV feed to Gopalganj 220/132kV S/s
   (b) Additional 132kV feed to Bettiah/Ramnagar and Raxaul

(c) Improve reliability of power supply to Nepal through Raxaul – Parwanipur 132kV line

Load flow results is shown at Exhibit-1.

ii. Load flow results considering proposal of BSPTCL of creation of 220kV level at Motihari (TBCB) S/s (along with 220kV D/c line to Gopalganj) and deletion of Motihari (New) 220/132kV S/s (along with deletion of associated lines) is shown at **Exhibit-2**. It may be observed in **Exhibit-2** that Motihari (TBCB) – Raxaul and Motihari (TBCB) – Bettiah 132kV D/c lines are critically loaded in the base case itself.

iii. Thus, in view of the above mentioned issues and load flow studies it is suggested that 220kV level may not be created at Motihari (TBCB) S/s.

iv. BSPTCL also informed that space for new 132kV bays are not available at the existing Raxaul/Bettiah substations. Therefore it was proposed that the new 220/132kV substation can be created near Bettiah/Raxaul by LILO of existing Bettiah – Raxaul 132kV D/c line.

v. In view of the above, two alternatives were considered for shifting the proposed new 220/132kV substation, one close to Bettiah and another close to Raxaul. The load flow results with new substation at Bettiah and Raxaul is shown at **Exhibit-3** and **Exhibit-4** respectively. It may be seen that from the load flow studies (**Exhibit-3**) that the load distribution on 132kV lines from Bettiah (New) is highly uneven and the flow on Motihari(TBCB) – Raxual 132kV D/c is around its thermal limit in base case itself. However, the issues are resolved when the substation is shifted to Raxual (Exhibit-4). It was observed from the above study results that the Raxaul (New) – Gopalganj 220kV D/c is mainly acting as a tie line. Considering the lower projected load growth of Bihar in 19th EPS, it was suggested that the implementation of Raxaul (New) – Gopalganj 220kV D/c may be taken up at a later date.

vi. Thus, it is was decided that shifting of the new 220/132kV S/s from Motihari (New) to Raxaul (New) with the following scope of works would be better option.

Raxaul (New) S/s: 220/132kV, 2x200MVA (to be implemented by BSPTCL)

(a) Sitamarhi (New) – Raxaul (New) 220kV D/c (Twin Moose)
(b) Raxaul (New) – Gopalganj 220kV D/c (Twin Moose/ Single Zebra)
(c) LILO of Bettiah – Raxaul 132kV D/c line at Raxaul (New)

7. Based on the above decision following was agreed:

(i) The available space in the Motihari substation is not adequate to accommodate the proposed 220kV extension of BSPTCL. Creation of 220kV level would restrict any future expansion plans at Motihari S/s. Load flow results also shows that Motihari (TBCB) – Raxaul and Motihari (TBCB) – Bettiah 132kV D/c lines are critically loaded, when 220kV level is created at Motihari (TBCB) S/s.

(ii) The new 220/132kV substation at Motihari is planned primarily to feed the loads of Gopalganj, Bettiah and Raxaul, it was decided to shift the planned substation towards Bettiah/Raxaul keeping the same connectivity. Based on above observations and load flow studies, it was proposed that the new

220/132kV substation may be created near Raxaul by the LILO of existing Bettiah – Raxaul 132kV D/c line.

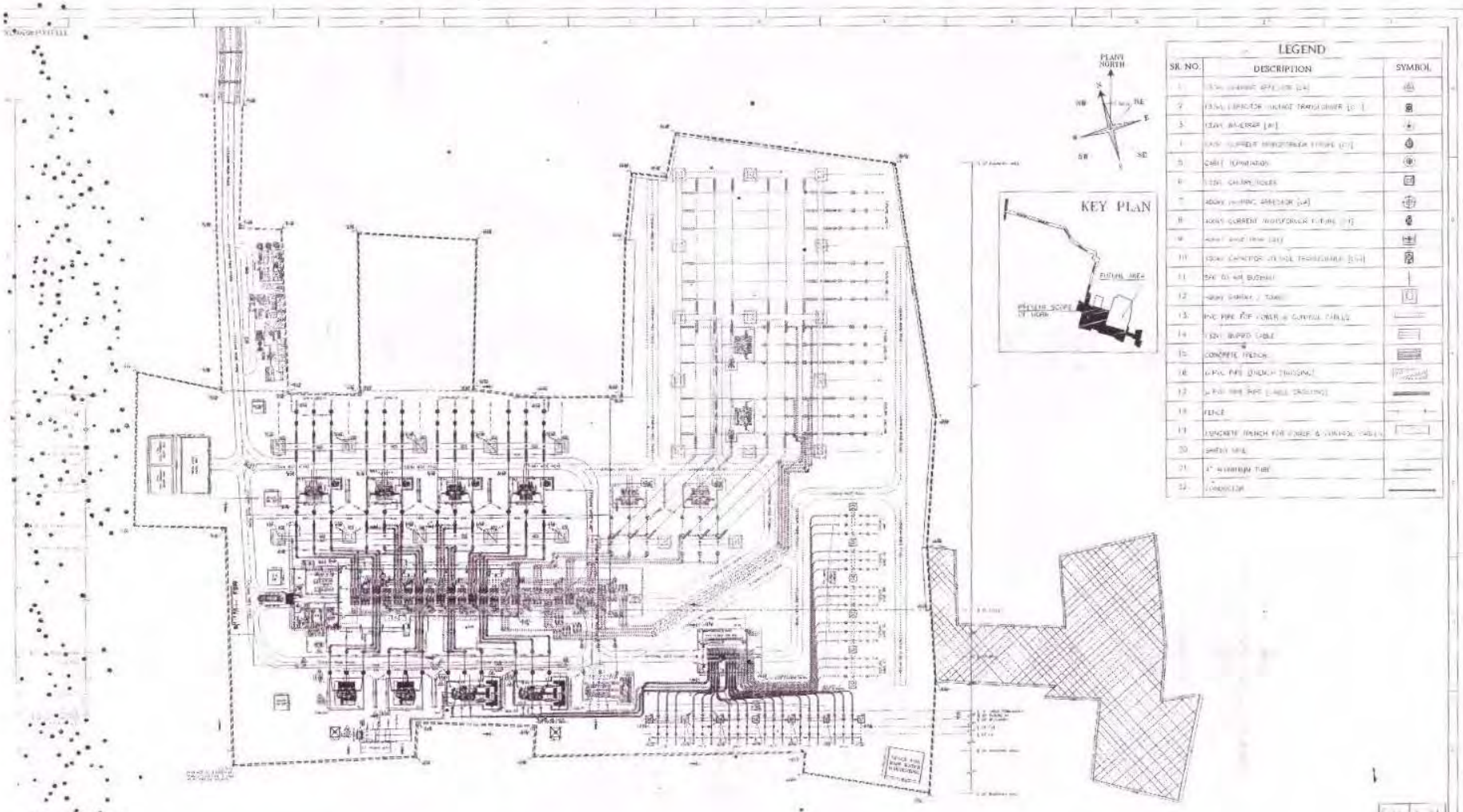
(iii) Considering the lower projected load growth of Bihar in 19th EPS, it was suggested that the implementation of Raxaul (New) – Gopalganj 220kV D/c may be taken up at a later date.

(iv) BSPTCL may send their proposal on the basis of above discussion to CEA for taking up with forthcoming meeting of the Standing Committee (SCMPSPER) for finalization.

Annexure-1

List of the participants of the meeting held on 18.01.2017 at CEA

Sl. No.	Name of the Participant	Designation	Organization
1	Pardeep Jindal	Chief Engineer(PSPA-II)	CEA
2	Rishika Sharan	Director(PSPA-II)	CEA
3	U.M.Rao	Deputy Director(PSPA-II)	CEA
4	Suyash A. Verma	Asst. Director	CEA
5	Ashok Pal	General Manager(CTU-Plg)	POWERGRID
6	Anupam Kumar	Engineer(CTU-Plg)	POWERGRID
7	H.R.Panday	ESE/DGM	BSPTCL
8	Pankaj Kumar	ESE/(P&E)	BSPTCL
9	Ravi.S.Prasad	ESE/(P&E)	BSPTCL



LEGEND

SR. NO.	DESCRIPTION	SYMBOL
1	132kV CURRENT OPTI VOR [CT]	
2	132kV POTENTIOR VOLTAGE TRANSFORMER [PT]	
3	132kV LA-METER [LA]	
4	132kV SURGE ARRESTER WITHOUT GAP [SA]	
5	CABLE TERMINATION	
6	132kV CALAMP HOLDER	
7	400kV HORN GAP ARRESTOR [LA]	
8	400kV CURRENT TRANSFORMER TYPE [CT]	
9	400kV SHUT TRIP [SW]	
10	132kV CAPACITOR VOLTAGE TRANSFORMER [CVT]	
11	52K SS MS BUSBAR	
12	400kV GANTRY / TOWER	
13	PVC PIPE FOR POWER & CONTROL CABLES	
14	132kV BURIED CABLE	
15	CONCRETE TRENCH	
16	6"PVC PIPE UNDER GROUND	
17	4" PVC PIPE CABLE CROSSING	
18	FENCE	
19	CONCRETE TRENCH FOR POWER & CONTROL CABLES	
20	GATE VALVE	
21	3" ALUMINIUM TUBE	
22	CONDUCTOR	

PRESENT SCOPE AREA – 22834.5 m²	
FUTURE SCOPE AREA – 15776.6 m²	
TOTAL AREA – 38611.07 m²	

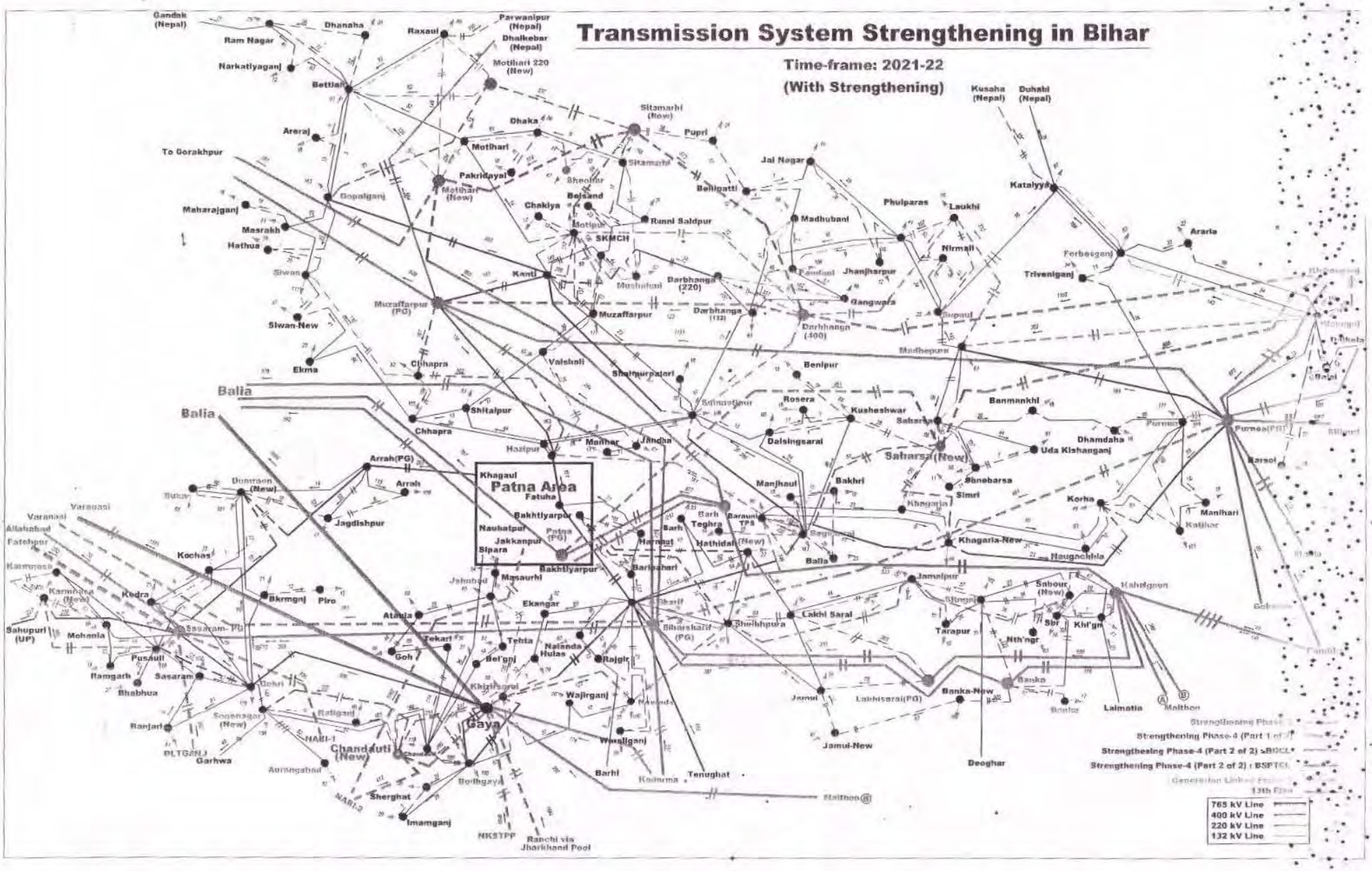
Rev.	Date	Description	Drawn By	Checked By	Approved
4	15.02.2021	[illegible]	[illegible]	[illegible]	[illegible]
3	03/10/2020	[illegible]	[illegible]	[illegible]	[illegible]
2	20.09.2020	FOR REVISED ADD IN [illegible] AS TAPPED	[illegible]	[illegible]	[illegible]
1	24/08/2020	FOR REVISED CONNECTED [illegible]	[illegible]	[illegible]	[illegible]
0	25/07/2020	FOR REVISED CONNECTED [illegible]	[illegible]	[illegible]	[illegible]
1	17/06/2020	FOR REVISED CONNECTED [illegible]	[illegible]	[illegible]	[illegible]
2	10/03/2020	FOR [illegible]	[illegible]	[illegible]	[illegible]

PROJECT	EASTERN REGION SYSTEM STRENGTHENING SCHEME-VI (ERSS-VI)
PACKAGE	400/132kV GIS SUBSTATION AT MOTIHARI, BIHAR
OWNER	Darbhanga-Motihari Transmission Company Limited
Owners Engineer	POWERGRID INDIA PRIVATE LTD
EPC Contractor	PAM INDIA INFRASTRUCTURE PVT LTD
EPC Sub-Contractor	TBEA ENERGY INDIA PVT. LTD.
Sub Vendor/Contractor	
Title	LAYOUT OF 400/132kV GIS SUBSTATION
Drawing No.	TBEA-2140700-0

TBEA

Date:
Rev.
Scale:

50


Transmission System Strengthening in Bihar
Time-frame: 2021-22
(With Strengthening)
Patna Area
Gaya
Balia
Varanasi
Allahabad
Fatehpur
Kanpur
Sahupuri (UP)
Mohania
Ramgarh
Bhabhua
Sasaram
Pusauli
Banjari
Garhwa
DLTGANJ
Chandauti (New)
Aurangabad
Sherghat
Imamganj
NKSTPP
Ranchi via Jharkhand Pool
Barhi
Koderma
Tenughat
Maithon
Jamui-New
Deoghar
Lakhisarai(PG)
Jamui
Banka-New
Banka
Laimatia
Khagaul
Fatuha
Bakhtiyarpur
Nauhatpur
Jakkanpur
Sipara
Patna (PG)
Barh
Teghra
Barauni TPS
Hathidah (New)
Begusarai
Khagaria-New
Naugachhia
Purnea(PG)
Saharsa(New)
Dalsingsarai
Kusheshwar
Rosera
Supaul
Madhepura
Darbhanga (400)
Darbhanga (132)
Darbhanga (220)
Muzaffarpur (PG)
Muzaffarpur
Motipur
SKMCH
Kanti
Sitamarhi (New)
Sitamarhi
Motihari
Motihari (New)
Dhaka
Raxaul
Parwanipur (Nepal)
Dhalkebar (Nepal)
Motihari 220 (New)
Bettiah
Gopalganj
Siwan
Siwan-New
Ekma
Chhapra
Shitalpur
Hajipur
Arrah(PG)
Arrah
Jagdishpur
Dumraon (New)
Buxar
Kochas
Bikramganj
Piro
Ataula
Ekangar
Masaurhi
Tekari
Goh
Tehta
Bel'ganj
Hulas
Nalanda
Rajgir
Wazirganj
Khizirsarai
Rafiganj
Sonenagar (New)
Bihta
Sasaram-PG
Kudra
Karmnasa
Karmnasa (New)
Varanasi
Allahabad
Fatehpur
Kanpur
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Mohania
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Pusauli
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Garhwa
DLTGANJ
Chandauti (New)
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Imamganj
NKSTPP
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Tenughat
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Lakhisarai(PG)
Jamui
Banka-New
Banka
Laimatia
Khagaul
Fatuha
Bakhtiyarpur
Nauhatpur
Jakkanpur
Sipara
Patna (PG)
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Barauni TPS
Hathidah (New)
Begusarai
Khagaria-New
Naugachhia
Purnea(PG)
Saharsa(New)
Dalsingsarai
Kusheshwar
Rosera
Supaul
Madhepura
Darbhanga (400)
Darbhanga (132)
Darbhanga (220)
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Muzaffarpur
Motipur
SKMCH
Kanti
Sitamarhi (New)
Sitamarhi
Motihari
Motihari (New)
Dhaka
Raxaul
Parwanipur (Nepal)
Dhalkebar (Nepal)
Motihari 220 (New)
Bettiah
Gopalganj
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Siwan-New
Ekma
Chhapra
Shitalpur
Hajipur
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Piro
Ataula
Ekangar
Masaurhi
Tekari
Goh
Tehta
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Hulas
Nalanda
Rajgir
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Khagaul
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Dhaka
Raxaul
Parwanipur (Nepal)
Dhalkebar (Nepal)
Motihari 220 (New)
Bettiah
Gopalganj
Siwan
Siwan-New
Ekma
Chhapra
Shitalpur
Hajipur
Arrah(PG)
Arrah
Jagdishpur
Dumraon (New)
Buxar
Kochas
Bikramganj
Piro
Ataula
Ekangar
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Wazirganj
Khizirsarai
Rafiganj
Sonenagar (New)
Bihta
Sasaram-PG
Kudra
Karmnasa
Karmnasa (New)
Kusaha (Nepal)
Duhabi (Nepal)
Katalyya
Araria
Forbesganj
Trivenigani
Phulparas
Laukhi
Nirmali
Jhanjharpur
Madhubani
Jaynagar
Belhatti
Pupri
Benipur
Banmankhi
Dhamdaha
Uda Kishanganj
Purnea(PG)
Barsoi
Manihari
Katihar
Simri
Bhagalpur
Manjhaul
Bakhri
Khagaria
Korha
Jamalpur
Sabour (New)
Kahalgaon
Bhagalpur
Tarapur
Nth'ngr
Ser
Khl'gn
Calchi Sarai
Bhelhipura
Bihar Sharif (PG)
Barhi
Barbaghari
Jehanabad
Harnaut
Rajgir
Ekangar
Masaurhi
Tekari
Goh
Tehta
Bel'ganj
Hulas
Nalanda
Rajgir
Wazirganj
Khizirsarai
Rafiganj
Sonenagar (New)
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Kudra
Karmnasa
Karmnasa (New)
Varanasi
Allahabad
Fatehpur
Kanpur
Sahupuri (UP)
Mohania
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Sasaram
Pusauli
Banjari
Garhwa
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Sherghat
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Ranchi via Jharkhand Pool
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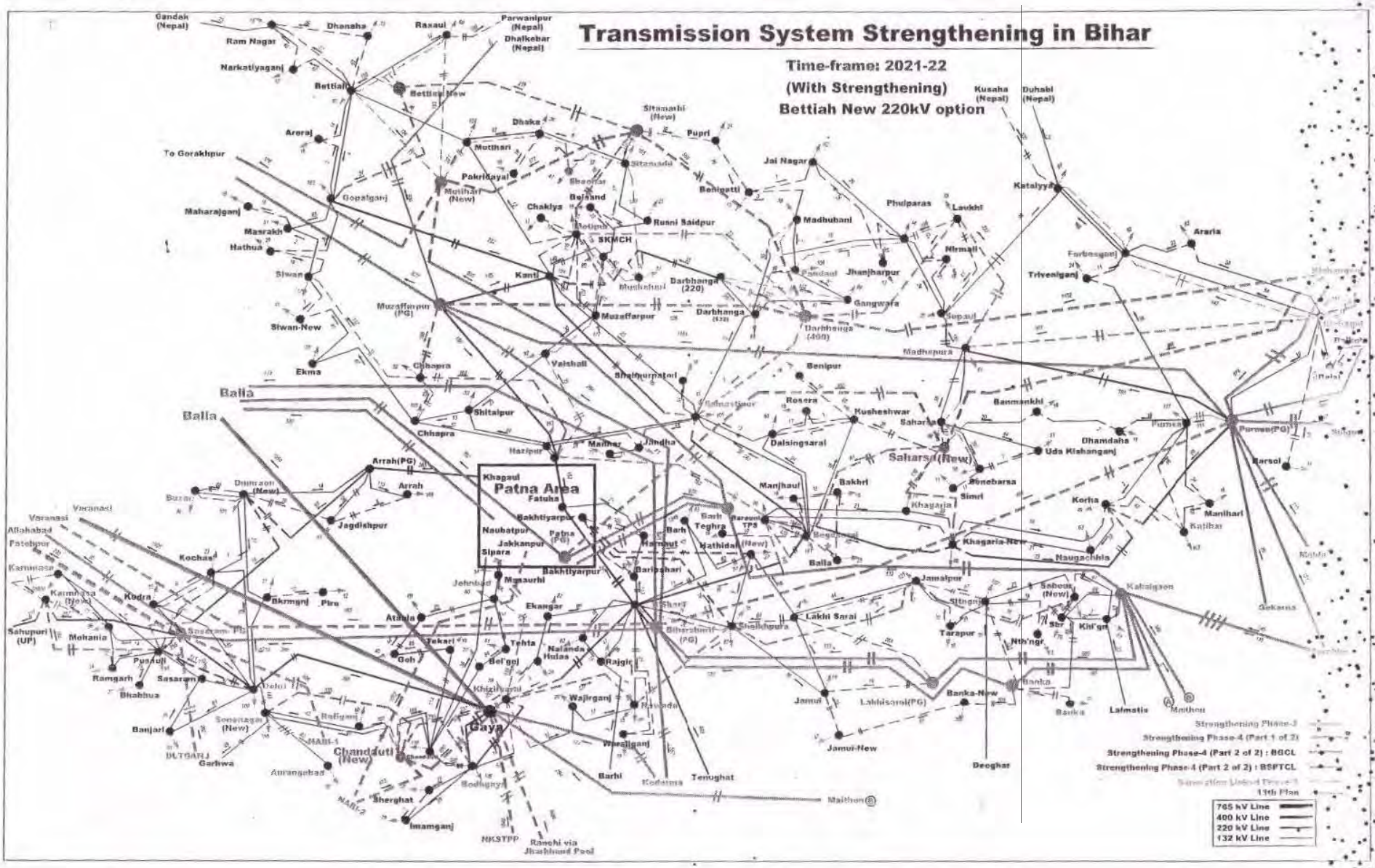
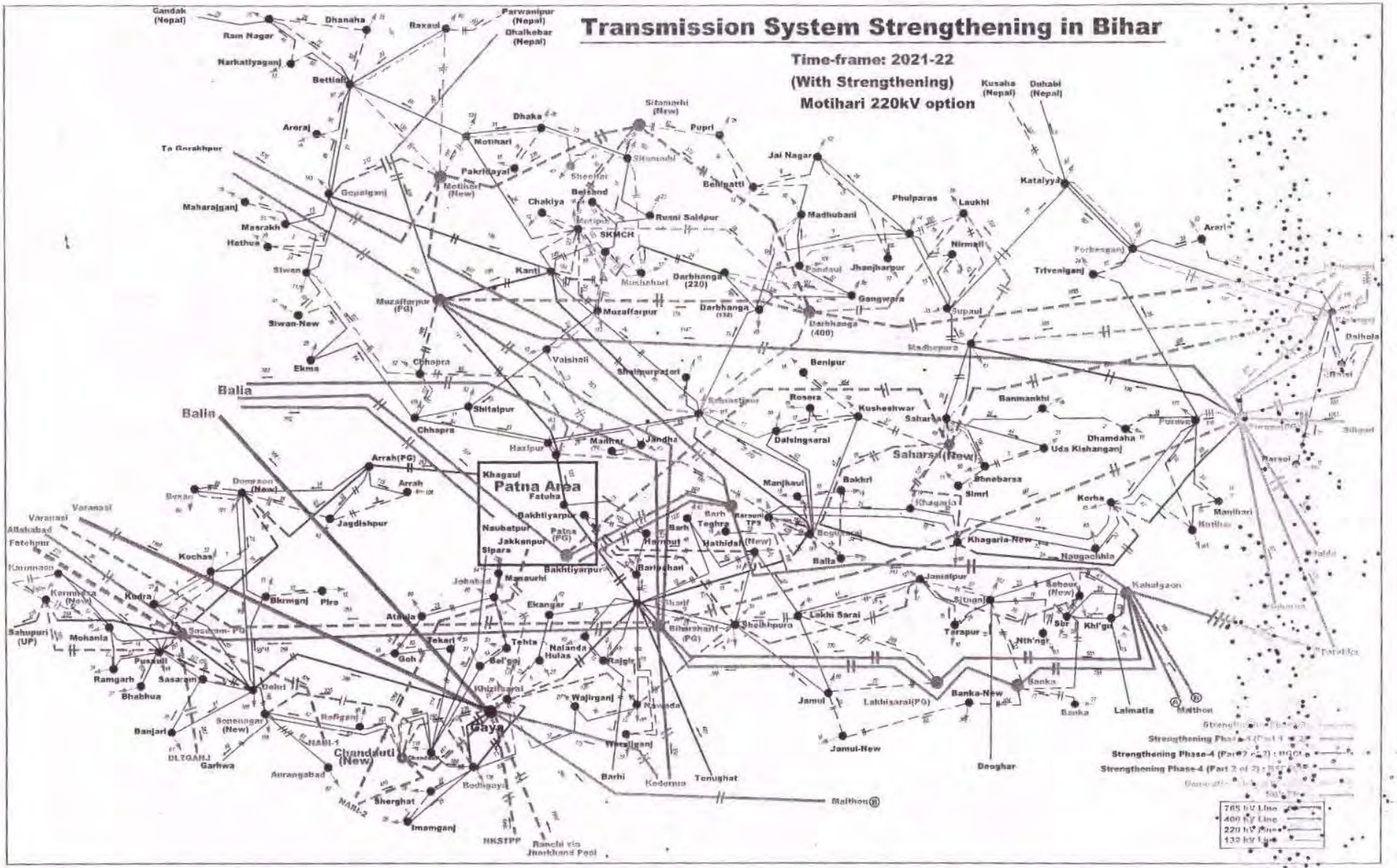
Koderma
Tenughat
Maithon
Jamui-New
Deoghar
Lakhisarai(PG)
Jamui
Banka-New
Banka
Laimatia
765 kV Line
400 kV Line
220 kV Line
132 kV Line


Transmission System Strengthening in Bihar
Time-frame: 2021-22
(With Strengthening)
Bettiah New 220kV option
Patna Area
Gaya
Saharsa (New)
Chandauti (New)
Strengthening Phase-3
Strengthening Phase-4 (Part 1 of 2)
Strengthening Phase-4 (Part 2 of 2) : BGCL
Strengthening Phase-4 (Part 2 of 2) : BSPTCL
13th Plan
765 kV Line
400 kV Line
220 kV Line
132 kV Line


Transmission System Strengthening in Bihar
Time-frame: 2021-22
(With Strengthening)
Motihari 220kV option
Patna Area
Gaya
Saharsa (New)
Khagaria-New
Banka-New
Jamui-New
Deoghar
Lakhisarai(PG)
Sasaram
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Kahalgaon
Purnea
Dalkola
Madhepura
Supaul
Darbhanga (400)
Darbhanga (220)
Muzaffarpur (PG)
Muzaffarpur
Motihari (New)
Sitamarhi (New)
Gopalganj
Siwan-New
Ekma
Chhapra
Balia
Ballia
Varanasi
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Bodhgaya
Tenughat
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765 kV Line
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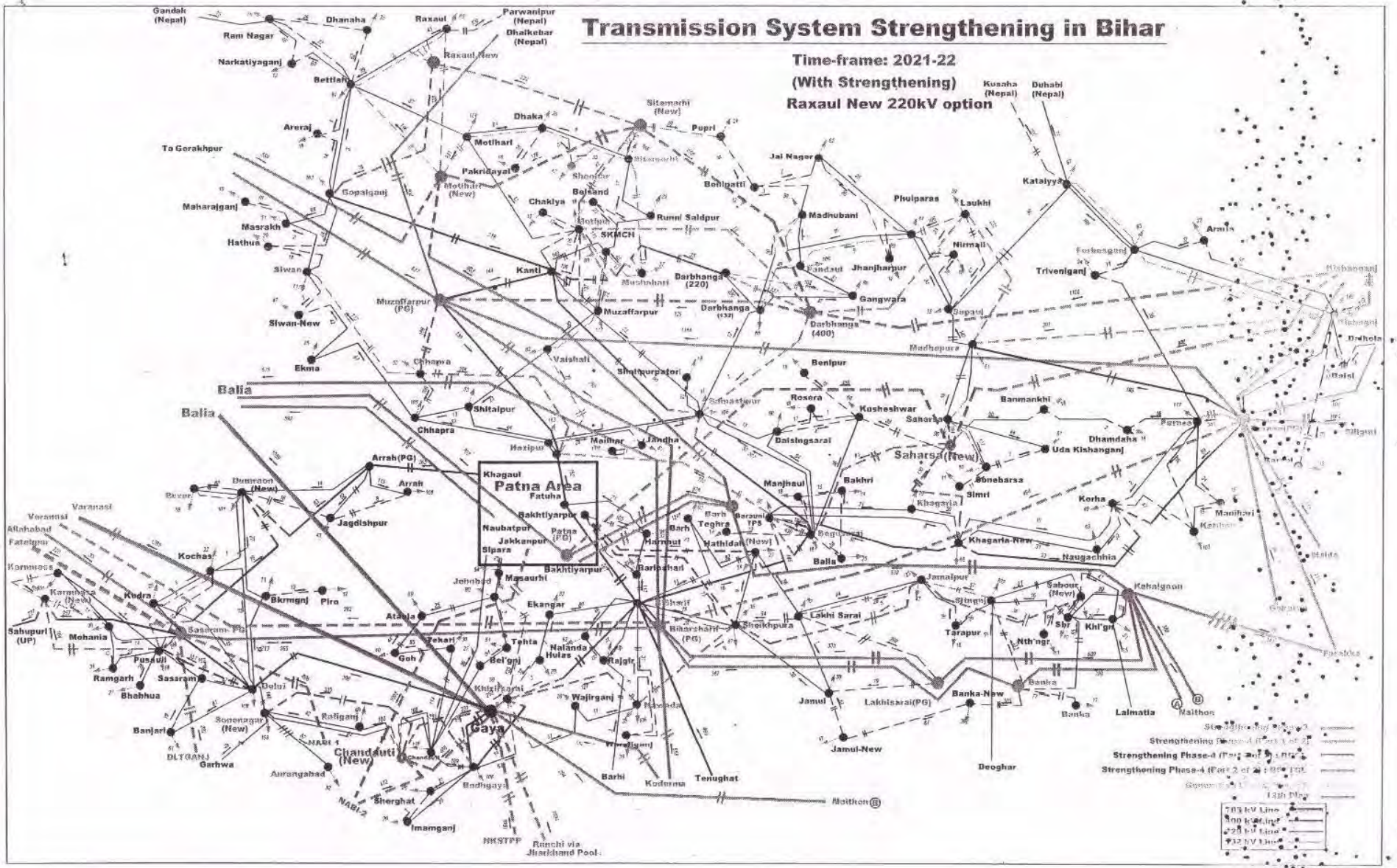

Transmission System Strengthening in Bihar
Time-frame: 2021-22
(With Strengthening)
Raxaul New 220kV option
Patna Area
Gaya
Balia
Saharsa (New)
Jamui-New
Deoghar
Maithon
Ranchi via Jharkhand Pool
Strengthening Phase-4 (Part 1 of 2)
Strengthening Phase-4 (Part 2 of 2)
765 kV Line
400 kV Line
220 kV Line
132 kV Line

Bihar State Power Transmission Company Ltd., Patna
A subsidiary company of Bihar State Power (Holding) Company Ltd., Patna
CIN – U40102BR2012SGC018889
Head Office, Vidyut Bhawan, Bailey Road, Patna – 800021,

Letter No. Trans/mis/72/2016/ 20 /BSPTCL, Patna Dated 28/3/17

From,

Dr. A.K Shrivastava
Chief Engineer (Planning & Engineering)

To,

Sri Pradeep Jindal
Chief Engineer (SP & PA-II),
Central Electricity Authority (CEA),
Sewa Bhawan, R.K Puram,
New Delhi - 110066

Sub:- BSPTCL Agenda to be submitted in the forthcoming meeting. (Copy Enclosed)

Ref:- Your office L. No.-69/1/ /PSPA-II/2017/88-89, dated-15.02.17

Sir,

With reference to the above, BSPTCL is submitting their proposal to put up in the forthcoming meeting of Standing Committee.

Thanking You.

Encl- As above.

Yours faithfully,

28.3.17
(Dr. A. K. Shrivastava)
Chief Engineer (P&E)

Agenda

Sub:- To construct a new GSS 220/132 KV, 2X200 MVA near Raxaul in place of Motihari new 220/132 KV, as proposed under 13th plan by BSPTCL.

1. BSPTCL proposed for installation of 400/220kV, 2x500MVA ICTs at the under construction 400/132kV Motihari GIS Substation(TBCB) to avoid additional expenditure and time on creating a new 220/132kV Motihari (New) substation.
2. Motihari (New) substation has been approved in the 18th Standing Committee Meeting under intra-state strengthening scheme to meet its expected 13th plan demand by providing feed to the following:-
   (a) 220kV feed to existing Gopalganj 220/132kV S/s.
   (b) 132kV feed to existing Bettiah and Raxaul GSS.
   (c) Improve reliability of power supply to Nepal through Raxaul – Parwanipur 132kV line.

3. To know the feasibility of creation of 220kV Voltage at 400/132kV Motihari, CEA called the meeting on 18th Jan-17 with the BSPTCL officers and the Substation experts of POWERGRID. After studying the layout of Motihari S/s and load flow studies by CEA following observation has been made by the experts:- Minutes of the meeting is attached.

a) Motihari (TBCB) – Raxaul and Motihari (TBCB) – Bettiah 132kV D/c lines are critically loaded in the base case itself.

b) It is suggested that 220kV level may not be created at Motihari (TBCB) S/s.

c) It was proposed that the new 220/132kV substation can be created near Bettiah/ Raxaul by LILO of existing Bettiah – Raxaul 132kV D/c line in place of Motihari (New) 220/132 as earlier proposed in 13th plan.

d) In view of the above, two alternatives were considered for shifting the proposed new 220/132kV substation, either close to Bettiah GSS or close to Raxaul GSS. Accordingly load flow has been done.

e) As per load flow studies, the load distribution on 132kV lines from Bettiah (New) is highly uneven and the flow on Motihari(TBCB) – Raxual 132kV D/c is around its thermal limit in base case itself. (C/278)

f) However, the issues are resolved when the substation is shifted to Raxual. It was observed from the above study results that the Raxaul (New) – Gopalganj 220kV D/c is mainly acting as a tie line.(C/277)

g) Considering the lower projected load growth of Bihar in 19th EPS, it was suggested that the implementation of Raxaul (New) – Gopalganj 220kV D/c may be taken up at a later date.

4. Based on the above decision CEA & CTU (Power Grid) agreed on following.

- The available space in the Motihari substation is not adequate to accommodate the proposed 220kV extension of BSPTCL. Creation of 220kV level would restrict any future expansion plans at Motihari S/s. Load flow results also shows that Motihari (TBCB) – Raxaul and Motihari (TBCB) – Bettiah 132kV D/c lines are critically loaded, when 220kV level is created at Motihari (TBCB) S/s.
- The new 220/132kV substation at Motihari is planned primarily to feed the loads of Gopalganj, Bettiah and Raxaul, it was decided to shift the planned

28-3

substation towards Bettiah/Raxaul keeping the same connectivity. Based on above observations and load flow studies, it was proposed that the new 220/132kV substation may be created near Raxaul by the LILO of existing Bettiah – Raxaul 132kV D/c line with the following scope of works.

Raxaul (New) S/s: 220/132kV, 2x200MVA (to be implemented by BSPTCL)

(a) Sitamarhi (New) – Raxaul (New) 220kV D/c (Twin Moose)
(b) Raxaul (New) – Gopalganj 220kV D/c (Twin Moose/ Single Zebra)
(c) LILO of Bettiah – Raxaul 132kV D/c line at Raxaul (New)

- Considering the lower projected load growth of Bihar in 19th EPS, it was suggested that the implementation of Raxaul (New) – Gopalganj 220kV D/c may be taken up at a later date.

In the light of above, it is requested to put up BSPTCL agenda in the forthcoming meeting of the Standing Committee (SCMPSPER) for finalization to construct a new GSS 220/132 KV, 2X200 MVA near Raxaul with the following scope of works to be implemented by BSPTCL.

1. Raxaul (New) S/s: 220/132kV, 2x200MVA
2. Sitamarhi (New) – Raxaul (New) 220kV D/c (Twin Moose)
3. Raxaul (New) – Gopalganj 220kV D/c (Twin Moose/ Single Zebra)
4. LILO of Bettiah – Raxaul 132kV D/c line at Raxaul (New)

in place of Motihari new 220/132 KV, as proposed under 13th plan with the following scope of works.

(a) Sitamarhi(New) – Motihari (New) 220kV D/c (Twin Moose)

(b) Motihari (New) – Gopalganj 220kV D/c(Twin Moose)

(c) Motihari (New) – Raxaul 132kV D/c

(d) Motihari (New) – Betiah 132kV D/c (Single Moose)

28.3.17

(Dr. A. K. Shrivastava)
Chief Engineer (P&E)

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली योजना एवं परियोजना मूल्यांकन प्रभाग-II [ISO: 9001:2008]
Power System Planning & Appraisal Division-II
सेवा भवन, रा. कृ. पुरम , नयी दिल्ली -110066
Sewa Bhawan, R. K. Puram, New Delhi-110066

No. 68/ER/PSPA-2/78 Dated: 07/02/2017

To

Chairman cum Managing Director,
Power Grid Corp. of India Ltd.,
"Saudamini", Plot No.2, Sector-29,
Gurgaon -122 001, Haryana.

Subject: Prior approval of the Government of India under Section 68 of Electricity Act, 2003 for "Eastern Region Strengthening Scheme-XVII (ERSS-XVII)"- Revision regarding.

Reference: POWERGRID letter no C/CP/ERSS-XVII dated 06.01.2017

Sir,

1. This has reference to POWERGRID letter no- C/CP/ERSS-XVII dated 06.01.2017 seeking prior approval of Government under section 68 of the Electricity Act, 2003 for "Eastern Region Strengthening Scheme-XVII (ERSS-XVII)". The scope under the subject scheme was discussed and modified in the 18th meeting of the Standing Committee on Power System Planning of ER held on June 13, 2016. The modified scope of works is as given below:

I. ERSS-XVII (Part-A):

i. 2×160 MVA, 220/132 kV ICT along with associated bays at Daltonganj S/s
ii. 4 nos. of 132 kV line bays at Daltonganj S/s.

II. ERSS-XVII (Part-B):

i. <u>Augmentation of transformation capacity at POWERGRID substations:</u>
a) Installation of 400/220 kV, 1×500 MVA ICT at Gaya Substation (400 kV bay in AIS and 220 kV bay in GIS).
b) Replacement of 400/220 kV, 2×315 MVA ICTs at Malda Substation by 400/220 kV, 2×500 MVA ICTs.

c) Installation of 3rd 400/220 kV, 1×315 MVA ICT (to be sourced from pool of spare ICTs) at New Siliguri S/s (400 kV bay in GIS and 220 kV bay in AIS).
d) Installation of 3rd 400/220kV, 1×315 MVA ICT (to be sourced from pool of spare ICTs) at Durgapur Substation with associated bays.
e) Installation of 400/220 kV, 2×315 MVA ICTs (to be sourced from pool of spare ICTs) at Jeypore S/s (one each in parallel to the existing ICTs).
f) Installation of 400/220 kV, 2×315 MVA ICTs (to be sourced from pool of spare ICTs) at Rourkela Substation (one each in parallel to the existing ICTs).

For elements from (c) to (f) above, sourcing of old ICTs from pool of spare ICTs shall be as given below.

New location for installation of old ICTs	**Source Location of Old ICT**
New Siliguri (ICT-3)	Malda (ICT-3)
Durgapur (ICT-3)	Purnea (ICT-2)
Jeypore (ICT-3 & ICT-4)	Patna (ICT-2) & Sasaram (ICT-2)
Rourkela (ICT-3 & ICT 4)	Ballabgarh (ICT-1) & Mandola (ICT-4)

ii. Re-conductoring of Maithon RB- Maithon 400 kV D/C line with twin HTLS (equivalent to quad moose) along with modifications/ additions in bay equipment at both ends of the line viz. Maithon 400/220 kV sub-station of POWERGRID and generation switchyard of Maithon-RB.

iii. **Bypassing arrangement of LILO of 400 kV lines at Angul:** LILO of Meramundali-Bolangir/Jeypore 400 kV S/c line and LILO of one circuit of Talcher – Meramundali 400 kV D/C line has been done at Angul 765/400 kV substation. Now, it is proposed to establish a switching arrangement at Angul substation such that, the above 400kV LILOs may be operated either by-passing Angul substation or terminating at Angul sub-station as and when required depending upon the power flow condition.

2. In view of above, CEA conveys the prior approval of Government under Section 68 of Electricity Act, 2003 for the schemes:
a) ERSS-XVII(Part-A), and
b) ERSS-XVII (Part-B)
with scopes as given above.
With this approval, the earlier approval given by CEA vide letter no. 68/ER/2015/1506 dated 07.07.2015 is revoked.

3. This approval is subject to compliance of

(a) The requirement of the relevant provisions of the Electricity Act, 2003, as amended from time to time and the rules and regulations framed thereunder and
(b) CEA's (Measures relating to Safety and Electricity Supply) Regulations, 2010 framed under the Electricity Act, 2003.

4. The approval is also subject to the following conditions:

(i) The implementing agency will commence construction of the project within three years, unless this term is extended by the Central Electricity Authority.

(ii) Central Electricity Authority may withdraw the approval before the expiry of the period of three years after giving a one-month notice.

(iii) "The implementing agencies shall abide by the provisions of Works of Licensee Rules, 2006 notified by the Government of India, Ministry of Power in the Gazette of India, extra-ordinary Part-II, Section 3(i) dated 18-04-2006 (vide GSR 217 (E) dated 18-04-2006)". Provided that "*nothing contained in this rule shall effect the powers conferred upon the licensee under section 164 of the Electricity Act, 2003*"

Yours faithfully,

9/2/17

(P. D. Siwal)
Secretary (CEA)

Copy to:
1. Joint Secretary (Trans), MOP, Shram Shakti Bhawan, New Delhi.

Annexure-5.1

पावर ग्रिड कारपोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)
पावरग्रिड

केन्द्रीय कार्यालय: "सौदामिनी" प्लॉट सं. 2, सैक्टर–29, गुडगाँव–122 001, (हरियाणा) दूरभाष: 0124-2571700-719, फैक्स : 0124-2571762,
"Saudamini" Plot No. 2, Sector-29, Gurgaon-122 001, (Haryana) Tel. : 0124-2571700-719, Fax : 0124-2571762, Web.: www.powergridindia.com

CIN : L40101DL1989GOI038121

Ref. No: C/CTU-Plg/E/LTA/Lanco Babandh

Date: 19-10-2016

Shri Pardeep Jindal
Chief Engineer (PSP&A-II)
CEA, Sewa Bhawan
R. K. Puram, N. Delhi-110066

Sub: Transmission system for Lanco Babandh TPS in Odisha Phase-I (2x660MW) & Phase-II (2x660MW) – Reg.

Sir,

This is with reference to your letter no. 68/ER/2016/PSPA-2/279 dated 27-09-2016 regarding requirement for revision in dedicated transmission system of Lanco Babandh Power Ltd.(LBPL) in view of reduction in LTOA quantum. In this regard, following is submitted:

- LTOA of 1600MW (NR-650MW & WR-950MW) was granted to Lanco Babandh (4x660MW) generation project vide intimation no. C/ENG/E/00/SEF/OA dated 14-05-2009 with the following dedicated transmission system:
  (i) Lanco Babandh Gen Switchyard – Angul 400kV 2xD/c line
  (ii) 3x1500MVA, 765/400kV ICTs at Angul with associated bays

745, CE, PSPA-II 24/10/16

- Subsequently, LBPL has relinquished its long term access to the tune of 800MW in line with CERC order dated 08-06-2013 in Petition No: 118/MP/2012. Based on the decisions of 11th Connectivity and LTA Meeting of ER held on 13-06-2016, revision to LTOA intimation was issued, revising the LTOA quantum from 1600MW to 800MW with allocation of NR-650MW & WR-150MW.
- Keeping in view the revised LTOA quantum of 800MW, following revised dedicated transmission system is proposed:
  (i) Lanco Babandh Gen Switchyard – Angul 400kV D/c line (Equivalent to triple snowbird or higher)
  (ii) 2x1500MVA, 765/400kV ICT (7x500MVA single phase units) at Angul along with associated bays

It is requested that CEA may take up the proposed revised dedicated system of LBPL in the forthcoming 19th Standing Committee meeting of ER. Simultaneously, we would also take up the revised scheme for deliberation in the forthcoming Connectivity and LTA meeting of ER.

Thanking you.

Yours faithfully,

(Subir Sen)
COO (CTU-Planning)

पंजीकृत कार्यालय: बी–9, कुतब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली–110016 दूरभाष: 011-26560112, 26560121, 26564812, 26564892,, फैक्स: 011-26601081
Regd. Office: B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi-110016 Tel.: 011-26560112, 26560121, 26564812, 26564892, Fax: 011-26601081, Web.: www.powergridindia.com

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली योजना एवं मूल्यांकन प्रभाग-2

[ISO: 9001:2008]

Power System Planning & Appraisal Division-II
सेवा भवन, रा. कृ.पुरम , नयी दिल्ली -110066
Sewa Bhawan, R. K. Puram, New Delhi-110066

No. 75/1/PSPA-II/2017/154-157 Dated 23 -02-2017

To

1. Managing Director,
Jharkhand Urja Sancharan Nigam Limited (JUSNL),
Engineering Building,
H.E.C., Dhurwa,
Ranchi-834004.
Fax-0651-2400799

2. COO(CTU-Plg),
Power Grid Corp. of India Ltd.(PGCIL),
"Saudamini", Plot No.2,
Sector-29,
Gurgaon-122001,
Haryana.
FAX : 95124-2571932

3. Shri Subhash Thakur,
Asst. General Manager,
Project Engineer(Electrical),
NTPC Ltd,
Engineering Office Complex,
A-8A, Sector-24,
Noida-201301(UP)

Subject: Minutes of meeting regarding draft report of JUSNL perspective transmission plan (2021-22) and Evacuation of power from Patratu TPS (3x800MW) held on 20.01.2017 at CEA

Sir,

The minutes of the meeting held on 20.01.2017 at CEA, Sewa Bhawan, R K Puram, New Delhi regarding above subject is enclosed.

Yours faithfully,

23/02/2017

(Rishika Sharan)
Director (PSPA-II)

Copy to:

PPS to Member(PS), CEA

Minutes of meeting regarding draft report of JUSNL perspective transmission (2021-22) and Evacuation of power from Patratu TPS (3x800MW) held on 20.01.2017 at CEA

List of participants is enclosed at **Annexure-I.**

1. Chief Engineer (PSPA-II), CEA welcomed the participants. He informed that draft report submitted by JUSNL for their perspective transmission plan up to year 2021-22 and evacuation of power from Patratu TPS (3x800MW), PVUNL would be discussed in this meeting. A meeting on 26.10.2016 was earlier held in CEA with CTU and JUSNL representatives to discuss the above, after which JUSNL has revised the studies.

2. **Evacuation of power from Patratu TPS (3x800MW)**

   Patratu Vidyut Utpadan Nigam Limited (PVUNL) (3X800+2X800MW) is a joint venture of NTPC Ltd. and the Jharkhand state government owned Patratu Thermal Power Station (PTPS).

   CTU representative informed that Patratu Vidyut Utpadan Nigam Ltd. (PVUNL) has applied for connectivity of 2400MW (Phase-I), to the ISTS system, from Dec, 2020 for their planned Patratu (3x800MW) TPS situated in Ramgarh District of Jharkhand.

   PVUNL informed that 85% of power is allocated to Jharkhand state and 15% is kept as unallocated power. This matter was discussed and it was agreed that as majority of power of Patratu TPS is allocated to Jharkhand, it would be prudent that Patratu TPS is directly connected with JUSNL (Jharkhand STU) system**.** If remaining share (15%) of power of Patratu TPS is to be transferred outside Jharkhand, PVUNL may apply for ISTS Long Term Access to CTU (POWERGRID), as per CERC regulations.

2.1 Immediate Evacuation System and Evacuation voltage level

2.1.1 Joint studies were carried out to evolve immediate evacuation system for Patratu (3x800MW) TPS and accordingly following power evacuation system from Patratu (3x800MW) TPS was evolved:

(a) Patratu gen. switchyard – Patratu (JUSNL) S/s 400kV (Quad Moose) D/c line

(b) Patratu gen. switchyard – Koderma (JUSNL) S/s 400kV (Quad Moose) D/c line

(c) Patratu gen. switchyard – New Chandil (JUSNL) S/s 400kV (Quad Moose) D/c line

(d) 420kV, 2x125MVAR bus reactors at Patratu gen. switchyard and 420kV, 1x125MVAR bus reactor at Patratu 400kV bus

(e) From Patratu 400/220/132kV substation:

(i) Patratu (JUSNL) S/s to Latehar 400kV D/c line (already under construction)

(ii) Patratu (JUSNL) to Ranchi (POWERGRID) 765/400kV S/s 400kV D/c line (already under construction) along with LILO of both circuits at Mandar 400/220kV S/s

2.2 In this way, Patratu generation would also get connected to strong ISTS pooling stations viz. (i) Ranchi (POWERGRID) 765/400kV through Patratu (JUSNL) and (ii) Chandwa Pool (POWERGRID) through Patratu (JUSNL) & Latehar (JUSNL) substations of JUSNL.

2.3 Further, the connectivity of Patratu (3x800MW) TPS to Koderma (northern part of Jharkhand) and New Chandil (south-eastern part of Jharkhand) through 400kV high capacity (Quad Moose) double circuit lines would facilitate the transfer the power from Patratu TPS to different load centers in Jharkhand.

2.4 These interconnections would complete the 400kV high-capacity ring viz**. Patratu TPS – Koderma – Jasidih – Dhanbad (ISTS) – New Chandil – Patratu TPS** in Jharkhand, which shall improve reliability of power transfer within the state.

2.5 From the joint studies, it was also observed that three-phase fault level at both Patratu (3x800MW) TPS and Patratu (400/220kV) substation is about 50kA. Accordingly, it was decided that 400kV bus at Patratu generation switchyard as well as Patratu (400/220kV) substation (JUSNL) would be designed with 63kA fault level for 1sec.

2.6 JUSNL informed that construction is yet to start at Patratu (400/220kV) substation. Therefore, it was suggested that JUSNL would explore possibility of construction of 400kV and 220kV level at Patratu (400/220kV) substation with fault level of 63kA and 50kA respectively.

2.7 In view of the above, it was suggested that JUSNL may take up the proposed transmission system for Patratu (3x800MW) TPS for approval in the forthcoming meeting of Standing Committee on Power System Planning of Eastern Region. Upon approval, ISTS Connectivity application of PVUNL for Patratu TPS shall be closed and PVUNL may apply for connectivity of its Patratu (3x800MW) TPS to JUSNL (STU of Jharkhand).

3. Perspective transmission plan of JUSNL up to 2021-22

3.1 JUSNL informed that at present power demand of Jharkhand is about 1855.5MW (JUSNL area has 1068MW load and DVC area has 787.5MW load). The total load projected for Jharkhand for the year 2021-22 is around 5613MW (4193MW for JUSNL area + 1420MW for DVC area).

3.2 Load flow studies were carried out for projected peak load of Jharkhand as 4193MW for the year 2021-22.

3.3 JUSNL had submitted draft report on perspective transmission plan of JUSNL up to 2021-22. In the meetings held on 26.10.2017 and 20.01.2017, some modifications were proposed by CEA and CTU to incorporate in the study. JUSNL incorporated these changes and submitted the compliance report vide their email dated 01.02.2017. The compliance report is attached at **Annexure-II.** The transmission system indicated by JUSNL in the perspective transmission plan is enclosed at **Annexure-III.**

3.4 In the meeting, it was pointed out that 220kV D/C line considered from Chaibasa (JUSNL) to Ramchandrapur 220/132kV substation was earlier envisaged as Chaibasa (POWERGRID) to Ramchandrapur 220/132 kV substation. In the 18th SCM of ER, JUSNL had informed following outlets for utilization of 4 no. 220kV line bays at Chaibasa (POWERGRID) substation:

(i) Chaibasa (POWERGRID) – Chaibasa (JUSNL) 220kV D/c
(ii) Chaibasa (POWERGRID) – Ramchandrapur (JUSNL) 220kV D/c line

3.5 However, as per detailed scope of work submitted by JUSNL, the line at (ii) above is proposed to be terminated at Chaibasa (JUSNL) substation and

hence connectivity considered in revised draft report studies i.e. Chaibasa (JUSNL) – Ramchandrapur 220kV D/c line is retained.

3.6 Accordingly, it is imperative that JUSNL may plan a new outlet from Chaibasa (POWERGRID) to utilize the remaining 2 no. 220kV line bays already constructed and get the proposal approved in the forthcoming SCM of ER.

4. Based on the above deliberations, the following was agreed:

4.1 Immediate Evacuation System of PVUNL (3x800MW)

(a) Patratu gen. switchyard – Patratu (JUSNL) S/s 400kV (Quad Moose) D/c line

(b) Patratu gen. switchyard – Koderma (JUSNL) S/s 400kV (Quad Moose) D/c line

(c) Patratu gen. switchyard – New Chandil (JUSNL) S/s 400kV (Quad Moose) D/c line

(d) 420kV, 2x125MVAR bus reactors at Patratu gen. switchyard and 420kV, 1x125MVAR bus reactor at Patratu 400kV bus

4.1.1 The following transmission system from Patratu (JUSNL) S/s is already under construction:

(a) Patratu (JUSNL) S/s – Latehar 400kV D/c line

(b) Patratu (JUSNL) – Ranchi (POWERGRID) 765/400kV S/s 400 kV D/c line

Note: *Patratu (JUSNL) – Ranchi (POWERGRID) 400kV D/c line would be LILOed at Mander 400/220kV S/s by Jharkhand as per perspective transmission plan of JUSNL up to 2021-22*

4.1.2 400kV level at Patratu generation switchyard as well as Patratu (400/220kV) substation (JUSNL) would be designed with 63kA fault level for 1sec. 220kV level at Patratu S/s to be designed with 50kA fault level for 1sec

4.1.3 As 85% of power of Patratu (3x800MW) TPS project is allocated to Jharkhand, it was agreed that the generation would be connected to Jharkhand system. In such case, connectivity to ISTS shall not be required. Accordingly, it was decided that the ISTS Connectivity application of PUVNL would be discussed for withdrawal/closure in the next Connectivity and LTA meeting of ER. PVUNL may apply for connectivity of its Patratu (3x800MW) TPS to JUSNL (STU of Jharkhand).

4.2 Perspective transmission plan of JUSNL up to 2021-22

4.2.1 The following 400/220kV intra-state substations along with downstream connectivity mentioned at **Annexure-III** were agreed under perspective transmission plan of JUSNL up to 2021-22:

(i) Jasidih 400/220kV, 2x500MVA
(ii) New Chandil 400/220kV, 2x500MVA
(iii) Koderma 400/220kV, 2x500MVA
(iv) Mandar 400/220kV, 2x500MVA

4.2.2 The transmission system planned for JUSNL network along with evacuation system of PVUNL would create a high capacity 400kV ring **Patratu TPS – Koderma – Jasidih – Dhanbad (ISTS) – New Chandil – Patratu TPS** in Jharkhand, which would improve reliability of power transfer within the state. The intra-state system of Jharkhand would also get well interconnected at various ISTS points for smooth power exchange.

4.2.3 420kV, 2x125MVAR bus reactors may be installed at the new 400kV substations of JUSNL for voltage control. 400kV and 220kV levels at the new substations may be implemented with fault level of 63kA and 50kA respectively.

4.2.4 The SLD of 400kV & 220kV network and geographical map of JUSNL system for the JUSNL network for the year is attached at **Annexure- IV (a), (b) & (c).**

4.3 Utilisation of balance 2 no. 220kV line bays at Chaibasa

4.3.1 The utilization of 2 no. 220kV line bays at Chaibasa may be updated by JUSNL in 19th SCM of ER.

Meeting ended with vote of thanks to chair.

Annexure-I

List of the participants of the meeting held on 20.01.2017 at CEA

Sl. No.	Name of the Participant	Designation	Organization
1	Pardeep Jindal	Chief Engineer(PSPA-II)	CEA
2	Rishika Sharan	Director(PSPA-II)	CEA
3	U.M.Rao	Deputy Director(PSPA-II)	CEA
4	Suyash A. Verma	Asst. Director	CEA
5	Ashok Pal	General Manager(CTU-Plg)	POWERGRID
6	Rohit Chandra	Engineer(CTU-Plg)	POWERGRID
7	A.K.Singh	ESE	JUSNL
8	Subhash Thakur	AGM	NTPC
9	Rakesha.H.S.	Manager	PRDC(JUSNL Consultant)
10	Sharad Mishra	Manager	INFRA/IEDCL

Annexure-II

Compliance statement for revised draft report comments

Sl. No.	Comments received on 20-01-2017	PRDC reply on 25-01-2017
1	CEA requested to submit the proposed substations and connectivity by segregating them based on the 400 kV source.	Noted and it will be submitted as per the required format.
2	PVUNL power evacuation scheme is finalized as the connectivity given below: <u>From PVUNL generation plant</u> 1. 400kV Quad moose D/C line from PVUNL to Patratu 400/220 kV substation. 2. 400kV D/C line from PVUNL to Koderma 400/220/132kV substation. 3. 400kV D/C line from PVUNL to Chandil 400/220/132kV substation. <u>From Patratu 400/220/132kV substation</u> – 4. 400kV D/C line from Patratu 400/220/132kV substation to Latehar 400/220/132kV substation. 5. Charging of 400kV S/C (presently charged at 220kV) line from PTPS to TTPS at 400kV and shifting the line from PTPS to Patratu 400/220/132kV substation. 6. 400kV D/C line from Patratu 400/220/132kV substation to Ranchi PGCIL 765/400kV substation with LILO at Mandar 400/220kV substation. Also, 63 kA breakers has to be considered at both PVUNL and Patratu 400 kV buses and 2*125 MVAr bus reactor at PVUNL 400 kV bus and 1*125 MVAr bus reactor at Patratu 400 kV bus has to be considered.	Noted and it will be incorporated in the studies.
3	400 kV D/C line from JUSNL Koderma 400/220/132 kV substation to PGCIL Daltonganj has to be removed from the studies.	Noted and it will be removed from the studies.
4	Corporate Phase I (2*270 MW) IPP generation has to be removed from the studies.	Noted and it will be removed from the studies.
5	400/220 kV ICT unit capacity for all the proposed 400/220 kV substations has to be considered as 500 MVA except at Patratu and Latehar since already commissioning work is in progress. Also, 63 kA breakers has to be considered in the 400 kV buses of all the proposed 400 kV substations.	Noted and it will be incorporated in the studies.
6	220 kV D/C line from JUSNL Koderma 400/220/132 kV substation to DVC Koderma substation has to be removed from the studies.	Noted and it will be removed from the studies.

Sl. No.	Comments received on 20-01-2017	PRDC reply on 25-01-2017
7	Following changes has to be made in the 220 kV connectivity in Ranchi area,: 1. 220 kV D/C line from Ratu 220/132 kV substation to Bero 220/132 kV substation has to be changed to Mandar 400/220 kV to Bero 220/132/33 kV substation. 2. 220 kV D/C line from Mandar 400/220 kV substation to Khunti 220/132 kV substation has to be removed.	Noted and it will be incorporated in the studies.
8	220 kV D/C line from Govindpur 220/132 kV substation to CTPS DVC generation has to be removed.	Noted and it will be removed from the studies.
9	220 kV D/C line considered from Chaibasa JUSNL to Ramachandrapur 220/132 kV substation has to be changed to Chaibasa PGCIL to Ramachandrapur 220/132 kV substation.	As per the discussion with JUSNL it is understood that the line will be terminated at Chaibasa JUSNL substation and hence connectivity considered in revised draft report studies is retained.
10	New 132 kV D/C line from Jasidih 400/220/132 kV substation to Hansdiha 132/33 kV substation has to be considered by removing 132 kV D/C line from Hansdiha to Banka.	Noted and it will be incorporated in the studies.
11	New 220/132 kV substation at Adityapur has to be considered to relieve the loading on existing Adityapur 132 kV substation with the following connectivity. 1. LILO of both the circuits of Chaibasa PGCIL to Ramachandrapur 220/132 kV substation at New Adityapur 220/132 kV substation. 2. LILO of 132 kV Chandil to old Adityapur line at New Adityapur 220/132 kV substation. 3. LILO of 132 kV Rajkharaswan to old Adityapur line at New Adityapur 220/132 kV substation. New 220kV D/C line has to be considered from New Adityapur 220/132 kV to Jadugoda 220/132 kV substation instead of earlier consider 220 kV LILO line.	Noted and it will be incorporated in the studies.
12	Instead of new 220 kV D/C line from new Chandil 400/220 kV substation to old Chandil 220/132 kV substation and Tamar 220/132 kV substations, LILO of both the circuits of existing 220 kV D/C line from Ranchi to old Chandil at new Chandil 400/220 kV substation has to be considered. Also new Chandil to old Chandil portion of the 220 kV line can be re-conductored with higher size conductor.	Noted and it will be incorporated in the studies.
13	New 132 kV D/C line from Bero 220/132 kV substation to Kamdara 132/33 kV substation can be considered.	Noted and it will be incorporated in the studies.

Sl. No.	Comments received on 20-01-2017	PRDC reply on 25-01-2017
14	The 220 kV D/C line from Chaibasa to Simdega can be revised considering the length of 165 km. Alternatively 220 kV D/C line from Bero 220/132 kV substation can be considered.	Simdega 220/132kV substation will be considered for year 2021-22 (Earlier it was considered for year 2018-19 with 220kV connectivity to Chaibasa) since commissioning schedule of Bero 220/132kV substation is year 2021-22 from which 220kV connectivity to Simdega will be considered.

I. Latehar 400kV substation (Loads in this area are also supplied by Daltonganj PGCIL 400kV substation)								
Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
1	Latehar	Latehar	400/220	2	315	630	400kV D/C line from Latehar 400/220/132kV substation to Patratu 400/220kV substation.	2017-18
							400kV D/C line from Latehar 400/220/132kV substation to Jharkhand pooling station. (By year 2021-22, with commissioning of Essar generation this connectivity will become Essar to Latehar and Essar to Jharkhand pooling station 400kV D/C line)	
			220/132	2	150	300	220kV D/C line from Latehar 400/220/132kV substation to Chatra 220/132kV substation.	
							Charging of 220kV D/C line (presently charged at 132kV) from Daltonganj 132/33kV substation to Latehar 132/33kV substation at 220kV, and termination of the line at PGCIL Daltonganj 400/220/132kV and Latehar 400/220/132kV substation.	
							132kV D/C line from Latehar 400/220/132kV substation to Latehar 132/33kV substation.	
2	Chatra	Chatra	220/132	2	150	300	220kV D/C line from Latehar 400/220kV substation to Chatra 220/132kV substation.	2017-18
							220kV D/C line from Chatra 220/132kV substation to PBCMP (NTPC).	
							132kV D/C line from Chatra 220/132/33kV substation to Chatra (Pratappur) 132/33kV substation.	
			132/33	2	50	100	Charging of under construction 220kV D/C line from Latehar 400/220kV substation to Chatra 220/132kV substation at 132kV level and connecting it to existing Latehar 132/33kV substation.	2016-17
3	Lohardagga	Lohardagga	220/132	2	150	300	Charging of 220kV D/C line from Lohardagga 132/33kV substation to Latehar 132/33kV substation at 220kV (previously line was charged at 132kV).	2018-19
							Charging of 220kV D/C line from Lohardagga 132/33kV substation to Hatia 220/132kV substation at 220kV (previously line was charged at 132kV).	
4	Garwha	Garwha	220/132	2	150	300	220kV D/C line from Daltonganj 400/220kV substation to Garwha 220/132kV substation.	2018-19
							132kV D/C line from Garwha 220/132kV substation to Garwha road 132/33kV substation.	
5	Chatra (Pratappur)	Chatra	132/33	2	50	100	132kV D/C line from Chatra 220/132/33kV substation to Chatra (Pratappur) 132/33kV substation.	2017-18
6	Mahuadanr	Latehar	132/33	2	50	100	132kV D/C line from Latehar 400/220/132kV substation to Mahuadanr 132/33kV substation.	2018-19
7	Chandwa	Latehar	132/33	2	50	100	132kV D/C line from Latehar 400/220/132kV substation to Chandwa 132/33kV substation.	2018-19
8	Chainpur	Gumla	132/33	2	50	100	132kV D/C line from Chainpur 132/33kV substation to Mahuadanr 132/33kV substation.	2020-21
							132kV D/C line from Gumla 132/33kV substation to Chainpur 132/33kV substation.	
9	Simaria	Chatra	132/33	2	50	100	132kV D/C line from Chatra 220/132/33kV substation to Simaria 132/33kV substation.	2021-22
10	Nagaruntari	Garwha	132/33	2	50	100	132kV D/C line from Garwha 220/132kV substation to Nagaruntari 132/33kV substation.	2019-20
11	Meral	Garwha	132/33	2	50	100	132kV D/C line from Garwha 220/132kV substation to Meral 132/33kV substation.	2019-20
12	Ramkanda	Garwha	132/33	2	50	100	132kV D/C line from Garwha 220/132kV substation to Ramakanda 132/33kV substation.	2019-20
13	Panki	Palamu	132/33	2	50	100	132kV D/C line from Chatarpur 132/33kV substation to Panki 132/33kV substation.	2019-20
14	Chatarpur	Palamu	132/33	2	50	100	132kV D/C line from Daltonganj 400/220/132kV substation to Chatarpur 132/33kV substation.	2018-19
							132kV D/C line from Chatarpur 132/33kV substation to Japla 132/33kV substation.	
Additional transmission lines for network strengthening								
1	132kV D/C line from 132/33kV Garwha road substation to Japla 132/33kV substation.							2016-17
2	132kV D/C line from Daltonganj PGCIL 400/220/132kV substation to Daltonganj 132/33kV substation.							2017-18
3	132kV D/C line from Garhwa road 132/33kV substation to Daltonganj 132/33kV substation.							2017-18

II. Patratu 400kV substation								
Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
1	Patratu	Hazaribagh	400/220	2	315	630	400kV D/C line from Patratu 400/220/132kV substation to Latehar 400/220/132kV substation.	2017-18
							Charging of 400kV S/C (presently charged at 220kV) line from PTPS to TTPS at 400kV and shifting the line from PTPS to Patratu 400/220/132kV substation.	
			220/132 (transformers shifted from PTPS to Patratu)	2	150	300	Shifting of 220kV D/C line from PTPS to Hatia 220/132kV substation to Patratu 400/220/132kV substation.	
							220kV D/C line from Patratu 400/220/132kV substation to PBCMP (NTPC).	
							220kV D/C line from Patratu 400/220/132kV substation to PTPS.	

			132/33	2	50	100	Shifting of 132kV S/C line from PTPS to Patratu (DVC) to Patratu 400/220/132kV substation. Shifting of 132kV S/C line from PTPS to Kanke 132/33kV substation to Patratu 400/220/132kV substation. Shifting of 132kV S/C line from PTPS to Hatia 132/33kV substation to Patratu 400/220/132kV substation.	
2	Barkagaon	Hazaribagh	132/33	2	50	100	132kV D/C line from Patratu 400/220/132kV substation to Barkagaon 132/33kV substation.	2018-19
3	Ramgarh	Hazaribagh	132/33	2	50	100	132kV D/C line from Ramgarh 132/33kV substation to existing Ramgarh (DVC) 132/33kV substation. 132kV D/C line from Chatra 220/132/33kV substation to Ramgarh 132/33kV substation. 132kV D/C line from Patratu 400/220/132kV substation to Ramgarh 132/33kV substation. 132kV D/C line from Bokaro (Jainamore) 220/132kV substation to Ramgarh 132/33kV substation.	2018-19
Additional transmission lines for network strengthening								
1	400kV D/C line from Patratu 400/220/132/33kV substation to Ranchi PGCIL 765/400kV substation.							2018-19

III. Jasidih 400kV substation

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
1	Jasidih	Deoghar	400/220	2	500	1000	400kV D/C line from Koderma 400/220/132kV substation to Jasidih 400/220/132kV substation.	2018-19
			220/132	2	150	300	220kV D/C line from Dumka 220/132kV substation to Jasidih 220/132/33kV substation.	2017-18
			132/33	2	50	100	132kV D/C line from Jasidih 220/132/33kV substation to Madhupur 132/33kV substation. 132kV D/C line from Deogarh 132/33kV substation to Jasidih 220/132/33kV substation.	
2	Giridih	Giridih	220/132	2	150	300	220kV D/C line from Koderma 400/220/132kV substation to Giridih 220/132/33kV substation. 220kV D/C line from Govindpur 220/132/33kV substation to Giridih 220/132/33kV substation.	2018-19
			132/33	2	50	100	132kV D/C line from Giridih 220/132/33kV substation to Jamua 132/33kV substation.	
3	Godda	Godda	220/132	2	150	300	220kV D/C line from Dumka 220/132 kV substation to Godda 220/132/33kV substation. 220kV D/C line from Godda 220/132/33kV substation to Lalmatia 220/132/33kV substation.	2018-19
			132/33	2	50	100	132kV D/C line from Godda 220/132/33kV substation to Amarpara 132/33kV substation. LILO of one circuit of 132kV D/C line from Dumka 132/33kV substation to Lalmatiya 220/132/33kV substation at Godda 220/132/33kV substation.	
4	Jamua	Giridih	132/33	2	50	100	132kV D/C line from Giridih 220/132/33kV substation to Jamua 132/33kV substation.	2018-19
5	Saria	Giridih	132/33	2	50	100	132kV D/C line from Bishnugarh 132/33kV substation to Saria 132/33kV substation.	2018-19
6	Chitra	Deoghar	132/33	1	50	70	LILO of 132kV S/C line from Deogarh 132/33kV substation to Jamtara 132/33kV substation at Chitra 132/33kV substation.	2016-17
				1	20			
7	Jarmundi	Dumka	132/33	2	50	100	LILO of 132 kV D/C line from Dumka 132/33kV substation to Deoghar 132/33kV substation at Jarmundi 132/33kV substation.	2018-19
8	Sikaripara	Dumka	132/33	2	50	100	132kV D/C line from Dumka 132/33kV substation to Sikaripara 132/33kV substation.	2018-19
9	Hansdiha	Dumka	132/33	2	50	100	LILO of one circuit of 132 kV D/C line from Lalmatiya 220/132/33kV substation to Dumka 132/33kV substation at Hansdiha 132/33kV substation. 132kV D/C line from Hansdiha 132/33kV substation to Banka (PGCIL) substation.	2018-19
10	Amarpara	Pakur	132/33	2	50	100	132kV D/C line from Godda 220/132/33kV substation Amarpara 132/33kV substation. 132kV D/C line from Pakur 132/33kV substation to Amarpara 132/33kV substation. 132kV D/C line from Dumka 132/33kV to Amarpara 132/33kV substation.	2018-19
11	Rajmahal	Sahebganj	132/33	2	50	100	132kV D/C line from Sahebganj 132/33kV substation to Rajmahal 132/33kV substation.	2018-19
12	Udhwa	Sahebganj	132/33	2	50	100	132kV D/C line from Sahebganj 132/33kV substation to Udhwa 132/33kV substation.	2018-19
Additional transmission lines for network strengthening								
1	400kV D/C line from PGCIL Dhanbad 400/220kV substation to Jasidih 400/220/132/33kV substation.							2019-20
2	Conversion of 220kV S/C line from Lalmatia 220/132/33kV substation to Farakka NTPC generation into D/C line.							2020-21
3	220kV D/C line from Giridih 220/132/33kV substation to Jasidih 400/220kV substation.							2021-22
4	132kV D/C line from 220/132kV Dumka substation to Jamtara 132/33kV substation.							2018-19
5	132kV D/C line from Sahebganj 132/33kV substation to Pakur 132/33kV substation.							2018-19
6	132kV D/C line from Saria 132/33kV substation to Giridih 220/132/33kV substation.							2021-22

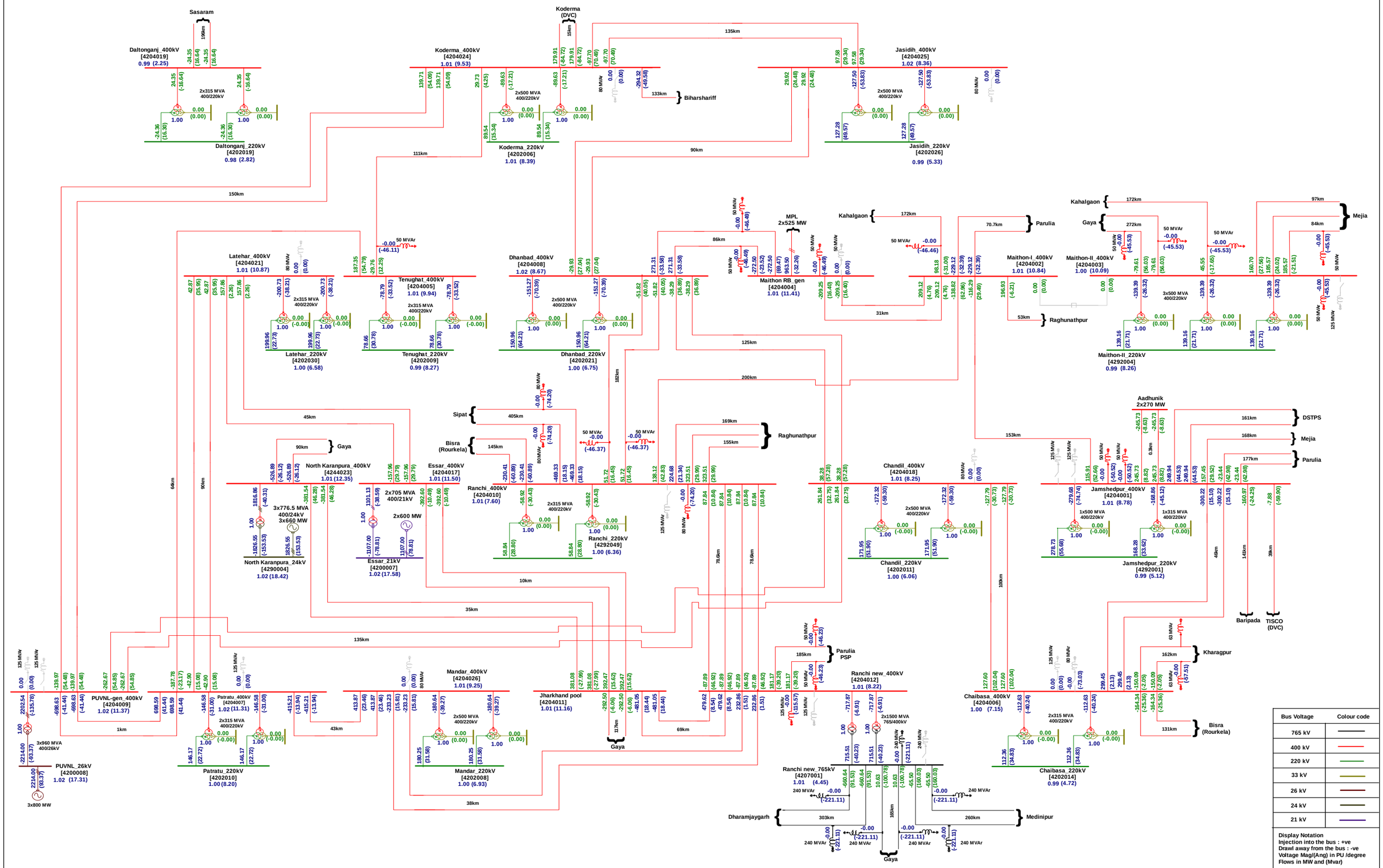
IV. Chandil 400kV substation (Loads in this are also supplied by Ramchandrapur and Chaibasa PGCIL 400kV								
Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
1	Chandil	Saraikela	400/220	2	500	1000	400kV D/C line from PGCIL Chaibasa 400/220/132kV substation to Chandil 400/220/132kV substation. LILO of 220kV D/C line from Ranchi PGCIL 400/220kV substation to Chandil 220/132kV substation at Chandil 400/220kV substation.	2018-19
2	Tamar	Ranchi	220/132	2	150	300	LILO of 220kV D/C line from Ranchi PGCIL 400/220kV substation to Chandil 220/132kV substation at Tamar 220/132kV substation.	2018-19
3	Simdega	Simdega	220/132	2	150	300	220kV D/C line from Bero 220/132/33kV substation to Simdega 220/132kV substation. 132kV D/C line from Simdega 220/132kV substation to Kolebira 132/33kV substation. LILO of 132kV D/C line from Simdega 132/33kV substation to Kurdeg 132/33kV substation at Simdega 220/132kV substation.	2021-22
			132/33	2	50	100	132kV D/C line from Manoharpur 132/33kV substation to Simdega 132/33kV substation. 132kV D/C line from Gumla 132/33kV substation to Simdega 132/33kV substation.	2016-17
4	Jadugoda	East Singhbhum	220/132	2	150	300	LILO of proposed 220kV D/C line from Ramchandrapur 220/132/33kV substation to Chaibasa 220/132kV substation at Jadugoda 220/132/33kV substation.(Interim arrangement) 220kV D/C line from Adityapur 220/132kV substation to Jadugoda 220/132/33kV substation.(With commissioning of Adityapur 220/132/33kV substation)	2018-19
5	Adityapur	East Singhbhum	220/132	2	150	300	LILO of 220kV D/C line from Ramchandrapur PGCIL 400/220kV substation to Chaibasa 220/132kV substation at Adityapur 220/132kV substation. 220kV D/C line from Adityapur 220/132kV substation to Jadugoda 220/132/33kV substation.(With commissioning of Adityapur 220/132/33kV substation) LILO of 132kV S/C line from Chandil 220/132kV substation to Adityapur 132/33kV substation at Adityapur 220/132kV substation. LILO of 132kV S/C line from Rajkharsawan 132/33kV substation to Adityapur 132/33kV substation at Adityapur 220/132kV substation.	2021-22
6	Chouka	Saraikela	132/33	2	50	100	132kV D/C line from Tamar 220/132/33kV substation to silli 132/33kV substation via Chouka 132/33kV substation.	2018-19
7	Chakuliya	East Singbhum	132/33	2	50	100	132kV D/C line from Chandil 220/132kV substation to Chakuliya 132/33kV substation. 132kV D/C line from Bahragora 132/33kV substation to Chakuliya 132/33kV substation. 132kV D/C line from Dalbhumgarh 132/33kV substation to Chakuliya 132/33kV substation.	2018-19
8	Bahragora	East Singbhum	132/33	2	50	100	132kV D/C line from Dalbhumgarh 132/33kV substation to Bahragora 132/33kV substation. 132kV D/C line from Bahragora 132/33kV substation to Chakuliya 132/33kV substation.	2018-19
9	Kandra	Saraikela	132/33	2	50	100	LILO of one circuit of 132kV D/C line from Chandil 220/132kV substation to Rajkharsawan 132/33kV substation at Kandra 132/33kV substation.	2018-19
10	Mango	East Singbhum	132/33	2	50	100	132kV D/C line form Ramchandrapur 220/132kV substation to Mango 132/33kV substation. LILO of one circuit of 132kV D/C line from Chandil 220/132kV substation to Golmuri 132/33kV substation at Mango 132/33kV substation.	2018-19
11	Sundernagar	East Singbhum	132/33	2	50	100	132kV D/C line from Jadugoda 132/33kV substation to Sundernagar 132/33kV substation.	2018-19
12	Manoharpur	West Singbhum	132/33	2	50	100	LILO of 132kV S/C line form Goelkera 132/33kV substation to Tarkera 220/132kV substation at Manoharpur 132/33kV substation (commissioned). 132 KV D/C line from Chaibasa 220/132/33kV substation to Manoharpur 132/33kV substation.	2016-17
13	Ramchandrapur	East Singbhum	132/33	2	50	100	Addition of 132/33kV transformers at existing Ramchandrapur 220/132kV substation.	2016-17
14	Kolebira	Simdega	132/33	2	50	100	132kV D/C line from Kamdara 132/33kV substation to Kolebira 132/33kV substation.	2018-19
15	Kurdeg	Simdega	132/33	2	50	100	132kV D/C line from Simdega 132/33kV substation to Kurdeg 132/33kV substation.	2018-19
Additional transmission lines for network strengthening								
1	400kV D/C line from PGCIL Dhanbad 400/220kV substation to Chandil 400/220kV substation.							2019-20
2	220kV D/C line from 220/132kV Ramchandrapura substation to Chaibasa 220/132/33kV substation.							2016-17
3	220kV D/C line from Chaibasa 220/132/33kV substation to Gua SAIL.							2018-19
4	132kV D/C line from 220/132 kV Ramchandrapur substation to Jadugoda 132/33kV substation.							2016-17
5	132kV D/C line from 132/33kV Jadugoda substation to Dalbhumgarh 132/33kV substation.							2016-17
6	132kV D/C line from 132/33kV Chakradharpur substation to Chaibasa 220/132/33kV substation.							2018-19
7	132kV D/C line from Noamundi 132/33kV substation to Chaibasa 220/132/33kV substation.							2018-19
8	LILO of one Ckt of 132 KV D/C line from Noamundi 132/33kV substation to Chaibasa 220/132/33kV substation at Kendposi 132/33kV substation.							2018-19
9	132kV D/C line from 220/132/33kV Chaibasa substation to Rajkharsawan 132/33kV substation.							2018-19
10	LILO of one circuit of 132kV D/C line from Chaibasa 220/132/33kV substation to Manoharpur 132/33kV substation at Goelkera 132/33kV substation.							2018-19
11	132kV D/C line from Noamundi 132/33kV substation to Manoharpur 132/33kV substation.							2020-21

V. Koderma 400kV substation								
Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
			400/220	2	500	1000	400kV D/C line from Koderma 400/220/132kV substation to Koderma (DVC) 400/220kV substation. 400kV D/C line from Koderma 400/220/132kV substation to Jasidih 400/220/132kV substation.	

1	Koderma	Koderma					LILO of 400kV S/C line from TTPS to Biharshariff at Koderma 400/220/132kV substation.	2018-19
			220/132	2	150	300	220kV D/C line from Koderma 400/220/132kV substation to Giridih 220/132/33kV substation.	
			132/33	2	50	100	-	
2	Domchanch	Giridih	220/132	2	150	300	220kV D/C line from Koderma 400/220/132kV substation to Domchanch 132/33kV substation.	2021-22
			132/33	2	50	100	-	
3	Barkatha	Koderma	220/132	2	150	300	220kV D/C line from Hazaribagh 220/132/33kV substation to Barkatha 220/132/33kV substation.	2021-22
			132/33	2	50	100	-	
4	Hazaribagh	Hazaribagh	220/132	2	150	300	220kV D/C line from Tenughat TPS to Hazaribagh 220/132/33kV substation.	2018-19
							220kV D/C line from Hazaribagh 220/132/33kV substation to Hazaribagh (DVC) 220/132kV substation.	
			132/33	2	50	100	132kV D/C line from Hazaribagh 220/132/33kV substation to Bishnugarh 132/33kV substation.	
5	Barhi	Hazaribagh	132/33	2	50	100	132kV D/C line from Chatra 220/132/33kV substation to Barhi 132/33kV substation.	2018-19
Additional transmission lines for network strengthening								
1	132kV D/C line from Barhi 132/33kV substation to Hazaribagh (JSEB) 220/132/33kV substation.							2021-22

VI. Mandar 400kV substation (Loads in this area are also supplied by Ranchi PGCIL 400kV substation)								
Sl. No.	**Name of substation**	**District**	**Voltage level (kV)**	**Proposed substation details**			**Connectivity**	**Commissioning year**
				No of units	**Capacity of each unit (MVA)**	**Total capacity (MVA)**		
1	Mandar	Ranchi	400/220	2	500	1000	LILO of 400KV D/C line from Ranchi PGCIL 765/400kV substation to Patratu 400/220/132/33kV substation at Mandar 400/220kV substation.	2021-22
							220kV D/C line from Ratu 220/132/33kV substation to Mandar 400/220kV substation.	
							220kV D/C line from Tamar 220/132/33kV substation to Mandar 400/220kV substation via Khunti 220/132/33kV substation.	
							LILO of 220KV D/C line from Hatia 220/132kV substation to Lohardagga 220/132kV substation at Mandar 400/220kV substation.	
							220kV D/C line from Mandar 400/220kV substation to Bero 220/132/33kV substation.	
2	Ratu	Ranchi	220/132	2	150	300	220kV D/C line from Patratu 400/220kV substation to Ratu 220/132kV substation.	2018-19
			132/33	2	50	100	132kV D/C line from Hatia 220/132kV substation to Ratu 220/132kV substation.	
3	Bero	Ranchi	220/132	2	150	300	220kV D/C line from Mandar 400/220kV substation to Bero 220/132/33kV substation.	2021-22
							220kV D/C line from Khunti 220/132/33kV substation to Bero 220/132/33kV substation.	
			132/33	2	50	100	132kV D/C line from Bero 220/132/33kv substation to Kamdara 132/33kV substation.	
4	Khunti	Khunti	220/132	2	150	300	220kV D/C line from Tamar 220/132/33kV substation to Khunti 220/132kV substation.	2021-22
							220kV D/C line from Khunti 220/132/33kV substation to Bero 220/132/33kV substation.	
			132/33	2	50	100	132kV D/C line from Tamar 220/132/33kV substation to Khunti 132/33kV substation.	2017-18
							LILO of 132kV S/C line form Hatia 132/33kV substation to Kamdara 132/33kV substation at Khunti 132/33kV substation.	
5	Sarwal	Ranchi	220/132	2	150	300	LILO of 220kV D/C line from Ranchi PGCIL 400/220kV substation to Chandil 220/132kV substation at Sarwal 220/132/33kV substation.	2020-21
			132/33	2	50	100	-	
6	Irba	Ranchi	132/33	2	50	100	132kV D/C line from Irba 132/33kV substation to Kanke 132/33kV substation.	2018-19
7	Gola	Hazaribagh	132/33	2	50	100	132kV D/C line from Gola 132/33kV substation to Silli 132/33kV substation.	2018-19
8	Angada	Ranchi	132/33	2	50	100	132kV D/C line from Sikkidri 132/33kV substation to Angada 132/33kV substation.	2018-19
							132kV D/C line from Angada 132/33kV substation to Silli 132/33kV substation.	
9	Silli	Ranchi	132/33	2	50	100	132kV D/C line from Silli 132/33kV substation to Angada 132/33kVsubstation.	2018-19
							132kV D/C line from Silli 132/33kV substation to Gola 132/33kVsubstation.	
							132kV D/C line from Chouka 132/33kVsubstation to silli 132/33kV substation.	
							132kV D/C line from Silli 132/33kV substation to Sikkidri 132/33kV substation.	
Additional transmission lines for network strengthening								
1	220kV D/C line from 220/132kV Hatia substation to Ranchi (PGCIL) 400/220kV substation.							2016-17
2	132kV D/C line from 132/33kV Kanke substation to Hatia 220/132kV substation.							2016-17
3	LILO of 132kV S/C (3rd ckt) from Hatia 132/33kV substation to Sikidri 132/33kV substation at Namkum 132/33kV substation.							2016-17
4	Re-conductoring of Hatia-Namkum-Sikidri 132kV D/C line with HTLS conductor.							2016-17
5	Re-conductoring of Hatia-Kamdara 132kV S/C line with HTLS conductor.							2016-17
6	132kV D/C line from Irba 132/33kV substation to Ramgarh 132/33kV substation.							2019-20
7	132kV D/C line from Irba 132/33kV substation to Ratu 220/132/33kV substation.							2019-20
Govindpur 220kV substation (Dhanbad PGCIL 400kV substation is a power source in this area)								
1	Govindpur	Dhanbad	220/132	2	150	300	220 kV D/C line from TTPS to Govindpur 220/132/33kV substation.	2016-17
							220kV D/C line from Dumka 220/132kV substation to Govindpur 220/132/33kV substation.	
			132/33	2	50	100	-	
2	Bokaro (Jainamore)	Bokaro	220/132	2	150	300	LILO of 220kV D/C line from TTPS to Govindpur 220/132/33kV substation at Bokaro 220/132/33kV substation	2017-18
			132/33	2	50	100	-	

3	Gomia	Giridih	220/132	2	150	300	220kV D/C line from Tenughat TPS to Gomia 220/132/33kV substation.	2018-19
			132/33	2	50	100	132kV D/C line from Gomia 220/132/33kV substation to Dugda 132/33kV substation.	
4	Chandrapura	Bokaro	220/132	2	150	300	220kV D/C line from Tenughat TPS to Chandrapura 220/132/33kV substation.	2020-21
			132/33	2	50	100	132kV D/C line from Chandrapura 220/132/33kV substation to Dugda 132/33kV substation.	
5	Baliyapur	Dhanbad	220/132	2	150	300	220kV D/C line from Govindpur 220/132/33kV substation to Baliyapur 220/132/33kV substation.	2020-21
			132/33	2	50	100	LILO of 132kV D/C line from Putki 132/33kV substation to Pathardih 132/33kV substation at Baliyapur 220/132/33kV substation.	
6	Topchanchi	Giridih	220/132	2	150	300	220kV D/C line from Govindpur 220/132/33kV substation to Topchanchi 220/132/33kV substation.	2020-21
			132/33	2	50	100	132kV D/C line from Topchanchi 220/132/33kV substation to Dugda 132/33kV substation.	
7	Palojori	Deoghar	220/132	2	150	300	LILO of 220kV D/C line from Dumka 220/132/33kV substation to Govindpur 220/132/33kV substation at Palojori 220/132/33kV substation.	2021-22
			132/33	2	50	100	-	
8	Petarwar	Bokaro	132/33	2	50	100	132kV D/C line from Bokaro (Jainamore) 220/132/33kV substation to Petarwar 132/33kV substation.	2018-19
9	Dugda	Bokaro	132/33	2	50	100	132kV D/C line from Bokaro (Jainamore) 220/132/33kV substation to Dugda 132/33kV substation.	2018-19
							132kV D/C line from Gomia 220/132/33kV substation to Dugda 132/33kV substation.	
10	Putki	Dhanbad	132/33	2	50	100	132kV D/C line from Govindpur 220/132/33kV substation to Putki132/33kVsubstation.	2018-19
							132kV D/C line from Putki 132/33kV substation to Pathardih 132/33kVsubstation.	
							132kV D/C line from Putki 132/33kV substation to Mahuda 132/33kV substation.	
11	Pathardih	Dhanbad	132/33	2	50	100	132kV D/C line from Putki 132/33kV substation to Pathardih 132/33kV substation.	2018-19
12	Chandankiyari	Bokaro	132/33	2	50	100	132kV D/C line from Govindpur 220/132/33kV substation to Chandankiyari 132/33kV substation.	2018-19
							132kV D/C line from Bokaro (Jainamore) 220/132/33kV substation to Chandankiyari 132/33kV substation.	
13	Mahuda	Dhanbad	132/33	2	50	100	132kV D/C line from Putki 132/33kV substation to Mahuda 132/33kV substation.	2018-19
14	Bishnugarh (Banaso)	Hazaribagh	132/33	2	50	100	132kV D/C line from Hazaribagh 220/132/33kV substation to Bishnugarh 132/33kV substation.	2018-19
							132kV D/C line from Saria 132/33kV substation to Bishnugarh 132/33kV substation.	
							132kV D/C line from Gomia 220/132/33kV substation to Bishnugarh 132/33kV substation.	
15	Nirsa	Dhanbad	132/33	2	50	100	132kV D/C line from Baliyapur 220/132/33kV substation to Nirsa 132/33kV substation.	2021-22
Additional transmission lines for network strengthening								
1	220kV D/C line from Dhanbad PGCIL to Govindpur 220/132/33kV substation.							2019-20
2	220kV D/C line from Dhanbad PGCIL to Bokaro (Jainamore) 220/132/33kV substation.							2019-20
3	132kV D/C line from Govindpur 220/132/33kV substation to Madhupur 132/33kV substation.							2021-22



		Rakesha H S	Sagar singh P	LFA	R3	24.01.2017	
		Rakesha H S	Sagar singh P	LFA	R2	03.11.2016	
		Rakesha H S	Manjunath MG	LFA	R1	24.10.2016	
		Rakesha H S	Sujay Ghosh	LFA	R0	26.08.2016	
APPROVED	REVEIWED	CHECKED	DRAWN	DESCRIPTION	REV	DATE:	REMARKS

Load Flow Study Results

Single line diagram of 765kV and 400 kV JUSNL transmission network for the year 2021-22

Jharkhand Urja Sancharan Nigam Limited
Regd. office - engineering building, H.E.C., Dhurwa, Ranchi - 834004

PO details: W.O. No. 07 C.E. (T)/J.U.S.N.L dated 02 August 2016.

Power Research & Development Consultants Pvt. Ltd.,
#5, 11th Cross, 2nd Stage, West of Chord Road, Bangalore- 560086, INDIA
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Fax: +91-080-2319 2210
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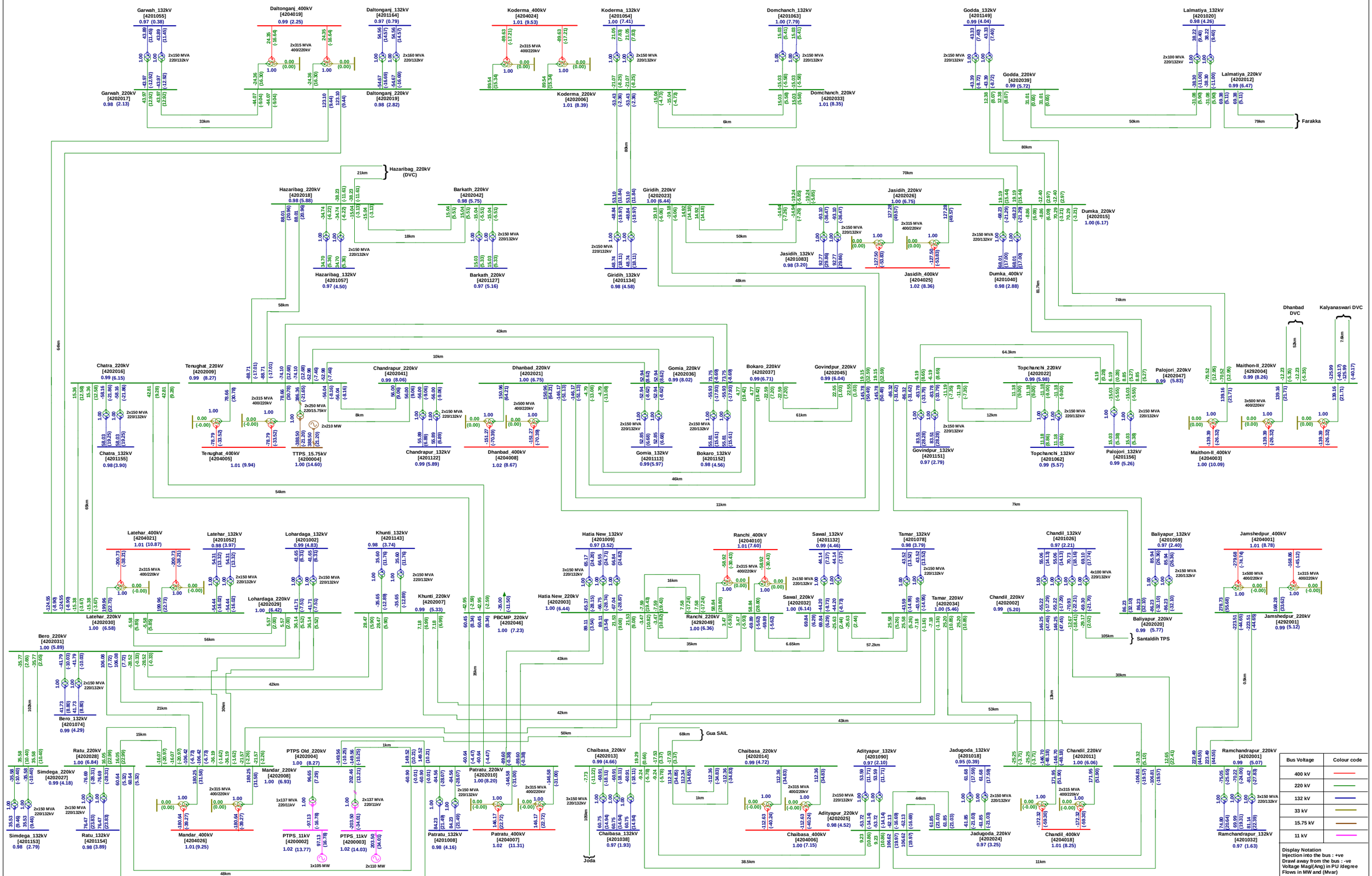
DRAWN IN : MiPower™

DWG. NO : LFA\2021-22\765-400kV



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		Rakesha H S	Sagar singh P	LFA	R2	03.11.2016	
		Rakesha H S	Manjunath MG	LFA	R1	24.10.2016	
		Rakesha H S	Sujay Ghosh	LFA	R0	26.08.2016	
APPROVED	REVEIWED	CHECKED	DRAWN	DESCRIPTION	REV	DATE:	REMARKS

Load Flow Study Results

Single line diagram of 220 kV JUSNL transmission network for the year 2021-22

Jharkhand Urja Sancharan Nigam Limited
Regd. office - engineering building,
H.E.C., Dhurwa, Ranchi - 834004

PO details: W.O. No. 07 C.E. (T)/J.U.S.N.L dated 02 August 2016.

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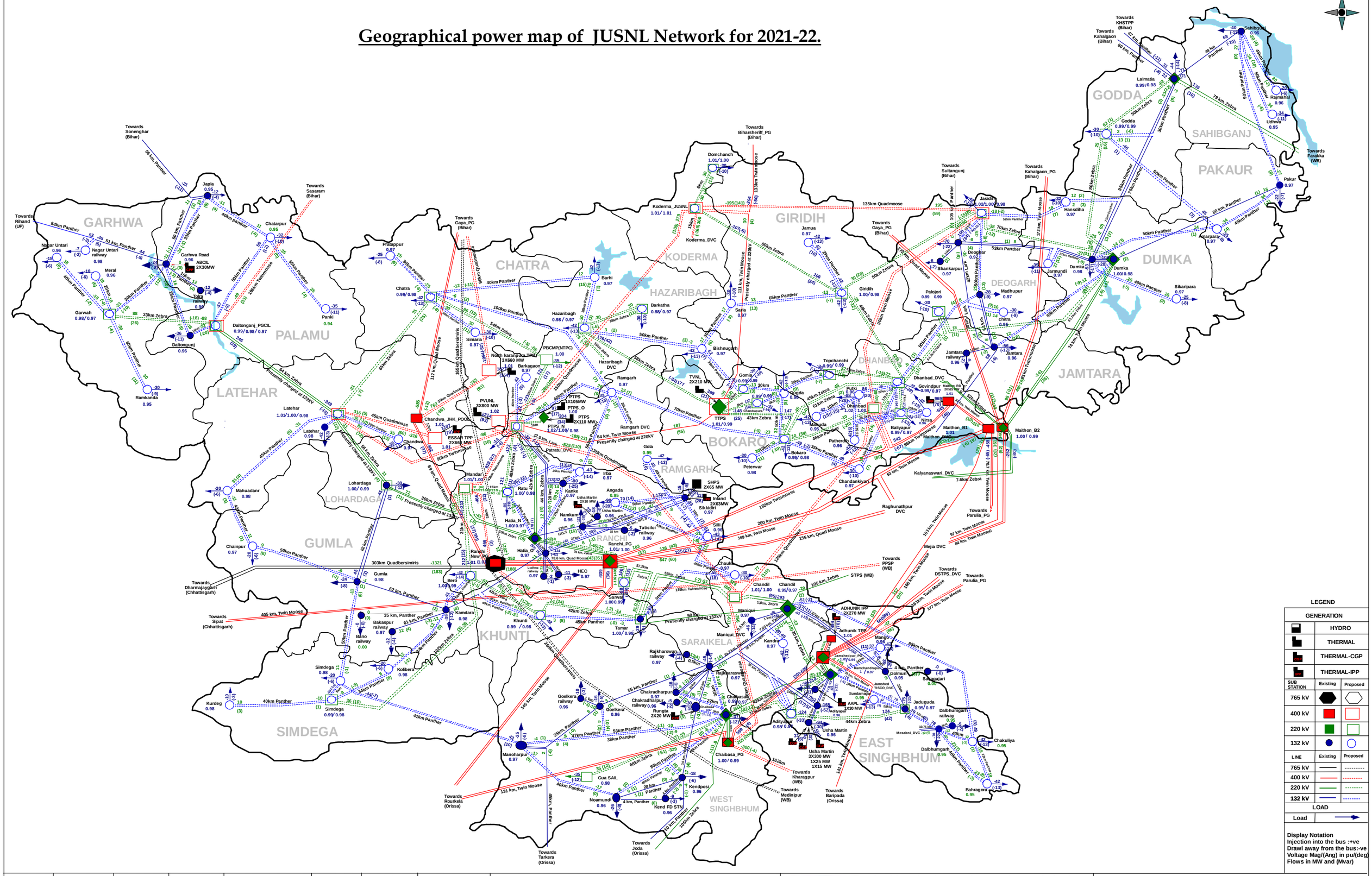
E-mail : prdc@vsnl.com

DRAWN IN : MiPower™

DWG. NO : LFA\2021-22\220kV

Geographical power map of JUSNL Network for 2021-22.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PALAMU
LATEHAR
LOHARDAGA
GUMLA
SIMDEGA
KHUNTI
RANCHI
RAMGARH
BOKARO
CHATRA
KODERMA
HAZARIBAGH
GIRIDIH
DEOGARH
DHANBAD
JAMTARA
GODDA
SAHIBGANJ
PAKAUR
DUMKA
WEST SINGHBHUM
EAST SINGHBHUM
SARAIKELA
Towards Sonenghar (Bihar)
Towards Sasaram (Bihar)
Towards Gaya_PG (Bihar)
Towards Biharsheriff_PG (Bihar)
Towards Gaya_PG (Bihar)
Towards Sultanganj (Bihar)
Towards Kahalgaon_PG (Bihar)
Towards KHSTPP (Bihar)
Towards Kahalgaon (Bihar)
Towards Farakka (WB)
Towards Rihand (UP)
Towards Dharmajaygarh (Chhattisgarh)
Towards Sipat (Chhattisgarh)
Towards Rourkela (Orissa)
Towards Tarkera (Orissa)
Towards Joda (Orissa)
Towards Baripada (Orissa)
Towards Medinipur (WB)
Towards Kharagpur (WB)
Towards PPSP (WB)
Towards DSTPS_DVC
Towards Parulia_PG
Towards Mejia DVC
Towards Jamshedpur_PG
Towards Chandrakyari
Towards Chandankyari
Towards Raghunathpur DVC
Towards Baharagora
Towards Jamshedpur_PG
Towards Jamshedpur_TISCO_DVC
Towards Adhunik TPP
Towards Adhunik IPP
Towards STPS (WB)
Towards Parulia_PG
Towards Mejia DVC
Towards Kalyaneswari_DVC
Towards Maithon_PG
Towards Maithon_DVC
Towards Govindpur
Towards Dhanbad_DVC
Towards Jamtara railway
Towards Deoghar
Towards Shankarpur
Towards Palojori
Towards Giridih
Towards Jasidih
Towards Hansdiha
Towards Lalmatia
Towards Godda
Towards Udhwa
Towards Rajmahal
Towards Sahibganj
Towards Pakur
Towards Jarmundi
Towards Dumka
Towards Sikaripara
Towards Jaganpur (B)
Towards Jamtara
Towards Chitra
Towards Madhupur
Towards Nagar Untari railway
Towards Meral
Towards Garhwa
Towards Ramkanda
Towards Japla
Towards Chatarpur
Towards Pratappur
Towards Chatra
Towards Barhi
Towards Hazaribagh
Towards Barkatha
Towards Sara
Towards Jamua
Towards Koderma_JUSNL
Towards Domchanch
Towards Koderma_DVC
Towards Giridih
Towards Bishnugarh
Towards Simaria
Towards Panki
Towards Daltonganj
Towards Daltonganj_PGCIL
Towards Toria railway
Towards Garhwa Road
Towards Nagar Untari railway
Towards Latehar
Towards Chandwa
Towards Chandwa_JHK_POOL
Towards ESSAR TPP
Towards PVUNL
Towards Ramgarh
Towards Ramgarh DVC
Towards Barkagaon
Towards North karanpura TPP
Towards PBCMP(NTPC)
Towards Hazaribagh DVC
Towards Patratu_DVC
Towards Lohardaga
Towards Mahuadanr
Towards Latehar
Towards Mandar
Towards Ranchi_New
Towards Ranchi_PG
Towards Hatia_N
Towards Hatia
Towards Irba
Towards Kanke
Towards Angada
Towards Namkum
Towards Tatisilai railway
Towards Ranchi
Towards Rahe
Towards Sikidiri
Towards Inland
Towards Sisai
Towards Raghunathpur DVC
Towards Chainpur
Towards Gumla
Towards Bero
Towards Lodhma railway
Towards HEC
Towards Kamdara
Towards Bano railway
Towards Bakaspur railway
Towards Simdega
Towards Kolibera
Towards Kurdeg
Towards Goelkera railway
Towards Goelkera
Towards Rungta
Towards Manoharpur
Towards Noamundi
Towards Gua SAIL
Towards Kendposi
Towards Kend FD STN
Towards Chaibasa_PG
Towards Chaibasa
Towards Rajkharswan railway
Towards Rajkharaswan
Towards Chakradharpur
Towards Chakradharpur railway
Towards Tamar
Towards Khunti
Towards Sarwal
Towards Chandil
Towards Maniqui
Towards Maniqui DVC
Towards Kandra
Towards Adityapur
Towards Golmuri
Towards Sonajari
Towards Jaduguda
Towards Dalbhumgarh railway
Towards Dalbhumgarh
Towards Chakuliya
Towards Bahragora
Towards Usha Martin
Towards Aditypur
Towards Mosabni_DVC
Towards Sundernagar
Towards AAPL
Towards Patherdih
Towards Bokaro
Towards Peterwar
Towards Chandankyari
Towards Nirsa
Towards Baliyapur
Towards Mahuda
Towards Topchanchi
Towards Gomia
Towards TVNL
Towards TTPS
Towards Bishnugarh
Towards Barhi
Towards Pratappur
Towards Chatra
Towards Barkagaon
Towards Hazaribagh
Towards Barkatha
Towards Sara
Towards Simaria
Towards Panki
Towards Daltonganj
Towards Daltonganj_PGCIL
Towards Toria railway
Towards Garhwa
Towards Ramkanda
Towards Japla
Towards Chatarpur
Towards Nagar Untari railway
Towards Meral
Towards Garhwa Road

Annexure-7.2

I. Latehar 400kV substation (Loads in this area are also supplied by Daltonganj PGCIL 400kV substation)

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
1	Latehar	Latehar	400/220	2	315	630	400kV D/C line from Latehar 400/220/132kV substation to Patratu 400/220kV substation.	2017-18
							400kV D/C line from Latehar 400/220/132kV substation to Jharkhand pooling station. (By year 2021-22, with commissioning of Essar generation this connectivity will become Essar to Latehar and Essar to Jharkhand pooling station 400kV D/C line)	
			220/132	2	150	300	220kV D/C line from Latehar 400/220/132kV substation to Chatra 220/132kV substation.	
							Charging of 220kV D/C line (presently charged at 132kV) from Daltonganj 132/33kV substation to Latehar 132/33kV substation at 220kV, and termination of the line at PGCIL Daltonganj 400/220/132kV and Latehar 400/220/132kV substation.	
							132kV D/C line from Latehar 400/220/132kV substation to Latehar 132/33kV substation.	
2	Chatra	Chatra	220/132	2	150	300	220kV D/C line from Latehar 400/220kV substation to Chatra 220/132kV substation.	2017-18
							220kV D/C line from Chatra 220/132kV substation to PBCMP (NTPC).	
							132kV D/C line from Chatra 220/132/33kV substation to Chatra (Pratappur) 132/33kV substation.	
			132/33	2	50	100	Charging of under construction 220kV D/C line from Latehar 400/220kV substation to Chatra 220/132kV substation at 132kV level and connecting	2016-17

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
							it to existing Latehar 132/33kV substation.	
3	Lohardagga	Lohardagga	220/132	2	150	300	Charging of 220kV D/C line from Lohardagga 132/33kV substation to Latehar 132/33kV substation at 220kV (previously line was charged at 132kV). Charging of 220kV D/C line from Lohardagga 132/33kV substation to Hatia 220/132kV substation at 220kV (previously line was charged at 132kV).	2018-19
4	Garwha	Garwha	220/132	2	150	300	220kV D/C line from Daltonganj 400/220kV substation to Garwha 220/132kV substation. 132kV D/C line from Garwha 220/132kV substation to Garwha road 132/33kV substation.	2018-19
5	Chatra (Pratappur)	Chatra	132/33	2	50	100	132kV D/C line from Chatra 220/132/33kV substation to Chatra (Pratappur) 132/33kV substation.	2017-18
6	Mahuadanr	Latehar	132/33	2	50	100	132kV D/C line from Latehar 400/220/132kV substation to Mahuadanr 132/33kV substation.	2018-19
7	Chandwa	Latehar	132/33	2	50	100	132kV D/C line from Latehar 400/220/132kV substation to Chandwa 132/33kV substation.	2018-19
8	Chainpur	Gumla	132/33	2	50	100	132kV D/C line from Chainpur 132/33kV substation to Mahuadanr 132/33kV substation. 132kV D/C line from Gumla 132/33kV substation to Chainpur 132/33kV substation.	2020-21
9	Simaria	Chatra	132/33	2	50	100	132kV D/C line from Chatra 220/132/33kV substation to Simaria 132/33kV substation.	2021-22
10	Nagaruntari	Garwha	132/33	2	50	100	132kV D/C line from Garwha 220/132kV substation to	2019-20

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
							Nagaruntari 132/33kV substation.	
11	Meral	Garwha	132/33	2	50	100	132kV D/C line from Garwha 220/132kV substation to Meral 132/33kV substation.	2019-20
12	Ramkanda	Garwha	132/33	2	50	100	132kV D/C line from Garwha 220/132kV substation to Ramakanda 132/33kV substation.	2019-20
13	Panki	Palamu	132/33	2	50	100	132kV D/C line from Chatarpur 132/33kV substation to Panki 132/33kV substation.	2019-20
14	Chatarpur	Palamu	132/33	2	50	100	132kV D/C line from Daltonganj 400/220/132kV substation to Chatarpur 132/33kV substation. 132kV D/C line from Chatarpur 132/33kV substation to Japla 132/33kV substation.	2018-19
Additional transmission lines for network strengthening								
1	132kV D/C line from 132/33kV Garwha road substation to Japla 132/33kV substation.							2016-17
2	132kV D/C line from Daltonganj PGCIL 400/220/132kV substation to Daltonganj 132/33kV substation.							2017-18
3	132kV D/C line from Garhwa road 132/33kV substation to Daltonganj 132/33kV substation.							2017-18

II. Patratu 400kV substation

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
1	Patratu	Hazaribagh	400/220	2	315	630	400kV D/C line from Patratu 400/220/132kV substation to Latehar 400/220/132kV substation. Charging of 400kV S/C (presently charged at 220kV) line from PTPS to TTPS at 400kV and	2017-18

							shifting the line from PTPS to Patratu 400/220/132kV substation.	
			220/132 (transformers shifted from PTPS to Patratu)	2	150	300	Shifting of 220kV D/C line from PTPS to Hatia 220/132kV substation to Patratu 400/220/132kV substation.	
							220kV D/C line from Patratu 400/220/132kV substation to PBCMP (NTPC).	
							220kV D/C line from Patratu 400/220/132kV substation to PTPS.	
			132/33	2	50	100	Shifting of 132kV S/C line from PTPS to Patratu (DVC) to Patratu 400/220/132kV substation.	
							Shifting of 132kV S/C line from PTPS to Kanke 132/33kV substation to Patratu 400/220/132kV substation.	
							Shifting of 132kV S/C line from PTPS to Hatia 132/33kV substation to Patratu 400/220/132kV substation.	
2	Barkagaon	Hazaribagh	132/33	2	50	100	132kV D/C line from Patratu 400/220/132kV substation to Barkagaon 132/33kV substation.	2018-19
3	Ramgarh	Hazaribagh	132/33	2	50	100	132kV D/C line from Ramgarh 132/33kV substation to existing Ramgarh (DVC) 132/33kV substation.	2018-19
							132kV D/C line from Chatra 220/132/33kV substation to	

							Ramgarh 132/33kV substation.	
							132kV D/C line from Patratu 400/220/132kV substation to Ramgarh 132/33kV substation.	
							132kV D/C line from Bokaro (Jainamore) 220/132kV substation to Ramgarh 132/33kV substation.	
Additional transmission lines for network strengthening								
1	400kV D/C line from Patratu 400/220/132/33kV substation to Ranchi PGCIL 765/400kV substation.							2018-19

III. Jasidih 400kV substation

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
1	Jasidih	Deoghar	400/220	2	500	1000	400kV D/C line from Koderma 400/220/132kV substation to Jasidih 400/220/132kV substation.	2018-19
			220/132	2	150	300	220kV D/C line from Dumka 220/132kV substation to Jasidih 220/132/33kV substation.	2017-18
			132/33	2	50	100	132kV D/C line from Jasidih 220/132/33kV substation to Madhupur 132/33kV substation.	
							132kV D/C line from Deogarh 132/33kV substation to Jasidih 220/132/33kV substation.	
2	Giridih	Giridih	220/132	2	150	300	220kV D/C line from Koderma 400/220/132kV substation to Giridih 220/132/33kV substation.	2018-19
							220kV D/C line from Govindpur 220/132/33kV substation to Giridih 220/132/33kV substation.	
			132/33	2	50	100	132kV D/C line from Giridih 220/132/33kV substation to Jamua 132/33kV substation.	
3	Godda	Godda	220/132	2	150	300	220kV D/C line from Dumka 220/132 kV substation to Godda 220/132/33kV substation.	2018-19

							220kV D/C line from Godda 220/132/33kV substation to Lalmatia 220/132/33kV substation.	
			132/33	2	50	100	132kV D/C line from Godda 220/132/33kV substation to Amarpara 132/33kV substation. LILO of one circuit of 132kV D/C line from Dumka 132/33kV substation to Lalmatiya 220/132/33kV substation at Godda 220/132/33kV substation.	
4	Jamua	Giridih	132/33	2	50	100	132kV D/C line from Giridih 220/132/33kV substation to Jamua 132/33kV substation.	2018-19
5	Saria	Giridih	132/33	2	50	100	132kV D/C line from Bishnugarh 132/33kV substation to Saria 132/33kV substation.	2018-19
6	Chitra	Deoghar	132/33	1 1	50 20	70	LILO of 132kV S/C line from Deogarh 132/33kV substation to Jamtara 132/33kV substation at Chitra 132/33kV substation.	2016-17
7	Jarmundi	Dumka	132/33	2	50	100	LILO of 132 kV D/C line from Dumka 132/33kV substation to Deoghar 132/33kV substation at Jarmundi 132/33kV substation.	2018-19
8	Sikaripara	Dumka	132/33	2	50	100	132kV D/C line from Dumka 132/33kV substation to Sikaripara 132/33kV substation.	2018-19
9	Hansdiha	Dumka	132/33	2	50	100	LILO of one circuit of 132 kV D/C line from Lalmatiya 220/132/33kV substation to Dumka 132/33kV substation at Hansdiha 132/33kV substation. 132kV D/C line from Hansdiha 132/33kV substation to Banka (PGCIL) substation.	2018-19
10	Amarpara	Pakur	132/33	2	50	100	132kV D/C line from Godda 220/132/33kV substation Amarpara 132/33kV substation. 132kV D/C line from Pakur 132/33kV substation to Amarpara 132/33kV substation. 132kV D/C line from Dumka 132/33kV to Amarpara 132/33kV substation.	2018-19
11	Rajmahal	Sahebganj	132/33	2	50	100	132kV D/C line from Sahebganj 132/33kV substation to Rajmahal 132/33kV substation.	2018-19
12	Udhwa	Sahebganj	132/33	2	50	100	132kV D/C line from Sahebganj 132/33kV substation to Udhwa 132/33kV substation.	2018-19
Additional transmission lines for network strengthening								

1	400kV D/C line from PGCIL Dhanbad 400/220kV substation to Jasidih 400/220/132/33kV substation.	2019-20
2	Conversion of 220kV S/C line from Lalmatia 220/132/33kV substation to Farakka NTPC generation into D/C line.	2020-21
3	220kV D/C line from Giridih 220/132/33kV substation to Jasidih 400/220kV substation.	2021-22
4	132kV D/C line from 220/132kV Dumka substation to Jamtara 132/33kV substation.	2018-19
5	132kV D/C line from Sahebganj 132/33kV substation to Pakur 132/33kV substation.	2018-19
6	132kV D/C line from Saria 132/33kV substation to Giridih 220/132/33kV substation.	2021-22

IV. Chandil 400kV substation (Loads in this are also supplied by Ramchandrapur and Chaibasa PGCIL 400kV substations)

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
1	Chandil	Saraikela	400/220	2	500	1000	400kV D/C line from PGCIL Chaibasa 400/220/132kV substation to Chandil 400/220/132kV substation. LILO of 220kV D/C line from Ranchi PGCIL 400/220kV substation to Chandil 220/132kV substation at Chandil 400/220kV substation.	2018-19
2	Tamar	Ranchi	220/132	2	150	300	LILO of 220kV D/C line from Ranchi PGCIL 400/220kV substation to Chandil 220/132kV substation at Tamar 220/132kV substation.	2018-19
3	Simdega	Simdega	220/132	2	150	300	220kV D/C line from Bero 220/132/33kV substation to Simdega 220/132kV substation. 132kV D/C line from Simdega 220/132kV substation to Kolebira 132/33kV substation. LILO of 132kV D/C line from Simdega 132/33kV substation to Kurdeg 132/33kV substation at Simdega 220/132kV substation.	2021-22
			132/33	2	50	100	132kV D/C line from Manoharpur 132/33kV substation to Simdega 132/33kV substation. 132kV D/C line from Gumla 132/33kV substation to Simdega 132/33kV substation.	2016-17

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
4	Jadugoda	East Singhbhum	220/132	2	150	300	LILO of proposed 220kV D/C line from Ramchandrapur 220/132/33kV substation to Chaibasa 220/132kV substation at Jadugoda 220/132/33kV substation.(Interim arrangement) 220kV D/C line from Adityapur 220/132kV substation to Jadugoda 220/132/33kV substation.(With commissioning of Adityapur 220/132/33kV substation)	2018-19
5	Adityapur	East Singhbhum	220/132	2	150	300	LILO of 220kV D/C line from Ramchandrapur PGCIL 400/220kV substation to Chaibasa 220/132kV substation at Adityapur 220/132kV substation. 220kV D/C line from Adityapur 220/132kV substation to Jadugoda 220/132/33kV substation.(With commissioning of Adityapur 220/132/33kV substation) LILO of 132kV S/C line from Chandil 220/132kV substation to Adityapur 132/33kV substation at Adityapur 220/132kV substation. LILO of 132kV S/C line from Rajkharsawan 132/33kV substation to Adityapur 132/33kV substation at Adityapur 220/132kV substation.	2021-22
6	Chouka	Saraikela	132/33	2	50	100	132kV D/C line from Tamar 220/132/33kV substation to silli 132/33kV substation via Chouka 132/33kV substation.	2018-19
7	Chakuliya	East Singbhum	132/33	2	50	100	132kV D/C line from Chandil 220/132kV substation to Chakuliya 132/33kV substation. 132kV D/C line from Bahragora 132/33kV substation to Chakuliya 132/33kV substation. 132kV D/C line from Dalbhumgarh 132/33kV substation to Chakuliya 132/33kV substation.	2018-19

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
8	Bahragora	East Singbhum	132/33	2	50	100	132kV D/C line from Dalbhumgarh 132/33kV substation to Bahragora 132/33kV substation. 132kV D/C line from Bahragora 132/33kV substation to Chakuliya 132/33kV substation.	2018-19
9	Kandra	Saraikela	132/33	2	50	100	LILO of one circuit of 132kV D/C line from Chandil 220/132kV substation to Rajkharsawan 132/33kV substation at Kandra 132/33kV substation.	2018-19
10	Mango	East Singbhum	132/33	2	50	100	132kV D/C line form Ramchandrapur 220/132kV substation to Mango 132/33kV substation. LILO of one circuit of 132kV D/C line from Chandil 220/132kV substation to Golmuri 132/33kV substation at Mango 132/33kV substation.	2018-19
11	Sundernagar	East Singbhum	132/33	2	50	100	132kV D/C line from Jadugoda 132/33kV substation to Sundernagar 132/33kV substation.	2018-19
12	Manoharpur	West Singbhum	132/33	2	50	100	LILO of 132kV S/C line form Goelkera 132/33kV substation to Tarkera 220/132kV substation at Manoharpur 132/33kV substation (commissioned). 132 KV D/C line from Chaibasa 220/132/33kV substation to Manoharpur 132/33kV substation.	2016-17
13	Ramchandrapur	East Singbhum	132/33	2	50	100	Addition of 132/33kV transformers at existing Ramchandrapur 220/132kV substation.	2016-17
14	Kolebira	Simdega	132/33	2	50	100	132kV D/C line from Kamdara 132/33kV substation to Kolebira 132/33kV substation.	2018-19
15	Kurdeg	Simdega	132/33	2	50	100	132kV D/C line from Simdega 132/33kV substation to Kurdeg 132/33kV substation.	2018-19
Additional transmission lines for network strengthening								
1	400kV D/C line from PGCIL Dhanbad 400/220kV substation to Chandil 400/220kV substation.							2019-20

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
2	220kV D/C line from 220/132kV Ramchandrapura substation to Chaibasa 220/132/33kV substation.							2016-17
3	220kV D/C line from Chaibasa 220/132/33kV substation to Gua SAIL.							2018-19
4	132kV D/C line from 220/132 kV Ramchandrapur substation to Jadugoda 132/33kV substation.							2016-17
5	132kV D/C line from 132/33kV Jadugoda substation to Dalbhumgarh 132/33kV substation.							2016-17
6	132kV D/C line from 132/33kV Chakradharpur substation to Chaibasa 220/132/33kV substation.							2018-19
7	132kV D/C line from Noamundi 132/33kV substation to Chaibasa 220/132/33kV substation.							2018-19
8	LILO of one Ckt of 132 KV D/C line from Noamundi 132/33kV substation to Chaibasa 220/132/33kV substation at Kendposi 132/33kV substation.							2018-19
9	132kV D/C line from 220/132/33kV Chaibasa substation to Rajkharsawan 132/33kV substation.							2018-19
10	LILO of one circuit of 132kV D/C line from Chaibasa 220/132/33kV substation to Manoharpur 132/33kV substation at Goelkera 132/33kV substation.							2018-19
11	132kV D/C line from Noamundi 132/33kV substation to Manoharpur 132/33kV substation.							2020-21

V. Koderma 400kV substation

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
1	Koderma	Koderma	400/220	2	500	1000	400kV D/C line from Koderma 400/220/132kV substation to Koderma (DVC) 400/220kV substation.	2018-19
							400kV D/C line from Koderma 400/220/132kV substation to Jasidih 400/220/132kV substation.	
							LILO of 400kV S/C line from TTPS to Biharshariff at Koderma 400/220/132kV substation.	
			220/132	2	150	300	220kV D/C line from Koderma 400/220/132kV substation to Giridih 220/132/33kV substation.	
			132/33	2	50	100	-	
2	Domchanch	Giridih	220/132	2	150	300	220kV D/C line from Koderma 400/220/132kV substation to Domchanch 132/33kV substation.	2021-22
			132/33	2	50	100	-	

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
3	Barkatha	Koderma	220/132	2	150	300	220kV D/C line from Hazaribagh 220/132/33kV substation to Barkatha 220/132/33kV substation.	2021-22
			132/33	2	50	100	-	
4	Hazaribagh	Hazaribagh	220/132	2	150	300	220kV D/C line from Tenughat TPS to Hazaribagh 220/132/33kV substation.	2018-19
							220kV D/C line from Hazaribagh 220/132/33kV substation to Hazaribagh (DVC) 220/132kV substation.	
			132/33	2	50	100	132kV D/C line from Hazaribagh 220/132/33kV substation to Bishnugarh 132/33kV substation.	
5	Barhi	Hazaribagh	132/33	2	50	100	132kV D/C line from Chatra 220/132/33kV substation to Barhi 132/33kV substation.	2018-19
Additional transmission lines for network strengthening								
1	132kV D/C line from Barhi 132/33kV substation to Hazaribagh (JSEB) 220/132/33kV substation.							2021-22

VI. Mandar 400kV substation (Loads in this area are also supplied by Ranchi PGCIL 400kV substation)

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
1	Mandar	Ranchi	400/220	2	500	1000	LILO of 400KV D/C line from Ranchi PGCIL 765/400kV substation to Patratu 400/220/132/33kV substation at Mandar 400/220kV substation.	2021-22
							220kV D/C line from Ratu 220/132/33kV substation to Mandar 400/220kV substation.	
							220kV D/C line from Tamar 220/132/33kV substation to Mandar 400/220kV substation via Khunti 220/132/33kV substation.	

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
							LILO of 220KV D/C line from Hatia 220/132kV substation to Lohardagga 220/132kV substation at Mandar 400/220kV substation.	
							220kV D/C line from Mandar 400/220kV substation to Bero 220/132/33kV substation.	
2	Ratu	Ranchi	220/132	2	150	300	220kV D/C line from Patratu 400/220kV substation to Ratu 220/132kV substation.	2018-19
			132/33	2	50	100	132kV D/C line from Hatia 220/132kV substation to Ratu 220/132kV substation.	
3	Bero	Ranchi	220/132	2	150	300	220kV D/C line from Mandar 400/220kV substation to Bero 220/132/33kV substation.	2021-22
							220kV D/C line from Khunti 220/132/33kV substation to Bero 220/132/33kV substation.	
			132/33	2	50	100	132kV D/C line from Bero 220/132/33kv substation to Kamdara 132/33kV substation.	
4	Khunti	Khunti	220/132	2	150	300	220kV D/C line from Tamar 220/132/33kV substation to Khunti 220/132kV substation.	2021-22
							220kV D/C line from Khunti 220/132/33kV substation to Bero 220/132/33kV substation.	
			132/33	2	50	100	132kV D/C line from Tamar 220/132/33kV substation to Khunti 132/33kV substation.	2017-18
							LILO of 132kV S/C line form Hatia 132/33kV substation to Kamdara 132/33kV substation at Khunti 132/33kV substation.	

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
5	Sarwal	Ranchi	220/132	2	150	300	LILO of 220kV D/C line from Ranchi PGCIL 400/220kV substation to Chandil 220/132kV substation at Sarwal 220/132/33kV substation.	2020-21
			132/33	2	50	100	-	
6	Irba	Ranchi	132/33	2	50	100	132kV D/C line from Irba 132/33kV substation to Kanke 132/33kV substation.	2018-19
7	Gola	Hazaribagh	132/33	2	50	100	132kV D/C line from Gola 132/33kV substation to Silli 132/33kV substation.	2018-19
8	Angada	Ranchi	132/33	2	50	100	132kV D/C line from Sikkidri 132/33kV substation to Angada 132/33kV substation.	2018-19
							132kV D/C line from Angada 132/33kV substation to Silli 132/33kV substation.	
9	Silli	Ranchi	132/33	2	50	100	132kV D/C line from Silli 132/33kV substation to Angada 132/33kVsubstation.	2018-19
							132kV D/C line from Silli 132/33kV substation to Gola 132/33kVsubstation.	
							132kV D/C line from Chouka 132/33kVsubstation to silli 132/33kV substation.	
							132kV D/C line from Silli 132/33kV substation to Sikkidri 132/33kV substation.	

Additional transmission lines for network strengthening		
1	220kV D/C line from 220/132kV Hatia substation to Ranchi (PGCIL) 400/220kV substation.	2016-17
2	132kV D/C line from 132/33kV Kanke substation to Hatia 220/132kV substation.	2016-17
3	LILO of 132kV S/C (3rd ckt) from Hatia 132/33kV substation to Sikidri 132/33kV substation at Namkum 132/33kV substation.	2016-17
4	Re-conductoring of Hatia-Namkum-Sikidri 132kV D/C line with HTLS conductor.	2016-17
5	Re-conductoring of Hatia-Kamdara 132kV S/C line with HTLS conductor.	2016-17
6	132kV D/C line from Irba 132/33kV substation to Ramgarh 132/33kV substation.	2019-20

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
7	132kV D/C line from Irba 132/33kV substation to Ratu 220/132/33kV substation.							2019-20

Govindpur 220kV substation (Dhanbad PGCIL 400kV substation is a power source in this area)

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
1	Govindpur	Dhanbad	220/132	2	150	300	220 kV D/C line from TTPS to Govindpur 220/132/33kV substation.	2016-17
							220kV D/C line from Dumka 220/132kV substation to Govindpur 220/132/33kV substation.	
			132/33	2	50	100	-	
2	Bokaro (Jainamore)	Bokaro	220/132	2	150	300	LILO of 220kV D/C line from TTPS to Govindpur 220/132/33kV substation at Bokaro 220/132/33kV substation	2017-18
			132/33	2	50	100	-	
3	Gomia	Giridih	220/132	2	150	300	220kV D/C line from Tenughat TPS to Gomia 220/132/33kV substation.	2018-19
			132/33	2	50	100	132kV D/C line from Gomia 220/132/33kV substation to Dugda 132/33kV substation.	
4	Chandrapura	Bokaro	220/132	2	150	300	220kV D/C line from Tenughat TPS to Chandrapura 220/132/33kV substation.	2020-21
			132/33	2	50	100	132kV D/C line from Chandrapura 220/132/33kV substation to Dugda 132/33kV substation.	
5	Baliyapur	Dhanbad	220/132	2	150	300	220kV D/C line from Govindpur 220/132/33kV substation to Baliyapur 220/132/33kV substation.	2020-21

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
			132/33	2	50	100	LILO of 132kV D/C line from Putki 132/33kV substation to Pathardih 132/33kV substation at Baliyapur 220/132/33kV substation.	
6	Topchanchi	Giridih	220/132	2	150	300	220kV D/C line from Govindpur 220/132/33kV substation to Topchanchi 220/132/33kV substation.	2020-21
			132/33	2	50	100	132kV D/C line from Topchanchi 220/132/33kV substation to Dugda 132/33kV substation.	
7	Palojori	Deoghar	220/132	2	150	300	LILO of 220kV D/C line from Dumka 220/132/33kV substation to Govindpur 220/132/33kV substation at Palojori 220/132/33kV substation.	2021-22
			132/33	2	50	100	-	
8	Petarwar	Bokaro	132/33	2	50	100	132kV D/C line from Bokaro (Jainamore) 220/132/33kV substation to Petarwar 132/33kV substation.	2018-19
9	Dugda	Bokaro	132/33	2	50	100	132kV D/C line from Bokaro (Jainamore) 220/132/33kV substation to Dugda 132/33kV substation.	2018-19
							132kV D/C line from Gomia 220/132/33kV substation to Dugda 132/33kV substation.	
10	Putki	Dhanbad	132/33	2	50	100	132kV D/C line from Govindpur 220/132/33kV substation to Putki132/33kVsubstation.	2018-19
							132kV D/C line from Putki 132/33kV substation to Pathardih 132/33kVsubstation.	
							132kV D/C line from Putki 132/33kV substation to Mahuda 132/33kV substation.	
11	Pathardih	Dhanbad	132/33	2	50	100	132kV D/C line from Putki 132/33kV substation to Pathardih 132/33kV substation.	2018-19

Sl. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No of units	Capacity of each unit (MVA)	Total capacity (MVA)		
12	Chandankiyari	Bokaro	132/33	2	50	100	132kV D/C line from Govindpur 220/132/33kV substation to Chandankiyari 132/33kV substation. 132kV D/C line from Bokaro (Jainamore) 220/132/33kV substation to Chandankiyari 132/33kV substation.	2018-19
13	Mahuda	Dhanbad	132/33	2	50	100	132kV D/C line from Putki 132/33kV substation to Mahuda 132/33kV substation.	2018-19
14	Bishnugarh (Banaso)	Hazaribagh	132/33	2	50	100	132kV D/C line from Hazaribagh 220/132/33kV substation to Bishnugarh 132/33kV substation. 132kV D/C line from Saria 132/33kV substation to Bishnugarh 132/33kV substation. 132kV D/C line from Gomia 220/132/33kV substation to Bishnugarh 132/33kV substation.	2018-19
15	Nirsa	Dhanbad	132/33	2	50	100	132kV D/C line from Baliyapur 220/132/33kV substation to Nirsa 132/33kV substation.	2021-22
Additional transmission lines for network strengthening								
1	220kV D/C line from Dhanbad PGCIL to Govindpur 220/132/33kV substation.							2019-20
2	220kV D/C line from Dhanbad PGCIL to Bokaro (Jainamore) 220/132/33kV substation.							2019-20
3	132kV D/C line from Govindpur 220/132/33kV substation to Madhupur 132/33kV substation.							2021-22

Bihar State Power Transmission Company Ltd., Patna
A subsidiary company of Bihar State Power (Holding) Company Ltd., Patna
CIN – U40102BR2012SGC018889
[SAVE ENERGY FOR BENEFIT OF SELF AND NATION]
Head Office, Vidyut Bhawan, Bailey Road, Patna – 800021.

Letter No. CE(P&E) 19/2016 /BSPTCL, Patna Dated

From,

Bhaskar Sharma
Director(P), BSPTCL

To,

Pardeep Jindal,
Chief Engineer(PSP &PA-2),
Central Electricity Authority(CEA),
PSPA Division,
Seva Bhavan, Delhi-110066

Sub:- Transmission system for Evacuation of Power from Buxar TPS(2X660 MW)
Ref:- Lt. no.1203-05 Dt.15/11/2012 by CEA.(copy enclosed)

Sir,

With reference to the above, the system studies were carried out jointly by Power Grid and BSPTCL to examine & review 12th plan transmission system requirement of Bihar and evacuation system associated with Buxur, Pirpainti and Lakhisarai.

In the above report, transmission system for evacuation of power from Buxar TPS(2x660) was planned as below-

1 Buxar TPS - Bihta (Now at Naubatpur) 400 kV D/c
2 Buxar TPS - Dumraon new 220 kV D/c (High Capacity)
3 Buxar TPS - Mohania (Pusauli-BSEB) 220 kV D/c (High Capacity)
4 Buxar TPS - Dehri 220 kV D/c
5 2x500 MVA, 400/220 kV ICT at Buxar generation switchyard - under the scope of respective generation project.

Above scheme has already been reviewed and informed by CEA vide letter under reference.

Due to capacity addition & unavailability of land in Patna, the original scheme under 12th plan of Patna Area was revised.

1. Earlier at 400 KV level Bihta GSS was proposed to be connected by Patna (PG) through 400 KV D/C line. Now Bihta has been shifted to Naubatpur, and it is connected vide LILO of Balia- Patna 400 KV D/C.

2. At 220 KV level, power evacuation was at Mohania/ Pusauli-(BSEB) 220 KV D/C as indicated in the map. (Copy enclosed)

At present near to Pusauli(PG) a new GSS has been commissioned i.e. Pusauli(BSPTCL), 220/132/33 KV and now under 13th plan the evacuation of power from Buxar TPS at 220 level is at Pusauli (BSPTCL) as indicated in the map.(Copy enclosed). Pusauli (BSPTCL) is connected with Kochas, Sasaram, Kudra, Mohania at 132 KV level and also proposed to be connected with upcoming Bhabhua & Ramgarh GSS at 132 KV level. After modification, load

flow studies were done jointly with POWERGRID and same have been approved in 18th SCM for 13th plan.

The utility entrusted with the development of Buxar TPS (SJVNL) has approached us and have intended to know the power evacuation plan of Buxar TPS.

In view of the above, it is requested that CEA may also examine the above modified plan associated with transmission line considering Generation point of view and may give their suggestion so that further necessary action may be taken from our end.

Encl – As above

Yours Faithfully,

25/10/16

(Bhaskar Sharma)
Director (Project)

Annexure-9.1

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

No. 2012/Elect(G)/150/1 Pt.II New Delhi, Dated 09.09.16

Chairperson
Central Electricity Authority
Sewa Bhawan, R. K. Puram
Sector-1, New Delhi - 110 066

Sub: Connectivity of Railway TSSs with ISTS network - Approval for Connectivity.

Central Electricity Authority (CEA) in their report on "Energy Plan for Indian Railways" of Feb 2015 has advised that for connecting its existing or future TSSs, Railways as Deemed Transmission Licence are required to communicate their connectivity requirement to CEA & CTU for consideration of integrated planning for ISTS in a coordinated manner.

Pursuant to above, Indian Railways is initially planning to connect its existing TSSs between Mughal Sarai - Howrah and Delhi - Bharuch routes of Railways by way of construction of associated infrastructure including transmission lines and bay extension work at ISTS points preferably at 220kV. Power requirement of Railways from the nearby proposed ISTS points as well as the indicative route diagrams for these sections are enclosed.

It is requested that the connectivity to Railways from these ISTS points for the given load may kindly be communicated at the earliest for planning and execution of transmission line works of Railways.

9.9.16

(Sudhir Garg)
Executive Director(EEM)
Railway Board

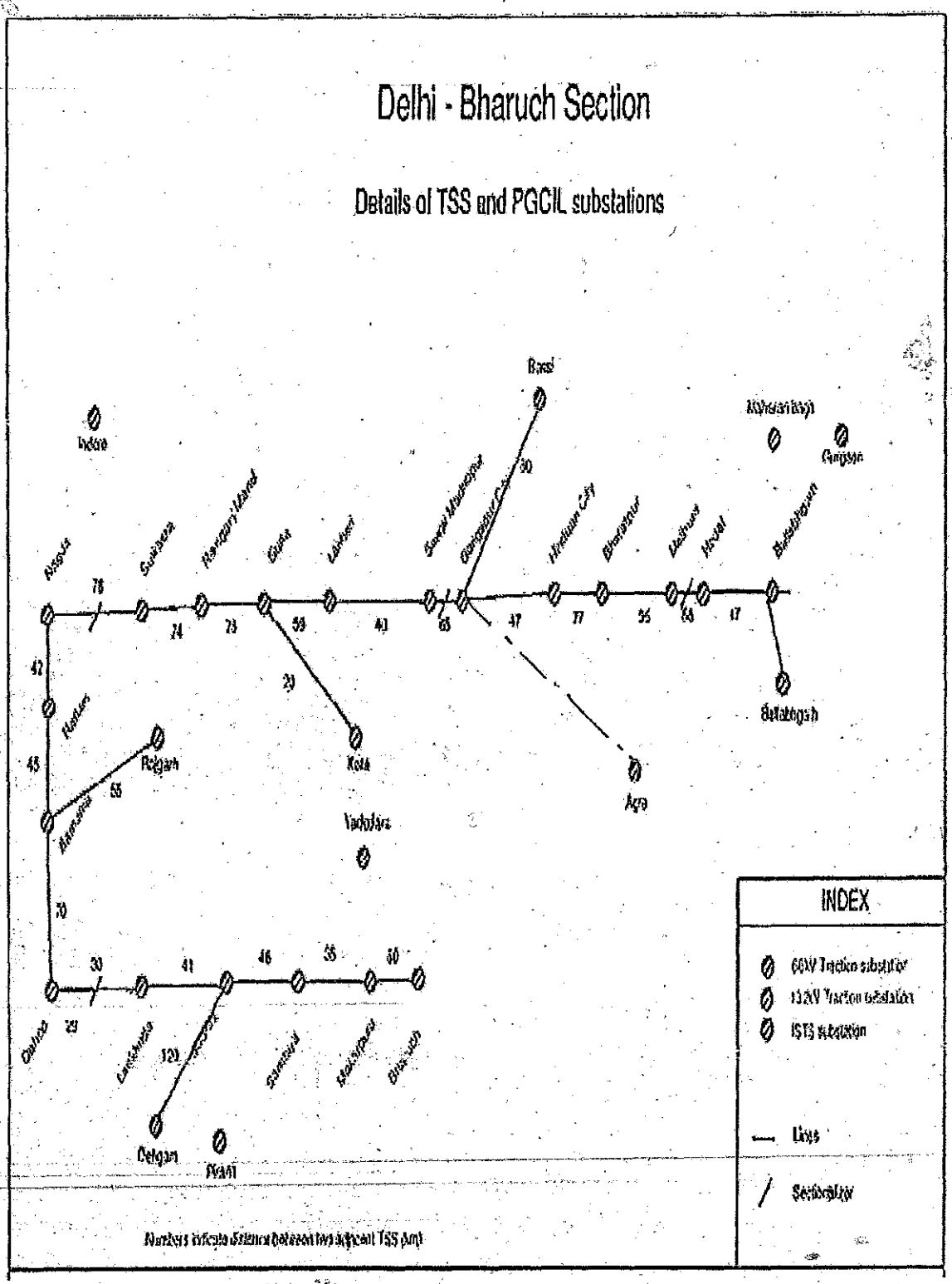
Copy to: CMD, PGCIL: - For kind information & n/a please.
CEO, REMCL: - For kind information & n/a please.

Mem(PS)
↓
CE (PSPA - II)
19/9

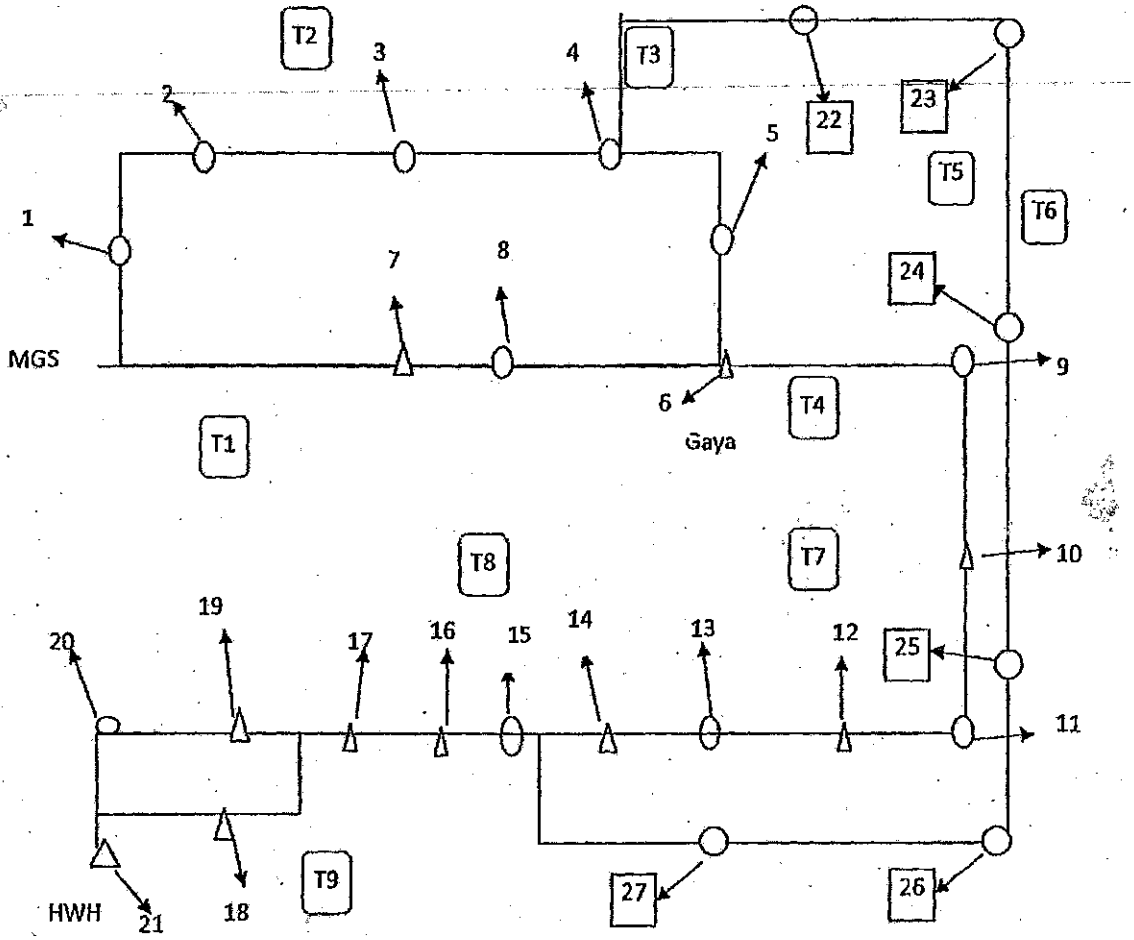
Connectivity scheme of TSS along Delhi - Bharuch route					
Sr.	PGCIL GSS	Connectivity required at (kV)	Railway TSS to be supplied	Grid Voltage at TSS	Tentative load requirement
1	Ballabhgarh	220	Ballabhgarh	66	50
2			Hodal	66	
3	Agra/Bassi	220	Mathura	132	60
4			Bharatpur	132	
5			Hindun city	132	
6			Gangapur city	132	
7	Kota	220	Sawaimadhopur	132	75
8			Lakheri	132	
9			Gudla	132	
10			Ramganj Mandi	132	
11			Suwasra	132	
12	Rajgarh	220	Nagda	132	75
13			Ratlam	132	
14			Bamania	132	
15			Dahod	132	
16	Dehgam	220	Limkheda	220	100
17			Godhra	132	
18			Samlaya	132	
19			Makarpura	132	
20			Bharuch	132	

Connectivity scheme of TSS in Mugalsarai-Howrah route

Sr.	Propo-sed ISTS point	Connecti vity required at (kV)	Railway TSS to be supplied	Grid Voltage at TSS	Contarct Demand (MVA)	Tentative load requirement (MW)
1	Arah/ Patna	220/ 132	Zamania	132kV	13.5	60
2			Dumraon		10.8	
3			Ara		10.8	
4			Danapur		10.8	
5			Jahanabad		10.8	
6	Pusauli/Gaya	220	Sonnagar		14	75
7			Rafiganj		10.8	
8			Gaya		9	
9			Paharpur		9	
10			Koderma		24	
11	Maithon/ Parulia	220	Hazaribag Road		14	75
12			Nimlaghat		19.5	
13			Pradhankunta		18	
14			Kumardhubi		20.5	
15			Kalipahari		New TSS	
16			Waria		25	
19	Shubhas-gram	220	Burddhwan		22	75
17			Bandel		18	
18			Belmuri		16	
20			Dankuni		11.5	
21			Belur		20	
22	Lucklsarai/Bih arsarif	220/132	Khusroopur		10.8	50
23			Mokama		10.8	
24			Luckeesarai.		10.8	
25			Jhajha		10.8	
26			Shankarpur		12.5	
27			Jamtara		12	


Delhi - Bharuch Section
Details of TSS and PGCIL substations
Agra
Kota
Belgaon
INDEX
Lines

SINGLE LINE DIAGRAM OF TSS/FP IN MGS-GAYA-HWH ROUTE (SONNAGAR ONWARDS)



Indicative list of Railway TSS/FP											
No.	Location		No.	Location of		No.	Location		No.	Location	
1	Zamania	TSS	8	Rafiganj	TSS	15	Kalipahari	TSS	22	Khusroopur	TSS
2	Dumraon	TSS	9	Paharpur	TSS	16	Waria	FP	23	Mokama	TSS
3	Ara	TSS	10	Koderma	FP	17	Barddhman	FP	24	Lucheesarai	TSS
4	Danapur	TSS	11	Hazaribagh Road	TSS	18	Bandel	FP	25	Jhajha	TSS
5	Jahanabad	TSS	12	Nimiaghat	FP	19	Belmuri	FP	26	Shankarpur	TSS
6	Gaya	FP	13	Pradhankunta	TSS	20	Dankuni	TSS	27	Jamtara	TSS
7	Sonnagar	FP	14	Kumardhubi	FP	21	Belur	FP			

Indicative list of Nearest ISTS point							
No.	Location	No.	Location	No.	Location	No.	Location
T1	Sasaram (Pusauli)	T4	Gaya	T7	Maithon	T9	Subhashgram
T2	Arah	T5	Biharsarif	T8	Parulia (Near Durgapur)		
T3	Patna	T6	Luckeesarai				

Annexure-9.2

भारत सरकार/ Government of India
विद्युत मंत्रालय / Ministry of Power
केंद्रीय विद्युत प्राधिकरण/ Central Electricity Authority
विद्युत प्रणाली योजना एवं मूल्यांकन – II प्रभाग /
Power System Planning & Appraisal - II Division
सेवा भवन, आर.के. पुरम, नई दिल्ली -110066/
Sewa Bhawan, R.K. Puram, New Delhi – 110 066

No. CEA/PS/PSPA-II/200/16/2016 362-63 Dt. 25-Oct-2016

To

1. Sh. J.C.S. Bora
General Manager
REMCL, RITES Bhawan No.1
Sector-29
Gurgaon

2. Dr. Subir Sen,
Chief Operating Officer (CTU),
Power Grid Corporation of India Ltd.,
"Saudamini" Plot No.2, Sector-29,
Gurgaon-122001 Haryana

Subject: Minutes of the meeting held in CEA for connectivity of Railway TSS with ISTS Network, held on 7-10-2016.

Sir,

A meeting was held in CEA on 7th October, 2016 to discuss connectivity of Railway's Traction Sub Stations (TSS) with Inter-State Transmission System (ISTS) network for two routes of Indian railways: - (i) Delhi-Bharuch route, and (ii) Mughal Sarai-Howrah route.

Minutes of the meeting are enclosed.

Yours faithfully,

25/10/2016

(Pardeep Jindal)
Chief Engineer(PSPA-II)
Tel: 26198092

Minutes of the meeting held in CEA for connectivity of Railway TSS with ISTS Network, held on 7-10-2016

1. A meeting was held in the office of CE (PSPA-II) to discuss connectivity of Railway TSS with ISTS for two routes of Railways i.e. (i) Delhi – Bharuch route, and (ii) Mughal Sarai - Howrah route. The meeting was attended by officials from REMCL, CTU i.e. Power Grid and CEA. List of participants is given at **Annexure-I**.

2. Following ISTS Sub-stations were preliminarily identified for the Delhi-Bharuch route for giving connectivity to the Railways TSS with ISTS sub-stations:

   (i) Ballabhgarh or Tughlakabad (under construction).
   (ii) Agra or Bassi (Rajasthan)
   (iii) Kota
   (iv) Rajgarh
   (v) Dehgam / Pirana or Vadodara.

3. Following Sub-Stations were preliminarily identified for the Mughal Sarai-Howrah route for giving connectivity to the Railways TSS with ISTS sub-stations:

   (i) Arah or Patna
   (ii) Gaya or Chandoti
   (iii) Maithon
   (iv) Durgapur
   (v) Lakhisarai
   (vi) Subhashgram

4. It was agreed that POWERGRID will examine the feasibility of taking out connectivity lines from these Sub-Stations to proposed TSS of Railways at 220 kV level along the two routes. For this, they will assess the availability of space for two (2) numbers of 220 kV bays for termination of connectivity line of Railways. They will also study the availability of margins in the transformation capacity at these ISTS sub-stations to meet the traction load. The Railway's traction load that would be incident on an ISTS substation would be of the order of 80 to 150 MW.

5. Railways will inform their present connectivity arrangement with local STUs along the above two routes. Railways (vide their letter dt. 19/10/2016) has sent these arrangements with existing STU points which is enclosed at **Annexure-II**. The need and modalities of disconnecting from existing STU nodes or paralleling with STU network would be decided based on system studies.

6. As Ministry of Power, Government of India has issued clarifications that Railways is a deemed licensee under third proviso of section 14 of the Electricity Act, 2003. Therefore, it would be appropriate, if issues relating to connectivity of TSS with ISTS are dealt by Railways instead of REMCL. It was also agreed that Indian Railways will appoint one nodal officer from Railway Board/Indian Railways for further discussion and correspondence on these matter with CEA/CTU. Railways may take assistance from their associates like REMCL etc., if required.

7. Railways/REMCL representative requested for convening of meeting of Standing Committee on Power System Planning for approval of connectivity at feasible points at the earliest. It was informed that these proposals would be taken up in the Standing Committee for discussion after finalization of technical analysis, including discussion with the respective STU whose system is currently being used for the TSS along above two railway routes.

Annexure-I

List of Participants of the meeting held in CEA for connectivity of Railway TSS with ISTS Network, held on 7-10-2016:

1. Pardeep Jindal, Chief Engineer(PSPA-II), CEA
2. Ravinder Gupta, Director(PSPA-II), CEA
3. Manjari Chaturvedi, Dy. Director(PSPA-I), CEA
4. J.C.S. Bose, GM, REMCL, Indian Railways
5. Mukesh Khanna, AGM(CTU-Plg), POWERGRID
6. Rajesh Kumar, Asstt.GM(CTU-Plg), POWERGRID
7. Bhaskar Wagh, Sr. Engineer(CTU-Plg), POWERGRID

Annexure – II 1/3

GOVERNMENT OF INDIA
MINISTRY OF RAILWAY
RAILWAY BOARD

No. 2012/Elect(G)/150/1Pt.-II

Dt. 19.10.16

To,

Chief Engineer
Central Electricity Authority
Sewa Bhawan, R. K. Puram
Sector-1, new Delhi-110066

(Kind attn: Mr. Pardeep Jindal)

Sub: Connectivity of Railways TSSs with ISTS network approval for connectivity.

Ref: This office's letter no. 2012/Elect(G)/150/1 Pt.-II dt. 09.09.16.

As desired regarding subject matter, detailed information about the connectivity of Railways TSSs with State Utilities is attached.

Encl: As above.

19/10

(Punit Agrawal)
Director Elect. Engg.(PS)
Railway Board

Copy: CEO/REMCL: For information and necessary action please.

Details of TSS along Delhi - Bharuch route

Sr. No.	Proposed ISTS Location	Location of TSS/FP	Coordinates		Existing STU point				
			Lattitude	Longitude	Location	State	State Utility	Highest Voltage Level(kV)	Approx Distance from TSS (km)
1	Bassi (PGCIL) (Raj.)/ Agra	Mathura	27.47948	77.673561	Mathura	UP	UPPCL	132	6.20
2		Bharatpur	27.236305	77.488417	Bharatpur	Raj.	JVVNL	220	1.40
3		Hindaun city	26.755726	77.03145	Hindaun	Raj.	JVVNL	220	1.50
4		Gangapurcity	26.468502	76.527469	Gangapur	Raj.	JVVNL	132	2.20
5	Kota (PGCIL) (Raj.)	Sawaimadhopur	26.019077	76.357241	Sawaimad hopur	Raj.	JVVNL	220	1.50
6		Lakheri	25.640532	76.192401	Lakheri	Raj.	JVVNL	132	1.10
7		Gurla	25.270958	75.885826	Sakatpura	Raj.	JVVNL	220	12.50
8		Ramganj Mandi	24.643331	75.939128	Morak	Raj.	JVVNL	220	8.50
9		Suwasra	24.070519	75.648657	Suwasra	MP	MPPTCL	132	1.90
10	Rajgarh (PGCIL) (MP)	Nagda	23.45578	75.412474	Nagda	MP	MPPTCL	220	1.80
11		Ratlam	23.340562	75.050409	Ratlam	MP	MPPTCL	220	3.00
12		Bamania	23.095907	74.758689	Ratlam	MP	MPPTCL	220	45.00
13		Dahod	22.844095	74.254539	Dahod	Guj.	MGVCL	132	1.54
14		Limkheda	22.835043	73.983611	Limkheda	Guj.	DGVCL	132	2.50
15	Dehgam/ Pirana (PGCIL) (Guj.)	Godhra	22.77691	73.606149	Godhara	Guj.	MGVCL	220	7.00
16		Samlaya	22.884588	73.30251	Asoj	Guj.	MGVCL	400	14.30
17		Mehamadabad	22.81935	72.752112	Mehamada bad	Guj.	MGVCL	132	3.00
18		Anand	22.561686	72.966306	Ode	Guj.	MGVCL	132	17.30
19		Makarpura	22.233282	73.175857	Jambuva	Guj.	MGVCL	400	2.20
20		Bharuch	21.704389	72.99928	Bharuch	Guj.	DGVCL	400	1.50

Details of TSS along Mughal Sarai - Howrah route

Sr. No.	Proposed ISTS Location	Location of TSS/FP	Coordinates		Existing STU point				
			Lattitude	Longitude	Location	State	State Utility	Highest Voltage Level	Approx. Distance from TSS (in KM)
1	2	4			11	12	13	14	15
1	Arah/ Patna	Zamania	25.374231	83.544083	Gajlpur	U.P	UPPCL	132 KV	57
2		Dumraon	25.571685	84.142882	Dumraon	Bihar	SBPDCL	132 KV	4
3		Ara	25.550561	84.67292	Arah	Bihar	SBPDCL	132 KV	4
4		Danapur	25.582015	85.04564	Khagoul	Bihar	SBPDCL	132 KV	1
5		Jahanabad	25.186422	84.984907	Jehanabad	Bihar	SBPDCL	132 KV	0
6	Lukhisarai	Khushroopur	25.485244	85.387659	Fatuha	Bihar	SBPDCL	132 KV	15
7		Mokama	25.392106	85.91419	Hatidah	Bihar	SBPDCL	132 KV	0
8		Luckeesarai	25.173039	86.092171	Luckhisarai	Bihar	SBPDCL	132 KV	4
9		Jhajha	24.767951	86.391983	Jamui	Bihar	SBPDCL	132 KV	38
18		Shankarpur	86.6377979	24.4391859	Baidyanath Dham	jharkhand	JUSNL	132 KV	8.80
19		Jamtara	23.956994	86.812246	Jamtara	jharkhand	JUSNL	132 KV	0.90
10	Pusauli/ Gaya	Gaya	24.803242	84.999769	Bodhgaya	Bihar	BSPTCL	220kV	6
11		SonNagar	24.882665	84.230187	Sonnagar	Bihar	BSPTCL	220kV	3
12		Rafiganj	24.820701	84.636464	Kaikaf	Bihar	BSPTCL	220 KV	10
13		Paharpur	24.627119	85.204086	Bodhgaya	Bihar	SBPDCL	132 KV	35
14		Koderma	24.439814	85.517085	Koderma	jharkhand	DVC	132 KV	0.5
15	Maithon/Durgapur	Hazaribagh Rd	24.181143	85.886921	Konar	jharkhand	DVC	132 KV	35
16		Nimiaghat	23.933776	86.075386	Nimiaghat	jharkhand	DVC	132 KV	0.5
17		Pradhankhanta	23.772310	86.516885	Sindri	jharkhand	DVC	132 KV	20
20		Kumardhubi	23.747561	86.793549	Kumardhubi	jharkhand	DVC	132 KV	0.65
27		Kali Pahari	23.665212	87.016251		W.B	Under construction		
21		Waria	23.538278	87.246715	DTPS	W.B	DVC	132 KV	0.87
22	Subhashgram	Bardhman	23.249832	87.869508	Bardhman	W.B	DVC	132 KV	1.9
23		Belmuri	22.936608	88.150029	Belmuri	W.B	DVC/WBSEB	132 KV	0.6
24		Dankuni	22.678228	88.290773	Liluah	W.B	WBSEB	132 KV	10.5
25		Bandel	22.922770	88.377676	Adisapatgram	W.B	WBSEB	132 KV	0.3
26		Belur	22.635744	88.3398	Liluah	W.B	WBSEB	132 KV	2.5

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

No: 200/16/PSPA-II/2017/ 373-381 Dated: 11 .05.2017

To

As per address list

Subject: Minutes of the meeting related to Connectivity of Railway TSSs with ISTS network in Mughalsarai-Howrah Railway Route.

Sir,

The minutes of the meeting held on 20.04.2017 at CEA, Sewa Bhawan, R K Puram, New Delhi regarding above subject is enclosed.

Yours faithfully,

Jindal 11/5/2017

(Pardeep Jindal)
Chief Engineer (PSPA-II)

List of addressee:

1. Executive Director(EEM), Railway Board, Room No. 102-A, Rail Bhawan, New Delhi- 110001	2. General Manager, Railway Energy Management Co. Ltd.(REMCL) Ground floor, Central wing, Plot No-1, Sector 29, Gurgaon-122001
3. COO (CTU), PGCIL, Saudamini, Plot No. 2, Sector-29, Gurgaon-122001. Fax No. 0124-2571760/62)	4. CEO, POSOCO B-9, Qutub Institutional Area, Katwaria Sarai, New Delhi-110016
5. Executive Director (System), Damodar Valley Corporation DVC Towers, VIP Road, Kolkata-700054. Tel. 033-23557939 Fax No. 033-23554841	6. Managing Director, Bihar State Power Transmission Company, Vidyut Bhavan, Baily Road, Patna-800021. Tel. 0612-2504442 Fax No. 0612-2504557
7. Managing Director, Jharkhand Urja Sancharan Nigam Limited Engineering Building, H.E.C., Dhurwa, Ranchi-834004. Fax-0651-2400799	8. Director (System Operation), West Bengal State Electricity Transmission Company Ltd, Vidyut Bhavan, 5th Floor, Block-D, Bidhannagar, Sector-II, Kolkata-700091. Fax No.033-23342243
9. Managing Director, Uttar Pradesh Power Corporation Limited (UPPCL), Shakti Bhavan, Ashok Marg, Lucknow, Uttar Pradesh	

Minutes of the meeting related to Connectivity of Railway TSSs with ISTS network in Mughalsarai-Howrah Railway Route, held on 20.04.2017 at CEA.

List of participants is enclosed at Annexure-1.

Member (Power System), CEA welcomed the participants and stated that in an earlier meeting held in CEA on 07.10.2016, in regard to connectivity of Railways with ISTS network for the Mughalsarai - Howrah and the Delhi - Bharuch routes, it was decided that the issue of disconnection or paralleling of Railway TSS with STU network, would be further studied. To discuss the matter, the meeting was being held.

The following were discussed in the meeting:

1. CE (PSPA-II), CEA informed that Railways has proposed to connect their Traction Sub-stations (TSS) with ISTS points in Mughalsarai-Howrah route. The identified ISTS substations are Patna, Gaya, Maithon, Durgapur, Lakhisarai and Subhashgram. He expressed that simultaneously paralleling of Railway TSS with STU and ISTS network may increase the fault level and would result in stranded infrastructure. He stated that, at present, Railways are getting supply from STU network on this route. He asked Railways about the necessity of another infrastructure for Railways, when they are able to draw power from STU network in a reliable manner.
2. Director (Railways) informed that the decision of Railways to get connected to ISTS network and disconnection from STU network is purely based on economics of getting cheaper power from other sources through ISTS network. He, however, confirmed that they are getting reliable power from STU network. He further informed that the infrastructure for Railways connectivity to STU network was funded by Railways and built by respective STUs as a deposit work for Railways. As per the contract agreement with STUs, the assets are maintained by STUs.
3. Member (Power System), CEA requested Railways to share the economic analysis of shifting of Railway load from STUs/DVC to ISTS in this route. Director (Railways) said that he would send the report immediately.
4. D.C.E (DVC) stated that Railways connectivity to DVC network (from generator point upto 25 kV system) was created and funded by DVC and not by Railways. At present total Railway load of DVC is about 320MW, which they supply to Railway, at an average cost of Rs.4.80/ unit. Which is quite competitive price considering the higher reliability of power supply from two sources specially for Railways. He also stated that DVC has already tied up for generation projects and made investment in transmission considering recent specific request from the Railways. Hence, proposal of Railways to disconnection from DVC would result these infrastructure, as redundant

and investment as non-performing asset for DVC. Before agreeing to Railways proposal based on their economic consideration, economic aspects of DVC/STUs should also be considered.

5. Director (Railways) agreed with the DVC statement and stated that considering above facts, the case of DVC would be resolved mutually. However, he further added that the scheme for disconnection in Mughalsarai-Howrah route have been planned in a holistic way and as per plan , Railway would be disconnected from DVC also on this route. He said that these disconnections would be carried out in accordance with the agreements between Railways and the STUs/DVC. He indicated that Railways can disconnect from STU/DVC, giving legal notice as per these agreements.
6. Chief Engineer (PSPA-II), CEA stated that Railways may intimate the STUs and DVC regarding the date from which Railways would likely to disconnect, so that they plan for utilization of those network for other purposes, if possible. Representative of Railways replied that the disconnection may takes place in around (3-5) years time. Railways said that they can send advance intimation to STUs for disconnection, once the scheme of connection with ISTS gets agreed in the Standing Committee of CEA.
7. Director(BSPTCL) stated that Railways connectivity network with STU were built as deposit work by STU for Railways, however as per the legal agreement, the infrastructure belongs to the STU. He added that the load of Railways TSS would be around 80 to 100 MW at each 220 kV point and this would lead to under-utilisation of bays/lines/space at each ISTS points and thus is not an optimal planning as per the Electricity Act. He added that space for 2 No. 220kV Bays at ISTS S/s have been kept for future expansion of states and in this case the user would be only the Railways and thus no space would be left for STUs to meet their future requirement.. He also informed that there is no space at Patna and Gaya ISTS S/s for Railways connectivity.
8. Chief Engineer (UPPTCL) stated that the infrastructure for Railways was created considering Railways as important customer in UP. Now after disconnections, bays etc would have to be utilised for other purposes. In future, if railways again requires connectivity from STUs, this would not again be allotted to them.
9. AGM (POSOCO) expressed that for reliable supply to Railways, the STU and ISTS network may be kept in parallel. This would be, as per CEA's Planning Criteria of Power System Planning for important loads. Chief Engineer (PSPA-I), CEA stated that generally connectivity from two points i.e both STU and ISTS are not recommended. Two connectivity's for Railways, however can be considered either from STU or ISTS. GM(REMCL) Railways stated that they have planned their connectivity to TSS from two ISTS supply points and shared their scheme (a copy of which is given at Annex-II)

10. Director (BSPTCL) stated that Railways load at Bihar would be around 200MW. Recently, Bihar have allowed open access for 50MW to Railways and the remaining may be granted gradually. He stated that state network would become stranded after building Railway network with ISTS. This would be national wastage of resources and Public money. He added that Railways may be advised to again look into the economics of connectivity to ISTS points, as many of the states have already granted/ are in the process of granting NOC for open access and as such there is no justification for getting connected with ISTS.
11. Regarding control area for scheduling, metering and deviation, AGM(POSOCO) informed that as per CERC order, there would be two control areas, in each state i.e.one for RLDC and the other for SLDC(if they have connections from STUs also) for above purposes.
12. It is noted that no representative from West Bengal and Jharkhand was present in the meeting.
13. On the basis of above following was concluded.

i. Railways has to share the economic analysis of shifting of Railway load from STUs/DVC to ISTS in this route, which is basis of their proposal. Representative of Railways intimated that they would soon send the report.

ii. As the transmission system is planned in an integrated manner, Railways were advised to again look into the economics of connectivity to ISTS points, as many of the states have already granted /are in the process of granting NOC for open access.

iii. Transmission system for delivery of power to Railways need to be planned in according with the Electricity Act 2003 and thus taken up for discussion with Standing Committee constituted by CEA.

iv. No representative from West Bengal and Jharkhand was present in the meeting. Meeting ended with vote of thanks to the Chair.

Annexure-I

List of the participants of the meeting held on 20.04.2017 at CEA

Sl. No.	Name of the Participant	Designation	Organization
1	K.K.Arya (**In chair**)	Member(Power System)	CEA
2	Pardeep Jindal	Chief Engineer, (PSPA-II)	CEA
3	Rishika Sharan	Director, (PSPA-II)	CEA
4	U.M.Rao	Dy. Director, (PSPA-II)	CEA
5	S.A.Verma	Asst. Director-I	CEA
6	Punit Agrawal	Director(Power Supply)	Ministry of Railways
7	J.C.S.Bora	G.M.	REMCL
9	Bhaskar Sharma	Director(Project)	BSPTCL
10	Suman Guchh	C.E.(Transmission)	UPPTCL
11	Subir Bhada	D.C.E (E)	DVC
12	Sangita Sil	S.E.(E)	DVC
13	S.S.Barpanda	AGM, NLDC	POSOCO
14	Ram Chandra	DGM(CTU-Plg)	POWERGRID

S.No. 77

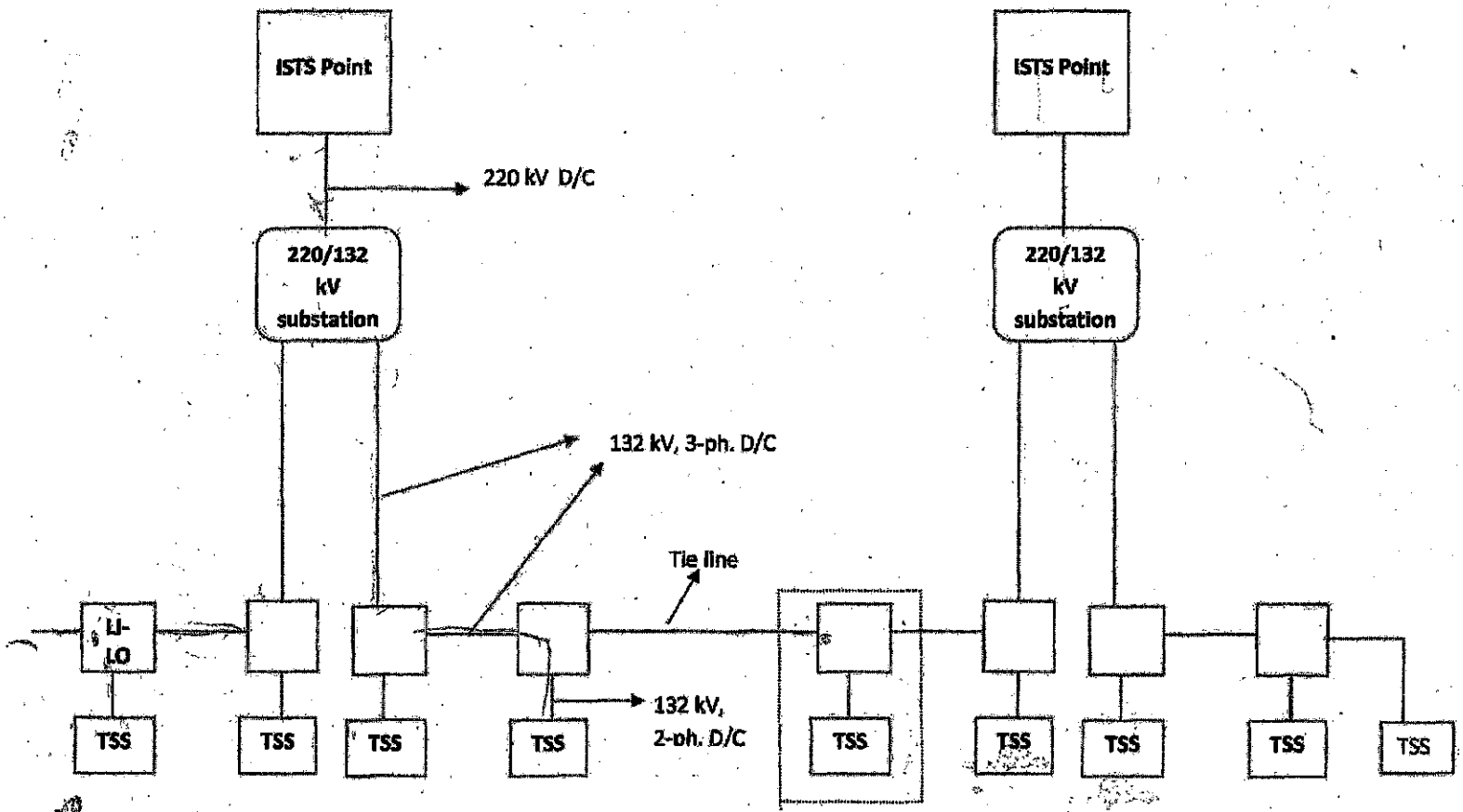
Annexure-II
Page 1

Summary of proposed transmission scheme is as under:

- Supply from the PGCIL substation shall be taken at 220 kV (or at 132 kV if available) through 2 no. bays.
- Supply from PGCIL substation shall be taken to 220/132 kV substation (to be constructed) through D/C lines. Land of size about 240x60 m shall be required for the 220/132 kV substation.
- From 220/132 kV substation, 132 kV supply shall be extended to up as well as down directions of the Railway line through D/C lines.
- On one direction 132 kV line shall feed about 3 TSS. Loop in Loop out arrangement shall be made at the existing TSS for extending supply to next TSS. Alternatively (in case of ROW problem near existing TSS) 2-Φ, 132 kV Supply from the above 3-Φ, 132 kV line shall be extended to the TSS from a Tee-off point to be constructed at open space near the TSS.
- One 220/132 kV substation and group of TSSs supplied through it shall be controlled through SCADA centre at the 220/132 kV substation.
- Group of two TSSs shall be protected by a common numerical distance protection relays to be provided at the 220/132 kV substation or at the selective TSS.
- Two Hot line communication channels shall be made available between each of the 220/132 kV substation and the TSS in that element and nodal Traction power control (TPC) of the element. Two Hot line links shall also be made available between two adjacent 220/132 kV substations and respective ISTS point.

PROPOSED SCHEME OF CONNECTIVTY OF TSS WITH ISTS POINT

Note: LILO can be within the TSS or out of TSS based on Land and ROW availability



भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली योजना एवं मूल्यांकन प्रभाग-2
Power System Planning & Appraisal Division-II
सेवा भवन, रा. कृ.पुरम , नयी दिल्ली -110066
Sewa Bhawan, R. K. Puram, New Delhi-110066

[ISO: 9001:2008]

No: 77/7/PSPA-II/2017/-12

Dated: 04.01.2017
05

To
Shri Ashok Pal,
GM (CTU-Planning)
Saudamini"Plot No.2, Sector-29,
Gurgaon- 122 001 "(Haryana)

Subject: Termination of 220 kV side of 400/220 kV, 500 MVA ICT-4 at 220kV bus of Biharsharif(BSPTCL) under ERSS-XX

Ref: (i) PGCIL letter no. C/CU-Plg/E/ERSS-XX dated 21.11.2016
(ii) e-mail dated 29.12.2016 from PGCIL

Sir,

This has reference to PGCIL letter dated 21.11.2016 in which PGCIL has requested CEA to grant principal approval for termination of 220 kV side of the 400/220 kV 4th transformer of 500 MVA at Biharsharif covered under the scope of ERSS-XX scheme. The 220 kV side of this ISTS transformer is proposed to be terminated at Biharsharif (BSPTCL substation) with small 220 kV inter-connecting line section from 220 kV ICT bushing to 220 kV ICT Bay. Further, PGCIL has also forwarded general lay out and SLD of Biharsharif 400kV and 220kV Substations through e-mail dated 29.12.2016.

The above documents have been examined and accordingly, we convey in-principal approval to PGCIL for termination of 220 kV side of the 400/220 kV 4th transformer of 500 MVA at 220kV bus of Biharsharif(BSPTCL) and laying of small 220 kV inter-connecting line section from 220 kV ICT bushing to 220 kV ICT Bay in the scope of ERSS-XX scheme of PGCIL.

This is issued with the approval of Member(Power System).

PJindal
05/01/2017

(Pardeep Jindal)
Chief Engineer (PSPA-II)

Annexure-13.1

Scope of Works for the scheme
"Interconnection of Northern part of Bangladesh with Indian Grid"

1.0 Indian Side

1.1 Transmission Lines

(a) Katihar (ER) – Parbotipur (Bangladesh) 765kV D/c line (to be initially operated at 400kV) – Indian Portion only

(b) LILO of both ckts of New Purnea - Rajarhat 400kV D/c (triple snowbird) line (one ckt via Gokarna and other ckt via Farakka) at Katihar

(c) Parbotipur (Bangladesh) - Bornagar (NER) 765kV D/c line (to be initially operated at 400kV) – Indian Portion only

(d) LILO of both circuits of Balipara – Bongaigaon 400kV D/c (quad) line at Bornagar substation

(e) Disconnection of Alipurduar – Bongaigaon 400kV D/c (quad) line from Bongaigaon and extension of the same to Bornagar with 400kV D/c (quad) line so as to form Alipurduar – Bornagar 400kV D/c (quad) line

1.2 Substation

(a) 400kV new substation at Katihar (Bihar) - upgradable to 765kV later

- **400 kV Line bays: 6 nos.**
  - 2 nos. for Katihar (ER) – Parbotipur (Bangladesh) 765kV D/c line to be initially operated at 400kV
  - 4 nos. for LILO of both ckts of Purnea - Rajarhat 400kV D/c (Triple Snowbird) line at Katihar (one ckt via Gokarna and other ckt via Farakka)
- **Reactive Compensation**
  - 420kV Bus Reactor alongwith associated bays: 2x125 MVAR
  - Shifting of 2 nos. 420kV, 80MVAR switchable Line Reactors at Purnea end of Purnea – Rajarhat 400 kV D/c (Triple) line from Purnea to Katihar end of Katihar – Rajarhat 400 kV D/c (Triple) line [1.1(b)]
- **Space for future 765kV switchyard**
  - 765/400kV 3x1500MVA ICTs (10x500MVA Single Phase Units) along with associated bays
  - 765kV Line bays (including space for sw. line reactor): 8 nos.
  - 765kV, 2x330MVAR (7x110 MVAR) Bus Reactors
- **Space for future 400kV switchyard**
  - 400kV Line bays (including space for sw. line reactor): 6 nos.

- 765/400kV 3x1500MVA ICTs (10x500MVA Single Phase Units) along with associated bays
- 400/220kV, 3x500MVA ICTs along with associated bays

- **Space for future 220kV switchyard**
  - 400/220kV, 3x500MVA ICTs along with associated bays
  - 10 nos. 220 kV line bays

(b) 400kV new substation at Bornagar (Assam) - upgradable to 765kV later

- **400 kV Line bays: 8 nos.**
  - 2 nos. for Parbotipur (Bangladesh) - Bornagar (NER) 765kV D/c line to be initially operated at 400 kV
  - 2 nos. for Siliguri/Alipurduar – Bornagar 400kV D/c (quad) line

    [Formed after shifting of Siliguri/Alipurduar – Bongaigaon 400kV D/c (quad) line from Bongaigaon to Bornagar at 1.1(e)]
  - 4 nos. for LILO of both circuits of Balipara - Bongaigaon 400kV D/c (quad) line

- **Reactive Compensation**
  - 420kV Bus Reactor alongwith associated bays: 2x125 MVAR
  - 420kV, 63MVAR switchable line reactor at Bornagar end on each line of Parbotipur (Bangladesh) - Bornagar (NER) 765kV D/c line to be initially operated at 400 kV [1.1(c)]
  - Shifting of 2 nos. 420kV, 80MVAR Line Reactors from Bongaigaon end of Siliguri/Alipurduar – Bongaigaon 400 kV D/c (Quad) line to Bornagar end of Alipurduar – Bornagar 400kV D/c (Quad) line [1.1(e)]
  - Shifting of 2 nos. 420kV, 63MVAR Line Reactors from Bongaigaon end of Balipara – Bongaigaon 400kV D/c (Quad) line to Bornagar end of Bornagar – Balipara 400kV D/c (Quad) line [1.1(d)]

- **Space for future 765kV switchyard**
  - 765/400kV 3x1500MVA ICTs (10x500MVA Single Phase Units) along with associated bays
  - 765kV Line bays (including space for sw. line reactor): 8 nos.
  - 765kV, 2x330MVAR (7x110 MVAR) Bus Reactors

- **Space for 400kV switchyard**
  - 400kV Line bays (including space for sw. line reactor): 6 nos.
  - 765/400kV 3x1500MVA ICTs (10x500MVA Single Phase Units) along with associated bays
  - 400/220kV, 3x500MVA ICTs along with associated bays

- **Space for 220kV switchyard**
  - 400/220kV, 3x500MVA ICTs along with associated bays
  - 10 nos. 220kV line bays

2.0 Bangladesh Side

2.1 <u>Transmission Lines</u>

(a) Katihar (ER) – Parbotipur (Bangladesh) 765kV D/c line (to be initially operated at 400kV) – Bangladesh Portion only

(b) Parbotipur (Bangladesh) – Bornagar (NER) 765kV D/c line (to be initially operated at 400kV) – Bangladesh Portion only

(c) LILO of Barapukuria – Bogra 230kV D/c line at Parbotipur

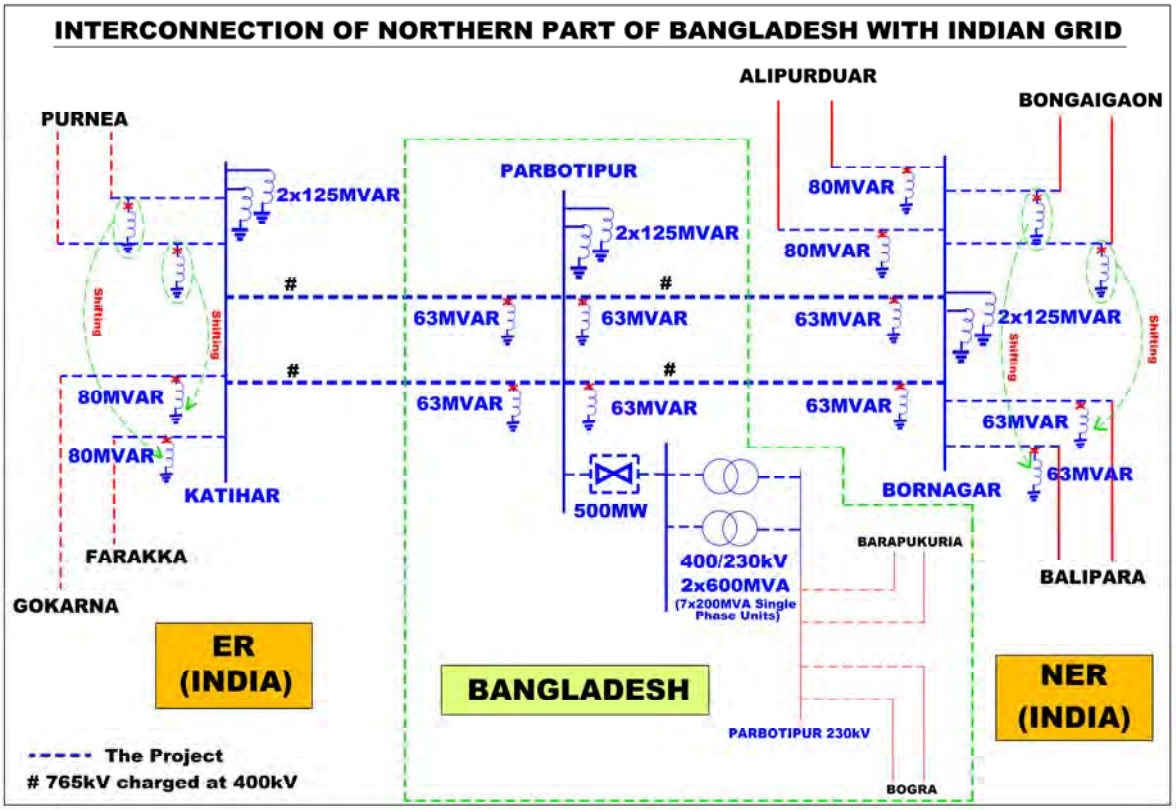
2.2 <u>Substation</u>

(a) 400/230kV new substation at Parbotipur - upgradable to 765kV later

- **500MW Back-to-Back HVDC Station**
- **400kV Line bays: 4 nos.**
  - 2 nos. 400kV line bays for Parbotipur (Bangladesh) – Katihar (ER) 765kV D/c line to be initially operated at 400kV
  - 2 nos. 400kV line bays for Parbotipur (Bangladesh) – Bornagar (NER) 765kV D/c line to be initially operated at 400kV
- **Reactive Compensation**
  - 420kV, 2x125 MVAR Bus Reactor alongwith associated bays
  - 420kV, 63 MVAR Switchable Line Reactor at Parbotipur end on each line of Parbotipur (Bangladesh) – Katihar (ER) 765kV D/c line to be initially operated at 400kV [2.1(a)]
  - 420kV, 63 MVAR Switchable line Reactor at Parbotipur end on each line of Parbotipur (Bangladesh) – Bornagar (NER) 765kV D/c line to be initially operated at 400kV [2.1(b)]
- 400/230kV, 2x600MVA (7x200 MVA single phase units) ICTs along with associated bays
- 230kV Line bays:
  - 4 nos. 230kV line bays for LILO of Barapukuria – Bogra 230 kV D/c line at Parbotipur
- **Space for future 765kV switchyard**
  - 765/400kV, 2x1500 MVA ICTs (7x500 MVA Single Phase Units) along with associated bays
  - 765kV Line bays: 8 nos.
  - 765kV, 2x330 MVAR (7x110 MVAR) Bus Reactors

- **Space for future HVDC / 400kV / 230kV switchyard**
  - 500MW HVDC Back-to-Back 2nd block at Parbotipur
  - 765/400kV, 2x1500 MVA ICTs (7x500 MVA Single Phase Units) along with associated bays
  - Capacity enhancement of 400/230kV Parbotipur substation by 600MVA (3x200MVA single phase ICTs) alongwith associated bays
  - 400kV Line Bays: 4 nos.
  - 230kV Line Bays: 8 nos. [including 2 nos. line bays for Parbotipur – Bogra – Kaliakoir 400kV (to be energized at 230kV) D/c line]

3.0 Schematic Diagram



Transmission system for Odisha UMPP

Introduction:

Orissa Integrated Power Limited (SPV for Odisha UMPP) has applied for LTA of 4000MW from Odisha UMPP (Bhedabahal, Odisha) with the following allocation:

Beneficiary	Quantum (MW)
Odisha	1300 MW
ER	**1300 MW**
Madhya Pradesh	400 MW
Chhattisgarh	200 MW
WR	**600 MW**
Tamil Nadu	300 MW
SR	**300 MW**
Rajasthan	400 MW
Uttarakhand	200 MW
Punjab	500 MW
Haryana	400 MW
Uttar Pradesh	300 MW
NR	**1800 MW**
Total	**4000 MW**

Odisha UMPP (4000MW) is expected to be commissioned by 2021-22 time-frame. Accordingly, studies have been carried out for 2021-22 time-frame to finalise transmission system for evacuation of power from Odisha UMPP.

Transmission System:

It has been assumed that Odisha UMPP shall consist of 6 generation units of 660MW each. As per coordinates provided, UMPP shall be established in proximity of the existing 765/400kV Sundargarh (Jharsuguda) substation of POWERGRID. On connecting the generation project to Sundargarh 765/400kV S/s, it was found that the fault levels were exceeding the rated limits. Thus, in order to control the fault level, split bus arrangement has been considered at UMPP switchyard with two bus sections having 3 generation units of 660MW each.

From the above mentioned power allocation it is observed that about 1800MW is to be transferred to beneficiaries in NR and about 600MW to WR. Accordingly, it is proposed that high capacity 765kV AC transmission lines be planned from Odisha UMPP in such a manner that power could be transferred to two routes viz. from ER to WR and from ER to NR.

Accordingly, the following alternatives have been considered:

Alternative-1 (transmission system approved in 17th ER-SCM) [Study Results at Exhibit-1]

- Establishment of new 765/400kV 3x1500MVA Pooling Station near Sundargarh
- LILO of Sundargarh-A – Raipur Pool 765 kV D/c line at Sundargarh (New)
- Odisha UMPP – Sundargarh New 765kV 2xD/c line
- Establishment of new 400/220kV 4x500MVA Station at Badarpur (New)
- Sundargarh (New) – Badarpur (New) ±800kV HVDC Bipole Line
- ±800kV HVDC 3000MW (upgradable to 6000MW in future) Terminals at Sundargarh (New) and Badarpur (New)

Due to space constraint at 765kV bus section at Sundargarh-A, LILO of either Sundargarh-A – Dharamjaygarh 765kV D/c line or Sundargarh-A – Raipur Pool 765kV D/c line has been considered at one section of Odisha UMPP switchyard. The other section of Odisha UMPP switchyard is proposed to be connected to either Sundargarh-B section or alternatively to Gaya S/s via Ranchi (New) for transfer of power towards NR.

Alternative-2 [Study Results at Exhibit-2(a) & 2(b)]

- Split bus at Odisha UMPP (3x660MW in Section-A and 3x660MW in Section-B)
- LILO of Sundargarh-A – Dharamjaygarh 765kV D/c line at Odisha UMPP-A

  Or

  LILO of Sundargarh-A – Raipur Pool 765kV D/c line at Odisha UMPP-A
- Odisha UMPP-B to Sundargarh-B 765kV D/c line
- Ranchi (New) – Gaya 765kV D/c line

Alternative-3 [Study Results at Exhibit-3]

- Split bus at Odisha UMPP (3x660MW in section-A and 3x660MW in Section-B)
- LILO of Sundargarh-A – Dharamjaygarh 765kV D/c line at Odisha UMPP-A

  Or

  LILO of Sundargarh-A – Raipur Pool 765kV D/c line at Odisha UMPP-A
- Odisha UMPP-B to Ranchi (New) 765kV D/c line
- Ranchi (New) – Gaya 765kV D/c line

Observations:

From the above study results, it is observed that power flow in all the alternatives are within acceptable limits. However, following are the observations for the above mentioned alternatives:

Alternative-1:

It is observed that existing/under-construction evacuation corridors from Sundargarh (Jharsuguda) are under-utilized. Further, as the expected cost of this alternative would be high, this alternative does not appear to be the optimised transmission system.

Alternative-2:

It is observed that loading of transmission lines is similar whether LILO of Sundargarh-A – Dharamjaygarh 765 kV D/c line is considered at Odisha UMPP-A or LILO of Sundargarh-A – Raipur Pool 765 kV D/c line is considered at Odisha UMPP-A section. Therefore, it is proposed that LILO of one of the 765kV D/c lines be done at Odisha UMPP-A bus section depending on the proximity of transmission line route from the UMPP. Odisha UMPP-B is proposed to be connected to Sundargarh-B through 765kV D/c line

The power flows from Sundargarh-A and Sundargarh-B sections to Ranchi (New) via Dharamjaygarh substation in WR through Sundargarh – Dharamjaygarh – Ranchi (New) 765kV corridor. Further, there is a high capacity 765kV ER-NR corridor from Gaya in ER to Varanasi and Balia substations in NR. Thus, by completing the missing link i.e. Ranchi (New) – Gaya 765 kV D/c line, it shall be possible to connect southern and northern portion of ER through strong 765kV link and this shall enhance power flow on WR-ER-NR and ER-NR corridors and also increase utilisation of the existing transmission capacity in ER-NR corridor in a better way.

Further, in Alternative-2 by construction of Ranchi (New) – Gaya 765 kV D/c line, the Sundargarh-A – Odisha UMPP-A – Dharamjaygarh – Ranchi (New) – Gaya – Varanasi/Balia 765kV corridor gets completed.

Alternative-3:

In this alternative, Odisha UMPP-A section is proposed to be connected same as mentioned in Alternative-2. However, in order to push more power through ER-NR corridor, Odisha UMPP-B bus section has been directly connected to Ranchi (New) through 765kV D/c line along with extension of 765kV D/c corridor to Gaya for further transfer of power to Varanasi and Balia substations in Northern Region.

Power flow on the existing Dharamjaygarh – Ranchi (New) 765kV 2xS/c lines is low in the base case itself. With construction of UMPP to Ranchi corridor it is observed that power flow on Dharamjaygarh – Ranchi (New) link is further reduced, as the two corridors become a parallel path (UMPP – Ranchi and UMPP – Dharamjaygarh – Ranchi).

Conclusion:

From above, Alternative-2 is found to be the most optimised/suitable one. In this alternative only by construction of Ranchi (New) – Gaya 765 kV D/c line, power flow in WR-ER-NR and ER-NR corridors is enhanced. This shall also result in better utilisation of existing and under construction inter-regional transmission lines.

Accordingly, following transmission system is proposed for Odisha UMPP:

- Split bus at Odisha UMPP (3x660MW in Section-A and 3x660MW in Section-B)
- LILO of Sundargarh-A – Dharamjaygarh 765kV D/c line at Odisha UMPP-A

  Or

  LILO of Sundargarh-A – Raipur Pool 765kV D/c line at Odisha UMPP-A
- Odisha UMPP-B to Sundargarh-B 765kV D/c line
- Ranchi (New) – Gaya 765kV D/c line

POWER MAP OF EASTERN REGION

Odisha UMPP Study

Alt-1: HVDC Bipole - Jharsuguda New - Badarpur

पावरग्रिड

Nepal

Bhutan

Bangladesh

ER-I

ER-II

SUNDERGARH

SUNDERGARH-A

ANGUL

TEESTA-III

PUNATSANGCHU

TEESTA-V

RANGPO

TALA

JIGMELING

SILIGURI

MALBASE

ALIPURDUAR

TO RANGIA

BISHWANATH CHARIYALI

DHALKEBAR

SITAMARHI

800KV HVDC BIPOLE

2000MW

AGRA

GORAKHPUR

MOTIHARI

MUZAFFARPUR

TO BALIA

DARBHANGA

SAHARSA

PURNEA

KISHENGANJ

ALLAHABAD

KANPUR

FATEHPUR

SARNATH

VARANASI

TUGH'BAD

BARH

PATNA

KAHALGAON

MALDA

BHRSHRF

SASARAM

TARANDAUTI

GAYA

FARRAKA

BADARPUR

MAHARANIBAGH

NABINGR

KODERMA

BAHARAMPUR

SG'DIGHI

TO BHERAMARA (BANGLADESH)

TO VINDHAYACHAL PL

DLTNGNJ

ESSAR

BOKARO B

DHANBAD

MAITHON RB

GOKARNA

JHRKND POOL

LT'HAR TN'GHAT

M'THAN

BKRSWAR

DURGAPUR

KATWA(New)

2500MW

NTPC STPP

PATRATU

DTPS

RAGHU-NATPUR

MEJIA B

BDT'NGR

RANCHI-N

RANCHI

PURULIA

TURGA

DPL

JEERAT(New)

JEERAT

PPSP-NEW

ADHUNIK

ARAMBAG

RJ'HAT

SUBHASGRAM

TO WR POOLING STATION

TO SIPAT(WR)

JMSD'PUR

JMSD'PUR (DVC)

GOKHALA

HALDIA

TO DJ'GARH(WR)

CHAIBASA

MEDINIPUR

KHRGPR

KOLAGHAT

ROURKELA

SUNDERGARH

STERLITE

BARIPADA

TO RAIGARH(WR)

TO RAIPUR POOL(WR)

KEONJHAR

BHADRAK

OD UMPP

OPGC

RENGALI

KVK

LAPANGA

DRPLI

DUBURI

TALCHER STPP

PARADEEP

K'TUNI

PANDIABIL

GMR

MM'DLI

MENDHASAL

LANCO

BOLANGIR

THERUBALI

NARENDRAPUR

INDRAVATI

JEYPORE

TO KOLAR(SR)

SRIKAKULUM (SR)

GAZUWAKA

GAZUWAKA (SR)

DJ'GARH(WR)

ROURKELA

IND-BRTH (2x350)

RAIGARH(WR)

STERLITE (3x600)

(600)

RAIPUR POOL(WR)

(660) OPGC (660)

LAPANGA

DRPLI (2x800)

ANGUL

JINDAL (2x600)

TALCHER STPP

MONNET (2x525)

M'MUNDLI-B KHUNTUNI

(3x350) (350) GMR

(660) (660) LANCO BBND

BOLANGIR

NARENDRAPUR

SRIKAKULUM (SR)

LEGEND

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

TIME FRAME: 2021-22

R:\ER & NER\ER\PSSE\REGION\Odisha Strengthening and UMPP\Study files\umpp\Final

Last Updated 06 July 2016

POWER MAP OF EASTERN REGION

Odisha UMPP Study
Alt:2 LILO of Jhar-A - Dharam. & Jharsuguda - B
Ranchi (New) - Gaya 765 kV D/c

पावरग्रिड

Nepal
Bhutan
Bangladesh
ER-I
ER-II

DHALKEBAR
SITAMARHI
800KV HVDC BIPOLE
MOTIHARI
MUZAFFARPUR
DARBHANGA
PURNEA
SAHARSA
KISHENGANJ
2000MW
TEESTA-III
TEESTA-V
RANGPO
PUNATSANGCHU
TALA
SILIGURI
MALBASE
JIGMELING
ALIPURDUAR
TO RANGIA
BISHWANATH CHARIYALI
AGRA
GORAKHPUR
TO BALIA
ALLAHABAD
KANPUR
FATEHPUR
VARANASI
SARNATH
TO VINDHAYACHAL PL
NEPTUR
JAK'NPR
BAKHTYPR
BARH
PATNA
BHRSHRF
LKSRAI
SASARAM
CHANDAUTI
GAYA
NABINGR
KAHALGAON
MALDA
FARRAKA
BANKA
BAHARAMPUR
SG'DIGHI
TO BHERAMARA (BANGLADESH)
GOKARNA
KODERMA
DLTNGNJ
ESSAR
BOKARO B
TN'GHAT
DHANBAD
MAITHON-RB
BKRSWAR
MTHN
DURGAPUR
JHRKND POOL
LT'HAR
PATRATU
NKSTPP
RANCHI-N
RANCHI
RAGHU-NATPUR
MEJIA-B
DPS
BDN'NGR
KATWA(New)
PURULIA
TURGA
PPSP-NEW
DPL
JEERAT(New)
JEERAT
ADHUNIK
ARAMBAG
RJ'HAT
SUBHASGRAM
C'TALA
HALDIA
TO WR POOLING STATION
TO SIPAT(WR)
JMSD'PUR
JMSD'PUR (DVC)
MEDINIPUR
KHRGPR
KOLAGHAT
TO DJ'GARH(WR)
CHAIBASA
ROURKELA
SUNDERGARH
STERLITE
BARIPADA
TO RAIGARH(WR)
TO RAIPUR POOL(WR)
OD UMPP
OPGC
DRPLI
KEONJHAR
BHADRAK
KVK
RENGALI
LAPANGA
DUBURI
TALCHER STPS
PARADEEP
ANGUL
K'TUNI
PANDIABIL
GMR
LANCO
M'MUNDLI
MENDHASAL
BOLANGIR
THERUBALI
INDRAVATI
NARENDRAPUR
JEYPORE
TO KOLAR(SR)
SRIKAKULUM (SR)
GAZUWAKA
GAZUWAKA (SR)

SUNDERGARH
DJ'GARH(WR)
ROURKELA
IND-BRTH (2x350)
RAIGARH(WR)
STERLITE (3x600)
(600)
RAIPUR POOL(WR)
(660)
OPGC (660)
LAPANGA
DRPLI (2x800)
ANGUL

SUNDERGARH
SUNDERGARH-A
JINDAL (2x600)
TALCHER STPP
MONNET (2x525)
ANGUL
M'MUNDLI-B
KHUNTUNI
(3x350) (350) GMR
(660) (660) LANCO BBMD
BOLANGIR
NARENDRAPUR
SRIKAKULUM (SR)

LEGEND

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

TIME FRAME: 2021-22

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Last Updated 06 July 2016

POWER MAP OF EASTERN REGION

Odisha UMPP Study

Alt 2a: LILO of Jhar-A - Raipur Pool & Jharsuguda - B

Ranchi (New) - Gaya 765 kV D/c

पावरग्रिड

Nepal

Bhutan

Bangladesh

ER-I

ER-II

DHALKEBAR

SITAMARHI

800KV HVDC BIPOLE

MOTIHARI

MUZAFFARPUR

DARBHANGA

SAHARSA

PURNEA

2000MW

KISHENGANJ

AGRA

GORAKHPUR

TO BALIA

ALLAHABAD

KANPUR

FATEHPUR

VARANASI

SARNATH

SASARAM

TO VINDHAYACHAL PL

NABINGR

DLTNGNJ

JHRKND POOL

RANCHI-N

RANCHI

PATRATU

ESSAR

CHANDAUTI

GAYA

KODERMA

BARH

PATNA

BHRSHRF

LKSRAI

BANKA

KAHALGAON

MALDA

FARRAKA

TEESTA-III

TEESTA-V

RANGPO

PUNATSANGCHU

TALA

SILIGURI

MALBASE

JIGMELING

ALIPURDUAR

TO RANGIA

BISHWANATH CHARIYALI

SG'DIGHI

BAHARAMPUR

TO BHERAMARA (BANGLADESH)

GOKARNA

MAITHON-RB

MTPS

DURGAPUR

KATWA(New)

DTPS

DPL

BDWNGR

JEERAT(New)

JEERAT

SUBHASGRAM

RJ'HAT

ARAMBAG

GOKHALA

HALDIA

MEDINIPUR

KHRGPR

KOLAGHAT

BARIPADA

KVK

PARADEEP

PANDIABIL

DUBURI

MENDHASAL

M'MUNDLI

K'TUNI

TALCHER STPP

ANGUL

GMR

LANCO

BOLANGIR

THERUBALI

INDRAVATI

JEYPORE

TO KOLAR(SR)

SRIKAKULUM (SR)

GAZUWAKA

GAZUWAKA (SR)

TO WR POOLING STATION

TO SIPAT(WR)

TO DJ'GARH(WR)

TO RAIGARH(WR)

TO RAIPUR POOL(WR)

OD UMPP

OPGC

DRPLI

LAPANGA

RENGALI

SUNDERGARH STERLITE

ROURKELA

CHAIBASA

JMSD'PUR

JMSD'PUR (DVC)

ADHUNIK

PPSP-NEW

PURULIA

TURGA

RAGHUNATHPUR

NBTPUR

JAK'NPR

BAKRTYPR

KEONJHAR

BHADRAK

NTPC

TO RAIPUR POOL(WR)

SUNDERGARH

DJ'GARH(WR)

RAIGARH(WR)

RAIPUR POOL(WR)

IND-BRTH (2x350)

STERLITE (3x600)

(600)

(660)

OPGC (660)

DRPLI (2x800)

ANGUL

LAPANGA

SUNDERGARH-A

JINDAL (2x600)

MONNET (2x525)

TALCHER STPP

(3x350) (350)

GMR

(660) (660)

LANCO BBND

BOLANGIR

NARENDRAPUR

SRIKAKULUM (SR)

M'MUNDLI-B

KHUNTUNI

SUNDERGARH

LEGEND

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

TIME FRAME: 2021-22

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Last Updated 06 July 2016

POWER MAP OF EASTERN REGION

Odisha UMPP Study

Alt-3: LILO of Jhar-A - Dharamjaygarh & Ranchi (New)
Ranchi (New) - Gaya 765 kV D/c

पावरग्रिड

Nepal
Bhutan
Bangladesh
ER-I
ER-II

DHALKEBAR
SITAMARHI
800KV HVDC BIPOLE
MOTIHARI
MUZAFFARPUR
DARBHANGA
PURNEA
SAHARSA
KISHENGANJ
AGRA
GORAKHPUR
TO BALIA
ALLAHABAD
KANPUR
FATEHPUR
VARANASI
SARNATH
TO VINDHAYACHAL PL
NEPTUR
JAK'NPR
PATNA
BARH
BAKHTYPR
KAHALGAON
MALDA
FARRAKA
BHRSHRF
LKSRAI
BANKA
SASARAM
CHANDAUTI
GAYA
NABINGR
KODERMA
ESSAR
DLTNGNJ
JHRKND POOL
NKSTPP
LTPHAR
PATRATU
DHANBAD
BOKARO B
TN'GHAT
M'THN
DURGAPUR
DTPS
RAGHU-NATPUR
MEJIA
BDN'NGR
KATWA(New)
RANCHI-N
RANCHI
PURULIA
TURGA
PPSP-NEW
DPL
ADHUNIK
JMSD'PUR
JMSD'PUR (DVC)
ARAMBAG
C'TALA
RJ'HAT
JEERAT(New)
JEERAT
SUBHASGRAM
HALDIA
MEDINIPUR
CHAIBASA
KHRGPR
KOLAGHAT
BARIPADA
ROURKELA
SUNDERGARH
STERLITE
TO RAIGARH(WR)
TO RAIPUR POOL(WR)
OD UMPP
OPGC
DRPLI
LAPANGA
RENGALI
KEONJHAR
BHADRAK
KVK
DUBURI
TALCHER STPS
ANGUL
JSPL
GMR
LANCO
M'MUNDLI
KHUNTUNI
PARADEEP
PANDIABIL
MENDHASAL
BOLANGIR
THERUBALI
INDRAVATI
NARENDRAPUR
JEYPORE
TO KOLAR(SR)
GAZUWAKA
SRIKAKULUM (SR)
GAZUWAKA (SR)
TO WR POOLING STATION
TO SIPAT(WR)
TO DJ'GARH(WR)
TO RANGIA
BISHWANATH CHARIYALI
TEESTA-III
TEESTA-V
RANGPO
TALA
SILIGURI
MALBASE
PUNATSANGCHU
JIGMELING
ALIPURDUAR
2000MW
BAHARAMPUR
TO BHERAMARA (BANGLADESH)
GOKARNA
SUNDERGARH-A
JINDAL (2x600)
MONNET (2x525)
TALCHER STPP
(3x350) (350) GMR
(660) (660) LANCO BSMD
SUNDERGARH
DJ'GARH(WR)
ROURKELA
IND-BRTH (2x350)
RAIGARH(WR)
STERLITE (3x600)
(600)
RAIPUR POOL(WR)
(660) OPGC (660)
DRPLI (2x800)
ANGUL

LEGEND

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

TIME FRAME: 2021-22

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Last Updated 06 July 2016

दामोदर घाटी निगम, Damodar Valley Corporation
विद्युत् विभाग, Electricity Department
डीवीसी टावर्स, वीआईपी रोड, कोलकाता-54, DVC Towers, VIP Road, Kolkata-54

No. EDCON /SPE/CEA/ 07 Dated : 05.01.2017

To
The Director (SP & PA),
System Planning & Project Appraisal Division,
Central Electricity Authority,
Sewa Bhawan, R. K. Puram, New Delhi-110066

Sub: Programme for 11th / 12th Plan network augmentation of DVC System – Submission of revised plan for approval

Ref.: 1). DVC's letter no. EDCON/SPM/CEA/379 dated 12.03.2012 & even no./791 dated 25.05.2012
2). CEA letter no. 74/1/2012-SP&PA/497 dated 03.05.2012 & even no./823-824 dated 31.07.12 (copy enclosed)

Dear Sir,

Reference above, this is to appraise you that as per the approved 11th / 12th Plan for network augmentation of DVC System (copy enclosed), a 220 KV new substation was proposed at Gola in Jharkhand with 220KV D/C lines connecting the new Gola S/S to Ramgarh(DVC), MTPS(DVC) and Ranchi(PGCIL) substations.

Due to financial crunch and a restriction imposed by MoP on investment i.r.o. DVC Transmission System, the construction of new 220KV substation at Gola has been dropped as of now. The above mentioned 220KV lines (proposed connecting Gola S/S with Ramgarh & MTPS substations of DVC and Ranchi-PG S/S) are complete/nearing completion. To utilise the up-coming 220KV lines to the best extent possible, a revised plan (copy enclosed) is proposed bypassing the Gola S/S (now dropped).

The revised plan, as proposed, may please be approved.

C.E.(PSPA-II) may kr. Sd/ 28/12/17

Yours faithfully,
Suman K. Bose 5/1/17
(Suman Bose)
Chief Engineer (SPE)
Mobile no. 08145524994

Encl: 1. Copy of letter dated 31.07.12 of CEA
2. Scope of work i.r.o. DVC System in the 12th Plan
3. Copy of the Revised Plan submitted for approval of CEA

Copy to: 1. The Executive Director (System), DVC, DVC Towers, Kolkata-54
2. The Executive Director (ER-I), PGCIL, Patna

Supdtg. Engr. (Plg.), Kolkata, Div. ? 1/3/17

No/301/CE/PSPA-II 2/3/17

Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
प्रणाली योजना एवं परियोजना मूल्यांकन प्रभाग
System Planning & Project Appraisal Division
[ISO: 9001:2008]
सेवा भवन, आर. के. पुरम, नई दिल्ली-110066
Sewa Bhawan, R. K. Puram, New Delhi-110066
वेबसाइट / Website: www.cea.nic.in

No.74/1/2012-SP&PA/ 833-834 Dated: 31.7.2012

Chief Engineer (PSR),
Damodar Valley Corporation,
Electricity Deptt.,
DVC Tower, VIP Road,
Kolkata-100 054.

Sub: Programme for 12th Plan network augmentation of DVC system.

Ref: i) CEA Lr. No. 74/1/2012-SP&PA/497 dated 03.05.12
ii) DVC's lr. No. EDCON/SPM/CEA/791 dated 25.5.12
iii) DVC's lr No. EDCON/SPM/CEA/379 dated 12.3.2012

Sir,

DVC vide their letter EDCON/SPM/CEA/1002 dated 11.7.12 has furnished their clarifications and revised system studies in line with our comments forwarded in May, 2012 on the subject cited proposal. It is observed that DVC has carried out the system studies considering its 12th Plan load of 4484 MW (presuming 7% higher load growth as compared to their 18th EPS load projection of 4173 MW) and evacuation for 8520 MW generation corresponding to 2016-17 scenario. Accordingly, the transmission system augmentation proposal for their 12th Plan has been revised by DVC.

It is noted that DVC has proposed to construct a 220kV Koderma- North Karanpura- Patratu D/C lines for establishment of a 220 kV D/C ring in the upper valley area (viz. Koderma-North Karanpura- Patratu- Ramgarh- Gola- MTPS- Burnpur-Kalyaneshwari- Maithon(PG)- Dhanbad- Giridhi- Koderma) to meet the growing demand in the area. It is also envisaged to establish a 220 kV D/C ring at lower valley (viz. Jamshedpur- Gola- MTPS- Barjora -Panagarh- Burdwan- Kharagpur- Mosabani) with construction of a 220kV D/C lines in the Barjora -Panagarh- -Burdwan-Kharagpur-Musabani section in order to provide reliable supply to the valley area. Further, establishment of a 400 kV Raghunathpur-Musabani-Jamshedpur (DVC) D/C line with creation of a new 400/220kV S/S at Mosabani was proposed in order to (i) supply 250MVA load of Tata Steel (Jamshedpur) through DVC's network from Mosabani and (ii)

The revised scope of 12th Plan Transmission augmentation works proposed by DVC is shown at Annexure.

The above proposal of DVC is found to be technically in order. However, it is to suggest that a provision for 2nd 1x315 MVA ICT at 400/220kV Mosabani S/S should be considered to meet outage of an ICT.

Encl.: as above.

Yours faithfully,

(D. R. Sahu)
Director (SP&PA)

Copy for kind information to:

Shri Pankaj Kumar, ED (SEF, OS, IT), POWERGRID, Saudamini, Sector 29 , Gurgaon.

11. Scope of Work in the 12th Plan

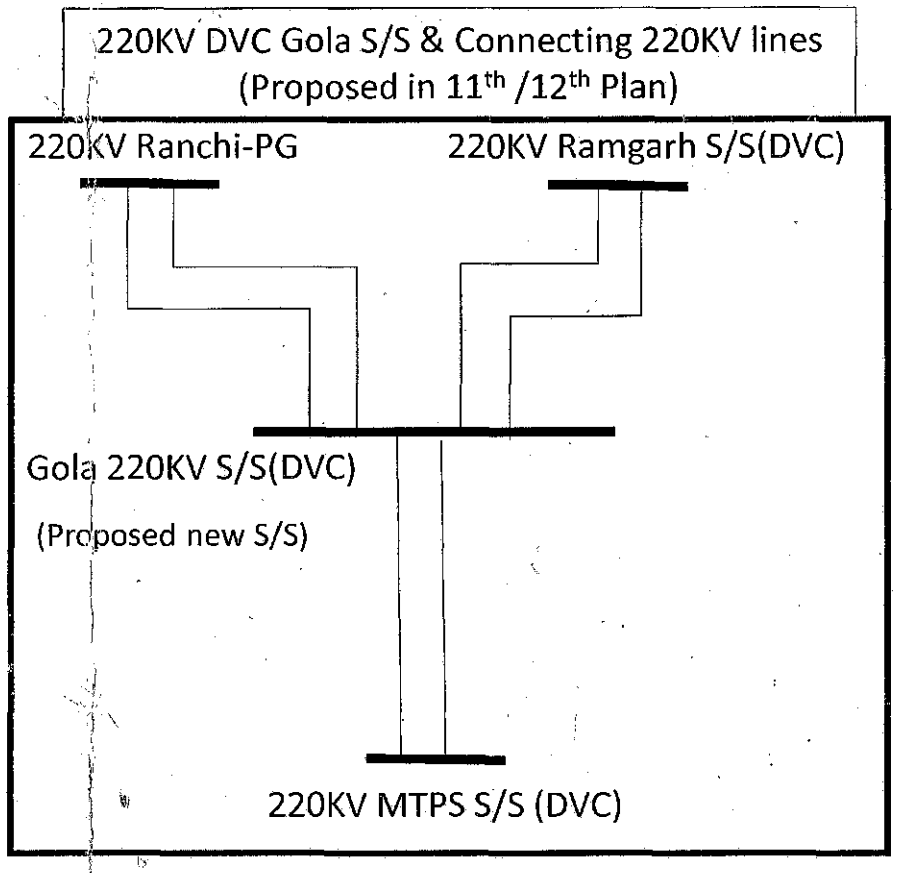
11TH PLAN SPILLOVER WORK

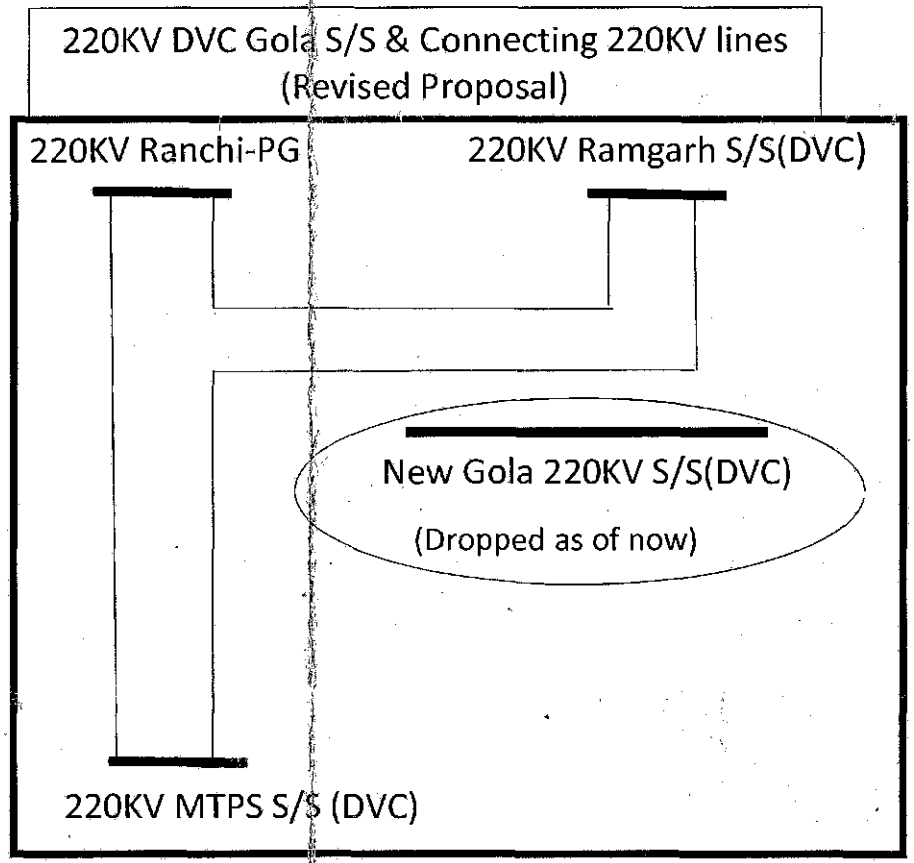
Sl.	11TH PLAN SPILL	CKM
	Lines	
1	400KV Maithon (PG) - Ranchi (PG) S/C LILO at RTPS (10.5KM x 2)	21.12
2	400KV D/C DSTPS - RTPS (70.5KM x 2)	141
3	400KV D/C RTPS - Ranchi (PG) line (155.5KM x 2)	311
3	220kV Kalyaneswari - MTPS line	
	S/C LILO at Burnpur S/S - 2nd ckt (20KM x 2)	40
5	a) 220kV D/C MTPS - Gola line (168KM x 2)	336
	b) 220KV D/C Gola - Ramgarh line (35KM x 2)	70
6	220KV BTPS - JSR line LILO at Gola (16.5KM x 2 x 2)	66
7	220KV D/C Dhanbad - Giridih line (43KM x 2)	86
8	220KV D/C Giridih - Koderma line (110KM x 2)	220
9	220KV D/C Gola - Ranchi line (56KM x 2)	112
10	132KV D/C Patherdih - Govindpur line extn to Dhanbad (14KM x 2)	28
11	132KV D/C Dhanbad - Govindpur line (15KM x 2) to be charged at 33KV	30
12	132KV LILO line to Jamuria S/S (7KM x 2) 2nd ckt along with bays	14
13	132KV D/C Koderma S/S - Koderma R/S line charged at 33KV (5KM x 2)	10
	Substation	
1	220KV Gola S/S	
2	132KV BIADA S/S	

NEW SUBSTATION INFRASTRUCTURE

SL.	New Works
	New Substations & Terminal infrastructure at existing substations
1	400KV/220KV/132KV Mosabani
2	220KV/132KV Kharagpur
3	220KV/33KV Raghunathpur
4	220KV/132kV/33KV Ranigunj
5	220KV/132kV Patratu
6	220KV/33KV Panagarh
7	220KV DSTPS
8	220KV/132KV Burdwan
9	220KV132kV North Karanpura
10	220KV/132kV/33KV Chas
11	220KV/132KV/33KV Mejia S/S
12	132KV/33KV Mugma

220KV network augmentation of DVC System proposed in 11th & 12th Plan – Submission of Revised plan





Annexure-21.2

Gmail

Uma Mahesh <umarao236@gmail.com>

Fw: Programme for 11th/12th Plan Network Augmentation of DVC System - Submission of revised Plan for approval

1 message

Pardeep Jindal <jindal_pardeep@yahoo.co.in> Tue, Apr 11, 2017 at 6:26 PM
Reply-To: Pardeep Jindal <jindal_pardeep@yahoo.co.in>
To: Sharan Rishika <rishika_sh@yahoo.com>, Uma Mahesh <umarao236@gmail.com>

—— Forwarded Message ——
From: Dinesh Singh <dksingh.dvc@gmail.com>
To: jindal_pardeep@yahoo.co.in
Cc: suman.bose@dvc.gov.in; Suman Bose <sumanbose1960@gmail.com>
Sent: Monday, 10 April 2017 7:19 PM
Subject: Programme for 11th/12th Plan Network Augmentation of DVC System - Submission of revised Plan for approval

Dear Sir,
Further to our request for approval of revised plan submitted vide letter dated 05.01.2017 (copy attached) and discussion on the subject held in your office on 05.04.2017, this is to intimate your that DVC is planning to augment the capacity of 132/33KV Gola substation by installing a third Power Transformer of 31.5MVA, 132/33KV rating to cater the load growth projection envisaged to be fed by earlier planned 220/33KV Gola Substation and which has been proposed to be dropped as of now. The 31.5MVA Transformer will be spare on replacement of the same by higher capacity transformer at other DVC substation.

May please approve the revised plan as placed by DVC.

Regards

D. K. Singh
Dy. Chief Engineer(E),
SPE, DVC,
DVC Towers, VIP Road,
Kolkata-54
Cell - 094345 35601
email: dinesh_singh@dvcindia.org
dksingh.dvc@gmail.com

Gola bypass.pdf
947K

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

No: 75/1/PSPA-II/2017/ 496-503 Dated: 06.07.2017

To

As per address list

Subject: Minutes of Meeting regarding 132kV Banka (PG) – Deoghar D/c transmission line.

Sir,

Meeting regarding 132kV Banka (PG) – Deoghar D/c transmission line held on 13.06.2017 at CEA, New Delhi. Minutes of the meeting is enclosed herewith.

JUSNL is requested to send their comments/observations, if any, in regard to dropping of proposed Banka (PG) – Deoghar 132kV D/c line.

Yours faithfully,

6/7/2017

(Rishika Sharan)
Director (PSPA-II)

List of addressee:

1. Member Secretary Eastern Regional Power Committee 14, Golf Club Road, Tollygunge Kolkata – 700033 Fax No. 033-24171358	2. Managing Director, Bihar State Power Transmission Co. Ltd., Vidyut Bhawan, Bailey Road, Patna-800021 Telefax: 0612-2504968
3. Managing Director, Jharkhand Urja Sancharan Nigam Limited Engineering Building, H.E.C., Dhurwa, Ranchi-834004. Fax-0651-2400799	4. Chief Electrical Engineer, Eastern Railway, 17-NS Road, Kolkata-700 001 (fax no.: 033-22300446)
5. COO(CTU-Plg), Power Grid Corp. of India Ltd. "Saudamini", Plot No.2, Sector-29, Gurgaon 122 001, Haryana. FAX : 95124-2571932	6. CEO, POSOCO B-9, Qutub Institutional Area, Katwaria Sarai, New Delhi-110016

Copy to: PPS to Member (Power System) - for kind information please.

Minutes of Meeting regarding 132kV Banka (PG) – Deoghar D/c transmission line held on 13.06.2017 at CEA

List of participants is enclosed at **Annexure-1**

1. Chief Engineer (PSPA-II), CEA welcomed the participants and highlighted about the purpose of the meeting. He informed that Banka (PG) - Deoghar 132kV D/C line (about 40 km) was agreed in the 01st -2014 Standing Committee Meeting on Power System Planning in Eastern Region(ER) (16th SCMPSP(ER)) held on 02nd May 2014.

2. In the 16th SCM meeting, ERPC had informed that the 132kV Deoghar S/S (JSEB) is being fed through 132kV line(s) from DVC source (132kV Maithon-Jamtara-Deoghar S/C) or from NTPC source (Lalmatia). There is also a feed from BSPTCL source through 132kV Sultanganj- Deoghar S/C line, which is normally kept open due to overloading in Kahalgaon-Sabour- Sultanganj section of BSPTCL system. The Deoghar & Jamtara sub-stations feed important railway loads of 10MW each to Shankarpur TSS & Jamtara TSS and loading on Maithon – Jamtara – Deoghar 132kV S/C line sometimes exceeds 75MW. The reliability of supply to railway loads is being affected. In view of above, it was agreed to provide an additional supply to Deoghar S/S (JSEB) from 400/132kV Banka S/S (PG) by creating a 132kV Banka- Deoghar D/C lines (about 40 Kms).

3. JUSNL vide their letter dated 30.07.2015 addressed to POWERGRID(copy enclosed at Annex-II) informed that termination of above line at Deoghar is not possible due to space constraint. Further, JUSNL informed that after commissioning of 132kV Jasidih – Deoghar line (about 5km), Deoghar S/s will be able to receive 250MVA of power through Jasidih S/s and Dumka S/s, whereas the transformation capacity at Deoghar is only 150MVA. The matter was discussed in 18th SCMPSP(ER) meeting and it was decided to review the possible interconnections at Deoghar in a separate meeting at CEA with Railways & other stakeholders.

4. In the meeting, representative of BSPTCL stated that Banka (PG) substation is having 2x200 MVA 400/132 kV ICTs at present, which are sufficient to meet the loads of BSPTCL only. PGCIL informed that Banka substation is proposed to be augmented with addition of 1x315 MVA, 400/132kV ICT under ERSS-XX (approved in 18th SCMPSP(ER)). BSPTCL representative suggested that power supply to Deoghar (Jharkhand) from Banka (PG) may be commenced only after commissioning of additional 315 MVA ICT at Banka (PG), which is planned under 13th plan.

5. Chief Engineer (PSPA-II), CEA enquired about reason for keeping 132kV Sultanganj- Deoghar S/C line open under normal condition.

6. Representative of BSPTCL stated that BSPTCL can supply power with exiting system to Deoghar (Jharkhand) through the above line during off-peak hours only, as the bus bars capacity at Sultanganj is inadequate. However, supply

during peak hours would be possible only after strengthening of bus bar at Sultanganj, which is likely to be completed in next 6 months.

7. Representative of CTU informed that POWERGRID has closed the ERSS-XVI project involving construction of Banka (PG) - Deoghar 132kV D/C line and the same was informed to CEA vide letter dated 27-10-2016.

8. Chief Engineer (PSPA-II), CEA expressed that in absence of representatives from JUSNL (Jharkhand) and Railways, it is difficult to assess the loading of the network in present situation.

9. Thus, the proposed Deoghar-Jasidih 132kV D/C line (by JUSNL) and strengthening of 132kV bus at Sultanganj (by BSPTCL) are likely to enhance the reliability of power supply to the Railways TSS at Deoghar. In view of above, it was decided to drop the proposal of construction of Banka (PG) - Deoghar 132kV D/C line in the next Standing Committee meeting.

Annexure-I

List of the participants of the meeting held on 13.06.2017 at CEA

Sl. No.	Name of the Participant	Designation	Organization
1	S.K.Ray Mohapatra	Chief Engineer, (PSPA-II)	CEA
2	Sanjay Srivastava	Chief Engineer, (PSE&TD)	CEA
3	Uma Maheswara Rao	Dy. Director, (PSPA-II)	CEA
4	Ashok Pal	General Manager(CTU-Plg)	POWERGRID
5	Manish Ranjan Keshari	Sr. Engineer(CTU-Plg)	POWERGRID
6	N.Nallarasan	Dy. General Manager	POSOCO
7	Pankaj Kumar	ESE	BSPTCL
8	Premjeet Kumar	ESE	BSPTCL

Jharkhand Urja Sanchran Nigam Ltd.

Office of the

General Manager Cum Chief Engineer

Transmission Zone - II, Dumka

Letter No. 390 /G.M (T) Dumka, Dated 30/07/2015

From,

Er. R. N. Singh
General Manager Cum Chief Engineer

To,

AGM (Engg-S/S)
(Sri A.P. Gangadharan)
Power Grid

Sub :- Termination of 132 kV D/C Banks (Power Grid) – Deoghar Transmission line.

Ref :- Your office letter no. C/Eng/SS/ERSS-XVI/ dated 30.4.2015.

Sir,

With reference to above subject, letter of field officers and single line diagram of 132/33 kV GSS. Deoghar are enclosed. It was requested to visit the Grid Sub-Station Deoghar and to have an idea of associated Transmission lines in this regard. Now, with the commissioning of 220 kV Rupnarayanpur – Dumka Transmission line and 220/132 kV GSS Dumka, Power for 132/33 kV GSS is availed from Rupnarayanpur through Dumka 132 kV S/C Sultanganj (Bihar) 132 kV S/C Maithan – Jamtara – Deoghar are alternate sources. At present 132 kV S/C Railway Deoghar-Shankarpur is supplied power from DVC.

Although space in switchyard and control room along with 2 no. feeders in 415 V and 2 no. of 220 V DC feeders may also be available. But in view of the present system it may be reanalyzed regarding the usability of termination at GSS Deoghar or proposed adjacent GSS Jasidih.

Yours faithfully,

30/7/15

(Er. R. N. Singh)
General Manager cum Chief Engineer

Jharkhand Urja Sancharan Nigam Limited

(CIN : U40108 JH 2013 SGC 001704)

Regd. Office – Engineering Building, HEC Dhurwa, Ranchi- 834004

Office of the

Electrical Superintending Engineer

Transmission Circle,

Deoghar

Letter No. ...188.../ ESE (T) Deoghar dated- ...08/05...../ 15

From,

Er. B. P. Bhagat,
Electrical Superintending Engineer.

To,

The General Manager cum Chief Engineer,
Transmission Zone- II, Dumka.

Sub :- Regarding Termination of 132 kV Banka – Deoghar Transmission Line at Grid Sub Station, Deoghar.

Sir,

With reference to above, please find enclosed herewith the Termination of 132 kV Banka – Deoghar Transmission line at Grid Sub Station, Deoghar submitted by Assistant Executive Engineer, Transmission Sub Division, Deoghar and duly signed by Electrical Executive Engineer, Transmission Division, Deoghar- I for your kind information and necessary action. The proposal submitted by Electrical Ex. Engineer Td. Divn. Deoghar-I is recommended.

Encl :- As above.

Yours faithfully,

B P Bhagat
08/05/15

(B.P. Bhagat)
Electrical Superintending Engineer

Termination of 132 kV Banka –Deoghar Tr Line at GSS Deoghar

Presently, Transformation capacity of GSS Deoghar is 100 MVA and its capacity becomes 150 MVA after installation of 3rd No Transformer by the end of this year which will be the highest Transformation capacity due to space unavailability at GSS Deoghar.

This Grid has been availing power from D/C Dumka –Deoghar Tr line, S/C Sultanganj-Deoghar Tr Line & S/C Jamtara-Deoghar Tr line. Generally, S/C Sultanganj-Deoghar Tr line remain in idle charging. The 132 kV main bus has been sectionalized by High level isolator due to incoming Power comes from Dumka Tr line & Jamtara Tr Line is not synchronized.

As 220/132/33 kV GSS Dumka is under construction and it is likely to be completed upto end of this year also Proposal for construction of 220/132/33 kV GSS Jasidih is under progress. Proposal for Commissioning of Two Nos 132 kV feeder at GSS Deoghar for receiving power from Proposed 220/132/33 kV GSS Jasidih has been under progress also.

As such Deoghar Grid will be capable to received power approximately to 250 MVA from GSS Dumka & GSS Jasidih which is enough for this Grid because maximum Transformation capacity is 150 MVA only. Also no space will be left in switchyard and control room for further commissioning of new panel & bays.

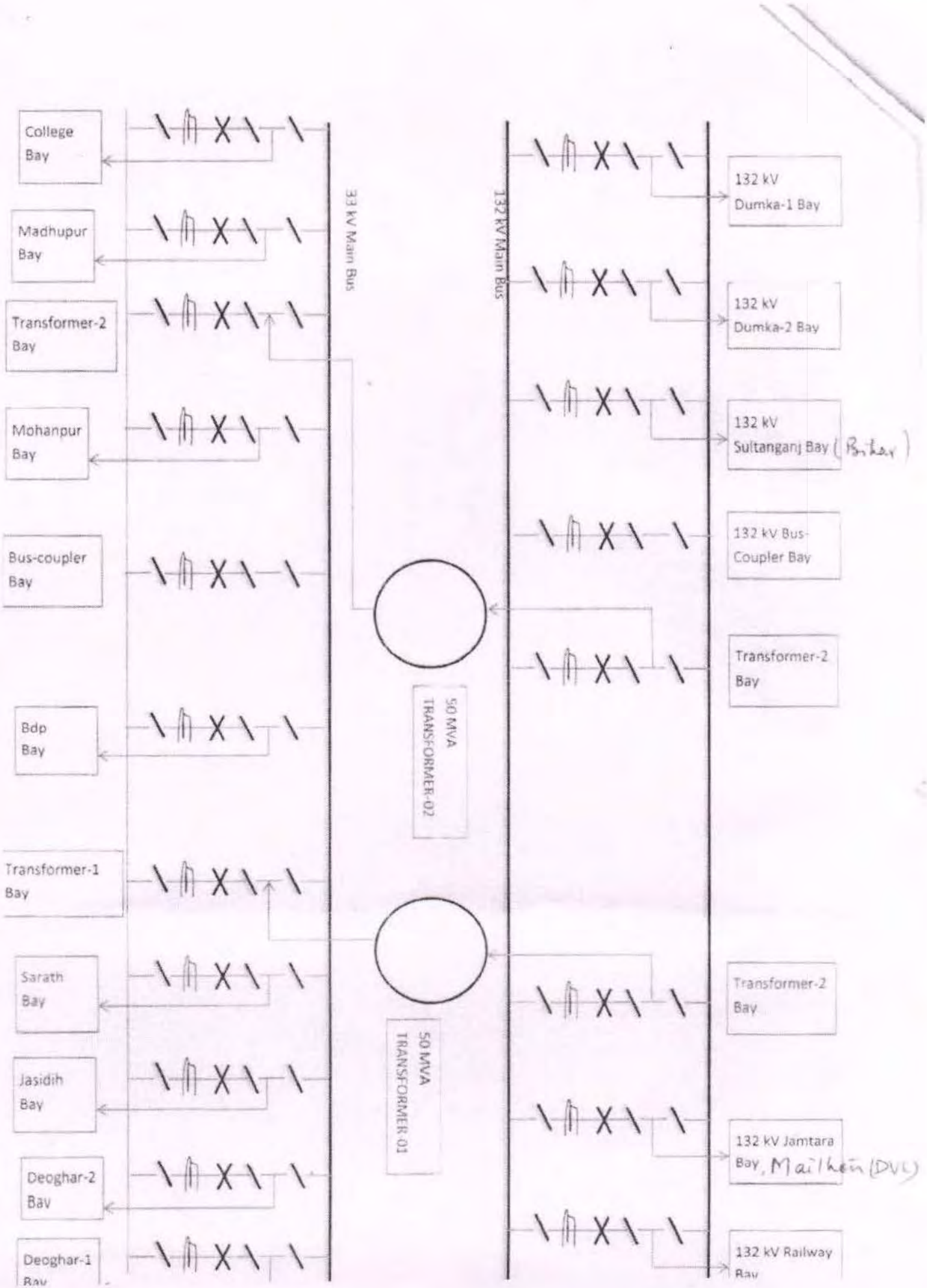
Hence, it is requested that proposal of Termination of 132 kV Banka- Deoghar Tr Line may be terminated to GSS Jasidih instead of GSS Deoghar. In proposed Jasidih GSS sufficient space is available for Termination of 132 kV Banka-Deoghar Tr line. Distance between GSS Jasidih & GSS Deoghar is only 5 km(approx.). So, that Deoghar Grid will be avail Power from 132 kV Banka-Deoghar Tr line also via GSS Jasidih without creating any mess.

09/05/15

AEE
Trans S/D Deoghar

09/5/15

EEE
Trans Div Deoghar-I


College Bay
Madhupur Bay
Transformer-2 Bay
Mohanpur Bay
Bus-coupler Bay
Bdp Bay
Transformer-1 Bay
Sarath Bay
Jasidih Bay
Deoghar-2 Bay
Deoghar-1 Bay
33 kV Main Bus
50 MVA TRANSFORMER-02
50 MVA TRANSFORMER-01
132 kV Main Bus
132 kV Dumka-1 Bay
132 kV Dumka-2 Bay
132 kV Sultanganj Bay (Bihar)
132 kV Bus-Coupler Bay
Transformer-2 Bay
Transformer-2 Bay
132 kV Jamtara Bay, Maithon (DVC)
132 kV Railway Bay