

Annexure-I



GUJARAT ENERGY TRANSMISSION CORPORATION LIMITED

Regd. Office: Sardar Patel Vidyut Bhavan,

Race Course, VADODARA – 390 007.

(CIN: U40100GJ1999SGCO36018)

Phone No.(0265) 2353086 (D) Fax No.(0265) 2337918/2338164 (GUVNL)

Web site: www.getco Gujarat.com -Email: stu.getco@gebmail.com

Ref No: CE(R&C)/STU/511/1

Date: 04/06/2020

To,
Shri Goutam Roy,
Chief Engineer (PSP&A-I),
Central Electricity Authority,
Power System Planning & Appraisal Division-I,
Sewa Bhavan, R. K. Puram,
New Delhi – 110 066.

Sub: Transmission system for evacuation of 10 GW RE power from potential RE zones in Khavda region – Modification in MoM of 1st WRPCTP meeting thereof.

Ref: MoM of 1st WRPCTP meeting issued vide letter No. CEA-PS-11-23(19)/1/2019-PSPA-I Division/I/9489/2020 dated 13.03.2020.

Dear Sir,

This has reference to the discussions held during 1st WRPCTP meeting held on 11.01.2020 at Ahmedabad, Gujarat. During the meeting, transmission system for evacuation of 10 GW RE power from potential RE zones in Khavda region were deliberated and finalized.

While going through the minutes, it is observed that GETCO views related to shifting of Bhuj-II, phasing out of schemes of Khavda region for implementation, critical loading of 400 KV / 220 KV transmission lines surrounding North / Central / South Gujarat areas due to load-generation change, etc. are recorded. However, few important points are not mentioned in the conclusion.

Therefore, we request that following points shall be covered under concluding part of the minutes:

- It is agreed that transmission scheme from Khavda region will be done in a way to have bare minimum scheme in Phase-I and shall be implemented as per LTA applications. Strengthening schemes may be bid out in next phase as per grant of LTA in future.
- It is also agreed that various 400 KV / 220 KV transmission lines of GETCO surrounding North, Central & Southern Gujarat area would be getting critically loaded (as per the load flow studies results for the Khavda system) because of huge RE integration in Western Gujarat and changed load-generation scenarios. Therefore, appropriate ISTS network strengthening as a part of RE integration will be planned at later stage matching with actual RE growth.

Also, at 4.18 it is recorded that "...The overloading of the 400 kV Intra-State lines in Gujarat may be because of backing down of conventional generation to achieve the load-generation balance. Overloading of intra-state elements due RE capacity addition under ISTS would be taken care in future in form of system strengthening schemes...."

Here, we wish to clarify that overloading of Intra-State elements includes both 400 KV as well as 220 KV elements. Further, the strengthening schemes shall be a part of associated ISTS scheme for RE integration only and not in form of regular system strengthening scheme. Alternatively, adequate strengthening schemes may be planned today itself as a part of RE integration schemes.

It is requested to amend the minutes of 1st WRPCTP meeting as above.

Thanking you,

Yours faithfully
For Gujarat Energy Transmission Corporation Limited



(N. P. Jadav)
Chief Engineer (R&C)

Copy to:

- 1) The Chief Operating Officer (CTU Planning), Power Grid Corporation of India Ltd., "Saudamini", Plot No-2, Sector – 29, Gurgaon, Haryana – 122 001.
- 2) The Member Secretary, Western Regional Power Committee, F-3, MIDC Area, Andheri (East), Mumbai – 400 093

367-12/2/2020-GEC
Government of India
Ministry of New and Renewable Energy
(Green Energy Corridor Division)

Block 14, CGO Complex, Lodhi Road
New Delhi-110003; dated 15.04.2020

Shri Goutam Roy
Chief Engineer (PSPA-I Division)
Central Electricity Authority
Sewa Bhawan, R.K. Puram Sector -1
Delhi – 110066

Subject: Modifications in the Renewable Energy Zones identified in Madhya Pradesh under 66.5 GW ISTS scheme

Sir,

This is with reference to the meeting convened by CEA through video conference on 30.03.2020 at 3pm. As discussed during the meeting, the following potential zones have been identified in the State of Madhya Pradesh:

- a) Agar-Shajahpur region - new Rajgarh substation: 1000 MW
- b) Further potential identified by SECI in the region surrounding the new Rajgarh substation: 1500 MW
- c) Chhatarpur (Bijawar and NTPC-Barethi): 1500 MW
- d) Neemuch: 1000 MW (500 MW RfP already issued by MP in Singoli tehsil)
- e) Khandwa (floating solar power project and others): 600 MW
- f) Morena: 1250 MW - land identified in Jhiniya village

Total: 6850 MW

2. CEA is requested to consider the above identified potential regions and plan the ISTS network in consultation with the Govt. of MP in the allotted/earmarked land.
3. This has the approval of Secretary, MNRE.

Yours faithfully



(Rohit Thakwani)
Scientist 'C'

Email: rohit.mnre@gov.in

Copy for information to

1. MD, SECI
2. Director (Transmission), Ministry of Power
3. COO (CTU), POWERGRID

Annexure-III

Dehgam(PG) & Ranchhodpura(GETCO) Fault level contribution (without rearrangement)

AT BUS 354003 [DEHGM4 400.00] AREA 3 *** FAULTED BUS IS: 354003 [DEHGM4 400.00] *** 0 LEVELS AWAY ***
 (kV L-G) V+:/0.000/0.00 VA:/0.000/0.00 VB:/0.000/0.00 VC:/0.000/0.00
 THEVENIN IMPEDANCE, X/R (PU) Z+:/0.002955/85.954, 14.13617
 THEVENIN IMPEDANCE, X/R (OHM) Z+:/4.729/85.954, 14.13617

X-----THREE PHASE FAULT-----X																
X-----	FROM	-----X	AREA	CKT	I/Z	/I+/ AN(I+)	/IA/ AN(IA)	/IB/ AN(IB)	/IC/ AN(IC)	/Z+/ AN(Z+)	APP	X/R				
352003	[DEHGM2	220.00]	3	1	AMP/OHM	848.1	-85.34	848.1	-85.34	848.1	154.66	848.1	34.66	19.21	90.00	9999.999
352003	[DEHGM2	220.00]	3	2	AMP/OHM	848.1	-85.34	848.1	-85.34	848.1	154.66	848.1	34.66	19.21	90.00	9999.999
352003	[DEHGM2	220.00]	3	3	AMP/OHM	1346.2	-85.34	1346.2	-85.34	1346.2	154.66	1346.2	34.66	12.10	90.00	9999.999
354002	[GANCS4	400.00]	3	1	AMP/OHM	2526.8	-85.69	2526.8	-85.69	2526.8	154.31	2526.8	34.31	48.52	84.65	10.683
354002	[GANCS4	400.00]	3	2	AMP/OHM	2526.8	-85.69	2526.8	-85.69	2526.8	154.31	2526.8	34.31	48.52	84.65	10.683
354004	[WANAKBORI	400.00]	3	1	AMP/OHM	2765.7	-86.21	2765.7	-86.21	2765.7	153.79	2765.7	33.79	22.53	84.87	11.141
354004	[WANAKBORI	400.00]	3	2	AMP/OHM	2765.7	-86.21	2765.7	-86.21	2765.7	153.79	2765.7	33.79	22.53	84.87	11.141
354005	[SOJA4	400.00]	3	1	AMP/OHM	4101.2	-86.02	4101.2	-86.02	4101.2	153.98	4101.2	33.98	13.60	84.87	11.139
354005	[SOJA4	400.00]	3	2	AMP/OHM	4101.2	-86.02	4101.2	-86.02	4101.2	153.98	4101.2	33.98	13.60	84.87	11.139
354014	[PIRANA_P	400.00]	3	1	AMP/OHM	5093.5	-86.67	5093.5	-86.67	5093.5	153.33	5093.5	33.33	17.31	84.65	10.684
354016	[SAMI4	400.00]	3	1	AMP/OHM	1494.6	-85.25	1494.6	-85.25	1494.6	154.75	1494.6	34.75	46.97	84.65	10.683
354016	[SAMI4	400.00]	3	2	AMP/OHM	1494.6	-85.25	1494.6	-85.25	1494.6	154.75	1494.6	34.75	46.97	84.65	10.683
354017	[RANCHODPURA	400.00]	3	1	AMP/OHM	5036.4	-85.82	5036.4	-85.82	5036.4	154.18	5036.4	34.18	19.25	84.65	10.687
354017	[RANCHODPURA	400.00]	3	2	AMP/OHM	5036.4	-85.82	5036.4	-85.82	5036.4	154.18	5036.4	34.18	19.25	84.65	10.687
354101	[NICOL TORREN	400.00]	3	2	AMP/OHM	5380.5	-86.67	5380.5	-86.67	5380.5	153.33	5380.5	33.33	7.73	84.66	10.689
364005	[NAGDA-4	400.00]	3	1	AMP/OHM	1736.5	-85.12	1736.5	-85.12	1736.5	154.88	1736.5	34.88	102.59	84.65	10.676
364005	[NAGDA-4	400.00]	3	2	AMP/OHM	1736.5	-85.12	1736.5	-85.12	1736.5	154.88	1736.5	34.88	102.59	84.65	10.676
	TO FIXED SHUNT			1	AMP/OHM	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00			
	TO FIXED SHUNT			2	AMP/OHM	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00			
	INITIAL SYM. S.C. CURRENT (I''k) (RMS) AMP					48837.1	-85.95	48837.1	-85.95	48837.1	154.05	48837.1	34.05			

AT BUS 354017 [RANCHODPURA 400.00] AREA 3 *** FAULTED BUS IS: 354017 [RANCHODPURA 400.00] *** 0 LEVELS AWAY ***
 (kV L-G) V+:/0.000/0.00 VA:/0.000/0.00 VB:/0.000/0.00 VC:/0.000/0.00
 THEVENIN IMPEDANCE, X/R (PU) Z+:/0.003415/85.906, 13.97102
 THEVENIN IMPEDANCE, X/R (OHM) Z+:/5.464/85.906, 13.97101

X-----THREE PHASE FAULT-----X																
X-----	FROM	-----X	AREA	CKT	I/Z	/I+/ AN(I+)	/IA/ AN(IA)	/IB/ AN(IB)	/IC/ AN(IC)	/Z+/ AN(Z+)	APP	X/R				
352017	[RANCHDPR	220.00]	3	1	AMP/OHM	1074.3	-86.13	1074.3	-86.13	1074.3	153.87	1074.3	33.87	19.21	90.00	9999.999
352017	[RANCHDPR	220.00]	3	2	AMP/OHM	1074.3	-86.13	1074.3	-86.13	1074.3	153.87	1074.3	33.87	19.21	90.00	9999.999
352017	[RANCHDPR	220.00]	3	3	AMP/OHM	1074.3	-86.13	1074.3	-86.13	1074.3	153.87	1074.3	33.87	19.21	90.00	9999.999
352017	[RANCHDPR	220.00]	3	4	AMP/OHM	1074.3	-86.13	1074.3	-86.13	1074.3	153.87	1074.3	33.87	19.21	90.00	9999.999
354003	[DEHGM4	400.00]	3	1	AMP/OHM	5972.4	-85.55	5972.4	-85.55	5972.4	154.45	5972.4	34.45	19.25	84.65	10.687
354003	[DEHGM4	400.00]	3	2	AMP/OHM	5972.4	-85.55	5972.4	-85.55	5972.4	154.45	5972.4	34.45	19.25	84.65	10.687
354006	[CHORN4	400.00]	3	1	AMP/OHM	4048.2	-85.60	4048.2	-85.60	4048.2	154.40	4048.2	34.40	31.83	84.65	10.683
354006	[CHORN4	400.00]	3	2	AMP/OHM	4048.2	-85.60	4048.2	-85.60	4048.2	154.40	4048.2	34.40	31.83	84.65	10.683
354024	[BACHAU	400.00]	3	1	AMP/OHM	2011.6	-86.79	2011.6	-86.79	2011.6	153.21	2011.6	33.21	77.39	85.97	14.204
354024	[BACHAU	400.00]	3	2	AMP/OHM	2011.6	-86.79	2011.6	-86.79	2011.6	153.21	2011.6	33.21	77.39	85.97	14.204
354036	[HALVAD NEW	400.00]	3	1	AMP/OHM	3136.9	-86.03	3136.9	-86.03	3136.9	153.97	3136.9	33.97	37.09	84.65	10.685
354036	[HALVAD NEW	400.00]	3	2	AMP/OHM	3136.9	-86.03	3136.9	-86.03	3136.9	153.97	3136.9	33.97	37.09	84.65	10.685

354136	[BANASKANTHA 400.00]	3	1	AMP/OHM	3558.4	-86.04	3558.4	-86.04	3558.4	153.96	3558.4	33.96	38.63	84.65	10.684
354137	[SANKHARI 400.00]	3	2	AMP/OHM	4075.7	-86.13	4075.7	-86.13	4075.7	153.87	4075.7	33.87	31.67	84.87	11.144
INITIAL SYM. S.C. CURRENT(I''k) (RMS) AMP					42268.3	-85.91	42268.3	-85.91	42268.3	154.09	42268.3	34.09			

Vadodara(PG) and Asoj(GETCO) Fault level contribution (without rearrangement)

AT BUS 354001 [ASOJ4 400.00] AREA 3 *** FAULTED BUS IS: 354001 [ASOJ4 400.00] *** 0 LEVELS AWAY ***
(kV L-G) V+:/0.000/0.00 VA:/0.000/0.00 VB:/0.000/0.00 VC:/0.000/0.00
THEVENIN IMPEDANCE, X/R (PU) Z+:/0.003130/86.581, 16.73682
THEVENIN IMPEDANCE, X/R (OHM) Z+:/5.009/86.581, 16.73682

X-----THREE PHASE FAULT-----X																	
X-----	FROM	X	AREA	CKT	I/Z	/I+/	AN(I+)	/IA/	AN(IA)	/IB/	AN(IB)	/IC/	AN(IC)	/Z+/	AN(Z+)	APP	X/R
352001	[ASOJ2 220.00]	3	1	AMP/OHM	1636.5	-85.68	1636.5	-85.68	1636.5	154.32	1636.5	34.32	12.10	90.00	9999.999		
352001	[ASOJ2 220.00]	3	2	AMP/OHM	1636.5	-85.68	1636.5	-85.68	1636.5	154.32	1636.5	34.32	12.10	90.00	9999.999		
352001	[ASOJ2 220.00]	3	3	AMP/OHM	1636.5	-85.68	1636.5	-85.68	1636.5	154.32	1636.5	34.32	12.10	90.00	9999.999		
352001	[ASOJ2 220.00]	3	4	AMP/OHM	1031.0	-85.68	1031.0	-85.68	1031.0	154.32	1031.0	34.32	19.21	90.00	9999.999		
354004	[WANAKBORI 400.00]	3	1	AMP/OHM	4755.0	-85.46	4755.0	-85.46	4755.0	154.54	4755.0	34.54	25.33	84.87	11.145		
354006	[CHORN4 400.00]	3	1	AMP/OHM	2459.9	-85.54	2459.9	-85.54	2459.9	154.46	2459.9	34.46	59.00	84.87	11.143		
354006	[CHORN4 400.00]	3	2	AMP/OHM	2623.0	-85.54	2623.0	-85.54	2623.0	154.46	2623.0	34.46	55.33	84.87	11.144		
354011	[SSP4 400.00]	3	1	AMP/OHM	4320.8	-85.38	4320.8	-85.38	4320.8	154.62	4320.8	34.62	27.67	84.87	11.148		
354029	[KOSAMBA 400.00]	3	1	AMP/OHM	3246.3	-85.59	3246.3	-85.59	3246.3	154.41	3246.3	34.41	40.67	84.87	11.142		
354035	[VADODARA 400.00]	3	1	AMP/OHM	9579.1	-88.12	9579.1	-88.12	9579.1	151.88	9579.1	31.88	3.80	86.67	17.196		
354035	[VADODARA 400.00]	3	2	AMP/OHM	9579.1	-88.12	9579.1	-88.12	9579.1	151.88	9579.1	31.88	3.80	86.67	17.196		
364001	[INDORE-4 400.00]	3	1	AMP/OHM	1757.4	-85.17	1757.4	-85.17	1757.4	154.83	1757.4	34.83	96.33	84.87	11.144		
364001	[INDORE-4 400.00]	3	2	AMP/OHM	1860.4	-85.17	1860.4	-85.17	1860.4	154.83	1860.4	34.83	91.00	84.87	11.145		
INITIAL SYM. S.C. CURRENT(I''k) (RMS) AMP					46109.6	-86.58	46109.6	-86.58	46109.6	153.42	46109.6	33.42					

AT BUS 354035 [VADODARA 400.00] AREA 3 *** FAULTED BUS IS: 354035 [VADODARA 400.00] *** 0 LEVELS AWAY ***
(kV L-G) V+:/0.000/0.00 VA:/0.000/0.00 VB:/0.000/0.00 VC:/0.000/0.00
THEVENIN IMPEDANCE, X/R (PU) Z+:/0.003168/87.074, 19.56519
THEVENIN IMPEDANCE, X/R (OHM) Z+:/5.069/87.074, 19.56519

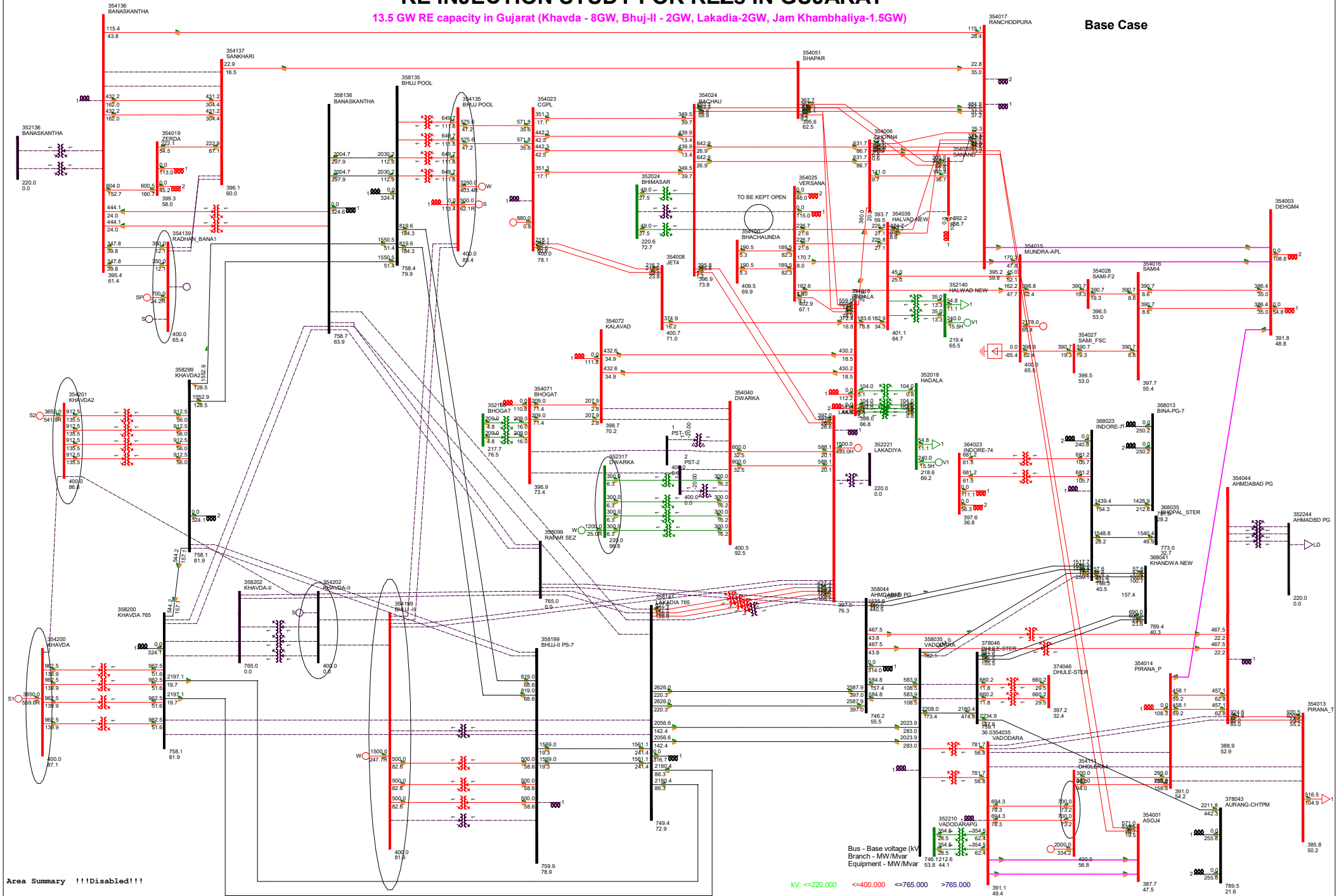
X-----THREE PHASE FAULT-----X																	
X-----	FROM	X	AREA	CKT	I/Z	/I+/	AN(I+)	/IA/	AN(IA)	/IB/	AN(IB)	/IC/	AN(IC)	/Z+/	AN(Z+)	APP	X/R
352210	[VADODARAPG 220.00]	3	1	AMP/OHM	1767.6	-85.54	1767.6	-85.54	1767.6	154.46	1767.6	34.46	12.10	90.00	9999.999		
352210	[VADODARAPG 220.00]	3	2	AMP/OHM	1767.6	-85.54	1767.6	-85.54	1767.6	154.46	1767.6	34.46	12.10	90.00	9999.999		
354001	[ASOJ4 400.00]	3	1	AMP/OHM	10191.7	-85.57	10191.7	-85.57	10191.7	154.43	10191.7	34.43	3.80	86.67	17.196		
354001	[ASOJ4 400.00]	3	2	AMP/OHM	10191.7	-85.57	10191.7	-85.57	10191.7	154.43	10191.7	34.43	3.80	86.67	17.196		
354111	[DHOLERA4 400.00]	3	1	AMP/OHM	3136.8	-87.24	3136.8	-87.24	3136.8	152.76	3136.8	32.76	29.14	86.42	15.978		
354111	[DHOLERA4 400.00]	3	2	AMP/OHM	3136.8	-87.24	3136.8	-87.24	3136.8	152.76	3136.8	32.76	29.14	86.42	15.978		
358035	[VADODARA 765.00]	3	1	AMP/OHM	7692.1	-89.36	7692.1	-89.36	7692.1	150.64	7692.1	30.64	54.62	90.00	9999.999		
358035	[VADODARA 765.00]	3	2	AMP/OHM	7692.1	-89.36	7692.1	-89.36	7692.1	150.64	7692.1	30.64	54.62	90.00	9999.999		
INITIAL SYM. S.C. CURRENT(I''k) (RMS) AMP					45556.0	-87.07	45556.0	-87.07	45556.0	152.93	45556.0	32.93					

RE INJECTION STUDY FOR REZs IN GUJARAT

13.5 GW RE capacity in Gujarat (Khavda - 8GW, Bhuj-II - 2GW, Lakadia-2GW, Jam Khambhaliya-1.5GW)

Annexure-IV

Base Case

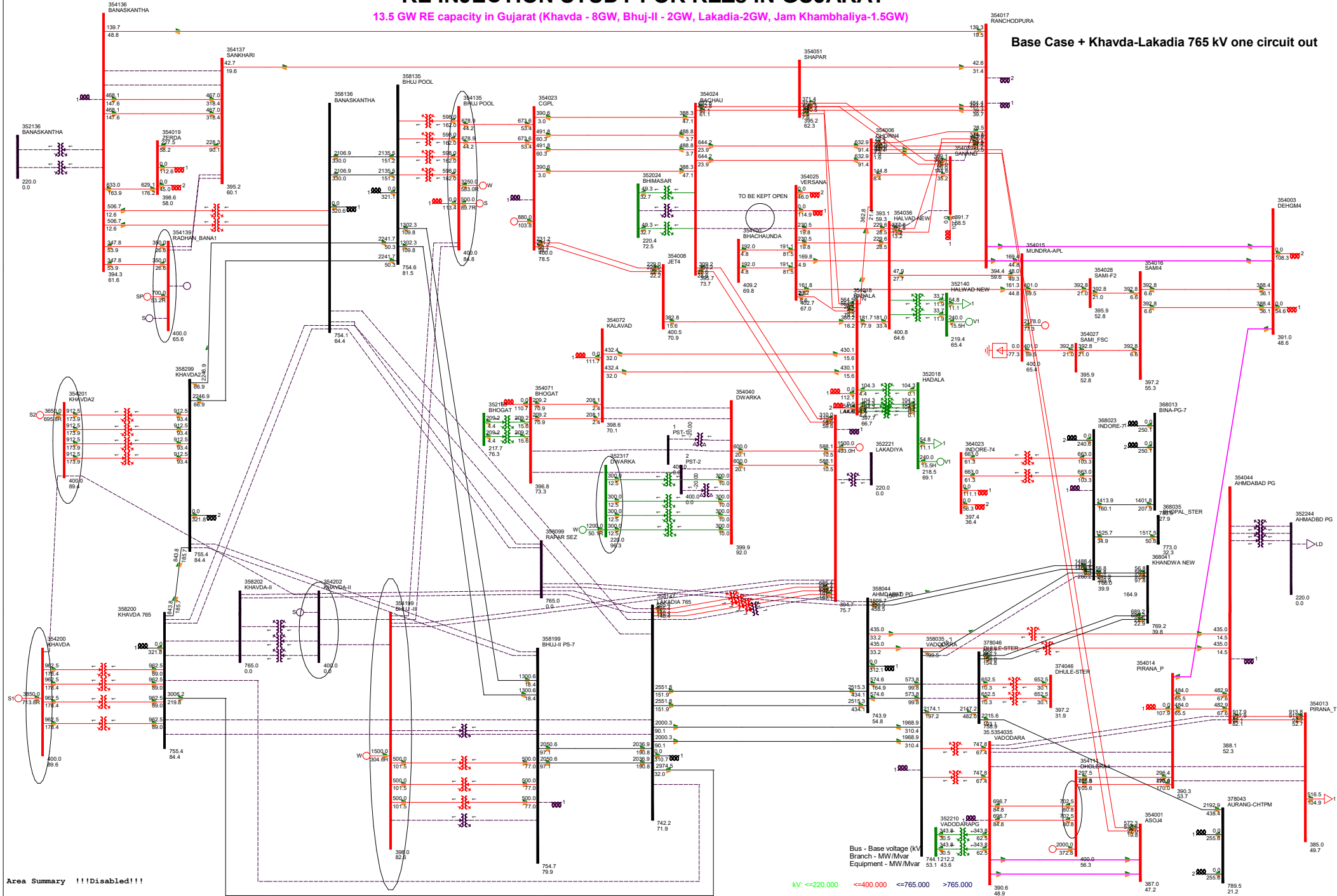


RE INJECTION STUDY FOR REZs IN GUJARAT

Annexure-IV

13.5 GW RE capacity in Gujarat (Khavda - 8GW, Bhuj-II - 2GW, Lakadia-2GW, Jam Khambhaliya-1.5GW)

Base Case + Khavda-Lakadia 765 kV one circuit out



Area Summary !!!Disabled!!!

Bus - Base voltage (kV)
 Branch - MW/Mvar
 Equipment - MW/Mvar

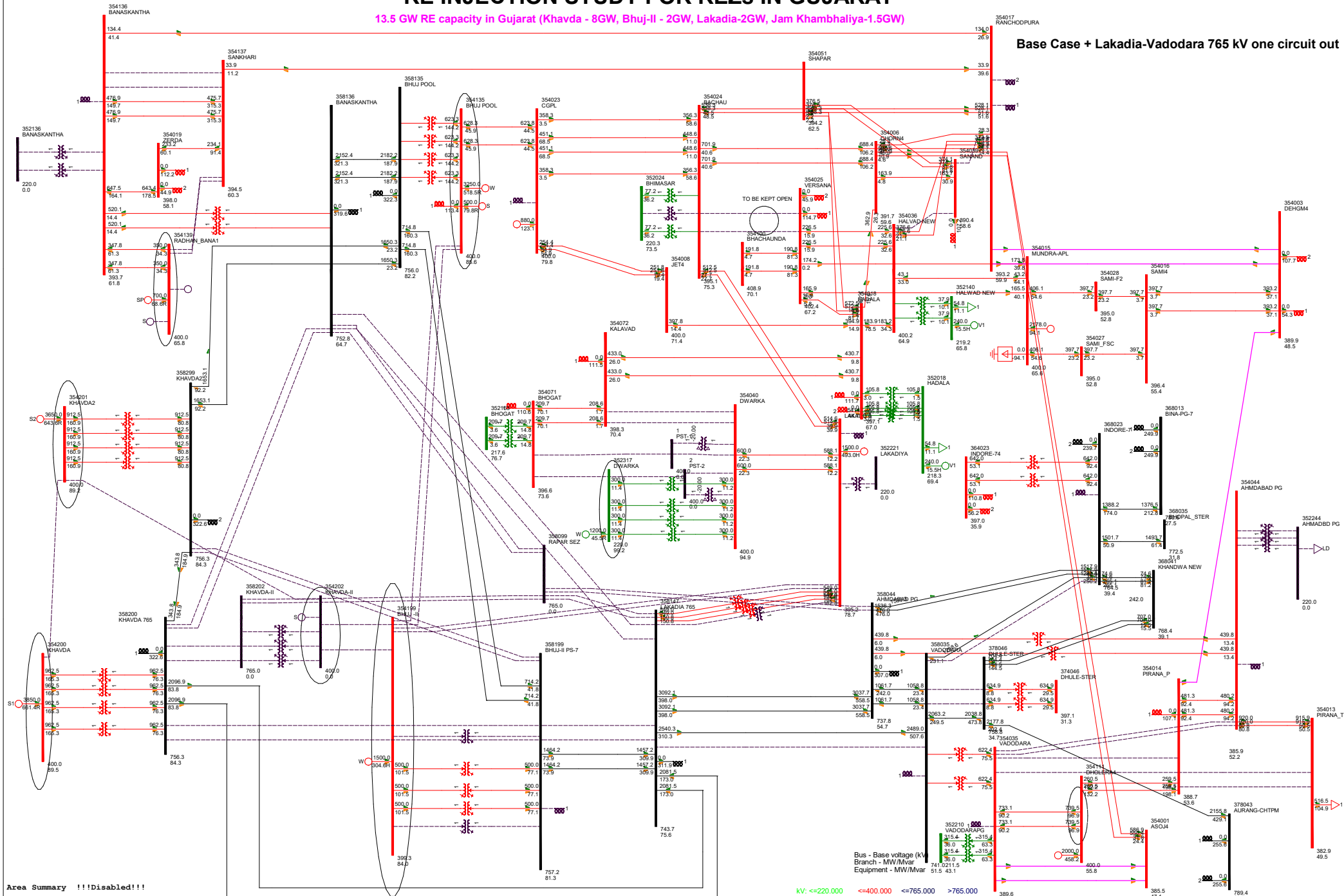
Color	Bus Base Voltage (kV)	Branch MW/Mvar	Equipment MW/Mvar
Red	<=220,000	<=400,000	<=765,000
Green	>=400,000	>=765,000	>=1,200,000
Blue	>=765,000	>=1,200,000	>=2,000,000
Purple	>=2,000,000	>=3,000,000	>=5,000,000

RE INJECTION STUDY FOR REZs IN GUJARAT

Annexure-IV

13.5 GW RE capacity in Gujarat (Khavda - 8GW, Bhuj-II - 2GW, Lakadia-2GW, Jam Khambhaliya-1.5GW)

Base Case + Lakadia-Vadodara 765 kV one circuit out



Area Summary !!!Disabled!!!

Bus - Base voltage (kV)
Branch - MW/Mvar
Equipment - MW/Mvar

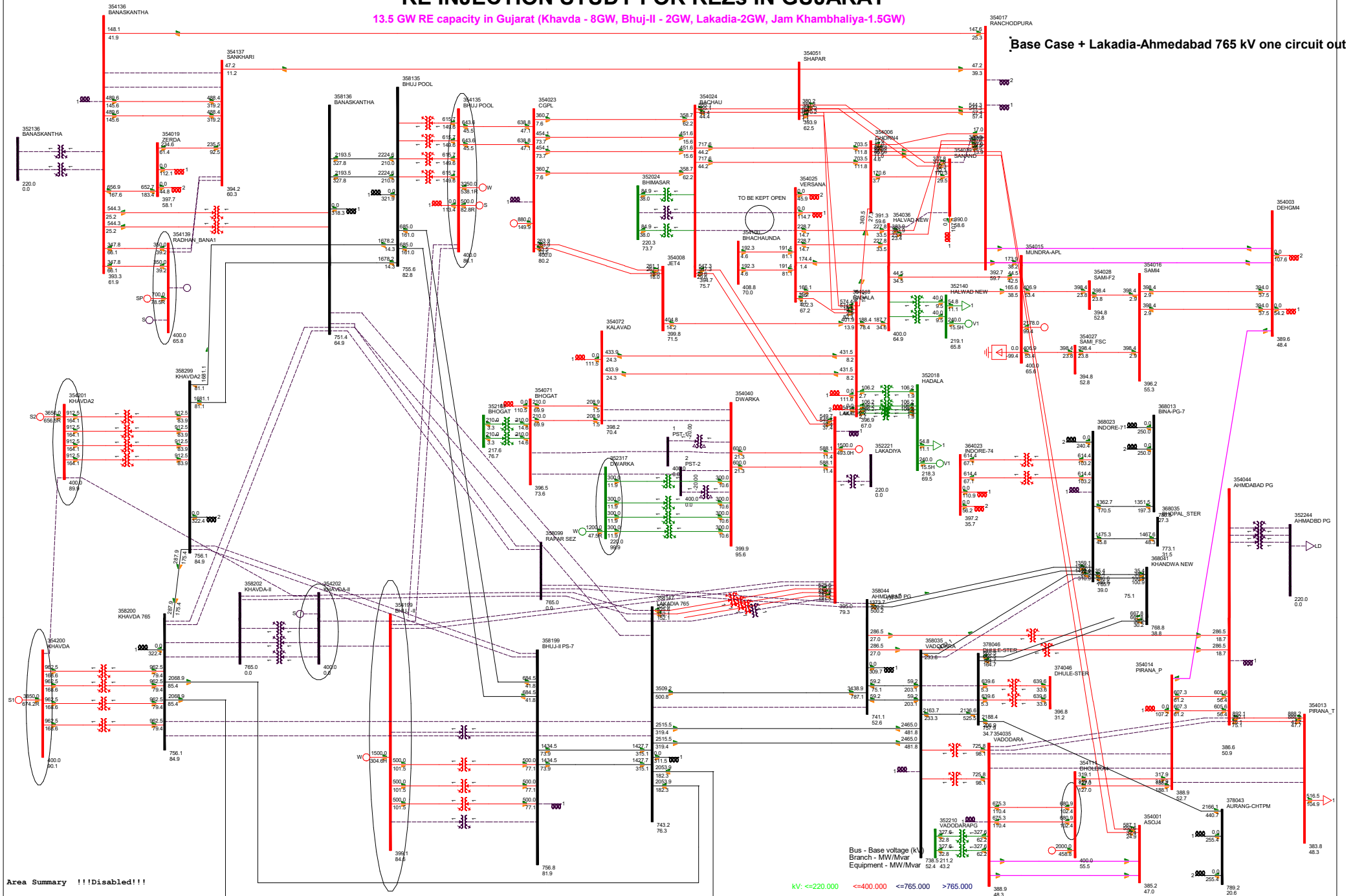
kv: ≤ 220.000 <math>< 400.000</math> ≤ 765.000 > 765.000

RE INJECTION STUDY FOR REZs IN GUJARAT

Annexure-IV

13.5 GW RE capacity in Gujarat (Khavda - 8GW, Bhuj-II - 2GW, Lakadia-2GW, Jam Khambhaliya-1.5GW)

Base Case + Lakadia-Ahmedabad 765 kV one circuit out

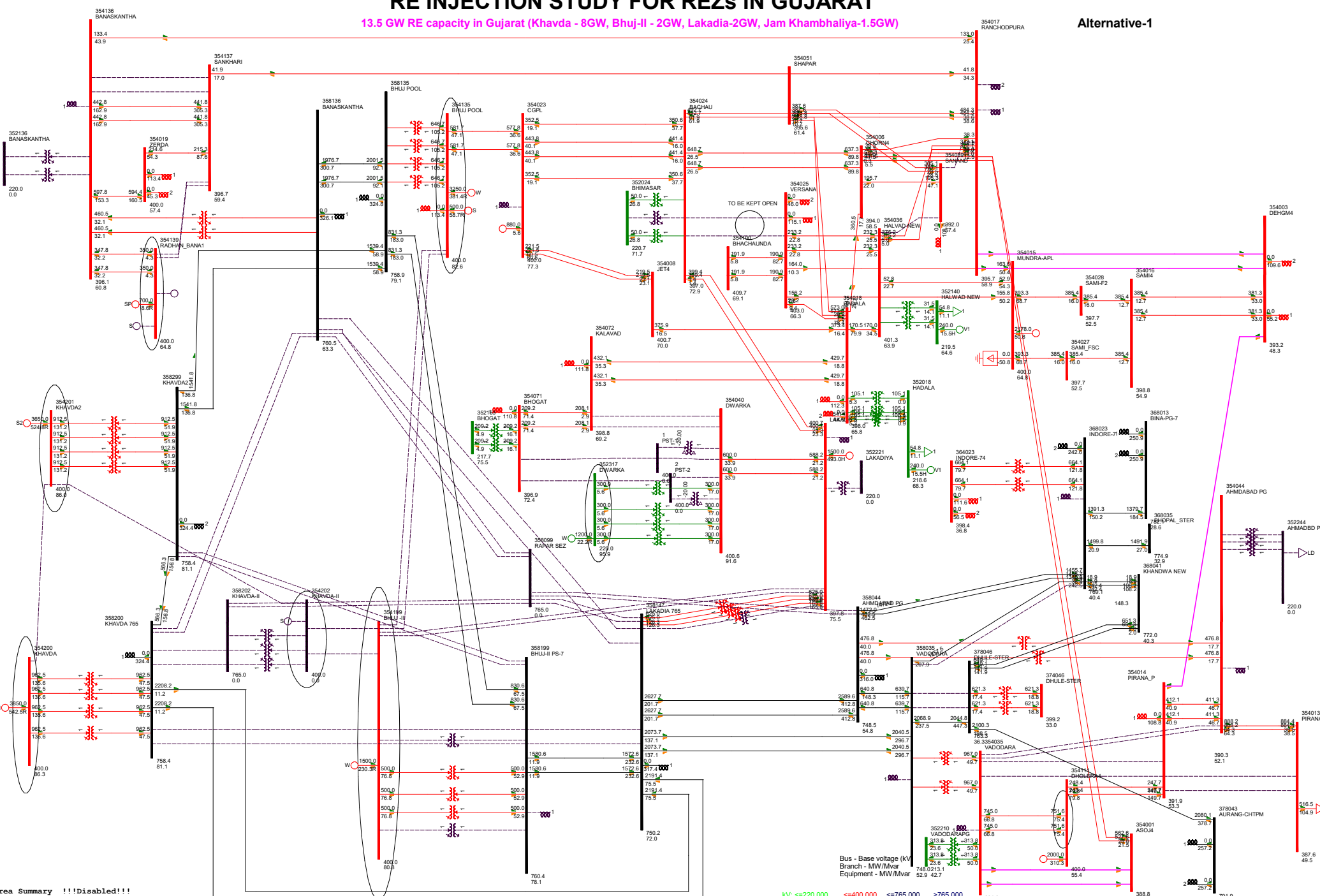


RE INJECTION STUDY FOR REZs IN GUJARAT

13.5 GW RE capacity in Gujarat (Khavda - 8GW, Bhuj-II - 2GW, Lakadia-2GW, Jam Khambhaliya-1.5GW)

Annexure-V

Alternative-1



Bus - Base voltage (kV)
Branch - MW/Mvar
Equipment - MW/Mvar

kv: <=220.000 <=400.000 <=765.000 >765.000

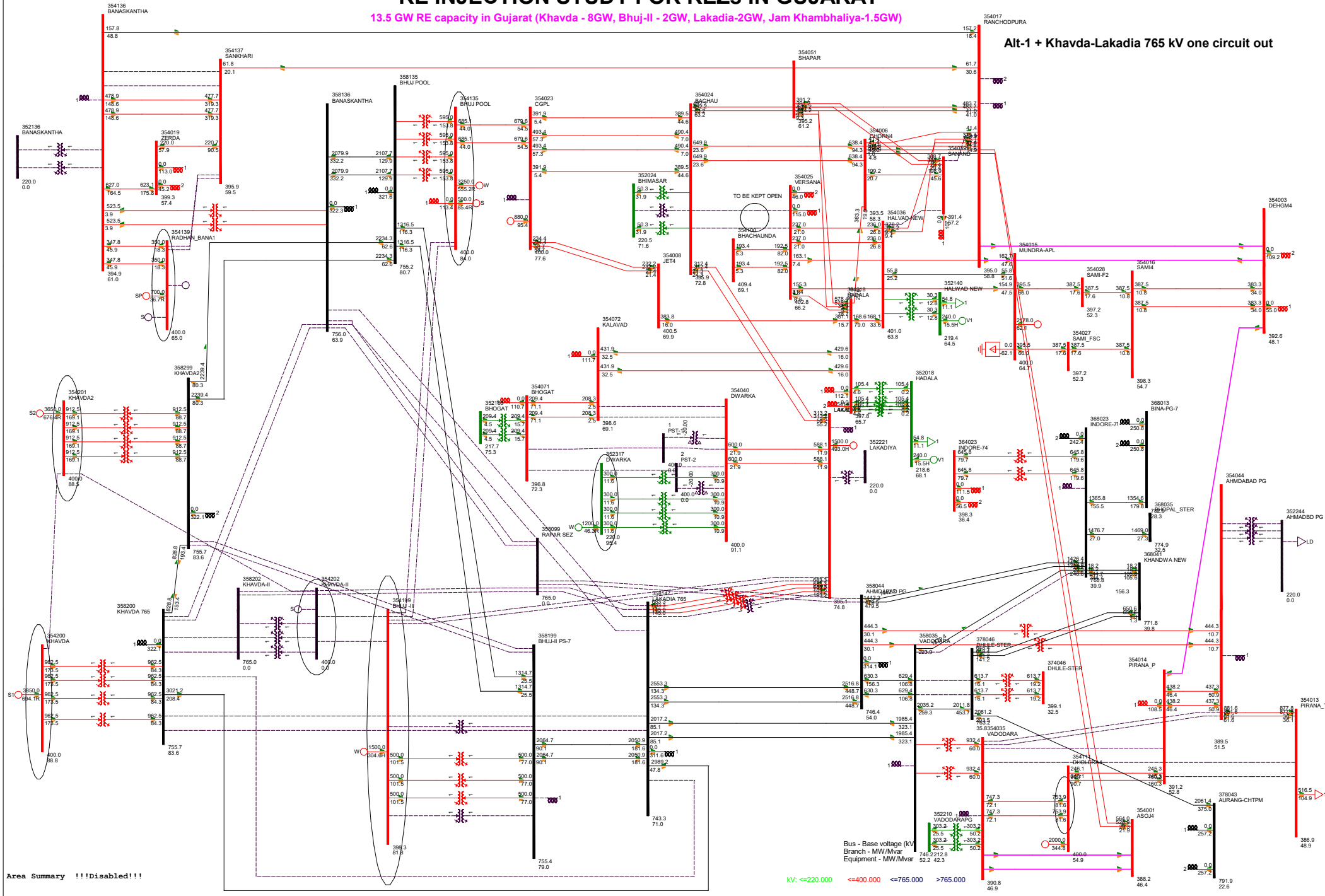
Area Summary !!!Disabled!!!

RE INJECTION STUDY FOR REZs IN GUJARAT

Annexure-V

13.5 GW RE capacity in Gujarat (Khavda - 8GW, Bhuj-II - 2GW, Lakadia-2GW, Jam Khambhaliya-1.5GW)

Alt-1 + Khavda-Lakadia 765 kV one circuit out



Area Summary !!!Disabled!!!

Bus - Base voltage (kV)
Branch - MW/Mvar
Equipment - MW/Mvar

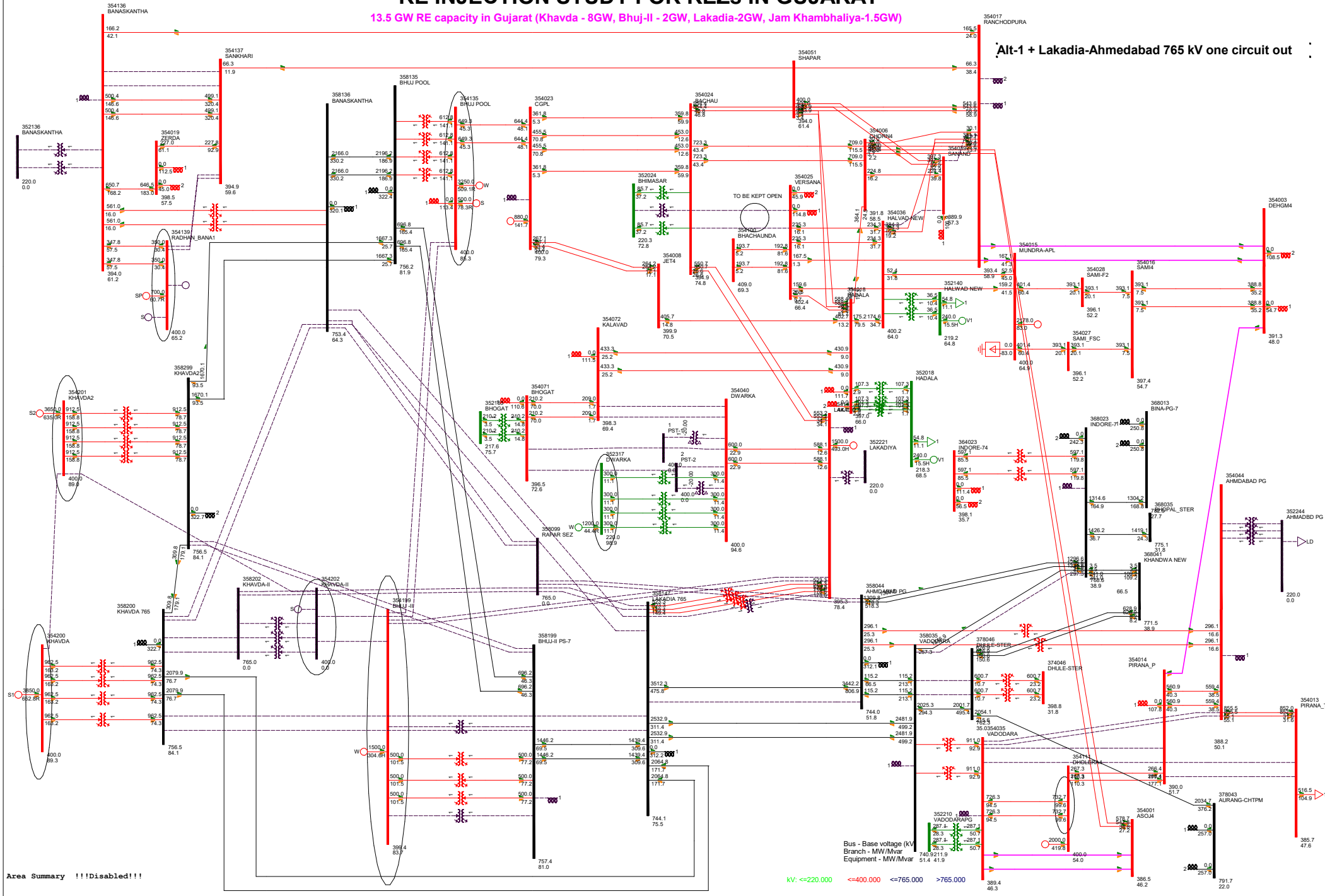
≤ 220.000	≤ 400.000	≤ 765.000	>765.000
--------------------------	--------------------------	--------------------------	----------

RE INJECTION STUDY FOR REZs IN GUJARAT

Annexure-V

13.5 GW RE capacity in Gujarat (Khavda - 8GW, Bhuj-II - 2GW, Lakadia-2GW, Jam Khambhaliya-1.5GW)

Alt-1 + Lakadia-Ahmedabad 765 kV one circuit out



Area Summary !!!Disabled!!!

Bus - Base voltage (kV)
Branch - MW/Mvar
Equipment - MW/Mvar

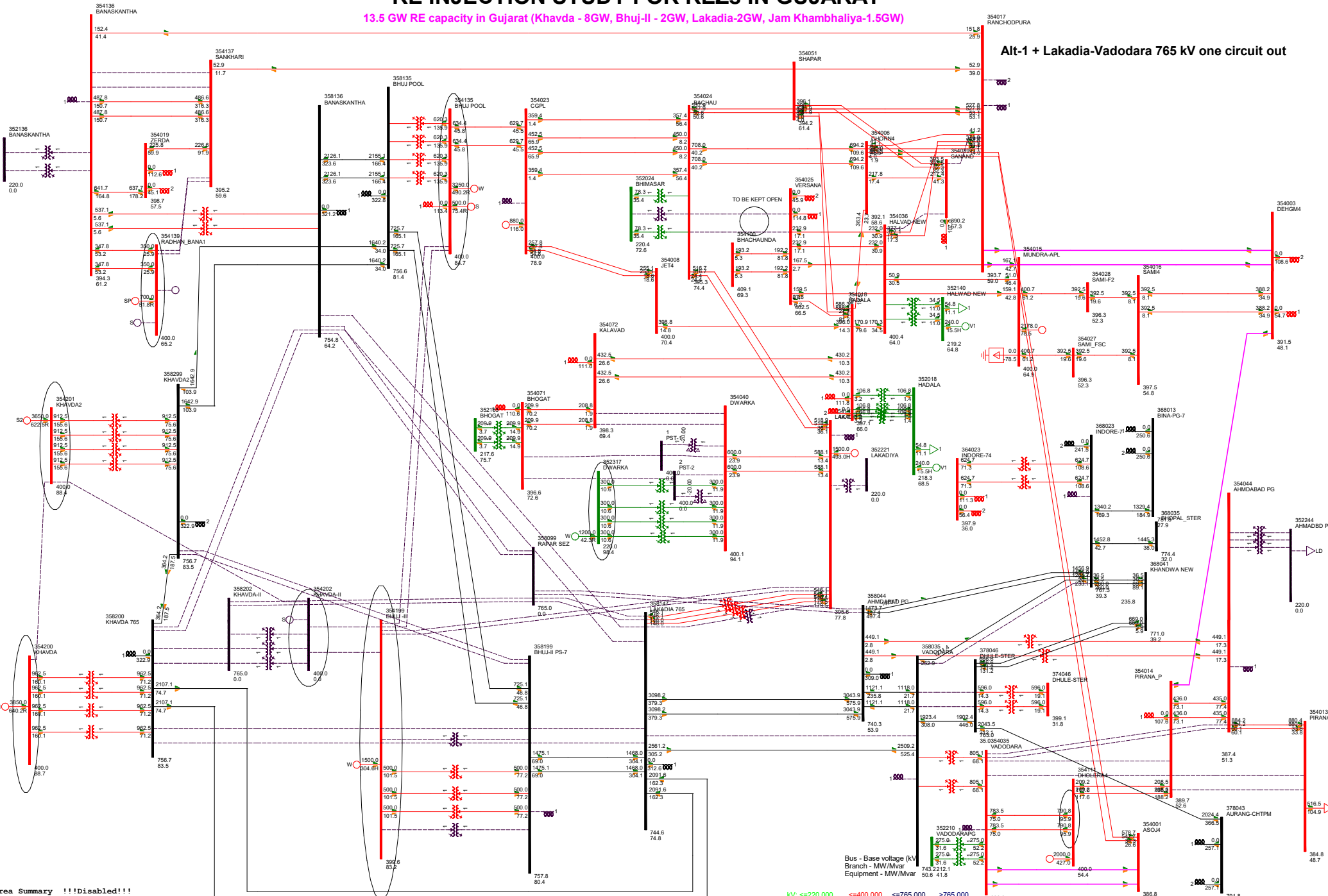
kv: <=220.000 <=400.000 <=765.000 >765.000

RE INJECTION STUDY FOR REZs IN GUJARAT

Annexure-V

13.5 GW RE capacity in Gujarat (Khavda - 8GW, Bhuj-II - 2GW, Lakadia-2GW, Jam Khambhaliya-1.5GW)

Alt-1 + Lakadia-Vadodara 765 kV one circuit out



Area Summary !!!Disabled!!!

Bus - Base voltage (KV)
Branch - MW/Mvar
Equipment - MW/Mvar

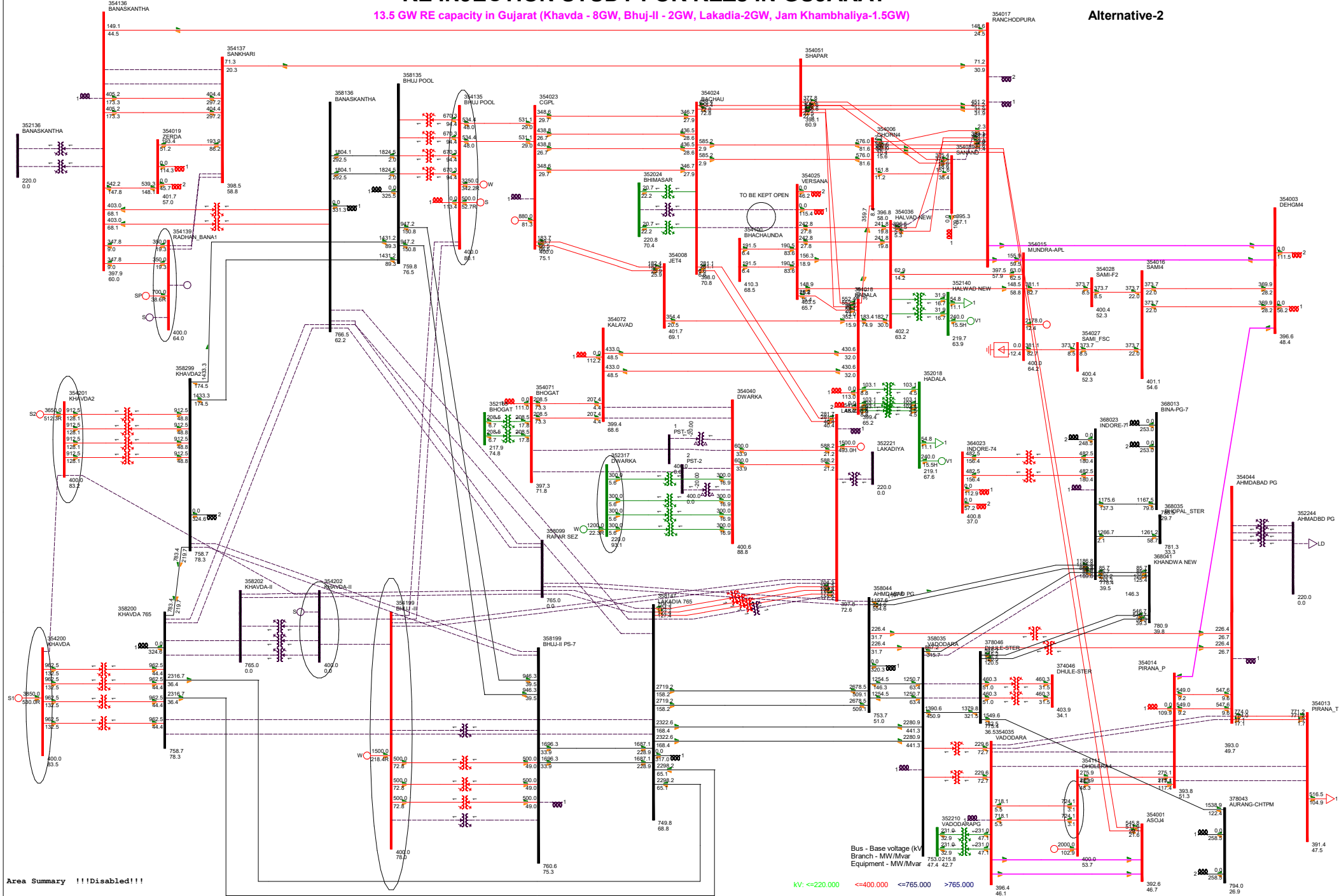
≤ 220.000 ≤ 400.000 ≤ 765.000 > 765.000

RE INJECTION STUDY FOR REZs IN GUJARAT

13.5 GW RE capacity in Gujarat (Khavda - 8GW, Bhuj-II - 2GW, Lakadia-2GW, Jam Khambhaliya-1.5GW)

Annexure-VI

Alternative-2

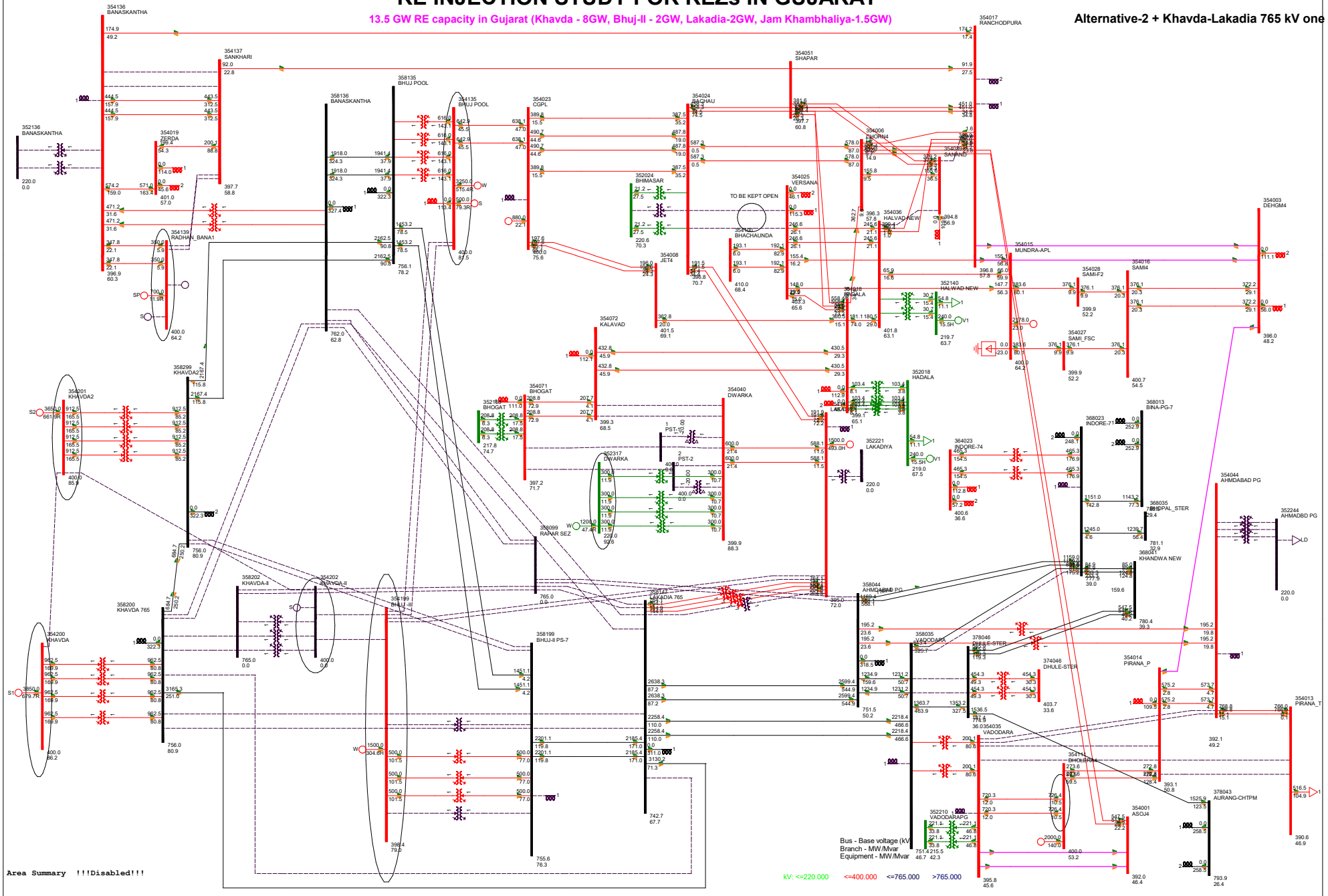


RE INJECTION STUDY FOR REZs IN GUJARAT

13.5 GW RE capacity in Gujarat (Khavda - 8GW, Bhuj-II - 2GW, Lakadia-2GW, Jam Khambhaliya-1.5GW)

Annexure-VI

Alternative-2 + Khavda-Lakadia 765 kV one circuit out



Area Summary !!!Disabled!!!

Bus - Base voltage (kV)
Branch - MW/Mvar
Equipment - MW/Mvar

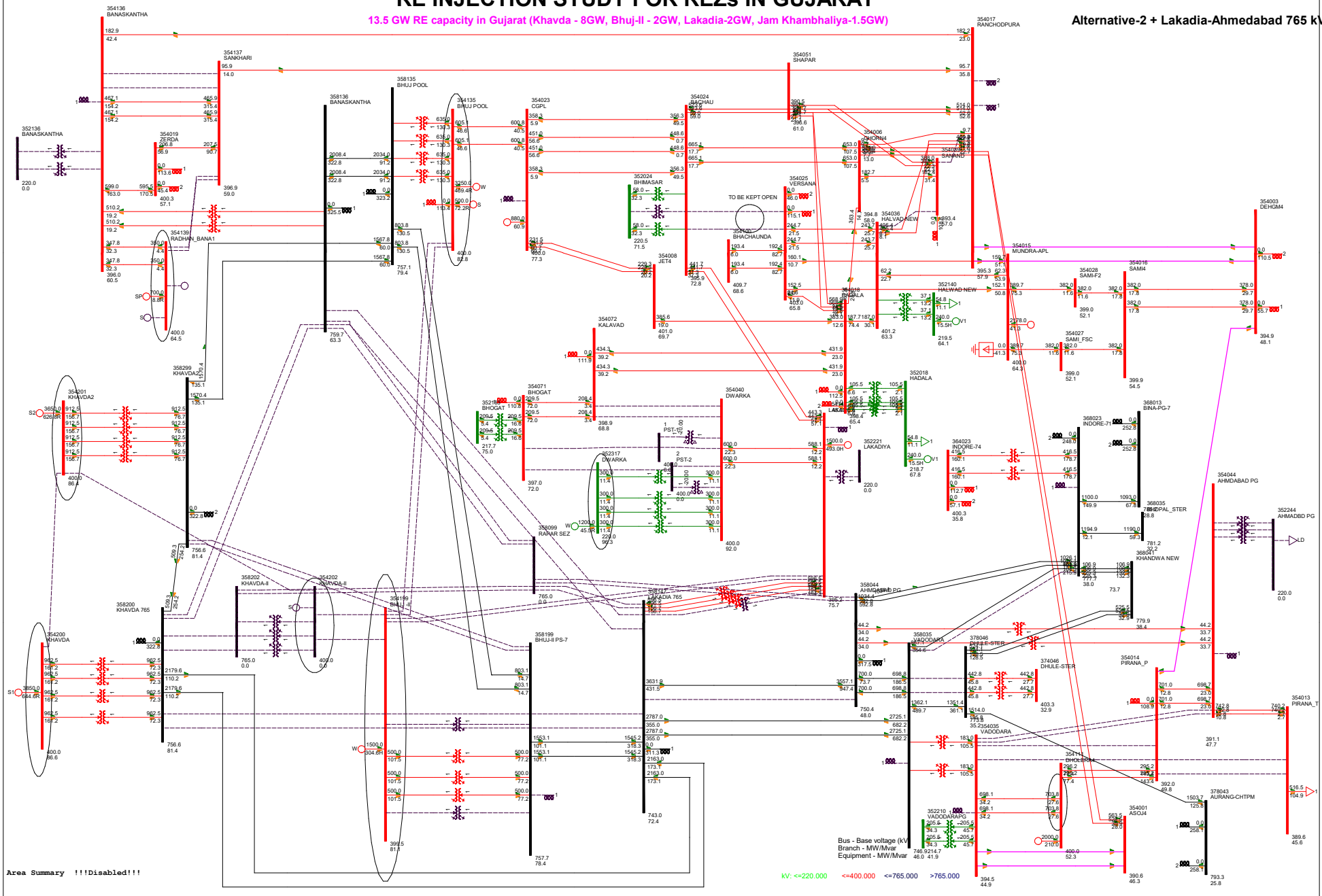
≤ 220.000 kV
 ≤ 400.000 kV
 ≤ 765.000 kV
> 765.000 kV

RE INJECTION STUDY FOR REZs IN GUJARAT

13.5 GW RE capacity in Gujarat (Khavda - 8GW, Bhuj-II - 2GW, Lakadia-2GW, Jam Khambhaliya-1.5GW)

Annexure-VI

Alternative-2 + Lakadia-Ahmedabad 765 kV one circuit out

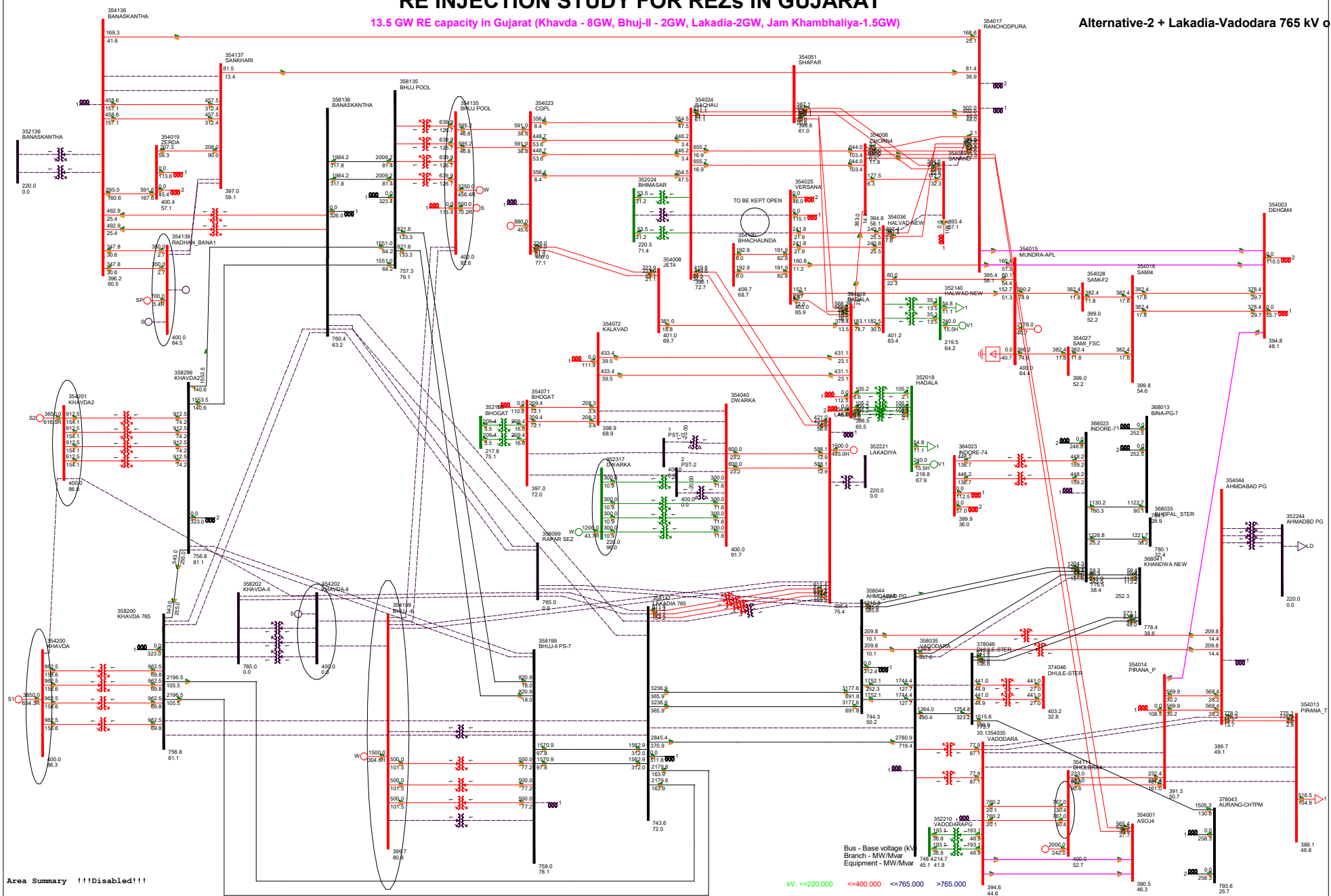


RE INJECTION STUDY FOR REZs IN GUJARAT

13.5 GW RE capacity in Gujarat (Khavda - 8GW, Bhuj-II - 2GW, Lakadia-2GW, Jam Khambhaliya-1.5GW)

Annexure-VI

Alternative-2 + Lakadia-Vadodara 765 kV one circuit out





भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

केन्द्रीय विद्युत प्राधिकरण

Central Electricity Authority

विद्युत प्रणाली योजना एवं मूल्यांकन-I प्रभाग

Power System Planning & Appraisal-I Division

To,

- (i) Shri Sanjay Dubey, IAS, Principal Secretaary, Energy Department, Second floor, Mantralaya, Vallabh Bhawann, Bhopal, Madhya Pradesh - 462004
- (ii) Principal Secretary (NRED), Mantralaya, Vallabh Bhawann, Bhopal, Madhya Pradesh - 462004
- (iii) Shri Sunil Tiwari, Managing Director, MPPTCL, Block no -2, Shakti Bhawan, Rampur, Jabalpur (M.P.) - 482008
- (iv) Shri Girish Kumar (Director), MNRE, Block-14, CGO Complex, Lodhi Road, New Delhi - 110003
- (v) Shri Subir Sen, COO (CTU), PGCIL, Saudamini, Plot No. 2, Sector - 29, Gurugram - 122001
- (vi) Managing Director (SECI), 1st Floor, D-3, A Wing, Prius Platinum Building District Centre, Saket, New Delhi - 110017


Subject: Minutes of Meeting to discuss Connectivity Issues at 220 kV voltage level with ISTS Sub-stations located in Madhya Pradesh.

महोदया / महोदय / Madam / Sir,

An e-meeting under the chairmanship of Chairperson, CEA to discuss Connectivity Issues at 220 kV voltage level with ISTS Sub-stations located in Madhya Pradesh was held on 15.07.2020.

The minutes of the meeting are enclosed herewith.

भवदीय,


(Goutam Roy) 4/8/20
Chief Engineer (PSPA-I)

Copy to: PPS to Chairperson, CEA, New Delhi.

Minutes of e- meeting held on 15.07.2020 under chairmanship of Chairperson, CEA to discuss Connectivity Issues at 220 kV voltage level with ISTS Sub-stations located in Madhya Pradesh

List of participants is attached as Annexure

1. Chairperson, CEA welcomed the participants and stated that the meeting has been convened to resolve Connectivity Issues of RE generators at 220 kV voltage level of ISTS Sub-stations located in Madhya Pradesh. He requested the members for fruitful discussion so that the issue could be resolved in this meeting.
2. CE (PSPA-I), CEA stated that in the meeting held earlier on 30.03.2020, the following decisions were taken with respect to grant of connectivity to RE developers at 220 kV level at ISTS S/stns in MP:
 - i) M/s Masaaya Solar Energy Pvt. Ltd may be granted connectivity at 220 kV level of existing Khandwa (PG) S/stn.
 - ii) CTU may proceed with grant of connectivity to 325 MW Wind Project of M/s SBESS Services Projectco Pvt Ltd at 220 kV level of existing Indore (PG) S/s. This would require implementation of Indore-Indore (PG) 2nd 220 kV D/c line for effecting the LTA that may be taken up as ISTS. Alternatively, since overloading of downstream network is involved in this case and considering RoW issues in Indore area, the modalities of implementing 400/220 kV transformer and directly connecting the generator to 400 kV bus of Indore (PG) S/stn could be explored. Any decision in this would require approval of the Western Regional Power Committee on Transmission Planning (WRPCTP)
 - iii) MPPTCL's concerns regarding applicability of STU transmission charges and losses on portion of power flowing from the generation project into Madhya Pradesh system is a commercial issue, which need to be addressed at appropriate forum.

Subsequently, MPPTCL vide e-mail dated 18.05.2020 had sent their observations on the minutes of meeting held on 30.03.2020 wherein it was stated that, Central Electricity Authority has been vested with the powers to resolve the dispute related with Generation, Transmission and Distribution amongst the stakeholders through different associated committees constituted under CEA and is presumed to be the appropriate forum to take decision on the concerned issue. Therefore, addressing the issue at appropriate forum other than CEA does not appear to be significant.

In the 47th and 48th meeting of Western Region Constituents regarding Connectivity and LTA applications in Western region convened by CTU on 06.05.2020 and 30.06.2020 respectively, MPPTCL once again had raised its concerns regarding applicability of State transmission charges & losses for additional power flowing through STU network if LTA is allowed with injection at 220 kV level. MPPTCL vide its email dated 18.05.2020 has requested CEA to address the same. In the 48th connectivity/LTA meeting held on

I/10790/2020

30.06.2020 MPPTCL was requested to convey their comments/observation on all the RE projects whose connectivity/LTA was under process by CTU at ISTS substations in Madhya Pradesh and a separate meeting would be held to discuss the same.

CE (PSPA-I), CEA requested MPPTCL to inform their present stand with respect to the above mentioned applications seeking connectivity/LTA at 220 kV voltage level in ISTS S/stns in MP.

3. MD, MPPTCL stated that about 43-50% power injected by the projects at Khandwa, Indore & Rajgarh S/s at 220 kV level would flow through MPPTCL (STU) network, resulting in increased loading and losses in the STU network. Accordingly, MPPTCL has been consistent in its view that STU transmission charges and losses on portion of power flowing from the generation project into Madhya Pradesh network would be applicable on the generation developer.
4. Principal Secretary (Energy), MP stated that as far as grant of connectivity at 220 kV level at Indore (PG) is concerned, on account of constraints in downstream system, CTU has come out with an option of an additional 1x500MVA, 400/220kV ICT (3rd) at Indore S/stn which would be segregated at 220 kV level to control overloading of downstream outlets. Since, with this arrangement, no additional power would flow through State network, therefore it is agreeable. However, in case of grant of connectivity at 220 kV level in Khandwa(PG) and Rajgarh S/stns, the problem of increased loading and losses in the STU network would remain. With RE expansion, this issue would be replicated in other states too. Accordingly, as a uniform approach to be followed for all future RE developers seeking ISTS connectivity, it can be agreed that either RE developers would be given the connectivity directly at 400 kV voltage level or alternatively segregated 400/220 kV transformer be implemented under ISTS at all such S/stns.
5. CTU made the following submissions over the observations and issues of MP:
 - i) In an integrated grid, power flows is through displacement. As far as total demand of MP is concerned, it remains same. With direct injection of power by RE generators at 220 kV level at Indore, Khandwa and Rajgarh 400/220 kV ISTS substations, the load of MP in the vicinity of Indore, Khandwa and Rajgarh shall be met locally and there shall be corresponding reduction in drawal of power from other ISTS substations in MP. Availability of generation near load centers would also reduce the overall loss of MP system.
 - ii) COO, CTU stated that even for Ultra mega Solar Parks at Neemuch (500 MW), Agar (550 MW) and Shajapur (450 MW) being developed by MP, M/s RUMS (the SPPD) has applied for connectivity at 220 kV voltage level. The pooling station under ISTS at Agar/Shajapur and Neemuch has been planned with injection level at 220 kV level. It may be noted that substantial power from these Solar Parks would be utilized by State itself.

I/10790/2020

6. CE (PSPA1), CEA stated that transmission system planning is done in a coordinated and optimal manner with an effort to utilize the available margins in the system. As far as MP's suggestion of granting ISTS connectivity to all future RE developers either at 400 kV voltage level or with implementation of segregated 400/220 kV transformers under ISTS would result in sub-optimal utilization of resources. Implementation of 400 kV bay for injection of mere 300 MW power is akin to under-utilisation of an asset. In case of injection of power at 220 kV level Indore (PG) S/stn, downstream STU network was found to be getting overloaded, so the option of either implementing the downstream system strengthening or implementing an additional 400/220 kV transformer was given. However, for Khnadwa and Rajgarh S/stn, even after RE injections at 220 kV voltage level, the downstream line loadings are well within the limits. Accordingly, it has been proposed that connectivity be granted to RE developers at 220 kV level at these substations.
7. SECI informed that these RE developers seeking connectivity at 220 kV level have come up via bidding process as per prevailing regulations. Now at this stage when financial closure has been achieved by the developers, they cannot agree for bearing any additional charges that have not been earlier mentioned in their bidding documents. Accordingly, it would not be prudent to impose upon them any additional condition to bear STU charges and losses or implement a dedicated 400/220 kV transformer at this stage.
8. Principal Secretary (Energy), MP enquired from SECI about the criteria of identifying the locations where RE bids are invited.
9. SECI informed that RE bids are floated primarily on pan-India basis. However, the list of potential locations where the transmission system gets identified in Regional Power Committees (Transmission Planning) are provided to the bidders/developers. Accordingly, the developers opt for the suitable location.
10. Principal Secretary (Energy), MP stated that considering the issue indicated by CEA, CTU & SECI, MPPTCL agrees for the connectivity of RE power of Masaaya Solar Energy Pvt. Ltd at 220 kV level of existing Khandwa (PG) S/stn and Spring energy at 220 kV level of Rajgarh S/stn. As regard to grant of connectivity at 220 kV level at Indore (PG) is concerned, CTU may proceed with grant of connectivity to 325 MW Wind Project of M/s SBESS Services Projectco Pvt Ltd at 220 kV level segregating it from the 220 kV existing Indore (PG) S/s and connecting the generator directly to 400 kV Indore (PG) bus through 400/220 kV transformer. He further stated that for any future connectivity in MP grid CTU should discuss with the STU beforehand so that the issue of overloading can be avoided.
11. MPNRED stated that they would be closing their bids for Neemuch, Agar and Shajpur Ultra Mega RE Power Parks by October' 2020. In the view of this, implementation of ISTS pooling stations in the time frame of July'2022 for evacuation of power from these Solar parks would be required. He further stated that Implementation of ISTS Transmission scheme for evacuation of power from RE projects in Rajgarh (2500 MW) has been decided to be done in phases. The transmission elements that have been formalized for evacuation of 1000 MW power from Agar and Shajapur Solar Park (1000 MW) under Phase-I comprises of establishment of Pachora 400/220 kV PS alongwith Pachora SEZ PS - Bhopal

I/10790/2020

(Sterlite) 400 kV D/c line. However, if instead of Pachora SEZ PP – Bhopal (Sterlite) 400 kV D/c line that is proposed under Ph-I, it is agreed to implement Pachora SEZ PP-Shujalpur 400kV D/c line (planned for Ph-II), it would result in cost and time saving as the length of line would get reduced.

12. CTU stated that any injection of power at Shujalpur S/s leads to overloading of 400/220kV ICTs and Shujalpur(PG)-Shujalpur(MP) 220kV D/c line under N-1 contingency condition. Hence, the same would require additional transmission system strengthening for which additional cost shall be incurred and its implementation would require approval by WRPC (TP). Also, with implementation of Pachora SEZ PP – Bhopal (Sterlite) 400 kV D/c line under first phase, evacuation of additional 500MW (in addition to 1000 MW in Phase-I) would be possible with the augmentation of 1x500MVA ICT at Pachora PS. CTU further stated that M/s RUMS may apply for LTA for firming up the Transmission system associated with the LTA from Rajgarh and Neemuch at the earliest and they may also apply for additional 500 MW Stage-I/II connectivity at Neemuch solar park as it would be developed as 2x500 MVA 400/220 kV P.S.

13. After detailed deliberations covering all the issues, the following was agreed :

i) The following Stage-II connectivity/LTA for RE developers were agreed :

S. No	RE developer	Connectivity point	LTA system
1	M/s Masaaya Solar Energy Pvt. Ltd Stage-II connectivity & LTA: 300MW	220 kV level of existing Khandwa (PG) S/stn. 220 kV line bay under developer scope.	Existing system
2	M/s Spring Vaayu Vidyut Pvt Ltd (300 MW): 100 MW additional LTA [Stage-II connectivity for 300MW & LTA for 200MW already granted]	220 kV level of existing Rajgarh S/s (already connected)	Existing system
3	M/s SBESS Services Projectco Pvt Ltd : Stage-II Connectivity for 324.4 MW already granted at existing 220 kV bus of Indore. LTA for 324.4 already applied	220 kV level of existing Indore (PG) 765/400/220 kV S/s. Connectivity system under ISTS scope: i) 220 kV bus extension of Indore 765/400/220 kV substation. ii) 220kV Hybrid	i) 1x500MVA, 400/220kV ICT (3rd) at Indore S/s along with associated ICT bays (400kV AIS & 220kV Hybrid/MTS) with 220kV ICT bay on extended bus. ii) Bus sectionaliser (Hybrid/MTS) between extended and existing 220 kV bus at Indore S/s [so that the 220kV bus

सेवा भवन, आर. के. पुरम-I, नई दिल्ली-110066 ईमेल: cea-pspa1@gov.in वेबसाइट: www.cea.nic.in

Sewa Bhawan, R.K Puram-I, New Delhi-110066 Email: cea-pspa1@gov.in Website: www.cea.nic.in

I/10790/2020

		/MTS line bay	section with dedicated line of SBESS as well as 3rd ICT may be segregated from the existing 220kV bus at Indore S/s, whenever required, in order to control the overloading of 220kV outlets from Indore S/s depending on the injection of power from SBESS]
4	M/s RUMS : Agar(550 MW) and Shajpur (450 MW) Solar Park M/s RUMS has applied for Stage-I/II connectivity and the same is under process. M/S RUMS has not yet applied for LTA	Connectivity at 220kV level proposed at planned Pachora P.S	M/s RUMS may apply for LTA for firming up the Transmission system associated with the LTA.
5	M/s RUMS : Neemuch Solar park (500 MW) M/s RUMS has applied for Stage-II connectivity and the same is under process. M/S RUMS has not yet applied for LTA	Connectivity at 220kV level proposed at envisaged Neemuch P.S.	M/s RUMS may apply for LTA for firming up the Transmission system associated with the LTA.

- ii) M/s RUMS to apply for additional 500 MW Stage-I/II connectivity at Neemuch solar park and LTA corresponding to the Stage-II quantum granted/applied for w.r.t Agar,Shajapur & Neemuch Solar Parks as mentioned in the above table.
- iii) For facilitating expeditious implementation of ISTS pooling stations at Pachora and Neemuch, MPNRED would be providing the boundary limits of the identified land for setting up the REZ pooling stations for Pachora and Neemuch RE power park complex.

Meeting ended with thanks to chair.

List of participants

सेवा भवन, आर. के. पुरम-I, नई दिल्ली-110066 ईमेल: cea-pspa1@gov.in वेबसाइट: www.cea.nic.in
Sewa Bhawan, R.K Puram-I, New Delhi-110066 Email: cea-pspa1@gov.in Website: www.cea.nic.in

I/10790/2020

Date: 15.07.2020

S.No	Name (S/Shri)	Designation	Mb. No.	Email
I. CEA				
1.	P.S.Mhaske	Chairperson- in chair	011-26732222	chair@nic.in
2.	Goutam Roy	Chief Engineer	8376817933	goutamroy.715@gmail.com
3.	Awdhesh Kr. Yadav	Director	9868664087	awd.ceal@gmail.com
4.	Priyam Srivastava	Dy. Director	9717650473	priyam.cea@gmail.com
5.	Vikas Sachan	Asst. Director	7838263649	vikas.cea@gov.in
II. Govt. of MP				
6.	Sanjay Dubey	Principal Secretary (Energy Dept.) & MPNRED	0755-2708031	secyenergy@mp.gov.in
III. MNRE				
7.	Girish Kumar	Scientist E	9717493267	gkumar.mnre@nic.in
IV. POWERGRID				
8.	Subir Sen	COO(CTU-Plg)	9650293185	subir@powergridindia.com
9.	Ashok Pal	CGM(CTU-Plg)	9910378105	ashok@powergridindia.com
10.	P.S. Das	GM, CTU	8826094863	psdas@powergridindia.com
11.	Bhaskar Wagh	Manager		bhaskarwagh@powergridindia.com
12.	Pratyush Singh	Sr. Engineer		pratyush.singh@powergridindia.com
13.	Shashank Shekhar	Engineer		shashankshekhar@powergridindia.com
V. MPPTCL				
14.	Sunil Tiwari	Managing Director	0761-2661234	md@mptransco.nic.in
15.	M.K.Jaitwal	Chief Engineer	9425805577	ce.pnd@mptransco.nic.in
16.	Mohan Dhoke	S E	0761-2702180	se3.pnd@mptransco.nic.in
VI. SECI				
17.	S. K. Mishra	Managing Director		sk.mishra@seci.co.in
18.	R.K. Agarwal	Consultant	9910346333	pikabaya56@gmail.com
VII. MPNRED				
19.	Deepak Saxena	Add. Comm & MD	0755-2556526	mduvnb@gmail.com
20.	Avaneesh Shukla	Executive Engineer	0755-2980002	avaneesh.shukla3@gmail.com

MADHYA PRADESH POWER TRANSMISSION CO. LTD.

(A wholly owned Govt. of Madhya Pradesh Undertaking)

CIN: U40109MP2001SGC014880

Block No.2, Shakti Bhawan, Rampur, Jabalpur (MP) 482008, Tel.:(0761) 270-2132, 2242

Fax No.: (0761) 2660908, e-mail: cepts321@yahoo.com/ce.pnd@mptransco.nic.in



No. 04-02/N-171/ 1157

Jabalpur, Date: 21-7-2020

To,

✓ **Shri Goutam Roy**
 Chief Engineer (PSP & A-I),
 Central Electricity Authority,
 Sewa Bhawan, R.K. Puram
 New Delhi – 110066.

Fax No.: 011-26102045
 -26175921

Sub: Proposed agenda point of MPPTCL for inclusion in 2nd Western Region Power Committee- Transmission Planning (WRPC-TP).

Ref: CEA Email dated 07.07.2020

In reference to your email cited above, the agenda point of MPPTCL proposed to be included in 2nd Western Region Power Committee - Transmission Planning (WRPC-TP) is given here under:

- (A) **LILLO of both circuit of Itarsi (PGCIL) to Bhopal (MPPTCL) 400kV D/C line (on Twin Moose) at Mandideep 400kV GIS Substation (Distt-Bhopal) to be constructed under TBCB process.**

Demand of Madhya Pradesh has reached 14555MW in FY 2019-20 and expected to grow upto 18000MW approximately by year 2022-23. Accordingly, system studies were carried out to evolve transmission system requirement for the end of 13th Plan period considering load demand of Madhya Pradesh as 18000MW. In this context it is to intimate that at present, MPPTCL is having only one 400kV substation at Bhopal. The 220kV substations Bhopal, Mandideep and Hoshangabad are being fed from Itarsi (PGCIL) 400kV substation as well as Bhopal(MPPTCL) 400kV substation through a 220kV DCDS line. Bhopal 400kV substation is also feeding the load of Beragarh, Vidisha, Mugaliyachhap, Adampur and Shujalpur 220kV substations of MPPTCL. Presently total transformation capacity of Bhopal(MPPTCL) 400kV substation is 4x315MVA i.e. 1260MVA. The maximum load recorded during 2019-20 on Bhopal 400kV substation is 1013MVA (80.40%). As the Bhopal is the Capital City of the Madhya Pradesh State, it is expanding very rapidly and entire supply of Bhopal City is dependent upon only one 400kV substation.

Therefore, in order to meet the future load growth of the Bhopal City and to cater the load of Mandideep industrial area, it is proposed to create a new 400/220/132/33kV GIS substation at Mandideep under TBCB route with intra-state transmission works as given hereunder :

- (i) Establishment of 400/220/132/33kV GIS substation at Mandideep with (2x500MVA,400/220kV) + (2x160MVA,220/132kV) + (1x50MVA,132/33kV) transformers and 1x125MVAR Bus Reactor

- (ii) LILO of both circuit of Itarsi (PGCIL) - Bhopal 400kV line (Twin Moose) at Mandideep 400kV GIS substation (2x10Km)
- (iii) LILO of both circuits of Hoshangabad - Mandideep - Adampur 220kV line at Mandideep 400kV GIS substation (2x10Km)
- (iv) LILO of Mandideep132 - Bagroda 132kV line at Mandideep 400kV GIS substation (10Km)
- (v) LILO of Mandideep220 - MACT Bhopal 132kV line at Mandideep 400kV GIS substation (10Km)

(B) LILO of Auriya(UP) – Mehgaon 220kV line at Bhind (TBCB) 220kV substation.

Creation of 220/132kV Substation at Bhind (Distt-Bhind) is being undertaken through TBCB process with (2x160)MVA,220/132kV transformation capacity and by laying a 220kV DCDS line from Morena(Adani-TBCB) 400kV S/s to Bhind 220kV S/s. M/s Powergrid-Bhind Guna Transmission Ltd. (PG-BGTL) has been selected as Transmission Service Provider (TSP) for implementation of above intra-state transmission project through TBCB process. M/s Powergrid-Bhind Guna Transmission Ltd. has started the activities and work is targeted to be completed in 36 months from Signing of Share Purchase Agreements(SPA) & Transfer of SPV i.e. from 11.09.2019.

It is further to mention that at present total transformation capacity of Mehgaon 220kV substation is (2x160)MVA (i.e. 320MA) and maximum load recorded during the year 2019-20 is 273MVA (85%). Moreover, due to space constraints, it is not possible to enhance the capacity at this substation. Mehgaon 220kV Substation is fed through 220kV lines connected from Auriya (UP) and Morena (Adani-TBCB) 400kV S/s and maximum load recorded during the year 2019-20 on these lines are 134MW and 231MW respectively. In case of outage of Morena (Adani-TBCB) – Mehgaon 220kV line, the Auriya(UP) – Mehgaon 220kV line gets overloaded and it is difficult to manage the loads feeding from Mehgaon 220kV S/s and reliability of supply in the area also affected.

Looking to the gradual increase in load of Mehgaon 220kV S/s and overloading on Auriya(UP) – Mehgaon 220kV line during contingency condition, it is has been proposed to LILO of Auriya(UP) – Mehgaon 220kV line at Bhind (TBCB) 220kV substation. The provision of 2 Nos. 220kV feeder bays for termination of LILO of Auriya(UP) – Mehgaon 220kV line at Bhind (TBCB) 220kV substation is already considered under the scope of work of TSP i.e. M/s Powergrid-Bhind Guna Transmission Ltd..

(C) LILO of Gwalior (Mahalgaon) - Datiya 220kV line at Gwalior (PGCIL) 765kV Substation.

It is to mention that at present total transformation capacity of Gwalior (Mahalgaon) 220kV substation is (2x160+120)MVA (i.e. 440MA) and maximum load recorded during the year 2019-20 is 304MVA. Gwalior (Mahalgaon) 220kV substation is fed through 220kV lines connected from Bina(MP) 400kV S/s and Gwalior (PGCIL) 765kV S/s. The maximum load recorded on Gwalior(Mahalgaon) to Gwalior(PGCIL) 220kV D/C line in the year 2019-20 is 135MW & 141MW respectively. In case of outage of any one circuit, the other 220kV circuit gets overloaded and it is difficult to

manage the feeding from Gwalior(Mahalgaon) 220kV S/s and reliability of supply in the area also affected.

Looking to the gradual increase in load of Gwalior (Mahalgaon) 220kV S/s and overloading on Gwalior(Mahalgaon) to Gwalior(PGCIL) 220kV D/C line during contingency condition, it is has been proposed to LILO of Gwalior (Mahalgaon) - Datiya 220kV line at Gwalior (PGCIL) 765kV Substation. PGCIL is requested to consider the provision for construction of 2 Nos. 220kV feeder bays for termination of LILO of Gwalior (Mahalgaon) - Datiya 220kV line at Gwalior (PGCIL) 765kV Substation in the matching timeframe.

In view of above, it is requested that aforementioned proposals of MPPTCL may please be considered as agenda items for inclusion in 2nd Western Region Power Committee- Transmission Planning (WRPC-TP) for approval of the committee.


Chief Engineer(Plg. & Design)
MPPTCL-Jabalpur

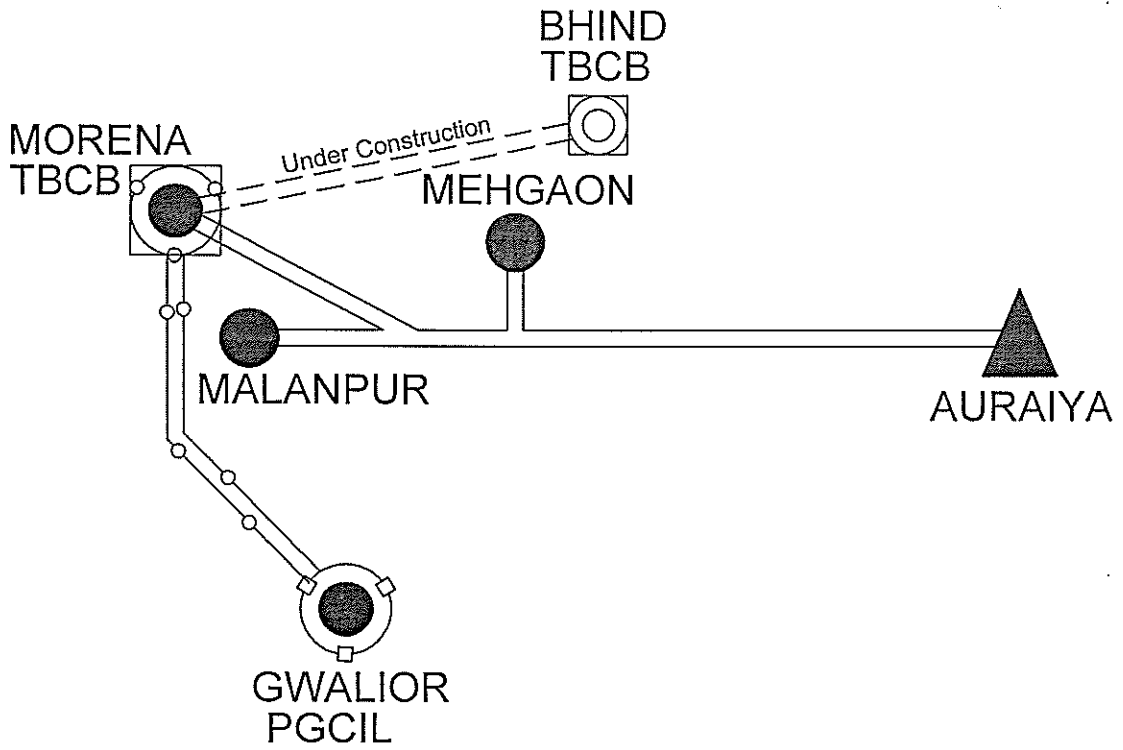
Copy to:

Staff officer, O/o Managing Director ,MPPTCL, Jabalpur

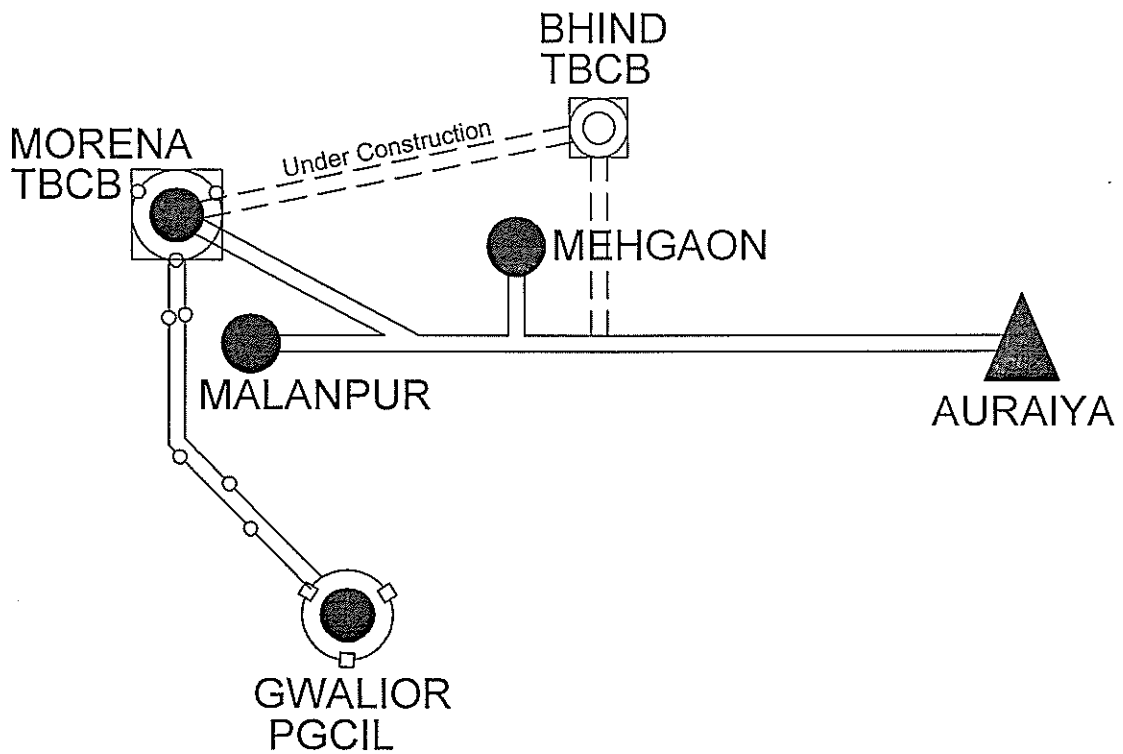
LILO OF MAHALGAON 220KV - AURAIYA(UP) LINE AT BHIND 220KV (TBCB)

Existing Arrangement

APPENDIX-I



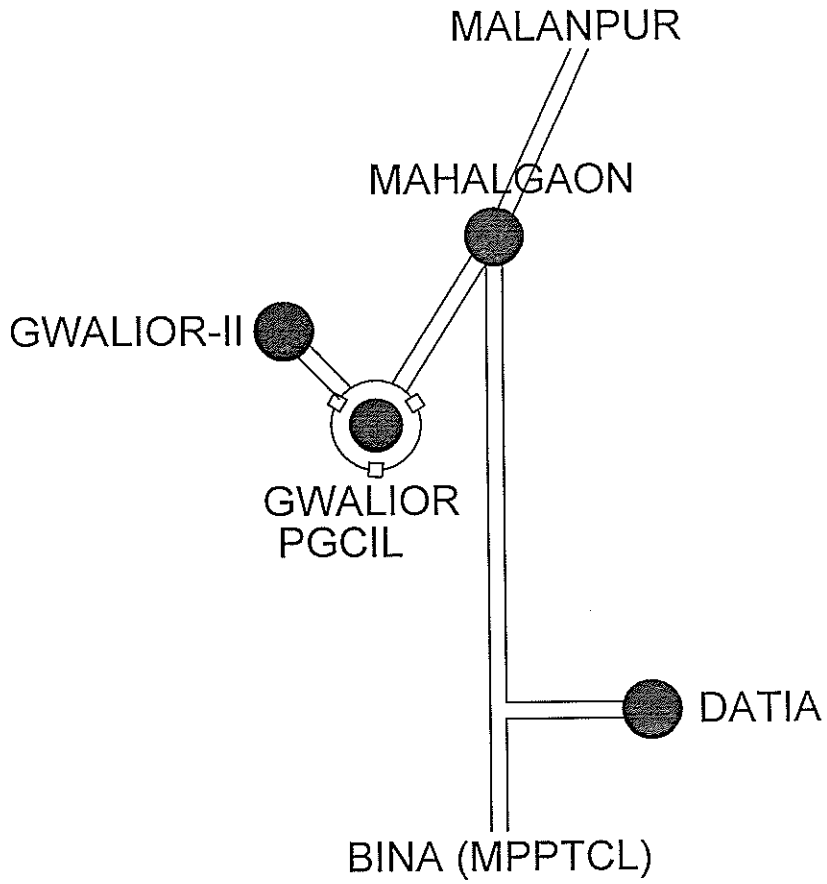
Proposed Arrangement



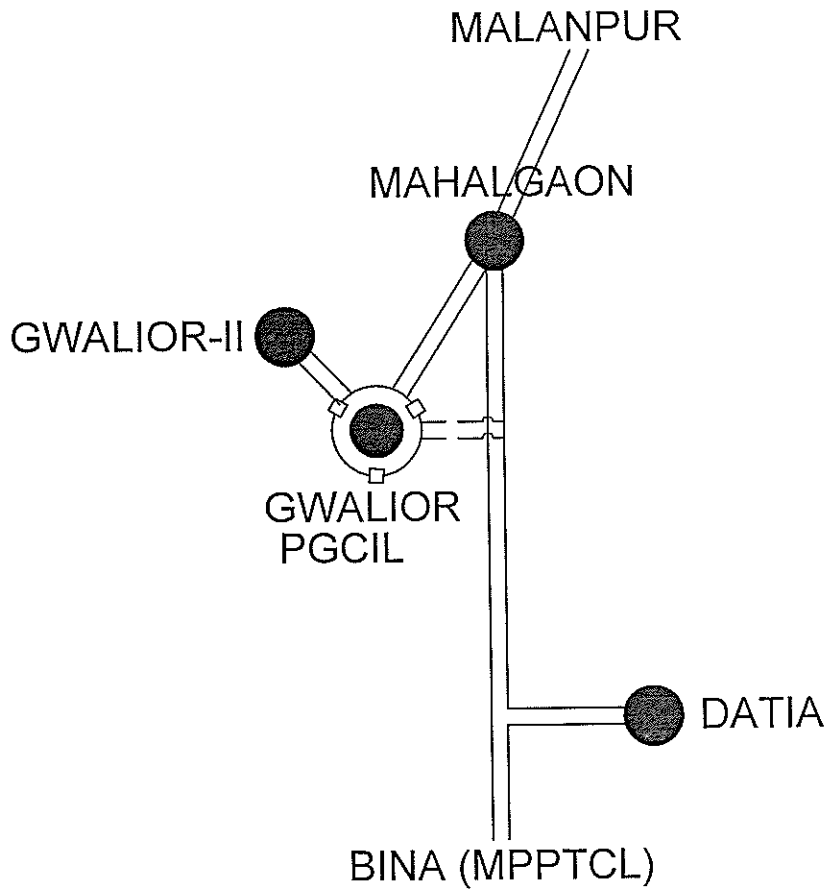
LIL OF MAHALGAON 220KV - DATIA 220KV LINE AT GWALIOR 765KV

Existing Arrangement

APPENDIX-II



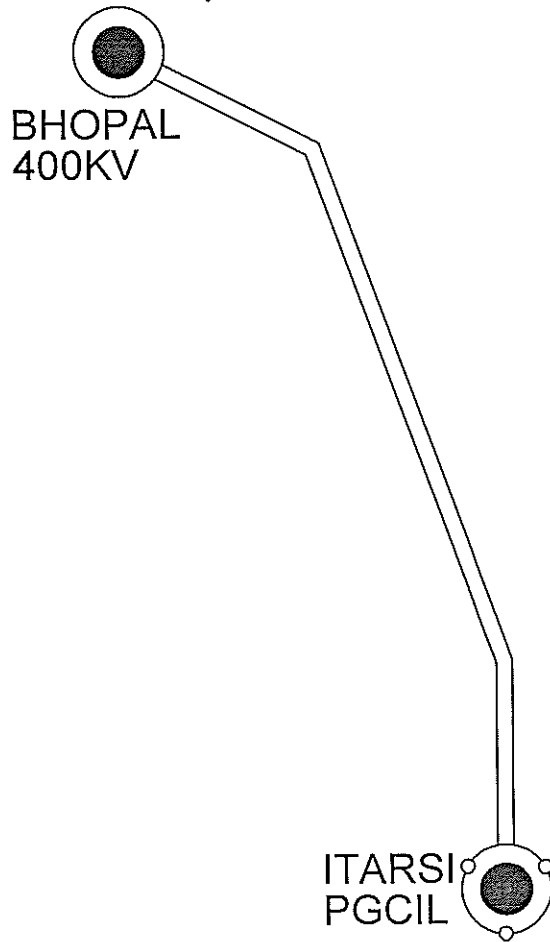
Proposed Arrangement



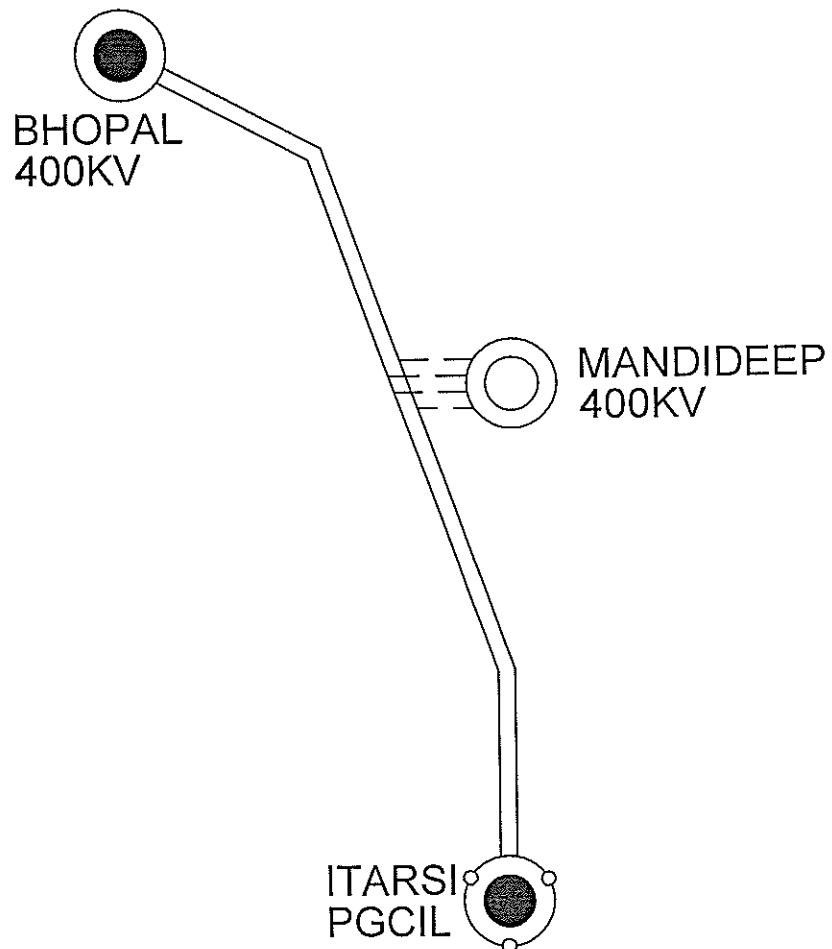
LILO OF BHOPAL 400KV - ITARSI (PGCIL) LINE AT MANDIDEEP GIS

Existing Arrangement

APPENDIX-III



Proposed Arrangement



MADHYA PRADESH POWER TRANSMISSION CO. LTD.

(A wholly owned Govt. of Madhya Pradesh Undertaking)

CIN: U40109MP2001SGC014880

Block No.2, Shakti Bhawan, Rampur, Jabalpur (MP) 482008, Tel.:(0761) 270-2132, 2242

Fax No.: (0761) 2660908, e-mail: cepts321@yahoo.com/ce.pnd@mptransco.nic.in



No. 04-02/N-171/

1198

Jabalpur, Date: 28-7-2020

To,

✓ Shri Goutam Roy

Chief Engineer (PSP & A-I),
Central Electricity Authority,
Sewa Bhawan, R.K. Puram
New Delhi – 110066.

Fax No.: 011-26102045
-26175921

Sub: Proposed agenda point of MPPTCL for inclusion in 2nd Western Region Power Committee Transmission Planning (WRPC-TP).

Ref: CEA Email dated 07.07.2020

In reference to your email cited above, the agenda point of MPPTCL proposed to be included in 2nd Western Region Power Committee - Transmission Planning (WRPC-TP) is given here under:

(A) Conversion of 400kV fixed line reactors as switchable line reactors installed on 400kV lines of PGCIL.

PGCIL has constructed 400kV bays at Bhopal & Nagda 400kV Substations of MPPTCL alongwith fixed line reactors for interconnection of following 400kV lines of PGCIL. These 400kV bays are the property of PGCIL and is being maintained by MPPTCL at the cost of PGCIL:

Sl. No.	Name of Line	Length (in Km)	Capacity (MVAR)		Switchable (S) / Fixed (F)	
			End-1	End-2	End-1	End-2
1	400kV bay for Damoh(PGCIL) to Bhopal(MPPTCL) 400kV D/C line (Ckt-1)	214	-	1x50	-	F
2	400kV bay for Damoh(PGCIL) to Bhopal(MPPTCL) 400kV D/C line (Ckt-2)	214	-	1x50	-	F
3	400kV bay for Nagda(MPPTCL) to Dehgam(Gujrat) 400kV D/C line (Ckt-1)	331	1x50	1x50	F	F
4	400kV bay for Nagda(MPPTCL) to Dehgam(Gujrat) 400kV D/C line (Ckt-2)	331	1x50	1x50	F	F

Looking to the reliability of the system, PGCIL is requested to convert the fixed line reactors into switchable line reactors installed on above 400kV lines. It is to inform that space for providing isolator and circuit breakers is available at Bhopal (MPPTCL) & Nagda (MPPTCL) 400kV Substations.

In view of above, it is requested that aforementioned proposals of MPPTCL may please be considered as agenda item for inclusion in 2nd Western Region Power Committee-Transmission Planning (WRPC-TP) for approval of the committee.


Chief Engineer (Plg. & Design)
MPPTCL-Jabalpur

Copy to:

Staff officer, O/o Managing Director, MPPTCL, Jabalpur



MADHYA PRADESH POWER TRANSMISSION CO. LTD.

(A wholly owned Govt. of Madhya Pradesh Undertaking)

CIN: U40109MP2001SGC014880

Block No.2, Shakti Bhawan, Rampur, Jabalpur (MP) 482008, Tel.:(0761) 270-2132, 2242

Fax No.: (0761) 2660908, e-mail: ce.pnd@mptransco.nic.in

No. 04-02/N-171/

1301

Jabalpur, Date: 13. 8. 2020

To,

✓ Shri Goutam Roy
Chief Engineer (PSP & A-I),
Central Electricity Authority,
Sewa Bhawan, R.K. Puram
New Delhi – 110066.

Fax No.: 011-26102045
-26175921

Sub: Proposed agenda point of MPPTCL for inclusion in 2nd Western Region Power Committee Transmission Planning (WRPC-TP).

Ref: CEA Email dated 07.07.2020

In reference to your email cited above, the agenda point of MPPTCL proposed to be included in 2nd Western Region Power Committee - Transmission Planning (WRPC-TP) is given here under:

(A) Construction of intra-state new EHV Substations alongwith associated transmission lines works in Madhya Pradesh through TBCB process :

Madhya Pradesh government vide Gazette notification dated 08.05.2020 has decided to construct following 400kV and 220kV intra-state EHV substations alongwith associated lines through TBCB process. For execution of intra-state transmission works in MP through TBCB process, M/s REC Transmission Projects Co. Ltd. (RECTPCL), New Delhi has been appointed by GoMP as Bid Process Coordinator (BPC).

Sl. No.	Name of Intra-State Transmission Work in MP through TBCB Process	Route Length (Km) / Capacity (MVA)
1	400/220/132/33kV GIS Substation at Mandideep (District-Raisen)	
i	Construction of 400/220kV GIS substation at Mandideep	(2x500MVA, 400/220kV) + (2x160MVA, 220/132kV) + (1x50MVA, 132/33kV) transformers and 1x125MVAR Bus Reactor
ii	LILO of both circuit of Itarsi (PGCIL) - Bhopal 400kV line (on Twin Moose) at Mandideep 400kV GIS S/s	2x10 Km
iii	LILO of both circuits of Hoshangabad - Mandideep - Adampur 220kV line at Mandideep 400kV GIS S/s	2x10 Km
iv	LILO of Mandideep132 - Bagroda 132kV line at Mandideep 400kV GIS S/s	10 Km
v	LILO of Mandideep220 - MACT Bhopal 132kV line at Mandideep 400kV GIS S/s	10 Km

Sl. No.	Name of Intra-State Transmission Work in MP through TCB Process	Route Length (Km) / Capacity (MVA)
2	220/132/33kV substation at Ajaygarh (District-Panna)	
i	Construction of 220/132/33kV substation Ajaygarh	(2x160MVA,220/132kV) + (2x50MVA,132/33kV) transformers
ii	LILO of both circuits of Satna-Chhatarpur 220kV line at Ajaygarh	2x10 Km
iii	Ajaygarh -Panna 132kV DCDS line	30 Km
iv	Ajaygarh -Luvkushnagar (Laundi) 132kV DCSS line	45 Km
3	220/132/33kV substation at Begamganj (District-Raisen)	
i	Construction of 220/132/33kV substation Begamganj	2x160MVA,220/132kV) + (2x50MVA,132/33kV) transformers
ii	Sagar - Begamganj 220kV DCDS line	70 Km
iii	Begamganj -Rahatgarh 132kV DCSS line	30 Km
iv	Begamganj -Silwani 132kV DCSS line	36 Km
v	Begamganj -Gyaraspur 132kV DCSS line	46 Km
vi	Begamganj -Gairatganj 132kV DCDS line	32 Km
4	220/132/33kV substation at Bisonikala (District-Hoshangabad)	
i	Construction of 220/132/33kV substation Bisonikala	(2x160MVA,220/132kV) + (2x50MVA,132/33kV) transformers
ii	LILO of both circuits of Satpura-Itarsi-Handiya 220kV line at Bisonikala	2x5 Km
iii	LILO of Seoni Malwa-Harda 132kV S/c line at Bisonikala	5 Km
5	220/132kV Substation at Bargawan (District-Singrauli)	
i	Construction of 220/132kV substation at Bargawan	(2x160MVA,220/132kV) + (1x50MVA,132/33kV) transformers
ii	LILO of both circuits of Sidhi - Hindalco 220kV line at Bargawan 220kV S/s	2x15 Km
iii	LILO of both circuits of Rajmilan - Morwa/ Waidhan 132kV line at Bargawan 220kV S/s	2x15 Km

Sl. No.	Name of Intra-State Transmission Work in MP through TCB Process	Route Length (Km) / Capacity (MVA)
6	220/132kV Substation at Khargone (District-Khargone)	
i	Construction of 220/132kV substation at Khargone	(2x160MVA,220/132kV) + (1x63MVA,132/33kV) transformers
ii	LILO of both circuits of Chhegaon - Nimrani 220kV line at Khargone 220kV S/s	2x15 Km
iii	LILO of Khargone - Julwaniya(Talakpura) 132kV line at Khargone 220kV S/s	10 Km
iv	LILO of Bhikangaon - Bistan 132kV line at Khargone 220kV S/s	10 Km
7	220/33kV substation at Shahpur (District-Betul)	
i	Construction of 220/33kV substation at Shahpur	2x50MVA, 220/33kV transformers
ii	LILO one circuit of Satpura TPS-Itarsi 220 kV line at Shahpur	5 Km
8	220/33kV substation at Manpur (Bijouri) (District-Umariya)	
i	Construction of 220/33kV substation at Manpur (Bijouri)	2x50MVA, 220/33kV transformers
ii	LILO of Birsinghpur-Satna 220kV line at New S/s Manpur (Bijouri)	20 Km

The brief technical justification of above 400kV and 220kV intra-state transmission works is enclosed as Annexure-I alongwith a power map indicating the aforementioned intra-state EHV substations alongwith associated lines through TCB process.


(B) Installation of additional 1x100MVA 400/132kV Transformer (3rd ICT) and 1x125MVAR Bus Reactor at Kirnapur 400/132kV Substation of MPPTCL.

A 400/132kV substation has been commissioned at Kirnapur (Balaghat) with 2x100 MVA, 400/132kV transformation capacity. This substation is sharing the load of Balaghat, Bhanegaon, Baihar, Katangi, Warseoni and Lalbarra 132/33kV substations. The total installed capacity at these 132/33kV substations is 385.5MVA. After commissioning of 400/132kV substation, substantial load of aforementioned 132/33kV substations is shifted on 2x100MVA transformers installed at Kirnapur substation and maximum load recorded at this substation during last 12 months is 163 MVA. Therefore, during the (N-1) contingency condition it will become difficult to manage the load in this area.

Further, Kirnapur 400kV substation is constructed between two 765 substations at Seoni and Raipur(CG) by LILO of Bhilai-Seoni 400kV S/C line at Kirnapur. Therefore, due to 765kV substations at both the ends, Kirnapur 400kV substation is experiencing very high voltages at 400kV level. The maximum voltage recorded at Kirnapur 400kV substation is 447kV which is much beyond the standard high voltage limit of 420kV.

In view of above, it is proposed to install 1 No. 100MVA, 400/132kV additional transformer (3rd ICT) and 1 No. 125MVAR, 400kV Bus reactor at Kirnapur 400kV substation.

In view of above, it is requested that aforementioned proposals of MPPTCL may please be considered as agenda item for inclusion in 2nd Western Region Power Committee-Transmission Planning (WRPC-TP) for kind reference and information of the members of the committee.


Chief Engineer (Plg. & Design)
MPPTCL-Jabalpur

Copy to:

Staff officer, O/o Managing Director, MPPTCL, Jabalpur

Construction of intra-state EHV Substations alongwith associated transmission lines in Madhya Pradesh through TBCB process

1) Construction of 400/220/132/33kV GIS Substation at Mandideep (Distt-Bhopal)

MPPTCL is having only one 400kV substation at Bhopal. The 220kV substations Bhopal, Mandideep and Hoshangabad are being fed from Itarsi (PGCIL) 400kV substation as well as Bhopal (MPPTCL) 400kV substation through a 220kV DCDS line. Bhopal 400kV substation is also feeding the load of Beragarh, Vidisha, Mugaliyachhap, Adampur and Shujalpur 220kV substations of MPPTCL. Presently total transformation capacity of Bhopal 400kV substation is 4x315MVA i.e. 1260MVA. The maximum load recorded during 2019-20 on Bhopal 400kV substation is 1013MVA. As the Bhopal is the Capital City of the Madhya Pradesh State, it is expanding very rapidly and entire supply of Bhopal City is dependent upon only one 400kV substation.

Therefore, in order to meet the future load growth of the Bhopal City, increase the reliability of the system and to cater the load of Mandideep industrial area, it is proposed to create a new 400/220/132/33kV GIS substation at Mandideep through TBCB route alongwith following intra-state transmission works as given hereunder :

i	Construction of 400/220kV GIS substation at Mandideep	(2x500MVA,400/220kV) + (2x160MVA,220/132kV) + (1x50MVA,132/33kV) transformers and 1x125MVAR Bus Reactor
ii	LILO of both circuit of Itarsi (PGCIL) - Bhopal 400kV line (on Twin Moose) at Mandideep 400kV GIS S/s	2x10 Km
iii	LILO of both circuits of Hoshangabad - Mandideep - Adampur 220kV line at Mandideep 400kV GIS S/s	2x10 Km
iv	LILO of Mandideep132 - Bagroda 132kV line at Mandideep 400kV GIS S/s	10 Km
v	LILO of Mandideep220 - MACT Bhopal 132kV line at Mandideep 400kV GIS S/s	10 Km

2) 220/132kV Substation at Ajaygarh (Distt.-Panna)

At present load of Ajaygarh area is being fed from 132kV Substation Lavkushnagar (Laundi). The 33kV voltage regulation at tail end feeder are 32% & 11.21% respectively as against prescribed limit of 9%. In order to improve voltage regulation and reduce the loading of existing 33kV feeder feeding load of Ajaygarh area, a new EHV Substation is required at Ajaygarh in Panna District. On construction of new EHV substation at Ajaygarh, the load has been shifted to proposed new substation from existing Panna and Lavkushnagar 132kV Substation and voltage regulation at tail end feeders shall also be within limits. Therefore, the construction of new EHV Substation at Ajaygarh shall result in improvement in voltage regulation and quality of power supply in Ajaygarh area and also provide additional 132kV interconnection to Panna and Lavkushnagar 132kV S/s and shall improve the reliability of supply in Ajaygarh, Panna, Devendranagar, Nagod and Pawai area. Overall it will also reduce the loading of existing Satna 220kV and Chhatarpur 220kV substations.

In view of above, it is proposed to create a 220/132/33kV substation at Ajaygarh through TBCB route alongwith following intra-state transmission works as given hereunder :

i	Construction of 220/132/33kV substation Ajaygarh	(2x160MVA,220/132kV) + (2x50MVA,132/33kV) transformers
ii	LILO of both circuits of Satna-Chhatarpur 220kV line at Ajaygarh	2x10 Km
iii	Ajaygarh -Panna 132kV DCDS line	30 Km
iv	Ajaygarh -Luvkushnagar (Laundi) 132kV DCSS line	45 Km

3) 220/132kV Substation at Begamganj (Distt.-Raisen)

At present load of Begamganj area is being fed from 132kV Substation Gairatganj and the voltage regulation at tail end feeders are more than the prescribed limit of 9%. In order to improve voltage regulation and reduce the loading of existing feeders feeding load of Begamganj area, a new EHV Substation is required at Begamganj in Raisen District. The construction of proposed EHV substation at Begamganj shall result in improvement in voltage regulation and quality of supply in Begamganj area.

The location of Begamganj is very important from the Transmission System Strengthening point of view. Therefore, a 220/132kV substation may be considered at Begamganj, which will provide the 132kV interconnection to Rahatgarh, Gyaraspur, Gairatganj and Silwani 132kV substations which are being presently fed through single radial feeders. This will improve the reliability of supply in Rahatgarh, Gyaraspur, Gairatganj, Silwani and Begamganj area to a great extent. Construction of 220/132kV substation Begamganj by laying 220kV DCDS line from Sagar 400kV substation will also reduce the loading on existing Bina, Ganj Basoda and Vidisha 220/132kV substations.

In view of above, it is proposed to construct a new 220/132/33kV substation at Begamganj through TBCB route alongwith following intra-state transmission works as given hereunder :

i	Construction of 220/132/33kV substation Begamganj	(2x160MVA,220/132kV) + (2x50MVA,132/33kV) transformers
ii	Sagar - Begamganj 220kV DCDS line	70 Km
iii	Begamganj -Rahatgarh 132kV DCSS line	30 Km
iv	Begamganj -Silwani 132kV DCSS line	36 Km
v	Begamganj -Gyaraspur 132kV DCSS line	46 Km
vi	Begamganj -Gairatganj 132kV DCDS line	32 Km

4) 220/132kV Substation at Bisonikala (Distt.-Hoshangabad)

At present load of Bisonikala area is being fed from 132kV Substation Seonimalwa. The voltage regulation at tail end feeders are 21.35% and 19.21% respectively as against prescribed limit of 9%. In order to improve voltage regulation and reduce the loading of existing 33kV feeders feeding load of Bisonikala area, a new EHV

Substation is required at Bisonikala in Hoshangabad District. On construction of new substation at Bisonikala, not only load has been shifted to proposed new substation from 132kV S/s Seoni Malwa but also the voltage regulation of 33kV feeders may also be within limits, which in turn results in improvement in voltage regulation and quality of supply in Bisonikala area. Construction of 220/132kV substation at Bisonikala will provide 132kV interconnection to Harda, Seonimalwa, Sodalpur and Sultanpur 132kV substations and will also reduce the loading of Itarsi and Handiya 220kV substations.

In view of above, it is proposed for construction of 220/132/33kV substation at Bisonikala through TBCB route alongwith following intra-state transmission works as given hereunder :

i	Construction of 220/132/33kV substation Bisonikala	(2x160MVA,220/132kV) + (2x50MVA,132/33kV) transformers
ii	LILO of both circuits of Satpura-Itarsi-Handiya 220kV line at Bisonikala	2x5 Km
iii	LILO of Seoni Malwa-Harda 132kV S/c line at Bisonikala	5 Km

5) Construction of 220/132/33kV Substation at Bargawan (Distt-Singrauli)

At present the load of Morwa, Singrauli and Waidhan area is being fed from Vindhyachal Thermal Power Station and Anuppur 220kV substation through 132kV D/C lines. At present the major power to Singrauli area is supplied from Vindhyachal TPS over a 132kV DCDS line and in case of N-1 contingency condition, it is difficult to manage power supply from Anuppur 220kV substation. Singrauli area is growing very fast due to development of number of Mega and Ultra Mega Power Projects/HT Consumers coming-up in this area. Moreover, number of coal blocks has also been allocated in this area which will start operation in coming years.

Therefore, looking to the future load growth of Singrauli area, in order to increase the reliability of supply and to reduce dependency on Vindhyachal TPS, it is proposed to construct a new 220/132/33kV substation at Bargawan through TBCB route alongwith following intra-state transmission works as given hereunder :

i	Construction of 220/132/33kV substation at Bargawan	(2x160MVA,220/132kV) + (1x50MVA,132/33kV) transformers
ii	LILO of both circuits of Sidhi - Hindalco 220kV line at Bargawan 220kV S/s	2x15 Km
iii	LILO of both circuits of Rajmilan - Morwa/ Waidhan 132kV line at Bargawan 220kV S/s	2x15 Km

6) Construction of 220/132kV Substation at Khargone (Distt-Khargone)

At present the load of Khargone area is being fed from Barwaha 220kV substation through 132kV DCDS line. During the last year demand of the Khargone 132kV S/s has been recorded as 117MVA. The demand of Khargone area is increasing very fast and 3Nos. 132/33kV substations at Bhikangaon, Andad and Talakpura are also receiving power from Khargone 132kV S/s. A new 132kV S/s Bistan is under construction in this area which shall be connected with Khargone 132kV S/s.

Therefore, in order to meet the load growth of this area and to increase the reliability of supply, it is proposed to create a new 220kV substation at Khargone through TBCB route alongwith following intra-state transmission works as given hereunder :

i	Construction of 220/132kV substation at Khargone	(2x160MVA,220/132kV) + (1x63MVA,132/33kV) transformers
ii	LILO of both circuits of Chhegaon - Nimrani 220kV line at Khargone 220kV S/s	2x15 Km
iii	LILO of Khargone - Julwaniya(Talakpura) 132kV line at Khargone 220kV S/s	10 Km
iv	LILO of Bhikangaon - Bistan 132kV line at Khargone 220kV S/s	10 Km

7) 220/33kV Substation at Shahpur (Distt.-Betul)

At present load of Shahpur area is being fed from Betul 132kV S/s and Sarni 220kV S/s. The voltage regulation at tail end of feeders works out to be 20.43%, 12.01% and 14.78% respectively as against prescribed limit of 9%. In order to improve voltage regulation and reduce the loading of existing feeders feeding load of Shahpur area, a new 132kV S/s is required at Shahpur in Betul District. On construction of new EHV substation at Shahpur, the load has been shifted to proposed new substation from 132kV S/s Chicholi, 132kV S/s Betul and 220kV S/s Sarni and voltage regulation at tail end feeders may also be within limits. The construction of new EHV substation at Shahpur shall result in improvement in voltage regulation and quality of supply in Shahpur area.

Since the Shahpur area is surrounded by dense forest from all sides and laying of 132kV line from nearest 220kV substation Sarni (Approx. 35 Kms.) through forest will involve substantial cost and time. In view of this, it would be appropriate to construct a new 220/33kV substation at Shahpur by LILO of Satpura TPS – Itarsi 220kV line which is passing nearby Shahpur area. This will reduce the line length and also minimize the involvement of forest in the line.

In view of above, it is proposed for construction of 220/33kV substation at Shahpur through TBCB route alongwith following intra-state transmission works as given hereunder :

i	Construction of 220/33kV substation at Shahpur	2x50MVA, 220/33kV transformers
ii	LILO one circuit of Satpura TPS-Itarsi 220 kV line at Shahpur	5 Km

8) 220/33kV Substation at Manpur(Bijouri) (Distt.-Umariya)

At present load of Manpur-Jaisinghnagar area is being fed from 132kV Substation Umariya and 132kV Substation Beohari. The voltage regulation at tail end feeder are 20.69%, and 22.83% respectively as against prescribed limit of 9%. In order to improve voltage regulation and reduce the loading of existing 33kV feeders feeding load of Manpur and Jaisinghnagar area, a new substation is required at Manpur(Bijouri) between Manpur and Jaisinghnagar in Umariya District.

On construction of new EHV substation at Manpur(Bijouri), the load has been shifted to proposed new substation from Umariya and Beohari 132kV S/s and voltage

regulation at tail end feeders may also be within limits. Construction of EHV substation Manpur(Bijouri) shall result in improvement in voltage regulation and quality of supply in Manpur and Jaisinghnagar area. However, laying of 132kV line for this substation from nearest 220kV S/s is technically not feasible due to non-availability of feederbays as well as long length of 132kV line. The nearest 220kV substation from the Manpur(Bijouri) area is Shahdol 220kV S/s. The length of 132kV line from Shahdol 220kV S/s up to Manpur(Bijouri) shall be more than 70Km. Also there will be involvement of dense forest in the route of 132kV line from Shahdol to Manpur(Bijouri).

Therefore, in order to reduce the line length and minimize the involvement of dense forest, it would be appropriate to construct a 220/33kV substation at Manpur(Bijouri) by LILO of 220kV Birsinghpur – Satna line which is passing at a distance of about 20km from proposed Manpur(Bijouri) substation. The construction of a 220/33kV substation in Manpur(Bijouri) area shall improve the voltage profile and reliability of supply in the area.

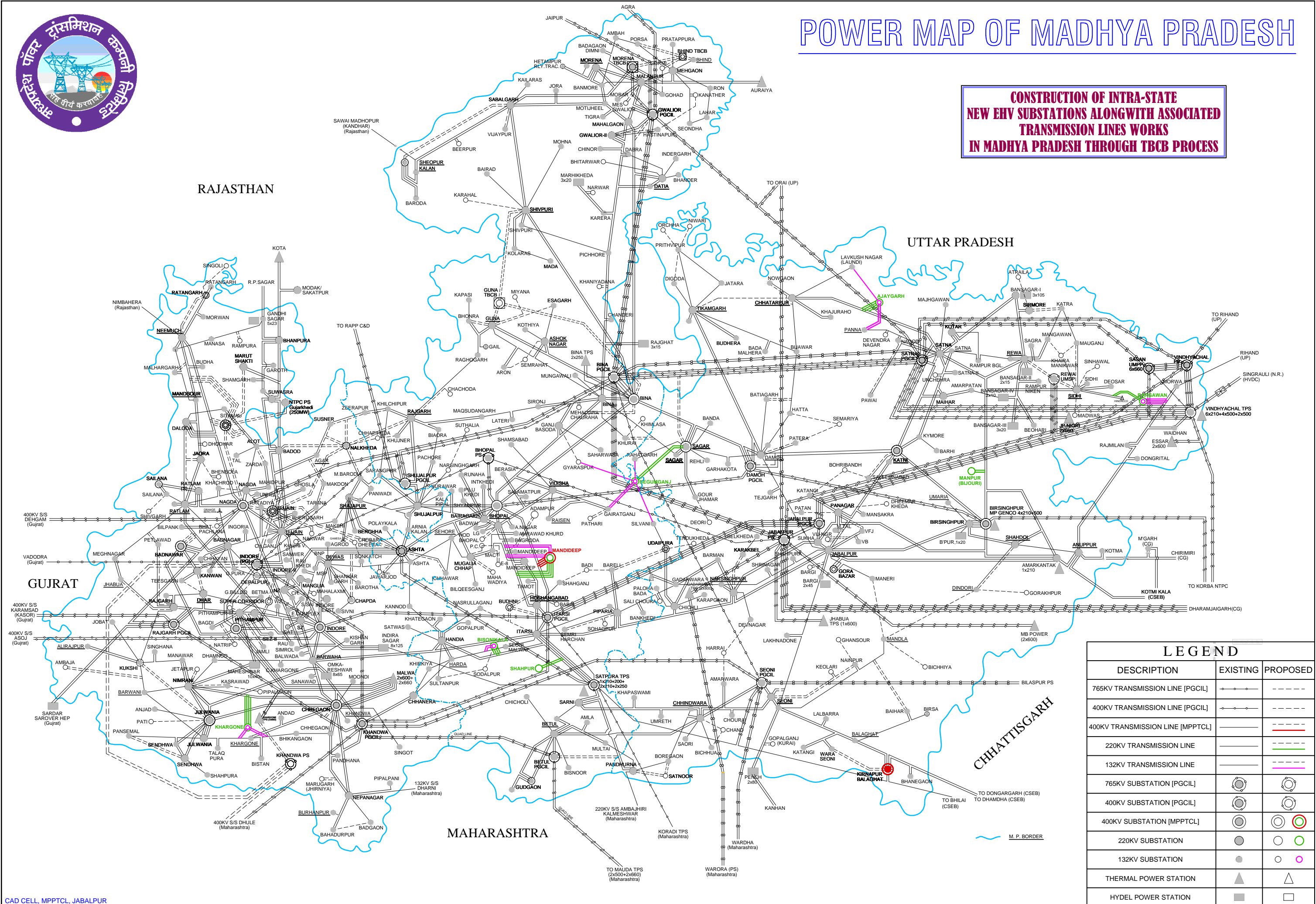
In view of above, it is proposed for construction of 220/33kV substation at Manpur (Bijouri) through TBCB route alongwith following intra-state transmission works as given hereunder :

i	Construction of 220/33kV substation at Manpur (Bijouri)	2x50MVA, 220/33kV transformers
ii	LILO of Birsinghpur-Satna 220kV line at New S/s Manpur (Bijouri)	20 Km



POWER MAP OF MADHYA PRADESH



**CONSTRUCTION OF INTRA-STATE
NEW EHV SUBSTATIONS ALONGWITH ASSOCIATED
TRANSMISSION LINES WORKS
IN MADHYA PRADESH THROUGH TBCB PROCESS**



LEGEND		
DESCRIPTION	EXISTING	PROPOSED
765KV TRANSMISSION LINE [PGCIL]	—●—●—●—	—●—●—●—
400KV TRANSMISSION LINE [PGCIL]	—●—●—●—	—●—●—●—
400KV TRANSMISSION LINE [MPPTCL]	—●—●—●—	—●—●—●—
220KV TRANSMISSION LINE	—●—●—●—	—●—●—●—
132KV TRANSMISSION LINE	—●—●—●—	—●—●—●—
765KV SUBSTATION [PGCIL]	●	●
400KV SUBSTATION [PGCIL]	●	●
400KV SUBSTATION [MPPTCL]	●	●
220KV SUBSTATION	●	●
132KV SUBSTATION	●	●
THERMAL POWER STATION	▲	▲
HYDEL POWER STATION	■	■



MAHARASHTRA STATE ELECTRICITY TRANSMISSION COMPANY LTD.
CIN NO - U40109MH2005SGC153646

Name of Office: Office of the Chief Engineer (STU)		To, Chief Engineer (SP&PA), Central Electricity Authority, Sevabhavan, R.K.Puram, New Delhi-110066 Fax – 011 26102045
Office Address: Prakashganga, 4 th floor / 'A' Wing, Plot C -19, E - block, BKC, Bandra (E), Mumbai: - 400051.		
 (022) 2659 5176 (O)	(022) 2659 5175 (P)	
E-Mail Id: cestu@mahatransco.in	 (022)2659 1222	

Ref: MSETCL/CO/STU/WRPCTP/Lockdown/143

Date: 20/07/2020

Sub: Proposed agenda items for 2nd Meeting of Western Region Power Committee (Transmission Planning) (WRPCTP).

Ref: Email from CE, Power System Planning & Appraisal – I, CEA dated 07/07/2020.

Sir,

With reference to above subject, proposed Agenda point for 2nd meeting of Western Region Power Committee (Transmission Planning) (WRPCTP) are given below.

Proposal: Creation of 220 kV level at 765/400 kV Shikrapur (PGCIL) S/s

Proposed Scope of Work:

1) **By PGCIL:-**

- a) 220 kV Level creation at 765/400 kV Shikrapur (PG) S/s along with **2x500MVA, 400/220kV ICT** at 765/400kV Shikrapur (PG)
- b) **220kV line bay- 4 nos.** at 765400 kV Shikrapur (PG) S/s.

2) **By MSETCL:-**

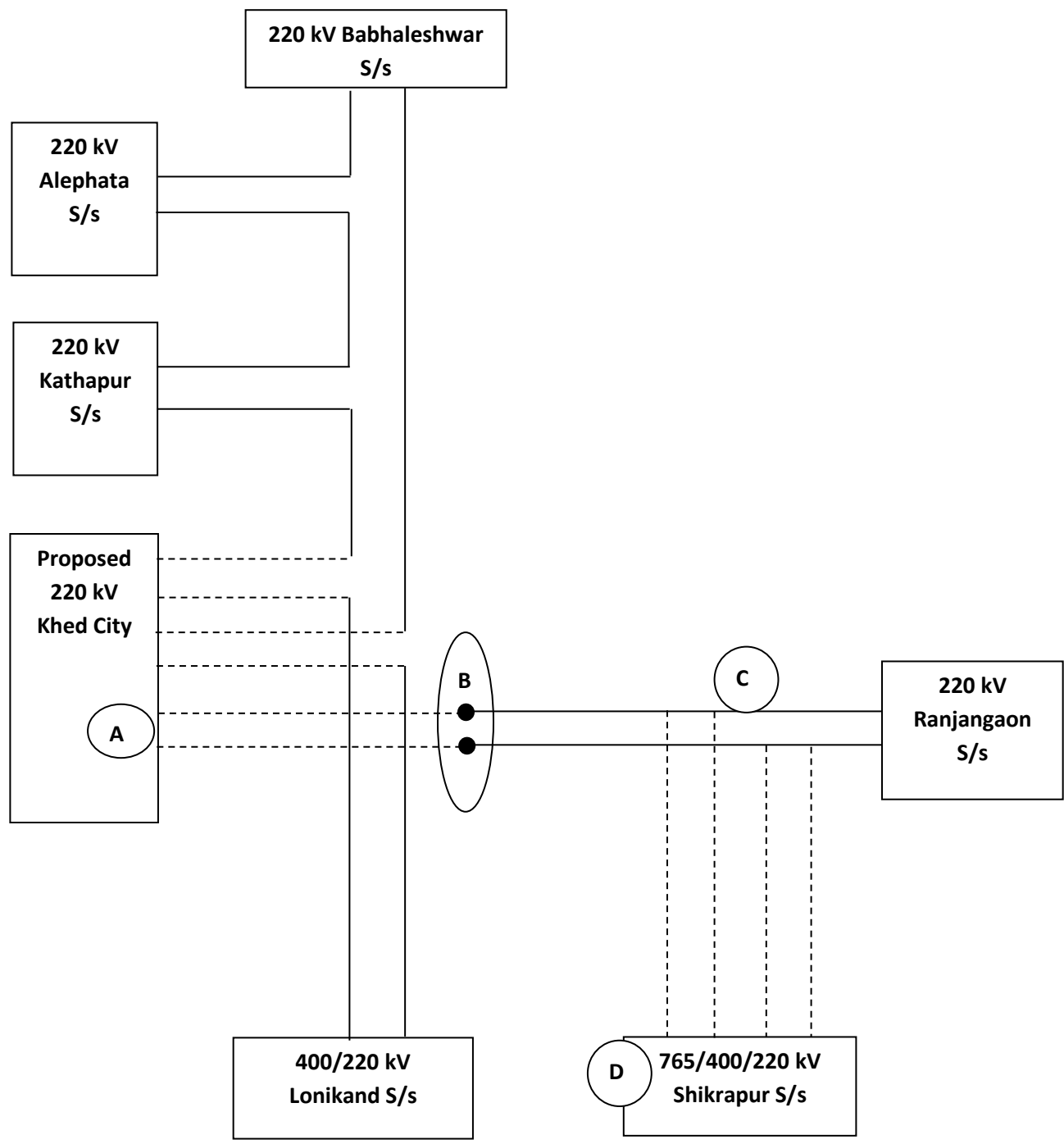
- a) Reorientation and termination of 220kV Babhleshwar – Ranjangaon ckt & Lonikand – Ranjangaon ckt at Point-B
- b) 220kV Khed City – Point B (Ranjangaon) D/C line – 13.5 km (STU Plan Year 2022-23)
- c) LILO on both ckts of 220kV Khed City – Ranjangaon D/C line at 765/400/220kV Shikrapur (PG) S/s – LILO distance 5 km. (STU Plan Year 2022-23)

Area To be Served:

Pune District (220 kV Ranjangaon, Alephata, Kathapur and Proposed KhedCity S/s)

Sub: -Proposed agenda items for 2nd Meeting of Western Region Power Committee (Transmission Planning) (WRPCTP).

SLD for proposed 220 kV Network from 765/400/220 kV Shikrapur S/s:



Point A – Point B = 13.5 km Proposed D/C line
 Point C – Point D = 5 km proposed M/C line

Sub: -Proposed agenda items for 2nd Meeting of Western Region Power Committee (Transmission Planning) (WRPCTP).

➤ **Load Flow Studies:**

Assumptions:

- i. The load flow study has been carried out considering load growth scenario in the year 2022-23 with Maharashtra State Demand – 26900 MW
- ii. Total Load considered for Pune District – 4500 MW

Case 1:- Existing Scenario (Annexure-I)

Contingency: Case-1 + 220 kV Babhleshwar – Ultratech Sugars line out (Annexure-II)

Case 2:- With 220 kV level creation at 765kV Shikrapur PG S/s (Annexure-III)

Contingency: Case-2 + 220 kV Babhleshwar – Ultratech Sugars line out (Annexure-IV)

➤ **Result Table:**

Line Flows:-

S.N	Name of Line/ICT/TF Power Flow	Case-1	Case-1A	Case-2	Case-2A
1	400kV Lonikand I-Talegaon S/C	461.5	492.1	326.5	335.1
2	400kV Lonikand I-Chakan S/C	285.2	313.9	160.6	168.5
3	400kV Lonikand I-Lonikand II D/C	157	179.6	38	45.1
4	400kV Karjat-Lonikand II D/C	380.6	403	354	365.6
5	400kV TalegaonPG-ShikrapurPG QUAD CKT	2502.8	2554.8	2092.4	2097.2
6	400kV TalegaonPG-Chakan S/C	778.4	816.3	608.1	618.9
7	220kV Lonikand I-Ranjangaon S/C	77.3	233.4	-	-
8	220kV Lonikand II-Kathapur S/C	35.1	13.5	-	-
9	220kV Kathapur-Alephata S/C	70.7	92.4	21.1	39.2
10	220kV Alephata-Babhleshwar S/C	272.5	296.3	224.5	242.2
11	220kV Babhleshwar-Utec Sugar S/C	195.3	Out	117.2	out
12	220kV Utech Suger-Ranjangaon S/C	191.8	0.9	-	-
13	220kV Shikrapur (PG)-Khedcity D/C	-	-	320.8	346.4
14	220V Khedcity-Lonikand I S/C	-	-	150.8	121.8
15	220kV Khedcity-Lonikand II S/C	-	-	147.4	117.7
16	220kV Shikrapur (PG)-Ranjangaon D/C	-	-	321	318
17	220kV Utec-Khedcity	-	-	116.7	0.94
18	3x315MVA,400/220kV ICT @ 400kV Lonikand I	522.3	573.9	380.4	398.4
19	2x500MVA, 400/220kV ICT @ 400kV Lonikand II	538	582.4	392	410.6
20	3x315MVA,400/220kV ICT @ 400kV TalegaonPG	681	694.5	607.2	610.8
21	1630 MVA,400/220kV ICT@400kV Babhleshwar (2x500MVA & 2x315 MVA)	1308	1224.6	1227.2	1175
22	2x500MVA,400/220kV ICT@400kV Shikrapur (PG)	-	-	630.6	668.2
23	3x315MVA,400/220kV ICT@400kV Chakan	492	501	447	450

Sub: -Proposed agenda items for 2nd Meeting of Western Region Power Committee (Transmission Planning) (WRPCTP).

Bus Voltages:-

S.N	Name of SS	Voltages (kV)			
		Case-1	Case-1A	Case-2	Case-2A
1	220kV Khedcity	-	-	221.2	220.9
2	220kV Alephata	214.5	214.1	218.4	218.2
3	220kV Ranjangaon	212.6	209.4	221.4	221
4	220kV Kathapur	214.4	213.6	218.5	218.2
5	220kV TalegaonPG	219.4	218.8	220.8	220.7
6	220kV Lonikand I	217.2	216.3	220.1	220
7	220kV Lonikand II	217.3	216.4	220.2	220
8	220kV Shikrapur PG	-	-	223.6	223.4

Transmission Loss:

S.N	Particulars	Power Loss (MW)			
		Case-1	Case-1A	Case-2	Case-2A
1	Pune Zone	177.39	186.46	165.62	164.43
2	Maharashtra State	1178.1	1186.43	1152.9	1151

Benefits:

- The 220 kV level creation at 765kV Shikrapur PG s/s with establishment of 2 x 500 MVA, 400/220 kV ICTs capacity will relieve the loading on existing ICTs at 400/220 kV Lonikand-I, Lonikand-II, Chakan & Jejuri s/s.
- 220 kV Ranjangaon, Kathapur & proposed KhedCity S/s will get strong source through 765/400/220 kV Shikrapur PG s/s.
- There is reduction in line loading on 400 kV Talegaon – Chakan line & 220 kV Urse – Chinchwad Corridor is observed.
- The 220kV level creation at 765/400 kV Shikrapur PG S/s will help to cater the fast load growth demand in Pune district & support 220kV transmission network.
- In absence of Koyna Generation, 220kV Shikrapur (PG) s/s supported the 220kV network of 400 kV Lonikand & 400kV Chakan s/s.
- With establishment of 220kV Shikrapur s/s the transmission network of Pune Ring main in Pune District will be strengthened and operational efficiency of 220kV network will be improved.
- There is improvement in Bus Voltages of 220 kV buses in the vicinity of Shikrapur.
- Total Saving in Losses
Pune Zone – 11.77 MW
Maharashtra State – 25.2 MW
- With 220 kV level creation at 765kV Shikrapur PG S/s, proposed 220 kV Talegaon (PG)-Khed city D/C line & 400kV Shikrapur PG –Lonikand-II DC lines can be deleted.

Sub: -Proposed agenda items for 2nd Meeting of Western Region Power Committee (Transmission Planning) (WRPCTP).

It is requested to include the above proposal in 2nd meeting of Western Region Power Committee (Transmission Planning) (WRPCTP) for approval please.

Thanking You.

Yours Faithfully,

**Signed Digitally
(S.S Jewalikar)
Chief Engineer (STU)**

Encl.: As above.

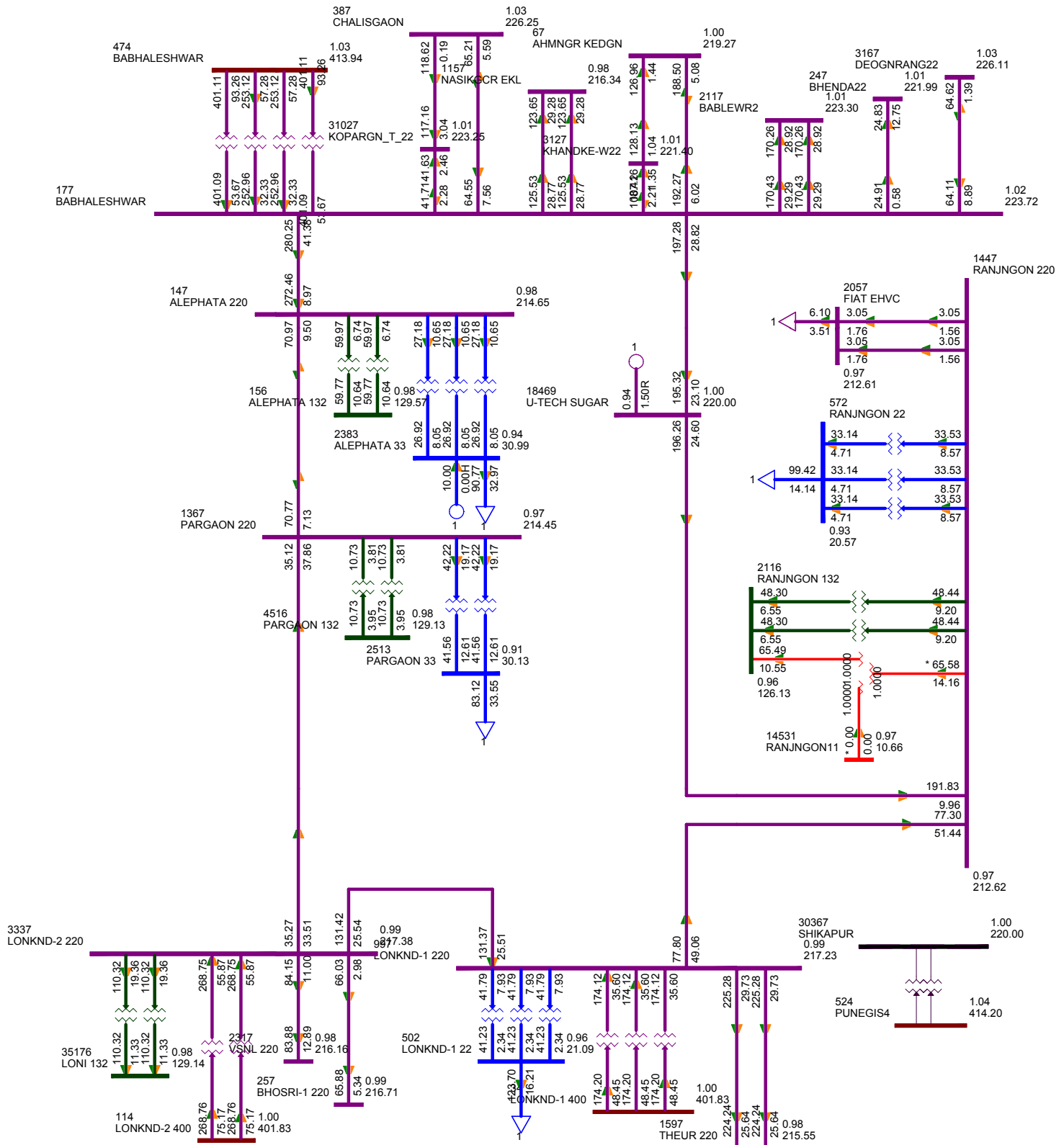
Copy s.w.r.s. to:

- 1) Chairman & Managing Director, MSETCL, C.O., Prakashganga, Mumbai
- 2) Member Secretary, WRPC, MIDC Area, Marol, Andheri East, Mumbai 400 094
- 3) Director (Operations/Project), MSETCL, C.O., Prakashganga, Mumbai.
- 4) Director (Project), PGCIL, Saudamini, Plot No. 2, Sector-29, Gurgaon-122001.

Copy f.w.c.to:

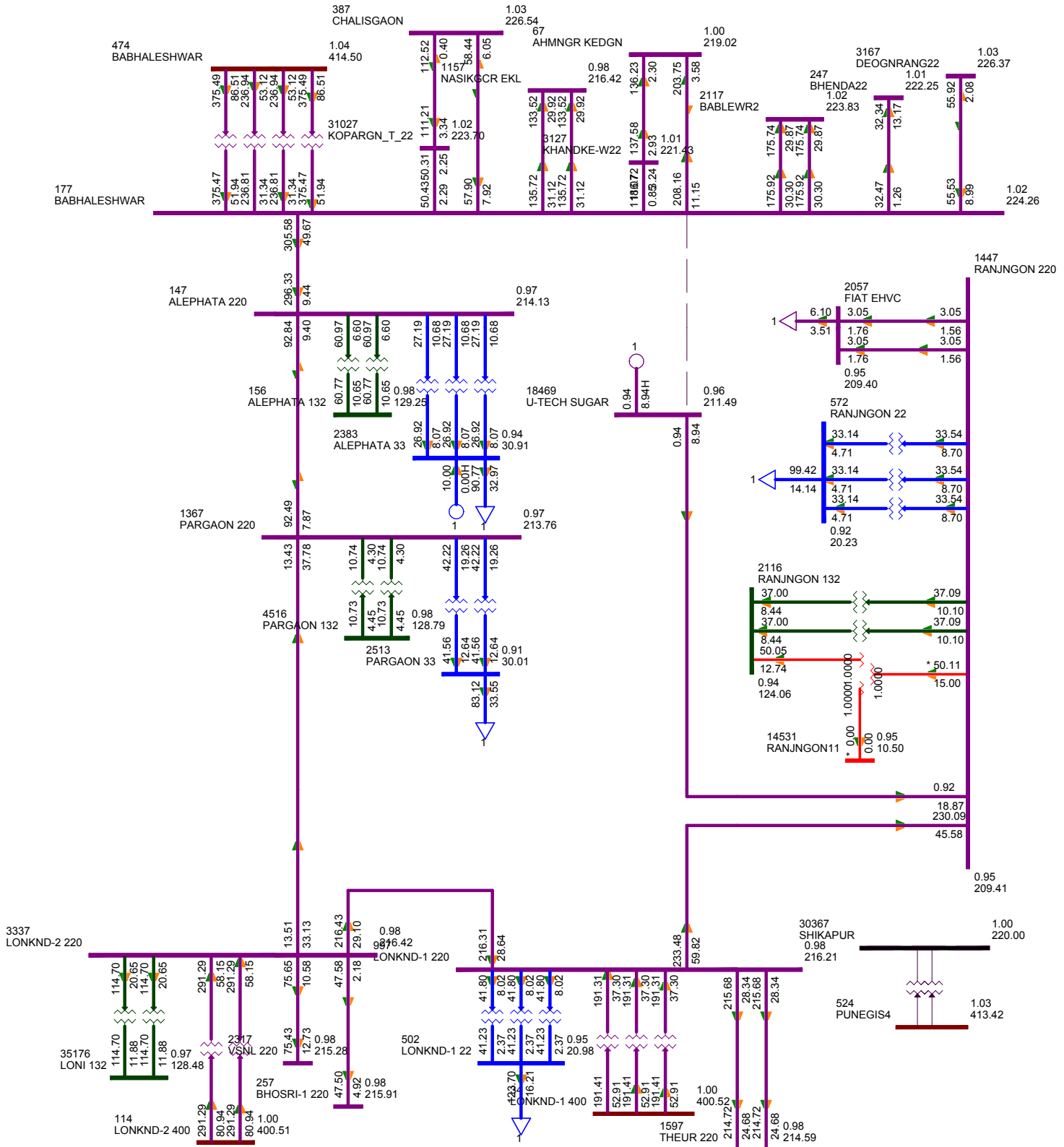
- 1) The Chief Engineer (Proj. Schemes/C&M), MSETCL, Prakashganga, Mumbai.
- 2) The Chief Engineer (SLDC), Airoli.
- 3) The Chief Engineer, EHV PC O&M Zone, Pune, MSETCL.

CASE-1: Load Flow Study Without 220 kV Level creation at 400 kV Shikrapur

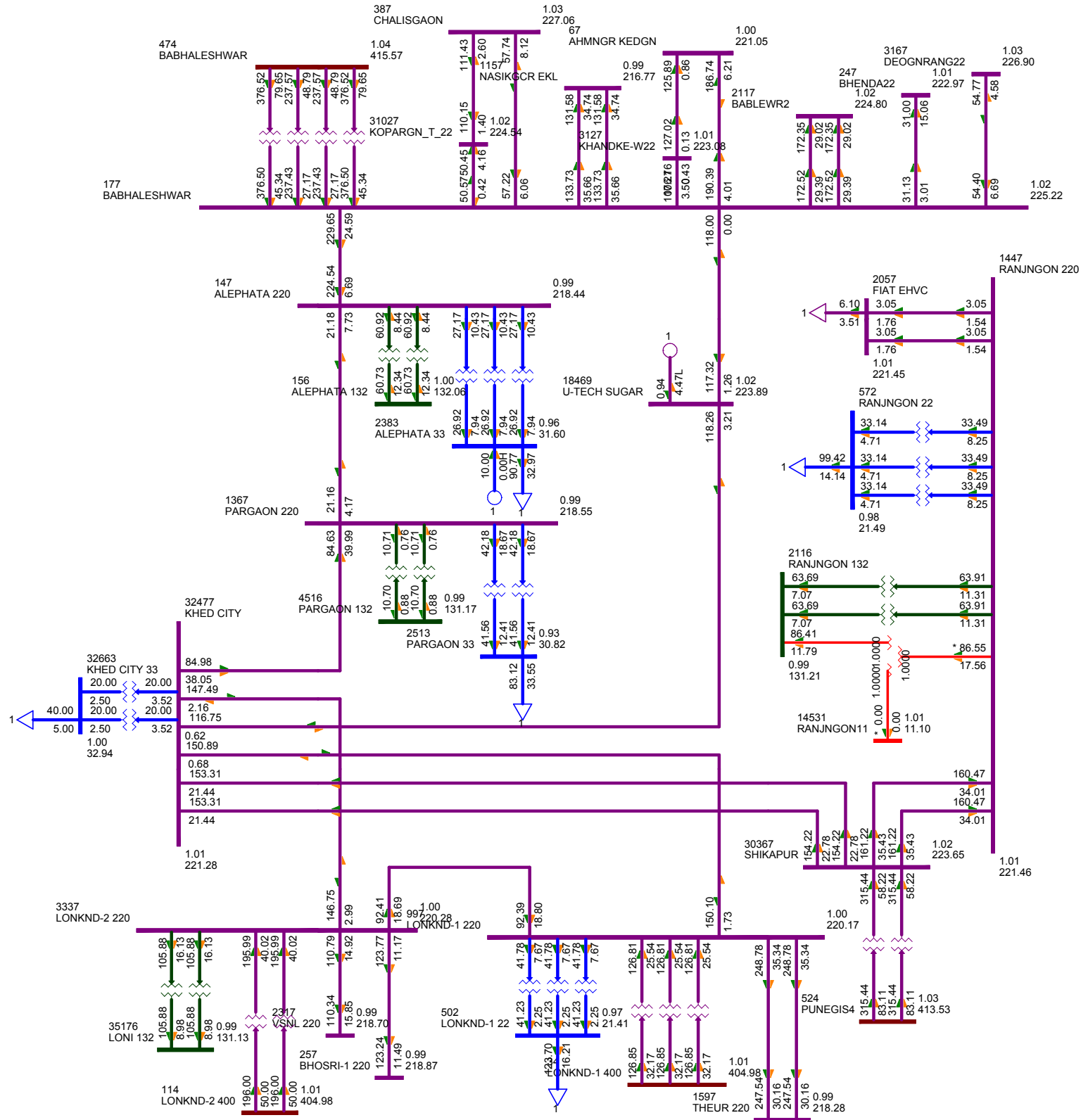


CASE-1A: Load Flow Study Without 220 kV Level creation at 400 kV Shikrapur

Contingency: 220 kV Babhaleshwar - Ultratech Sugar line out



CASE-2: Load Flow Study For 220 kV Level creation at 400 kV Shikrapur



I/9926/2020

Annexure-X



भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

केन्द्रीय विद्युत प्राधिकरण

Central Electricity Authority

विद्युत प्रणाली योजना एवं मूल्यांकन-I प्रभाग

Power System Planning & Appraisal-I Division**To,**

- (i) Shri Subir Sen, COO (CTU), PGCIL, Saudamini, Plot No. 2, Sector - 29, Gurugram – 122001
- (ii) Director (SO), POSOCO, B-9, Qutub Institutional Area, Katwaria Sarai, New Delhi – 110010
- (iii) Shri Devendra Kumar Patel, AVP (Head-Projects), Bharat Aluminium Company Limited, Cosmos Building, Balco Nagar, Korba – 495 684, Chhattisgarh, Mob. 9893122359
Email id: Devendra.patel@vedanta.co.in, nitinkumar.gupta@vedanta.co.in

Sub: Additional feed to BALCO to meet reliability requirements – Minutes of the Meeting

Dear Sir,

A meeting through Video Conference among CEA, CTU, NLDC and BALCO was held on 28.04.2020 to discuss the issue of provision of additional feed to BALCO through LILO of 2nd circuit of Korba - Birsinghpur 400kV D/c line at BALCO along with bypass arrangement at BALCO switchyard to cater to contingency conditions. The minutes of the meeting are attached herewith.

भवदीय,

(Goutam Roy)
Chief Engineer(PSPA-I)

I/9926/2020

Minutes of the meeting held on 28.04.2020 to discuss the issue of provision of additional feed to BALCO through LILO of 2nd circuit of Korba - Birsinghpur 400kV D/c line at BALCO along with bypass arrangement at BALCO switchyard to cater to contingency conditions

The list of participants are attached as Annexure-I.

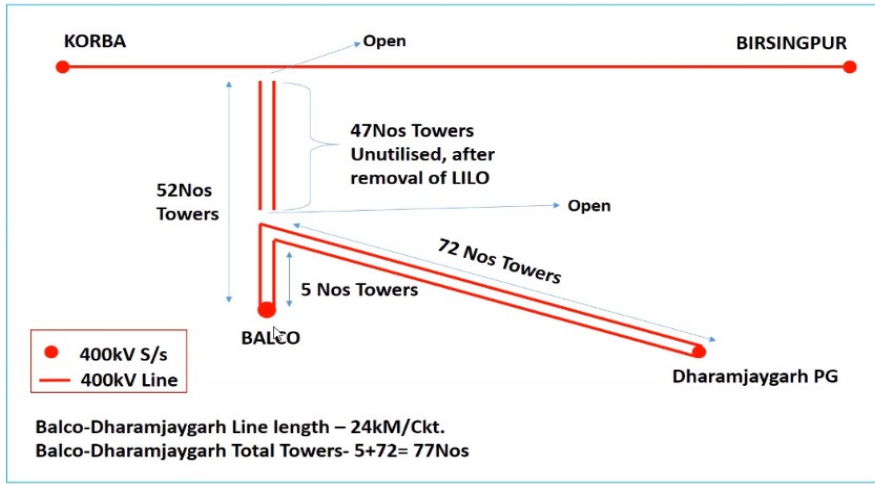
Chief Engineer (PSPA-I), CEA welcomed all the participants and stated that based on the petition of M/S BALCO for providing the BALCO - Dharamjaygarh 400kV D/c 2nd line as a bulk Consumer, CERC directed for formation of a committee under the Chairmanship of Member (PS), CEA with CTU, NLDC and BALCO to deliberate on all modalities for construction of BALCO - Dharamjaygarh 400kV D/c 2nd line as a bulk Consumer. The committee submitted its report on 09.05.2019. Subsequently, CERC in order dated 29.01.2020 in above petition agreed with recommendation of the committee with regards to providing connectivity to BALCO (250MW Bulk consumer) through existing 400 kV BALCO-Dharamjaygarh D/c line with suitable metering, accounting and scheduling arrangements for the two entities namely BALCO (as a captive generator) and BALCO (as bulk consumer) and also observed that the suggestion of the Committee on providing additional source to BALCO may be considered by CTU in consultation with CEA and NLDC so that required reliability is met. This meeting has been convened to discuss the provision of additional feed to BALCO through LILO of 2nd circuit of Korba - Birsinghpur 400kV D/c line at BALCO along with bypass arrangement at BALCO switchyard to cater to contingency conditions.

CGM CTU stated that Connectivity to BALCO as bulk consumer for its 250 MW would be granted through existing BALCO-Dharamjaygarh 400 kV D/c line as agreed by CERC. The LILO line section of 2nd circuit of Korba - Birsinghpur 400kV D/c line already exists as part of earlier interim connectivity arrangement except for few towers which needs to be constructed by M/s BALCO. The 400kV bypass arrangement shall have to be implemented by BALCO for which M/s BALCO needs to submit the bypassing scheme. However, for meeting reliability following two options are available which needs be deliberated and finalized:

- i. LILO of 2nd circuit of Korba - Birsinghpur 400kV D/c line at existing BALCO 400 kV switchyard with suitable bypass arrangement.
- ii. LILO of 2nd circuit of Korba - Birsinghpur 400kV D/c line at new 400kV switchyard along with 400/220 kV ICTs with suitable bypass arrangement. New 400kV switchyard would be implemented by M/s BALCO.

BALCO stated that no space is available in existing BALCO 400 kV switchyard for terminating LILO of 2nd circuit of Korba - Birsinghpur 400kV D/c line. The 2 nos. of 400kV bays at BALCO switchyard (associated with interim arrangement through LILO) have already been utilized for termination of the BALCO-Dharamjaygarh 400kV D/c dedicated line. For the dedicated line, few towers of LILO section have already been utilized as depicted below:

I/9926/2020



In view of the above, termination of LILO of 2nd circuit of Korba – Birsinghpur 400 kV D/c line at existing 400kV switchyard would not be possible. For termination of LILO, a new 400/220 kV, 2x315 MVA GIS S/s has been planned. Even though this would require additional capital investment, BALCO is ready for the same as the Aluminium smelter load is a critical load. There would be 2 nos. of 400 kV S/s, one with existing smelters (for captive generators) and new GIS S/s (for Bulk consumer) with new smelter. Both substations would be located 6-7 km away from each other and would remain connected through 220 kV D/c line. He further informed that load of existing smelters is 940 MW and generation is of about 1440 MW. The load of planned smelter would be about 800 MW and generation of about 580 MW. The proposed schematic is as given below:



Existing Layout

I/9926/2020



Proposed Layout

Regarding rating of 400/220kV ICTs to be installed by BALCO, CTU suggested that considering that the drawl requirement of BALCO, which may reach more than 500MW (under contingency condition of outage of BALCO-Dharamjaygarh 400kV D/c line), So BALCO may install 2x500MVA, 400/220kV ICTs as no significant cost difference exists between 2x315MVA & 2x500MVA ICTs

Representative of BALCO agreed to look into it and assured that the contingency arrangement is not required on permanent basis. Only when the duration of outage of BALCO-Dharamjaygarh 400kV D/c line exceeds 1 hour, the additional feed shall be required to support the smelter plant.

POSOCO enquired about the following:

- i. The connectivity proposal that has been agreed for BALCO as bulk consumer.
- ii. Existence of any islanding scheme for BALCO plant in case of outage of BALCO-Dharamjaigarh 400 kV D/c line.
- iii. In case of outage of captive generators, the entire smelter load would be drawing power from ISTS grid. Scheme for taking care for this condition.

CTU clarified that the connectivity proposal of BALCO has already been deliberated by the committee constituted by CERC and CERC has already agreed with connectivity proposal of BALCO and the instant meeting is to be deliberated on the bypass arrangement for LILO of 2nd circuit of Korba - Birsinghpur 400kV D/c line at BALCO, with which would utilized in case of outage of BALCO-Dharamjaygarh 400kV D/c dedicated line.

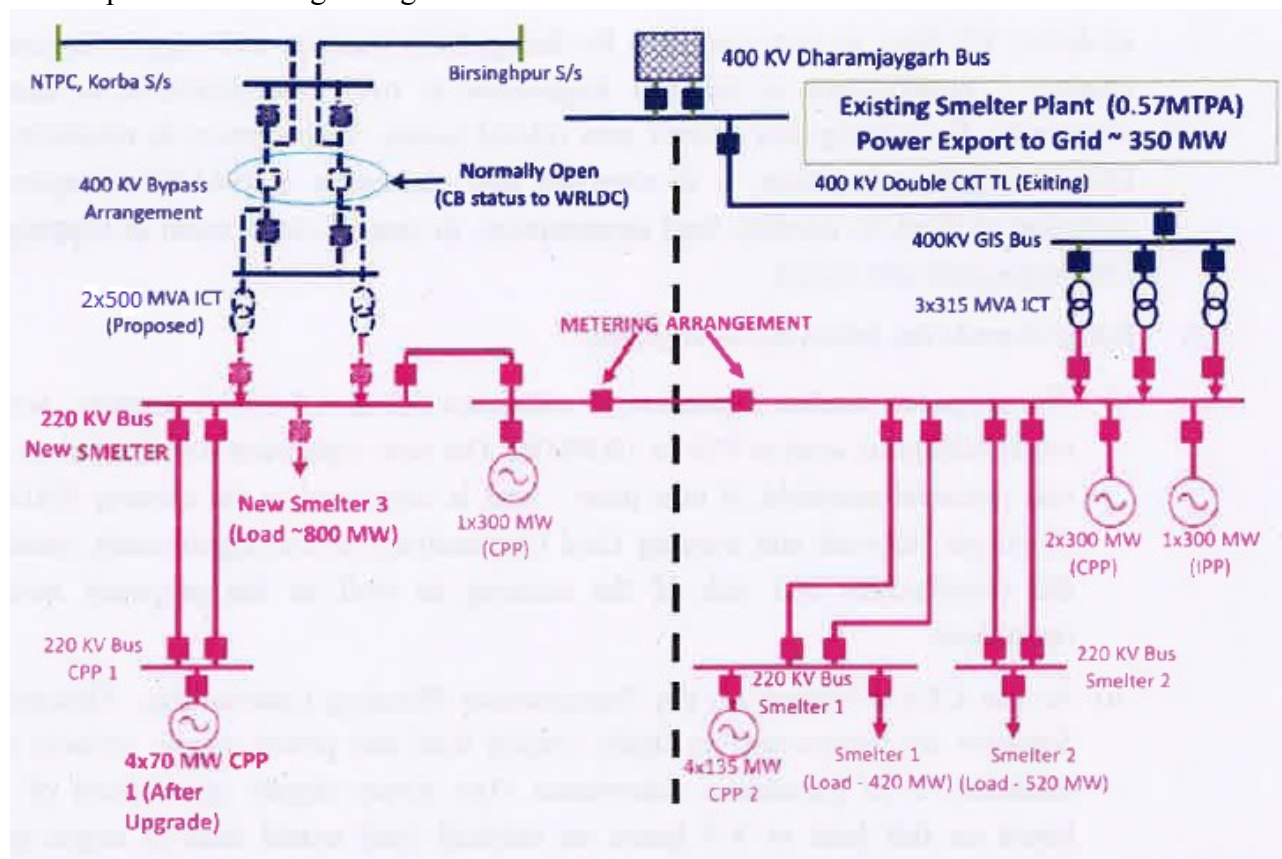
BALCO stated that islanding scheme already exists and same has operated successfully in the past. In case of outage of captive generators, they would be solely dependent on the ISTS grid for imports.

I/9926/2020

CEA stated that there would be import restrictions from the grid during such conditions (outage of BALCO captive generators) depending on margins available and import capacity of M/s BALCO. The entire smelter load cannot be fed from ISTS grid. Therefore, BALCO needs to match their smelter load to the grid imports capacity.

After further deliberations, following was agreed:

- i. Additional feed to BALCO shall be provided through LILO of 2nd circuit of Korba - Birsinghpur 400kV D/c line at 2x500MVA, 400/220kV BALCO (GIS) switchyard as per the following arrangement.



- ii. Implementation of 2x500MVA, 400/220kV BALCO (GIS) switchyard and extension of LILO section up to new 400 kV GIS switchyard would be in the scope of M/s BALCO. M/s BALCO to follow all statutory and regulatory provisions.
- iii. The bypass of 400 kV LILO line would be through keeping the tie breakers of 400 kV line bays in normally open condition as indicated in the above schematic. The 400/220 kV ICTs shall be kept charged from 220kV side of BALCO switchyard.
- iv. Additional feed to BALCO would be put to use as a contingency arrangement only in case of outage of BALCO-Dharamjaigarh 400kV D/c line. M/s BALCO to request POSOCO/WRLDC for use of the contingency arrangement / scheme.
- v. The details of the bypass scheme and procedure for operationalization of the above scheme to be worked out by WRLDC, WRPC and BALCO.
- vi. The current tripping incidence on 27.04.2020 at Dharamjaigarh as well as tripping details of BALCO lines needs to be deliberated in Protection Coordination Committee of WRPC and BALCO to implement the recommendations of PCC.

The meeting ends with the thanks to chair.

I/9926/2020

Annexure-I

List of the participants of the meeting held on 28.04.2020 through VC to discuss the issue of provision of additional feed to BALCO through LILO of 2nd circuit of Korba - Birsinghpur 400kV D/c line at BALCO along with bypass arrangement at BALCO switchyard to cater to contingency conditions

S. No.	Name of the participants (Shri / Smt.)	Organization
1.	Goutam Roy	Central Electricity Authority
2.	Awdhesh Kumar Yadav	Central Electricity Authority
3.	Priyam Srivastava	Central Electricity Authority
4.	Vikas Sachan	Central Electricity Authority
5.	Ashok Pal	Central Transmission Utility
6.	Partha Sarthi Das	Central Transmission Utility
7.	Pratyush Singh	Central Transmission Utility
8.	Rajiv Kumar Porwal	NLDC
9.	S. Usha	WRLDC
10.	Pushpa S.	WRLDC
11.	Vivek Pandey	WRLDC
12.	Pradeep Kumar Sanodiya	WRLDC
13.	Devendra Patel	BALCO
14.	Nitin Kumar Gupta	BALCO