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विद्युत मंत्रालय / Ministry of Power
केन्द्रीय विद्युत प्राधिकरण / Central Electricity Authority
प्रणाली योजना एवं परियोजना मूल्यांकन प्रभाग
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No. 26/10/2014-SP&PA/ 1559-72 **Date: 29th August, 2014**

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Sub: Additional agenda notes for the 37th meeting of the Standing Committee on Power System Planning in Western Region

Sir,

In continuation to our earlier letter of even no. dated 22.08.2014, it is intimated that the additional agenda notes for the 37th meeting of the Standing Committee on Power System Planning in Western Region are available on CEA website (www.cea.nic.in) at the following link: Home page-Wing-wise Document-Power System Wing-Standing Committee on Power System Planning-Western Region).

Kindly make it convenient to attend the meeting.

Yours faithfully,

रवीन्द्र गुप्ता

(Ravinder Gupta)
Director, SP&PA

Additional Agenda Note for 37th Meeting of Standing Committee on Power System Planning in Western Region

1.0 Inter-regional System Strengthening Scheme for NR & WR

1.1 In the 35th Meeting of Standing Committee on Power System Planning of Western Region held on 03.01.2013 the transmission system for transfer of power from IPPs of SR to WR / NR was reviewed and the following was agreed as WR-NR system strengthening scheme:

(i) Solapur – Pune 765kV S/c (2nd) line.
(ii) Jabalpur Pooling station - Orai 765 KV D/c line.
(iii) Orai – Aligargh 765kV D/c line.
(iv) Aligarh – Hapur 765kV D/c line.
(v) Orai – Orai (UPPTCL) 400kV D/c (Quad) line.
(vi) LILO of one circuit of Satna-Gwalior 765 KV line at Orai S/s.
(vii) 2x1000MVA, 765/400KV substation at Orai S/s.
(viii) LILO of Agra-Meerut 765 kV S/c line at Aligarh S/s.
(ix) 2x1500MVA, 765/400KV S/s at Aligarh.
(x) LILO of Kanpur – Jhatikara 765 kV S/c at Aligarh S/s.

1.2 In the 31st Meeting of Standing Committee on Power System Planning of Northern Region held on 02.01.2013 (one day prior to SCM of WR), the above transmission system was revised due to changed scenario in Northern Region. In the meeting it was agreed that Aligarh – Hapur 765 kV D/C line would be taken up later as per system requirement and Aligarh would be developed as switching station (GIS) initially. The revised scheme is as given below:

(i) Solapur – Pune 765kV S/c (2nd) line.
(ii) Jabalpur Pooling station - Orai (GIS) 765 kV D/c line
(iii) Orai (GIS) – Aligarh (GIS) 765 kV D/c line
(iv) Orai (GIS) – Orai(UPPTCL) 400kV D/c (Quad) line
(v) LILO of one circuit of Satna-Gwalior 765 KV D/c line at Orai (GIS)
(vi) Establishment of 2x1000MVA, 765/400 kV GIS substation at Orai (GIS)
(vii) LILO of Agra-Meerut 765 kV S/c line at Aligarh (GIS)
(viii) Establishment of 765 kV GIS Switching Station at Aligarh
(ix) LILO of Kanpur – Jhatikara 765 kV S/c at Aligarh (GIS)

1.3 Subsequently, in the 36th SCM of WR Aurangabad- Sholapur 765 kV D/C line was agreed in lieu of Sholapur- Pune 765 kV (2nd) S/C line as system strengthening scheme for export of power to SR.

1.4 Taking into account the above changes, the elements of the WR-NR system strengthening scheme as given below; are being implemented by POWERGRID into two parts.

Part-A
(i) Aurangabad- Sholapur 765 kV D/C line.

Part-B
(ii) Jabalpur Pooling station - Orai (GIS) 765 kV D/c line
(iii) Orai (GIS) – Aligarh (GIS) 765 kV D/c line
(iv) Orai (GIS) – Orai(UPPTCL) 400kV D/c (Quad) line

(v) LILO of one circuit of Satna-Gwalior 765 KV D/c line at Orai (GIS)
(vi) Establishment of 2x1000MVA, 765/400 kV GIS substation at Orai (GIS)
(vii) LILO of Agra-Meerut 765 kV S/c line at Aligarh (GIS)
(viii) Establishment of 765 kV GIS Switching Station at Aligarh
(ix) LILO of Kanpur – Jhatikara 765 kV S/c at Aligarh (GIS)

1.5 Further, in order to facilitate charging and maintaining the voltage within stipulated limits under various network operating conditions, the following reactive compensation as part of Inter-Regional System Strengthening Scheme for WR and NR has been approved in the 34th meeting of Meeting of Standing Committee on Power System Planning of Northern Region held on 08.08.2014:

		Approximate Line length	**Line Reactor- From bus/circuit**	**Line Reactor- To bus/circuit**
	Line Reactors			
1.	Aurangabad – Solapur 765 kV D/c	275 km.	240 MVAR *(Switchable)*	240 MVAR
2.	Jabalpur Pooling station - Orai (GIS) 765 kV D/c	360 km.	330 MVAR	330 MVAR
3.	Orai (GIS) – Aligarh (GIS) 765 kV D/c	280 km.	240 MVAR	240 MVAR
4.	Orai (GIS) – Orai (UPPTCL) 400 kV D/c (Quad)	30 km.	-	-
5.	LILO of one circuit of Satna-Gwalior 765 kV D/c at Orai (GIS)	60 km.		
	Existing Satna-Gwalior 765kV S/c	360 km.	*240 MVAR (Switchable)- (to be converted into bus reactor)*	*240 MVAR*
	Satna-Orai 765kV S/c	180 km.		*240 MVAR*
	Orai-Gwalior 765kV S/c	300 km.	*240MVAR*	*240 MVAR (Switchable)*
5.	LILO of Agra-Meerut 765 kV S/c line at Aligarh	30 km.		
	Existing Agra-Meerut 765kV S/c	270 km.		*240 MVAR (Switchable)*
	Agra-Aligarh 765kV S/c	130 km.	-	-
	Aligarh-Meerut 765kV S/c	200 km.		*240 MVAR (Switchable)*
6.	LILO of Kanpur – Jhatikara 765 kV S/c at Aligarh S/s	30 km.		
	Existing Kanpur-Jhatikara 765kV S/c	465 km.	*330 MVAR (Switchable)*	*330 MVAR (Fixed)*
	Kanpur-Aligarh 765kV S/c	330 km.	*330 MVAR (Switchable)*	*330 MVAR (Switchable)*
	Aligarh-Jhatikara 765kV S/c	190 km.		*330 MVAR (Presently fixed to be made Switchable)*
	Bus Reactors			
7.	2x1000MVA, 765/400KV GIS substation at Orai	2x330MVAR bus reactor		
8.	765KV Switching Station at Aligarh (GIS)	2x330MVAR bus reactor		

Members may please concur the above proposal.

2.0 Establishment of new 400/220 kV substations in Western Region and underlying 220 kV network.

2.1 There are many 400/220 kV substations under implementation as a part of the ISTS. The 220 kV transmission lines from the 400/220 kV substations are implemented by the State Transmission Utility. For gainful utilization, it is necessary that that both the 400/220 kV substation as well as the underlying transmission system are implemented in matching time frame. At present, the following new substations planned under various transmission schemes, are under implementation by POWERGRID:

(i) Magarwada 2x315 MVA (400/220 kV system) : September, 2014
(ii) Betul 2x315 MVA (400/220 kV system) : 2016-17
(iii) Vadodara 2x500 MVA (400/220 kV system) : 2016-17

2.2 MPPTCL, GETCO and Daman&Diu may intimate the status of implementation of underlying transmission system.

Members may deliberate.

3.0 Delinking of Associated Transmission System of Krishnapatnam with commissioning of Krishnapatnam UMPP in Western Region

3.1 The following transmission system associated with Krishnapatnam UMPP in Western Region was discussed and agreed during the 27th meeting of Standing Committee on Power system Planning in Western Region :

ATS of Krishnapatnam UMPP	
Scheme	Transmission system
Scheme A: Increasing SR-WR Inter-Regional Transmission Capacity through HVDC back-to-back	1) Narendra – Kolhapur 400kV D/C line 2) 1000 MW HVDC back-to-back at Narendra (or at Kolhapur, to be decided based on land availability) of which 500 MW through shifting of equipment from Sasaram.
Scheme B Synchronous Inter-connection of SR and WR	1) Raichur - Sholapur 765kV S/C line-1
Scheme C: Evacuation System for Krishnapatnam UMPP	1) Krishnapatnam UMPP – Nellore 400 kV, Quad D/C line 2) Krishnapatnam UMPP – Kurnool 400kV, Quad D/C line 3) Krishnapatnam UMPP –Gooty, 400 kV, Quad D/C line 4) Raichur - Sholapur 765kV S/C line-2 5) Sholapur – Pune 765kV S/C line 6) Kurnool – Raichur 765kV S/C line 7) 765kV substations at Kurnool, Raichur, Sholapur and Pune, with 765/400kV 3000 MVA transformers at each of the substations. 8) Inter-linking of Raichur 765kV (PG) S/S with Raichur(KPTCL) 400kV S/S

Scheme D System strengthening in Western Region corresponding to power from Krishnapatnam UMPP	1) Pune (WR) – Navi Mumbai (WR) 400kV D/C line

3.2 The Scheme-C of Krishnapatnam UMPP ATS, for implementation purpose was divided into three parts (Part-A, Part-B and Part-C) by POWERGRID, as listed below.

ATS of Krishnapatnam UMPP under scope of POWERGRID	
Part	Transmission system
Part-A	1) Krishnapatnam UMPP – Nellore 400 kV, Quad D/C line 2) Krishnapatnam UMPP –Gooty, 400 kV, Quad D/C line
Part-B	1) Establishment of new 765/400 kV substations at Raichur, Sholapur and Pune with 2X1500 MVA ICTs and 1X240 MVAR bus reactors. 2) LILO of existing Raichur- Gooty 400 kV D/C Quad line at Raichur (New) substation. 3) Raichur - Sholapur 765kV S/C line 4) Sholapur – Pune 765kV S/C line 5) Pune (New) – Pune 400 kV Quad D/C line.
Part-C	1) Establishment of new 765/400 kV substations at Kurnool with 2X1500 MVA ICTs and 1X240 MVAR bus reactor. 2) Krishnapatnam UMPP- Kurnool (new) 400 kV D/C Quad line with 63 MVAR line reactors at each end on both circuits. 3) Kurnool (New) – Raichur 765 kV S/C line. 4) LILO of N'Sagar – Gooty 400 kV S/C line at Kurnool (New) substation. 5) Kurnool (New) – Kurnool (APTRANSCO) 400 kV D/C Quad line.

The 2nd Raichur- Sholapur 765 kV S/C line was decided to be implemented through tariff based competitive bidding route.

Scheme –D: System strengthening in Western Region corresponding to power from Krishnapatnam UMPP was also being implemented by POWRERGRID as WRSSS-V.

3.3 Scheme-A i.e, Kolhapur/Narendra 1000 MW HVDC back-to-back link along with Narendra – Kolhapur 400 kV D/c line was scheduled for commissioning in the year 2010-11, anticipating the surplus in Southern Region (including power from various upcoming IPPs in Srikakulam, Tuticorin, Krishnapatnam complex) to transfer power from South to West/North till the commissioning of Raichur - Sholapur 765 kV lines. Due to high cost involved in shifting and re-commissioning of HVDC module from Sasram, the scheme was not a techno-economic solution. Accordingly, in the 31st SCM of WR, in place of Scheme-A the following transmission system was agreed as inter-regional System Strengthening Scheme between SR-WR associated with new IPP Generation Projects in Nagapattinam / Cuddalore:

(i) New 400 kV substations each at Narendra (GIS) and Kolhapur (GIS) (to be upgraded to 765 kV).

(ii) Narendra – Kolhapur 765kV D/c line (initially to be operated at 400 kV)
(iii) LILO of both circuits of existing Kolhapur – Mapusa 400 kV D/c line at proposed Kolhapur 400 kV s/s
(iv) 400 kV interconnection between Narendra (existing) and Narendra 400 kV GIS S/s
(v) Kolhapur – Padghe 765 kV D/c one circuit via Pune(initially to be operated at 400 kV)

3.4 Subsequently establishment of Pune 765/400 kV substation as GIS and its interconnection at 400 kV level through LILO of both circuits of Aurangabad – Pune 400 kV D/c line & Parli – Pune 400 kV D/c line at Pune 765/400 kV GIS was agreed in the 30th and 32nd SCM of WR respectively.

3.5 In the 36th SCM of WR, LILO of one ckt of Aurangabad-Padghe 765 kV D/C line at Pune in lieu of Kolhapur-Padghe 765 kV D/C one ckt via Pune was agreed as system strengthening scheme in WR for transfer of power to SR from IPPs in Chhattisgarh.

3.6 In the 33rd SCM of SR held on 20.10.2011, Part-B and some elements of Part-C of ATS of Krishnapatnam UMPP was de-linked from the commissioning of Krishnapatnam UMPP generation project and their implementation was taken up as system strengthening scheme due to the following reasons:
(i) Delay/ Uncertainty in implementation of Krishnapatnam UMPP generation project.
(ii) Synchronous interconnection of WR and SR grid.
(iii) To increase inter-regional transmission capacity between WR and SR.

3.6.1 The transmission elements under **Part-B** delinked from ATS of KUMPP are as given below:

(i) Establishment of new 765/400 kV substations at Raichur and Sholapur with 2X1500 MVA ICTs and 1X240 MVAR bus reactors.
(ii) Establishment of new 765/400 kV GIS substation at Pune with 2X1500 MVA ICTs and 1X240 MVAR bus reactor.
(iii) LILO of existing Raichur- Gooty 400 kV D/C Quad line at Raichur (New) substation.
(iv) Raichur - Sholapur 765kV S/C line
(v) Sholapur – Pune 765kV S/C line
(vi) LILO of both circuits of Aurangabad – Pune 400 kV D/c line at Pune 765/400 kV GIS
(vii) LILO of both circuits of Parli – Pune 400 kV D/c line at Pune 765/400 kV GIS

3.6.2 The transmission elements under **Part-C (Part-C1)** delinked from ATS of KUMPP is as given below:

(i) Establishment of new 765/400 kV substations at Kurnool with 2X1500 MVA ICTs and 1X240 MVAR bus reactor.
(ii) LILO of N'Sagar – Gooty 400 kV S/C line at Kurnool (New) substation.
(iii) Kurnool (New) – Kurnool (APTRANSCO) 400 kV D/C Quad line.

The transmission elements under **Part-C (Part-C2)** which have been deferred in view of uncertainty of KUMPP are as given below:

(i) Krishnapatnam UMPP- Kurnool (new) 400 kV D/C Quad line with 63 MVAR line reactors at each end on both circuits.
(ii) Kurnool (New) – Raichur 765 kV S/C line.

3.6.3 Further the Krishnapatnam UMPP – Gooty 400 kV D/C line , transmission element of Part-A, has been realigned as Nellore pooling station – Gooty 400 kV D/C quad line and is being implemented as Regional system strengthening scheme. Kurnool(New) – Raichur 765 kV S/C line has also been taken up regional system strengthening scheme.

3.7 In the 32nd SCM of WR POWERGRID has requested for review of Pune – Navi Mumbai 400kV D/C line, being implemented as WRSS-V, in view of severe RoW constraints envisaged in its implementation. In the meeting, it was decided that instead of dropping this line MSETCL would review and suggest an alternative location for termination of line from Pune for onward dispersal of power. No proposal has been received from MSETCL in this regard till date.

3.8 The summary of the changes/ modifications in the Transmission system associated with KUMPP is tabulated below:

Transmission system associated with KUMPP and additional transmission capacity between WR-SR					
Original scheme			**D/M /NC**	**Modified scheme**	
S. No.	**Transmission elements**	**SS/ ATS**		**SS/ ATS**	**Transmission elements**
(i)	Narendra – Kolhapur 400kV D/C line	**SS**	**M**	**SS**	New 400 kV substations each at Narendra (GIS) and Kolhapur (GIS) (to be upgraded to 765 kV).
					Narendra – Kolhapur 765kV D/c line (initially to be operated at 400 kV)
(ii)	1000 MW HVDC back-to-back at Narendra/Kolhapur				LILO of both circuits of existing Kolhapur – Mapusa 400 kV D/c line at proposed Kolhapur 400 kV s/s
					400 kV interconnection between Narendra (existing) and Narendra 400 kV GIS S/s
(iii)	Raichur - Sholapur 765kV S/C line-2	**SS**	**NC**	**SS**	same
(iv)	Krishnapatnam UMPP – Nellore 400 kV	**ATS**	**D**	**ATS**	same
(v)	Krishnapatnam UMPP – Gooty	**ATS**	**M**	**SS**	Nellore pooling station- Gooty 400 kV D/C line.
(vi)	Establishment of new 765/400 kV substations at Kurnool with 2X1500 MVA ICTs and 1X240 MVAR bus reactor.	**ATS**	**M**	**SS**	same
(vii)	LILO of N'Sagar – Gooty 400 kV S/C line at Kurnool (New) substation.	**ATS**	**M**	**SS**	same

(viii)	Kurnool (New) – Kurnool (APTRANSCO) 400 kV D/C Quad line	**ATS**	**M**	**SS**	same
(ix)	Krishnapatnam UMPP-Kurnool (new) 400 kV D/C Quad line with 63 MVAR line reactors at each end on both circuits.	**ATS**	**D**	**ATS**	same
(x)	Kurnool (New) – Raichur 765 kV S/C line	**ATS**	**M**	**SS**	same
(xi)	Establishment of new 765/400 kV substations at Raichur and Sholapur with 2X1500 MVA ICTs and 1X240 MVAR bus reactors.	**ATS**	**M**	**SS**	same
(xii)	Establishment of new 765/400 kV GIS substation at Pune with 2X1500 MVA ICTs and 1X240 MVAR bus reactor.	**ATS**	**M**	**SS**	same
(xiii)	LILO of existing Raichur-Gooty 400 kV D/C Quad line at Raichur (New) substation.	**ATS**	**M**	**SS**	same
(xiv)	Raichur - Sholapur 765kV S/C line	**ATS**	**M**	**SS**	same
(xv)	Sholapur – Pune 765kV S/C line	**ATS**	**M**	**SS**	same
(xvi)	LILO of both circuits of Aurangabad – Pune 400 kV D/c line at Pune 765/400 kV GIS	**ATS**	**M**	**SS**	same
(xvii)	LILO of both circuits of Parli – Pune 400 kV D/c line at Pune 765/400 kV GIS	**ATS**	**M**	**SS**	same
(xviii)	Pune – Navi Mumbai 400kV D/C	**SS**	**M**	**SS**	Modified proposal to be received from MSETCL

Note: ATS – Associated Transmission System, SS: System Strengthening, M: Modified, NC: No Change, D: Deferred

Members may please concur.

4.0 Contingency arrangement for operation of Pune (GIS) - Sholapur 765 kV S/C line.

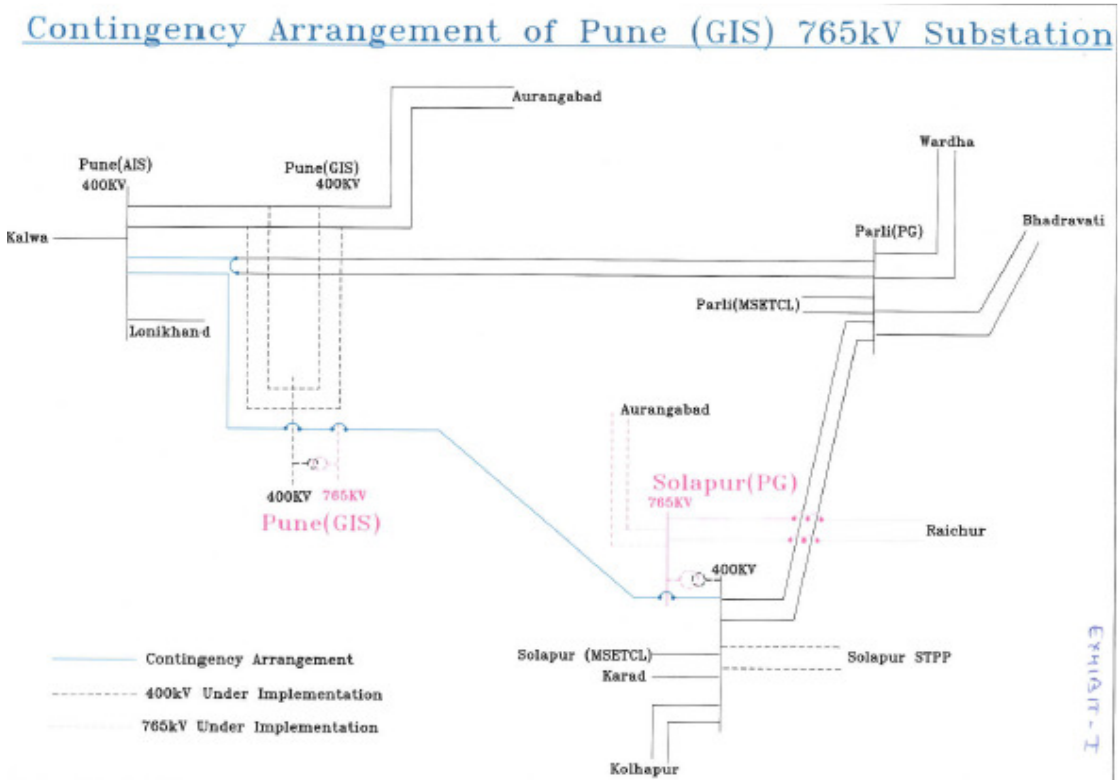
4.1 The Pune (GIS) – Solapur 765kV S/C line along with Pune 765/400 kV GIS being implemented by POWERGRID was agreed as a part of transmission system for Krishnapatnam UMPP. Due to uncertainty in implementation of KUMPP and the requirement of increasing the inter-regional transmission capacity between WR-SR, most of the transmission elements which were part of the ATS of Krishnapatnam UMPP were de-linked from the commissioning of Krishnapatnam UMPP generation project and their implementation was taken up as system strengthening scheme. This was agreed in the 33rd SCM of SR held on 20.10.2011.

4.2 POWERGRID has informed that Pune 765/400 kV GIS is getting delayed due to delay in land acquisition and is expected to be commissioned by December 2014/ January 2015 whereas the Pune (GIS) – Sholapur 765kV S/C line shall be ready in earlier time frame. To provide an additional infeed to Sholapur, POWERGRID has proposed the following contingency arrangement, by charging Pune (GIS) – Sholapur 765kV S/C line charged at 400 kV level:

(i) Charging of Pune (GIS) – Sholapur 765kV S/C line at 400kV by passing Pune (GIS) and connecting to the existing Pune (AIS) substation utilizing LILO of Parli- Pune (AIS) 400kV line at Pune (GIS).

(ii) One no. 400 kV bay at Pune 400 kV AIS would be released by bunching of the existing Parli – Pune 400kV D/C line. This bay would be utilized for terminating the Sholapur-Pune (GIS) 765 kV line charged at 400 kV level.

(iii) Out of 2 nos. of 400kV bays available at Sholapur, one bay would be arranged for Sholapur – Sholapur STPP and another one would be utilized in terminating the Pune (GIS) – Sholapur line.



4.3 The studies carried out by POWERGRID with 1250 MW export from WR to SR over Sholapur- Raichur 765 kV D/C line is enclosed as Annexure-1. Pune (GIS) – Sholapur 765kV S/C line at 400kV provides an additional in feed to Sholapur which helps in power transfer to SR in case of outage of one circuit of Parli – Sholapur 400 kV S/C line.

Members may please deliberate.

5.0 Additional 400 kV feed to Goa

5.1 The peak demand met by Goa during the period April to July 2014 is about 489 MW and as per the 18th EPS, it is expected to grow to 815 MW by the end of 12th Plan (2016-17). At present demand of Goa is mainly catered through Mapusa 3X315 MVA, 400/220 substation, which gets, it feed from Kolhapur 400 kV substation through a 400 kV D/C line. Goa system is also connected with Maharashtra and Karnataka through 220 kV lines.

5.2 As per the new Planning Criteria under "n-1-1" contingency of 400 kV Kolhapur – Mapusa D/C line, there shall be severe constraints in meeting the demand of Goa on remaining 220 kV network. To improve the reliability and power supply situation in Goa, an additional 400 kV in feed to Goa along with new 400/220 kV substation in Goa is proposed.

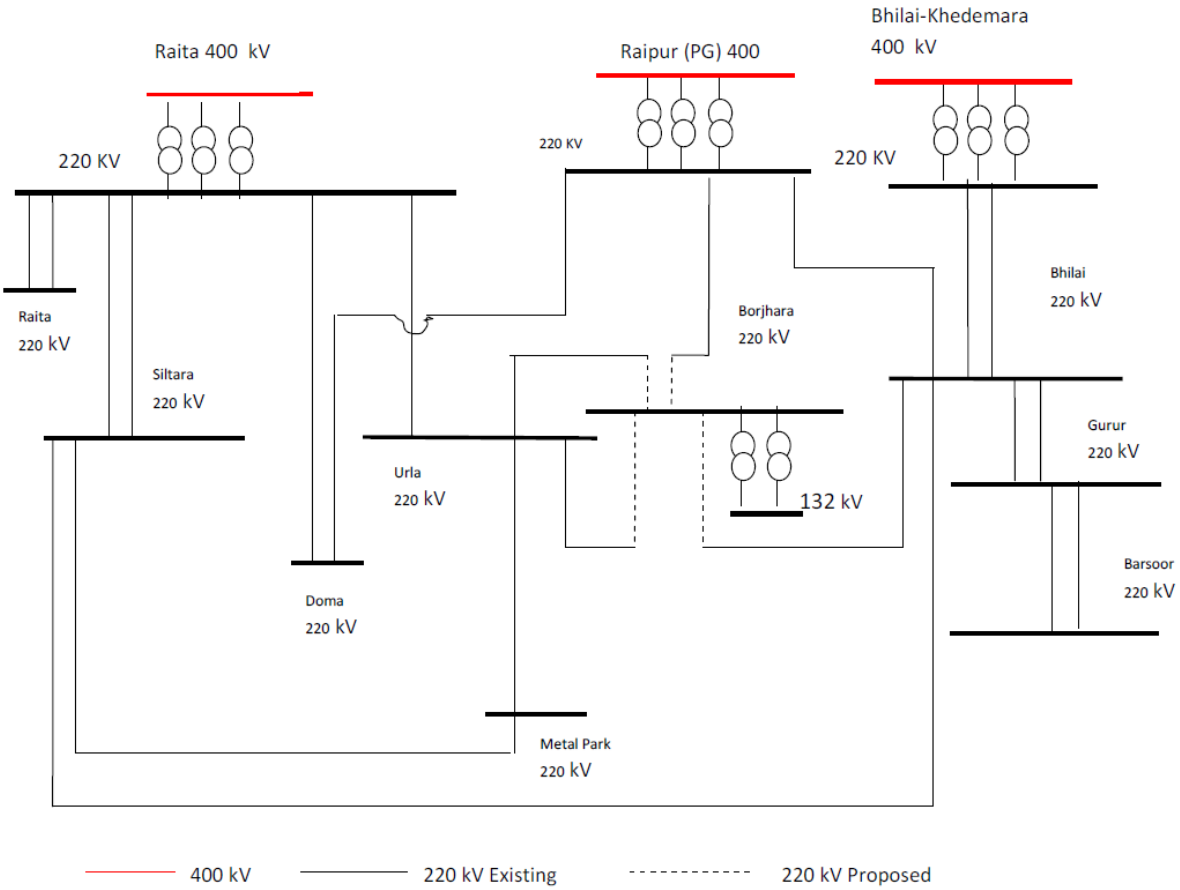
The details of the new 400/220 kV substation along with the 400 kV interconnections and 220 kV transmission lines for dispersal of power would be worked out jointly by CEA, CTU and Goa electricity department. This would be put in the next standing committee meeting of WR

Members may deliberate.

6.0 LILO of Raipur (PGCIL) – Urla 220 kV line at proposed Borjhara 220 kV substation- Agenda by CSPTCL.

6.1 CSPTCL has planned to upgrade the existing Borjhara 132 kV substation to 220 kV substation. Borjhara is an important substation for power supply to state capital city Raipur and at present it gets supply from Urla 220/132 kV substation through a single 132 kV feeder. The details of the scheme proposed by CSPTCL is as given below:

S.No.	Transmission proposal	Implementation Phase
1	1X160 MVA, 220/132 kV substation at Borjhara	Phase I
2	LILO of 220 kV Raipur (PGCIL) - Urla line on multi circuit towers at Borjhara	
3	LILO of Bhilai- Gudhiyari 132 kV line at 220/132 kV substation at Borjhara	
4	LILO of 220 kV Khedemara(Bhilai) – Urla line at Borjhara	Phase II
5	1X160 MVA, 220/132 kV ICT at Borjhara substation	



6.2 The above proposal involves LILO of 220 kV line emanating from inter state 400/220 kV substation, therefore it is put for the approval of the standing committee. The power flow on these lines is tabulated below:

S.No.	Transmission element	Power Flow in MW- Base Case	Power Flow in MW on outage of 220 kV line		
			Raipur- Borjhara	Raita - Urla	Raipur- Borjhara & Raita- Urla
1.	Raipur – Borjhara 220 kV S/C line	192	0	241	0
2.	Raita – Urla 220 kV S/C line	162	223	0	0
3.	Siltara- Urla 220 kV S/C line	66	105	132	221
4.	Borjhara – Urla 220 kV 2XS/C line	21 + 21	35 + 35	63 + 63	-16
5.	Khedamara – Borjhara 220 kV S/C line	21	90	53	166
6	Raipur- Khedemara 220 kV S/C line	168	230	165	251

6.3 CSPTCL has intimated that works under Phase-I have already been included in the capital investment plan for the year 2013-16 and works under Phase-II ould be included in the capital investment plan for the year 2016-19. Provision of 3rd 160

MVA, 220/132 kV transformer at Borjhara substation would be made depending on the actual loading on the transformers after commissioning of the substation.

Member may deliberate and approve the proposal of CSPTCL.

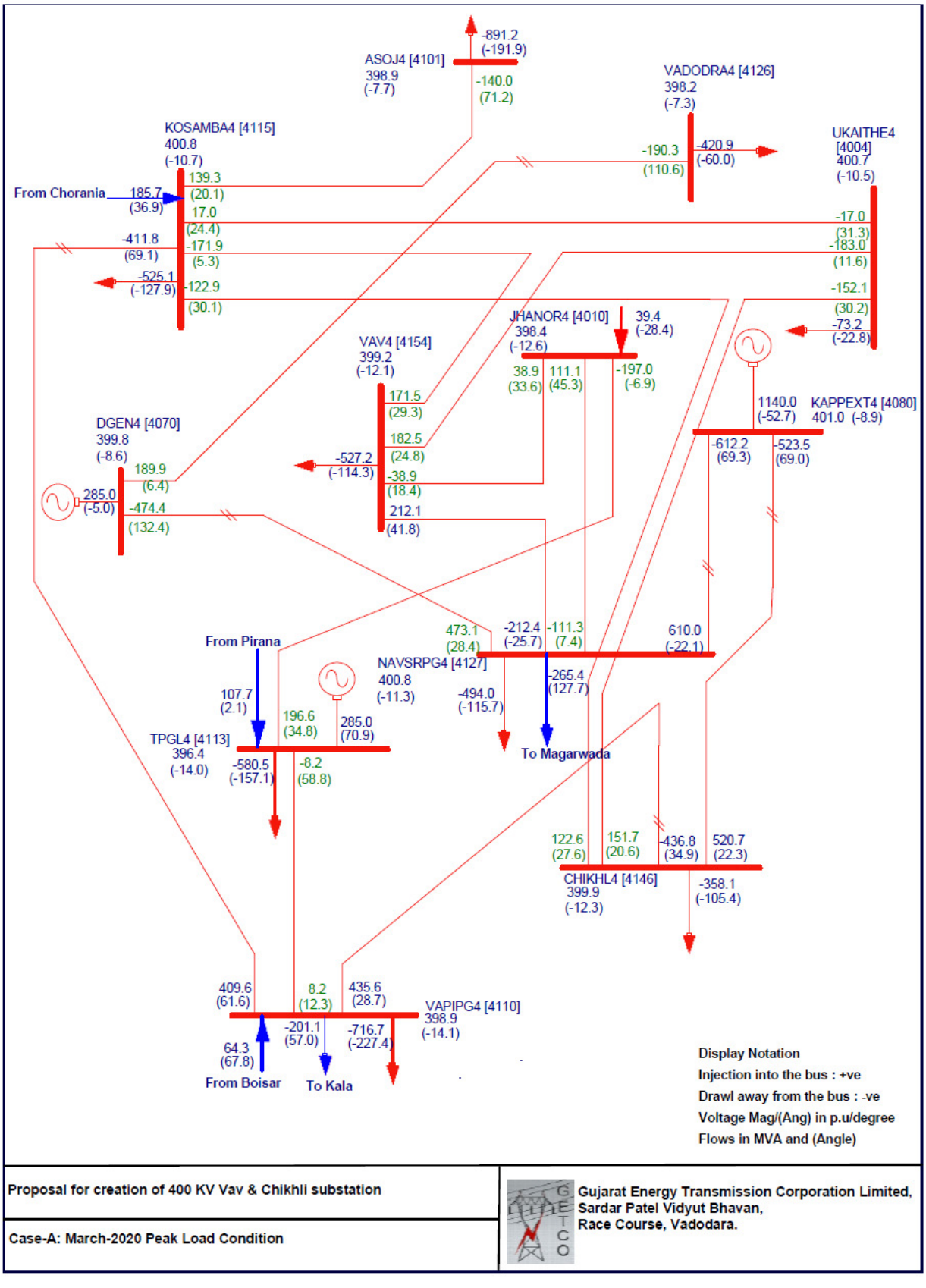
7.0 New Transmission schemes in South Gujarat area- Agenda by GETCO.

7.1 GETCO has informed that due to high price and non availability of gas the dispatches from gas based generation projects located in south Gujarat has reduced drastically. South Gujarat area is predominantly industrial load and high load growth is anticipated in this area. Due to less availability of generation from gas based projects, many 220 kV lines are getting critically loaded and 220 kV network is not capable of handling any contingency in the area.

7.2 To strengthen transmission network in south Gujarat, GETCO has proposed two nos. 400 kV substations at Vav and Chikli. 220 kV Vav substation supplies power to Surat city and is connected with Mota, Sachin, Bhestan and Navsari 220 kV substations. Similarly, 220 kV Chikli substation is connected to Mota, Sachin, Navsari & Bhilad 220 kV substation. The following 400 kV interconnections has been proposed by GETCO:

(i) LILO of one circuit of 400 kV Ukai TPS – Kosamba 400 kV D/C line at proposed 400 kV Vav substation of GETCO.
(ii) LILO of one circuit of 400 kV D/C Jhanor – Navsari (PG) line at proposed 400 kV Vav substation of GETCO.
(iii) LILO of both circuits of Kakrapar – Vapi (PG) 400 kV D/C line at proposed 400 kV Chikhli substation of GETCO.
(iv) LILO of one circuit of 400 kV Ukai TPS – Kosamba 400 kV D/C line at proposed 400 kV Chikhli substation of GETCO.

7.3 Vav and Chikli 400 kV substation has been proposed by GETCO for feeding loads. The above proposed interconnections involve LILO of inter-state transmission line namely, Jhanor – Navsari 400 kV D/C line and Kakrapar – Vapi 400 kV D/C line and is therefore put up or the approval of the standing committee. The exhibit furnished by GETCO depicting the power flow for March 2020 peak conditions of Gujarat and assuming minimum dispatch from gas based generation in south Gujarat is as given below:



Members may deliberate and approve the proposal of GETCO.

8.0 Modifications in the already agreed schemes in the 36th SCM of WR/ 18th LTA meeting of WR constituents held on 29.08.2013.

8.1 In the 36th SCM of WR/ 18th LTA meeting of WR constituents held on 29.08.2013, the additional system strengthening scheme for Sipat STPS, Chattishgarh IPPs and ATS for Gadarwara STPS was agreed. In addition 4000 MW Raigarh(Kotra) – Pugalur HVDC was also agreed for export of power to Southern Region.

8.2 Subsequently, in view of the deficit scenario in SR and to enable import of about 16000 MW in Southern Region, the Raigarh(Kotra) – Pugalur 4000 MW HVDC was also upgraded to 6000 MW and a new Warora pool - Warangal - Hyderabad-Kurnool 765kV link was planned. In view of these changed scenario, the following modifications in the already agreed scheme is put up for approval please:

Approved in the 36th SCM of WR	**Modified Scheme**
Additional Transmission System Strengthening for Sipat STPS (i) Sipat – Bilaspur Pooling Station 3rd 765 kV S/c line. (ii) Bilaspur Pooling Station – Dhanwahi pooling station 765 kV D/c line. (iii) Establishment of new 2X1500, 765/400 kV Dhanwahi Pooling Station. (iv) LILO of both circuits of Jabalpur - Orai 765 kV D/C at Dhanwahi pooling station. (v) LILO of all circuits of Vindhyachal – Jabalpur 400 kV 2xD/c line at Dhanwahi pooling station.	**Additional Transmission System Strengthening for Sipat STPS** (i) Sipat – Bilaspur Pooling Station 3rd 765 kV S/c line. (ii) Bilaspur Pooling Station – Rajnandgaon 765 kV D/c line.
Additional System Strengthening Scheme for Chhattisgarh IPPs (i) Raipur (Pool) – Rajnandgaon 765 kV D/c line. (ii) Rajnandgaon – Pooling station near Warora 765 kV D/c line. (iii) LILO of one circuit of Aurangabad – Padghe 765 kV D/c line at Pune. (iv) Establishment of new substation near Rajnandgaon 765/400 kV, 2x1500 MVA substation. (v) LILO of all circuits of Raipur/Bhilai – Bhadrawati 400 kV lines at Rajnandgaon.	**Additional System Strengthening Scheme for Chhattisgarh IPPs** (i) Raipur (Pool) – Rajnandgaon 765 kV D/c line. (ii) Rajnandgaon – Pooling station near Warora 765 kV D/c line. (iii) LILO of one circuit of Aurangabad – Padghe 765 kV D/c line at Pune. (iv) Establishment of 765 kV Rajnandgaon switching station. (v) Raigarh (Kotra) - Champa (Pool) – Dharamjaigarh 765 kV 2nd S/c line.

Approved in the 36th SCM of WR	Modified Scheme
(vi) Raigarh (Kotra) - Champa (Pool) – Dharamjaigarh 765 kV 2nd S/c line.	
Transmission System Associated with Gadarwara STPS (2x800MW) of NTPC Ltd.	**Transmission System Associated with Gadarwara STPS (2x800MW) of NTPC Ltd.**
i) Gadarwara STPS-Jabalpur Pool 765 kV D/C ii) Gadarwara STPS-Warora (Pooling Station) 765 kV D/C iii) Warora (Pooling Station)- Parli (New) 765 kV D/C iv) Parli (New)-Sholapur 765 kV D/C v) LILO of both circuits of Wardha-Parli (PG) 400 kV D/C line at Warora (Pooling Station) (Quad) vi) Establishment of 2x1500 MVA 765/400 kV Warora (Pooling Station) vii) Parli (New)-Parli (PG) 400 kV D/C (Quad) viii) Establishment of 2x1500 MVA 765/400 kV Parli (New) S/S	i) Gadarwara STPS-Jabalpur Pool 765 kV D/C ii) Gadarwara STPS-Warora (Pooling Station) 765 kV D/C iii) Warora (Pooling Station)- Parli (New) 765 kV D/C iv) Parli (New)-Sholapur 765 kV D/C v) Warora 765/400 kV (Pooling Station) (Quad) – Warora (MSETCL) 400 kV D/C Quad line. vi) Establishment of 2x1500 MVA 765/400 kV Warora (Pooling Station) vii) Parli (New)-Parli (PG) 400 kV D/C (Quad) viii) Establishment of 2x1500 MVA 765/400 kV Parli (New) S/S

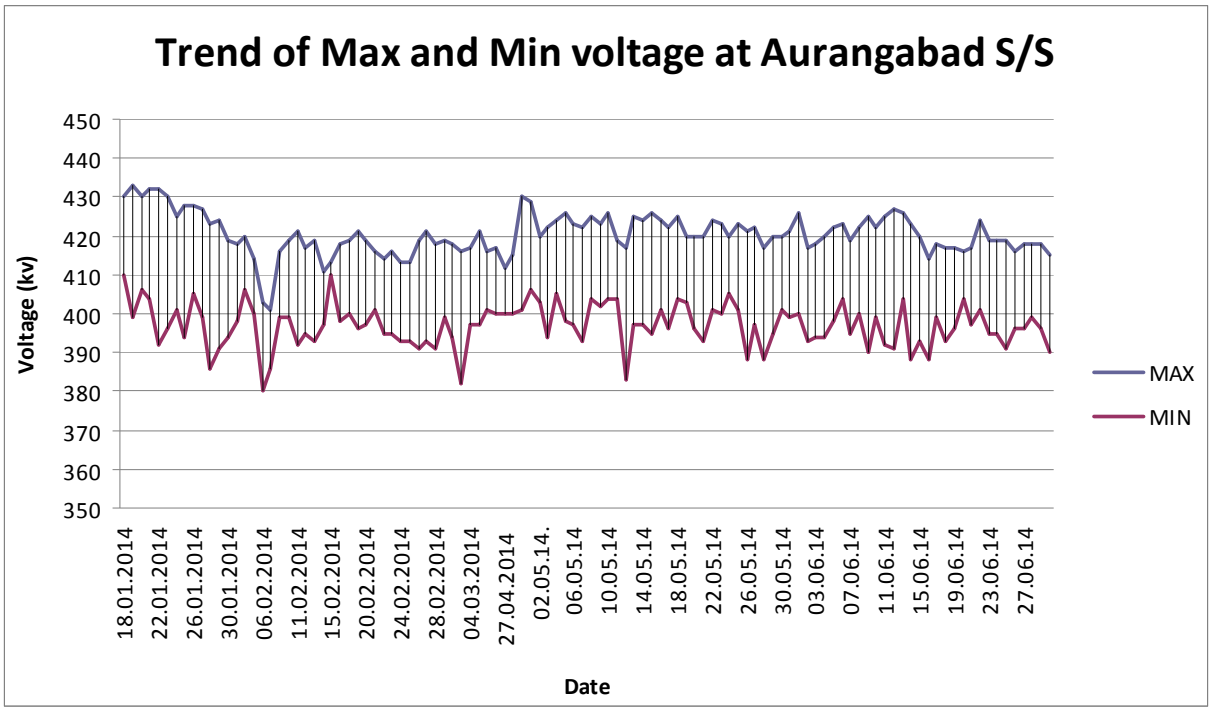
The system studies for earlier system approved and modified scheme is enclosed at Annexure-2A & Annexure-2B respectively.

Members may discuss.

9.0 Commissioning of 2X80 MVAR 400 kV line reactors associated with Aurangabad – Boisar 400 kV Quad line as bus reactors at Aurangabad.

9.1 POWERGRID has intimated that the Aurangabad-Boisar 400 kV D/C quad line, being implemented as a part of the transmission system associated with IPPs in Chattishgarh, is scheduled for commissioning by May 2015. The associated line 2x80 MVAR line reactors at Aurangabad are ready for commissioning.

9.2 POWERGRID has proposed to commission the 2X80 MVAR 400 kV line reactors associated with Aurangabad – Boisar 400 kV Quad line as bus reactors at Aurangabad till the availability of the line to control the overvoltage whenever required. The trend of maximum voltage at Aurangabad 400 kV SS for the period 18th January 2014 to 30th June 2014 is as given below:



Members may deliberate.

Contingency Arrangement of Pune (GIS) 765kV Substation

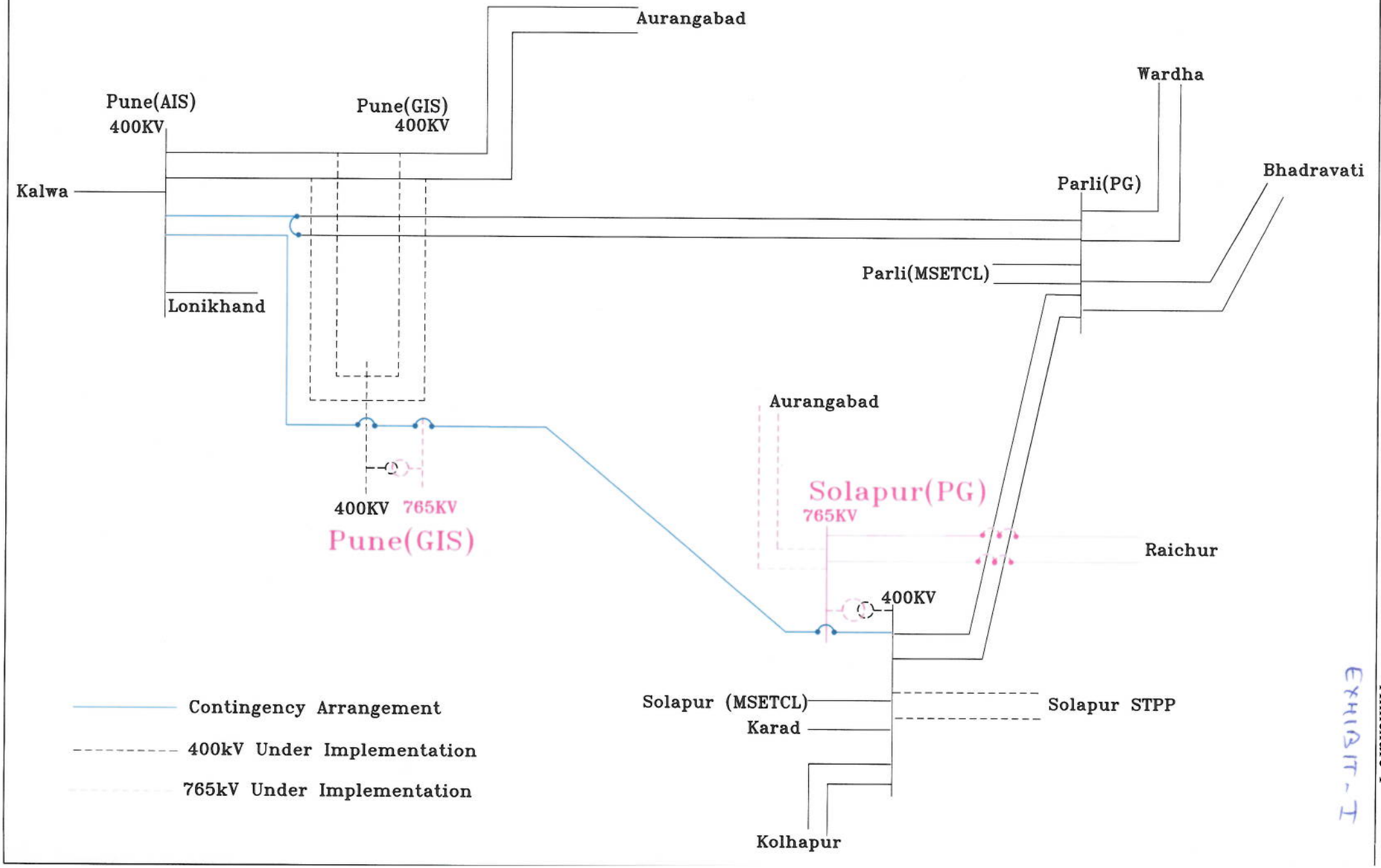


EXHIBIT-I

Annexure-1

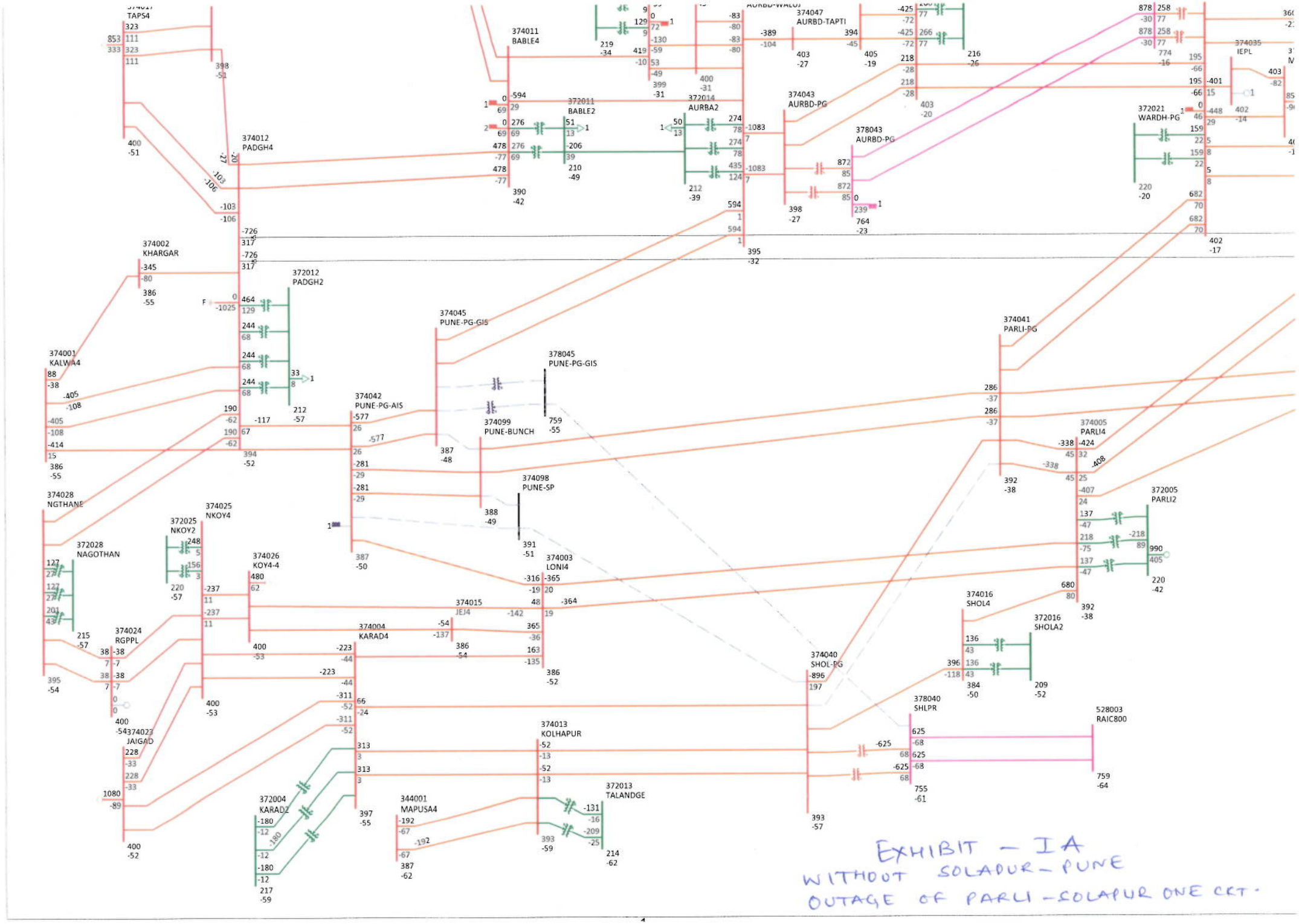


EXHIBIT – IA
WITHOUT SOLAPUR – PUNE
OUTAGE OF PARLI – SOLAPUR ONE CKT.

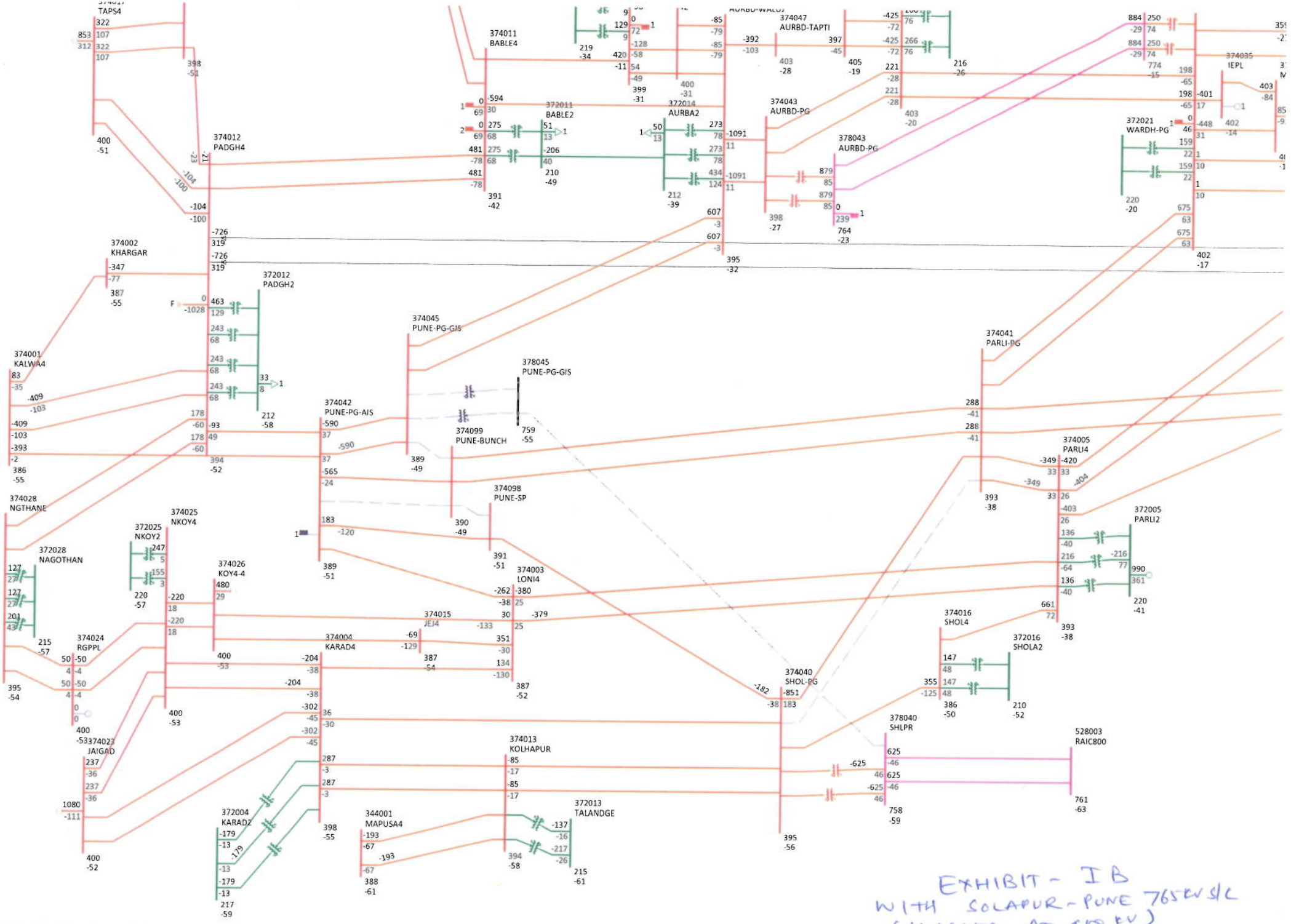


EXHIBIT - IB
WITH SOLAPUR-PUNE 765KV S/C
(CHARGED AT 400 KV)

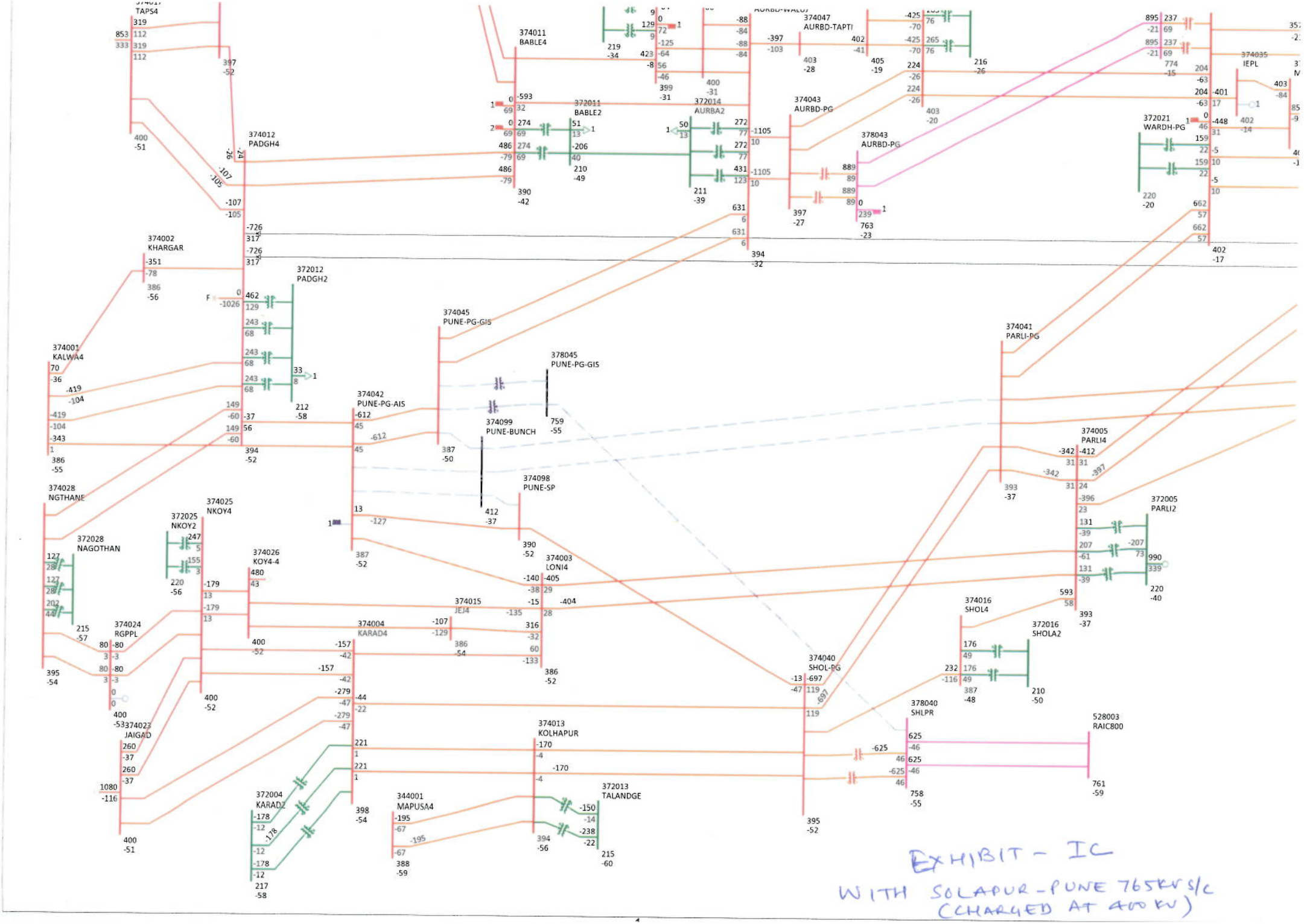
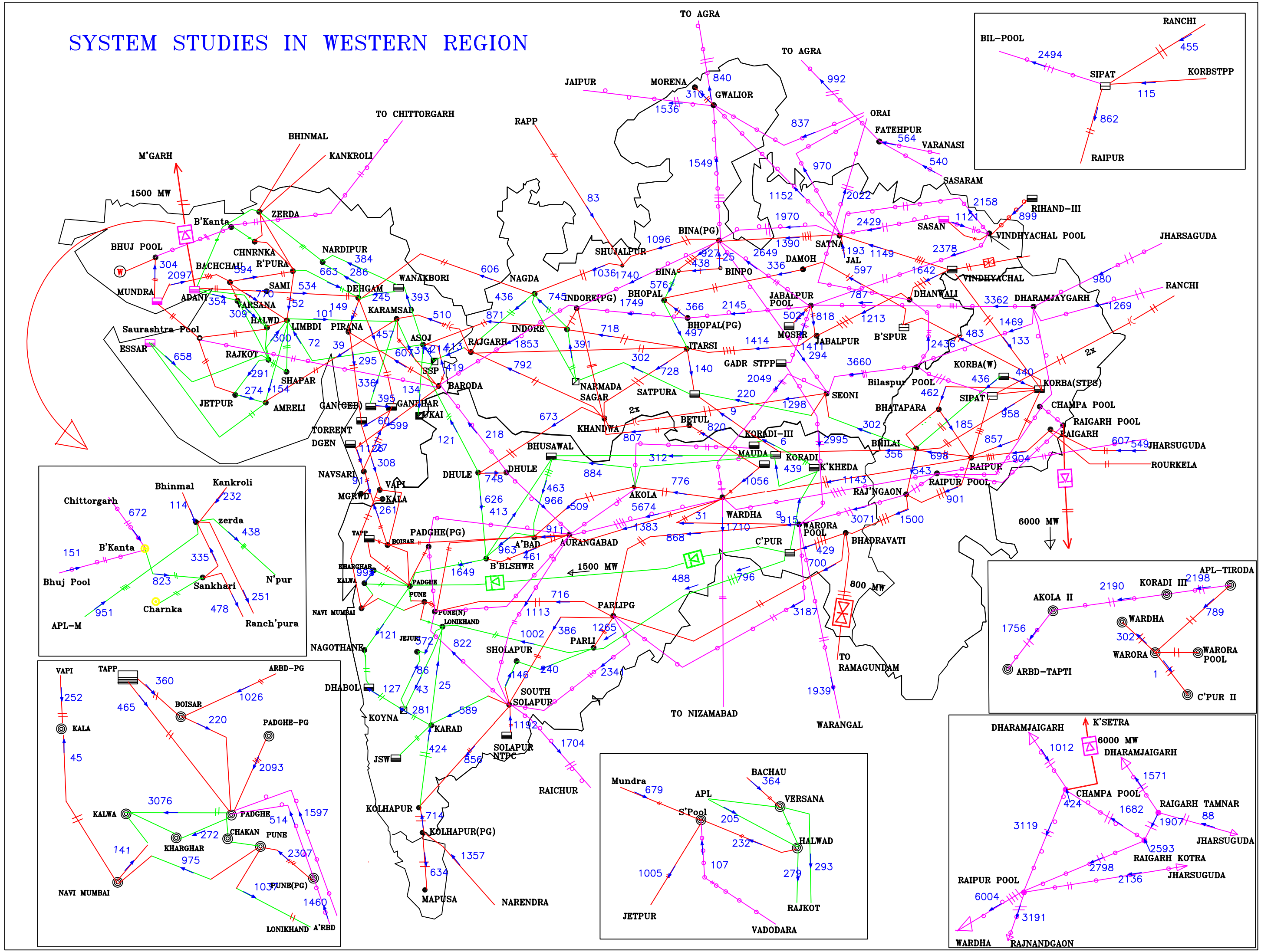


EXHIBIT - IC

WITH SOLAPUR-PUNE 765KV S/C (CHARGED AT 400 KV)

Annexure-2 A

SYSTEM STUDIES IN WESTERN REGION



Annexure - 2 B

SYSTEM STUDIES IN WESTERN REGION