Central Electricity Authority
System Planning & Project Appraisal Division
Sewa Bhawan, R.K. Puram, New Delhi – 110066

No. 51/4/SP&PA-2013/ 469-480 **Date: 22-July-2013**

To

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.The Director (Transmission), Transmission Corp. of Andhra Pradesh Ltd., Vidyut Soudha, **Hyderabad – 500 082.** **FAX : 040-66665137**	4.The Director (Transmission), Karnataka State Power Transmission Corp.Ltd., Cauvery Bhawan, **Bangalore 560 009**. **FAX : 080 -22228367**
5.The Member (Transmission), Kerala State Electricity Board, Vidyuthi Bhawanam, Pattom, P.B. No. 1028, **Thiruvananthapuram - 695 004.** **FAX : 0471-2444738**	6. Member (Distribution), Tamil Nadu electricity Board (TNEB), 6th Floor, Eastern Wing, 800 Anna Salai, **Chennai - 600002.** **FAX : 044-28516362**
7.The Director (Power), Corporate Office, Block – I, Neyveli Lignite Corp. Ltd., **Neyveli , Tamil Nadu – 607 801.** **FAX : 04142-252650**	8.The Superintending Engineer –I, First Floor, Electricity Department, Gingy Salai, **Puducherry – 605 001**. **FAX : 0413-2334277/2331556**
9. Director (Projects), National Thermal Power Corp. Ltd. (NTPC), NTPC Bhawan, Core-7, Scope Complex, Lodhi Road, **New Delhi-110003.** **FAX-011-24360912**	10. Director (Operations), NPCIL, 12th Floor,Vikram Sarabhai Bhawan, Anushakti Nagar, **Mumbai – 400 094.** **FAX : 022- 25991258**

Sub: 36th meeting of the Standing Committee on Power System Planning of Southern Region
- **Additional Agenda.**

Sir,

The **36th meeting** of the Standing Committee on Power System Planning of Southern Region is proposed to be held by next month. Complete agenda is available at CEA's website

(www.cea.nic.in).

Exact date and **v**enue of the meeting would be conveyed separately.

Please make it convenient to attend the meeting.

Yours faithfully,

(K. K.Arya)
Chief Engineer(I/C) (SP&PA)
(Telephone: 011 26732305, Fax No. 011 26102045)

Copy to:

Shri S. K. Soonee, CEO, POSOCO,
B-9, Qutub Institutional Area,
Katwaria Sarai,
New Delhi-110016

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

ADDITIONAL AGENDA

Agenda Note for 36th Meeting of
Standing Committee on Power System Planning in Southern Region (SCPSPSR)

Date and Venue: (to be communicated shortly)

A.0 Installation of reactors at certain 400kCV Substations by APTRANSCO

A.1 APTRANSCO vide their letter CTO/131/F/D.No.377/13 dated 29-6-2013 has proposed the installation of 8 number of reactors at following substations in order to avoid line trippings in 400kV transmission lines:

S. No.	400kV Substation	Capacity of reactor (MVAR)
1	Vemagiri	125(in addition to 80MVAR already planned)
2	Kalpakka	80 (additional)
3	Mamadipalli	125
4	Sankarpalli	80
5	Gajwel	125
6	Malkaram	125
7	Mahboobnagar	80
8	Kurnool	125

A.2 APTRANSCO may present the studies. Members may discuss and agree.

B.0 Development of Analytics as part of Unified Real Time Dynamic State Measurement (URTDSM) scheme

B.1 Implementation of Unified Real Time Dynamic State Measurement (URTDSM) scheme as system strengthening consists of installation of Phasor Measurement Unit(PMU) at existing State, ISTS and IPP stations and lines at 400kV and above including that coming up by 2014-15, generation switchyard at 220kV and above, Phasor Data Concentrator(PDC) at all SLDC, RLDC & NLDC along with OPGW communication links was agreed in the Joint meeting of all the five(5) Regional Standing committees on Power System Planning held on 05.03.2012.

B.2 In URTDSM, the user interface application software is proposed to visualize and analyze the real time phasor data. It was also decided that following analytics are to be developed in parallel with implementation of the URTDSM scheme in association with premier academic institutions like IIT using PMU based measurement.

- Line Parameter Estimation
- Vulnerability analysis of distance relays
- Linear state estimator
- Supervised Zone-3 distance protection scheme to prevent unwanted tripping of backup distance relays
- CT/CVT calibration
- Control Schemes for improving system security (based on angular, voltage and frequency instability)

Purpose and deliverables for above analytics is enclosed at **Annexure-I**.

B.3 Based on the discussion, development of above analytics in association with IIT Bombay progressively in three(3) years has been undertaken which will be installed at all SLDC, RLDC, NLDC, RPC, CEA and CTU. The cost of development of analytics is included in the URTDSM project. CTU would involve CEA and POSOCO in development of analytics.

B.4 Members may discuss.

C.0 Provision of Bus Reactor for controlling high voltages

C.1 POWERGRID have furnished following information regarding high voltages at different grid points in SR as per the details below:

a. POSOCO in its quarterly feedback to planners had raised issue regarding over voltages encountered during real time operation (copy of the relevant pages of the recent operational feedback are enclosed at **Annexure-II**).

b. The issue of high voltages was deliberated during recently held TCC & SRPC meetings wherein incidences of high voltages have been deliberated. During the meeting, provision of 1x125 MVAR bus reactor at Gooty was in-principally approved subject to ratification in the Standing Committee.

c. The issue of high voltages were also discussed in the special TCC meeting held at Bengaluru on 24th June , 2013 wherein persistent high voltage issues at Kaiga, Narendra, Guttur, Hasan, Hiriur, Vijayawada, Gooty, Kurnool, Nagarjunasagar, Tirunelveli etc. were deliberated. During the meeting it was decided to explore providing bus reactor at Trivendrum or conversion of line reactor to switchable line reactor. Further, it was also agreed to recommend to Standing Committee for higher capacity reactor requirement at Kaiga and additional reactor at 400 kV Hassan substation.

d. From the recently collected shift reports from SRLDC (copy attached at **Annexure-III**), it is seen that high voltages are also experienced at Malkaram and Gajwel substations of APTRANSCO. In this regard, a large number of lines are getting tripped on overvoltage. Such occurrences have adverse effect on the healthiness of the equipment.

e. High voltages are also experienced at Khammam substation. Earlier a 765/400 kV substation equipped with adequate bus and line compensation was planned at Khammam. However, due to certainty of the gas in vemagiri area, the implementation of the substation has been put on hold. As the time frame of the commissioning of this substation is uncertain, it is proposed to install bus reactor at Khammam for controlling high voltages.

f. Yelahanka is going to be the latest addition in the Bengaluru Ring Main. This substation is presently having only 1x63 MVAR bus reactor and no line reactors. The short circuit level in the Bengaluru area is quite high, therefore to have desired effect on voltages, it is prudent to provide additional bus reactor in the substation to control the high voltages.

C.2 In view of the above, following bus reactors are proposed:

Installation of 1x125 MVAR bus reactor each at (i)Gooty, (ii)Kaiga, (iii) Hassan, (iv)Khammam, (v) Malkaram, (vi) Gajwel, (vii)Narendra(New), (viii)Trivendrum and 2x63 MVAR bus reactors at (ix)Yelahanka substation.

C.3 Members may kindly discuss and approve.

D.0 Provision of Transformation capacity at Madurai.

D.1 It has been reported that transformers at Madurai are getting high loading specially during high wind conditions. The above issue was deliberated during the special TCC meeting held at Bengaluru on 24th June, 2013.

D.2 To address the overloading of transformers, it is proposed to provide 1x500 MVA 400/220 kV transformer at Madurai.

D.3 Members may discuss and agree.

E.0 Provision of Spare 765/400 kV Transformers in Southern Region.

E.1 To cater to the increasing load demand and import requirement Southern Region is going to have substantial 765 kV grid. In the near future 7 nos. of 765 kV substations are likely to be available which include Nellore pooling station, Raichur, Kurnool, Tiruvallem, Srikakulam, Vemagiri & Hyderabad. Further, in the present meeting 3 more new 765/400 kV stations are proposed at Chilakluripeta, Cudddapha, Nizamabad.

E.2 765 kV system are bulk capacity systems which shall have very adverse effects incase of outage of 765/400 kV transformers requiring long time for repair and

replacement. Further, in the near future the Southern region shall be dependent to a large extent on power import through 765 kV systems. Therefore, it is prudent to have 765/400 kV transformers as Regional Spare to meet the any contingency on the transformers.

E.3 Therefore, POWERGRID has proposed to procure 2x1500 MVA transformers as spare and kept at suitable location to meet any exigencies at the earliest. Members may kindly discuss and approve.

F.0 Proposal of Electricity Department, Puducherry for erection of 230kV line to Karaikal

(The above agenda item has already been given in Main Agenda under Agenda item no# 4.0. The system study results for above proposal are now enclosed at Annexure-III)

G.0 Review of the evacuation scheme for Yeramarus (2x800 MW), Edlapur(1x800 MW) Thermal Power Generation

(The above agenda item has already been given in Main Agenda under Agenda item no# 11.0. The system study results for above proposal are now enclosed at Annexure-IV)

Annexure-I

DEVELOPMENT OF ANALYTICAL TOOLS USING PMU BASED PHASOR

S No.	MEASUREMENTS Task	Aim	Deliverables
1.	Line Parameter Estimation	Estimate & Validate transmission line parameter. Inputs required: a) PMU based phasor measurement at both ends of line, bus voltage phasor	• Positive and Zero sequence Line parameter estimation (R,X,B) • Errors in line parameters will be logged for information to operator & correction in linear state estimator parameter.
2.	On line vulnerability analysis of distance relays.	Development of software for validating distance relay characteristic (Zone-1, Zone-2, Zone-3) in real time basis by superimposing on field setting of distance relays. Inputs required: b) PMU based phasor measurement at both ends of line, bus voltage phasor c) Distances relay characteristic and settings.	• Visualization of relay characteristic and apparent impedance trajectory in the R-X plane. • Alarm / messages when thresholds are violated or apparent impedance is some margin (say 20%) from Zone 1, 2 or Zone 3 characteristics of the relay. • Identification of power swing beyond a configurable threshold due to any disturbance in the system • Identification of load encroachment condition in the system • Creation & storage of distance relay characteristics of different lines using templates & available settings • Data available in standard format(CSV, excel, comtrade) • Trigger input for DSA
3.	Linear State Estimator	Development of 3-phase linear state estimator, software based on weighted least square technique.	• Network topology processor to update the bus model • Bad data detection • Topology error detection to identify the switch device errors

S No.	MEASUREMENTS Task	Aim	Deliverables

		Inputs required:
		a) PMU based phasor measurement at both ends of line and bus voltage phasor,
		b) Substation bus switching scheme/topology
			• Observability analysis to identify maximum observable network with available measurement.
			• Pseudo & historical measurement generation in case of lack of observability.
			• Alarms & warnings for model inconsistencies & limit violation.
			• Network connectivity/graph to provide:
			  • Island details
			  • Issue alarm for loss of connectivity
			  • visualisation by making line dotted/different colour
			  • Component outage
			• Visualization of state estimator output in tabular & graphical form.
			• Power system condition can be played-back along with topology connectivity and flow measurement
			• Three phase State Estimator

4.	Supervised Zone-3 distance protection scheme to prevent unwanted tripping	The analytics will provide adaptive Zone-3 backup protection to avoid unwanted Zone-3 tripping. Inputs required: a) PMU based phasor measurement at both ends of line and bus voltage b) Distance relay characteristics and settings of candidate line	• Identification of presence of persistent fault in the observable system. • Identification of presence of power swing & load encroachment in the observable system. • The software will generate control signal for disabling of Zone -3 protection based on system condition and adopted protection philosophy
5.	CT/CVT Calibration.	This module will evaluate the accuracy of these instruments.	• Evaluation of CT/CVT errors in magnitude • Evaluation of CT/CVT errors in phase

S No.	MEASUREMENTS Task	Aim	Deliverables
		Inputs required: a) PMU based phasor measurement at both ends of line, bus voltage phasor b) Benchmarked PT to act as reference c) Linear State Estimator	• Identification of faulty CT/CVT from steady state and transient response • Computation of compensation factors for correcting the steady state response of CT/CVT for state estimation • Verification of measurements against benchmark-CT/CVT • Highlighting the variation using graphs
6	Emergency control for improving system security(Based on angular, voltage & frequency stability)	The module will continuously monitor and analyse the stability (like voltage & angular) based on the trajectories of various parameters like voltage, current phasors, breaker status etc Inputs required: d) PMU based phasor measurement at both ends of line, bus voltage phasor	• Based on the analysis of the evolving trajectories a decision on whether to take an automatic control action and its quantum & location shall be taken by such a scheme. • Five such Wide-Area Emergency Control Schemes shall be developed, which will involve appropriate action in any or all regions, adaptively, depending on the event, such as Controlled system separation (adaptive islanding), Adaptation of relays and control systems using wide area Information etc.

Annexure -I

5.2. ICT Constraints

S. No	ICT	Season/ Antecedent Conditions	Description of the constraints	Figure/ table no.	Has the constraint occurred in earlier quarter? Details.
1	400/220kV 315MVA ICTs at Hyderabad (Ghanapur, Mamidipalli and Malkaram SS)	Whole year	During the Peak load period Hyderabad loads will be high	Graph No-31 Graph No-32	Yes
2	400/230kV 315MVA ICTs at Hosur	During peak period of every day	N-1 criteria will not satisfy during the peak	Graph No-33	Yes
3	400/220kV 500 MVA ICTs at Somanahalli	During peak period During peak period of every day	N-1 criteria will not satisfy during the peak	Graph No-34,35	Yes

5.3. Nodes Experiencing High Voltage

S. No	Nodes	Season/ Antecedent Conditions	Description of the constraints	Figure/ table no.	Has the constraint occurred in earlier quarter?
1	Vemagiri and Vijayawada area	Whole Year	Voltages at Vemagiri and Vijayawada area remain very high (>415 kV) even during peak months. At least one 400 kV line is kept open at all times to contain this over voltage. During off-peak months the voltages cross 438 KV for sustained periods and many lines are kept open. Many of the IPPs connected to Vemagiri are at 400 kV level and are absorbing reactive power. GT taps were optimized and yet the problem persists. With more IPPs slated to connect in this area Bus Reactors of sufficient capacity needs to be provided at Vemagiri.	Graph No-36	Yes

S. No	Nodes	Season/ Antecedent Conditions	Description of the constraints	Figure/ table no.	Has the constraint occurred in earlier quarter?
2	Gooty, Karnool, Srisailam & Ghanapur	Monsoon period and off peak period	Voltages at Gooty, Karnool and Srisailam remain very high during monsoon period and offpeak condition.	Graph No-37 Graph No-38	Yes
3	Kaiga,Guttur and Narendra Area	Whole Year	During Low generation period and offpeak period 400kV Kaiga, 400kV Narendra Voltage are very High.	Graph No-39 Graph No-40	Yes

5.4. Lines opened on high voltage

Sr. No.	Name	Total no. days open during Quarter	Corresponding nodes experiencing high voltage	Graph No.
1	400 kV TALAGUPPA - NEELAMANGALA	57	400kV Talaguppa, 400kV Tirunelvelli, 400kV Srisailem, 400kV Guttur 400kV Kaiga, 400kV Vemagiri, 400kV Narendra, 400kV Vijayawada, 400kV Karnool 400kV Hassan 400kV Hyderabad	Graph No-36-46
2	400 kV TIRUNELVELI - KUDAMKULAM 3	45		
3	400 kV TIRUNELVELI - KUDAMKULAM 2	44		
4	400 kV TIRUNELVELI - KUDAMKULAM 1	42		
5	400 kV SRISAILAM-MAMIDIPALLI 1	39		
6	400 kV GUTTUR - NARENDRA 1	36		
7	400 kV UDUMALPET - TIRUNELVELI 1	32		
8	400 Kv TRICHUR - KOCHI 1	29		
9	400 kV VTPS IV - SRISAILAM 2	28		
10	400 kV KAIGA - GUTTUR 1	26		
11	400 kV UDUMALPET - TIRUNELVELI 2	26		
12	400 Kv HASSAN - UPCL 2	25		
13	400 kV VIJAYAWADA - VEMAGIRI 1	23		
14	400 kV VIJAYAWADA - VEMAGIRI 4	21		
15	400 kV VEMAGIRI - SIMHADRI 2	18		
16	400 kV VIJAYAWADA - VEMAGIRI 2	18		
17	400 kV MYSORE - HASAN 1	17		
18	400 kV RAMAGUNDAM - HYDERABAD 4	17		
19	400 kV KALPAKKA - VEMAGIRI 1	15		
20	400 kV MADURAI - TIRUNELVELI 1	15		
21	400 kV TRIVENDRUM - TIRUNELVELI 2	15		
22	400 kV VIJAYAWADA - LANCO 1	14		
23	400 Kv HASSAN - UPCL 1	13		
24	400 kV GUTTUR - NARENDRA 2	11		
25	400 kV TIRUNELVELI - KUDAMKULAM 4	11		
26	400 Kv TRICHUR - KOCHI 2	11		

27	400 kV KAIGA - GUTTUR 2	9		
28	400 kV SRISAILAM-MAMIDIPALLI 2	8		
29	400 kV VEMAGIRI - SIMHADRI 1	8		
30	400 kV VIJAYAWADA - LANCO 2	8		
31	400 kV GUTTUR - HIRIYUR 1	7		
32	400 kV HASSAN - NEELAMANGALA 1	7		
33	400 kV KHAMMAM - KALPAKKA 1	7		
34	400 kV KHAMMAM - MAMIDIPALLY 2	7		
35	400 kV CHITTOOR - SPDR	6		
36	400 kV CUDDAPPA - CHITTOOR	6		
37	400 kV MADURAI - PUGALUR 1	6		
38	400 kV MADURAI - PUGALUR 2	6		
39	400 kV N'SAGAR - GOOTY	6		
40	400 kV VTPS IV - SRISAILAM 1	6		
41	400 kV HYDERABAD - N'SAGAR	5		
42	400 kV KALPAKKA - VEMAGIRI 2	5		
43	400 kV N'SAGAR - MAHABOOB NAGAR	5		
44	400 kV MAHABOOB NAGAR - RAICHUR	4		
45	400 kV NELAMANGALA - MYSORE 1	4		
46	400 kV GAJWEL - HYDERABAD	3		
47	400 kV MYSORE - HASAN 2	3		
48	400 kV NEYVELI TS 2 - TRICHY	3		
49	400 kV N'SAGAR - CUDDAPPA 1	3		
50	400 kV VIJAYAWADA - NELLORE 1	3		
51	400 kV VIJAYAWADA - VEMAGIRI 3	3		
52	400 kV ALAMATHI - VALLUR 1	2		
53	400 kV JEYPORE - GAZUWAKA 1	2		
54	400 kV KAIGA - NARENDRA 2	2		
55	400 kV KHAMMAM - MAMIDIPALLY 1	2		
56	400 kV KHAMMAM - N'SAGAR	2		
57	400 kV MADURAI - TIRUNELVELI 2	2		
58	400 kV NELLORE - ALAMATHI 1	2		
59	400 kV NELLORE - ALAMATHI 2	2		
60	400 kV RAICHUR - GOOTY 1	2		
61	400 kV RAICHUR - GOOTY 2	2		
62	400 kV RAICHUR - MUNIRABAD	2		
63	400 kV RAMAGUNDAM - GAJWEL	2		
64	400 kV RAMAGUNDAM - HYDERABAD 3	2		
65	400 kV TALAGUPPA - HASSAN	2		
66	400 kV VIJAYAWADA - NELLORE 2	2		
67	400 kV GHANAPUR - MAMIDIPALLY	1		
68	400 kV HYDERABAD - KURNOOL	1		
69	400 kV MALKARAM - HYDERABAD	1		
70	400 kV NEYVELI TS 2 (EXP) - PUGALUR	1		
71	400 kV RAMAGUNDAM - CHANDRAPUR 1	1		
72	400 kV RAMAGUNDAM - MALKARAM	1		
73	400 kV TRIVENDRUM - TIRUNELVELI 1	1		
74	400 kV VIJAYAWADA - VTPS IV 2	1		
	Grand Total	824		

Annex VI.C: Graphs Indicating Nodes Experiencing High Voltage in SR

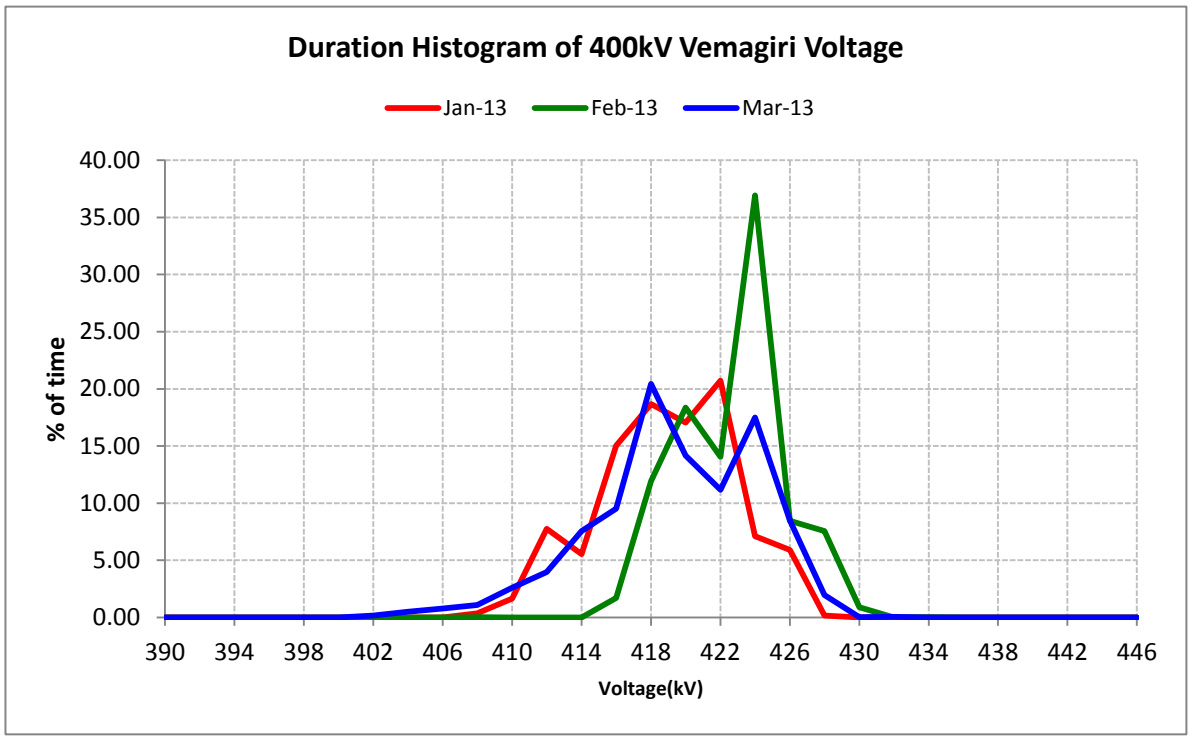


Figure 98

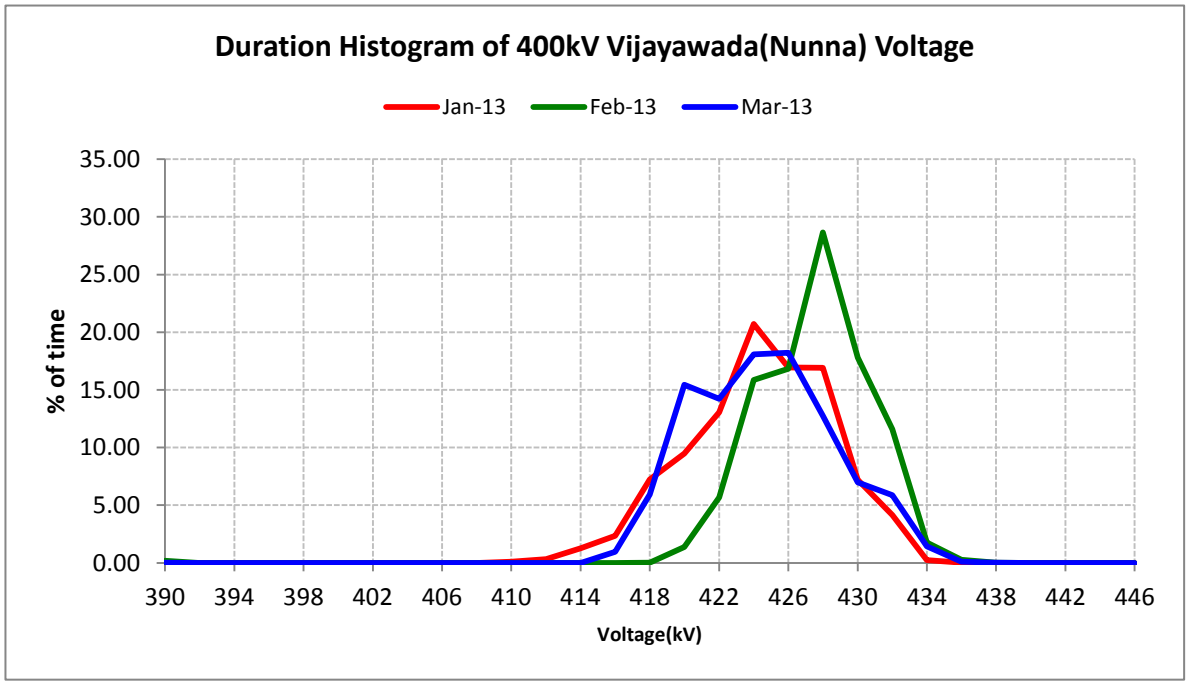


Figure 99

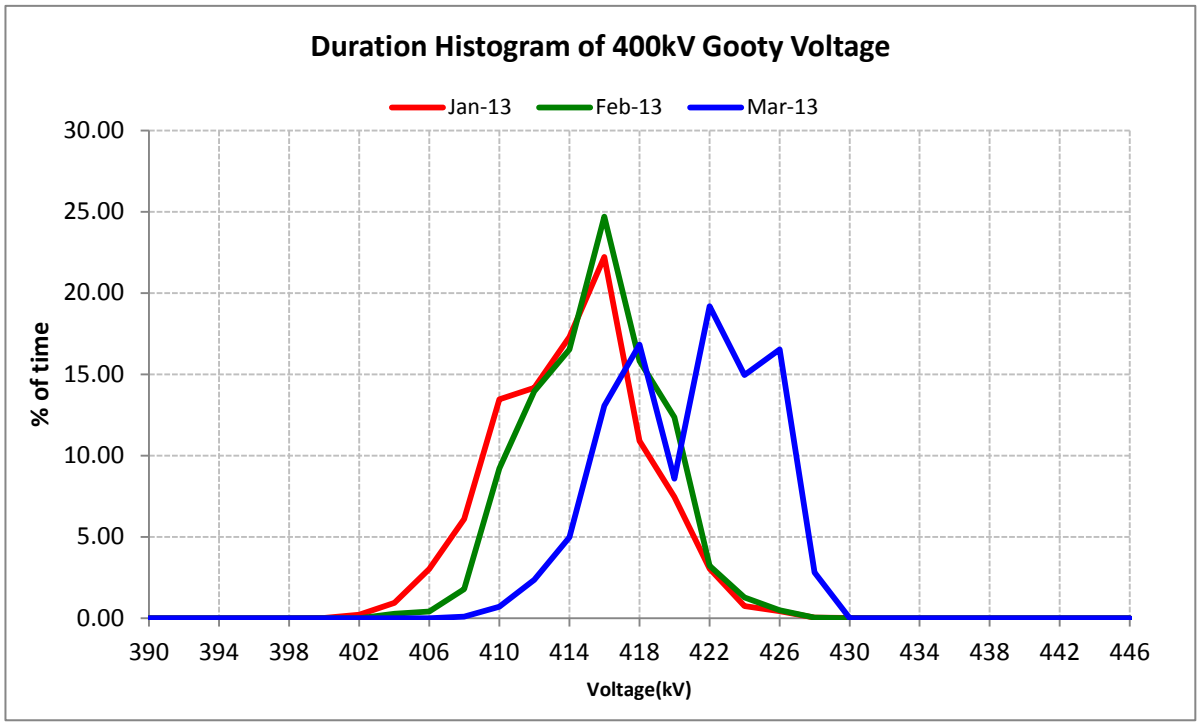


Figure 100

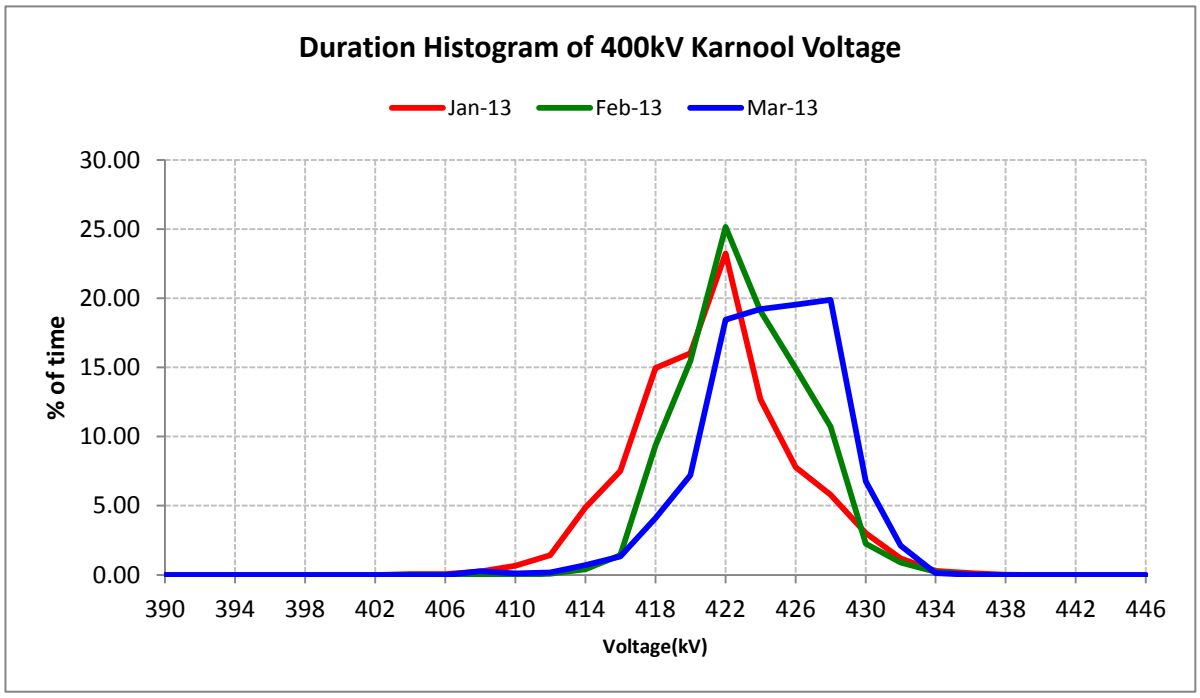


Figure 101

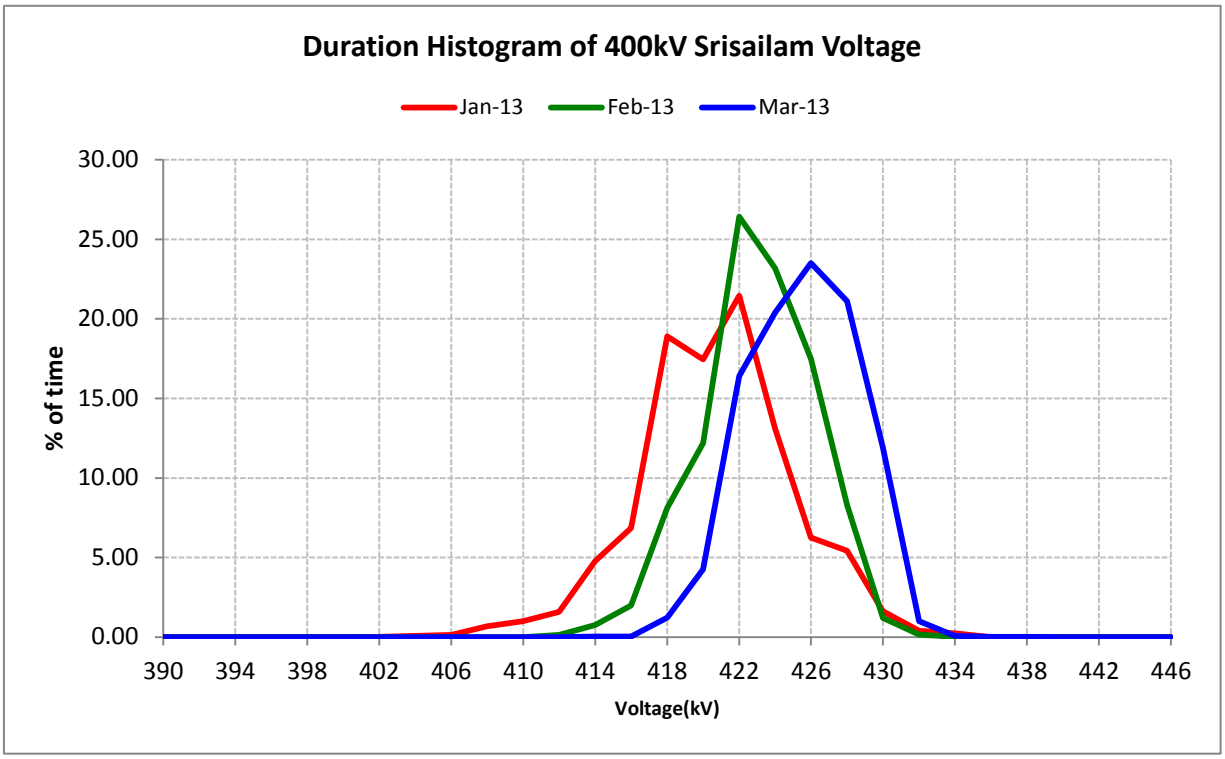


Figure 102

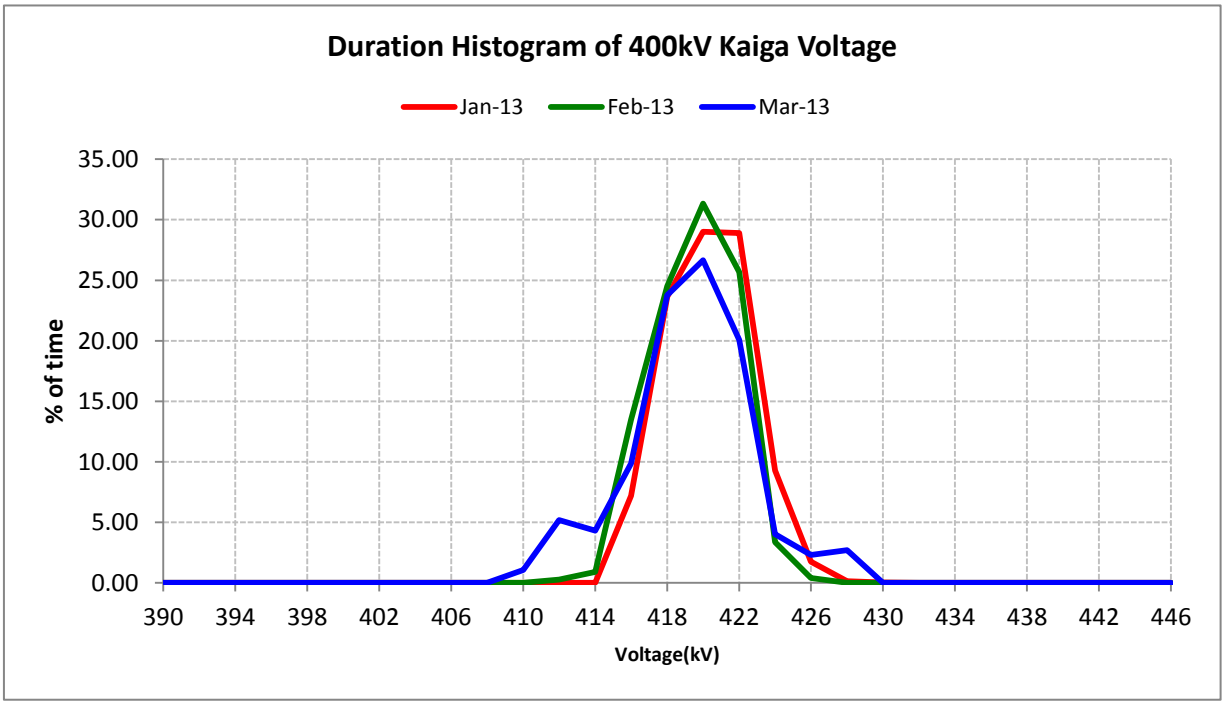


Figure 103

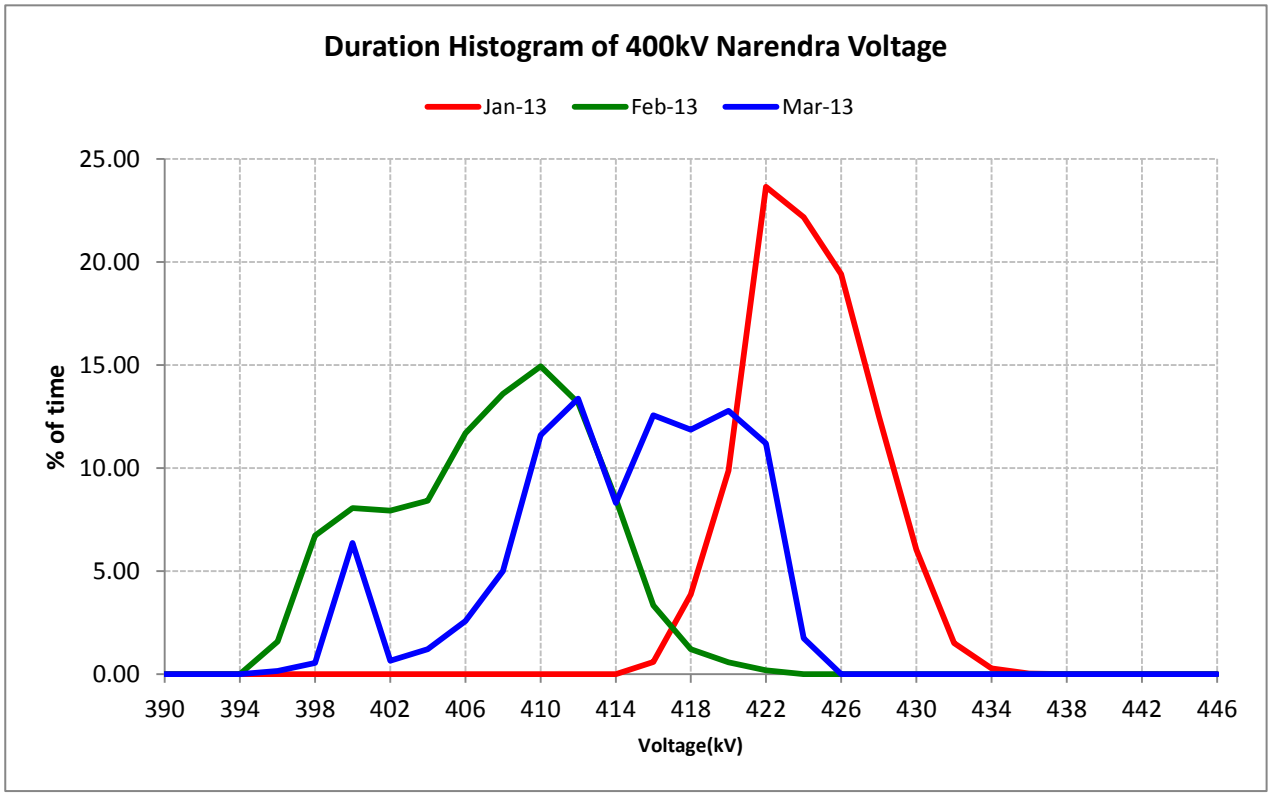


Figure 104

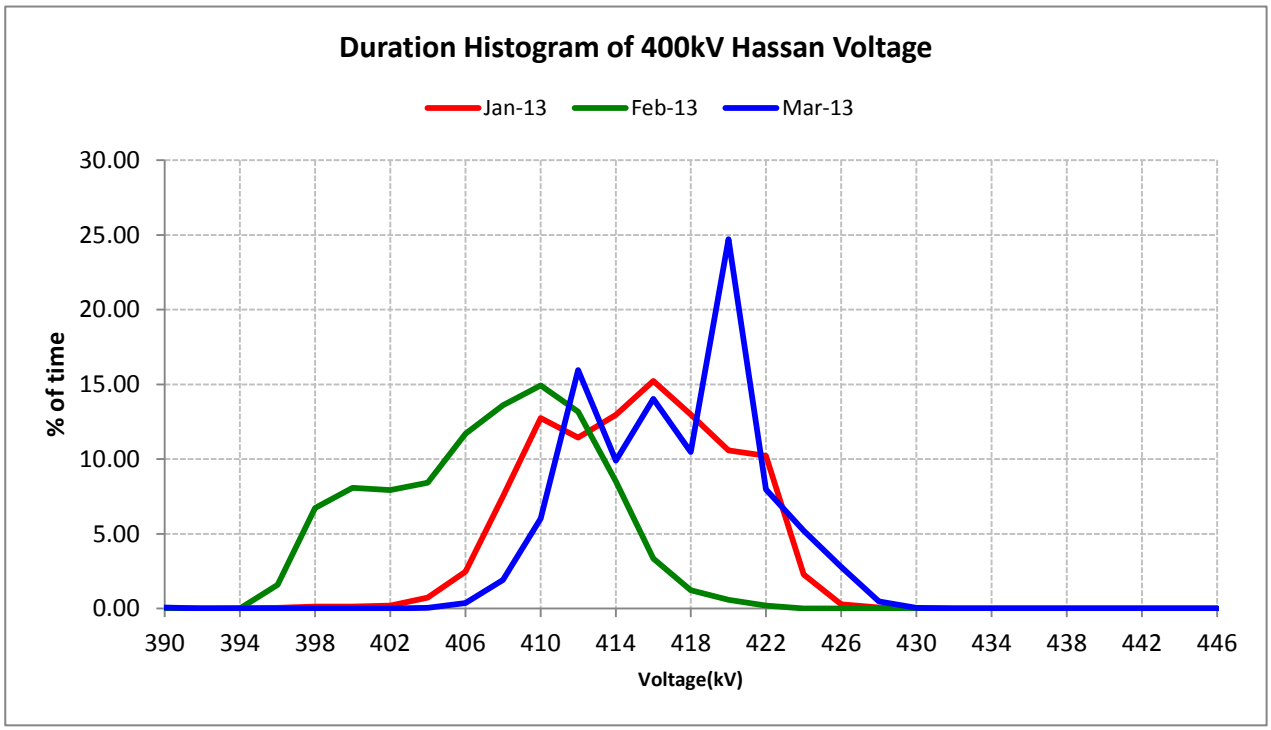


Figure 105

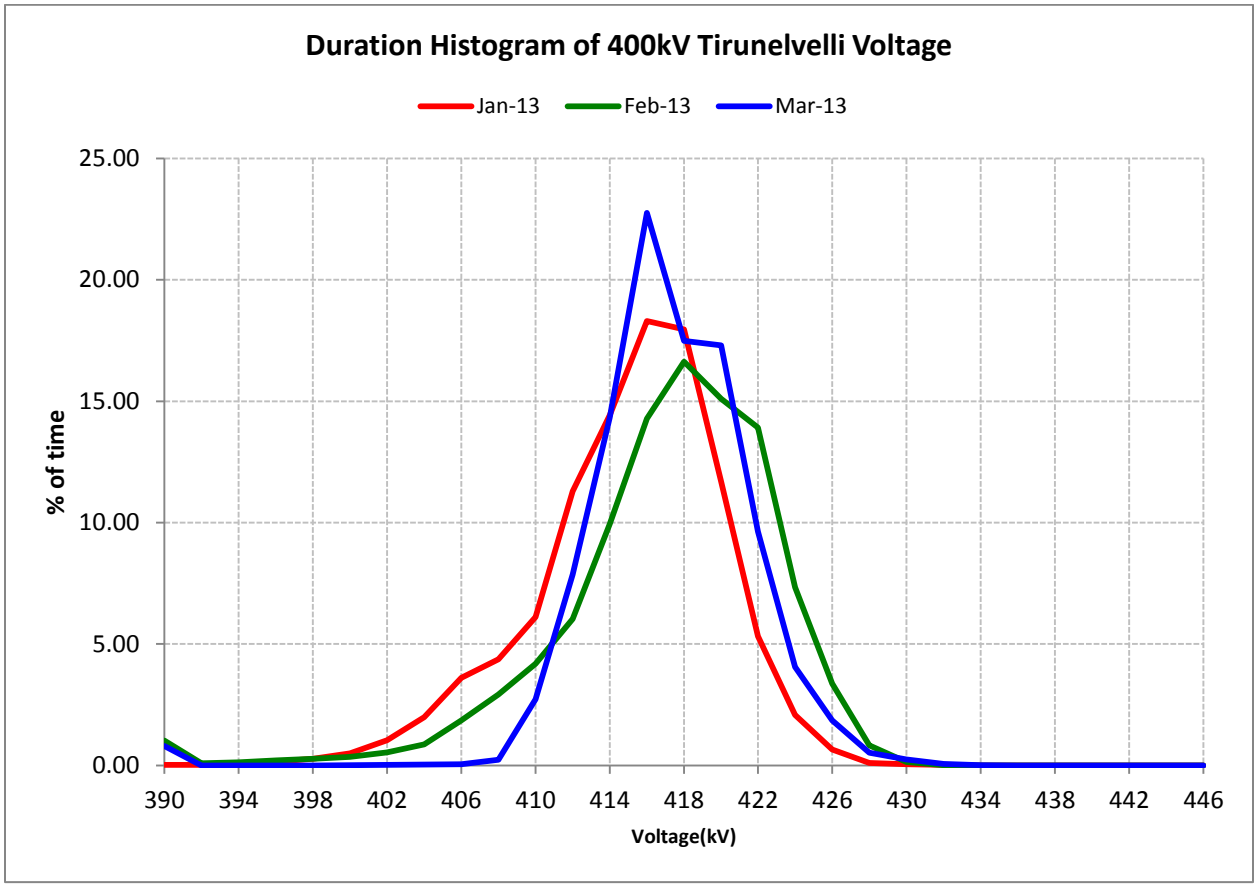

Duration Histogram of 400kV Tirunelvelli Voltage
Jan-13
Feb-13
Mar-13
25.00
20.00
15.00
10.00
5.00
0.00
% of time
390
394
398
402
406
410
414
418
422
426
430
434
438
442
446
Voltage(kV)

Figure 106

Annexure-II

SRLDC : Shift Summary						Evening Shift	5-Jul-13
Issues	Less generation	NIL. No loss of generation in NLC due to strike					
	Reduced IR import	Nil					
	Low voltage	NIL					
	High voltage	MALKARAM,KRNL , NAR , GTR, RAMAGUNDAM, VEMAGIRI , VIJAYAWADA.					
	High Line Loading	NIL					
	Flowgate violation	Nil					
	Sudden Variation of loads	Nil					
	Sudden Load crash	Nil					
Units tripped /Revived (210 MW & above)	UNIT	No.	Tripped at	Reason	Synchronised at	Loss of Generation (MW)	1000
	KOTHAGUDAM TPS (500MW)	11	15:17	AUXILLIARY SUPPLY FAILURE	20:24		
	BELLARY TPS (500MW)	2	15:48	AUXILLIARY SUPPLY FAILURE	20:28		
					-		
Tripping Details (HVDC/400 kV /220 kV elements)	LINE/ICT		Tripping Time	Remark		Normalised at	
	400 Kv HIRIYUR-BTPS 1		15:48	BREAKER PROBLEM AT BTPS END		20:46	
Freqency Profile	Maximum	50.19 Hz. at 14:02 Hrs				Frequency in IEGC range	89 %
	Minimum	49.54 Hz. at 15:19 Hrs					
	Reason for Low/High freq						
Scheduling details	Open Access (Curtailment,New Approvals,pending Approvals etc)	1. ONE CONTIGENCY APPROVED (ER -SR PATH) FOR 05.07.13					
		2. ONE CONTIGENCY APPROVED (KPTCL TO AP) FOR 06.07.13					
		3. ER - SR PATH STERLITE STOA CUTILMENT DONE FROM 83-96 BLKS. (0 MW) AS PER ERLDC MSG.					
	Surrender/Reallocation of ISGS	*State*	*URS details*		*URS power*		*duration/blk*
		NIL					
	ATC and congestion	1-96 BLKS. ER - SR , WR - SR NO MARGINE, AS PER NLDC MSG.					
S/W related issues	SCADA	NIL					
	Communication, Data	NIL					
	IT, Scheduling S/W	NIL					

	Owner	Name of Line	Compensation %	Installed End	Status
Status of FSCs in SR	PGCIL	400 KV N.Sagar-Cudapa 1	40.00%	Cudapa	FSC in Service
	PGCIL	400 KV N.Sagar-Cudapa 2	40.00%	Cudapa	FSC in Service
	PGCIL	400 KV Gooty -Nelamangala	40.00%	Gooty	FSC in Service
	PGCIL	400 KV Gooty -Somanahalli	40.00%	Gooty	FSC in Service

	APTRANSCO	KPTCL	KSEB	TNEB	PONDY	others	Reason
Messages to constituents and physical regulation if any	2		1				Message 'A'
							Message 'B'
							Message 'C'
							Contemplating Regulatory measures
							Underdrawal message
							Maximising MVAR drawals
							To take all measures to contain OV
							HIGH Voltage message
Details of Grid Incidents and Grid Disturbances with Snap shots of Abnormal events	Nil						

In case of grid incident & grid disturbance FIR report to be enclosec

Details of major Line/ equipment S/D in SR

Sl.No.	Name of the element	Owner	Planned/ Emergency	Daily Basis/ Continuous	Reason	Shutdown Planned				Shutdown Actual				TTC/ATC Revision	Remarks
						Start Date	Start Time	End Date	End Time	Start Date	Start Time	End Date	End Time		
NIL															

SRLDC : Shift Summary

Night Shift	14-Jun-13

Issues	Less generation	Nil
	Reduced IR import	Nil
	Low voltage	Nil
	High voltage	Hyderabad, Gajwel,Malkaram, Kurnool, Gooty, Khammam,Vijayawada(Above 430kV THROUGHT N.SHIFT at AP Area)
	High Line Loading	Nil
	Flowgate violation	Nil
	Sudden Variation of loads	Nil
	Sudden Load crash	Nil

Units tripped /Revived (210 MW & above)	UNIT	No.	Tripped at	Reason	Synchronised at	Loss of Generation (MW)	Nil
	NIL						

Tripping Details (HVDC/400 kV /220 kV elements)	LINE/ICT	Tripping Time	Remark	Normalised at
	400/220 kV ICT-1 AT HOODY	23:10	EMERGENCY S/D BY KPTCL TO ATTEND ISO. PROBLEM	0:40
	400 Kv HASSAN - UPCL 2	23:13	TRIPPED ON OVER VOLTAGE	
	400 kV RAMAGUNDAM - GAJWEL	23:46	TRIPPED ON OVER VOLTAGE	6:54
	400/220 Kv ICT-3 AT MALKARAM	23:46	OVER FLUX PROTECTION OPERATED	
	400 kV MALKARAM - HYDERABAD	0:00	TRIPPED ON OVER VOLTAGE	
	400 kV KHAMMAM - KALPAKKA 2	0:02	TRIPPED ON OVER VOLTAGE	7:02
	400 kV HYDERABAD - MAMIDIPALLY	2:34	TRIPPED ON OVER VOLTAGE	7:08

Freqency Profile						Frequency in IEGC range	84 %
	Maximum	50.50	Hz.	at	0:01 Hrs		
	Minimum	49.61	Hz.	at	6:35 Hrs		
	Reason for Low/High freq						

Scheduling details					
	Open Access (Curtailment,New Approvals,pending Approvals etc)	NIL			
	Surrender/Reallocation of ISGS	*State*	*URS details*	*URS power*	*duration/blk*
		AP	SURR. IN	RGDMU1-6,7,NLCIIST1/2,SIM-ST2,IGSTPS	DIFF. BLKS.
		KAR	SURR. IN	RGDMU1-6,7,NLCIIST1/2,SIM-ST2,TAL-ST2,NLCEXP	DIFF. BLKS.
		KSEB	RE-ALLOCATED FROM	NLCIIST1/2 ,IGSTPS	DIFF. BLKS.
		PONDY	SURR. IN	RGDMU7,NLCIIST1/2	DIFF. BLKS.
	ATC and congestion	NIL			

S/W related issues		
	SCADA	NIL
	Communication, Data	MAHABOOB NAGAR DATA NOT UPDATING
	IT, Scheduling S/W	Nil

Status of FSCs in SR	Owner	Name of Line	Compensation %	Installed End	Status
	PGCIL	400 KV N.Sagar-Cudapa 1	40.00%	Cudapa	FSC not in service(LINE SHUT DOWN)
	PGCIL	400 KV N.Sagar-Cudapa 2	40.00%	Cudapa	FSC in Service
	PGCIL	400 KV Gooty -Nelamangala	40.00%	Gooty	FSC in Service
	PGCIL	400 KV Gooty -Somanahalli	40.00%	Gooty	FSC in Service

Messages to constituents and physical regulation if any	APTRANSCO	KPTCL	KSEB	TNEB	PONDY	others	Reason
			2	4			Message 'A'
			1				Message 'B'
							Message 'C'
							Contemplating Regulatory measures
				4			Underdrawal message
	22					AP/SEPL	Maximising MVAR absorption
							To take all measures to contain OV

Details of Grid Incidents and Grid Disturbances with Snap shots of Abnormal events	NIL

In case of grid incident & grid disturbance FIR report to be enclosed

SRLDC : Shift Summary

Night Shift	5-Jul-13

Issues	Less generation	NIL . No loss of generation in NLC due to strike
	Reduced IR import	Nil
	Low voltage	Nil
	High voltage	Malkaram, Hyderabad,Karnool,Khammam,Vijayawada,Vemagiri
	High Line Loading	Nil
	Flowgate violation	Nil
	Sudden Variation of loads	Nil
	Sudden Load crash	Nil

	UNIT	No.	Tripped at	Reason	Synchronised at		
Units tripped /Revived (210 MW & above)	KOTHAGUDAM TPS	11	21:48	Turbine vibration	1:32	**Loss of Generation (MW)**	**nil**

	LINE/ICT	Tripping Time	Remark	Normalised at
	220 kV AMBEWADI - PONDA 1	3:24	Directional Over Current operated	4:08

Freqency Profile	Maximum	50.30	Hz.	at	2:01	Hrs		Frequency in IEGC range	91 %
	Minimum	49.63	Hz.	at	5:30	Hrs			
	Reason for Low/High freq								

Scheduling details	Open Access (Curtailment,New Approvals,pending Approvals etc)			
	Surrender/Reallocation of ISGS	*State*	*URS details*	*URS power*	*duration/blk*
		APTRANSCO	surrendered from NLYII		1-18
		PONDY	surrendered from NLYII		1-18
	ATC and congestion	NIL			

S/W related issues	SCADA	Nil
	Communication, Data	Nil
	IT, Scheduling S/W	Nil

	Owner	Name of Line	Compensation %	Installed End	Status
Status of FSCs in SR	PGCIL	400 KV N.Sagar-Cudapa 1	40.00%	Cudapa	FSC in Service
	PGCIL	400 KV N.Sagar-Cudapa 2	40.00%	Cudapa	FSC in Service
	PGCIL	400 KV Gooty -Nelamangala	40.00%	Gooty	FSC in Service
	PGCIL	400 KV Gooty -Somanahalli	40.00%	Gooty	FSC in Service

	APTRANSCO	KPTCL	KSEB	TNEB	PONDY	others	Reason
Messages to constituents and physical regulation if any			4				Message 'A'
			1				Message 'B'
							Message 'C'
							Contemplating Regulatory measures
				9			Underdrawal message
							Maximising MVAR drawals
							To take all measures to contain OV
							For corrective steps for H/F and U/Drawals
Details of Grid Incidents and Grid Disturbances with Snap shots of Abnormal events	Nil						

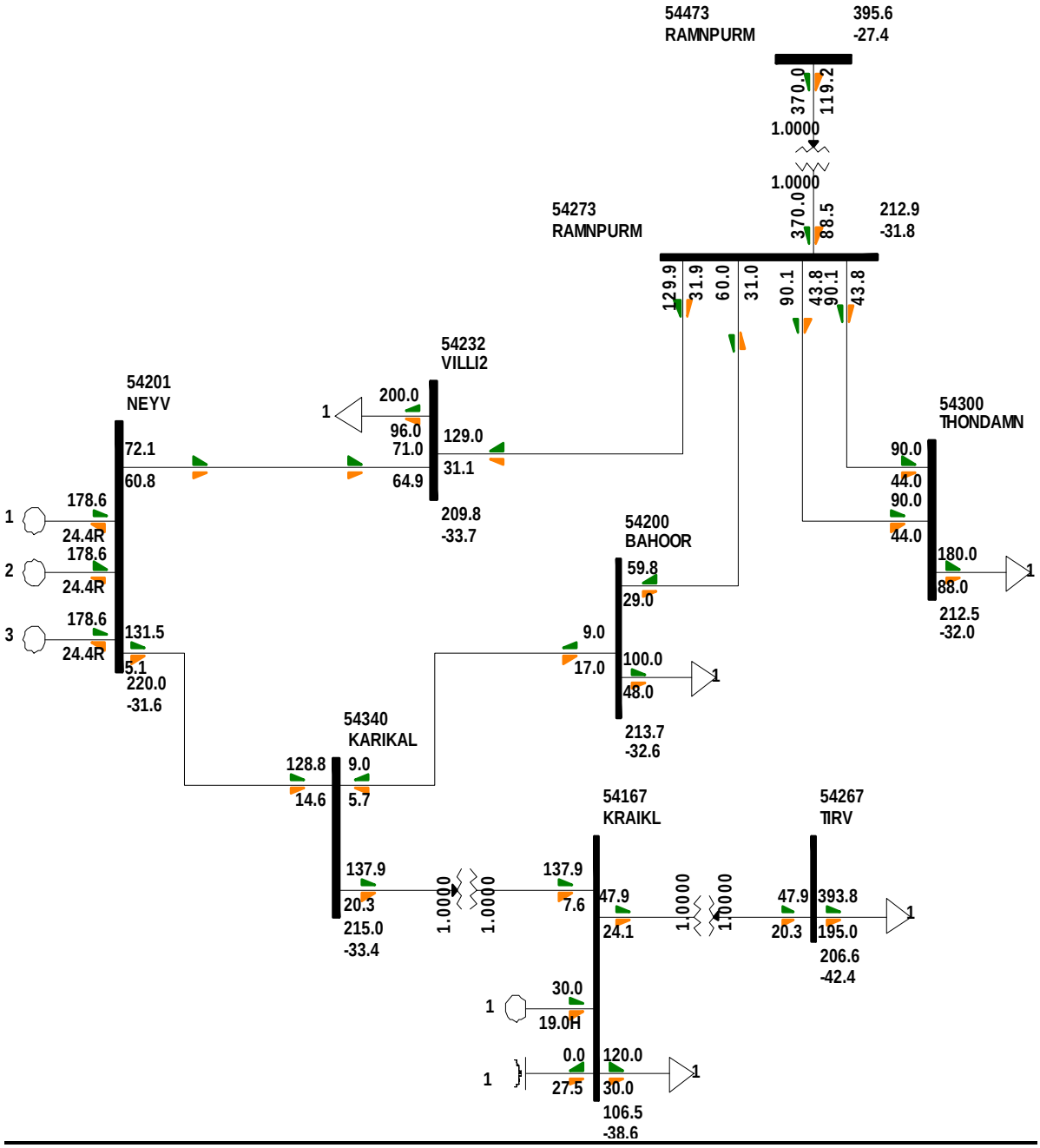
In case of grid incident & grid disturbance FIR report to be enclosed

Details of major Line/ equipment S/D in SR

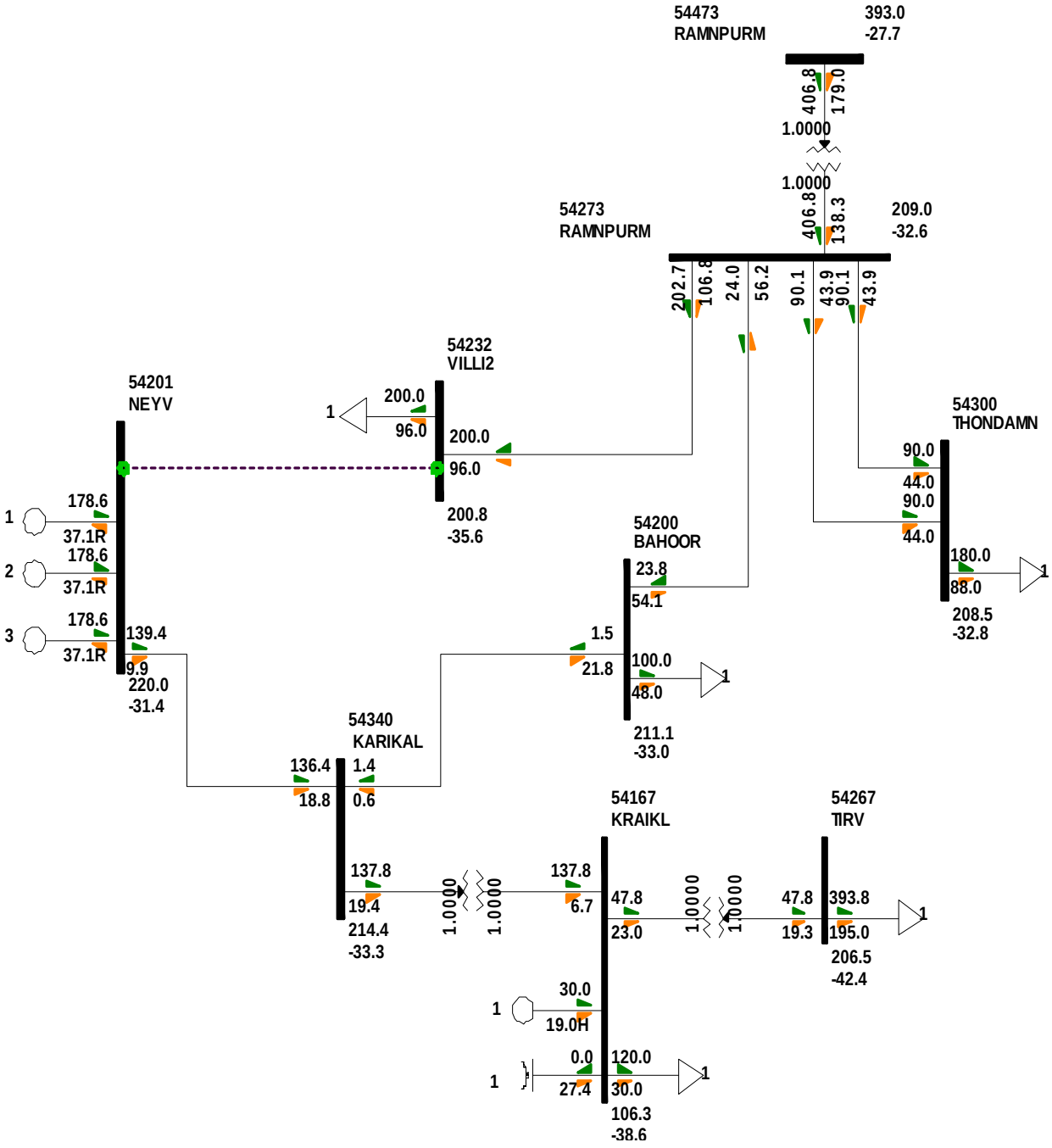
Sl.No.	Name of the element	Owner	Planned/ Emergency	Daily Basis/ Continuous	Reason	Shutdown Planned				Shutdown Actual				TTC/ATC Revision	Remarks
						Start Date	Start Time	End Date	End Time	Start Date	Start Time	End Date	End Time		
1	Nil														
2															

Annex-III

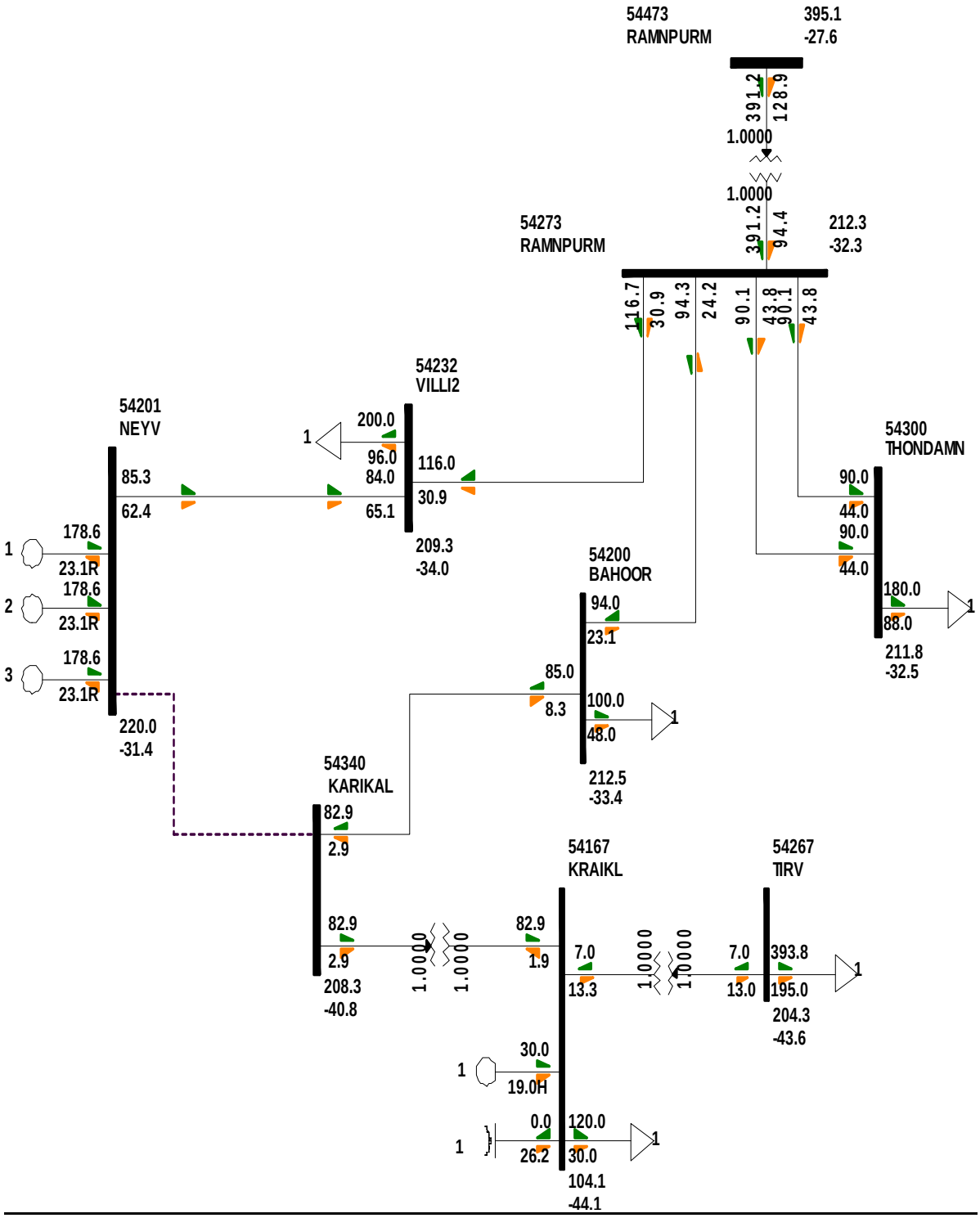
Karaikal Studies



OUTAGE OF NEYVELI- VILLINAUR S/C LINE



OUTAGE OF NEYVELI- KARAIKAL S/C LINE



Annexure-IV

Load Flow Studies for Yeramaras (2x800 MW) and Edlapur (1x800 MW) generation projects for the 2016-17 Time Frame

- The Load Flow results for the Base Case without the Yeramaras & Edlapur generation projects are placed at **Exhibit-I**

- The results with the earlier approved transmission system are placed at **Exhibit-II & III**, wherein it may be observed that practically the evacuation of power from the Yeramaras & Edlapur generation projects is banking on the ISTS transmission network which also necessitated bypassing the LILO of Raichur – Gooty 400kV D/c line at Raichur (new) as this enhances the fault level at Raichur generation project beyond its designed capacity. Further for the Exhibit-III it may also be observed that this also overloads the Raihcur – Kurnool 765kV 2xS/c line under contingency of one circuit. Therefore this has necessitated the review of the transmission system associated with Yeramaras & Edlapur generation projects.

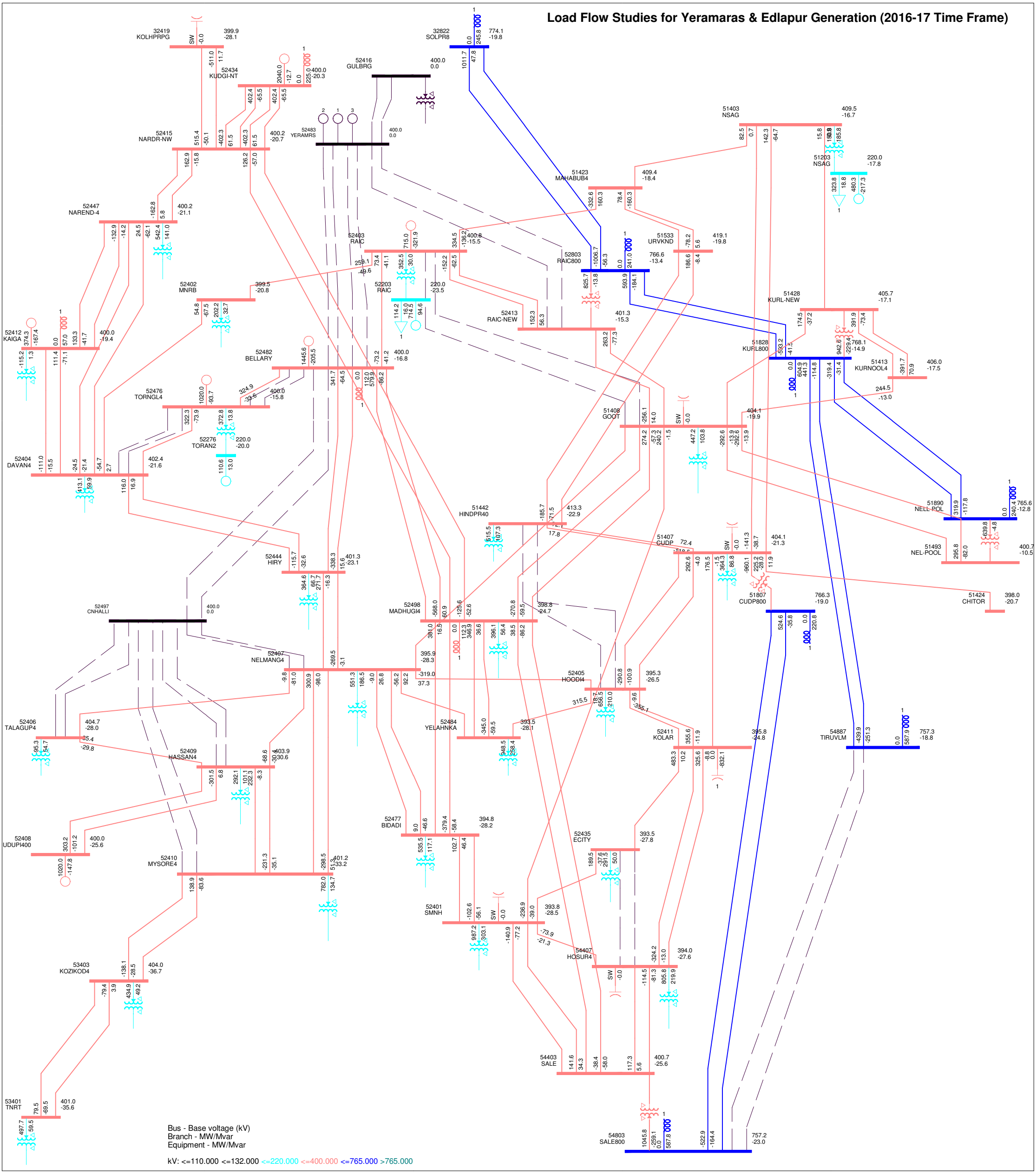
- The load flow results for the base case with following new transmission system are placed at **Exhibit-IV**,

    - Yeramaras – Bellary 400kV 2xD/c (quad) line or multi circuit line utilizing corridor of Raichur – Bellary 400kV S/c line
    - Yeramaras – Gulbarga 400kV D/c line
    - Replacement of Bellary – Jindal – Davagere 400kV S/c line with 400kV quad D/c line
    - Bellary – C.N. Halli 400kV quad D/c line
    - C.N. Halli – Mysore 400kV D/c line
    - LILO of both circuits of Talguppa – Neelamangla 400kV D/c line at C.N. Halli
    - Terminate LILO of one circuit of Talguppa – Neelamangla 400kV D/c line at Hassan for making it C.N. Halli – Hassan 400kV D/c line
    - Establishment of 400/220kV substations at C.N. Halli & Gulbarga with 2x500MVA transformers

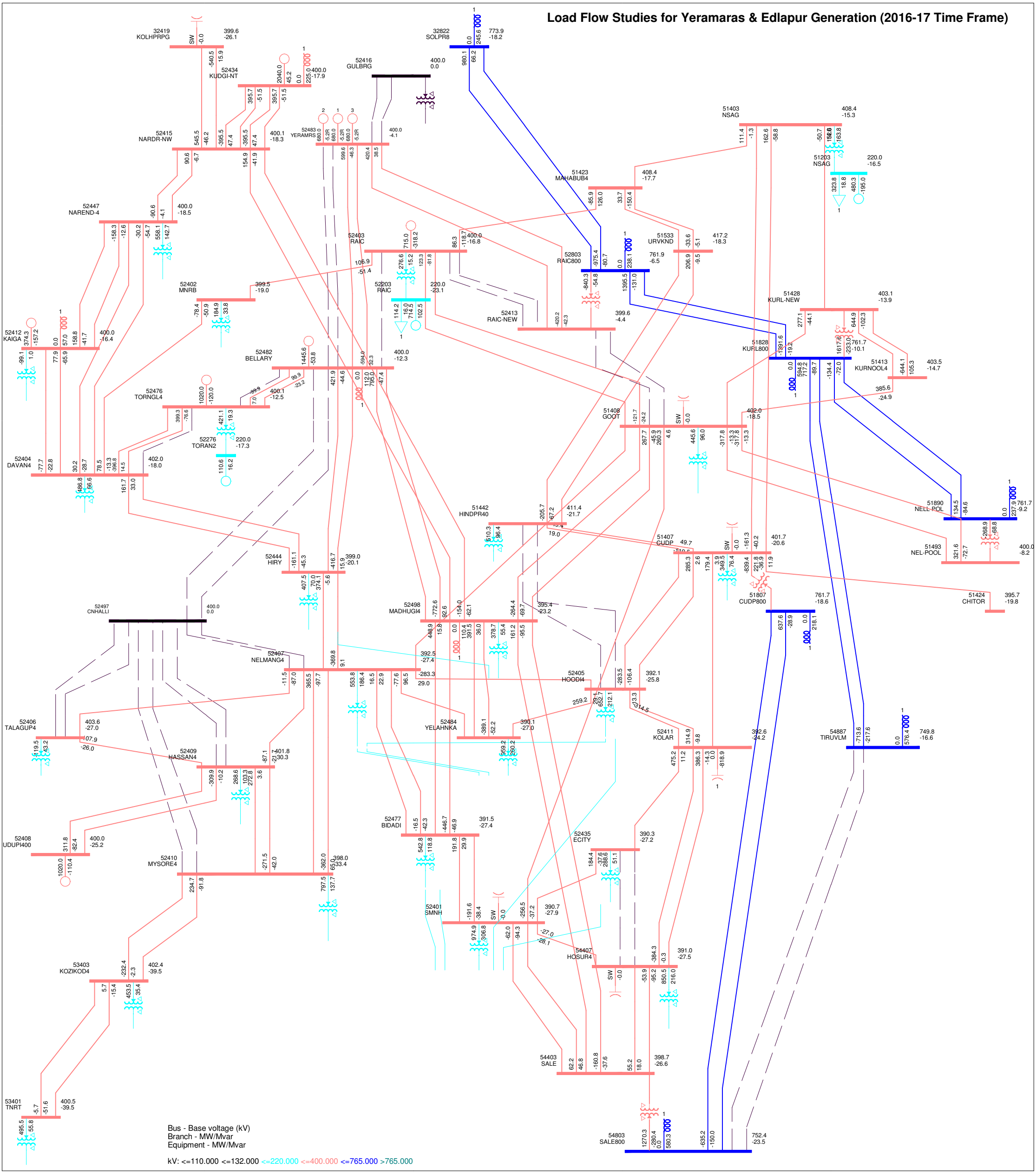
- It may be observed that all the transmission lines are well within the limits. Further as per the Manual on Transmission Planning criteria the transmission is tested for N-1-1 contingency and the results are placed at **Exhibit-V & VI**.

- In view of the above studies above transmission system is proposed associated with Yearamaras (2x800 MW) & Edlapur (1x800 MW) generation projects

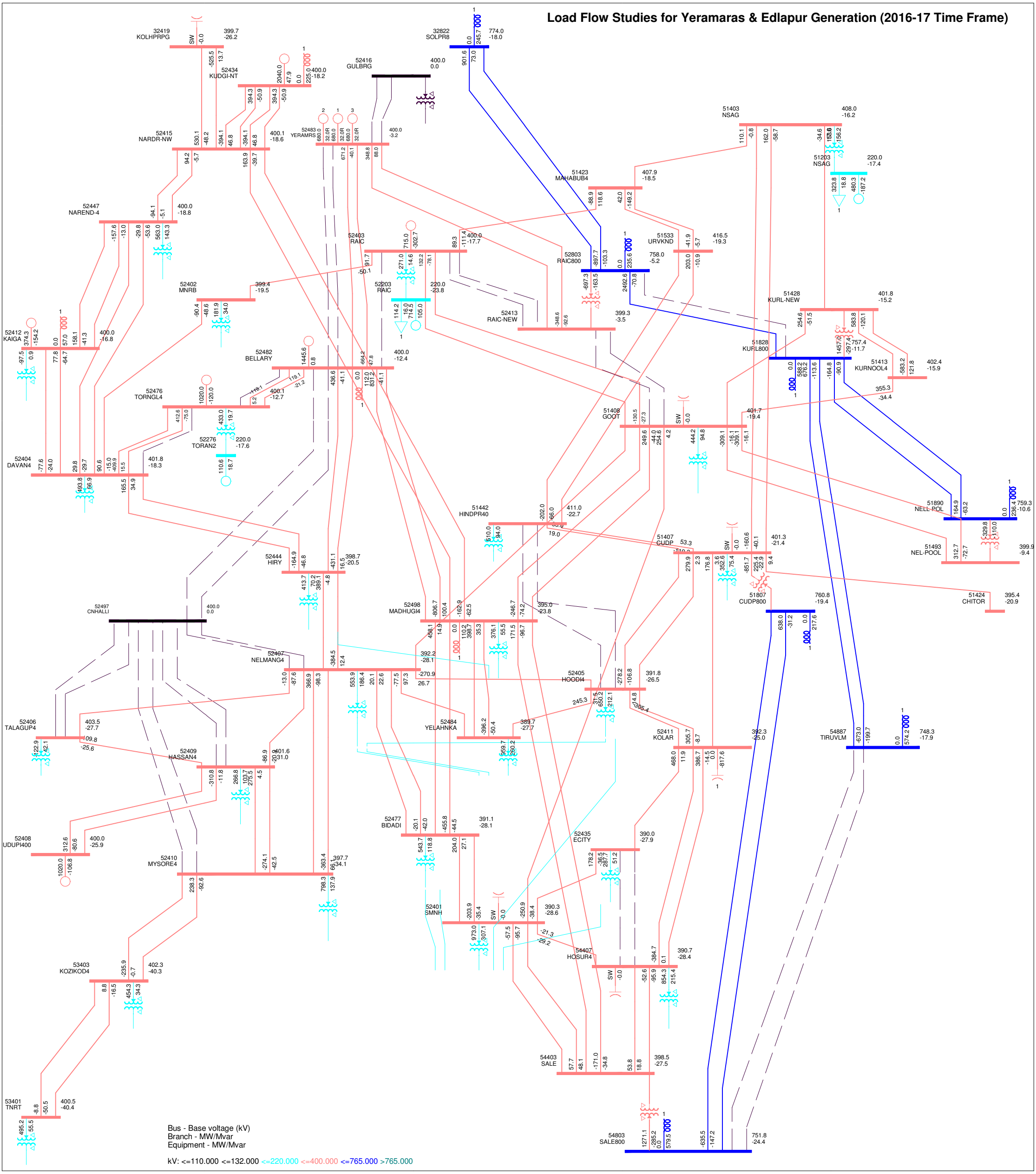
Load Flow Studies for Yeramaras & Edlapur Generation (2016-17 Time Frame)



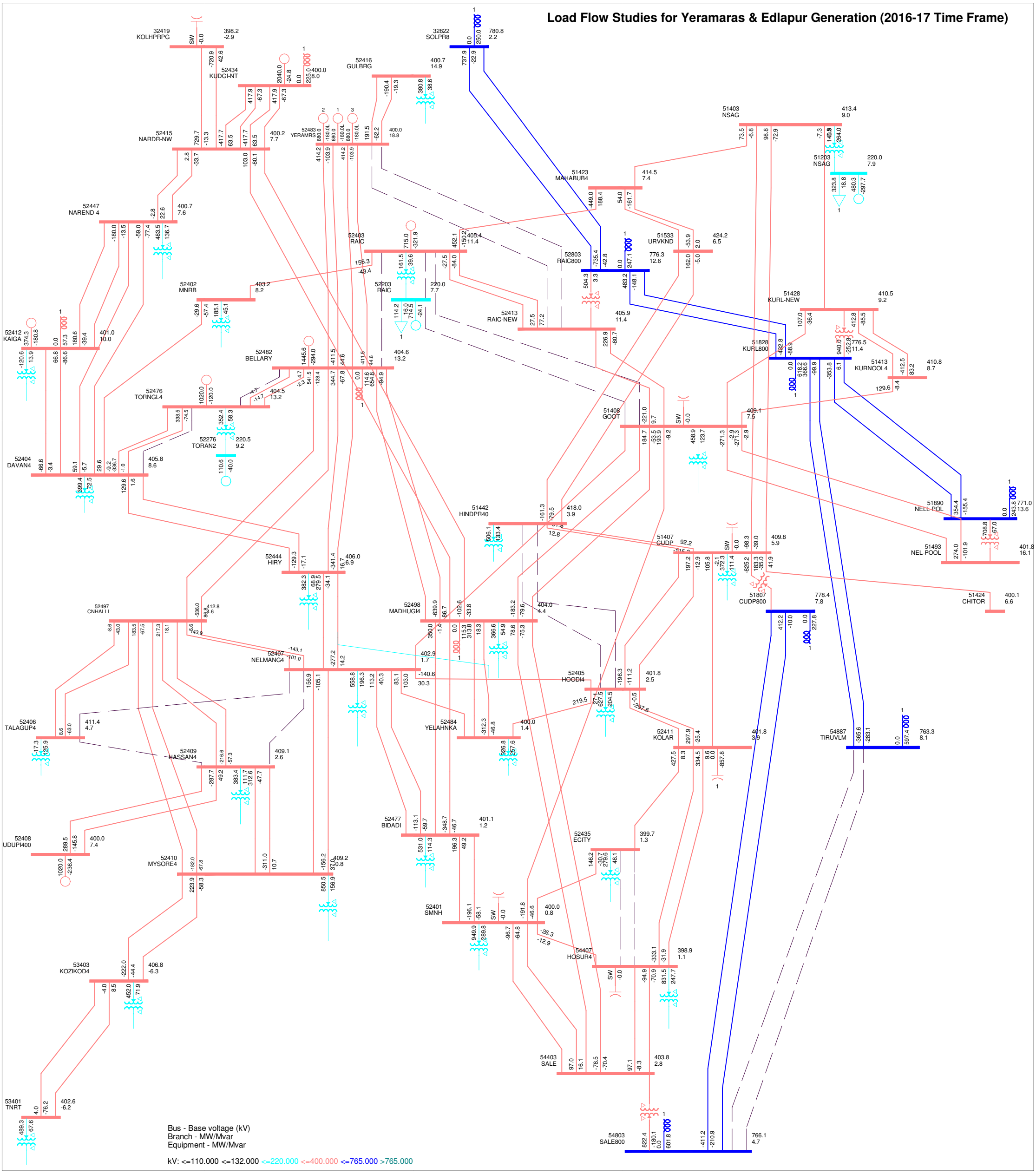
Load Flow Studies for Yeramaras & Edlapur Generation (2016-17 Time Frame)



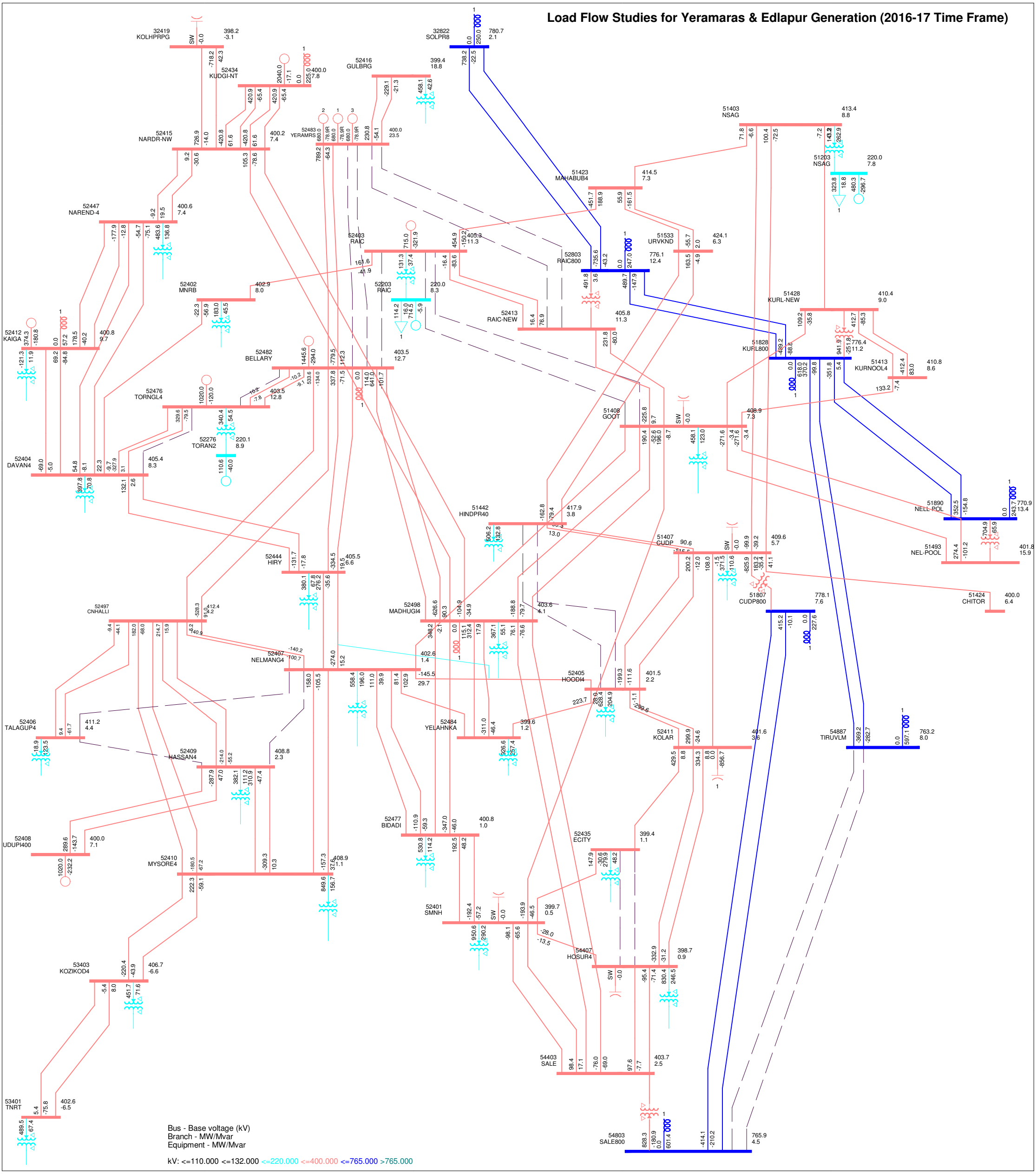
Load Flow Studies for Yeramaras & Edlapur Generation (2016-17 Time Frame)



Load Flow Studies for Yeramaras & Edlapur Generation (2016-17 Time Frame)



Load Flow Studies for Yeramaras & Edlapur Generation (2016-17 Time Frame)



Load Flow Studies for Yeramaras & Edlapur Generation (2016-17 Time Frame)