सेंट्रल ट्रांसमिशन यूटिलिटी ऑफ इंडिया लिमिटेड
CENTRAL TRANSMISSION UTILITY OF INDIA LIMITED
(Wholly Owned Subsidiary of Power Grid Corporation of India Limited)
(A Government of India Enterprise)

Ref: CTU/W/07/2nd WR Joint Study

27th Dec, 2021

As per Distribution List

Sub: 2nd Joint study meeting on Transmission Planning for Western Region held on 10.12.2021 – Minutes of Meeting

Sir,

Please find enclosed the minutes of the 2nd Joint study meeting on Transmission Planning for Western Region held on 10.12.2021 to discuss transmission network augmentation w.r.t. Chhattisgarh through video conferencing.

The minutes are also available at our website (*www.powergrid.in >> CTU Open Access*).

Thanking you,

Yours faithfully,

(Partha Sarathi Das)
Sr. General Manager

Encl: Minutes of Meeting

Distribution List:

1. Chief Engineer (PSP&A – I) Central Electricity Authority Sewa Bhawan, R.K.Puram, New Delhi-110 066.	**2. Managing Director** Chhattisgarh State Power Transmission Co. Ltd., Dangania, Raipur- 492 013
3. Member Secretary Western Regional Power Committee MIDC area, Marol, Andheri East, Mumbai 400 093	**4. Director (SO)** POSOCO 9th Floor, IFCI Towers, 61, Nehru Place, New Delhi – 110019
5. Chief General Manager (I/c) Western Regional Load Despatch Centre F-3, M.I.D.C. Area, Marol, Andheri East, Mumbai-400 093	

Minutes of the 2nd Joint study meeting on Transmission Planning for Western Region held on 10.12.2021 over VC amongst CEA, CTU, WRPC, POSOCO and CSPTCL to discuss transmission network augmentation w.r.t. Chhattisgarh

The 2nd Joint Study Meeting on Transmission Planning for Western Region was held on 10.12.2021 over VC amongst CEA, CTU, WRPC, POSOCO and CSPTCL to discuss transmission network augmentation w.r.t. Chhattisgarh. List of participants is enclosed at **Annexure-I**. Sr. GM, CTUIL welcomed all the participants. Thereafter, deliberations as per the agenda commenced and the gist of deliberations are as given below.

I. Brief Background

1. CSPTCL vide letter dated 02.08.2021 has intimated the following issues being faced when power demand of Chhattisgarh is more than 4600 MW:

   i. Overloading of 2x315 MVA, 400/220 kV ICTs at NSPCL, Bhilai

   ii. Overloading of 2x315 MVA ICTs at 400/220 kV ICTs at Bhatapara (PG) S/s

   iii. Overloading of 2x315 MVA ICTs at 400/220 kV ICTs at Raigarh (PG) S/s

   iv. Reduction in central sector drawl of Chhattisgarh due to opening of 400 kV Korba (NTPC) - Korba West line to limit the fault current at NTPC Korba

   v. Increase in Central Sector share without any additional ISTS interconnection

   Subsequently, a meeting was held on 03.09.2021 to discuss the Transmission constraints on Inter State Transmission system being faced by CSPTCL. In the meeting, it was inter-alia agreed that the transmission system of Chhattisgarh would be studied holistically in a joint study meeting between CEA, CTUIL, CSPTCL and WRLDC to work out the strengthening requirement in Inter-state / Intra-state transmission system. Further, meetings were held on 15.09.2021 & 21.09.2021 and inputs regarding downstream network, loading pattern etc. were submitted by CSPTCL.

   In order to finalize the above issues, the system studies were carried out and details of the same along with deliberations in the meeting are given below.

II. System Studies and Deliberations in the meeting

Study Considerations:

i. Timeframe: 2024-25

ii. Chhattisgarh Load: 8500 MW (CSPTCL load considered in PSSE file), however as per 19th EPS, the peak demand of Chhattisgarh would be 7513 MW in the time-frame of 2024-25. The higher peak demand is considered to plan the robust network in Chhattisgarh.

iii. Chhattisgarh generation: 2548MW Despatch (I.C. 2960MW: DSPM – 500 MW, Korba West – 1340 MW, Marwa – 1000 MW, Hasdeo: 120MW)

iv. Power Transfer through ISTS: About **6000MW** (As against present transfer requirement of about **3570MW** as per CSPTCL letter dated 02.08.2021).

2. The planned Intra-state schemes submitted by STU as well as other proposals were incorporated in the study file and the proposals were studied and deliberated as per details given below. The load flow / short circuit results are given at **Annexure-II**.

   The schematic of 220kV network of Chhattisgarh is also enclosed at **Annexure-III**.

S. No.	Proposal(s) finalised in the meeting	Remarks / element wise implementation time frame	Implementation proposed under	Justification	Deliberations in the meeting
1	**Creation of 400 kV level at Dhardehi S/s:** i. Upgradation of Existing 220/132 kV Dhardehi S/s to 400kV level through augmentation of 2x315 + 1x500 MVA, 400/220 kV ICTs at Dhardehi along with associated ICT bays ii. 2x125MVAr, 420kV bus reactors at 400 kV level at Dhardehi S/s along with associated bus reactor bays	Jun'25	Intra-state	To provide strong 400kV source at existing 220/132 kV Dhardehi S/s S/s and to feed the load in Mungeli area	CSPTCL informed that upgradation of Existing 220/132 kV Dhardehi S/s to 400kV level through augmentation of 2x315 MVA, 400/220kV ICTs is already under tendering process and is expected by Jun'25. Hence, it would not be presently possible to implement the 2x500MVA 400/220kV ICTs in place of 2x315MVA ICTs. LILO of Korba (West) – Raita 400 kV S/c line at Dhardehi, which was earlier proposed by CSPTCL, has been reviewed by them based on feedback from site and instead of the said LILO, LILO of Korba (West) – Bhilai 400 kV S/c line at Dhardehi is proposed. The proposal was studied and following was observed: • Power flows were in order with the revised LILO proposal. • There is only marginal increase in fault level at Bhilai S/s. • Additional 500MVA, 400/220kV ICT (3rd) shall be required at Dhardehi S/s.
	iii. LILO of Korba (West) – Bhilai 400 kV S/c line at Dhardehi with 63MVAr switchable line reactor at Dhardehi end of both lines along with associated line bays at Dhardehi	Jun'25	Intra-state		

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	iv. Bilaspur Pool – Dhardehi 400 kV D/c line (conductor with minimum capacity of 2100 MVA/Ckt at nominal voltage) (~50-60km.) along with associated line bays at both ends	Jun'25	Intra-state		• Flow on Dhardehi – Mungeli 220 kV D/c line was observed to be on higher side (2x180MW & 1x265MW under N-1). Hence, high capacity conductor (ampacity equivalent to twin moose) may be considered to cater to future load growth in the area. CSPTCL requested to keep 2 nos. 400kV line bays at Bilaspur Pool under ISTS. It was deliberated that in order to ensure matching of the 400kV bays with the associated line (Jun'25), the scope of bays may be kept under Intra-state. ***After further deliberations, the scope of work as identified along side was agreed under Intra-state with implementation time-frame of Jun'25.***
	v. Dhardehi – Mungeli 220 kV D/c line (conductor with minimum ampacity equivalent to ACSR twin moose at nominal voltage) along with associated line bays at both ends	Jun'25	Intra-state		
2	**Creation of 220 kV level (GIS) at 765/400 kV Raipur Pool S/s** i. Augmentation of 3x500 MVA,	Mar'24	**ISTS**	To facilitate drawl of power at 220kV level from 765/400 kV Raipur Pool	CSPTCL informed that Raipur Pool – Borjhara 220 kV D/c line, which was planned earlier, needs to be reviewed as it is very difficult to implement based on RoW issues

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	400/220 kV ICTs at Raipur Pool S/s along with associated ICT bays (220kV-GIS) ii. 8 nos. 220kV line bays (GIS) at Raipur Pool S/s for termination of various 220kV lines planned by CSPTCL			S/s	near Borjhara. It was deliberated that the direct feed to Borjhara/Urla, which are major load centres, was desirable as it eases flows on Raipur(PG) 400/220kV ICTs. However, considering constraints in implementation of lines upto Borjhara/Urla, following alternative was evolved: • LILO of Raipur(PG) – Urla 220kV S/c line at Borjhara along with associated line bays • LILO of Borjhara – Urla 220kV S/c line at Raipur Pool along with associated line bays CSPTCL was requested to explore feasibility of implementation of the above LILO lines along with time-frame of implementation and intimate within 2 weeks. It was further highlighted that with proposed 220kV interconnections from Raipur(Pool), the proposed 2x500MVA, 400/220kV ICTs at Raipur(Pool) become N-1 non compliant (N-
	iii. Raipur Pool – Rajnandgaon 220 kV D/c line along with associated line bays at Rajnandgaon iv. Raipur Pool – Gendpur 220 kV D/c line along with associated line bays at Gendpur v. Raipur Pool – Bemetra 220 kV D/c line along with associated line bays at Dhamdha vi. LILO of Raipur(PG) – Urla 220kV S/c line at Borjhara	Mar'24 **To be informed**	Intra-state		

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	along with associated line bays at Borjhara vii. LILO of Borjhara – Urla 220kV S/c line at Raipur Pool				1: 510MW). In view of the same, it was decided to provide 3x500MVA, 400/220KV ICTs at Raipur Pool. ***After further deliberations, the scope of work as identified along side was agreed with scope at (i) & (ii) under ISTS and balance under Intra-state subject to Implementation feasibility of 220kV LILO lines at (vi) & (vii) along with confirmation regarding their implementation time-frame***
3	**Creation of 220 kV level at 765/400 kV Dharamjaigarh S/s** i. Augmentation of 2x500 MVA, 400/220 kV ICTs at Dharamjaigarh S/s along with associated ICT bays ii. 4 nos. 220kV line bays at Dharamjaigarh S/s for termination of various 220kV lines planned by CSPTCL	Dec'24	**ISTS**	To facilitate drawl of power at 220kV level from 765/400 kV Dharamjaigarh S/s	Load flow studies indicated that LILO of Korba(East) – Raigarh (CSPTCL) 220 kV S/c line at Dharamjaigarh S/s, as proposed earlier by CSPTCL, leads to high fault level at Korba East (~38kA) with high contribution from Dharamjaygarh. Also, the said LILO was not found to be helpful from load flow point of view. In view of the above, it was decided to drop the above LILO line. ***After further deliberations, the scope of work as identified along side was agreed***

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	iii. Dharamjaigarh – Chhuri 220 kV D/c line along with associated line bays at Chhuri iv. Dharamjaigarh – Dharamjaigarh CSP 220 kV D/c line along with associated line bays at Dharamjaigarh CSP v. LILO of DSPM – Korba(West) 220 kV S/c at Korba(East) along with associated line bays at Korba(East)	Dec'24	Intra-state		***with scope at (i) & (ii) under ISTS and balance under Intra-state***
4	**Establishment of 400/220 kV Pithora S/s** i. Establishment of 3x500 MVA, 400/220 kV ICTs & 3x160MVA, 220/132kV ICTs at Pithora along with associated ICT bays and 6 nos. 220kV line bays ii. 2x125MVAr, 420kV bus reactors at 400 kV level at	Mar'26	**Views of CSPTCL to be communicated confirmed within 2 weeks**	To provide strong 400kV source in Pithora area so as to feed loads in its vicinity at Raigarh, Saraipalli & Paraswani	CTU informed that LILO of both circuits of Raipur (PG) – JPL 400 kV D/c line at Pithora S/s leads to following benefits: • NSPCL ICTs get offloaded to some extent due to lesser injection from JPL at Raipur S/s • JPL – Raipur line is a long line (~260km.) and hence after the proposed LILO, length of line shall get reduced to about 180km. (each section).

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	Pithora S/s along with associated bus reactor bays				Further, 3x160MVA, 220/132kV ICTs would be required at proposed Pithora S/s to maintain N-1 compliance of the ICTs. Regarding reactive compensation on the JPL-Pithora (~180km.) and Pithora-Raipur (~180km.) 400kV D/c line sections formed after the LILO, it was noted that the JPL – Raipur 400kV D/c line has 50MVAr non-switchable line reactors at Raipur end. Hence, to provide adequate reactive compensation, following was agreed: • 80MVAr switchable line reactors at Pithora end of JPL – Pithora 400kV D/c line • 50MVAr switchable line reactors at Pithora end of Pithora – Raipur 400kV D/c line WRLDC stated that the JPL – Raigarh & JPL – Gerwani 220kV lines are out of service since a long time and taking the above lines into service would help to reduce loadings on ICTs at Raigarh as well as Pithora S/s as well as to increase reliability of supply to
	iii. LILO of both circuits of Raipur (PG) – JPL 400 kV D/c line at Pithora S/s along with associated line bays at Pithora S/s with following reactive compensation: • 80MVAr switchable line reactors at Pithora end of JPL – Pithora 400kV D/c line • 50MVAr switchable line reactors at Pithora end of Pithora – Raipur 400kV D/c line	Mar'26			
	iv. LILO of both circuits of Raigarh – Saraipalli 220 kV D/c line at Pithora S/s along with associated line bays at Pithora S/s v. Pithora – Paraswani 220 kV	Mar'26	Intra-state		

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	D/c line along with associated line bays at both ends				Gerwani S/s. The proposal was studied and it was found to reduce loading on Pithora ICTs such that only 2x500MVA ICTs were required instead of 3x500MVA ICTs. CSPTCL was requested to intimate the reason for not utilising the above already existing lines. CSPTCL stated that the lines are idle charged from one end and are not put into operation due to certain commercial reasons. On query from CSPTCL, it was informed that 2x315 MVA 400/220kV ICTs at JPL switchyard are part of ISTS and hence there is no reason not to utilise the above ICTs for benefit of Chhattisgarh. **CSPTCL was asked to revert back on the issue with detailing and explanation of reasons thereof.** CSPTCL stated that they shall examine the issue and inform within 2 weeks. CSPTCL also requested to take up the establishment of 400/220 kV Pithora S/s along with LILO of

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					JPL – Raipur at Pithora under ISTS as this leads to several benefits to ISTS as discussed above in addition to feeding load of Chhattisgarh in Pithora area. It was informed that if the works at (i), (ii) & (iii) are taken up under ISTS, the establishment of 3x160MVA, 220/132kV ICTs at Pithora and 132kV switchyard may not be considered in ISTS scope. In such a case, CSPTCL shall have to establish another 220/132kV S/s in its vicinity and interconnect the same with Pithora S/s at 220kV level. It was also observed that if 132kV works are not implemented, it leads to N-1 non-compliance of Pithora – Saraipalli 220kV D/c line. ***In view of the above, CSPTCL was requested to submit their views on above proposal within 2 weeks and the scheme shall be finalised thereafter.***

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5	**Augmentation of 1x500 MVA, 400/220 kV ICT at Raigarh (PG)** i. Augmentation of 1x500 MVA, 400/220 kV ICTs at Raigarh (PG) S/s along with associated ICT bays	Mar'24	**ISTS**	To overcome issue of high loading on 2x315MVA, 400/220kV ICTs at Raigarh (PG) S/s in current time-frame as well as to provide additional 220kV outlet to Malda from Raigarh(PG) S/s.	The matter was deliberated and it was observed that Raigarh ICTs remain N-1 compliant even after considering the proposed Raigarh – Malda 220kV D/c line (N-1 flow of 281MW). Further, as discussed above, if JPL – Raigarh & JPL – Gerwani 220kV lines are taken into service, loadings on ICTs at Raigarh shall reduce further. ***In view of the above, it was decided to take a final view on the matter based on feedback from CSPTCL regarding utilization of 400/220kV ICTs at JPL.***
	ii. Raigarh (PG) – Malda 220 kV D/c line along with associated line bays at both ends	Mar'24	Intra-state		
6	**Augmentation of 1x500 MVA, 400/220 kV ICT at Bhatapara (PG)** i. Augmentation of 1x500 MVA, 400/220 kV ICTs at Bhatapara (PG) S/s along with associated ICT bays – Under ISTS (Already agreed in 3rd WRPC(TP))	MoP has allocated scheme to POWERGRID with implementation by 01.05.2023 or matching with CSPTCL line (iii) below whichever is later	**ISTS** *(Already agreed in 3rd WRPC(TP) & 5th NCT meetings)*	To overcome issue of high loading on 2x315MVA, 400/220kV ICTs at Bhatapara (PG) S/s in current time-frame as well as to provide additional 220kV outlet to	It was informed that MoP has allocated the scheme to POWERGRID with implementation by 01.05.2023 or matching with CSPTCL line at (iii) below whichever is later. However, as intimated by CSPTCL, the line is to be dropped and the revised line shall be Bhatapara (PG) – Bhatapara (CSPTCL) 220 kV D/c line as mentioned at Sl. (ii) along side.

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	ii. Bhatapara (PG) – Bhatapara (CSPTCL) 220 kV D/c line along with associated line bays at both ends	31.12.2023	Intra-state	Bhatapara (CSPTCL) from Bhatapara(PG) S/s.	Studies indicate that the proposed line helps to maintain N-1 compliancy of Bhatapara(PG) – Bhatapara(CSPTCL) 220kV S/c line under outage of Bhatapara(PG) – Suhela 220kV S/c line. CSPTCL indicated that they are planning to commission the line by 31.12.2023. ***In view of the above, it was decided that in terms of the MoP OM, POWERGRID may also match the schedule of 3rd 400/220kV ICT with commissioning of line at Sl. (ii) along side i.e. 31.12.2023 (instead of line at Sl. (iii) which has been dropped).***
	iii. LILO of one circuit of Bhatapara (PG) – Suhela 220 kV T/c line at Bhatapara (CSPTCL)	To be Dropped		The line was agreed in 3rd WRPC(TP) but needs to be dropped based on feedback from CSPTCL	
7	**Establishment of Kumhari 220/132 kV S/s** i. Raipur (PG) – Kumhari 220 kV D/c line along with associated line bays at both ends ii. Kumhari – Bhilai 220 kV D/c line along with	Mar'24	Intra-state	To feed load in vicinity of Kumhari area of Chhattisgarh.	It was informed that the proposed interconnection of Kumhari 220/132kV S/s with both Raipur and Bhilai 400/220kV substations leads to high short circuit level at both Raipur (~43kA) & Bhilai (~46kA) 220kV buses which is beyond the design limit. Further, as informed by POWERGRID, space for only 1 220kV bay is available at Raipur (PG) S/s after considering 2 nos.

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	associated line bays at both ends				bays allocated to Railways and 1 no. bay allocated to Sherisha Rooftop Solar. In view of the same, it was advised that CSPTCL may feed Kumhari S/s radially through Bhilai S/s. CSPTCL stated that based on their last visit to Raipur S/s, space is available on the West side of the S/s which may accommodate 3-4 additional 220kV line bays. Hence, Kumhari S/s may be interconnected to Raipur(PG) S/s also. It was observed that the proposed interconnection somewhat increases fault level at Raipur S/s 220kV bus (from 37.6kA to 38.4kA) nearer to its design limit of 40kA. Hence, some other alternatives may also be explored by CSPTCL. ***After further deliberations, following was decided:*** • ***CSPTCL shall review the proposal in view of high fault level at***

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					Raipur(PG) and Bhilai(CSPTCL) S/s and space constraints at Raipur(PG). • ***POWERGRID shall be requested to review the space availability at Raipur(PG) S/s for additional 220kV line bays.***
8	**Raipur Pool – Dhamtari 400 kV D/c line (~80-90km.)** (conductor with minimum capacity of 2100 MVA/Ckt at nominal voltage) along with associated line bays at both ends	Mar'24 *(to be matched with line at Sl. 9)*	**Views of CSPTCL to be communicated confirmed within 2 weeks**	To provide strong ISTS feed to Dhamtari S/s of CSPTCL and improve reliability of power supply to the area. The scheme also helps to relieve overloading on NSPCL ICTs.	The scheme was agreed based on fair loadings observed on the line and also enhanced utilisation of Dhamtari 400/220kV ICTs. It was also observed that with higher flows on Dhamtari – Gurur – Bhilai – Khedamara 220kV corridor, the power drawl from NSPCL to Khedamara decreases, thereby easing flows on NSPCL ICTs. CSPTCL requested to implement the line under ISTS. However, considering the radial feed to Dhamtari S/s of CSPTCL, it emerged that the scheme may be implemented under Intra-state. CSPTCL requested to give them more time to confirm the same. ***In view of the above, CSPTCL was***

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					requested to submit their views on above proposal within 2 weeks and the scheme shall be finalised thereafter.
9	Dhamtari(Kurud) – *Gurur* 220 kV D/c (2nd) line along with associated line bays at both ends	Mar'24 (*to be matched with line at Sl. 8*)	Intra-state	To ensure N-1 compliance of Dhamtari – Gurur 220kV D/c line	The proposal was agreed in matching time-frame of Raipur Pool – Dhamtari 400 kV D/c line at Sl. 8 above.
10	• LILO of 400 kV Raita-Jagdalpur line at 400 KV Kurud (Dhamtari) S/s along with associated line bays at Kurud (Dhamtari) S/s with 50MVAr line reactor at Kurud (Dhamtari) end of Kurud (Dhamtari) – Jagdalpur 400kV line section • 50MVAr fixed line reactor at Raita end of Raita - Kurud (Dhamtari) 400kV line section to be converted to switchable.	Mar'24	Intra-state	To provide additional outlets from Kurud (Dhamtari) S/s through LILO of Raita-Jagdalpur 400 kV line at 400 KV Kurud (Dhamtari) S/s as well as provision of adequate reactive compensation on the lines emanating from Kurud (Dhamtari) S/s	It was informed that one ckt of Raita – Jagdalpur 400kV D/c line is already LILOed at Kurud(Dhamtari). Now, CSPTCL has proposed to LILO the other ckt at Kurud(Dhamtari) S/s. ***The proposal was agreed to enhance reliability of power supply to Dhamtari S/s. The reactive compensation was also discussed and finalised as given along side in order to address overcompensation on Raita - Kurud(Dhamtari) 400kV D/c line (~88km.) and provide adequate compensation on Kurud (Dhamtari) – Jagdalpur 400kV line section (~243km.) formed after the proposed LILO.***

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	• 50MVAr fixed line reactor at Raita end of existing Raita – Kurud 400kV line to be converted to switchable				
11	125MVAR, 420kV Bus reactors at following 400 KV S/s of CSPTCL: 1. Jagdalpur 2. Dhamtari (Kurud) 3. Raita 4. Korba (West)	Jagdalpur, Dhamtari(Kurud) & Raita: Dec'23 Korba(West) - based on feedback from CSPGCL.	Intra-state	Presently, no bus reactors are available at Jagdalpur, Dhamtari (Kurud), Raita and Korba (West) even though voltages are observed to be on the higher side. Hence, 125MVAR, 420kV bus reactors are proposed to control overvoltages.	CSPTCL stated that administrative approval has already been obtained for 80MVAr bus reactor at Jagdalpur. It was informed that voltages at Jagdalpur S/s have historically been on the higher side and hence it would be prudent to install a higher capacity bus reactor. ***After further deliberations, the installation of 125MVAR, 420kV bus reactors at Jagdalpur, Raita & Dhamtari (Kurud) was agreed to control overvoltages at the 400kV substations. Regarding Korba(West), CSPTCL stated that they shall take up the matter with CSPGCL for space in their switchyard and intimate within 2 weeks.***

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12	Khedamara – Bhilai 220 kV D/c (2nd) line along with associated line bays at both ends	Mar'23	Intra-state	To enhance reliability of existing Khedamara – Bhilai 220 kV D/c line	Load flow studies indicated that the proposed line helps to overcome N-1 non-compliance of existing Khedamara – Bhilai 220 kV D/c line. ***After further deliberations the proposal was agreed.***
14	Jeypore – Jagdalpur 400kV D/c line (conductor with minimum capacity of 2100 MVA/Ckt at nominal voltage) **(~80km.)** along with associated bays at both ends. Bays at Jeypore shall be of GIS type in view of space constraints.	Mar'24	**ISTS**	To improve reliability of power supply to Jagdalpur S/s as well as improve short circuit level at the substation (from just 6.5kA to 14.5kA (3ph)) as well as Jeypore(Odisha)	CSPTCL informed that Jagdalpur S/s is located in the southern end of Chhattisgarh and is fed only through a 400kV D/c line from Raita / Dhamtari(Kurud). The short circuit strength of the substation is also very low and there are wide variations in voltages at the substation. The reliability of power supply to the area needs to be enhanced considering tower outage / N-1-1 contingencies. In view of the above, it is proposed to interconnect the substation with jeypore substation in Odisha which is located within 80-90 km. of the Jagdalpur S/s. The proposal was studied and it was deliberated that although very less power flow is observed on the line (~80MW from Jagdalpur to Jeypore), the line shall provide

S. No.	Proposal(s) finalised in the meeting	Remarks / element wise implementation time frame	Implementation proposed under	Justification	Deliberations in the meeting
					additional anchoring to Jagdalpur and Jeypore substations thereby increasing: • Reliability under Double circuit tower outage or N-1-1 outage conditions • Short circuit strength (from just 6.5kA to 14.5kA (3ph) at Jagdalpur S/s and from 12.5kA to 17.5kA (3ph) at Jeypore S/s) It was also deliberated that no other interconnection of Jagdalpur S/s with any other ISTS / Intra-state node appears possible within 150-200km. radius. ***After further deliberations, the line was agreed under ISTS with a schedule of Mar'24. However, the scheme shall also be deliberated with ER stakeholders before taking up in the NCT forum.***
15	**Scheme to control fault level at Raipur(PG) & Bhilai(Khedamara) S/s (CSPTCL)** Bypassing of Raipur – Bhilai	Mar'23	Intra-state		It was observed that with above proposals, fault level at Bhilai & Raipur 400/220kV substations becomes critical (more than 40kA). Main issue is that Bhilai – Raipur 400kV S/c line is very small (~13km.) and

S. No.	Proposal(s) finalised in the meeting	Remarks / element wise implementation time frame	Implementation proposed under	Justification	Deliberations in the meeting
	400kV S/c line at Bhilai end and connecting it to one circuit of Bhilai – Raita 400kV T/c line so as to form Raipur – Raita 400kV S/c line.				both substations contribute heavily to each other. To tackle the issue, the given line reconfiguration was studied and the three phase fault levels were observed to be within design limits at both the substations (Raipur: 33kA & Bhilai: 35kA). WRLDC informed that the issue of high loading on Raipur – Bhilai as observed in real-time and reported in several operational feedback reports is also expected to be resolved with above arrangement. ***After further deliberations, the scheme to control fault level at Raipur(PG) & Bhilai(Khedamara) S/s (CSPTCL) was agreed under Intra-state.***

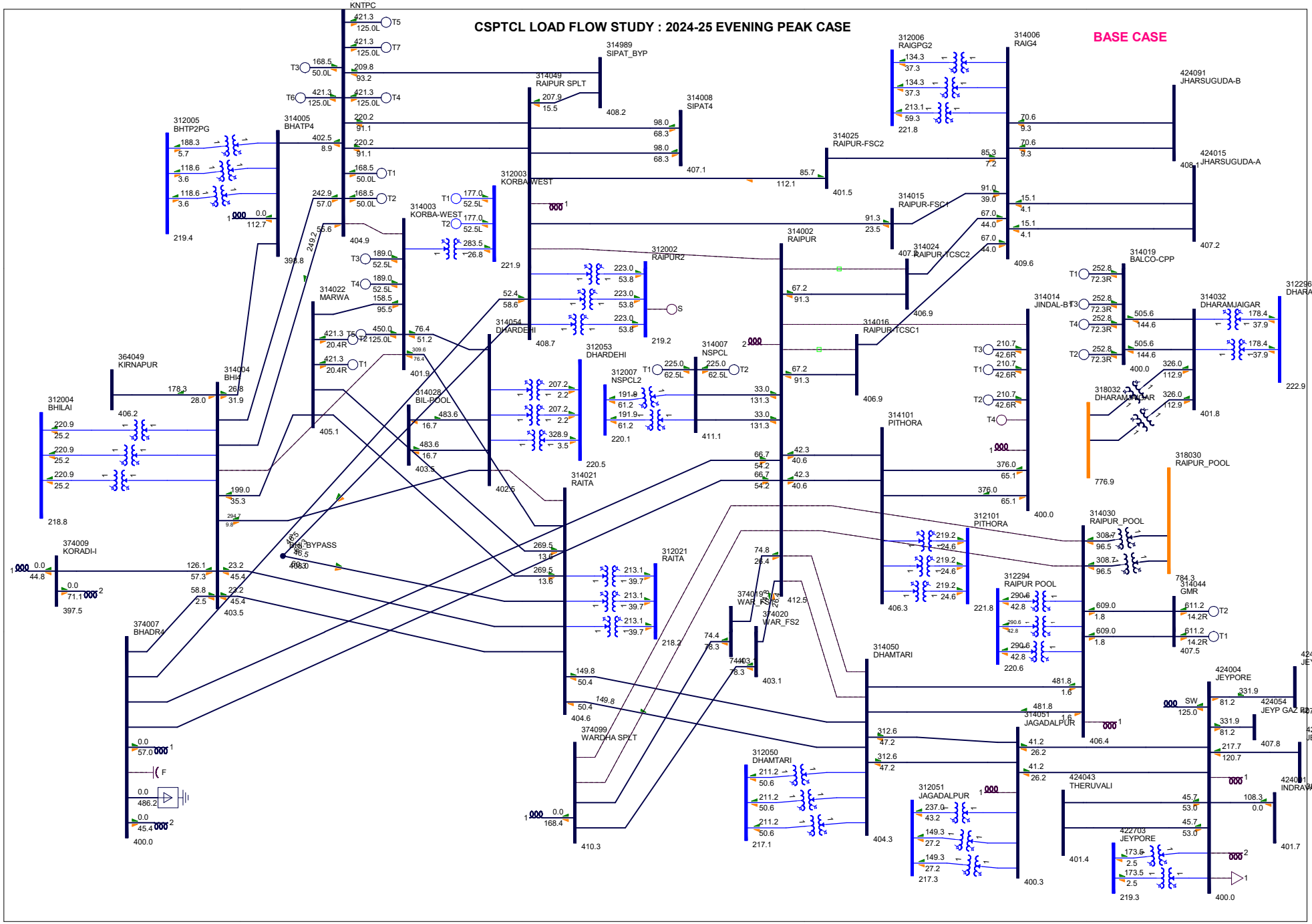
CSPTCL was requested to provide their feedback w.r.t. various issues as discussed above within 2 weeks of the meeting.

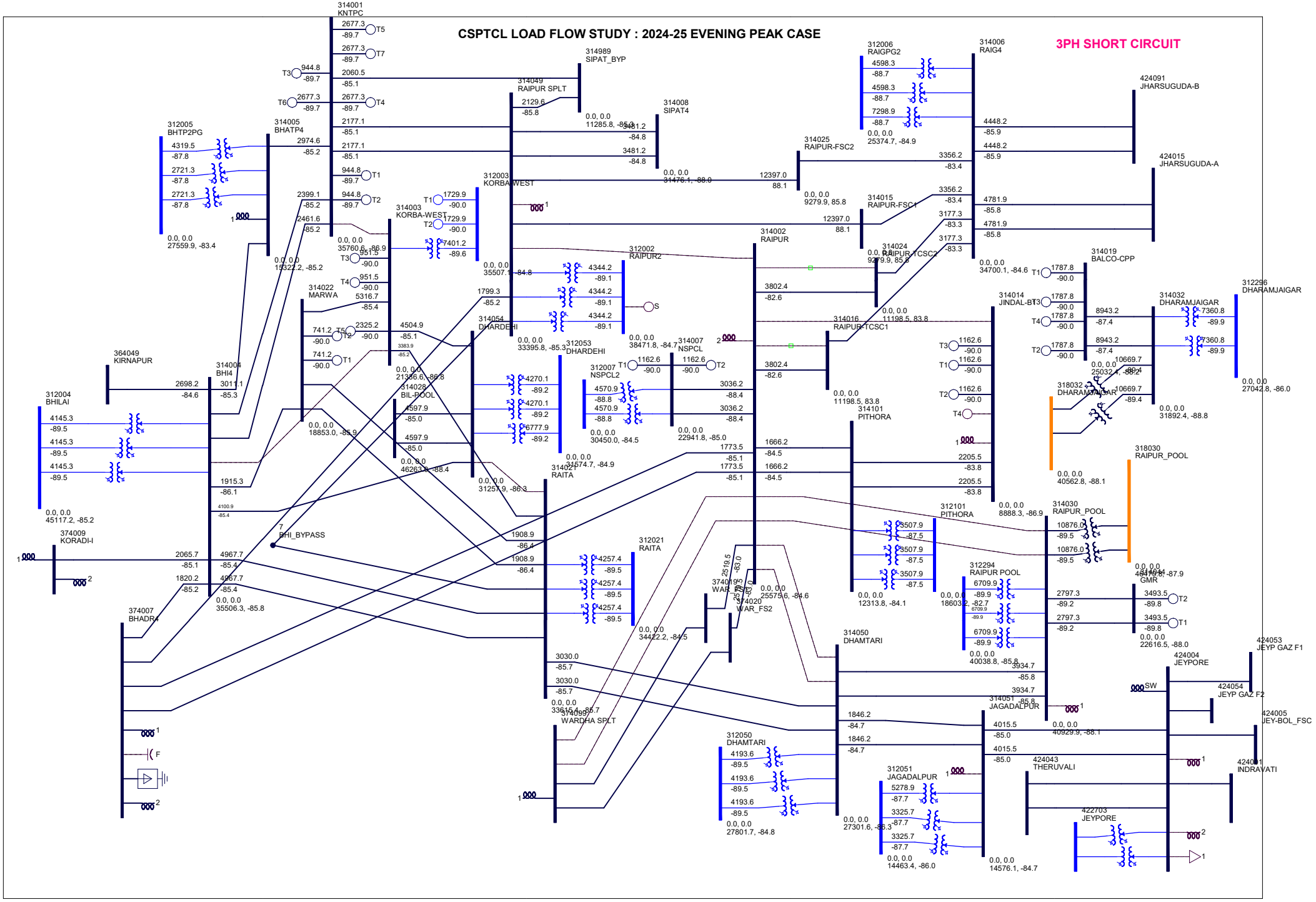
Meeting ended with a vote of thanks.

Annexure-I: List of Participants

Name	**Organization**	**Designation**
Vikas Sachan	PSPA-1, CEA	Asst. Director
Gaurab Dash	NLDC, POSOCO	
Pushpa Seshadri	WRLDC, POSOCO	General Manager
Pradeep Kumar Sanodiya	WRLDC, POSOCO	Manager
M Venkateswara Rao	WRLDC, POSOCO	Dy. Manager
P.S. Das	CTUIL	Sr GM
Bhaskar Wagh	CTUIL	Ch. Manager
Pratyush Singh	CTUIL	Manager
Shashank Shekhar	CTUIL	Dy. Manager
R. K. Shukla	CSPTCL	Chief Engineer
Manoj Verma	CSPTCL	Executive Engineer (PL)

Annexure-II: SLD covers proposals of Dhardehi 400/220kV S/s, Pithora 400/220kV S/s, Raipur- Pool - Dhamtari 400kV D/c line, Jeypore - Jagdalpur 400kV D/c line, Bypassing of Raipur - Bhilai 400kV S/c line at Bhilai end and connecting it to one circuit of Bhilai - Raita 400kV T/c line and other ICT Augmentation works in Chhattisgarh (with N-1 contingencies)




CSPTCL LOAD FLOW STUDY : 2024-25 EVENING PEAK CASE
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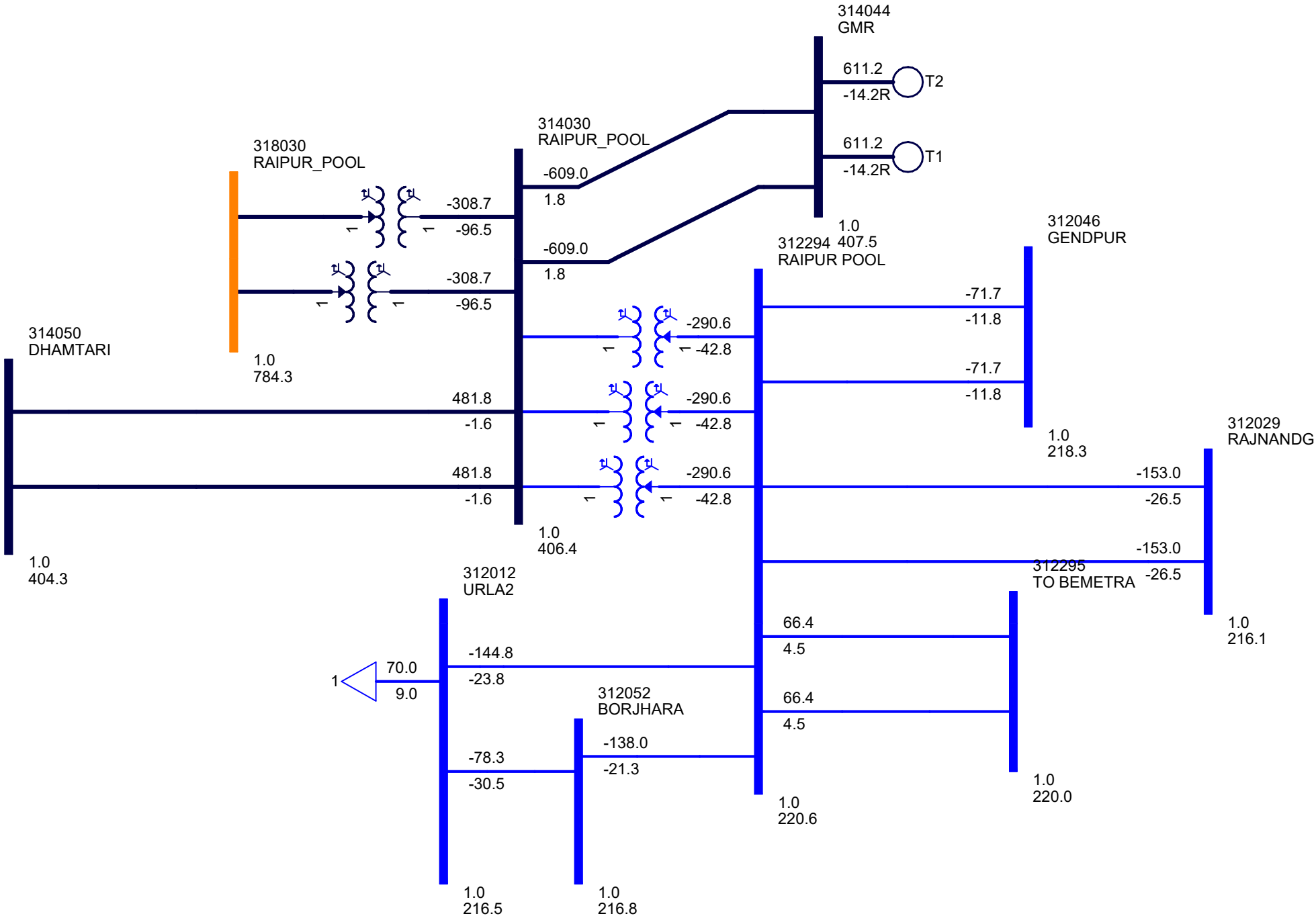
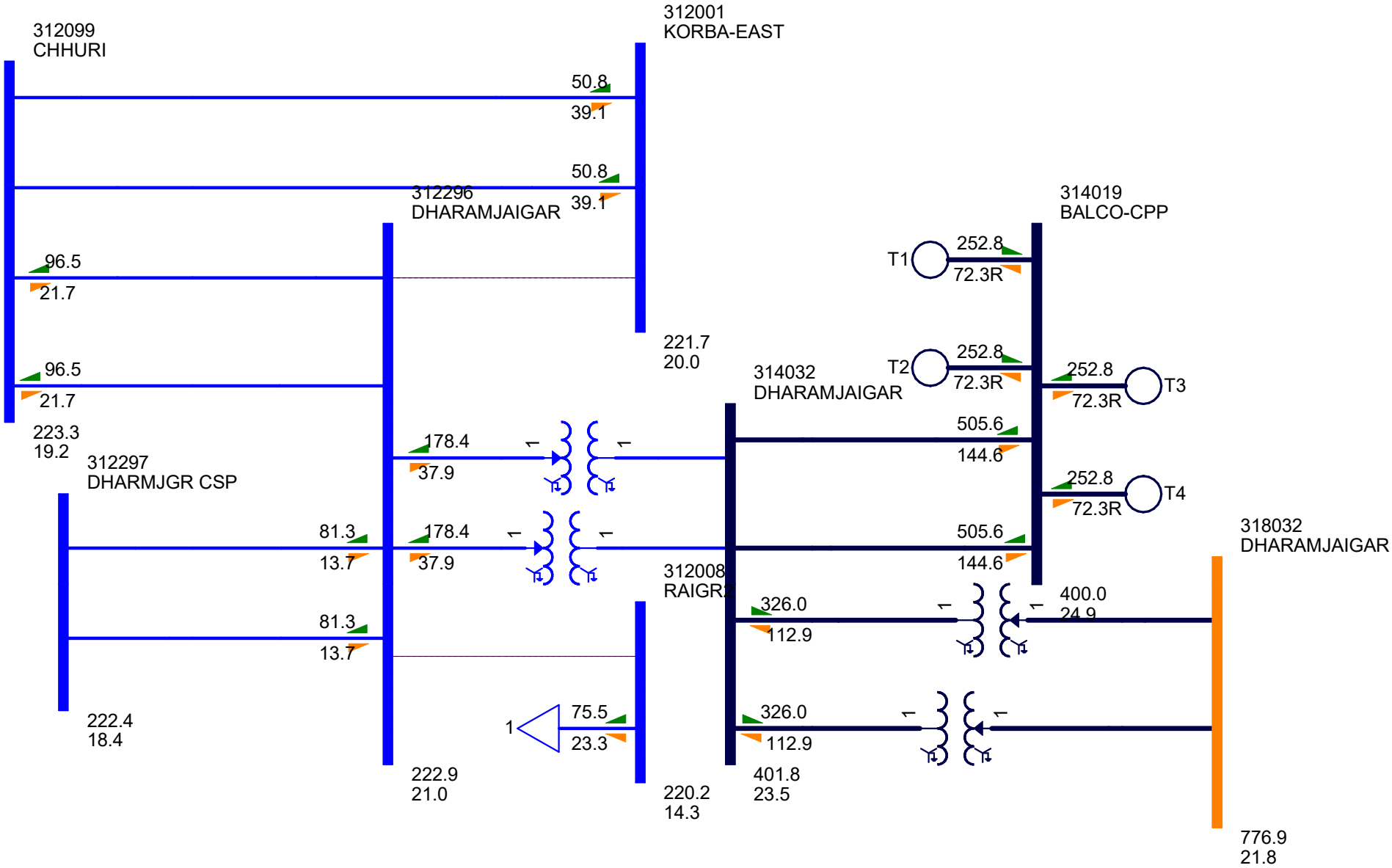
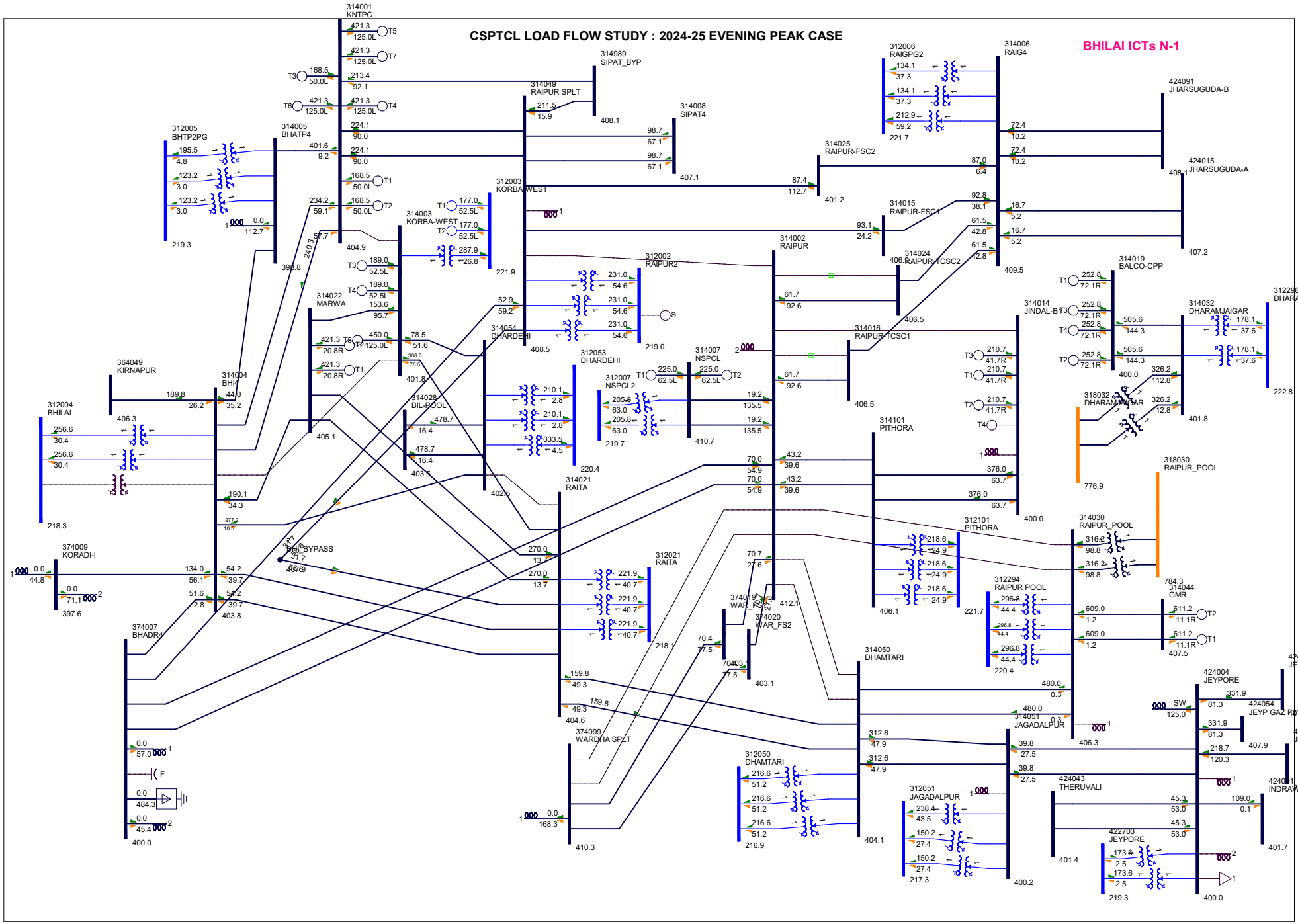
314008 SIPAT4
312006 RAIGPG2
314006 RAIG4
424091 JHARSUGUDA-B
424015 JHARSUGUDA-A
314025 RAIPUR-FSC2
314015 RAIPUR-FSC1
312005 BHTP2PG
314005 BHATP4
312003 KORBA WEST
314003 KORBA-WEST
312002 RAIPUR2
314002 RAIPUR
314024 RAIPUR-TCSC2
314019 BALCO-CPP
314014 JINDAL-BT3
314016 RAIPUR-TCSC1
314032 DHARAMJAIGAR
312296 DHARAMJAIGAR
314022 MARWA
314054 DHARDEHI
312053 DHARDEHI
314007 NSPCL
312007 NSPCL2
314028 BIL-POOL
364049 KIRNAPUR
314004 BHI4
312004 BHILAI
314101 PITHORA
318032 DHARAMJAIGAR
318030 RAIPUR_POOL
314030 RAIPUR_POOL
312101 PITHORA
312294 RAIPUR POOL
374009 KORADI-I
BHI_BYPASS
314021 RAITA
312021 RAITA
374019 WAR_FS1
374020 WAR_FS2
374007 BHADRA
374099 WARDHA SPLT
314050 DHAMTARI
312050 DHAMTARI
314051 JAGADALPUR
312051 JAGADALPUR
424043 THERUVALI
422703 JEYPORE
424004 JEYPORE
424053 JEYP GAZ F1
424054 JEYP GAZ F2
424005 JEY-BOL_FSC
424001 INDRAVATI
GMR

Creation of 220 kV level (GIS) at 765/400 kV Raipur Pool S/s



Creation of 220 kV level at 765/400 kV Dharamjaigarh S/s




CSPTCL LOAD FLOW STUDY : 2024-25 EVENING PEAK CASE
BHILAI ICTs N-1
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314008 SIPAT4
312006 RAIGPG2
314006 RAIG4
424091 JHARSUGUDA-B
424015 JHARSUGUDA-A
312005 BHTP2PG
314005 BHATP4
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312003 KORBA WEST
314015 RAIPUR-FSC1
314024 RAIPUR-TCSC2
314003 KORBA-WEST
312002 RAIPUR2
314002 RAIPUR
314019 BALCO-CPP
314014 JINDAL-BT
314032 DHARAMJAIGAR
312296 DHARAMJAIGAR
314022 MARWA
314054 DHARDEHI
314016 RAIPUR-TCSC1
312053 DHARDEHI
314007 NSPCL
312007 NSPCL2
318032 DHARAMJAIGAR
364049 KIRNAPUR
314004 BHI
314028 BIL-POOL
314101 PITHORA
318030 RAIPUR_POOL
312004 BHILAI
314021 RAITA
312101 PITHORA
314030 RAIPUR_POOL
374009 KORADI-I
BHI-S BYPASS
312021 RAITA
312294 RAIPUR POOL
314044 GMR
374019 WAR_FS1
374020 WAR_FS2
374007 BHADR4
314050 DHAMTARI
424004 JEYPORE
424053 JEYP GAZ F1
424054 JEYP GAZ F2
374099 WARDHA SPLT
312050 DHAMTARI
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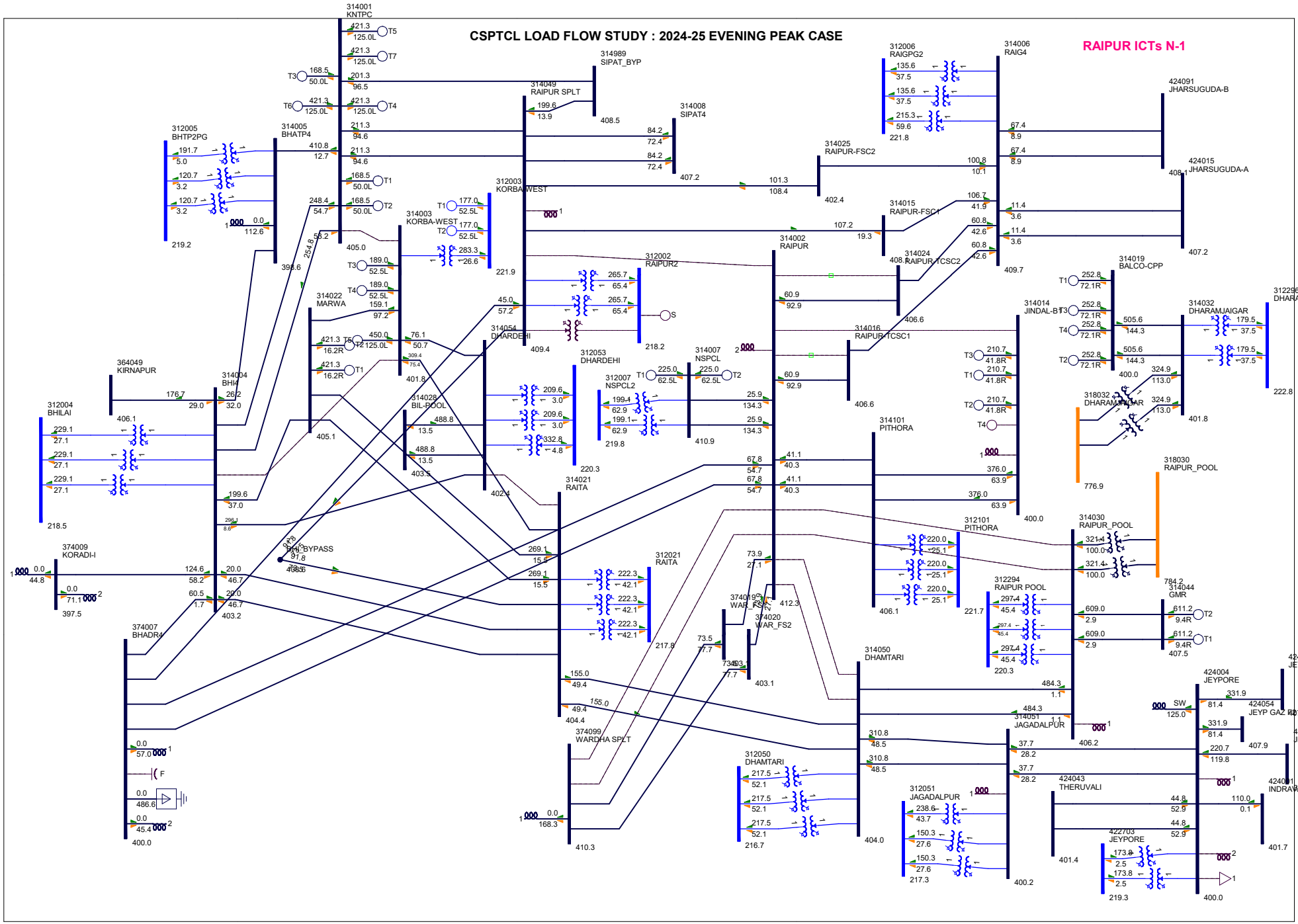
422703 JEYPORE
424001 INDRAVATI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314008 SIPAT4
312006 RAIGPG2
314006 RAIG4
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424015 JHARSUGUDA-A
314025 RAIPUR-FSC2
314015 RAIPUR-FSC1
314024 RAIPUR-TCSC2
312005 BHTP2PG
314005 BHATP4
312003 KORBA WEST
314003 KORBA-WEST
312002 RAIPUR2
314002 RAIPUR
314019 BALCO-CPP
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314032 DHARAMJAIGAR
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314022 MARWA
314054 DHARDEHI
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318032 DHARAMJAIGAR
364049 KIRNAPUR
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314007 NSPCL
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312004 BHILAI
314028 BIL-POOL
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312101 PITHORA
314030 RAIPUR_POOL
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BHI BYPASS
312021 RAITA
374019 WAR_FS1
374020 WAR_FS2
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314044 GMR
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374099 WARDHA SPLT
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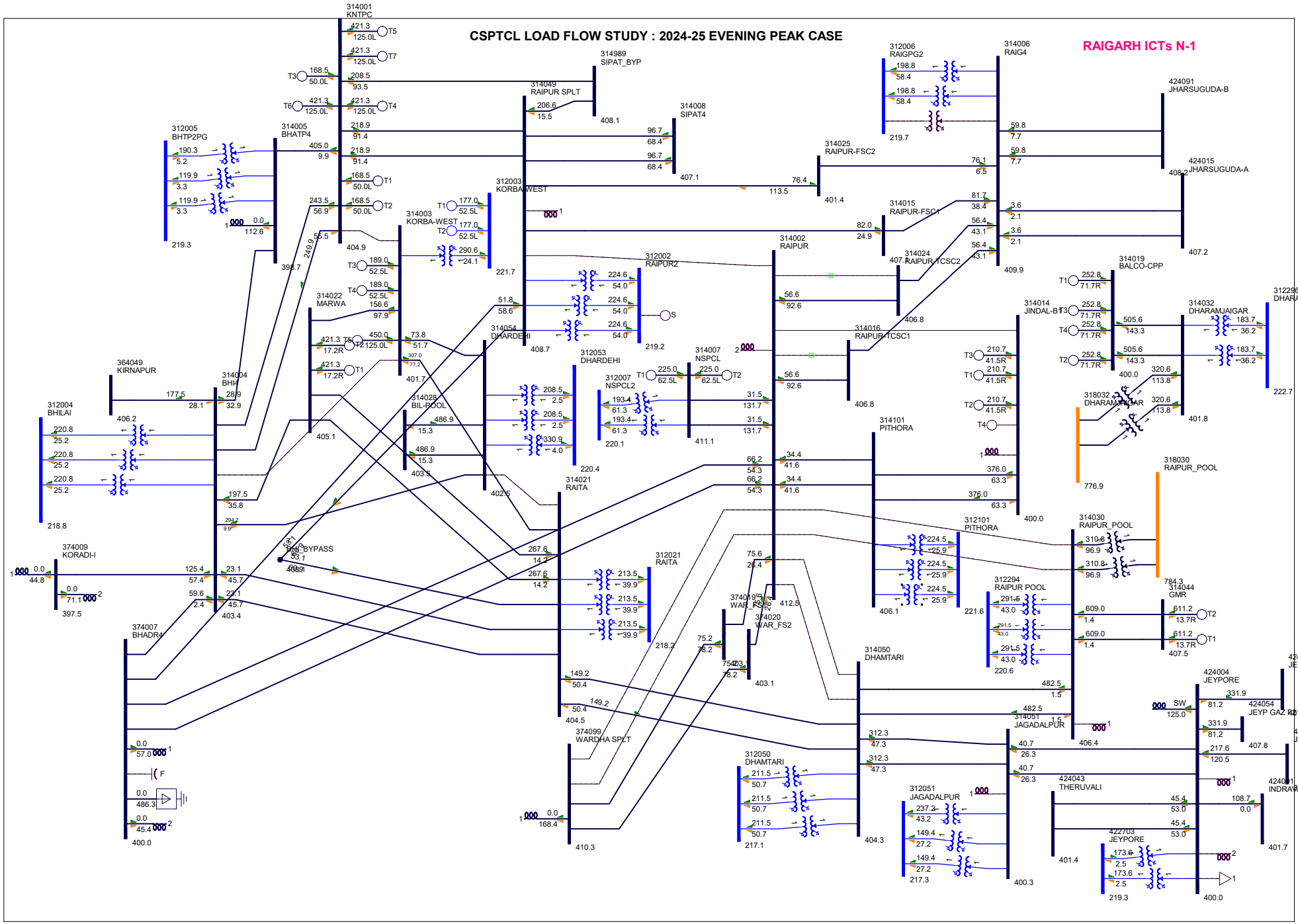
CSPTCL LOAD FLOW STUDY : 2024-25 EVENING PEAK CASE
RAIGARH ICTs N-1
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312006 RAIGPG2
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312003 KORBA WEST
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314032 DHARAMJAIGAR
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314054 DHARDEHI
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314016 RAIPUR-TCSC1
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314004 BHIL
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314021 RAITA
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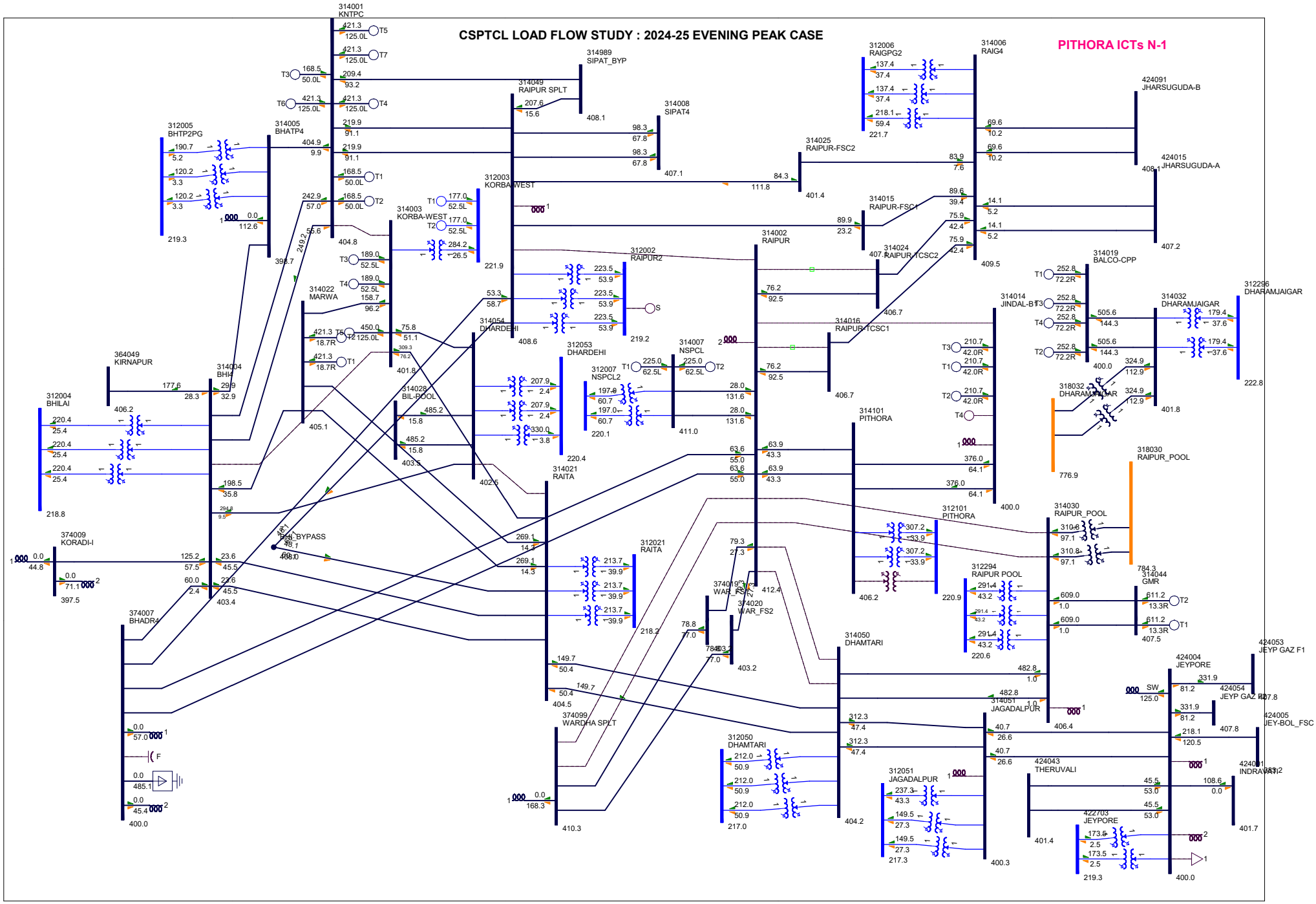
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314008 SIPAT4
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312296 DHARAMJAIGAR
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314054 DHARDEHI
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314007 NSPCL
312007 NSPCL2
318032 DHARAMJAIGAR
364049 KIRNAPUR
314004 BHIL
312004 BHILAI
314028 BIL-POOL
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314021 RAITA
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374009 KORADI-I
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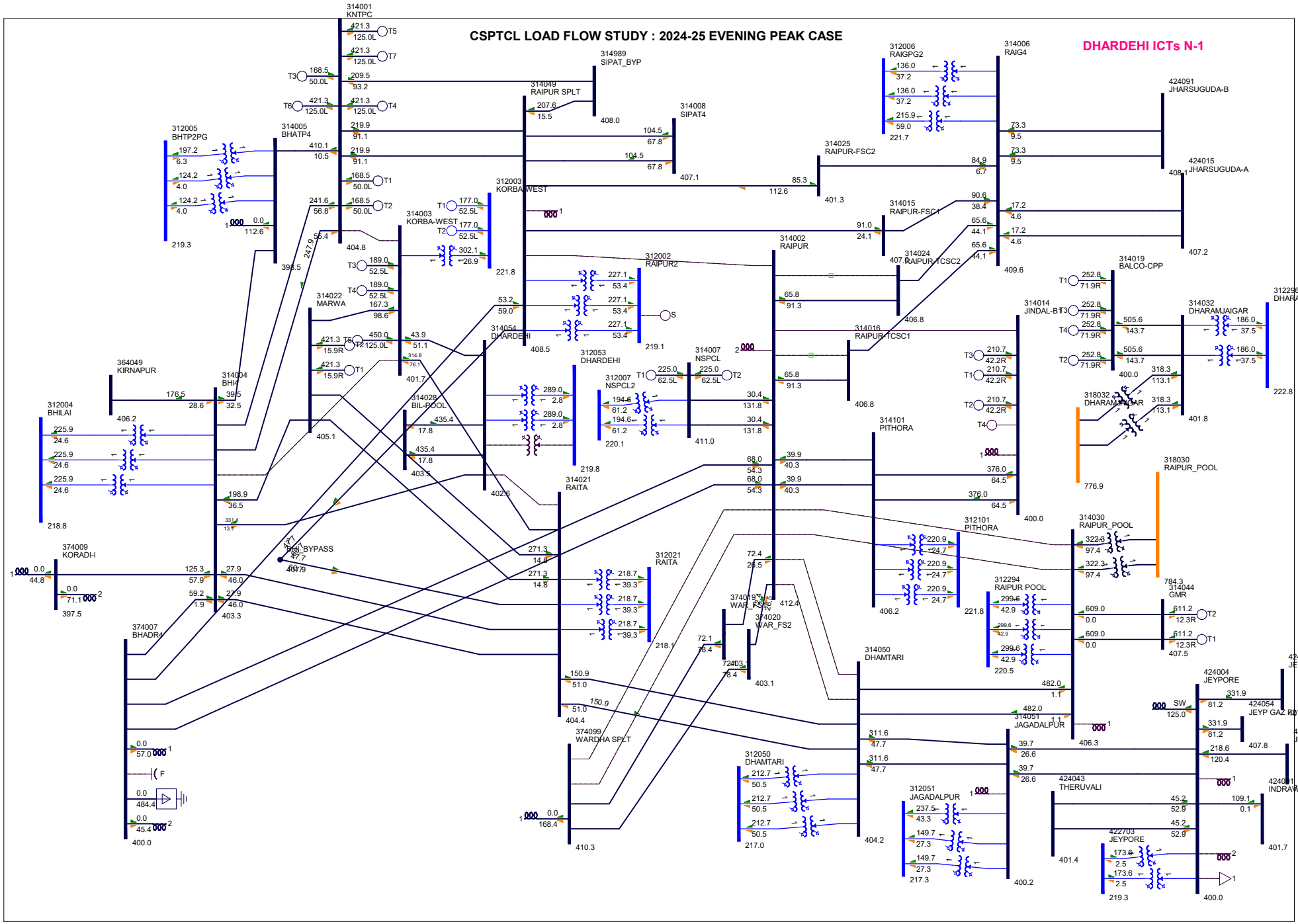
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DHARDEHI ICTs N-1
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314021 RAITA
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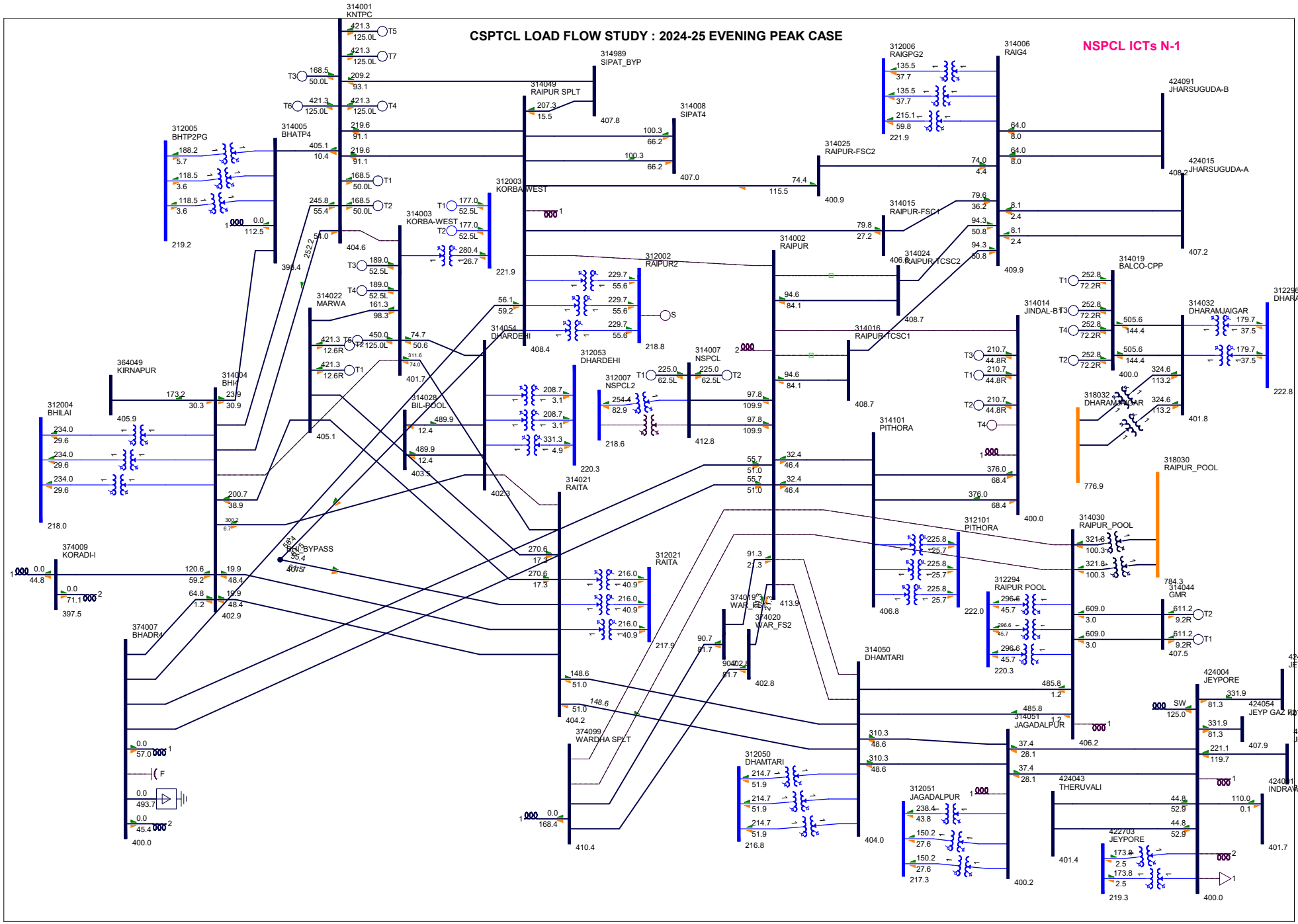
CSPTCL LOAD FLOW STUDY : 2024-25 EVENING PEAK CASE
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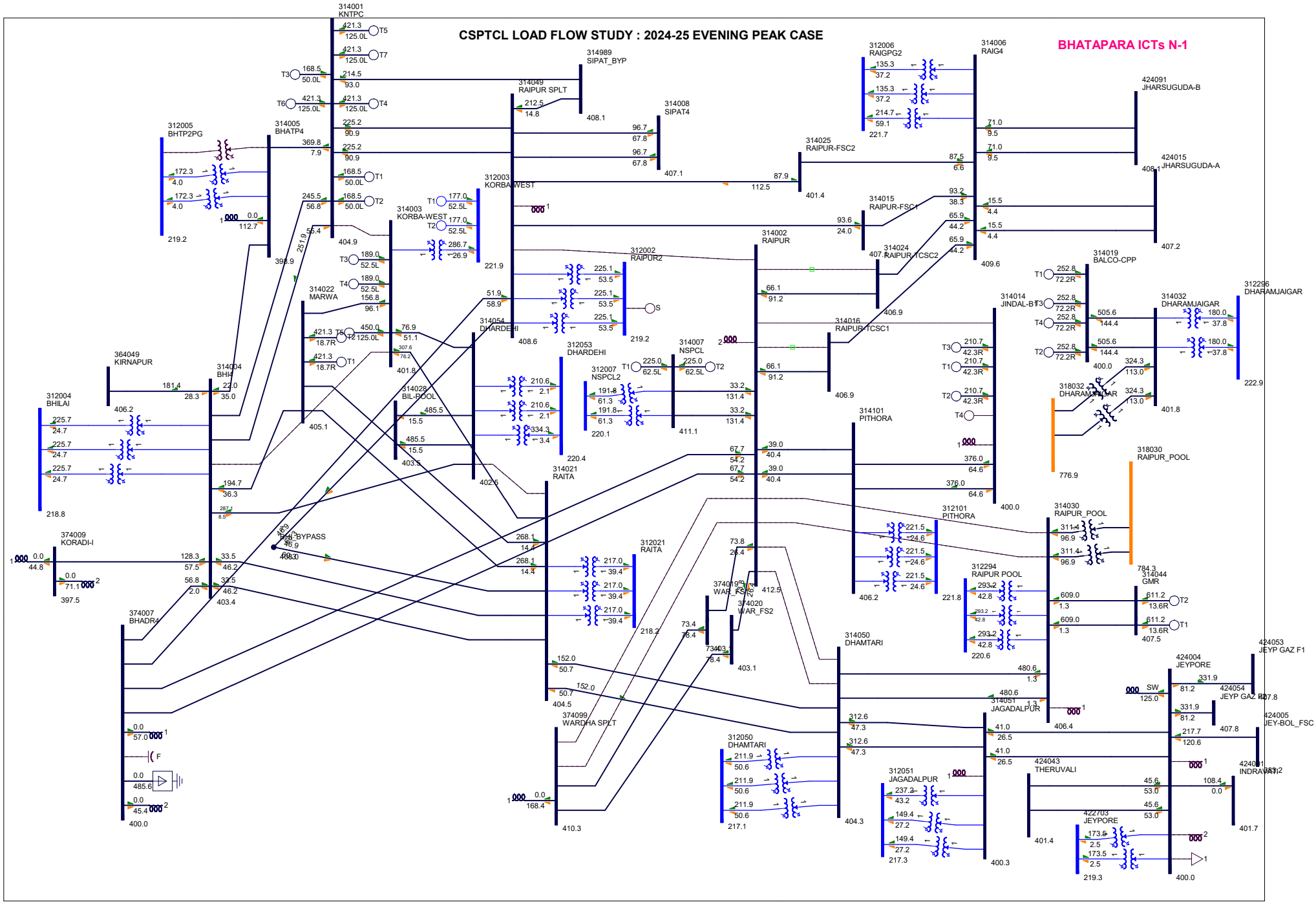
CSPTCL LOAD FLOW STUDY : 2024-25 EVENING PEAK CASE
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314051 JAGADALPUR
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422703 JEYPORE
424004 JEYPORE
424053 JEYP GAZ F1
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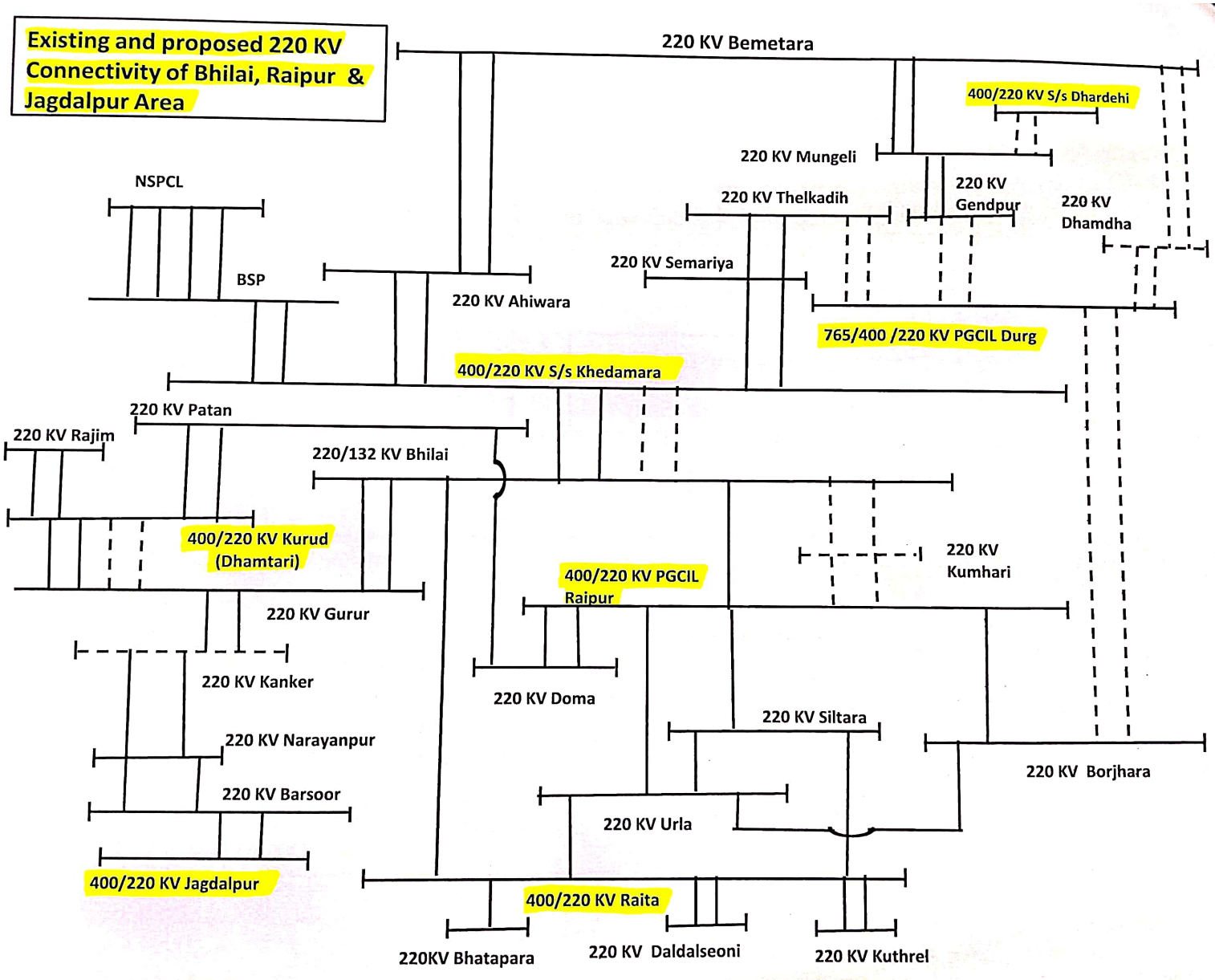
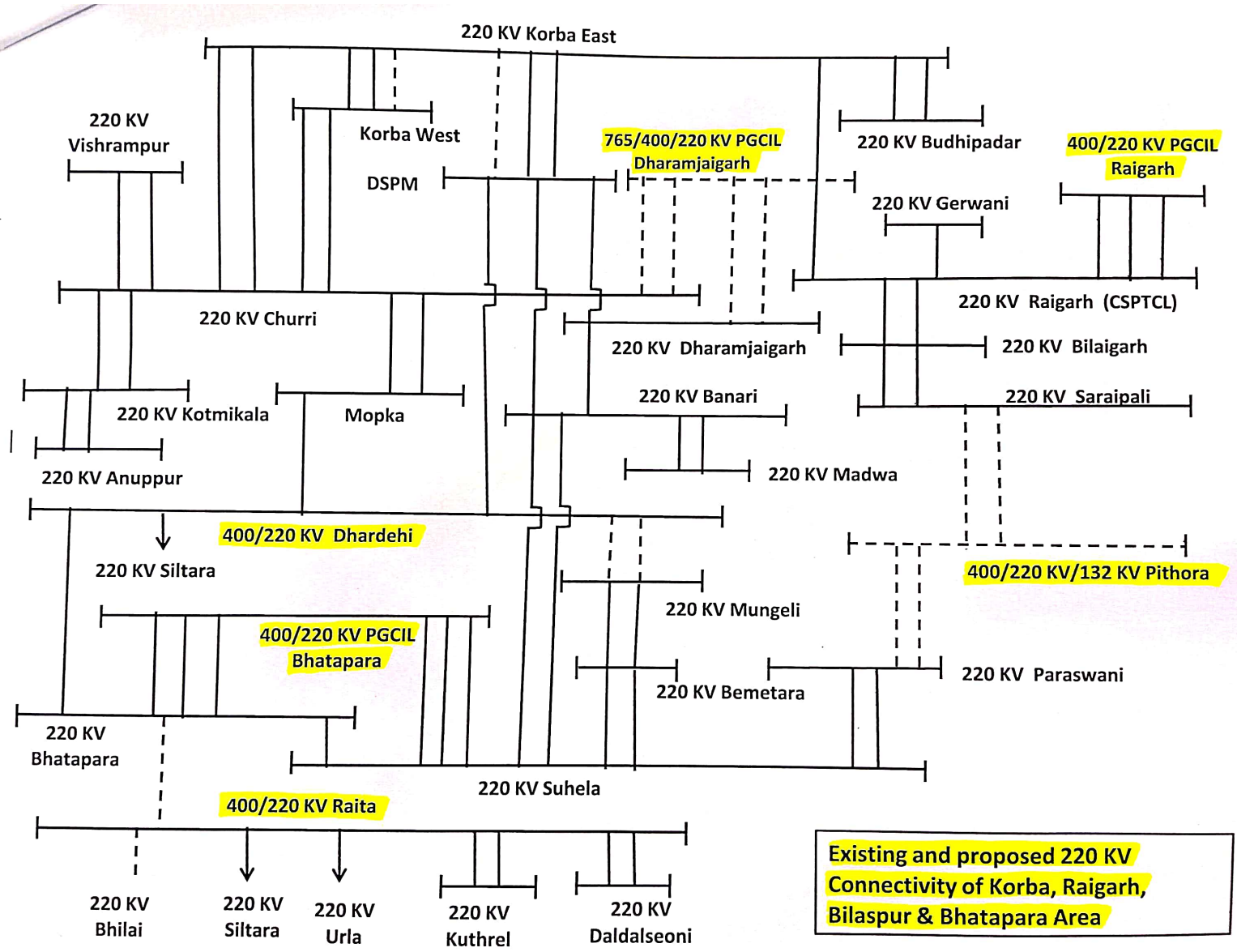
424041 INDRAVATI
374099 WARDHA SPLT
BYPASS
SW
F
S


Existing and proposed 220 KV Connectivity of Bhilai, Raipur & Jagdalpur Area
220 KV Bemetara
400/220 KV S/s Dhardehi
220 KV Mungeli
220 KV Thelkadih
220 KV Gendpur
220 KV Dhamdha
NSPCL
BSP
220 KV Ahiwara
220 KV Semariya
765/400 /220 KV PGCIL Durg
400/220 KV S/s Khedamara
220 KV Patan
220 KV Rajim
220/132 KV Bhilai
400/220 KV Kurud (Dhamtari)
220 KV Kumhari
400/220 KV PGCIL Raipur
220 KV Gurur
220 KV Kanker
220 KV Doma
220 KV Siltara
220 KV Narayanpur
220 KV Borjhara
220 KV Barsoor
220 KV Urla
400/220 KV Jagdalpur
400/220 KV Raita
220KV Bhatapara
220 KV Daldalseoni
220 KV Kuthrel



Existing and proposed 220 KV Connectivity of Korba, Raigarh, Bilaspur & Bhatapara Area