



सत्यमेव जयते

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली योजना एवं मूल्यांकन प्रभाग-II
Power System Planning & Appraisal Division-II

सेवा मे / To,

संलग्न सूची के अनुसार
As per list enclosed

विषय: दक्षिणी क्षेत्र के लिए विद्युत प्रणाली योजना पर स्थायी समिति की 42 वीं बैठक की अतिरिक्त कार्यसूची-II ।

Subject: Additional Agenda-2 for 42nd meeting of Standing Committee on Power System Planning for Southern Region.

महोदय(Sir)/महोदया(Madam),

दक्षिणी क्षेत्र के लिए विद्युत प्रणाली योजना पर स्थायी समिति की 42 वीं बैठक 27 अप्रैल, 2018 को 10:00 बजे से होटल क्राउन प्लाजा, एरनाकुलम (केरल) में आयोजित की जायेगी । बैठक की अतिरिक्त कार्यसूची-II संलग्न है ।

The 42nd meeting of the Standing Committee on Power System Planning of Southern Region will be held at 10:00 hrs on 27th April, 2018 at Hotel Crown Plaza, Ernakulam (Kerala). Additional Agenda-2 for the meeting is enclosed.

भवदीय/Yours faithfully,

Sd/-

(बी.एस.बैरवा/B.S. Bairwa)
निदेशक/ Director

Address List:

1. The Member Secretary, Southern Regional Power Committee, 29, Race Course Cross Road, Bangalore 560 009. FAX : 080-22259343	2. The Director (Projects), Power Grid Corp. of India Ltd. “Saudamini”, Plot No.2, Sector-29, Gurgaon 122 001, Haryana. FAX : 95124-2571932
3. CEO, POSOCO, B-9, Qutub Institutional Area, Katwaria Sarai, New Delhi-110016	4. The Director (Transmission), Karnataka State Power Trans. Corp.Ltd., Cauvery Bhawan, Bangalore - 560 009. FAX : 080 -22228367
5. The Director (Transmission), Transmission Corp. of Andhra Pradesh Ltd., (APTRANSCO) Vidyut Soudha, Hyderabad – 500 082. FAX : 040-66665137	6. The Director (Grid Transmission and Management), Transmission Corp. of Telangana Ltd., (TSTRANSCO) Vidyut Soudha, Khairatabad Hyderabad – 500 082. FAX : 040-23321751
7. The Director (Trans. & System Op.), Kerala State Electricity Board, Vidyuthi Bhawanam, Pattom, Thiruvananthapuram - 695 004. FAX : 0471-2444738	8. Member (Distribution), Tamil Nadu electricity Board (TNEB), 6 th Floor, Eastern Wing, 800 Anna Salai, Chennai - 600002. FAX : 044-28516362
9. The Director (Power), Corporate Office, Block – I, Neyveli Lignite Corp. Ltd., Neyveli , Tamil Nadu – 607 801. FAX : 04142-252650	10. The Superintending Engineer –I, First Floor, Electricity Department, Gingy Salai, Puducherry – 605 001. FAX : 0413-2334277/2331556
11. Director (Projects), National Thermal Power Corp. Ltd. (NTPC), NTPC Bhawan, Core-7, Scope Complex, Lodhi Road, New Delhi-110003. FAX-011-24360912	12. Director (Operations), NPCIL, 12 th Floor, Vikram Sarabhai Bhawan, Anushakti Nagar, Mumbai – 400 094. FAX : 022- 25991258

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3	ED, SRLDC 29, Race Course Cross Road, Bangalore 560 009 FAX – 080-22268725	

Additional Agenda-2 for 42nd Meeting of Standing Committee on Power System Planning in Southern Region (SCPSPSR)

Date: 27 April, 2018 Time: 10:00 Hrs

Venue: Hotel Crowne Plaza, Ernakulam, Kerala

36. New Transmission System proposed for extending the Power supply to CRDA area

36.1 CRDA scheme includes a 400 kV ring in and around capital city and proposed 400 kV substations at Thullur/Inavolu, Gudiwada and Chilakaluripet along with associated 3 Nos. 220 kV Substations & 8 Nos. 132 kV Substations and lines in a phased manner.

36.2 The above scheme was discussed and approved in the 39th Standing Committee Meeting held on 28th & 29th December 2015 at New Delhi.

36.3 Further, it is to submit that M/s APCRDA estimated the power demand to the tune of 2718.619 MW based on their consultant reports of M/s Aarvee Associates, SIIMP Consultants and also proposed 3 Nos. 400/220 kV Substations and 19 Nos. 220/33 kV Substations scattered in three Zone to meet the aforesaid estimated demand in phased manner.

Accordingly the system studies have been carried out keeping the Transmission requirement works for the year 2020-21 is taken as the base case and duly considering the proposed estimated power demand in the Capital City to the tune of 2718.619 MW by the year 2050. However, the load growth rate and future generation for the rest of network (other than CRDA network) was not considered in the present system studies.

Zone - 1

- i. Erection of 400/220 kV Borupalem SS with 3 x 500 MVA ICTs.
- ii. Making LILO 400 kV TMSC line of Eluru – Sattenapalli & 400 kV TMSC line of Sattenapalli – Nunna line to proposed 400/220 kV Borupalem SS.
- iii. Erection of 220/33 kV Sakhamuru SS with 3 x 80 MVA PTRs.
- iv. Erection of 220 kV XLPE DC line from proposed 400/220 kV Borupalem SS to proposed 220/33 kV Sakhamuru SS.
- v. Erection of 220/33 kV Nekkallu SS with 3 x 80 MVA PTRs.
- vi. Erection of 220 kV XLPE DC line from proposed 400/220 kV Borupalem SS to proposed 220/33 kV Nekkallu SS.
- vii. Erection of 220/33 kV Ananthavaram SS with 3 x 80 MVA PTRs.
- viii. Erection of 220 kV XLPE DC line from proposed 400/220 kV Borupalem SS to proposed 220/33 kV Ananthavaram SS.
- ix. Erection of 220/33 kV Thulluru SS with 3 x 80 MVA PTRs.

- x. Erection of 220 kV XLPE DC line from proposed 400/220 kV Borupalem SS to proposed 220/33 kV Thulluru SS.
- xi. Erection of 220/33 kV Abbarajupalem SS with 3 x 80 MVA PTRs.
- xii. Erection of 220 kV XLPE DC line from proposed 400/220 kV Borupalem SS to proposed 220/33 kV Abbarajupalem SS.
- xiii. Erection of 220/33 kV Rayapudi AGC-1 SS with 3 x 80 MVA PTRs.
- xiv. Erection of 220 kV XLPE DC line from proposed 400/220 kV Borupalem SS to proposed 220/33 kV Rayapudi AGC-1SS.
- xv. Erection of 220/33 kV Nelapadu AGC-1 SS with 3 x 80 MVA PTRs.
- xvi. Erection of 220 kV XLPE DC line from proposed 400/220 kV Borupalem SS to proposed 220/33 kV Nelapadu AGC-1 SS.

Zone -2

- xvii. Erection of 400/220 kV Tallayapalem SS with 3 x 500 MVA ICTs.
- xviii. Making LILO 400 kV HTLS DC line of VTS-IV – Sattenapalli to proposed 400/220 kV Tallayapalem SS.
- xix. Erection of 220/33 kV Lingayapalem SS with 3 x 80 MVA PTRs.
- xx. Making 220 kV LILO of existing 220 kV SC VTS – Narasaraopet & 220 kV SC VTS – Podili to proposed 220/33 kV Lingayapalem SS.
- xxi. Erection of 220/33 kV Uddandrayunipalem SS with 3 x 80 MVA PTRs.
- xxii. Erection of 220 kV XLPE DC line from proposed 220 kV Lingayapalem SS to proposed 220/33 kV Uddandrayunipalem SS.
- xxiii. Erection of 220/33 kV Tallayapalem SS with 3 x 80 MVA PTRs.
- xxiv. Erection of 220 kV XLPE DC line from proposed 400/220 kV Tallayapalem SS to proposed 220/33 kV Tallayapalem SS.
- xxv. Erection of 220/33 kV Velagapudi SS with 3 x 80 MVA PTRs.
- xxvi. Erection of 220 kV XLPE DC line from proposed 400/220 kV Tallayapalem SS to proposed 220/33 kV Velagapudi SS.
- xxvii. Erection of 220/33 kV Malkapuram SS with 3 x 80 MVA PTRs.
- xxviii. Erection of 220 kV XLPE DC line from proposed 400/220 kV Tallayapalem SS to proposed 220/33 kV Malkapuram SS.

- xxix. Erection of 220/33 kV Krishnayapalem SS with 3 x 80 MVA PTRs.
- xxx. Erection of 220 kV XLPE DC line from proposed 400/220 kV Tallayapalem SS to proposed 220/33 kV Krishnayapalem SS.
- xxxi. Erection of 220/33 kV Venkatapalem SS with 3 x 80 MVA PTRs.
- xxxii. Erection of 220 kV XLPE DC line from proposed 400/220 kV Tallayapalem SS to proposed 220/33 kV Venkatapalem SS.

Zone-3

- xxxiii. Erection of 400/220 kV Nidamaru SS with 3 x 500 MVA ICTs.
- xxxiv. Making LILO one circuit of 400 kV QMDC line of Gudivada – Chilakaluripet to proposed 400/220 kV Nidamaru SS.
- xxxv. Erection of 220/33 kV Nidamaru SS with 3 x 80 MVA PTRs.
- xxxvi. Erection of 220 kV XLPE DC line from proposed 400/220 kV Nidamaru SS to proposed 220/33 kV Nidamaru SS.
- xxxvii. Erection of 220/33 kV Bethapudi SS with 3 x 80 MVA PTRs.
- xxxviii. Erection of 220 kV XLPE DC line from proposed 400/220 kV Nidamaru SS to proposed 220/33 kV Bethapudi SS.
- xxxix. Erection of 220/33 kV Yerrabalem SS with 3 x 80 MVA PTRs.
 - xl. Erection of 220 kV XLPE DC line from proposed 400/220 kV Nidamaru SS to proposed 220/33 kV Yerrabalem SS.
 - xli. Erection of 220/33 kV Kuragallu SS with 3 x 80 MVA PTRs.
 - xl.ii. Erection of 220 kV XLPE DC line from proposed 400/220 kV Nidamaru SS to proposed 220/33 kV Kuragallu SS.
 - xl.iii. Erection of 220/33 kV Inavolu SS with 3 x 80 MVA PTRs.
 - xl.iiii. Erection of 220 kV XLPE DC line from proposed 400/220 kV Nidamaru SS to proposed 220/33 kV Inavolu SS.
 - xl.v. Erection of 220 kV XLPE DC line from proposed 220 kV Malkapuram SS to proposed 220/33 kV Sakhamuru SS.
 - xl.vi. Erection of 220 kV XLPE DC line from proposed 220 kV Malkapuram SS to proposed 220/33 kV Inavolu SS.
 - xl.vii. Erection of 220 kV XLPE DC line from proposed 220 kV Malkapuram SS to proposed 220/33 kV Krishnayapalem SS.

5. The EHT system losses and line loadings are kept below for kind perusal.

SL. No.	Description	BASE CASE	WITH CRDA SCHEME
		MW	MW

1	400 kV VTS-IV - Sattenapally	2 x 309.1	-
2	400 kV VTS-IV - Nunna	80.3	-410.6
3	400kV Vemagiri - Eluru	2 x 236.6	2 x 319.4
4	400kV Sattenapalli - Nunna	-123.1	-
5	400kV Sattenapalli - Eluru	-135.1	-
6	400kV Nunna - Eluru	190.4	-175
7	400kV Eluru - Gudivada	2 x 281.6	2 x 379.7
8	400kV Gudivada - Chilakaluripet	2 x 94.7	81.9
9	ICT loadings at 400/220 kV Borupalem SS	-	3 x 260
10	400 kV Borupalem - Sattenapalli	-	2 x -79.7
11	400 kV Borupalem - Eluru	-	-454.7
12	400 kV Borupalem - Nunna	-	-166.1
13	ICT loadings at 400/220 kV Tallayapalem SS	-	3 x 363
14	400 kV Tallayapalem - VTS	-	2 x -714.1
15	400 kV Tallayapalem - Sattenapalli	-	2 x 169.6
16	ICT loadings at 400/220 kV Nidamarru SS	-	3 x 206.9
17	400 kV Nidamarru - Gudivada	-	-343.9
18	400 kV Nidamarru - Ch. Peta	-	-276.8
19	400/220 kV Borupalem connectivity		
20	400/220 kV Borupalem - Sakhamuru	-	2 x -53.3
21	400/220 kV Borupalem - Nekkalu	-	2 x 77.8
22	400/220 kV Borupalem - Ananthavaram	-	2 x 89
23	400/220 kV Borupalem - Thulluru	-	2 x 74.8
24	400/220 kV Borupalem - Abbarajupalem	-	2 x 63
25	400/220 kV Borupalem - Rayapudi AGC	-	2 x 60.7
26	400/220 kV Borupalem - Nelapadu AGC	-	2 x 78
27	400/220 kV Tallayapalem connectivity		
28	220 kV Lingayapalem - VTPS	-	2 x -191.4
29	220 kV Lingayapalem - Narasaraopet	-	86.5
30	220 kV Lingayapalem - Podili	-	66.8

31	220 kV Podili - Narasaraopet	-	-43.9
32	220 kV Lingaryapalem Uddandrayanipalem	- -	2 x 33.2
33	400/220 kV Tallayapalem Tallayapalem	- -	2 x 65.2
34	400/220 kV Tallayapalem - Velagapudi	-	2 x 69.8
35	400/220 kV Tallayapalem - Malkapuram	-	2 x 216.2
36	400/220 kV Tallayapalem Karishnayapalem	- -	2 x 120.8
37	400/220 kV Tallayapalem Venkatapalem	- -	2 x 72.6
38	400/220 kV Nidamarru connectivity		
39	400/220 kV Nidamarru - Nidamarru	-	2 x 79
40	400/220 kV Nidamarru - Bethapudi	-	2 x 83.6
41	400/220 kV Nidamarru - Yerrabalem	-	2 x 74.3
42	400/220 kV Nidamarru - Kuragallu	-	2 x 76.6
43	400/220 kV Nidamarru - Inavolu	-	2 x -3.1
44	220 kV Malkapuram - Sakhamuru	-	2 x 115.4
45	220 kV Malkapuram - Inavolu	-	2 x 66.4
46	220 kV Malkapuram - Karishnayapalem	-	-70.5
EHT system losses		448.560	494.120

36.4 Hence, new Transmission System proposed for extending the power supply to CRDA area is herewith submitted for consideration to include in additional agenda in the 42nd meeting of Standing Committee on Power System Planning to Southern Region.

36.5 The study result carried by APTRANSCO enclosed at Annexure-XV

37. Evacuation of power from Renewable Energy sources in Southern Region

37.1 Tirunelveli area:

The transmission system comprising of establishment of 2x500 MVA 400/230kV Pooling Station at Tirunelveli GIS along with its interconnection with Tuticorin Pooling Station through 2 nos. of 400kV D/c (quad) lines was envisaged to facilitate interconnection of wind generation in Tirunelveli/Tuticorin area with rest of the Grid. The transmission scheme is under advanced stage of commissioning as part of “Green Energy corridor”.

37.2 CTU has received number of Connectivity & LTA applications at the Tirunelveli PS, the details of the same are as below:

37.3 Table-1

Sl. No.	Type of applications	Applications received		Applications granted	
		Numbers	Quantum (MW)	Nos.	Quantum (MW)
1.	Connectivity	20	5700	10	3150
2.	LTA	7	950	4	300

Out of 11 nos. of applications except for 1 application(250 MW), connectivity has been granted to 10 applicants.

37.4 Further out of 11 nos application, LTA has been granted for 300 MW (4 applicants) and balance is proposed to be granted. Details are as follows:

Table-2

Sl. No.	Application	Quantum (in MW)	Status of LTA
1.	Suzlon Power Infrastructure Ltd.	75	LTA granted
2.	Suzlon Power Infrastructure Ltd.	75	LTA granted
3.	Suzlon Power Infrastructure Ltd.	75	LTA granted
4.	Mytrah Energy (India) Pvt. Ltd.	75	LTA granted
5.	ReGen Wind Farm (TN) Pvt. Ltd.	60	Proposed for grant of LTA
6.	ReGen Wind Farm (TN) Pvt. Ltd.	60	Proposed for grant of LTA
7.	ReGen Wind Farm (TN) Pvt. Ltd.	60	Proposed for grant of LTA
8.	ReGen Wind Farm (TN) Pvt. Ltd.	60	Proposed for grant of LTA
9.	Orange Sironj Wind Power Pvt. Ltd. (Kurukkusalai Wind Farm)	200	Proposed for grant of LTA
10.	Mytrah Energy (India) Pvt. Ltd.	225	Proposed for grant of LTA
	Total	965	

37.5 The LTA application at the Tirunelveli PS includes the PPA for 750 MW which has been signed by the wind developers under competitive bidding conducted by SECI under Tranche-I,II & III. In addition, in recent bid held by SECI for 2000 MW under Tranche-IV, 200 MW from M/s Betam is envisaged to come up in Tirunelveli Area. Details are as below:

Table-III

Sl. No.	Application	SEC I tranche	Bid won for	LTA quantum applied/ granted	Status of LTA
1.	Mytrah Energy (India) Pvt. Ltd.	I	250	300	LTA granted for 75 MW, 225 MW proposed to be granted
2.	Green Infra Renewable Pvt. Ltd.	I	250	250	LTA applied
3.	Orange Sironj Wind Power Pvt. Ltd.	II	200	200	Proposed for grant of LTA

	(Kurukkusalai Wind Farm)				
4.	Betam Wind Energy Pvt. Ltd.	III	50		LTA not yet applied
5.	Betam Wind Energy Pvt. Ltd.	IV	200		LTA not yet applied
	Total		950	750	

37.6 During the interactions with SECI/MNRE, it has been indicated that there is a wind potential of about 2500 MW in Tirunelveli area.

37.7 With above back ground, system studies were carried out for evacuation of power from Tirunelveli Pooling Station in a phased manner.

37.8 **Phase-I:** Studies were carried out with the existing/under-construction transmission system for evacuation of power from Tirunelveli area including 558 MW LTA of CEPL and Tuticorin JV(2x500 MW). The results are enclosed at Exhibits-I. From the study results it has been observed that line loadings are generally in order and wind power upto 1000 MW can be evacuated from Tirunelveli PS with the addition of 1 no of 400/230 kV 500 MVA ICT at Tirunelveli PS (GIS).

37.9 Presently, 2x500 MVA transformers are at advanced stage of commissioning at Tirunelveli PS (GIS) and considering “N-1” of 1 transformer at Tirunelveli PS as per Planning Criteria, additional 1x500 MVA transformer shall be required at Tirunelveli PS for meeting the ‘N-1’ criteria.

37.10 In view of the above, augmentation of 1x500 MVA transformer (3rd) at Tirunelveli PS is proposed for evacuation of 1000 MW generation at Tirunelveli PS.

37.11 **Phase-II:** System studies were also carried out for evacuation of additional 1500 MW of power injection at Tirunelveli PS as per the wind potential indicated by SECI/MNRE in Tirunelveli area. In this scenario, it is observed that upgradation of the transmission corridor of Tuticorin PS-Salem (Dharmapuri)- Vasanthanarsapur (Madhugiri) to its rated voltage of 765kV is required which is presently charged at 400 kV, for evacuation of total 2500 MW wind generation from Tirunelveli PS (GIS). For this, augmentation of transformation capacity with additional 2x500 MVA, 400/230kV ICTs at Tirunelveli PS is required considering the N-1 contingency. The study results are enclosed at **Exhibit-II**.

37.12 Accordingly, following is proposed for Phase-II scenario:

- i.) Upgradation of Tuticorin PS - Salem (Dharmapuri)- Vasanthanarsapur (Madhugiri) to its rated voltage of 765kV along with associated 765kV bays and transformers (2x1500 MVA)
- ii.) Upgradation of 400/230kV Tirunelveli GIS Pooling Station with 2x500 MVA, 400/230kV transformers along with associated 400kV & 230kV transformer bays. Further, 5 nos. 230kV line bays (GIS) is also proposed to be included.

37.13 Members may discuss

38. In principal approval for Transmission scheme for Wind Energy Zones (WEZs) in Southern Region

38.1 Govt of India has set an ambitious target for 175GW renewable capacity by 2022, out of which 60 GW is envisaged to be set up through wind power projects. As part of targeted wind capacity of 60GW by 2022, wind capacity of about 34GW is already achieved in Mar'18. SECI has already tendered/awarded 6050MW of wind capacity in Interstate connected wind bids. Further capacities (wind/solar) are being tendered both by SECI as well as NTPC under Interstate schemes. SECI is also targeting 10 GW scheme for ISTS connected wind power projects in current FY. In view of the wind capacity expansion plan as well as connectivity applications received in ISTS for wind capacity, it is expected that wind capacity may cross the milestone of 60 GW in next 3-4 years.

38.2 NIWE has assessed India's wind power potential of 302GW at 100m hub height with scientific rigor and based on latest available data-sets of wind as well as land geologically spread across India. To identify actual developable wind potential by 2022, several round of discussions were held in Dec'17 & Jan'18 with MNRE, National institute of wind energy (NIWE), STUs, State Nodal Agency of wind potential rich states, POWERGRID & wind developers/PPs for prioritization of wind energy zones (WEZs) in wind resource rich states for which Interstate transmission infrastructure requirement is to be assessed.

38.3 Based on various inputs like district wise NIWE potential (Rank-I-Wasteland/II-cultivable/ III-forest land), SNA developable potential, pooling station wise wind capacity sanctioned by STU, RE applications received in ISTS by CTU & detailed discussion with wind IPPs/developers, prioritized wind energy zones along with projected capacity in each WEZ were identified, which may come up by 2022 in wind resource rich states. Wind Developers//PPs also provided detailed inputs on the wind potential zones based on the feasibility of wind farm development considering availability of resources (Wind/Land etc.), land cost, ROW, existing and planned STU transmission system in complex as well as taking account of present regime of competitive wind bids scenario. Further, Interstate transmission infrastructure required for its evacuation and transfer was evolved by POWERGRID. These WEZs were in addition to resource rich pockets which are being developed as part of Green Energy Corridors-ISTS scheme viz. Bhuj & Banaskatnatha (WR), Bhadla (NR), Tirunelveli/Tuticorin(SR) etc.

38.4 As an outcome of above meetings, five WEZs were identified viz. Koppal (2500 MW) in Karnataka, Kurnool (3000 MW) in Andhra Pradesh, Karur (2500 MW) in Tamil

Nadu, Dwarka (2000 MW) in Gujarat and Osmanabad (2000 MW) in Maharashtra. Copy of the minutes of meeting in this regard is enclosed in Annexure-XVI). Details of WEZs of Southern region is as under

38.5 WEZ in Andhra Pradesh (Kurnool : 3000MW)

As decided in MNRE meeting, it was agreed that Kurnool distt. (3000 MW) should be the priority Wind Energy Zones (WEZ) due to lot of waste land availability, high wind power density (WPD) (good NIWE potential), application received by CTU (about 6000 MW) as well as SNA/STU input for which ISTS substation/infrastructure can be developed/made available. However depending on the land availability for pooling station, to address applications for connectivity in ISTS, same may be planned for common location of Kurnool & Ananthpur distt. Proposed Interstate transmission scheme for evacuation of Wind Power Injection in Kurnool WEZ is as under:

- Establishment of 765/400/220kV 3x1500 MVA, 7x500 MVA Pooling station at suitable location in Kurnool Distt (e.g. near Adoni)
- Pooling station (near Adoni PS/suitable location in Kurnool distt.) - Kurnool(new) 765 kV D/c Line
- 220kV line bays for interconnection of wind projects (10 nos)
- 1x240 MVA (765kV) & 1x125MVA (400kV) bus reactor at Pooling station in Kurnool Distt.

System study results are enclosed at Exhibit-III.

38.6 WEZ in Karnataka (Koppal : 2500MW)

In the MNRE meeting, it was agreed that Koppal distt should be the priority WEZ (2500 MW) in Karnataka for which ISTS substation/infrastructure can be developed/made available. In the meeting, it was also discussed that in SECI bids, there is a requirement of land acquisition in 9-10 months time period from LOA. In Karnataka most of the wind sites are on cultivable land, which requires pvt companies to obtain permission, therefore site acquisition/development in the Karnataka in SECI timelines is challenging. However considering good wind power density, application received by CTU (about 3000 MW) as well as waste land availability, Koppal distt should be the priority WEZ in Karnataka where ISTS need to be developed/made available on priority. This shall also address applications for connectivity in ISTS. Same may be planned for common location of Koppal & Gadag districts. Interstate transmission scheme proposed for evacuation of Wind Power Injection in Koppal WEZ is as under:

- Establishment of 6x500 MVA pooling Substation near Munirabad /suitable location in Koppal distt.

- Pooling station (near Munirabad /suitable location in Koppal distt.) - Munirabad 400 kV D/c (Quad) Line
- Pooling station (near Munirabad /suitable location in Koppal distt.) - Narendra (New) 400 kV D/c (Quad) Line
- 220kV line bays for interconnection of wind projects (9 nos)
- 2x125 MVAR bus reactor at Pooling station (near Munirabad /suitable location in Koppal distt.)

System study results are enclosed at Exhibit-IV.

38.7 WEZ in Tamil Nadu (Karur : 2500MW)

It was agreed in MNRE meeting that Karur distt (2500 MW) should be the priority zones for which ISTS substation/infrastructure can be developed/made available. CTU has also received applications for connectivity in ISTS for about 4000 MW in that area. However depending on the land availability for Substation, to address applications for connectivity in ISTS, same may be planned for common location of Karur & Tiruppur distt. This shall also address applications for connectivity in ISTS. Interstate transmission scheme proposed for evacuation of Wind Power Injection in Karur WEZ is as under:

Alternative-1:

- Establishment of 6x500 MVA, 400/230 kV Karur Pooling Station
- LILO of both circuits of Pugalur - Pugalur(HVDC) 400 kV D/c (Quad) line at Karur PS
- 220kV line bays for interconnection of wind projects (9 nos)
- 2x125 MVAR Bus reactor at Karur PS

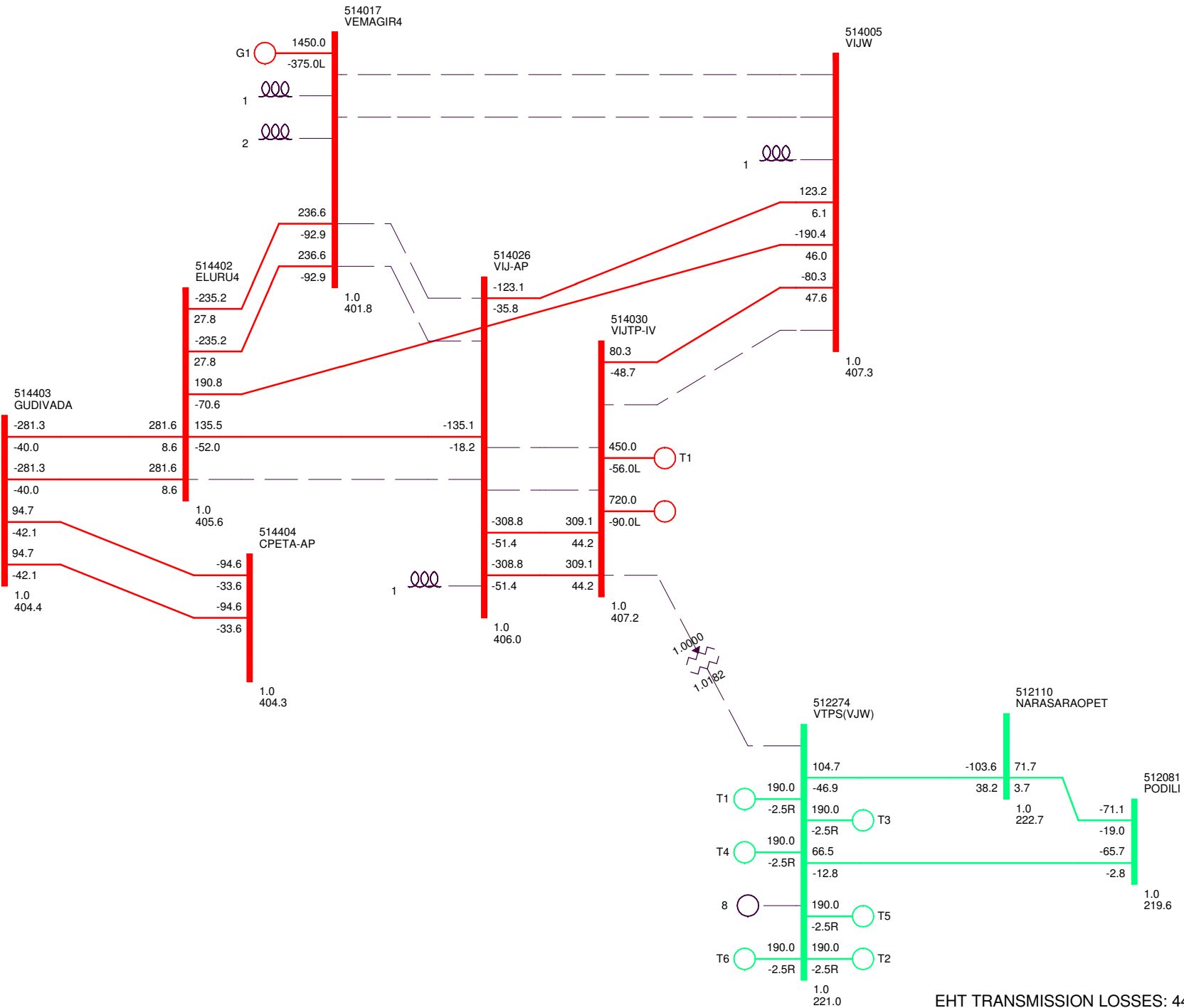
Alternative-2:

- Establishment of 6x500 MVA, 400/230 kV Karur Pooling Station
- LILO of both circuits of Arasur - Pugalur(HVDC) 400 kV D/c (Quad) line at Karur PS
- 220kV line bays for interconnection of wind projects (9 nos)
- 2x125 MVAR Bus reactor at Karur PS

System study results are enclosed at **Exhibit-V**.

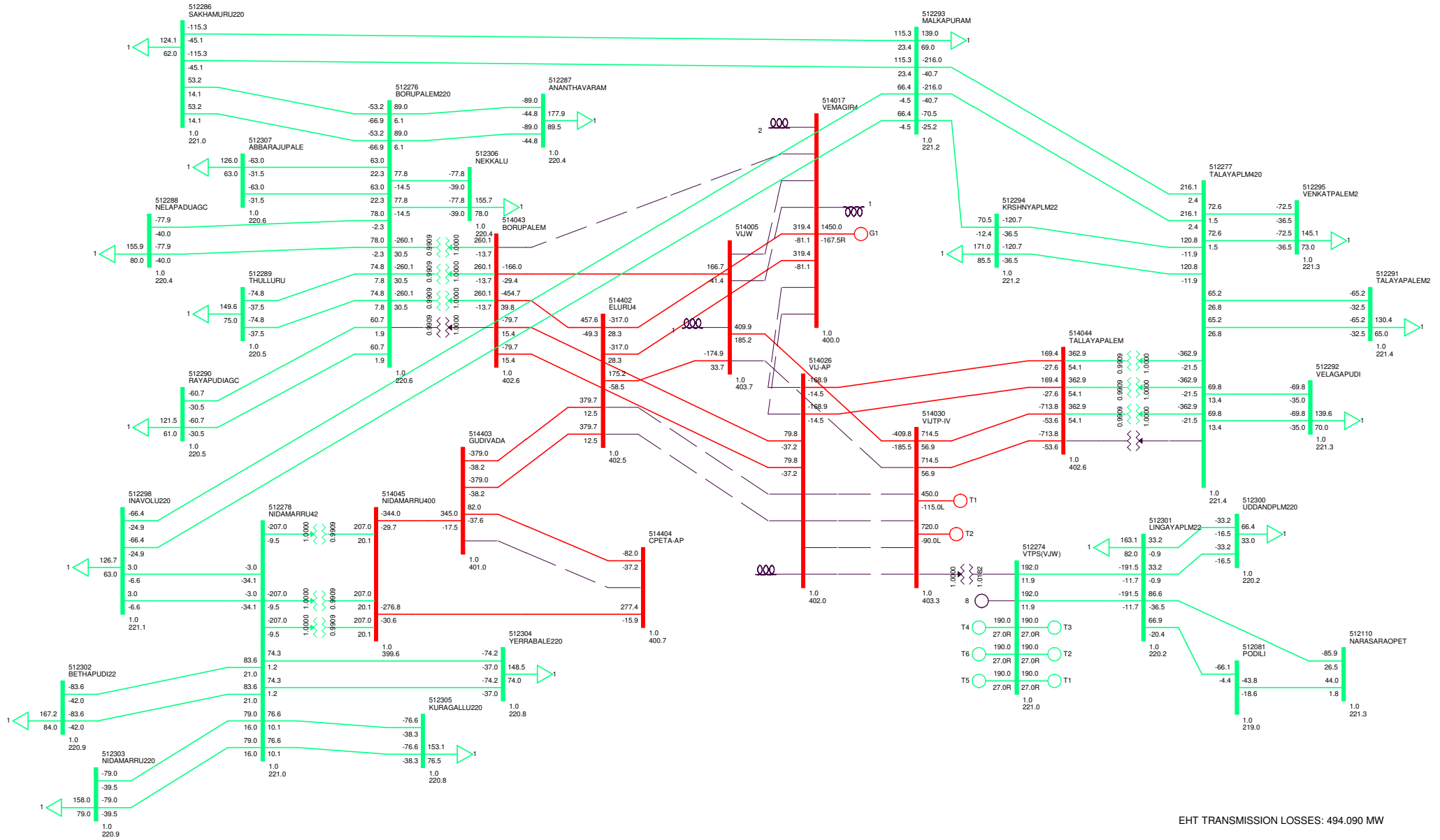
38.8 Members may discuss

BASE CASE WITHOUT CRDA



EHT TRANSMISSION LOSSES: 448.560 MW

WITH CRDA SCHEME WITH NEW LOADS



EHT TRANSMISSION LOSSES: 494.090 MW

Exhibit-I(a) : Base case

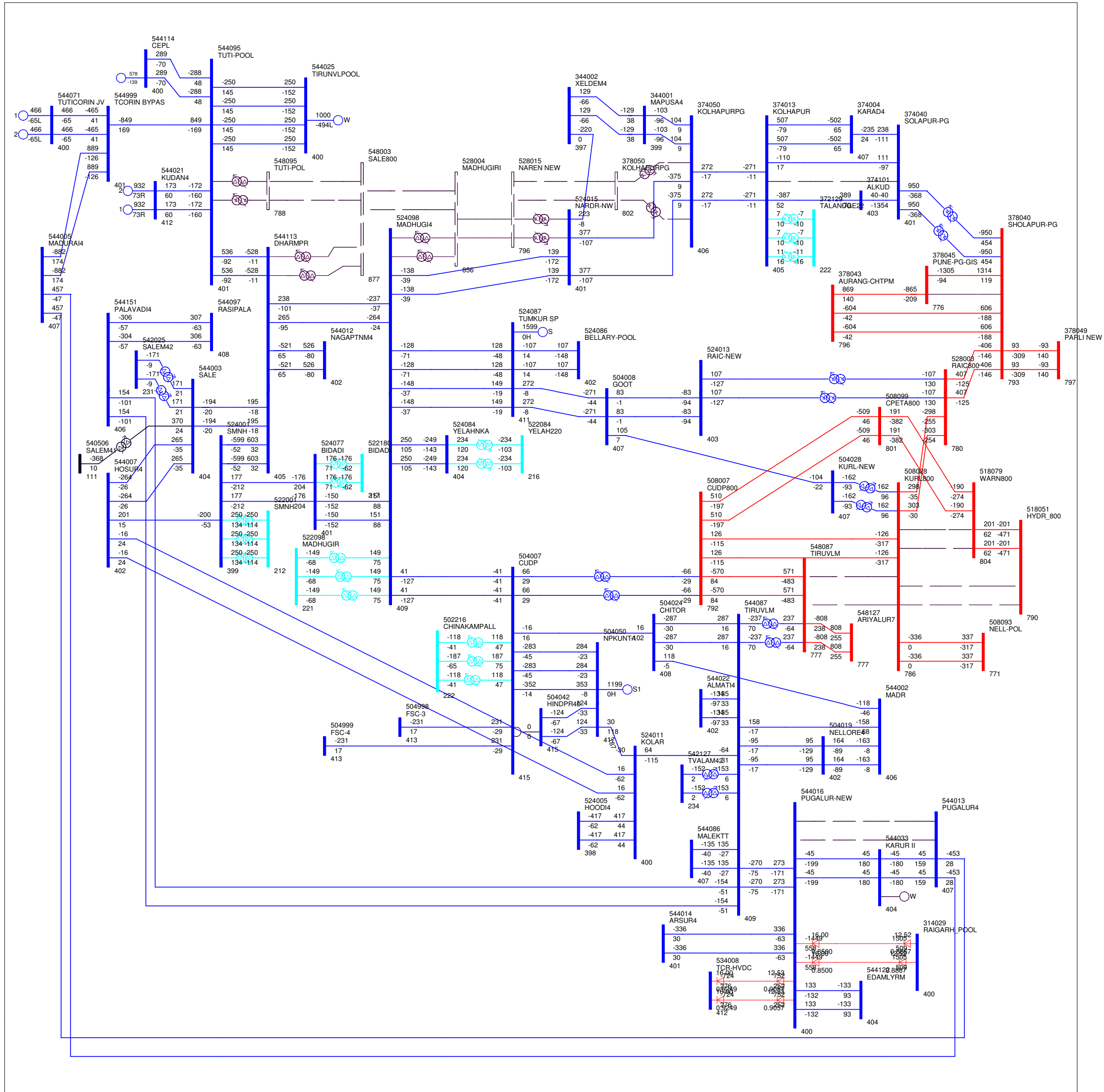
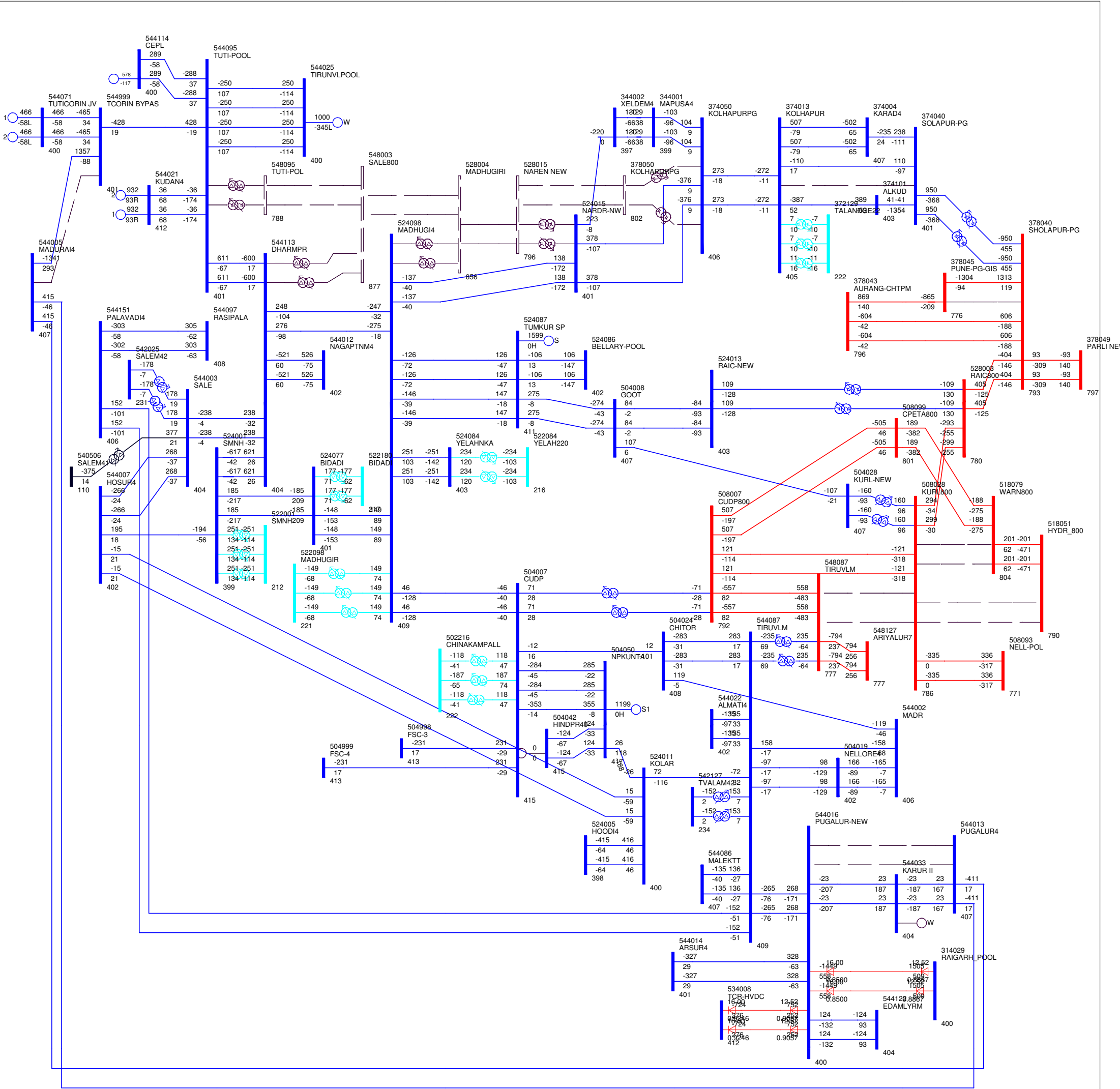
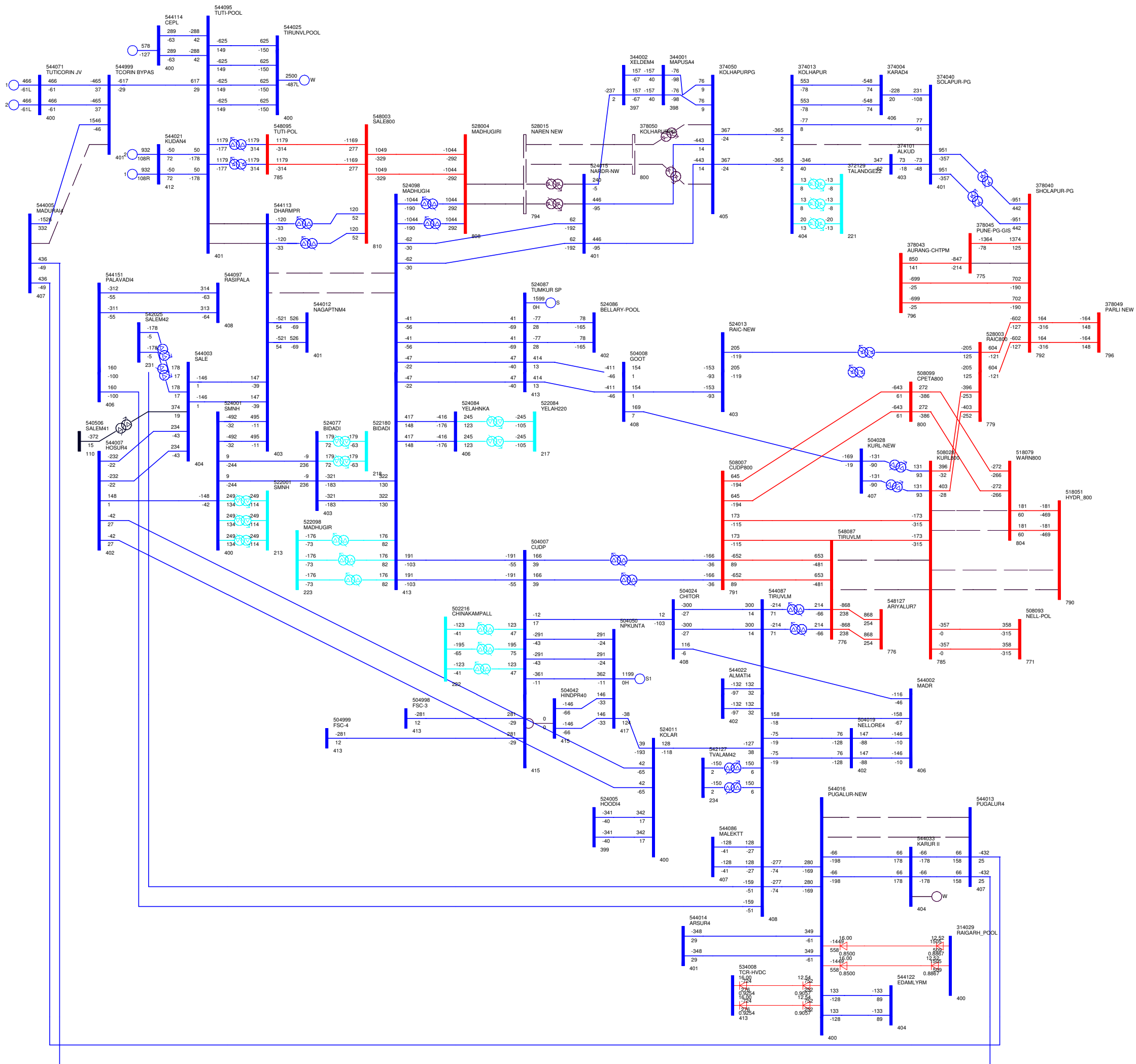
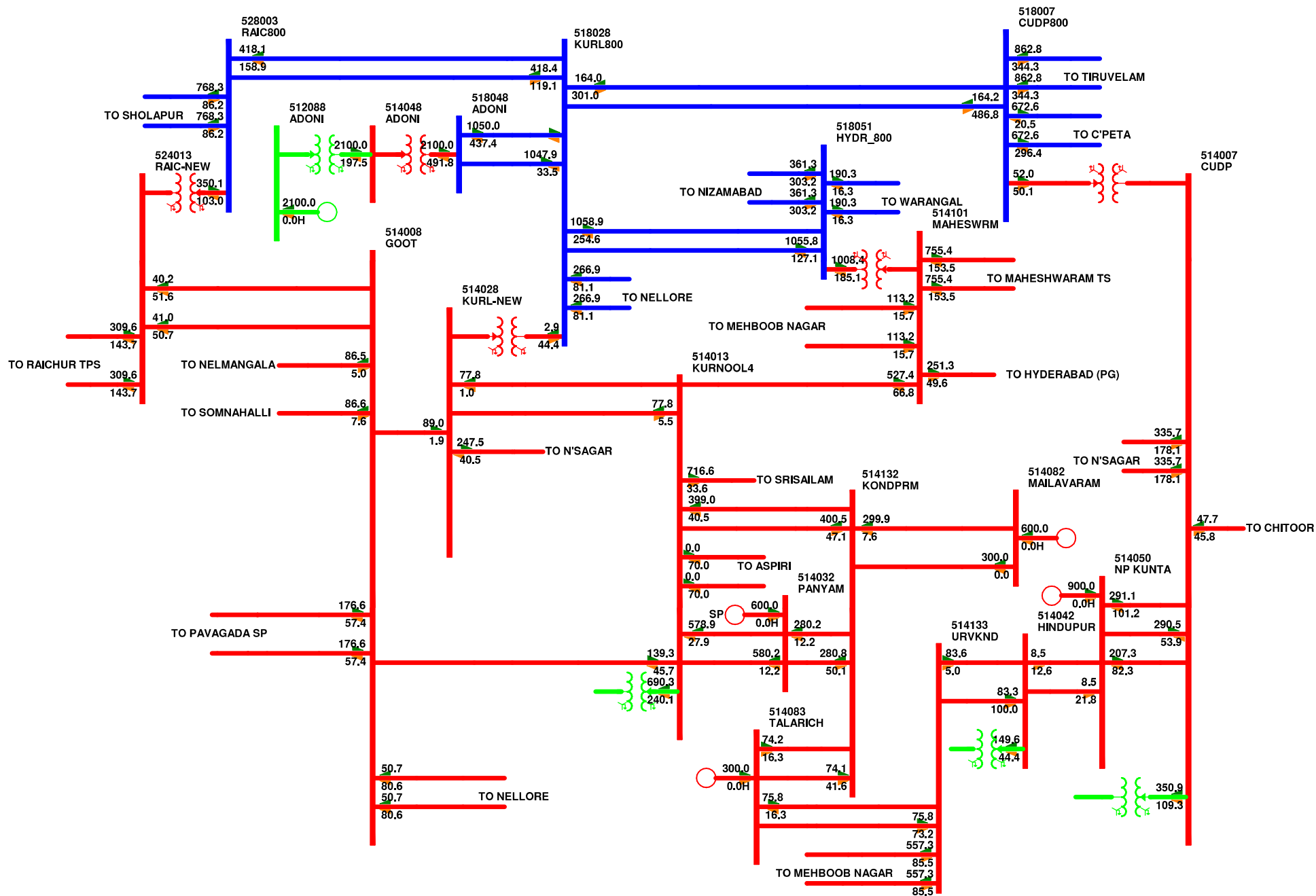


Exhibit-I(b) : Base case with N-1 of Tuticorin
PS - Madurai line



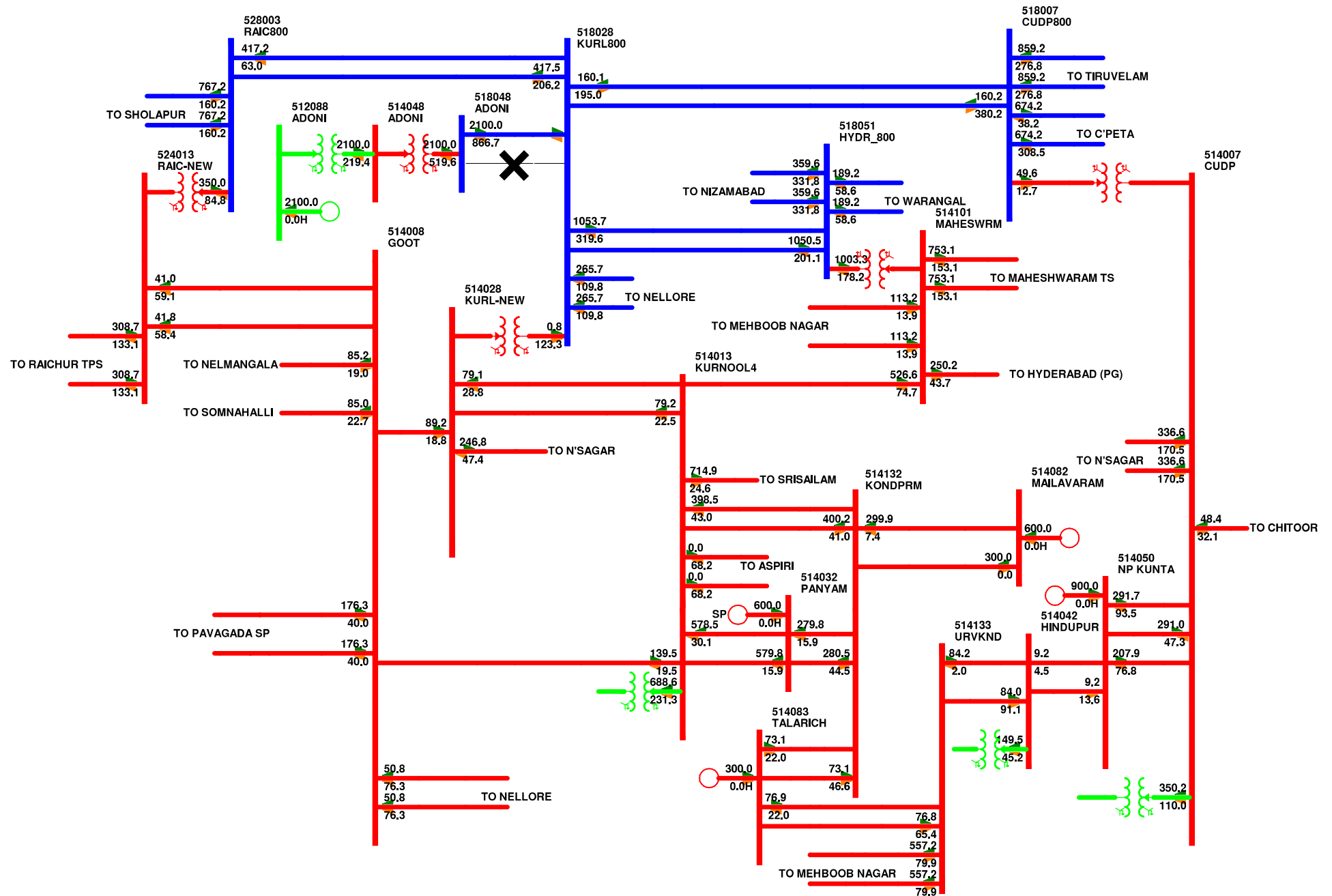


TRANSMISSION SYSTEM FOR KURNOOL/ANANTAPUR WEZ



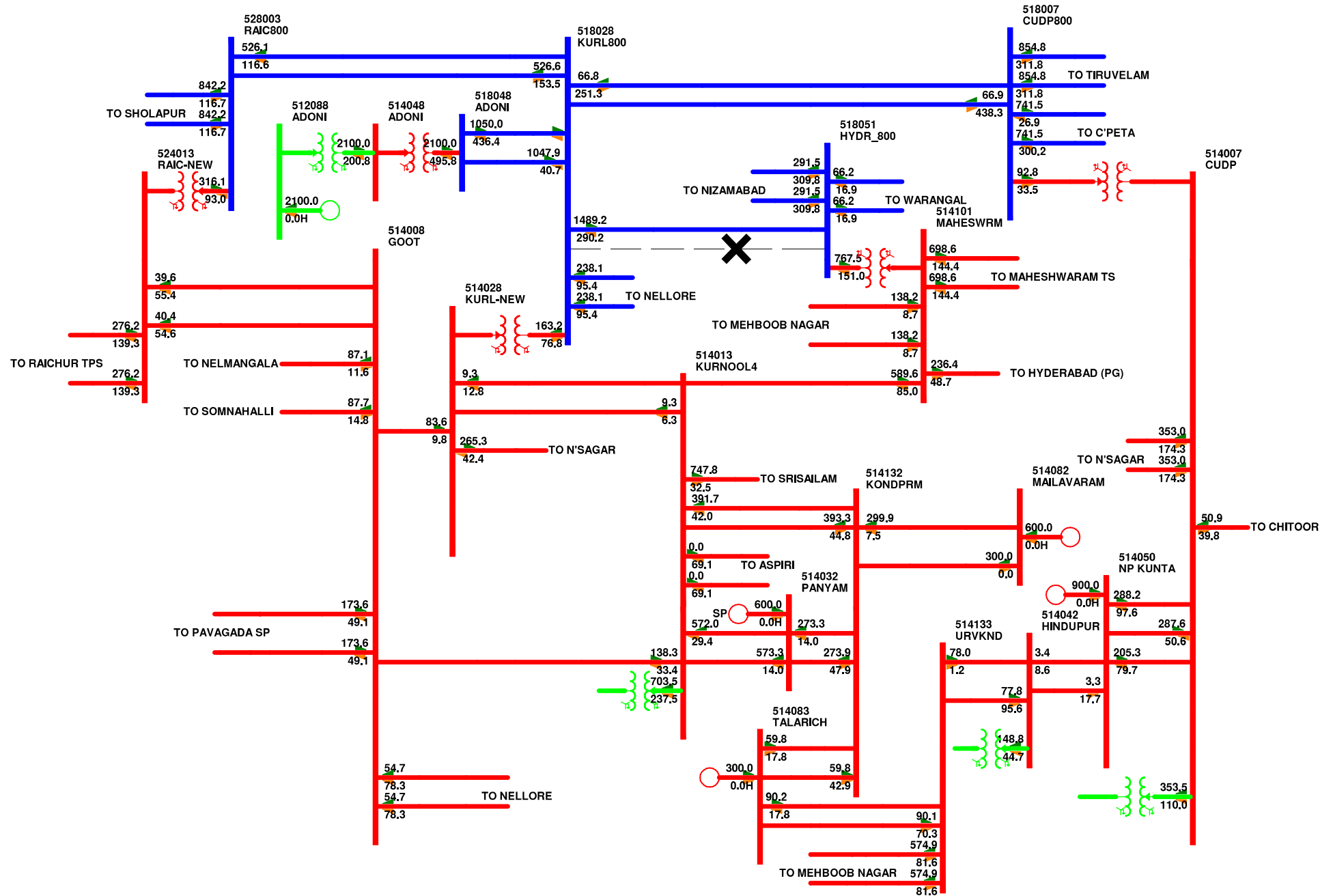
Base Case: Adoni(3000 MW)

TRANSMISSION SYSTEM FOR KURNOOL/ANANTAPUR WEZ



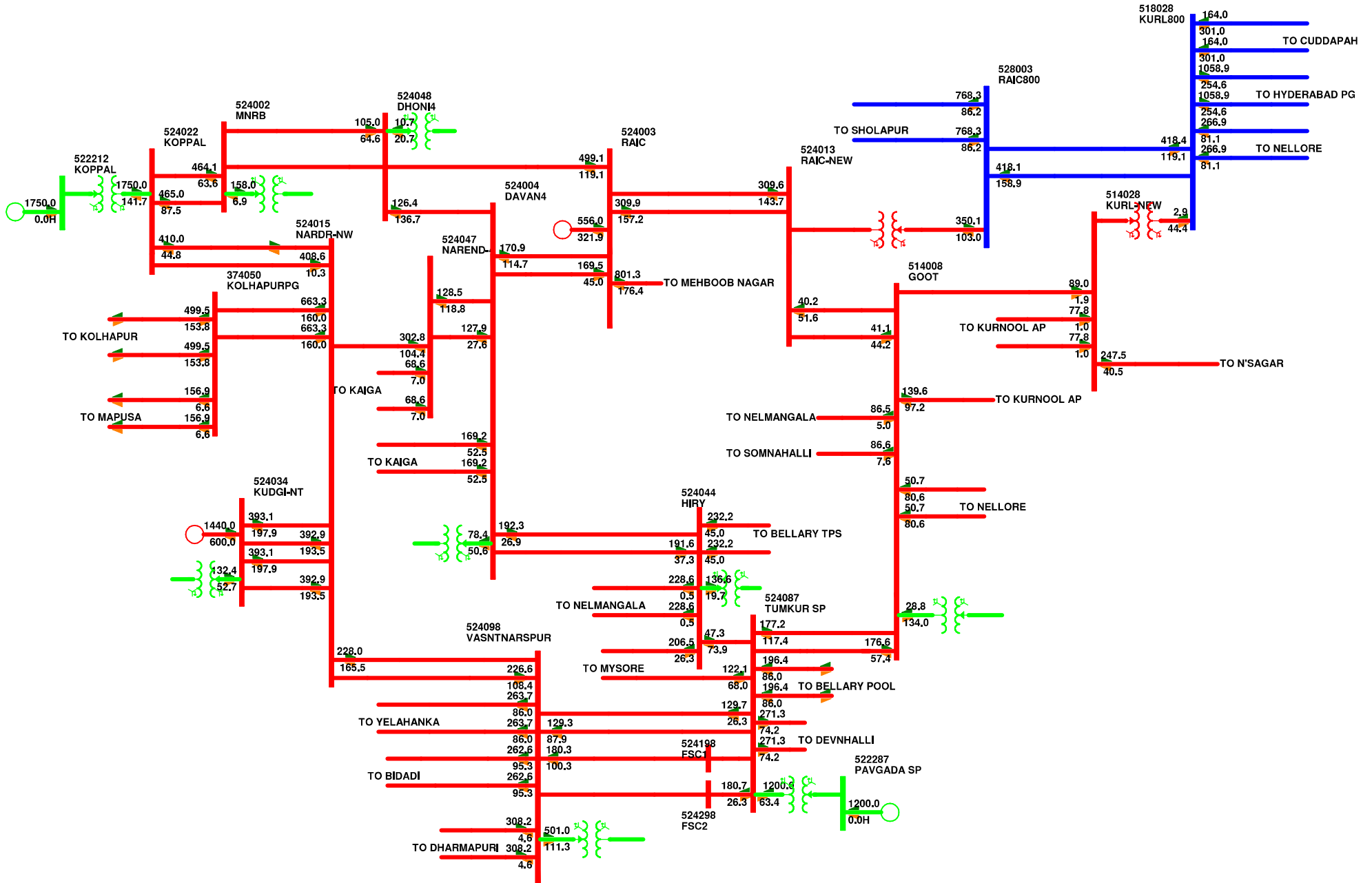
Outage of one ckt of Adoni-Kurnool D/c Line

TRANSMISSION SYSTEM FOR KURNOOL/ANANTAPUR WEZ



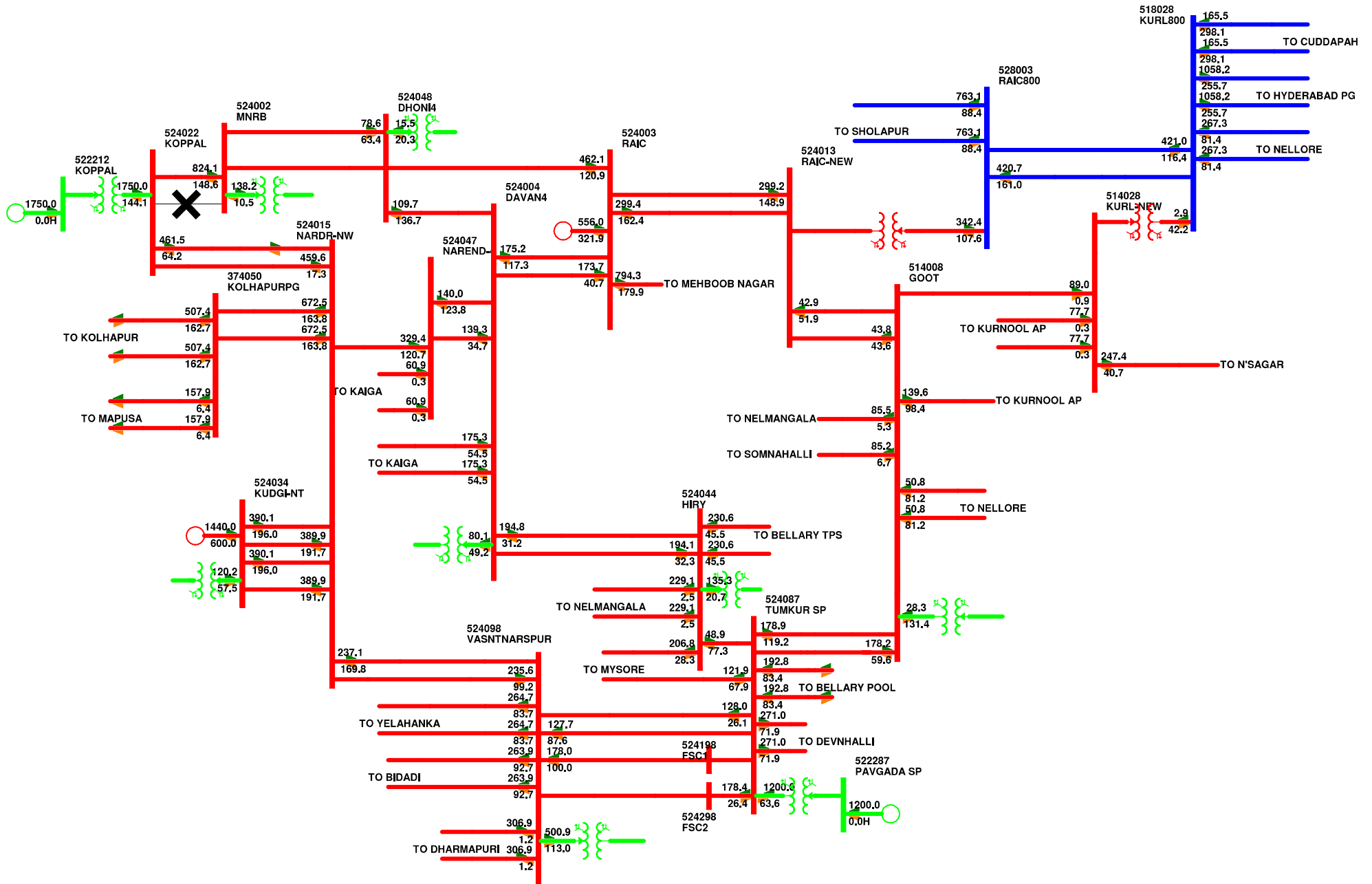
Outage of one ckt of Kurnool-Hyderabad D/c Line

TRANSMISSION SYSTEM FOR KOPPAL/GADAG WEZ



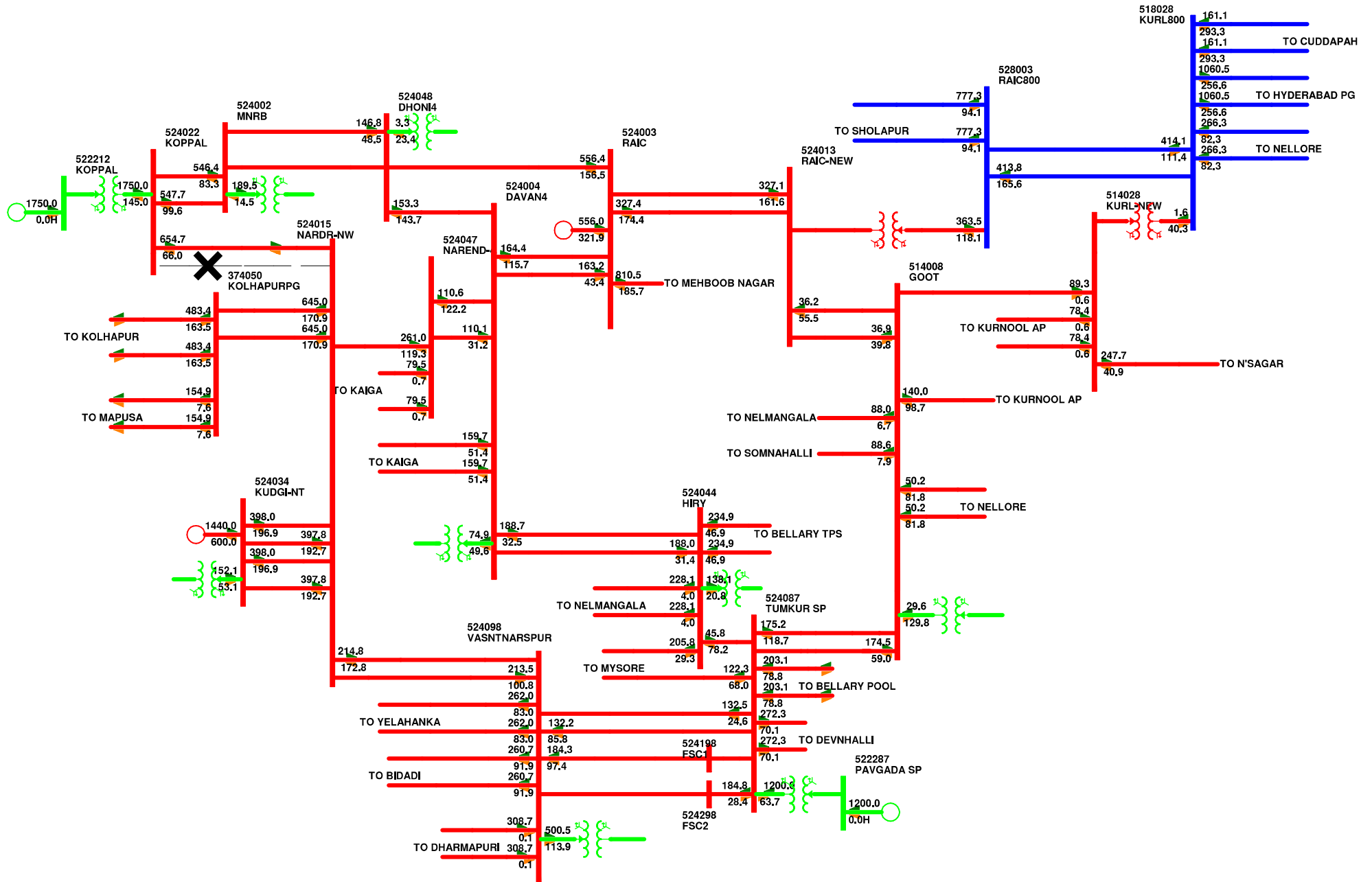
Base Case: Koppal(3000 MW)

TRANSMISSION SYSTEM FOR KOPPAL/GADAG WEZ



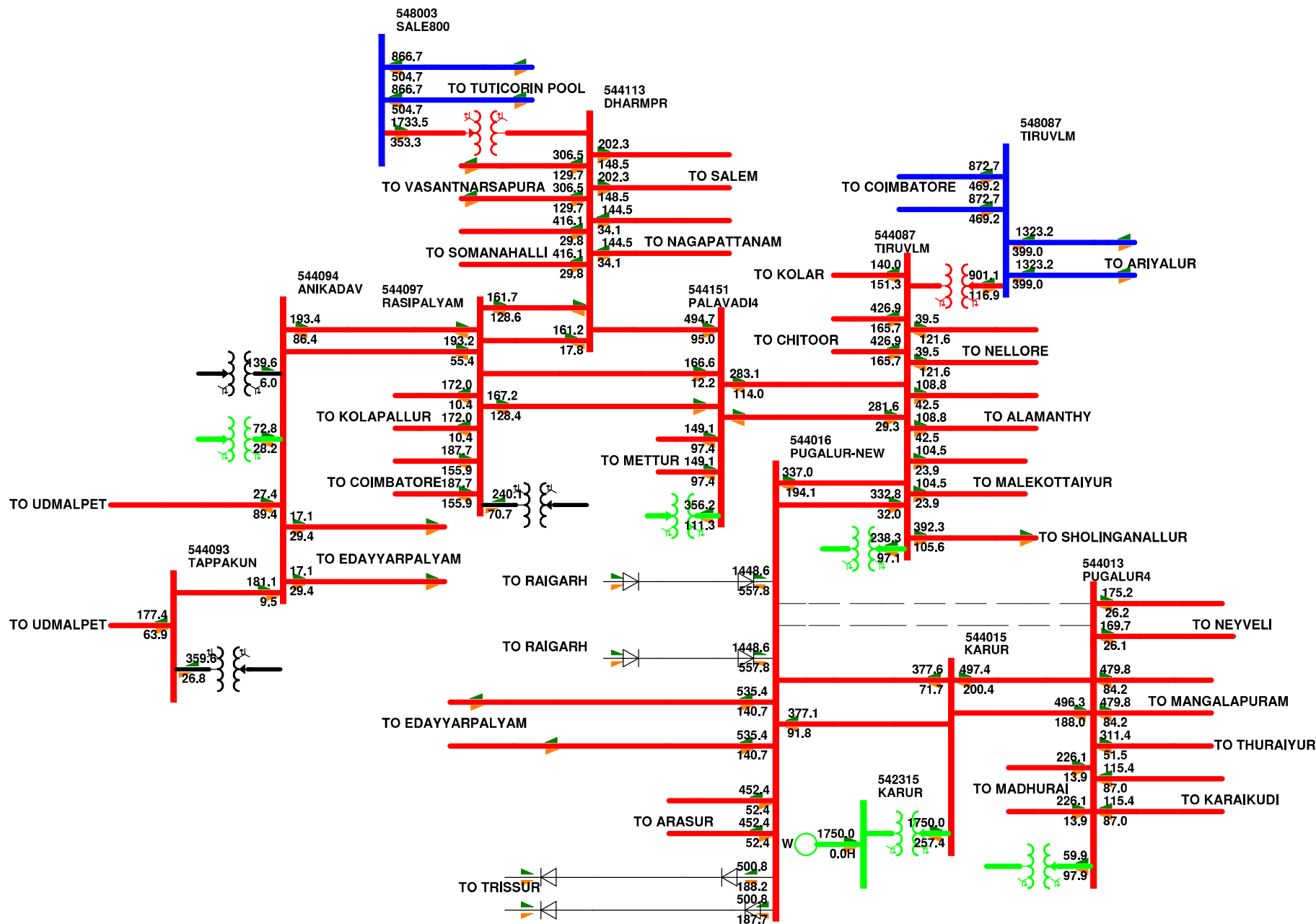
Outage of one ckt of Koppal-Munirabad D/c Line

TRANSMISSION SYSTEM FOR KOPPAL/GADAG WEZ



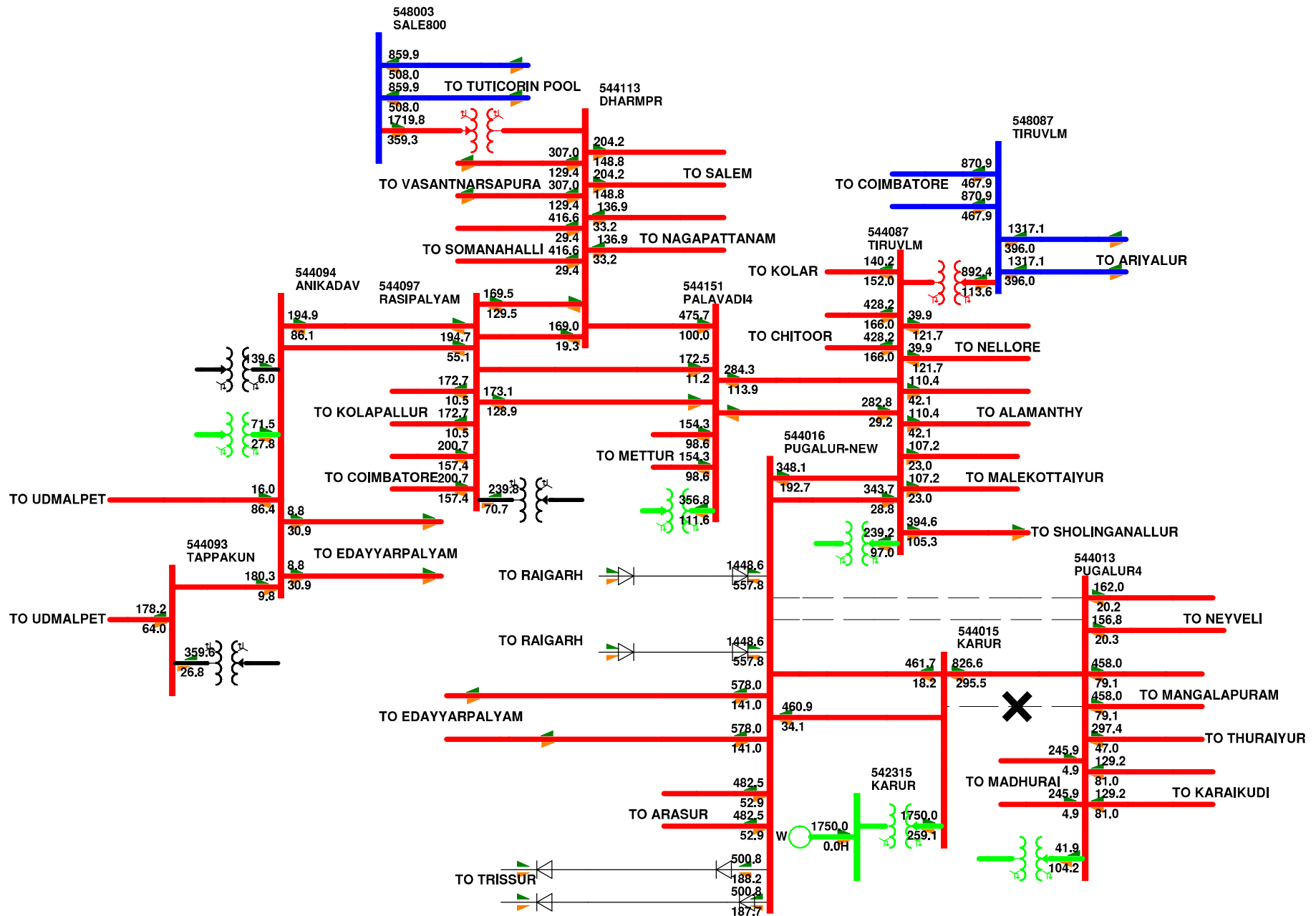
Outage of one ckt of Koppal-Narendra(New) D/c Line

TRANSMISSION SYSTEM FOR KARUR-TIRUPPUR WEZ



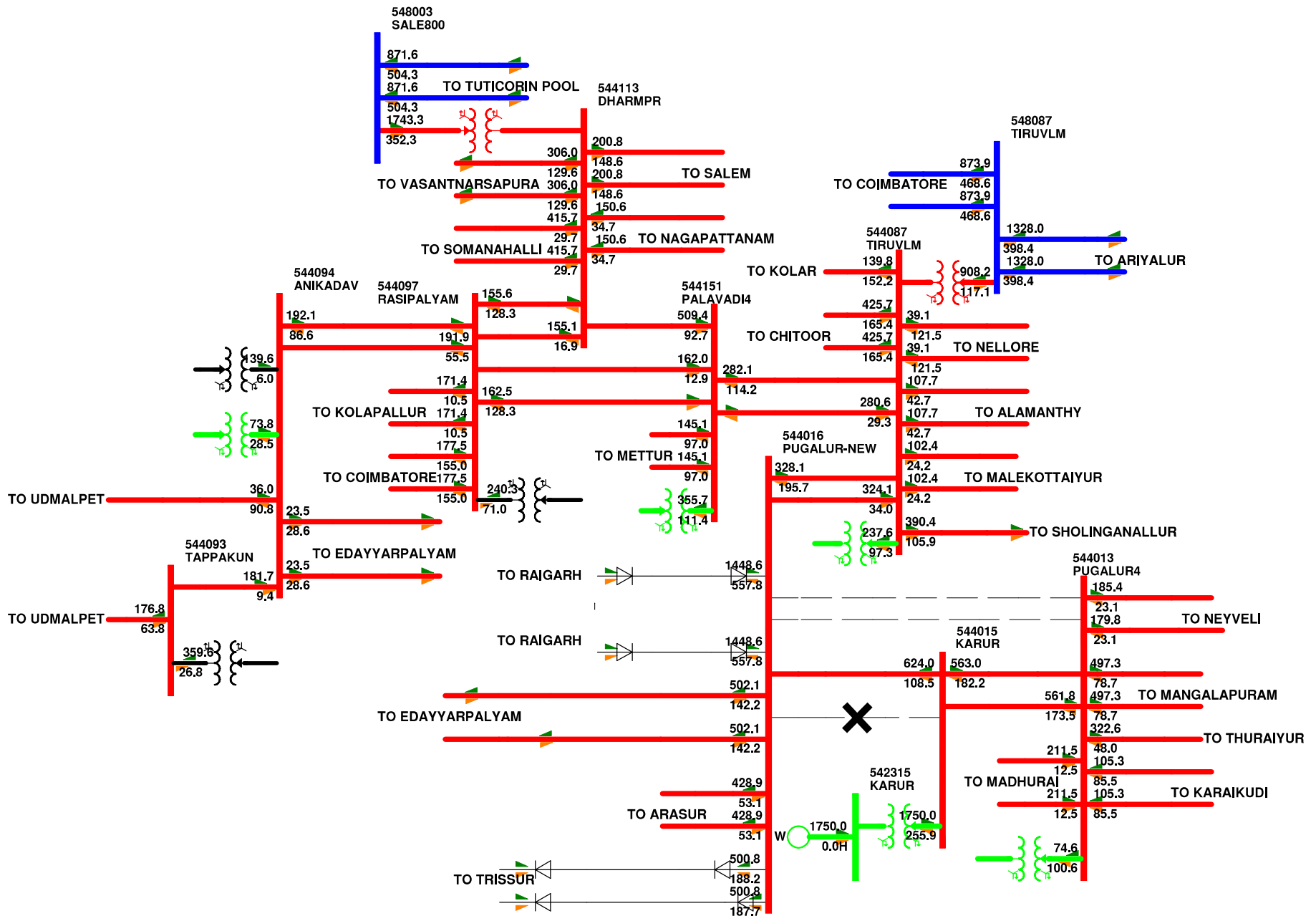
Alternative-1 :Base Case Karur(2500 MW)

TRANSMISSION SYSTEM FOR KARUR-TIRUPPUR WEZ



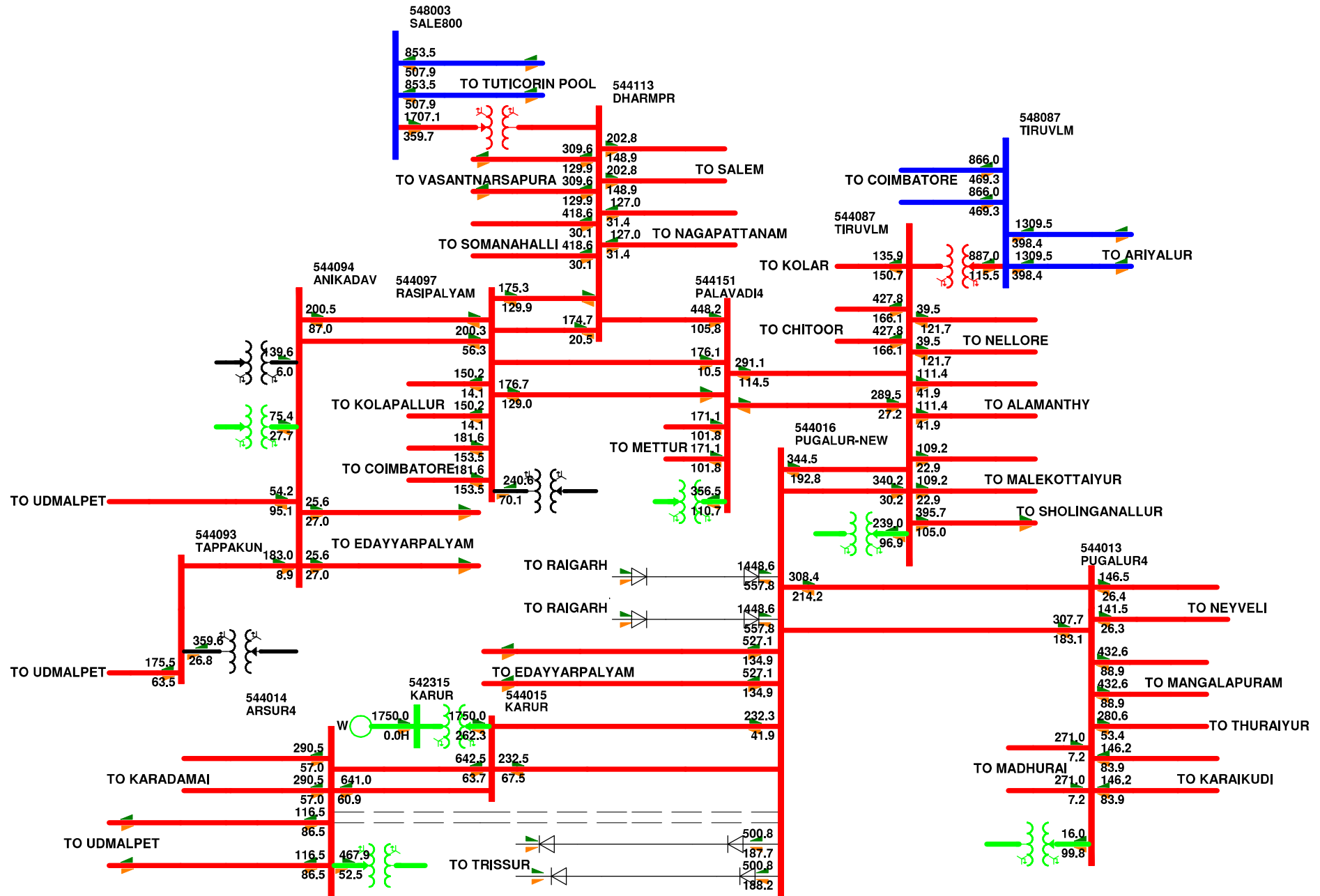
Outage of one ckt of Karur-Pugalur (Existing) D/c Line

TRANSMISSION SYSTEM FOR KARUR-TIRUPPUR WEZ



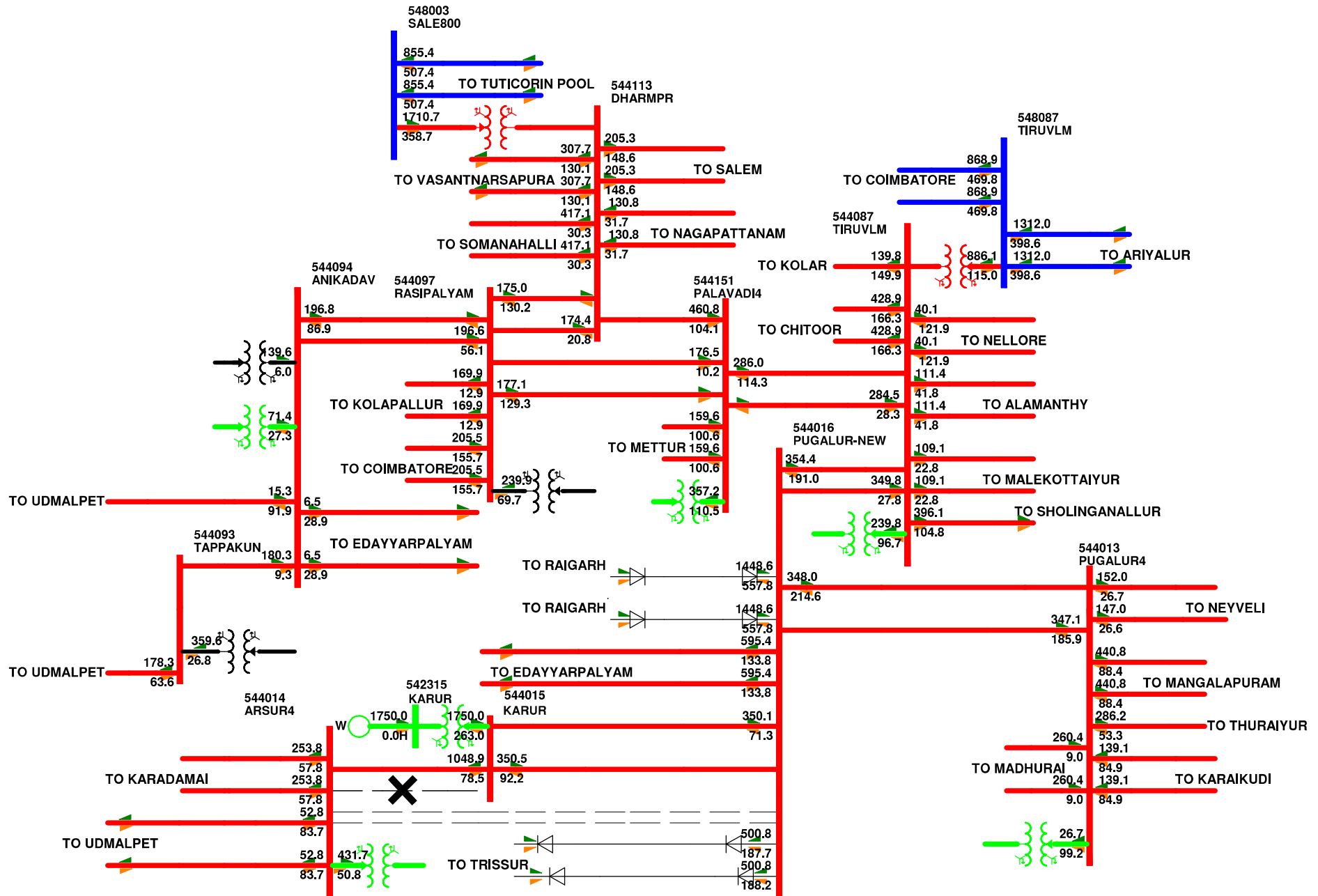
Outage of one ckt of Karur-Pugalur (HVDC) D/c Line

TRANSMISSION SYSTEM FOR KARUR-TIRUPPUR WEZ



Alternative-2 :Base Case Karur(2500 MW)

TRANSMISSION SYSTEM FOR KARUR-TIRUPPUR WEZ



Outage of one ckt of Karur-Arasur D/c Line

F.No.238/56/2017-Wind

भारत सरकार /Government of India

**नवीन और नवीकरणीय ऊर्जा मंत्रालय/ Ministry of New and Renewable Energy
(Wind Power Division)**


**CGO Complex, Block No.14,
Lodhi Road, New Delhi – 110 003**

Dated: 19.02.2018

OFFICE MEMORANDUM

Subject: Minutes of the meeting held to assess the evacuation and transmission infrastructure requirement for achieving wind power capacity target of 60 GW by 2022 -Reg.

Please find attached herewith a copy of the minutes of the meeting held on 25th January, 2018 in MNRE, New Delhi to assess the evacuation and transmission infrastructure requirement for achieving wind power capacity target of 60 GW by 2022 for your kind information and necessary action.


(A.Hari Bhaskaran)
Scientist 'C'

Encl: As above

To,
SNAs & STUs (Tamil Nadu, Karnataka, Gujarat, Andhra Pradesh, Telangana, Maharashtra, Madhya Pradesh and Rajasthan), PGCIL, NIWE and CEA.

Copy for information to:

JS (Wind)/ Adviser (DN)/ Scientist 'F'(GU)/ Scientist 'E'(BKP), MNRE

Minutes of the meeting held to assess the evacuation and transmission infrastructure requirement for achieving wind power capacity target of 60 GW by 2022

- 1.0. A meeting was convened under the Chairmanship of Shri Dilip Nigam, Adviser (NSM), MNRE on 25th January, 2018 in MNRE, New Delhi to assess the evacuation and transmission infrastructure requirement for achieving wind power capacity target of 60 GW by 2022. The meeting was attended by officials of MNRE, POWERGRID, NIWE, SNAs of wind resource rich states and Wind IPPs/Developers & IWTMA. The list of participants is attached at *Annexure-I*
- 2.0 POWERGRID made a presentation (copy enclosed) on the data received from SNA/STU as well as connectivity applications in ISTS in major districts. Based on the above data, district wise potential was segregated into three categories:
 1. Category -I Districts : With High NIWE Potential & High Quantum of Applications received by CTU
 2. Category -II Districts : With High NIWE Potential & Less Quantum of Applications received by CTU
 3. Category -III Districts : With High Quantum of Applications received by CTU but Less NIWE Potential

List of the above districts is enclosed at *Annexure-II*.

- 3.0 In the meeting, Wind Developers//IPP were requested to provide their inputs on the wind potential zones based on feasibility of wind farm development considering availability of resources (Wind/Land etc.), land cost, ROW as well as taking into account of present regime of competitive wind bids scenario. It was decided that based on above inputs, planning/development of ISTS infrastructure for above identified priority wind zones/complexes may be carried out. Wind developers/IPP stated that if transmission infrastructure is made available to above zones (sites/complexes meeting above criteria), these site will be the low hanging fruits to get first priority in its development towards realising GOI target of 60 GW wind capacity by 2022. It was decided that objective of the meeting is to identify wind potential zones along with their priority ranking and feasible quantum of potential development keeping various aspects into consideration so that suitable ISTS infrastructure can be identified/evolved.

Developers/IPP also brought to the notice that there is a need for policy intervention at State level for Intra state transmission infrastructure utilisation for RE. Even though STU pooling stations are being implemented/planned in RE rich pockets under schemes like Green Energy Corridors etc, same couldn't be utilised for ISTS transaction mainly because of Intra State transmission charges. At some of the ISTS stations in Southern region, 220kV switchyard are owned by STU which limits its injection for ISTS transaction again due to above reason. Accordingly, MNRE was requested for some policy intervention to optimally utilise these existing/under implementation STU infrastructure.

- 4.0 M/s NIWE indicated that their wind potential assessment was carried out on 100 m agl reference. However, due to technological advancement, hub heights are increasing to 120-130 m ,which may increase the CUF of sites by 2-2.5% w.r.t to present estimates.
- 5.0 It was discussed that out of total envisaged 60 GW wind capacity by 2022, 33 GW capacity is existing and balance 27 GW is to be established. Out of remaining 27 GW, based on SNA/STU data it was estimated that about 15 GW capacity is already sanctioned in Intra state and balance 12 GW or more may come up in ISTS. However, in view of encouragement of RE by GoI as well as trend of falling wind tariff, it may surpass envisaged 60 GW target. Therefore, it was decided that as existing GEC-ISTS infrastructure (Bhuj Pool/ Tirunelveli PS etc as Wind rich pockets) may cater to wind injection of 4500-5000 MW, planning for evacuation of additional capacity from other prioritised wind energy zones may be carried out.
- 4.0 Accordingly, following was deliberated in the meeting regarding various wind energy zones (WEZ):

4.1 Tamil Nadu

- (i) POWERGRID deliberated that total applications received by CTU in Tirunelveli/Tuticorin & Karur/Tiruppur districts is about 8000 MW & 4000 MW respectively which is higher than the balance developable potential (Tuticorin+Tirunelveli-3000 MW, Coimbatore/Karur/Tiruppur- 1250 MW) indicated by NCES, Tamil Nadu. NCES in earlier meeting indicated that though Coimbatore, Karur, Tiruppur has good wind potential but due to land availability & ROW issues in Tiruppur & Coimbatore, it is difficult to exploit the potential.
- (ii) Wind developers/IPP also informed that since all wind development till date in Tamil Nadu is on private (cultivable) land, hence acquiring cultivable land in future is not a big limitation
- (iii) Wind developers/IPP also informed that due to huge demand from wind developers, the land costs have escalated recently in Tirunelveli/Tuticorin region, however due to high CUF, these two zones (Tirunelveli/Tuticorin & Karur/Tiruppur) will be the most preferred zones for upcoming SECI ISTS wind bids

Complexes of Karur/Tiruppur districts

- (iv) M/s Suzlon opined that based on above criterion, Karur/Tiruppur districts (Palaghat pass region) may be considered as wind priority zone where existing ISTS substation 220kV bays at Pugalur, Arasur & Udumalpet are almost exhausted. Wind developers also informed that according to their assessment complexes in Karur/Tiruppur distt have about 2500-3000 MW additional potential which can be harnessed and need to be considered as one of the most priority site for development of new ISTS substation/infrastructure.

- (v) M/s Renew indicated that as per their assessment though Karur/Tirupur has good potential site but due to land availability issues it may be kept in medium priority zones for development.
- (vi) M/s Mytrah representative informed that they will come back after getting inputs from their Site/HQ. M/s Mytrah subsequently submitted their inputs stating that in TN Kanyakumari belt has got good potential (1000 MW) site. Other developers didn't indicate anything on Kanyakumari belt, however offshore studies in coastal zones of TN (down south) are being carried out separately. M/s Mytrah also informed to keep Western part of Karur distt as their 2nd best priority site for development which has got 2000-2500 MW potential.

Complexes of Tirunelveli/Tuticorin districts

- (vii) M/s Suzlon opined that about 4000 MW of potential can be harnessed in Tirunelveli/Tuticorin complexes as above site are high wind density zones. POWERGRID informed that they are already developing 400/230kV, 2x500 MVA Substation under GEC-ISTS scheme where transformation capacity can be enhanced to total 2500 MVA.
- (viii) M/s Renew indicated they have not analysed the above sites yet.

Conclusion for Tamil Nadu WEZ

- a) Based on the above inputs, it was agreed by PGCIL that Karur distt should be priority WEZ (2500 MW quantum) in Tamil Nadu where ISTS transmission infrastructure needs to be developed/made available, However depending on the land availability for Substation, to address applications for connectivity in ISTS, same may be planned for common location of Karur & Tiruppur distt.
- b) It was also agreed by PGCIL that as Tirunelveli Pooling Station (PG) capacity is yet to be harnessed fully, there is no immediate need to plan a new substation in Tirunelveli/Tuticorin district and same may be kept for next phase.

4.2 Karnataka

- (i) POWERGRID informed that KREDL (State SNA) has provided very less balance developable potential (only about 600 MW) in the state of Karnataka. In earlier meeting, KREDL had cited the reason of embargo put by KERC on signing of fresh PPA by DISCOMs.
- (ii) POWERGRID indicated that total connectivity applications received by CTU in Category-I districts i.e. Koppal, Chitradurga & Gadag district is about 3000 MW, 750 MW & 750 MW respectively.
- (iii) Developers/IPP also informed that in SECI bids, there is requirement of land acquisition in 9-10 months' time period from LOA. In Karnataka also, wind

potential sites are majorly on cultivable land. In GoK policy, for private companies, agriculture land can be bought only after taking Govt. permission and then conversion is done. Since the permission and conversion process takes time, site acquisition/development in the Karnataka in SECI timelines is challenging.

- (iv) Developers/IPPs informed that Bellary district is a mining area hence there is meagre chances of wind development. Belgaum is having a lot of cultivatable land and hence faces difficulty in development. However, M/s Mytrah indicated potential of about 1000 MW near Chikkodi in Belgaum distt. It was discussed that in Bijapur & Bagalkot distt, most of the wind development has already taken place and KPTCL Intra-state transmission developments are also taking place in these districts. Therefore these districts don't come under priority as of now for ISTS development and may come up in future once the other preferred sites are exhausted.
- (v) M/s Mytrah subsequently indicated requirement of ISTS infra near Basavana Bagewadi in Bijapur distt, however CTU is not in receipt of applications in Bijapur distt so far. The other developers didn't indicate any such requirement. However in case it is found to be a better site after wind resource assessment by other developers, its priority can also be kept for next phase of this exercise.
- (vi) Regarding Tumkur & Dharwad districts which are classified as Category-III districts (Low potential & large nos of application), NIWE informed that both are less potential districts. Wind developers informed that Tumkur district is very near to Bangalore and land costs are very high and hence not viable to develop and same applies to Dharwad district as well.
- (vii) Chitradurga though is a high WPD site but issues of further development on its cultivable land portion are a challenge. Therefore its priority can also be kept for next phase of this exercise.
- (viii) M/s Suzlon indicated that in view of the good wind potential & land availability near Munirabad area in Koppal distt, there is a need to develop new substation near Munirabad for harnessing of about 1000-1500 MW potential. M/s Renew also emphasised good potential of Koppal distt of about 1000-1500 MW. M/s Mytrah Ltd subsequently indicated 2000-2500 MW wind potential toward North of Koppal distt.
- (ix) POWERGRID informed that Koppal & Gadag are contiguous districts and possibly the new ISTS substation along with transmission interconnections may be planned near the border of these districts to address the applications of both the districts.

Conclusion for Karnataka WEZ

- a) Based on the above inputs, it was agreed by PGCIL that only Koppal distt should be the priority WEZ (2500 MW quantum) in Karnataka for which ISTS substation/infrastructure can be developed/made available. However depending on the

land availability for Substation, to address applications for connectivity in ISTS, same may be planned for common location of Koppal & Gadag distt.

4.3 Andhra Pradesh

- (i) In Andhra Pradesh, Kurnool & Anantapur districts were classified under Category-I (High Potential, large applications) whereas Cuddapah district is classified under Category-II site (High Potential, less applications)
- (ii) As per data provided by NREDCAP (SNA), envisaged balance developable potential in Anantapur and Kurnool district is about 5300 MW & 3000 MW respectively.
- (iii) POWERGRID informed that Andhra Pradesh has already planned system for more than 6700 MW under GEC intra state scheme which includes substations like Hindupur, Urvakonda, Urvakonda-II, Kondapuram in Anantapur distt and Aspiri in Kurnool distt.
- (iv) POWERGRID again emphasised on underutilisation of these infrastructure, if wind doesnot up in Intra state and duplicity in construction of new system under ISTS
- (v) POWERGRID deliberated that total applications received by CTU in Kurnool & Anantapur districts are 6000 MW & 2000 MW respectively. In Cuddapah district also, 500 MW quantum of applications are received.
- (vi) Wind developers/IPP indicated that though Cuddapah has high NIWE potential, but due to mining & RoW issues, only about 500 MW can be developed.
- (vii) Therefore, it was decided that only Kurnool & Anantapur distt should be the priority WEZ in Andhra Pradesh where ISTS need to be developed/made available on priority Accordingly above potential complexes were discussed in specific as under:

Complexes in Kurnool distt

- M/s Suzlon & M/s Renew informed that due to lot of waste land availability as well as high WPD, around 2500-3000 MW wind potential can be harnessed in Kurnool district
- M/s Mytrah also subsequently intimated that around 2500-3000 MW potential can be harnessed in Kurnool district
- NREDCAP also opined need of a new ISTS substation near Pattikonda in Kurnool district, in view of good potential availability in that complex in Kurnool distt

Complexes in Anantapur distt

- M/s Suzlon & M/s Renew indicated Anantapur distt too has a potential of around 1500-2000 MW & about 2500 MW respectively

Conclusion for Andhra Pradesh WEZ

Based on the above inputs, it was agreed by PGCIL that Kurnool distt should be the priority WEZ (3000 MW quantum) in AP for which ISTS substation/infrastructure can be developed/made available. However depending on the land availability for Substation, to address applications for connectivity in ISTS, same may be planned for common location of Kurnool & Anantpur distt.

4.4 Telangana

- (i) As per data provided by TSREDCO (SNA), envisaged balance developable wind potential in Mehboobnagar district is about 1500 MW. POWERGRID informed that they have also received applications for 1200 MW in Mehboobnagar distt.
- (ii) Wind developers/IPPs informed that the Mehboobnagar is having low CUF sites. Moreover lot of solar plants are coming up near these sites in Mehboobnagar distt and therefore land acquisition has become an issue in recent times due to land acquisition activities by the Solar developers. Rangareddy distt too has some potential (200-300 MW) but have low WPD.

Conclusion for Telangana WEZ

Based on the above inputs, it was agreed by PGCIL that though Mehboobnagar has wind potential but due to above constraints, it may not be accorded highest priority. Therefore ISTS transmission development for Mehboobnagar Wind Energy Zones may be taken up in its next phase.

4.5 Gujarat

- (i) In Gujarat, Category-I districts (High Potential, large applications) included Kutch and Jamnagar/Dwarka Devbhumi. It was seen that there is substantial mis-match between quantum of connectivity application vis-à-vis balance developable potential indicated by GEDA. For eg. in Kutch (Bhuj and Bhachau) application received for about 13,000 MW while balance developable potential by GEDA is only 1500 MW. Similarly, in Jamanagar/Devbhumi Dwarka districts, application received is for about 1500 MW while balance developable potential by GEDA is about 4000 MW.
- (ii) NIWE indicated that as per their assessment wind potential in Kutch and Jamnagar/Dwarka districts are of the order of 45000 MW and 10635 MW respectively.
- (iii) Developers indicated that potential of about 8000 MW and 1500 MW can be developed in Kutch and Jamnagar/Dwarka Devbhumi districts respectively.
- (iv) For category-II (High Potential, less application) districts viz. Amreli, Bhavanagr and Rajkot also have moderate NIWE potential, however no applications are received in above districts so far except in Rajkot for about 600 MW.

Developers informed that in Bhvangar and Amreli district, land availability constraint may arise due to nearby Gir sanctuary. However developers informed that offshore wind potential zones have been identified off the shores of Amreli and Bhavnagar districts. A substation can be planned to cater the offshore wind potential around these districts.

Director, MNRE stated that offshore wind potential development is in very nascent stage at this juncture and planning a substation for offshore wind farms is too early.

- (v) Developers also stated that near Rajkot, moderate potential exist but being a fast growing city (Rajkot), getting land in this urban area would be very difficult therefore this cannot be considered as a wind priority zone and may be taken up in next phase.

Complexes of Kutch districts

- (vi) M/s Renew mentioned that Kutch distt possess about 8000 MW wind potential which can be further segregated into two wind complex one of around 6000 MW towards west of Bhuj and around 2000 MW in Northeast of Bachau in above distt.
- (vii) M/s Suzlon also opined that about 8000 MW of potential can be harnessed in Kutch district as many sites are having high wind density and good CUF.
- (viii) POWERGRID informed that they are already developing 765/400 kV, 2x1500 MVA Bhuj Pooling station under GEC-ISTS scheme which can evacuate approx. 3000-3500 MW power. Further, connectivity in ISTS is also provided to applicants for about 700 MW quantum at 400/220kV, 2x315 MVA Bhimasar (Bachau) Substation.

Complexes of Jamnagar/Devbhumi Dwarka districts

- (ix) M/s Renew indicated that as per their assessment Jamnagar/Devbhumi Dwarka districts have potential of about 2000 MW. There is no ISTS substation is available in Saurashtra region of Gujarat. Therefore considering good WPD and land availability in Dwarka/Jamnagar distt , ISTS infrastructure may be planned on priority in this region.
- (x) POWERGRID informed that GETCO has already planned a 400/220kV Substation in Bhogat to cater to wind injection requirement in Dwarka/Jamnagar distt.

Conclusion for Gujarat WEZ

- a) Based on the above inputs, it was agreed by PGCIL that Dwarka distt should be the priority WEZ (2000 MW quantum) in Gujarat where ISTS infrastructure need to be developed/made available on priority.

- b) It was also agreed by PGCIL that in view of implementation of high capacity Bhuj substation, planning of a new substation in its near vicinity may be taken up later on based on the developments taking place in that area.

4.6 Maharashtra

- (i) In Maharashtra under category-II distt (High Potential, less applications), Ahmednagar, Dhule, Nashik, Sangli and Satara, distt are having high NIWE potential of the order of 5700 MW, 4400 MW, 5000 MW, 10450 MW and 8476 MW respectively. However, POWERGRID did not receive any application in these districts. Developers informed that though Satara and Sangli distt have high NIWE potential of which some potential is already harnessed but due to practical limitations like forest land, local issues and eco sensitivity of Western Ghats, further development is constrained. Further due to above issues, nothing much has happened in wind development in past 3 years in these districts.
- (ii) Category-III (less Potential, large applications) districts in Maharashtra includes Beed, Osmanabad, Aurangabad and Solapur which are having potential about 3000 MW, 1500 MW, 600 MW and 500 MW respectively. Developers indicated wind potential in Maharashtra can be harnessed in Beed and Osmanabad districts as present wind installed capacity is quite less and land is available in these districts. Further, they also confirmed that Aurangabad and Sholapur districts are not having developable potential. Same was confirmed by MEDA also.
- (iii) POWERGRID informed that they have also received applications for 2000 MW & 1000 MW in Osmanabad/Latur and Beed distt respectively. MEDA also informed that joint wind resource assessment has been carried out by MEDA & NIWE in Solapur/Osmanabad/Latur, and out of 409 sites, only one site is found suitable in Latur. However, Beed/Latur distt has got more waste land available for the development.
- (iv) M/s Suzlon indicated that in view of less wind installed capacity & ample land availability in these distt, total about 1500-2000 MW potential can be harnessed in both the distt.
- (v) M/s Renew also emphasised good potential of about 1500 MW & 1000 MW in Osmanabad & Beed distt respectively.

Conclusion for Maharashtra WEZ

Based on the above inputs, it was agreed by PGCIL that Osmanabad should be the priority WEZ (2000 MW quantum) in Maharashtra where ISTS need to be developed/made available on priority but with lowest ranking. However, depending on the land availability for substations, a common substation for Beed & Osmanabad may be planned to address applications for connectivity in ISTS.

4.7 Madhya Pradesh

- (i) It was noted that only one district (i.e Shajapur) is having about half of the NIWE potential (3250 MW) of Madhya Pradesh, however the same has low CUF sites. It was further noted that no applications are received by CTU in Shajapur so far. Further, Shajapur is also having high solar radiation, where M/s RUMS is planning solar parks (about 1000 MW).
- (ii) POWERGRID stated that they have received various applications of the order of 200-300 MW each in 4-5 districts viz. Betul, Dhar, Ashoknagar, Rajgarh & Sehore, which may be provided connectivity to nearby ISTS substations. However as per NIWE above sites are in low CUF range.
- (iii) MPPTCL earlier intimated that they had already planned and implementing transmission infrastructure for its sanctioned wind projects (3300 MW).

Conclusion for Madhya Pradesh WEZ

Based on the above inputs, it was agreed by PGCIL that presently no new ISTS substation is required in Madhya Pradesh, however, if a substation is planned in Shajapur to cater the solar park, provision can be kept to accommodate the wind generation also.

4.8 Rajasthan

- (i) In Rajasthan, Jaisalmer district was classified under Category-I (High Potential, large nos of application) whereas Jodhpur district is classified as Category-III site (less Potential, large applications). Barmer is also categorised in Category –II distt (High Potential, less applications)
- (ii) POWERGRID deliberated that total applications received by CTU in Jaisalmer & Jodhpur districts are about 4000 MW & 1500MW respectively. In Barmer district, only 200 MW of applications are received.
- (iii) As per data provided by RRECL(SNA), envisaged balance developable potential in Jaisalmer district is about 2000 MW, whereas no developable potential in future is envisaged in Barmer & Jodhpur districts
- (iv) Wind developers opined that Jaisalmer district, though has low CUF, is best potential wind site in Rajasthan having about 4000MW of wind potential. However Jaisalmer being a low CUF wind zone, wind capacity may be developed in subsequent stages when other sites in various states are exhausted or if there is major advancement in wind turbine technology for harnessing the potential from low CUF sites
- (v) In Jodhpur, despite low NIWE potential, about 1500MW application is received by CTU. Wind developers suggested that Jodhpur has about 1500-1600MW wind potential which will be developed at a later stage with advancement in wind turbine technology.

- (vi) POWERGRID indicated that they are already developing 765/400/220kV Bhadla PS in Jodhpur distt whereas 765/400kV (with a provision for 220kV) Fathegarh PS is coming up through TBCB route in Jasialmer distt for various Solar Parks. Therefore wind projects may be provided connectivity on those stations based on infrastructure availability.

Conclusion for Rajasthan WEZ

Based on the above inputs, it was agreed by PGCIL that as Rajasthan is having low priority wind sites and ISTS transmission infrastructure is already being developed for solar parks, additional ISTS infrastructure for wind project may be planned in next phase based on the developments in western Rajasthan.

Summary of meeting discussions:-

- a) Based on the earlier SNA/STU inputs and information provided by various wind IPPs/Developers, following was agreed by PGCIL as prioritized wind energy zones for planning/development of additional ISTS infrastructure:

Priority Ranking	State	District/Complex	Quantum (MW) (Approx.)
1	Karnataka	Koppal	2500 MW
2	Andhra Pradesh	Kurnool	3000 MW
3	Gujarat	Dwarka	2000 MW
4	Tamil Nadu	Karur	2500 MW
5	Maharashtra	Osmanabad	2000 MW

- b) POWERGRID (CTU) to evolve transmission plan for above prioritized wind energy zones to facilitate evacuation & transfer of quantum indicated against each of these WEZ.
- c) As high transmission capacity already exist /being implemented in some of the other quality potential wind zones viz. Bachau & Bhuj in Kutch distt (Gujarat), Tirunelveli/Tuticorin distt (Tamil Nadu), CTU informed that further ISTS development may be taken up in next phase of this exercise based on subsequent developments

Meeting ended with a vote of thanks to the Chair.

Annexure-I**Participant List**

S. No.	Name	Designation	Organisation	Mobile
1	Sh Dilip Nigam	Adviser (NSM)	MNRE	
2	Sh. G. Upadhyay	Director	MNRE	
3	Sh Shiv Dayal	ASO	MNRE	
4	Sh P V Ramesh	Project Director	NREDCAP	9000550978
5	Sh Prafulla V. Tapde	Manager	MEDA	9422807719
6	Sh Surendra Vashistta	Project Manager	RREC	9461561594
7	Sh J. Bastin	ADT-WRA&O	NIWE	9445798021
8	Sh K. Boopathi	Add. Director	NIWE	9445798004
9	Sh Dilip Rozekar	AGM(CTU-Plg)	POWERGRID	9910378106
10	Sh Kashish Bhmabhani	CM(Smart Grid)	POWERGRID	9971399117
11	Sh Sandeep Kumawat	Dy Manager	POWERGRID	9650293192
12	Sh Chinmay Sharma	Sr Engineer	POWERGRID	8826094869
13	Sh Narendra Sathvik R	Engineer	POWERGRID	7042195056
14	Sh S. Vinod	AVP-Project	Renew Power	9910391155
15	Sh Ajith Pillai	DGM-WRA	Renew Power	8130198496
16	Sh O P Taneja		IWTMA	9971096623
17	Sh Naresh Pandal	Head&VP-Power Evacuation	Suzlon	9850829701
18	Sh Ananat Naik	VP	Suzlon	9818232658
19	Sh Dharmendra Gupta		Mytrah Energy	8587044337
20	Sh Pankaj Sharma		Ostro	9999974664