

TAMILNADU TRANSMISSION CORPORATION LTD.
(Subsidiary of TNEB Ltd.)

From

Er.T.Senthilvelan, B.E.,
Director/Transmission Projects,
TANTRANSCO,
144, Anna Salai,
Chennai -2.

The Member (Power System),
Central Electricity Authority,
Sewa Bhavan, R.K.Puram,
New Delhi 110 066.

Lr.No.CE/Plg.&R.C/SE/SS/EE-II/AEE1/F. 2nd SRSCT/D. 115 /19 dt. 24.05.19

Dear Sir,

Sub: 2nd Southern Region Standing Committee on Transmission
– Agenda points - reg.

Ref: Joint study meeting held on 01.5.19 & 02.05.19 at SRPC/Bangalore.

The proposals in respect of TANTRANSCO, TamilNadu have been furnished below for including in the forthcoming Southern Region Standing Committee on Transmission (SRSCT) as the Agenda items for deliberations:

1.Vembakkam 230/110 kV SS:

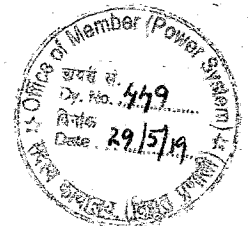
Administrative approval was accorded by TANTRANSCO for establishing a 230/110 kV SS at Vembakkam by LILO of 230 kV MAPS – Echur line and the work is to be commenced soon. Hence approval for making LILO of 230 kV MAPS – Echur line at Vembakkam 230 kV SS is required as MAPS is a central generating station.

2. Bus Reactors:

Approval for erecting 400 kV Bus reactors are requested at the following locations :

1	Korattur	400KV	2x125 MVar
2	Manali	400KV	2x125 MVar
3	Guindy	400KV	2x125 MVar
4	Ottiapakkam	400KV	2x125 MVar
5	Pulianthope	400KV	1x125 MVar
6	Alamathy	400KV	1x125 MVar
7	Vellalaviduthi	400 kV	1x63 MVar

(WORK UNDER PROGRESS)



No-107/PSRD-II
24/5/2019

3. Alagarkoil 400/230-110 kV SS (in place of Kondagai) :

Konthagai 400/230-110 kV substation proposal was approved by CEA in the 41st and 42nd meeting of Standing Committee on Power System Planning with the following 400 kV connectivity :

- i) LILO of one circuit of 400 kV Kayathar-Karaikudi DC line by erecting 25 Km of DC line to Konthagai 400 kV SS.
- ii) 400 KV DC Link line from the proposed Virudhunagar 765/400 kV SS to Konthagai 400 kV SS.
- iii) Provision of 2x500 MVA 400/230 kV ICT & 2x200 MVA 400/110kV capacity.

As the identified land at Konthagai is only sufficient to establish a 400 kV GIS SS, as a cost effective measure, it has been decided to establish a 400 kV AIS SS in the premises of the existing Alagarkoil 230 kV SS by retaining the same 400 kV connectivity of Konthagai SS at Alagarkoil . System studies has been conducted for the same and the study results are enclosed herewith.

Hence approval may be accorded for establishing Alagarkoil 400/230-110 kV substation in place of Kondagai 400 kV SS with the following connectivity:

400 kV connectivity:

- i) LILO of one circuit of 400 kV Kayathar-Karaikudi DC line by erecting 25 Km of DC line to Konthagai 400 kV SS.
- ii) 400 KV DC Link line from the proposed Virudhunagar 765/400 kV SS to Konthagai 400 kV SS.
- iii) Provision of 2x500 MVA 400/230 kV ICT & 2x200 MVA 400/110kV capacity.
- iv) 230kV and 110 kV connectivity of the existing Alagarkoil 230 kV SS will be retained. Additional 230 kV connectivity to the proposed new 230 kV SS at Thirupalai near Alagarkoil.

4. Vishwanathapuram 400/230-110kV SS:

Vishwanathapuram 400/230-110 kV SS has been envisaged for the following reasons:

- 1) Hosur area is a fastly developing industrial area. Industrial expansion is expected by way of proposed establishment of SEZ in future. Presently, EHT/HT service applications for around 90 MVA is pending with the distribution circle.

- 2) Due to overloading of auto transformers of the existing Hosur 230 kV SS & the upcoming Uddanapally 230 kV SS and certain 110 kV lines in that area , there is no feasibility to accommodate any additional loads.
- 3) There is no redundancy in the network for reliable operation in the event of contingency conditions.
- 4) Ensuring reliability of source in this area will reduce power interruption and avoid major revenue loss.

In view of the above, establishment of a 400 kV SS is necessitated to ensure reliability and source adequacy.

The proposal for establishment of Vishwanathapuram 400/110kV SS was discussed in the 1st meeting of Southern Region Standing Committee on Transmission (SRST) and it was decided to carry out joint system studies of Southern Region. Subsequently the proposal for establishment of Vishwanathapuram 400/230-110kV SS was discussed in the joint study meeting held on May 1st to 2nd 2019 at SRPC, Bengaluru.

ICTs:

2 x 500 MVA , 400/230 kV ICTs

3 x 200 MVA , 400/110 kV ICTs.

Provision of 1 x 125 MVA Bus Reactor.

Provision of 2 X 50 MVA Line reactor one on each line of 400kV Vishwanathapuram –Thiruvalem line at Vishwanathapuram SS end.

400 KV connectivity:

LILO of 400 kV Thiruvalem – Palavady Quad moose D/C line at the proposed Vishwanathapuram 400/ 230-110 kV SS.

230 KV connectivity:

- i. 230kV S/C line to the existing Hosur 230 kV SS.
- ii. 230kV D/C line to the proposed 230kV SS near Bagalur.
- iii. 230kV S/C line to the proposed Kalukondapally 230 kV SS.

110 KV connectivity:

- i. 110kV D/C line to Shoolagiri 110kV SS.
- ii. 110kV S/C line to Uddanapally 230kV SS
- iii. 110kV S/C line to proposed Alur 110kV SS.
- iv. 110kV D/C line to proposed Hosur SEZ 110kV SS.
- v. 110kV S/C line to proposed Vishwanathapuram 110kV SS.

System studies has been conducted for the same and the study results are enclosed herewith.

Hence approval may be accorded for establishing Vishwanathapuram 400/230-110kV substation with the above mentioned connectivity.

5. Thiruvalem 400/110kV Ratio Introduction:

There is a tremendous demand growth due to Industrial development in and around Ranipet area. Hence, it is very essential to have a strengthened and reliable transmission network for providing uninterrupted power supply.

The proposed 400/110kV ratio introduction at Thiruvalem 400/230kV substation will give relief to the existing Thiruvalem 230 kV substation and will be useful for transferring the existing 110kV loads of Thiruvalem 230/110kV substation to the now proposed 400/110kV bus , during execution of the already sanctioned 110kV feeders strengthening work (fed from Thiruvalem 230KV SS) which is pending for execution due to non feasibility of transferring of loads of existing fully loaded feeders.

Hence, approval may be accorded for the proposed 400/110kV ratio introduction at Thiruvalem 400/230kV substation with the following connectivity.

400/110 kV ratio introduction at Thiruvalem 400/230 kV SS:

ICT : 2x200 MVA 400/110kV ICTs.

110 kV Connectivity:

- i) 110 kV Thiruvalem - M.V.Puram DC line.
- ii) 110 kV Thiruvalem - SIPCOT DC line.
- iii) 110kV Thiruvalem - Vaduganthangal SC line.

It is requested that the above points may be included in the agenda for the ensuing 2nd meeting of the SRSCT.


(D.Ravichandran)
Chief Engineer/Planning & R.C (i/c)
For Director/Transmission Projects

Encl :

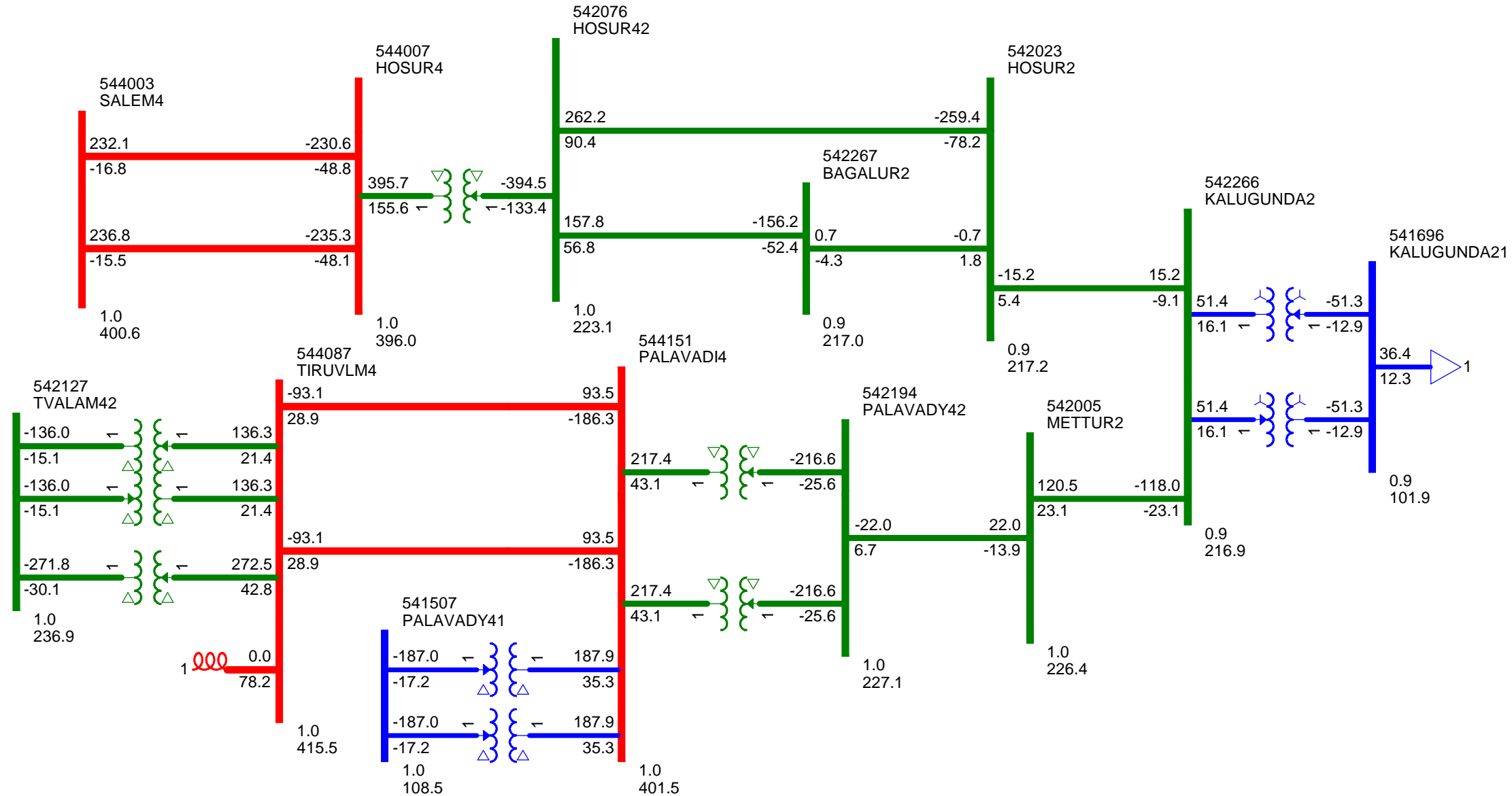
Study results in sav. File - by email.

ESTABLISHMENT OF PROPOSED VISHWANATHAPURAM 400/230-110 KV SUBSTATION

BASECASE : WITHOUT THE PROPOSED VISHWANATHAPURAM 400/230-110 KV SUBSTATION

CONDITION : FULL WIND FULL SOLAR

YEAR CONDITION : 2022-23

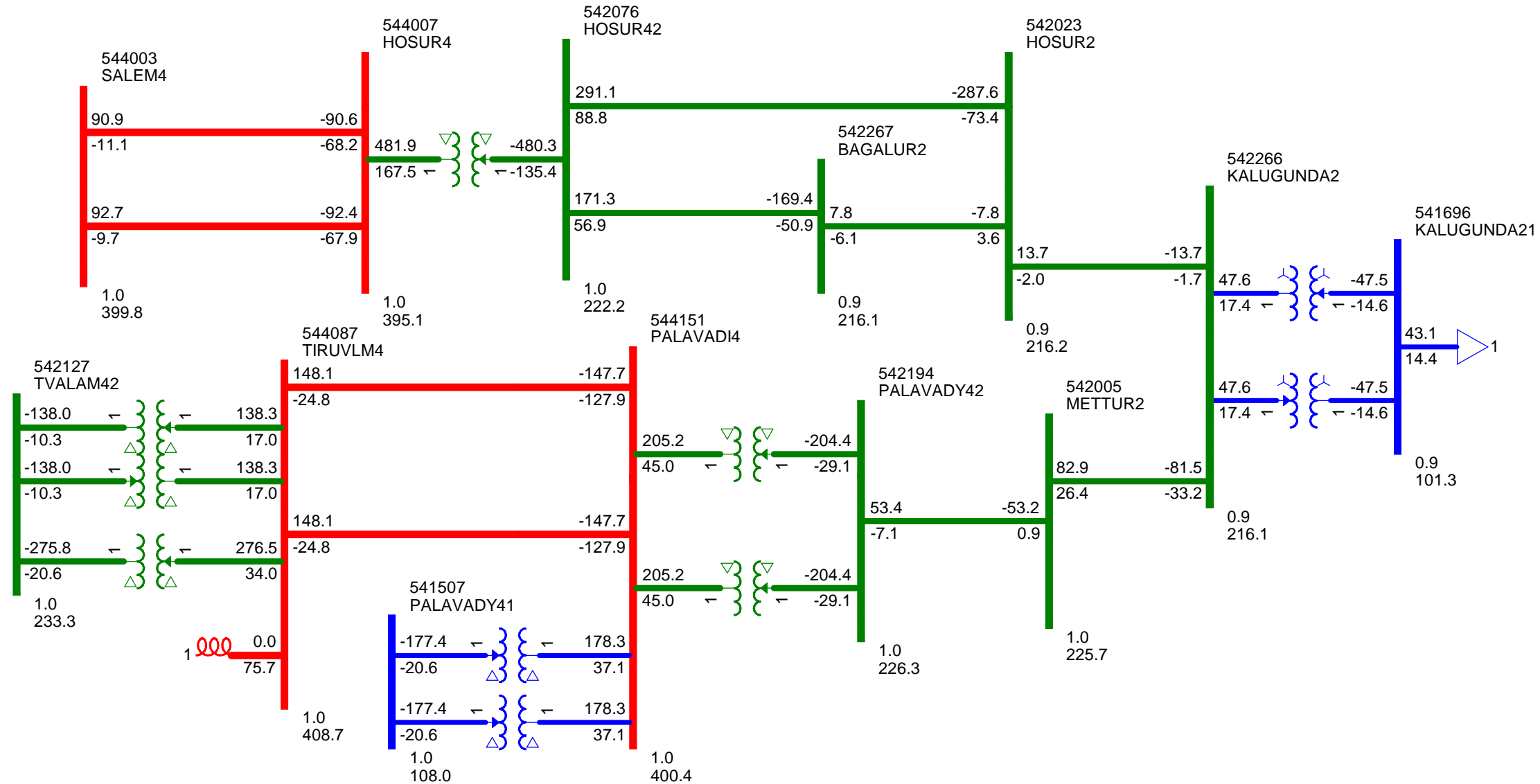


ESTABLISHMENT OF PROPOSED VISHWANATHAPURAM 400/230-110 KV SUBSTATION

BASECASE : WITHOUT THE PROPOSED VISHWANATHAPURAM 400/230-110 KV SUBSTATION

CONDITION : NIL WIND NIL SOLAR

YEAR CONDITION : 2022-23

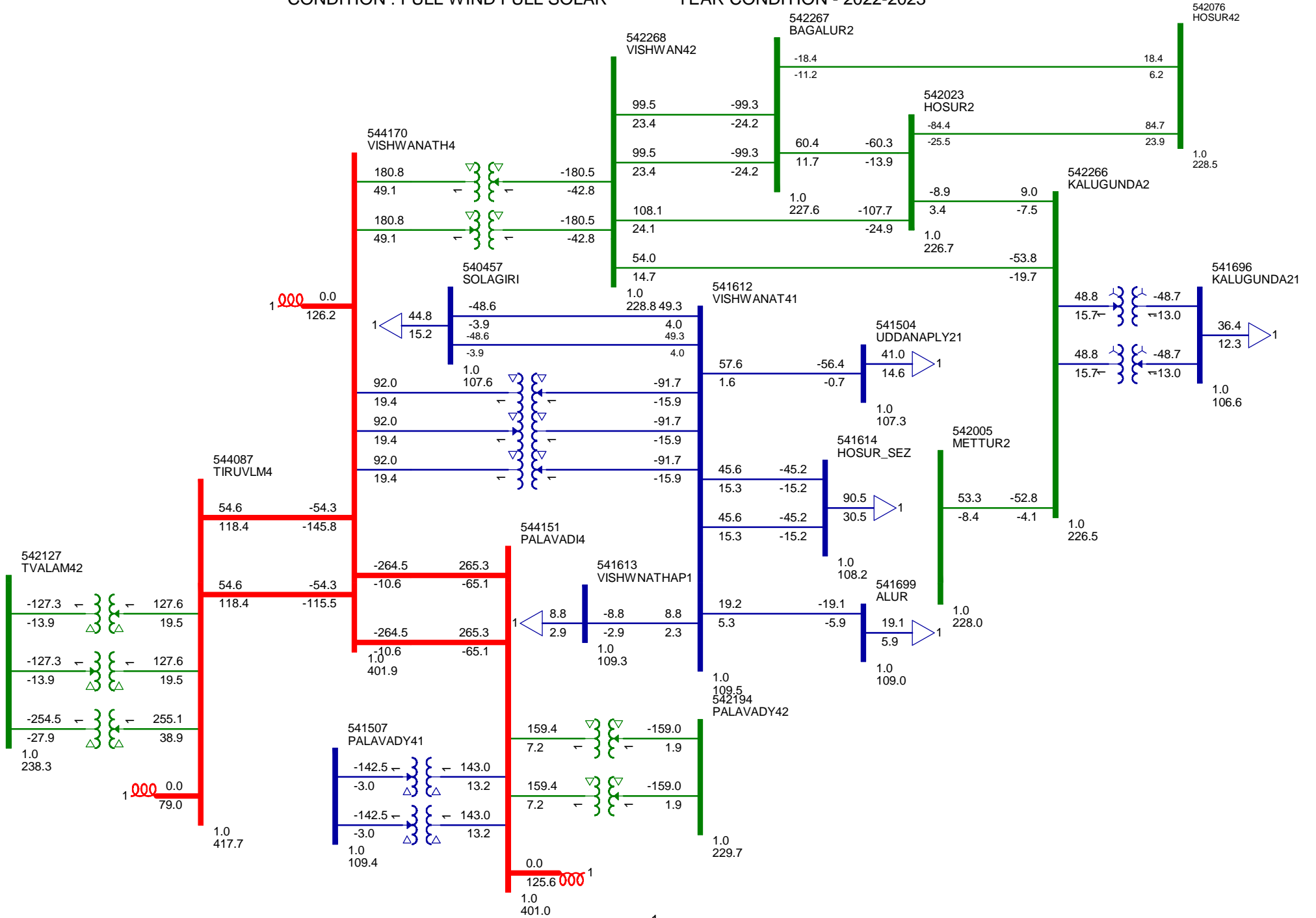


ESTABLISHMENT OF PROPOSED VISHWANATHAPURAM 400/230-110 KV SUBSTATION

CASE 1 : BASECASE + WITH THE PROPOSED VISHWANATHAPURAM 400/230-110KV SS

CONDITION : FULL WIND FULL SOLAR

YEAR CONDITION - 2022-2023

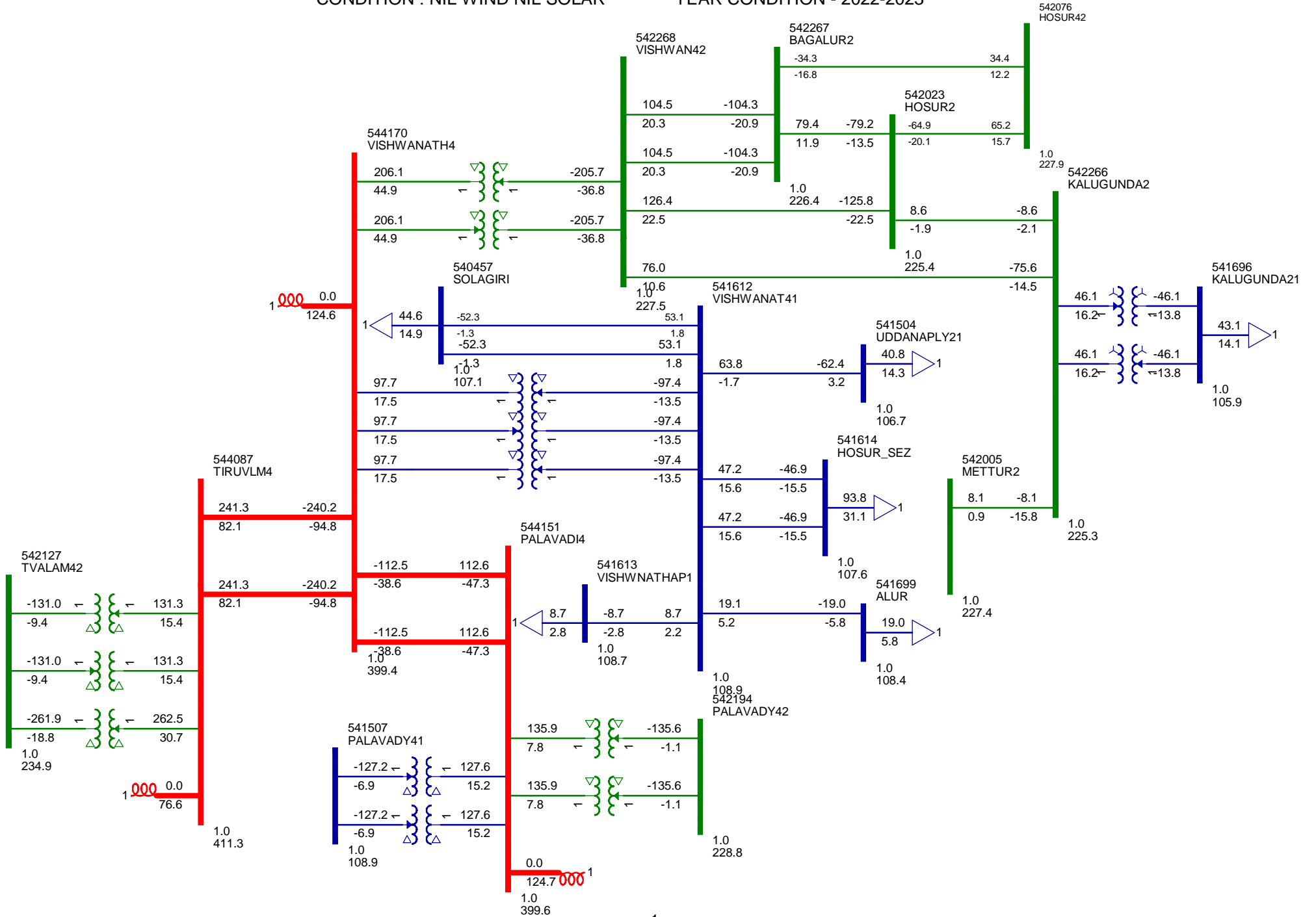


ESTABLISHMENT OF PROPOSED VISHWANATHAPURAM 400/230-110 KV SUBSTATION

CASE 1 : BASECASE + WITH THE PROPOSED VISHWANATHAPURAM 400/230-110KV SS

CONDITION : NIL WIND NIL SOLAR

YEAR CONDITION - 2022-2023



1/17/2019



TRANSMISSION CORPORATION OF ANDHRA PRADESH LIMITED

From: Chief Engineer/IPC & Power Systems
 APTRANSCO,
 Vidyut Soudha, Gunadala,
 Vijayawada – 520008

To: The Chief Engineer (PSP & A-II),
 Central Electricity Authority,
 Seva Bhavan, R.K.Puram,
 NEW DELHI – 110 066

Lr.No.CE(IPC&PS)/SE(PS)/EE(SS<SS)/DEE-3/F. SCM/D.No.2002621 Dt:17-01-2019

Sir,

Sub: - APTRANSCO – Inclusion of 2 Nos. items in the Agenda discussion in the forthcoming 2nd Meeting of Southern Region Standing Committee on Transmission (SRST) - Reg.

APTRANSCO have proposed the following 2 Nos. items to include in the agenda items for discussion in the forthcoming 2nd Meeting of Southern Region Standing Committee on Transmission (SRST).

Item: I Proposal for crection of 400/220/132 kV Chilakaluripet SS near Kukkapalli varipalem village in Guntur district.

Item: II Proposal for extension of EHT Power Supply of 582.0 MW for Godavari – Penna Interlink Phase-I Lift Irrigation Scheme in Guntur district.

The details of the schemes proposed are detailed on Annexure – I & II and are herewith enclosed.

Hence, it is requested to include the above proposals in the Agenda Items for discussion in the forth coming Standing Committee meeting.

Encl: Annexure – I & II

Yours faithfully,

Chief Engineer (IPC & Power Systems)

Copy to:

Dr. Subir Sen, COO
 PGCIL, 'Saudamini', Plot NO.2, Sector-29,
 GURGAON - 122001, Haryana.

Director (SC)
 - For Agenda of SR-SCCT
 - urgent pl.
 21/1/19

CE (IPC)

ANNEXURE - I

Item: I

Proposal for erection of 400/220/132 kV Chilakaluripet SS near Kukkapalli varipalem village in Guntur district.

APTRANSCO has proposed for erection of 400/220 kV Chilakaluripet SS along with the following associated lines under 400 kV ring around capital city scheme.

- i. 400 kV Bus extension at proposed 765/400 kV Chilakaluripet (PGCIL) SS for erection of 400/220 kV Chilakaluripet SS with 2 x 500 MVA PTRs after the construction of proposed 765/400 kV Chilakaluripet (PGCIL) SS.
- ii. Erection of 220/132 kV Chilakaluripet SS with 2 x 100 MVA PTRs.
- iii. 220 kV DC line (20 KM approx.) from proposed 220/132 kV Chilakaluripet SS to proposed 400/220 kV Chilakaluripet SS.
- iv. 132 kV LILO (10.5 KM approx.) of existing 132 kV Chilakaluripeta – Nallapdu at proposed 220/132 kV Chilakaluripet SS
- v. 132 kV LILO (10.5 KM approx.) of existing 132 kV Chilakaluripeta – Marripalem at proposed 220/132 kV Chilakaluripet SS.

2. The same was discussed and approved by CEA in the 39th meeting of the Standing Committee on Power System Planning of Southern Region held on 28th & 29th December 2015 at New Delhi.

3. Now the proposed new site for construction of 400/220 kV Chilakaluripeta SS is in the vicinity of all 220 kV and 132 kV lines. Hence it is proposed to construct the 400/220/132 kV Chilakaluripeta SS with 220 kV & 132 kV features to avoid construction of separate 220/132 kV Chilakaluripeta SS and associated lines.

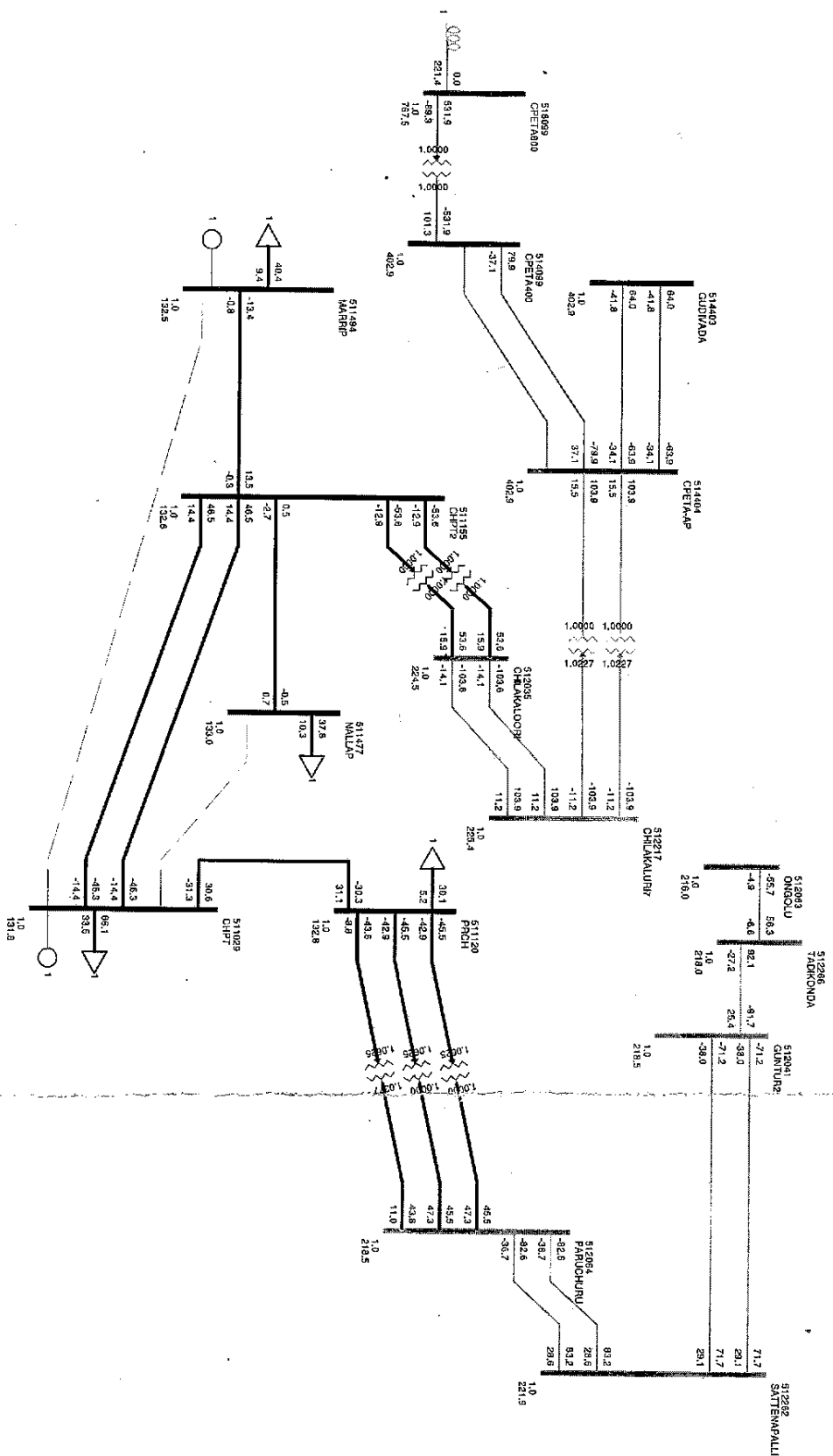
4. Accordingly APTRANSCO has proposed the following scheme for construction of 400/220/132 kV Chilakaluripeta SS instead of construction of separate 400/220 kV and 220/132 kV Chilakaluripeta SS:

- i. Erection of 400/220/132 kV Chilakaluripet SS with 2 x 500 MVA ICTs and 2 x 100 MVA PTRs.
- ii. 400 kV QMDC line (33 KM approx.) from 765/400kV Chilakaluripet SS (PGCIL) to 400/220/132 kV Chilakaluripet SS.

- iii. Making 220 kV SC LILO (0.7 KM approx.) of existing 220 kV Sattenapalli – Parchuru DC line at proposed 400/220/132 kV Chilakaluripet SS.
- iv. Making 220 kV DC LILO (6 KM approx.) of existing 220 kV Ongole – Guntur-2 (Prathipadu) SC line at proposed 400/220/132 kV Chilakaluripet SS
- v. 132 kV SC LILO (2.5 KM approx.) of existing 132 kV Chilakaluripeta – Nallapdu SC line at proposed 400/220/132 kV Chilakaluripet SS
- vi. 132 kV SC LILO (2.5 KM approx.) of existing 132 kV Chilakaluripeta – Mrippalem SC line at proposed 400/220/132 kV Chilakaluripet SS.
- vii. 132 kV DC/SC LILO (2 KM approx.) of existing 132 kV Chilakaluripeta – Parchuru DC/SC line at proposed 400/220/132 kV Chilakaluripet SS.

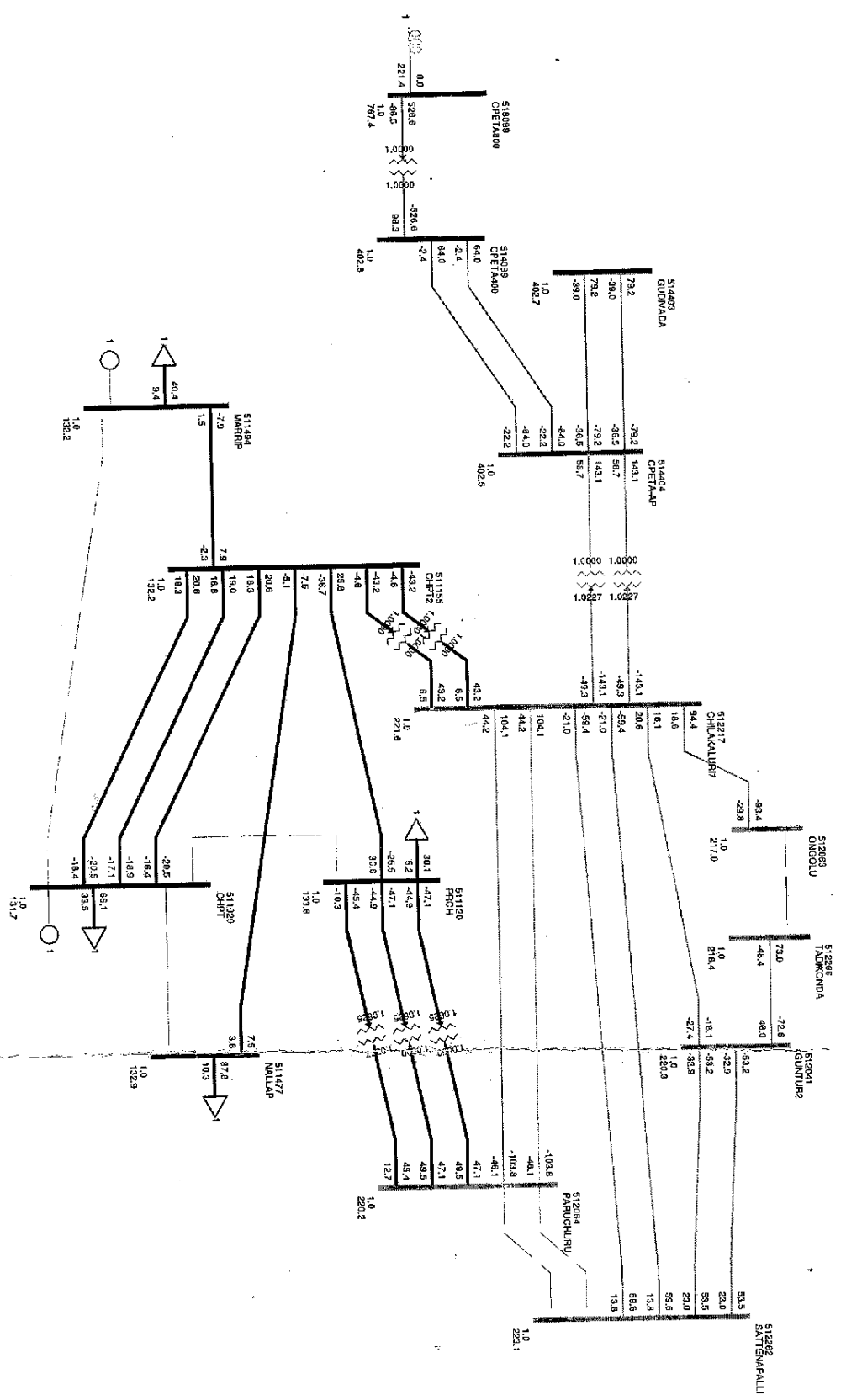
The load flow results are enclosed herewith. The same is sent through e-mail also.

EXISTING SYSTEM



EHT TRANSMISSION LOSSES: 454,990 MW

MODIFIED SCHEME FOR ERECTION OF 400/220/132 KV CHILKALURIPET SS



EHT TRANSMISSION LOSSES: 452.850 MW

ANNEXURE - II**Item: II****Proposal for extension of EHT Power Supply of 582.0 MW for Godavari – Penna Interlink Phase-I Lift Irrigation Scheme in Guntur district.**

It is to submit that the Chief Engineer/Krishna Delta System/Water Resources Dept./Vijayawada have requested for extension of 582.0 MW of power supply at 220 kV and 132 kV level to the following proposed 5 Nos. Pumping Stations under Godavari – Penna Interlink Phase-I Lift Irrigation Scheme in Guntur district.

Sl. No.	Name of LI Scheme	Load in MW
1.	Lift – 1: 220/11 kV Harischandrapuram SS	39.00
2.	Lift – 2: 220/11 kV Lingapuram SS	96.00
3.	Lift – 3: 220/11 kV Gorantla SS	120.00
4.	Lift – 4: 400/220/11 kV Burugubanda SS	192.00
5.	Lift – 5: 220/11 kV Nakarikallu SS	135.00
	Total	582.00

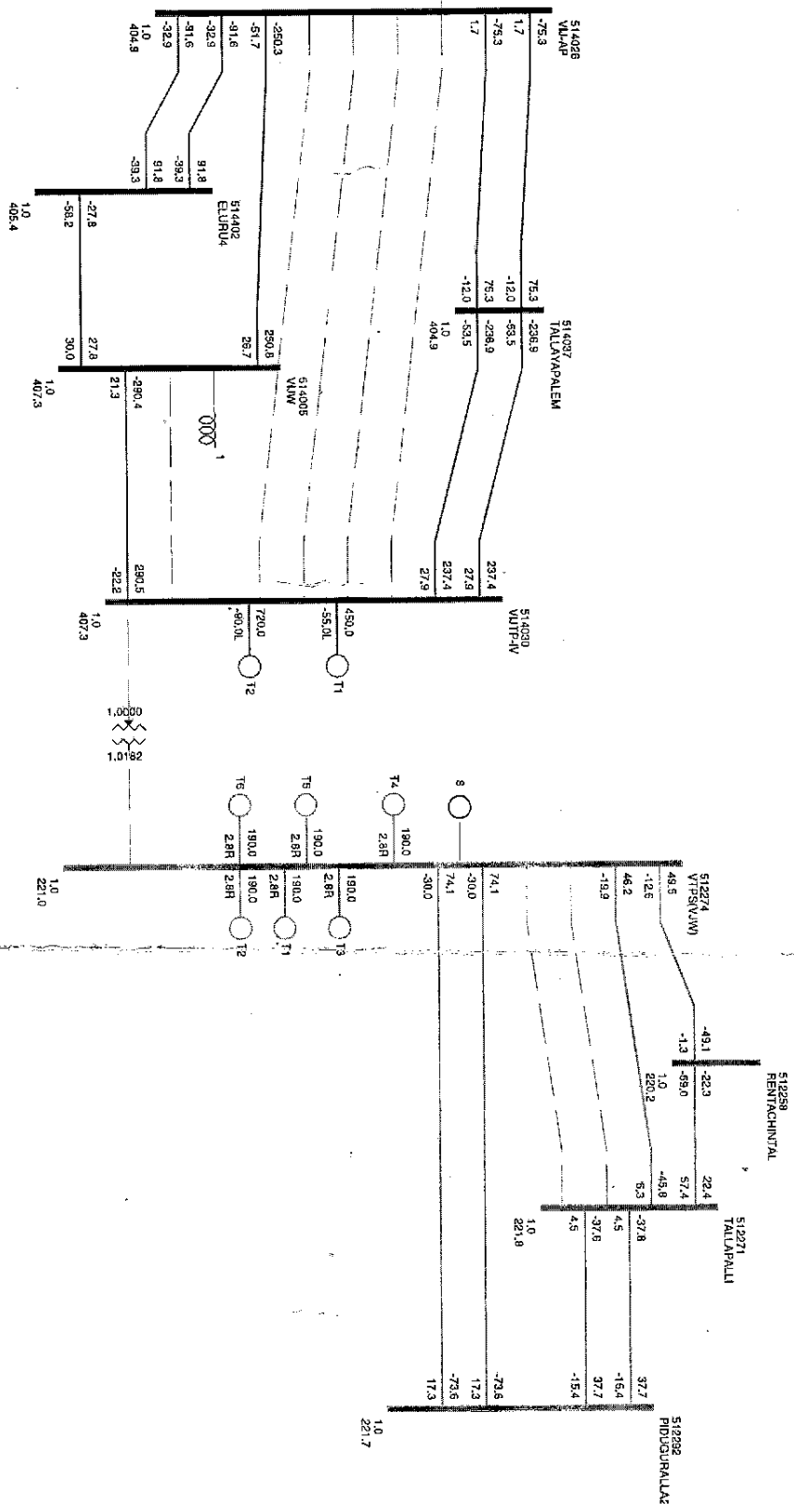
2. Accordingly, APTRANSCO has proposed the following dedicated scheme for extension of 582.0 MW of power supply at 220 kV and 132 kV level to the above proposed 5 Nos. Pumping Stations under Godavari – Penna Interlink Phase-I Lift Irrigation Scheme in Guntur district.

- i. Erection of 400/220/11 kV Bhurugubanda SS with 2 x 500 MVA ICTs.
- ii. Making LILO (14 KM approx.) of 400 kV Twin Moose Satteanapalli – Eluru & Satteanapalli – Nunna lines at proposed 400/220/11 kV Bhurugubanda SS.
- iii. Making 220 kV DC LILO (3 KM approx.) of existing 220 kV VTS – Piduguralla DC line at proposed 400/220/11 kV Bhurugubanda SS.
- iv. Erection of 220/11 kV Harischandrapuram SS.
- v. Making 220 kV DC LILO (3 KM approx.) of existing 220 kV VTS – Piduguralla DC line at proposed 220/11 kV Harischandrapuram SS.
- vi. Erection of 220/11 kV Lingapuram SS.

- vii. Making 220 kV LILO (1 KM approx.) of existing 220 kV VTS – Tallapalli SC line & 220 kV VTS – Rentachintala SC line at proposed 220/11 kV Lingapuram SS.
- viii. Erection of 220/11 kV Gorantla SS.
- ix. Erection of 220 kV Twin Moose DC Line (17 KM approx.) from proposed 400/220/11 kV Bhurugubanda SS to proposed 220/11 kV Gorantla SS.
- x. Making 220 kV LILO (6 KM approx.) of existing 220 kV VTS – Tallapalli SC line & 220 kV VTS – Rentachintala SC line at proposed 220/11 kV Gorantla SS
- xi. Erection of 220/11 kV Nakarikallu SS.
- xii. Erection of 220 kV Twin Moose DC Line (26 KM approx.) from proposed 400/220/11 kV Bhurugubanda SS to proposed 220/11 kV Nakarikallu SS.

The load flow results are enclosed herewith. The same is sent through e-mail also.

BASE CASE



EHT TRANSMISSION LOSSES: 449.070 MW

2/15/2019



TRANSMISSION CORPORATION OF ANDHRA PRADESH LIMITED

From: Chief Engineer/IPC & Power Systems
APTRANSCO,
Vidyut Soudha, Gunadala,
Vijayawada - 520008

To: The Chief Engineer (PSP & A-II),
Central Electricity Authority,
Seva Bhavan, R.K.Puram,
NEW DELHI - 110 066

Lt.No.CE(IPC&PS)/SE(PS)/EE(SS<SS)/DEE-3/F.SCM ACTHUTHAPURAM/D.No.2002786 Dt:14-02-2019

Sir,

Sub: - APTRANSCO - Proposal for erection of 400/220 kV Atchuthapuram GIS and connected Transmission Network in Visakhapatnam district - Inclusion of Agenda Item for discussion in the forthcoming 2nd Meeting of Southern Region Standing Committee on Transmission (SRST) - Reg.

APTRANSCO has approved the following dedicated Transmission Scheme for erection of 400/220 kV Atchuthapuram GIS and connected Transmission Network in Visakhapatnam district to meet the load demand in the scheme area.

- i. Up-gradation of 220 kV Atchuthapuram SS to 400/220 kV Atchuthapuram SS with 3 x 500 MVA PTRs.
- ii. Making LILO (4 KM approx.) of existing 400 kV Kalapaka - Vemagiri TMSC & Vemagiri - Simhadri-TMSC line at proposed 400/220 kV Atchuthapuram SS.
- iii. Making 220 kV LILO (12 KM approx.) of existing 220 kV Pendurthi - Upper Sileru SC line at proposed 400/220 kV Atchuthapuram SS.
- iv. Making 220 kV LILO (12 KM approx.) of existing 220 kV Koruprolu - Kakinada SC line & Koruprolu - Anak SC line at proposed 400/220 kV Atchuthapuram SS.
- v. Erection of 220 kV DC line (8 KM approx.) from 220 kV Brandix SS to proposed 220 kV Atchuthapuram SS

Hence, it is requested to include the above proposals in the Agenda Items for discussion in the forth coming 2nd Meeting of Southern Region Standing Committee on Transmission (SRST). The same is sent through e-mail also.

Yours faithfully,

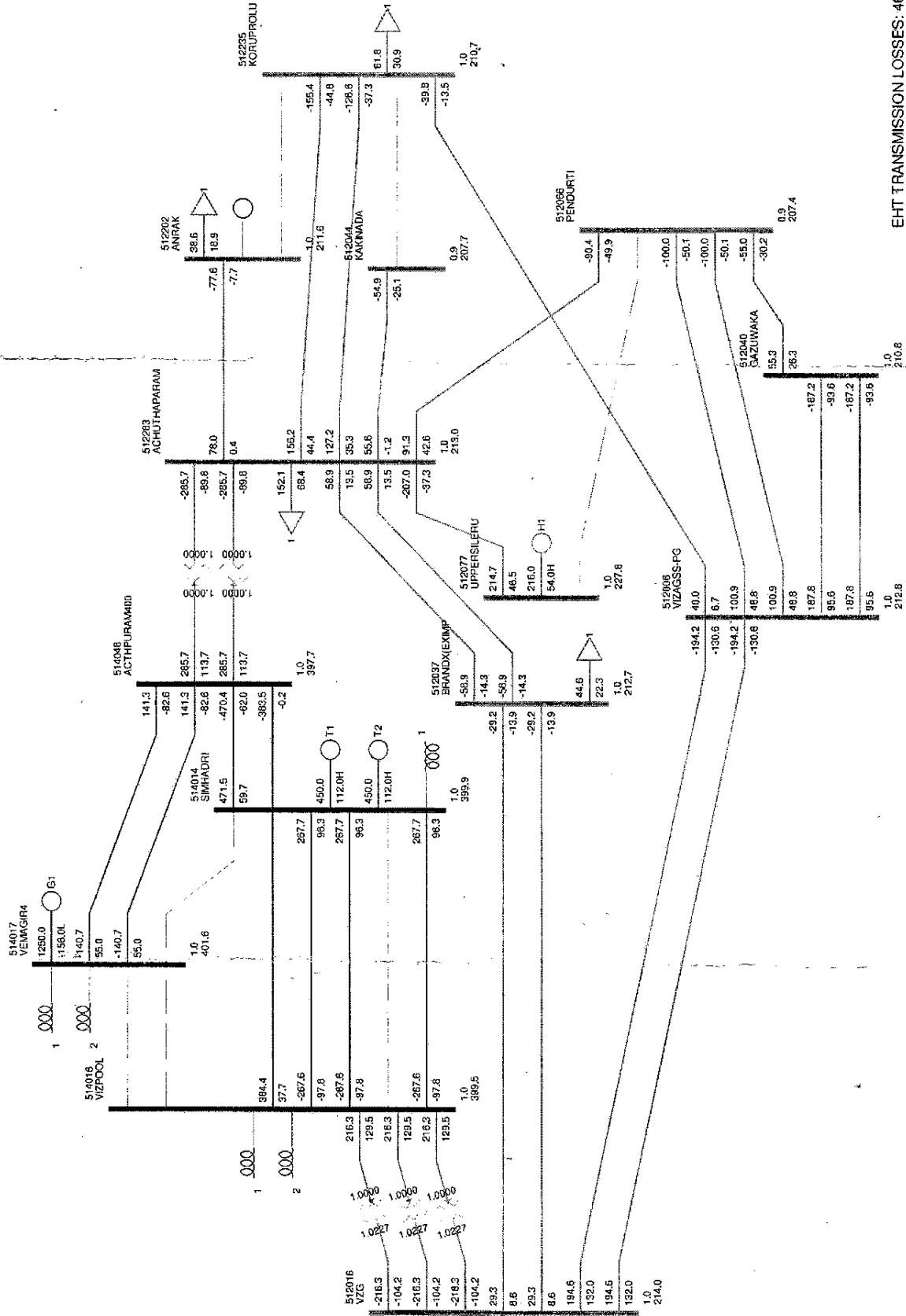
Chief Engineer (IPC & Power Systems)

Copy to:

Dr. Subir Sen, COO
PGCIL, 'Saudamini', Plot NO.2, Sector-29,
GURGAON - 122001, Haryana.

Lt.No.CE(IPC&PS)/SE(PS)/EE(SS<SS)/DEE-3/F.SCM ACTHUTHAPURAM/D.No.2002786 Dt:14-02-2019

WITH UP-GRADATION OF 220 KV ACTUTHAPURAM SS TO 400/220 KV ACTUTHAPURAM SS



EHT TRANSMISSION LOSSES: 467.460 MW

LOAD FLOWS WITH & WITHOUT PROPOSED 400/220 KV ATCHUTHAPURAM SS

Sl. No.	Description	Base Case (MW)	With 400/220 kV Atchuthapuram SS (MW)
1	ICT Loadings at 400/220 kV Kalapaka	3 x 292.4	3 x 216.3
2	400 kV Kalapaka - Simhadri	3 x -323.3	3 x -267.6
3	400 kV Kalapaka - Vemagiri	191.7	-
4	400 kV Vemagiri - Simhadri	-200.6	-
5	220 KV Kalapaka - VSS	2 x 198.8	2 x 194.6
6	220 kV Kalapaka - Brandix	2 x 154.9	2 x 29.3
7	220 kV VSS - Gazuwaka	2 x 177.8	2 x 187.8
8	220 kV Gazuwaka - Pendurthi	29.2	55.3
9	220 kV VSS - Pendurthi	2 x 68.5	2 x 100.9
10	220 kV VSS - Koruprolu	165.1	40
11	220 kV Uppersileru - Pendurthi	200.9	-
12	220 kV Koruprolu - Anrak SS	9	-
13	220 kV Kakinada - Koruprolu	30.4	-
14	220 kV Atchuthapuram - Brandx	2 x -76.0	2 x 58.9
15	ICT Loadings at 400/220 kV Atchuthapuram SS	-	2 x 285.7
16	400 kV Atchuthapuram - Simhadri	-	-470.4
17	400 kV Atchuthapuram - Kalapaka	-	-383.5
18	400 kV Atchuthapuram - Vemagiri	-	2 x 141.3
19	400/220 kV Atchuthapuram -Uppersileru	-	-207
20	400/220 kV Atchuthapuram - Pendurthi	-	91.3
21	400/220 kV Atchuthapuram - Anrak SS	-	78
22	400/220 kV Atchuthapuram - Koruprolu	-	1 x 156.2 + 1 x 127.2
23	400/220 kV Atchuthapuram - Kakinada	-	55.6
EHT Transmission Losses		479.790	467.460

11/2/2018



TRANSMISSION CORPORATION OF ANDHRA PRADESH LIMITED

From:

Chief Engineer/IPC & Power Systems

APTRANSCO

Vidyut Soudha, Gunadala,

Vijayawada - 520008

To

The Chief Engineer (PSP & A-II),

Central Electricity Authority,

Seva Bhavan, R.K.Puram,

NEW DELHI - 110 066

Lr.No.CE(IPC&PS)/SE(PS)/EE(SS-SS)/DEE-3/F.POLAVARAM 960MW/D.No.2002120 Dt:02-11-2018

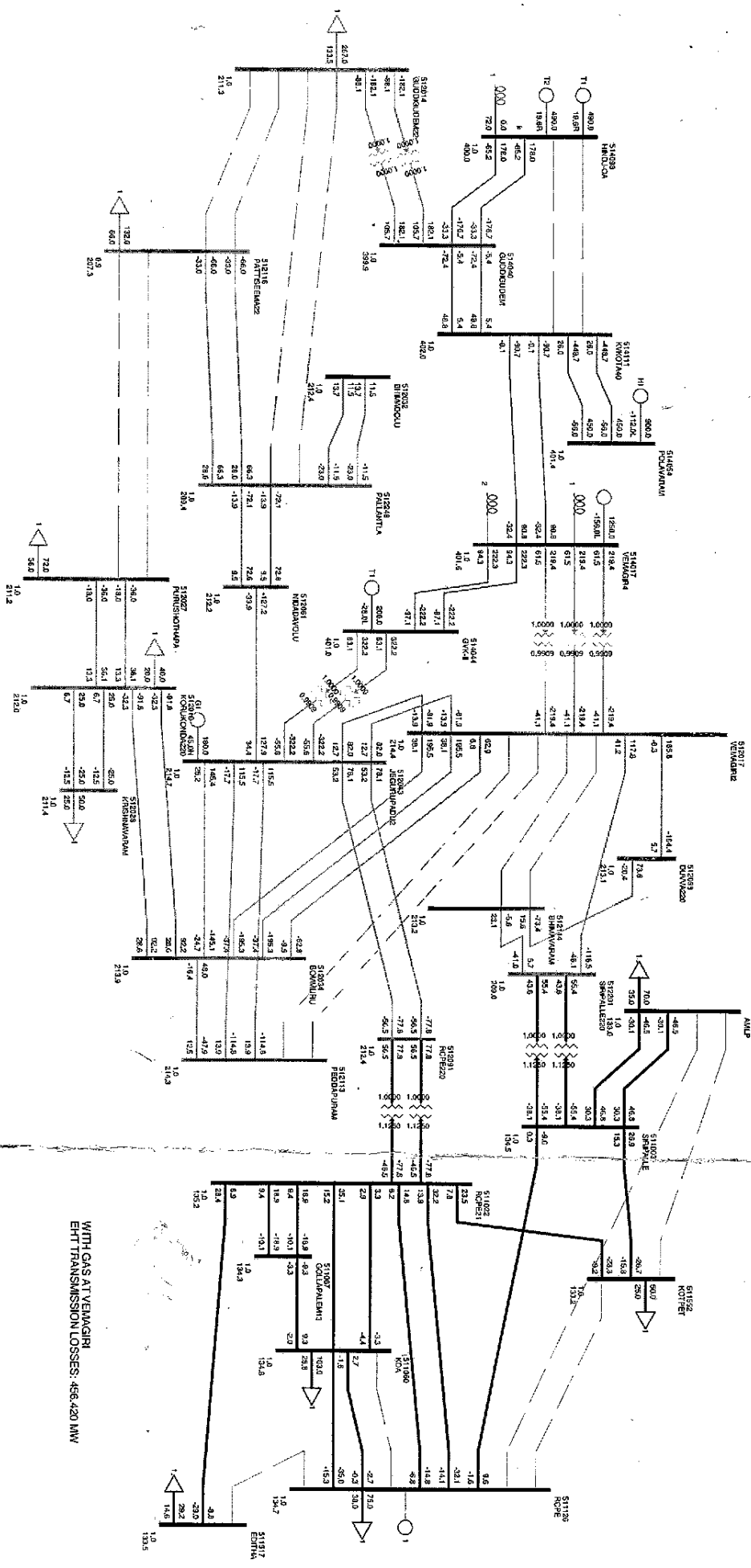
Sir,

Sub: APTRANSCO - Proposal for evacuation of 960 MW (12 x 80 MW) power from Polavaram Hydro Electric Project of APGENCO in East Godavari district and System Improvement network connected to 400 kV Guddigudem SS and Inter Connection of 220 kV Lines - Inclusion of Agenda Item for discussion in the forthcoming 2nd Meeting of Southern Region Standing Committee on Transmission (SRSTC) - Reg.

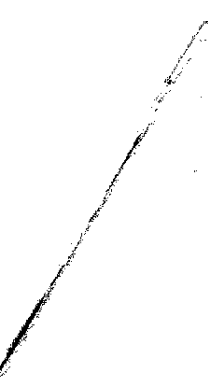
It is to submit that APGENCO is setting up 12 x 80 MW (960 MW) Polavaram Hydro Electric Project in East Godavari district. In this regard APTRANSCO has proposed the following dedicated Transmission Scheme for evacuation of 960 MW (12 x 80 MW) power from Polavaram Hydro Electric Project of APGENCO in East Godavari district. The same was approved in 42nd Standing Committee Meeting held on 27th April 2018 at Ernakulam, Kerala.

- i. 400 kV Quad Moose DC line (79 KM) from 400 kV KV Kola to proposed Polavaram Hydro Electric Project.
 - ii. 2 x 125 MVAR bus Reactor at Polavaram Hydro Electric Project.
2. APTRANSCO has proposed the following dedicated Transmission System for 220 kV downstream evacuation scheme from 400 kV Polavaram Hydro Electric project by providing 2 x 500 MVA ICTs to overcome the overloading conditions in and around scheme area.
- i. 220 kV features at 400 kV Polavaram SS with 2 x 500 MVA ICTs.
 - ii. Erection of 220 kV Twin Moose DC line (16 KM approx.) from 400/220 kV Polavaram to 220 kV Pattiseema SS.
 - iii. Making Twin Moose DC LILO (1 KM approx.) of proposed 400/220 kV Polavaram to 220 kV Pattiseema SS Twin Moose DC line at 220 kV Purushothapatnam SS.
4. The same was discussed in the 1st Southern Region Standing Committee Meeting on Transmission held on 07.09.2018 at Chennai. The same was approved in the 1st Southern Region Standing Committee Meeting and Minutes of Meeting is awaited.
5. Meanwhile, APGENCO officials have declared that there IS no site for providing of 220 kV features at Polavaram HEP. Hence APTRANSCO approved the following dedicated Revised Transmission Evacuation Scheme from proposed 12 x 80 MW (960 MW) Polavaram Hydro Electric Project in East Godavari district and providing the 400 kV network under Polavaram Evacuation and System Improvement network connected to 400 kV Guddigudem SS (which is sanctioned in 41st Standing Committee Meeting under Chintalapudi Lift Irrigation Scheme) and inter connection of 220 kV lines.
- i. Erection of 400 kV QMDC (30 KM) line from 400 kV Polavaram SS to 400/220/11 kV Guddigudem SS.
 - ii. Making LILO (12 KM) of existing 220 kV DC line from Pallantla - Pattiseema at 400/220 kV Guddigudem SS.
 - iii. Laying of 220 kV DC line (32 KM) from 220 kV Purushothapatnam SS to 400/220 kV Guddigudem SS.

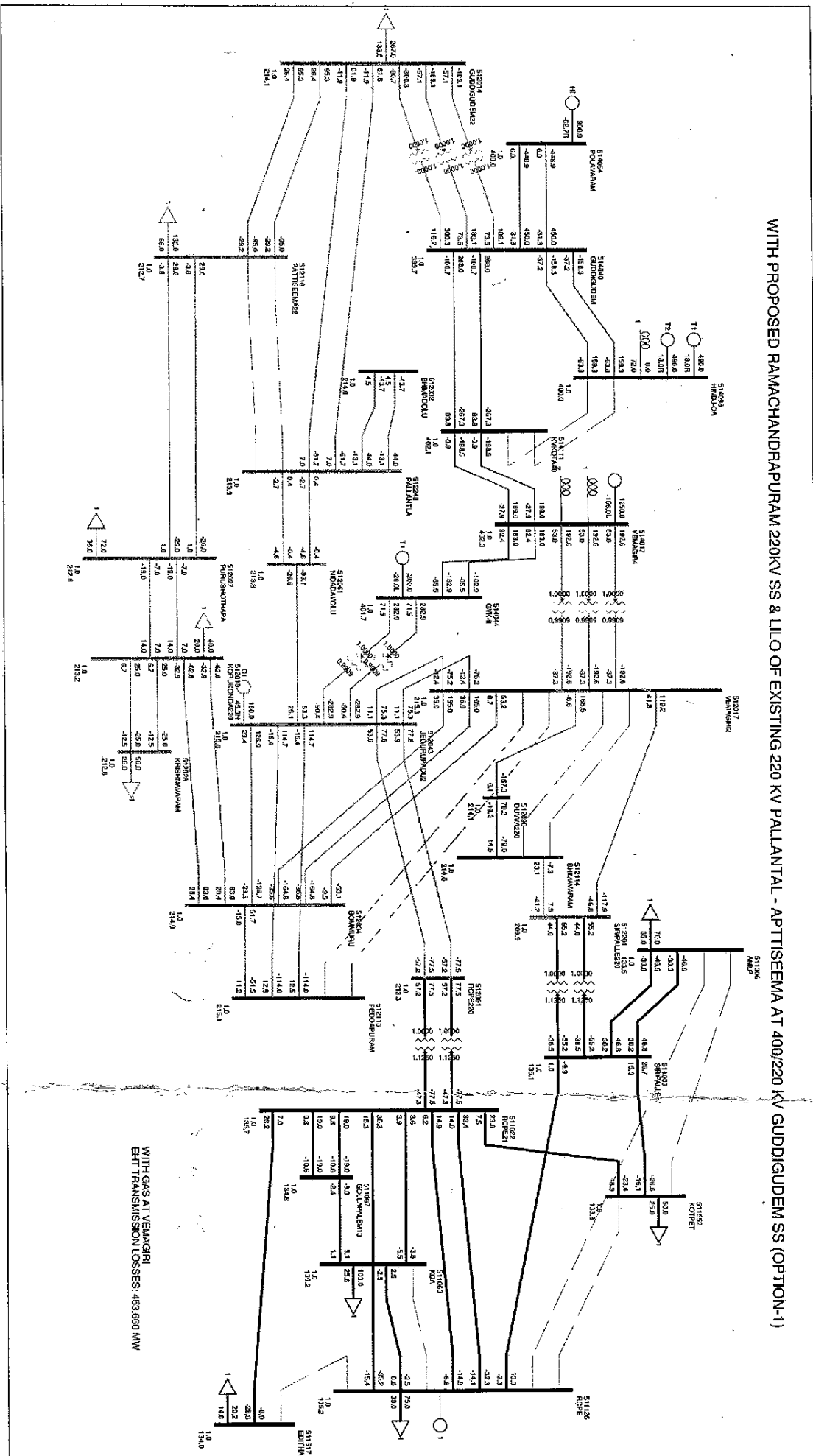
BASE CASE



WITH GAS AT YEAMAGRI
EHT TRANSMISSION LOSSES: 456.420 MW

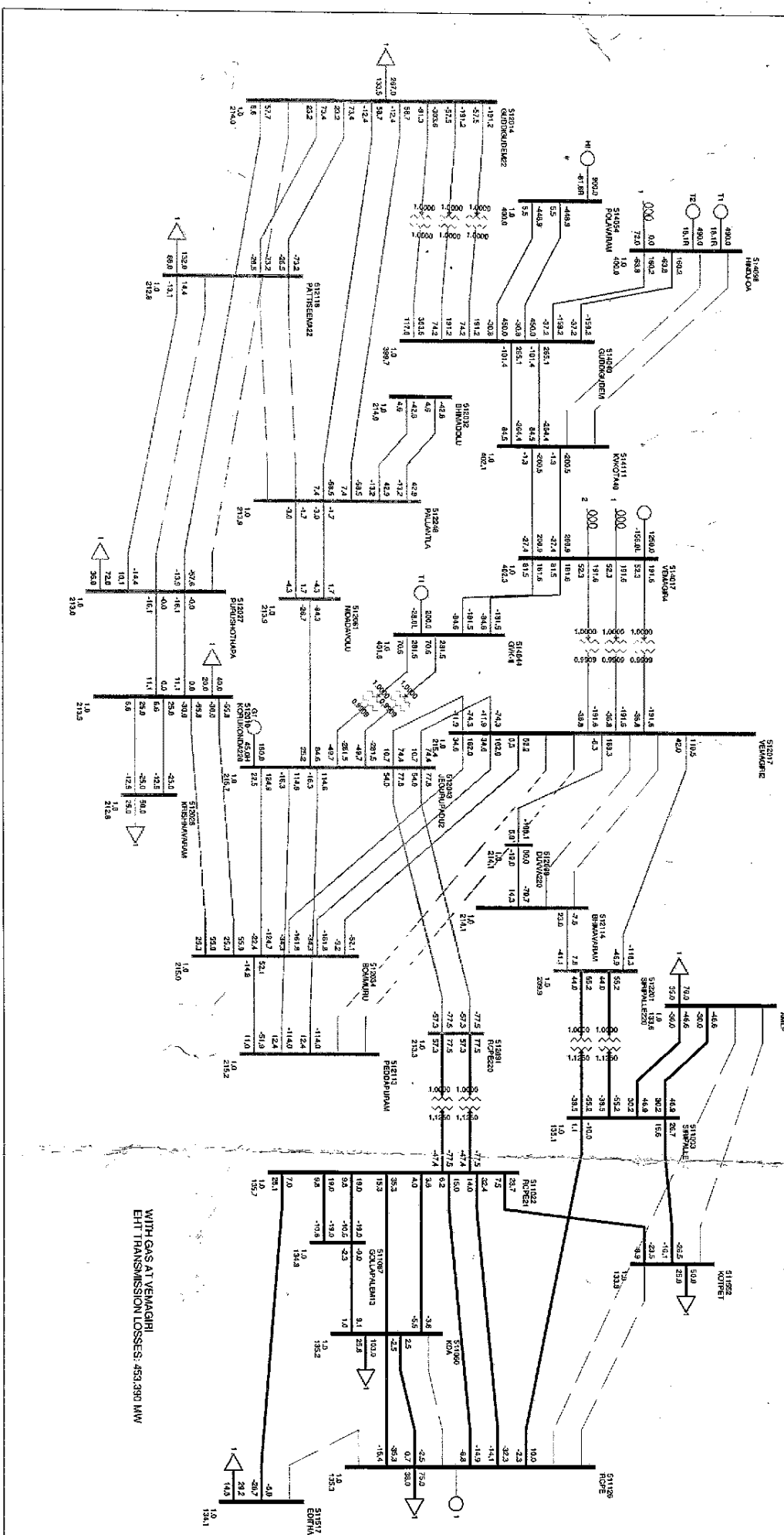


WITH PROPOSED RAMACHANDRAPURAM 220KV SS & LLO OF EXISTING 220 KV PALLANTAL - APTTISEEMA AT 400/220 KV GUDDIGDEM SS (OPTION-1)



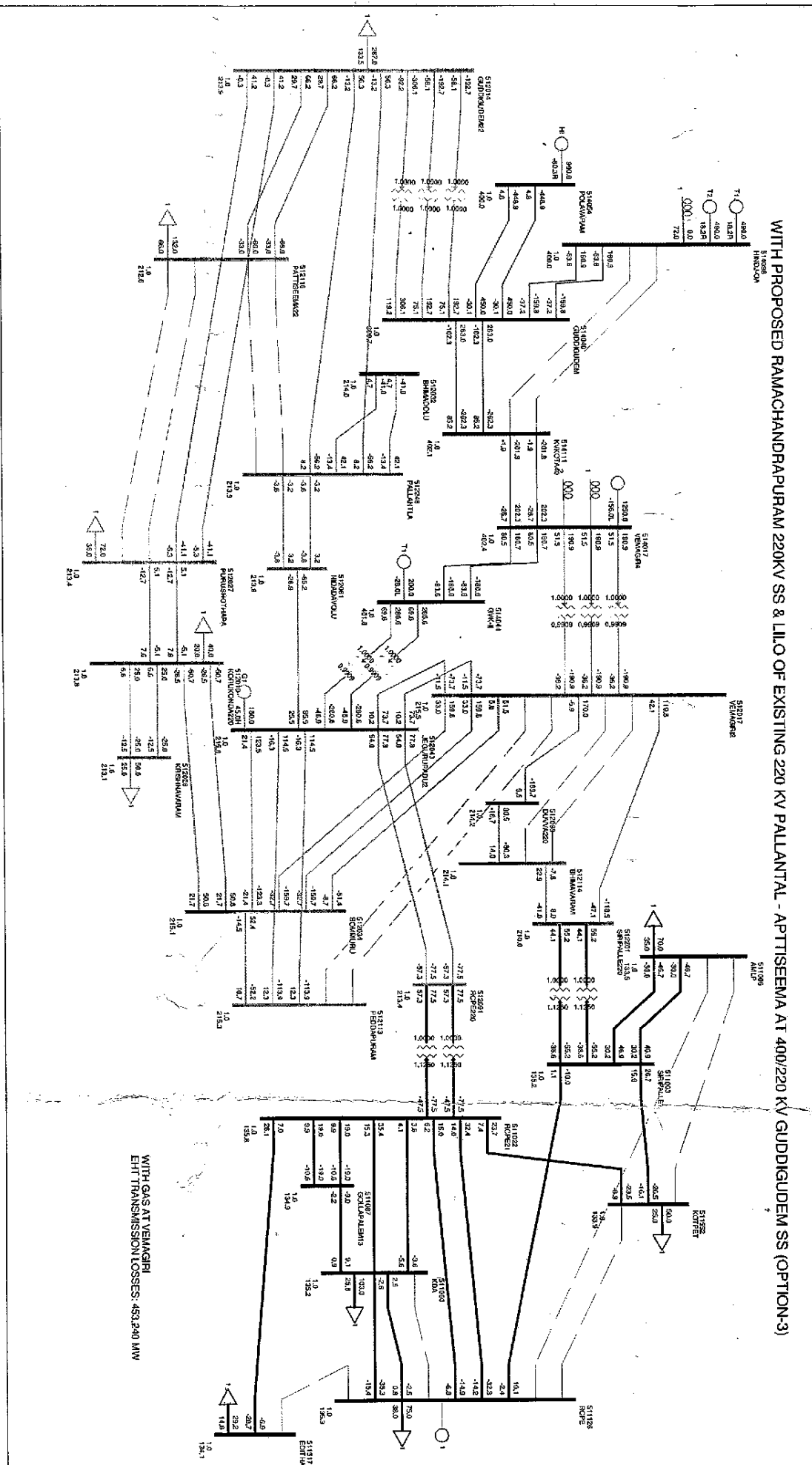
WITH GAS AT VENANGERI
EHT TRANSMISSION LOSSES: 483.660 MW

WITH PROPOSED RAMACHANDRAPURAM 220KV SS & LILO OF EXISTING 220 KV PALLANTAL - APTTISEEMA AT 400/220 KV GUDDIGUDEM SS (OPTION-2)



WITH GAS AT YEMAGIRI
EHT TRANSMISSION LOSSES: 453.390 MW

WITH PROPOSED RAMACHANDRAPURAM 220KV SS & LIL OF EXISTING 220 KV PALLANTAL - APTTISEEMA AT 400/220 KV GUDDIGDEM SS (OPTION-3)



WITH GAS AT VEANGRI EHT TRANSMISSION LOSSES: 453.240 MW

to be included

TRANSMISSION CORPORATION OF ANDHRA PRADESH LIMITED

From:
Chief Engineer/IPC & Power Systems
APTRANSCO,
Vidyut Soudha, Gunadala,
Vijayawada - 520008

To
The Chief Engineer (PSP & A-II),
Central Electricity Authority,
Seva Bhavan, R.K.Puram,
NEW DELHI - 110 066

Lr. No. CE(IPC&PS)/SE(PS)/DE(SS<SS)/ADE-3/F. KSEZ/D. No. 401/2019, Dt. 29.03.2019.

Sir,
Sub: APTRANSCO - M/s Kakinada SEZ Pvt. Ltd. - Port based Multi Product SEZ in U. Kothapalli and Thondangi Mandals in Kakinada, East Godavari district - Proposal for Extension of total power of 450 MVA, including 210 MVA power for establishment of Petrochemical Complex by M/s GAIL (India) Ltd and 240 MVA power supply at 220KV level in Kakinada SEZ- Inclusion of Agenda Item for discussion in the forthcoming 2nd Southern Region Standing Committee on Transmission Meeting - Reg.

APTRANSCO approved the following dedicated Transmission Scheme for Extension of total power of 450MVA, including 210 MVA power for establishment of Petrochemical Complex by M/s GAIL (India) Ltd and 240 MVA power supply at 220 KV level in Kakinada SEZ.

- i. Up-gradation of 220/132/33 kV Kakinada SEZ SS to 400/220/132/33 kV Kakinada SEZ SS with 2 x 315 MVA PTRs.
- ii. Making LILO (10 KM) of 400 kV TMDC line of HNPCL - KV Kota line at proposed 400/220/132/33 kV Kakinada SEZ SS.
- iii. 220 kV DC line (5 KM) from proposed 400/220/132/33 kV Kakinada SEZ SS to M/s GAIL (Petrochemical Complex at Kakinada SEZ).
- iv. Laying of 220kV DC line (60 KM approx.) from 220 kV Samalkota SS to proposed 220/132 kV Kakinada SEZ SS.

Hence, it is requested to include the above proposal as Agenda item for discussion in the forth coming 2nd Southern Region Standing Committee on Transmission Meeting. The same will be sent through e-mail.

Yours faithfully,

[Signature]
Chief Engineer (IPC & Power Systems)
2/5

Copy to:

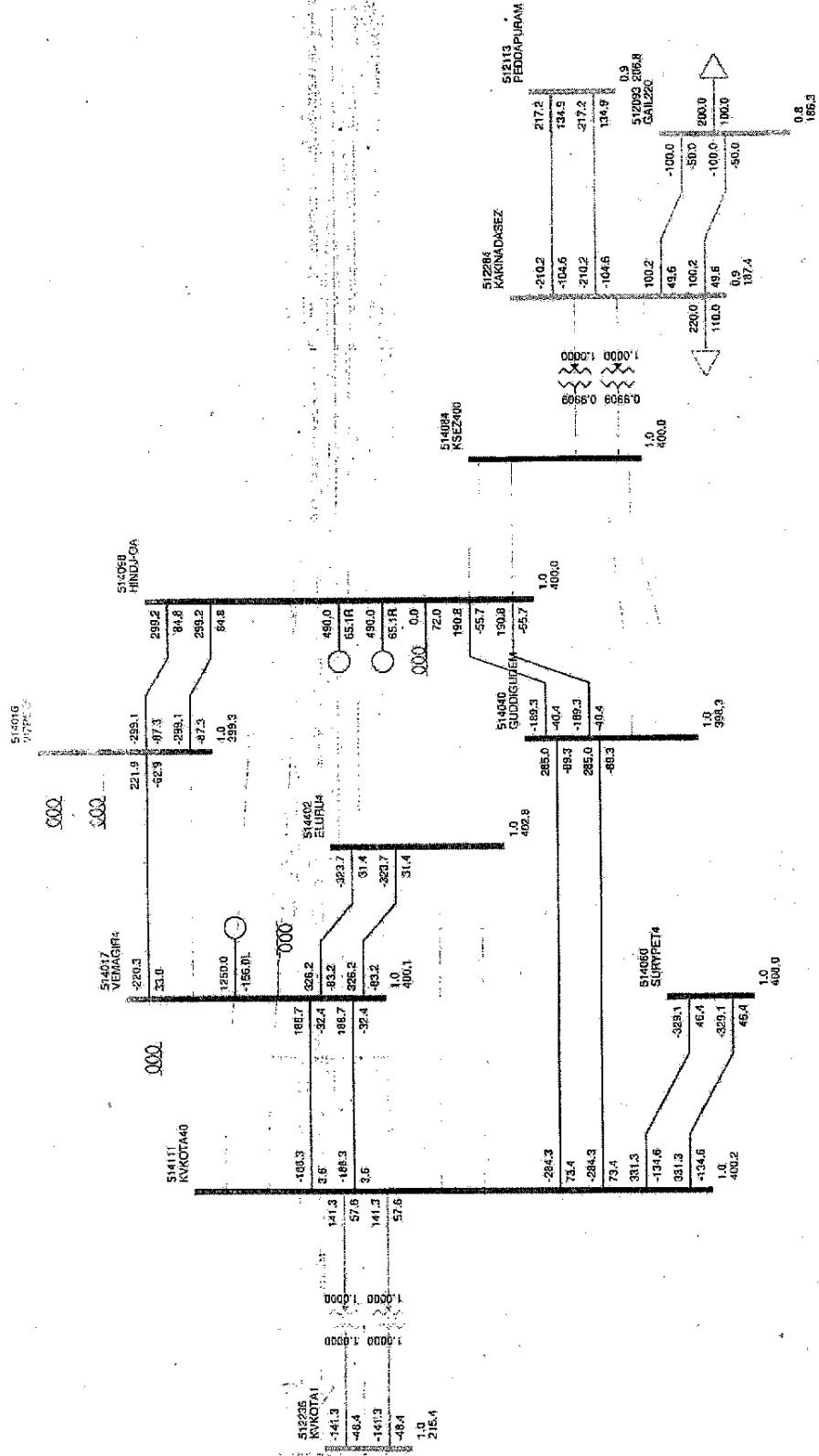
Dr. Subir Sen, COO
PGCIL, 'Saudamini', Plot NO.2, Sector-29,
GURGAON - 122001, Haryana

Copy to P.S. to Director/Grid & Transmission Management
VS/APTRANSCO/Vijayawada

} For favour of
} information please.

LINE FLOWS WITH AND WITHOUT 400/220/132/33 KV KAKINADA SEZ SS			
SL. No.	Description	Base case (MW)	With 400/220/132kV at Kakinada SEZ (MW)
1	ICT loadings at 400/220 kV K V Kota	2 x 141.3	2 x 125.8
2	400 kV KV Kota - Suryapet	2 x 331.3	2 x 321.5
3	400 kV KV Kota - Vemagiri	2 x -188.3	2 x -235.5
4	400 kV KV Kota - Guddigudem	2 x -284.3	2 x -211.8
5	400 kV Hinduja - Guddigudem	2 x 190.8	-
6	400kV Hinduja - Kalapaka	2 x 299.2	2 x 188.6
7	400kV Vemagiri - Kalapaka	-220.3	-190.6
8	400kV Vemagiri - Eluru	2 x 326.2	2 x 326.2
9	ICT loadings at 400/220 kV Kakinda SEZ		2 x 237.1
10	400kV Kakinada SEZ - Guddigudem		2 x 62.4
11	400kV Kakinada SEZ - Hinduja		2 x -299.5
12	220kV Kakinada SEZ - Peddapuram	2 x -210.2	2 x 26.9
13	220kV Kakinada SEZ - Gail	2 x 100.2	2 x 100.2
HT Transmission Losses		501.350	479.790

BASE CASE



EHT TRANSMISSION LOSSES: 501,350 MW

TRANSMISSION CORPORATION OF TELANGANA LIMITED

From
The Chief Engineer,
Construction, TSTRANSCO,
Vidyut Soudha,
Khairathabad,
Hyderabad -500 082.
Ph.No: 040-23336886.
Fax No: 040-23336171.
Email: ce.const@tstransco.in

To
The Chief Engineer,
PSPA-2,
Central Electricity Authority,
New Delhi. - 01
Email: cea-pspa2@gov.in
pjindal@nic.in

Lr.No. TST/CE (Const)/SE (Const)/DE-2/ADE-1/F.Domalpentia/D.No.1640 /18,

Dt.27. 02.2019.

Sir,

Sub:- TSTRANSCO – LILO of one circuit of existing 220KV Srisailam-Dindi DC line to the proposed 220/33KV Domalapenta SS in Telangana State – Approval - Requested - Regarding.

Ref:- T.O.O (CE-Transmission) Ms No.173 Dated: 15.12.2016.

TSTRANSCO has taken up erection of 220/33KV Substation at Domalapenta by making LILO of one circuit of the existing 220KV Srisailam-Dindi DC line for facilitating extension of supply to the consumers in Telangana region as they are presently being fed by Andhra Pradesh. The erection works of line and substation are completed and ready for commissioning.

The following are the particulars of line lengths:

1. 220KV Srisailam – Dindi DC line (Existing) – 81.5KM
2. 220KV Srisailam – Domalapenta (Proposed) – 1.6KM
3. ~~220KV Dindi – Domalapenta (Proposed) – 80KM~~
4. Length of LILO part – 160 Mtrs (0.16KM)

Further, line differential relays are installed at both ends for 220KV Srisailam – Domalapenta line, as the line length is less than 10KM. Relay settings are being arranged by APGENCO for the above line. The line differential relays were also handed over by TSTRANSCO to APGENCO for installation in place of existing distance schemes.

Since the proposal for LILO of one circuit of the existing 220KV Srisailam-Dindi DC line to the proposed 220/33KV Domalapenta SS is for interstate line, it is requested to accord approval for the same.

Yours faithfully,


**CHIEF ENGINEER
CONSTRUCTION**

Copy to:

The Chief Engineer/Power Systems/TSTRANSCO/Vidyut Soudha/Hyderabad
The Chief Engineer/SLDC/TSTRANSCO/Vidyut Soudha/Hyderabad
The Superintending Engineer/ SLDC/TSTRANSCO/Vidyut Soudha/Hyderabad
F:\DE-2\Mahabubnagar\Lr-CEA-Domalapenta.docx

Sh. D. S. Reddy, Dy. CE, PSPA-2
5/11/19, 23-19
(24)

TRANSMISSION CORPORATION OF ANDHRA PRADESH LIMITED

From:
Chief Engineer/IPC & Power Systems
APTRANSCO,
Vidyut Soudha, Gunadala,
Vijayawada – 520004

To
The Chief Engineer (PSP & A-II),
Central Electricity Authority,
Seva Bhavan, R.K.Puram,
NEW DELHI – 110 066

Lr. No. CE(IPC&PS)/SE(PS)/EE(SS<SS)/DEE-3/F. DOMALAPENTA-TS/D. No. 399/2019, Dt. 13.03.2019.

Sir,

Sub: - Proposal for erection of 220/33kV Substation at Domalapenta by making LILO of one circuit of existing 220 kV Srisailam – Dindi DC line to the proposed 220/33 kV Domalapenta SS in Telangana State – Approval - Reg.

Ref: - Letter No. CEA-PS-12-14(31)/1/2018-PSPA-II Division 181/4257/2019 received from Director/CEA.

* * *

With reference to the letter cited above, it is to inform that APTRANSCO have no objection for the proposal of TSTRANSCO for erection of 220/33kV Substation at Domalapenta by making LILO of one circuit of the existing 220 kV Srisailam - Dindi DC line at proposed 220/33 kV Domalapenta SS in Telangana State.

This is for favour of information and for taking further necessary action.

Yours faithfully,


Chief Engineer (IPC & Power Systems)

Copy submitted to

Executive Director/SLDC/APTRANSCO/Vidyut Soudha/Vijayawada

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Sh. Ishan, Dir
Pl. sent to ...
20/3/19

SP114
20.03.19

21522 *21522* (PG)

TRANSMISSION CORPORATION OF TELANGANA LIMITED

From
Chief Engineer/ Power Systems
TSTRANSCO,
Vidyut Soudha,
Hyderabad.

To
The Chief Engineer/PS P&A -II,
Central Electricity Authority(CEA),
RK Puram, Sewa Bhavan,
New Delhi-110066

~~Lr.No. CE(PS)/SE(PS)/DE(SS-II)/ADE/AE/F. /D.No. 112/18 Dt. 10/01/2019~~

Sir,

Sub: TSTRANSCO - Modifications in earlier approved Kaleshwaram Lift Irrigation Scheme - Regarding.

Ref: CEA Lr. No.51/4/(41st)/PSPA-II-2017/1569-82, Dated: 06-DEC-2017

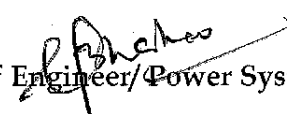
In the minutes of meeting of 41st SCPSPSR, erection of 400kV SS at Medaram, Karimnagar Dist. Pkg-6 and erection of 400kV QMDC line from 400kV Ramadugu SS - 21kM was accorded approval. However as per the field requirement the connectivities are executed and commissioned as below:

S.No	Approved connectivities as per minutes of meeting of 41 st SCPSPSR Column(i)	Modified connectivities as per field requirement Column(ii)
1	Erection of 400kV SS at Medaram, Karimnagar Dist. Pkg-6.	Erection of 400kV GIS SS at Medaram, Karimnagar Dist. Pkg-6. (Commissioned on 28.08.2018)
2	Erection of 400kV Quad Moose DC Line from 400kV Ramadugu LI SS to 400kV Medaram LI SS - 21 kM.	Erection of 400kV Quad Moose DC Line from 400kV Ramadugu LI SS to 400kV Medaram Outdoor Switchyard - 20.35 kM. (Circuit-II commissioned on 20.08.2018 Circuit-I commissioned on 31.10.2018) Erection of 400kV 2500 Sqmm Double Circuit XLPE Power Cable from 400kV Medaram Outdoor Switchyard to 400kV MedaramGIS SS. [Circuit-II (1.352kM for 3-Phase) commissioned on 24.08.2018 Circuit-I (1.460kM for 3-Phase) commissioned on 24.12.2018]

SRLDC, Bengaluru while giving permission for charging the above, has asked that the same may be taken up in the upcoming Standing Committee meeting and approval may be taken.

In view of the above, it is requested to approve and ratify the modifications mentioned at column(ii) of above table in the forth coming Southern Region Standing Committee on Transmission (SRST).

If you require any further information regarding the above, please mail us at se.ps@tstransco.in, de.studies2@tstransco.in or contact (9491063385, 8985041740).


Chief Engineer/Power Systems

Copy to:

1. Dr. Subir Sen/ COO/CTU Smart Grid, PGCIL Corporate Office, Saudamini, Plot No.2, Sector 29, Near IFFCO Chowk, Gurgaon (Haryana) - 122001, INDIA
2. The General Manager/SRLDC, 29, Race Course Cross Road, Bengaluru - 560009
3. The Executive Director/ Lift Irrigation Schemes/ TSTRANSCO
4. The Chief Engineer/SLDC/TSTRANSCO
5. SE(T) to Chairman and Managing Director/ TSTRANSCO
6. DE(T) to Director/Projects /TSTRANSCO
7. DE(T) to Director/ Transmission/ TSTRANSCO
8. ADE(T) to Director/ Lift Irrigation Schemes/ TSTRANSCO
9. PS to Director/Grid Operations/TSTRANSCO

Director (IS)

- Pl. discuss
- For next Agenda, also.


31/1/19

TRANSMISSION CORPORATION OF TELANGANA LIMITED

From
Chief Engineer/ Power Systems,
TSTRANSCO,
Vidyut Soudha,
Hyderabad, Telangana – 500082.

To
The Chief Engineer/ PS P&A-II,
Central Electricity Authority (CEA),
RK Puram, Sewa Bhavan,
New Delhi-110066.

Lr. No. CE(PS)/SE(PS)/DE(SS II)/ADE/AE/F. /D.No. 06/19, Dt. 17/04/2019

Sir,

Sub: TSTRANSCO – Revised proposals for earlier approved transmission evacuation scheme of Yadadri (Damaracherla) TPP (5x800 MW) and Palamuru Rangareddy Lift Irrigation Scheme – Approval requested – Regarding.

Ref: CEA Lr. No. 51/4/(39th)/PSPA-II 2016/115-1210, Dated: 18-FEB-2016
CEA Lr. No. 51/4/(40th)/PSPA-II-2017/-92 103, Dated: 16-FEB-2017

It is to inform that, the transmission evacuation of Yadadri (Damaracherla) TPP (5x800 MW) and Palamuru Rangareddy Lift Irrigation schemes were approved in 39th and 40th SCPSPSR respectively.

In this connection, it is to bring to your kind notice that TSTRANSCO has proposed revised transmission evacuation scheme of Yadadri (Damaracherla) TPP (5x800 MW) as per field requirement and also to provide start up power to Yadadri (Damaracherla) TPP. The proposed revised scheme is as follows:

Approved Transmission Evacuation Scheme of Yadadri (Damaracherla) TPP (5x800 MW) as per minutes of meeting of 39 th SCPSPSR	Revised Transmission Evacuation Scheme of Yadadri (Damaracherla) TPP (5x800 MW)
1) Proposed Damaracherla Switchyard to proposed 400/220/132kV Choutuppal SS by Quad Moose DC Line	1) Proposed Yadadri (Damaracherla) Switchyard to proposed 400/220/132kV Choutuppal SS by Quad Moose DC Line – 150kMs
2) Proposed Damaracherla Switchyard to proposed 400/220kV Dindi SS by Quad Moose DC Line	2) Proposed Yadadri (Damaracherla) Switchyard to 400/220kV Dindi SS by Quad Moose DC Line – 140kMs
3) Proposed Damaracherla Switchyard to proposed 400/220kV Maheshwaram (TSTRANSCO) SS by Quad Moose DC Line	3) Proposed Yadadri (Damaracherla) Switchyard to proposed 400/220kV Damaracherla SS by Quad Moose DC Line – 5kMs
4) Proposed Damaracherla Switchyard to proposed 400/220kV Jangaon SS (Jangaon SS is included in the	4) Proposed Yadadri (Damaracherla) Switchyard to 400/220kV Jangaon SS by Quad Moose DC Line – 155kMs

<p>Manuguru and KTPS VII Evacuation Scheme)by Quad Moose DC Line</p> <p>5) From Proposed 400/220/132kV Choutuppal SS to Upcoming 220/33kV Hayathnagar SS by Single Moose DC Line</p> <p>6) From proposed 400/220/132kV Dindi SS to Upcoming 220/33kV Thimmajipet SS by Single Moose DC line</p> <p>7) From proposed 400/220/132kV Dindi SS to proposed 220/132kV Nagarkurnool SS by Single Moose DC line</p> <p>8) From proposed 400/220/132kV Dindi SS to Existing 220/33kV KM Pally SS by Single Moose DC line</p> <p>9) 400/220kV Dindi SS with 3x500MVA</p> <p>10) 400/220/132kV Choutuppal SS with 3x500MVA+2x100 MVA</p> <p>11) 220/132kV Nagarkurnool SS with 2x100 MVA</p> <p>12) 2x125 MVAR Bus Reactor at Damaracherla switchyard</p>	<p>5) Double circuit LILO of existing 400kV Khammam – Mamidpally TMDC Line to proposed 400/220/132kV Choutuppal SS – 15kMs</p> <p>6) 220kV TMDC line from proposed 400/220kV Damaracherla SS to 220/132kV Miryalaguda SS – 25kMs</p> <p>7) 220kV SMDC line from proposed 400/220kV Damaracherla SS to 220/132kV Huzurnagar SS – 45kMs</p> <p>8) Double Circuit LILO of existing 220kV Narketpally – Malkaram DC line to proposed 400/220/132kV Choutuppal SS on multi circuit towers – 15kMs</p> <p>9) 2nd circuit stringing on existing 132kV Ramannapet-Choutuppal DC/SC line – 25kMs</p> <p>10) LILO of both circuits of 132kV Ramannapet – Choutuppal DC line to proposed 400/220/132kV Choutuppal SS on multi circuit towers – 10kMs</p> <p>11) 132kV DC line from proposed 400/220/132kV Choutuppal SS to Upcoming 132/33kV Dandumalkapur SS – 25kMs</p> <p>12) 400/220kV Damaracherla SS with 3x500MVA</p> <p>13) 400/220/132kV Choutuppal SS with 2x500MVA+2x100MVA</p> <p>14) 2x125 MVAR Bus Reactor at Yadadri (Damaracherla) Switchyard</p> <p>15) 1x125 MVAR Bus Reactor at proposed 400/220/132kV Choutuppal SS (approved in 1st SRSCT meeting)</p>
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400/220kV Dindi SS, connected 220kV lines to KM Pally and Nagarkurnool substations and 220/132kV Nagarkurnool SS were envisaged under Dindi System Improvement Scheme.

Startup power to Yadadri (Damaracherla) TPP (5x800 MW) will be facilitated at 400kV level duly taking the 220kV Supply from 220kV Miryalaguda SS and stepping up the voltage from 220kV to 400kV level at proposed 400/220kV Damaracherla SS.

Further it is to inform that the Chief Engineer/PRLIS/I& CAD dept. vide letter dated 20.05.2017 informed that the rated input power of pump motors of various pumping stations under Palamuru Rangareddy Lift Irrigation Scheme is revised as follows:

Name of the Pumping Station	No. of Motors including future extension	Rated input power of each motor	Rated input power of each motor with 25% overloaded	Total input power of all motors
(1)	(2)	(3)	(4)	(col.2xcol.3)
Stage-I Pumping Station, Narlapur	8+1=9	107 MW	145 MW	963 MW
Stage-II Pumping Station, Yedula	9+1=10	117 MW	145 MW	1170 MW
Stage-III Pumping Station, Vattem	9+1=10	115 MW	145 MW	1150 MW
Stage-IV Pumping Station, Uddandapur	5+1=6	113 MW	145 MW	678 MW
Stage-V Pumping Station, K.P. Laxmidevipally	3+1=4	59 MW	75 MW	236 MW
Total	39 Nos			4197 MW

Accordingly, TSTRANSCO has proposed revised connectivities for Palamuru . Rangareddy Lift Irrigation Scheme as follows:

Approved Palamuru Rangareddy Lift Irrigation Scheme as per minutes of meeting of 40 th SCSPSR	Revised Palamuru Rangareddy Lift Irrigation Scheme
1) 400kV Quad Moose DC line from Veltoor to proposed 400kV Yedula LI SS – 50kMs	1) 400/11kV LI SS at Narlapur with 9x160MVA and 2x25MVA 400/11kV PTRs
2) 400kV Quad Moose DC line from proposed 400kV Yedula LI SS to proposed 400kV Narlapur LI SS – 30kMs	2) 400/11kV LI SS at Yedula with 10x160MVA and 2x25MVA 400/11kV PTRs
3) 400kV Quad Moose DC line from proposed 400kV Yedula LI SS to proposed 400kV Vattem/Karvena LI SS – 60kMs	3) 400/11kV LI SS at Vattem with 10x160MVA and 2x25MVA 400/11kV PTRs
4) 400kV Quad Moose DC line from Maheshwaram TSTransco SS to proposed 400kV Yedula LI SS – 130kMs	4) 400/11kV LI SS at Uddandapur with 6x160MVA and 2x25MVA 400/11kV PTRs

<p>5) LILO of both circuits of 400kV Suryapet – Manikonda (Kethireddypalli) Quad Moose DC line to proposed 400kV Uddandapur LI SS – 50kMs</p> <p>6) 400kV Quad Moose DC line from proposed 400kV Vatterem LI SS to proposed 400kV Uddandapur LI SS – 50kMs</p> <p>7) 220kV Twin Moose DC line from 220kV Parigi SS to KP Laxmidevipally LI SS – 20 kMs</p> <p>8) 125MVAR Bus Reactor at Narlapur 400kV LI SS</p> <p>9) 125MVAR Bus Reactor at Yedula 400kV LI SS</p> <p>10) 125MVAR Bus Reactor at Vatterem 400kV LI SS</p> <p>11) 125MVAR Bus Reactor at Uddandapur 400kV LI SS</p>	<p>5) 220/11kV LI SS at KP Laxmidevipally with 4x80MVA and 2x25MVA 220/11kV PTRs</p> <p>6) 400kV QMDC line from 400kV Veltoor SS to proposed 400kV Yedula LI SS – 50kMs</p> <p>7) 400kV QMDC line from proposed 400kV Yedula LI SS to proposed 400kV Narlapur LI SS – 30kMs</p> <p>8) 400kV QMDC line from proposed 400kV Yedula LI SS to proposed 400kV Vatterem LI SS – 60kMs</p> <p>9) 400kV QMDC line from proposed 400kV Vatterem LI SS to proposed 400kV Uddandapur LI SS – 50kMs</p> <p>10) 400kV QMDC line from 400kV Maheshwaram (TS) SS to proposed 400kV Uddandapur LI SS – 65kMs</p> <p>11) 400kV QMDC line from 400kV Dindi SS to 400kV Yedula LI SS – 60kMs</p> <p>12) 220kV DC line from 400/220/132kV . Kethireddypalli (Manikonda) SS to proposed 220kV KP Laxmidevipally LI SS – 46kMs</p> <p>13) 125MVAR Bus Reactor at Narlapur 400kV LI SS</p> <p>14) 125MVAR Bus Reactor at Yedula 400kV LI SS</p> <p>15) 125MVAR Bus Reactor at Vatterem 400kV LI SS</p> <p>16) 125MVAR Bus Reactor at Uddandapur 400kV LI SS</p>
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The load flow studies duly incorporating the above proposals are herewith furnished along with block diagrams showing the revised connectivities.

In view of the above, it is requested to approve revised proposals for transmission evacuation scheme of Yadari (Damaracherla) TPP (5x800 MW) and Palamuru Rangareddy Lift Irrigation Scheme in the forth coming Southern Region Standing Committee on Transmission (SRST).

If you require any further information regarding the above, please mail us at se.ps@tstransco.in , de.studies2@tstransco.in or contact (9491063385).

- Encl:
1. PSSE converged case through email
 2. Study Results along with Block Diagrams


Chief Engineer/ Power Systems

Copy to:

1. Dr. Subir Sen/ COO/ CTU, Smart Grid, PGCIL Corporate Office, Saudamini, Plot No. 2, Sector 29, Near IFFCO Chowk, Gurgaon (Haryana) – 122001, INDIA
2. The General Manager/ SRLDC, 29, Race Course Cross Road, Bengaluru – 560009
3. Chief Engineer/ 400kV/ TSTRANSCO/ Vidyut Soudha/ Hyderabad
4. SE(T) to Chairman and Managing Director/ TSTRANSCO
5. DE(T) to Director/ Projects
6. DE(T) to Director/ Transmission
7. ADE(T) to Director/ Lift Irrigation Schemes
8. PS to Director/ Grid Operations

ZONE TOTALS
 IN MW/MVAR

X-- ZONE --X	FROM -----AT ZONE BUSES-----			TO			-NET INTERCHANGE-				
	GENE- FROM IND	TO IND	TO	TO BUS	GNE BUS	TO LINE	FROM	TO	TO TIE	TO TIES	
	RATION GENERATN	MOTORS	LOAD	SHUNT	DEVICES	SHUNT CHARGING	LOSSES	LOSSES	LINES	+ LOADS	
51 TELANGANA	14666.9 505.6	0.0 0.0	0.0 0.0	13257.9 4549.9	0.0 -1480.3	0.0 0.0	0.0 2663.5	0.0 13054.1	383.6 5240.6	1025.5 2586.1	958.4 2553.4
58 TEL-LOAD	0.0 0.0	0.0 0.0	0.0 0.0	9814.3 3237.4	0.0 -9.5	0.0 0.0	0.0 0.0	0.0 1355.8	30.3 380.6	-9844.6 -2252.6	-9777.5 -2220.0
COLUMN TOTALS	14666.9 505.6	0.0 0.0	0.0 0.0	23072.2 7787.3	0.0 -1489.8	0.0 0.0	0.0 2663.5	0.0 14410.0	413.8 5621.2	-8819.1 333.4	-8819.1 333.4

RATING SET A %MVA FOR TRANSFORMERS
 % I FOR NON-TRANSFORMER BRANCHES

BUS 511176 PARIGI	132.00	CKT	MW	MVAR	MVA	% 0.9980PU	-76.37	X---	LOSSES	---	X----	AREA	-----X	X----	ZONE	-----X	511176
						131.74KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 511177 PARIGI	132KV132.00	1	38.3	-19.4	42.9	64			0.00	0.00	5	SOUTH			51	TELANGANA	
TO 511177 PARIGI	132KV132.00	2	38.3	-19.4	42.9	64			0.00	0.00	5	SOUTH			51	TELANGANA	
TO 511183 VIKARABAD	132.00	1	11.2	7.2	13.3	20			0.05	0.14	5	SOUTH			51	TELANGANA	
TO 511359 RAKAMCHERLA	132.00	1	29.5	15.5	33.4	40			0.11	0.26	5	SOUTH			51	TELANGANA	
TO 511359 RAKAMCHERLA	132.00	2	29.5	15.5	33.4	40			0.11	0.26	5	SOUTH			51	TELANGANA	
TO 512147 PARIGI	220.00	1	-73.4	0.2	73.4	122	1.0200UN		0.00	5.63	5	SOUTH			51	TELANGANA	
TO 512147 PARIGI	220.00	2	-73.4	0.2	73.4	122	1.0200UN		0.00	5.63	5	SOUTH			51	TELANGANA	
BUS 511195 MIRYALAGUDA	132.00	CKT	MW	MVAR	MVA	% 0.9887PU	-63.62	X---	LOSSES	---	X----	AREA	-----X	X----	ZONE	-----X	511195
						130.51KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO LOAD-PQ			101.0	29.0	105.1												
TO 511199 MADGULLI	132.00	1	69.9	19.6	72.6	110			1.50	3.90	5	SOUTH			51	TELANGANA	
TO 511200 DISCHINCHERL	132.00	1	65.6	21.0	68.9	104			0.76	2.02	5	SOUTH			51	TELANGANA	
TO 511283 YERRABALLI	132.00	1	41.5	14.9	44.1	53			0.47	1.11	5	SOUTH			51	TELANGANA	
TO 511284 WADPALLI NEW	132.00	1	-12.1	-27.5	30.0	36			0.04	0.10	5	SOUTH			51	TELANGANA	
TO 511284 WADPALLI NEW	132.00	2	-2.8	-7.2	7.7	12			0.01	0.03	5	SOUTH			51	TELANGANA	
TO 511284 WADPALLI NEW	132.00	3	-2.8	-7.2	7.7	12			0.01	0.03	5	SOUTH			51	TELANGANA	
TO 512047 MIRYALAGUDA	220.00	1	-80.1	-13.1	81.2	85	1.0000UN		0.00	4.21	5	SOUTH			51	TELANGANA	
TO 512047 MIRYALAGUDA	220.00	2	-80.1	-13.1	81.2	85	1.0000UN		0.00	4.21	5	SOUTH			51	TELANGANA	
TO 512047 MIRYALAGUDA	220.00	3	-50.1	-8.2	50.7	85	1.0000UN		0.00	2.63	5	SOUTH			51	TELANGANA	
TO 512047 MIRYALAGUDA	220.00	4	-50.1	-8.2	50.7	85	1.0000UN		0.00	2.63	5	SOUTH			51	TELANGANA	
BUS 511233 MALKARAM	132.00	CKT	MW	MVAR	MVA	% 0.9905PU	-70.04	X---	LOSSES	---	X----	AREA	-----X	X----	ZONE	-----X	511233
						130.75KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO LOAD-PQ			78.5	7.8	78.9												
TO 511234 LGMPET	132.00	1	28.2	1.5	28.3	43			0.15	0.39	5	SOUTH			51	TELANGANA	
TO 512030 MALKARAM	220.00	1	-65.7	-5.7	65.9	69	1.0000UN		0.00	2.77	5	SOUTH			51	TELANGANA	
TO 512030 MALKARAM	220.00	2	-41.0	-3.6	41.2	69	1.0000UN		0.00	1.73	5	SOUTH			51	TELANGANA	
BUS 511251 NARKETPALLY	132.00	CKT	MW	MVAR	MVA	% 0.9829PU	-67.65	X---	LOSSES	---	X----	AREA	-----X	X----	ZONE	-----X	511251
						129.74KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO LOAD-PQ			19.0	2.0	19.1												
TO SHUNT			0.0	-4.8	4.8												
TO 511252 RAMANNAPET	132.00	1	30.1	0.4	30.1	18			0.13	0.35	5	SOUTH			51	TELANGANA	
TO 511252 RAMANNAPET	132.00	2	30.1	0.4	30.1	18			0.13	0.35	5	SOUTH			51	TELANGANA	

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TO 511253	SHALIGOWRM	132.00	1	30.2	11.3	32.3	39	0.18	0.47	5	SOUTH	51	TELANGANA						
TO 511254	NALGONDA-1	132.00	1	60.7	16.1	62.8	76	0.58	1.51	5	SOUTH	51	TELANGANA						
TO 511254	NALGONDA-1	132.00	2	60.7	16.1	62.8	76	0.58	1.51	5	SOUTH	51	TELANGANA						
TO 511256	ATIPAMULA	132.00	1	44.9	17.7	48.2	58	0.54	1.43	5	SOUTH	51	TELANGANA						
TO 511395	PARAMPUJYA	132.00	1	-39.8	-25.0	47.0	57	0.20	0.53	5	SOUTH	51	TELANGANA						
TO 512068	NARKET	220.00	1	-45.4	-6.6	45.9	76	1.0000UN	0.00	2.18	5	SOUTH	51	TELANGANA					
TO 512068	NARKET	220.00	2	-72.6	-10.6	73.4	76	1.0000UN	0.00	3.48	5	SOUTH	51	TELANGANA					
TO 512068	NARKET	220.00	3	-45.4	-6.6	45.9	76	1.0000UN	0.00	2.18	5	SOUTH	51	TELANGANA					
TO 512068	NARKET	220.00	4	-72.6	-10.6	73.4	76	1.0000UN	0.00	3.48	5	SOUTH	51	TELANGANA					
BUS 511252	RAMANNAPET	132.00	CKT	MW	MVAR	MVA	%	0.9783PU	-68.31	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511252
								129.13KV			MW	MVAR		5	SOUTH		51	TELANGANA	
TO LOAD-PQ				60.0	19.0	62.9													
TO SHUNT				0.0	-19.1	19.1													
TO 511251	NARKETPALLY	132.00	1	-30.0	-0.9	30.0	18	0.13	0.35	5	SOUTH	51	TELANGANA						
TO 511251	NARKETPALLY	132.00	2	-30.0	-0.9	30.0	18	0.13	0.35	5	SOUTH	51	TELANGANA						
TO 511272	CHOUTUPPAL	132.00	3	-0.0	0.9	0.9	1	0.00	0.00	5	SOUTH	51	TELANGANA						
TO 511272	CHOUTUPPAL	132.00	4	-0.0	0.9	0.9	1	0.00	0.00	5	SOUTH	51	TELANGANA						
BUS 511257	CHOTUPPAL132132.00	CKT	MW	MVAR	MVA	%	0.9695PU	-68.70	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511257	
								127.97KV			MW	MVAR		5	SOUTH		51	TELANGANA	
TO LOAD-PQ				77.0	34.0	84.2													
TO 511272	CHOUTUPPAL	132.00	1	-38.5	-17.0	42.1	52	0.17	0.42	5	SOUTH	51	TELANGANA						
TO 511272	CHOUTUPPAL	132.00	2	-38.5	-17.0	42.1	52	0.17	0.42	5	SOUTH	51	TELANGANA						
BUS 511266	SURYAPET	132.00	CKT	MW	MVAR	MVA	%	0.9793PU	-67.44	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511266
								129.27KV			MW	MVAR		5	SOUTH		51	TELANGANA	
TO 511133	THUNGATURTHI132.00	1	3.3	-15.4	15.8	19	0.07	0.16	5	SOUTH	51	TELANGANA							
TO 511133	THUNGATURTHI132.00	2	3.3	-15.4	15.8	19	0.07	0.16	5	SOUTH	51	TELANGANA							
TO 511196	SURYAPET 132132.00	1	75.4	32.3	82.0	100	0.46	1.09	5	SOUTH	51	TELANGANA							
TO 511196	SURYAPET 132132.00	2	75.4	32.3	82.0	100	0.46	1.09	5	SOUTH	51	TELANGANA							
TO 511253	SHALIGOWRM	132.00	1	19.1	-0.3	19.1	23	0.12	0.29	5	SOUTH	51	TELANGANA						
TO 511253	SHALIGOWRM	132.00	2	19.1	-0.3	19.1	23	0.12	0.29	5	SOUTH	51	TELANGANA						
TO 512049	SURYAPET2	220.00	1	-97.8	-16.6	99.2	165	1.0000UN	0.00	10.26	5	SOUTH	51	TELANGANA					
TO 512049	SURYAPET2	220.00	2	-97.8	-16.6	99.2	165	1.0000UN	0.00	10.26	5	SOUTH	51	TELANGANA					
BUS 511271	DANDUMALKAPU132.00	CKT	MW	MVAR	MVA	%	0.9637PU	-69.29	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511271	
								127.21KV			MW	MVAR		5	SOUTH		51	TELANGANA	
TO LOAD-PQ				67.5	18.6	70.0													
TO 511272	CHOUTUPPAL	132.00	1	-33.8	-9.3	35.0	43	0.30	0.72	5	SOUTH	51	TELANGANA						
TO 511272	CHOUTUPPAL	132.00	2	-33.8	-9.3	35.0	43	0.30	0.72	5	SOUTH	51	TELANGANA						
BUS 511272	CHOUTUPPAL	132.00	CKT	MW	MVAR	MVA	%	0.9770PU	-68.28	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511272
								128.97KV			MW	MVAR		5	SOUTH		51	TELANGANA	
TO 511252	RAMANNAPET	132.00	3	0.0	-2.5	2.5	3	0.00	0.00	5	SOUTH	51	TELANGANA						
TO 511252	RAMANNAPET	132.00	4	0.0	-2.5	2.5	3	0.00	0.00	5	SOUTH	51	TELANGANA						
TO 511257	CHOTUPPAL132132.00	1	38.7	16.9	42.2	51	0.17	0.42	5	SOUTH	51	TELANGANA							
TO 511257	CHOTUPPAL132132.00	2	38.7	16.9	42.2	51	0.17	0.42	5	SOUTH	51	TELANGANA							
TO 511271	DANDUMALKAPU132.00	1	34.1	8.8	35.2	43	0.30	0.72	5	SOUTH	51	TELANGANA							
TO 511271	DANDUMALKAPU132.00	2	34.1	8.8	35.2	43	0.30	0.72	5	SOUTH	51	TELANGANA							
TO 512153	CHOUTTUPPAL	220.00	1	-72.7	-23.3	76.4	127	1.0000UN	0.00	6.11	5	SOUTH	51	TELANGANA					
TO 512153	CHOUTTUPPAL	220.00	2	-72.7	-23.3	76.4	127	1.0000UN	0.00	6.11	5	SOUTH	51	TELANGANA					
BUS 511360	HUZURNAGAR	132.00	CKT	MW	MVAR	MVA	%	0.9690PU	-65.39	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511360
								127.90KV			MW	MVAR		5	SOUTH		51	TELANGANA	
TO 511198	MATTAMPALLY	132.00	1	60.7	20.6	64.1	79	0.63	1.49	5	SOUTH	51	TELANGANA						
TO 511198	MATTAMPALLY	132.00	2	60.7	20.6	64.1	79	0.63	1.49	5	SOUTH	51	TELANGANA						
TO 511202	VERPRM	132.00	1	1.8	-3.7	4.2	5	0.00	0.00	5	SOUTH	51	TELANGANA						
TO 511202	VERPRM	132.00	2	1.8	-3.7	4.2	5	0.00	0.00	5	SOUTH	51	TELANGANA						

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TO	512157	HUZURANAGAR	220.00	1	-62.6	-16.9	64.8	108	1.0000UN	0.00	4.47	5	SOUTH	51	TELANGANA					
TO	512157	HUZURANAGAR	220.00	2	-62.6	-16.9	64.8	108	1.0000UN	0.00	4.47	5	SOUTH	51	TELANGANA					
BUS	512004	KHAM	220.00	CKT	MW	MVAR	MVA	%	1.0061PU	-60.29	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512004
									221.35KV											
TO	512139	KHAMMAM-TS	220.00	1	106.0	70.1	127.1	33		0.00	0.00	5	SOUTH	51	TELANGANA					
TO	512139	KHAMMAM-TS	220.00	2	106.0	70.1	127.1	33		0.00	0.00	5	SOUTH	51	TELANGANA					
TO	514004	KHAM	400.00	1	-59.1	-39.1	70.9	37	1.0000UN	0.00	1.58	5	SOUTH	51	TELANGANA					
TO	514004	KHAM	400.00	2	-59.1	-39.1	70.9	37	1.0000UN	0.00	1.58	5	SOUTH	51	TELANGANA					
TO	514004	KHAM	400.00	3	-93.8	-62.1	112.5	38	1.0000UN	0.00	2.50	5	SOUTH	51	TELANGANA					
BUS	512011	HYD TS	220.00	CKT	MW	MVAR	MVA	%	1.0045PU	-67.82	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512011
									221.00KV											
TO	512022	CHANDRGUTTA	220.00	1	94.2	-25.6	97.6	51		0.29	1.55	5	SOUTH	51	TELANGANA					
TO	512099	SHAMSBD	220.00	1	145.2	12.4	145.8	76		0.65	3.48	5	SOUTH	51	TELANGANA					
TO	512119	FABCITY	220.00	1	-77.2	5.1	77.4	40		0.02	0.21	5	SOUTH	51	TELANGANA					
TO	512119	FABCITY	220.00	2	-77.2	5.1	77.4	40		0.02	0.21	5	SOUTH	51	TELANGANA					
TO	512121	KOTHUR	220.00	1	105.0	11.1	105.6	55		0.73	3.92	5	SOUTH	51	TELANGANA					
TO	512126	SHIVRAMPALLI	220.00	1	188.3	33.9	191.3	44		0.98	5.53	5	SOUTH	51	TELANGANA					
TO	512127	HIAL-AIRPORT	220.00	1	141.5	4.2	141.6	33		0.08	0.42	5	SOUTH	51	TELANGANA					
TO	512127	HIAL-AIRPORT	220.00	2	141.5	4.2	141.6	33		0.08	0.42	5	SOUTH	51	TELANGANA					
TO	514012	HYD TS	400.00	1	-165.3	-12.6	165.8	87	1.0000UN	0.00	8.65	5	SOUTH	51	TELANGANA					
TO	514012	HYD TS	400.00	2	-165.3	-12.6	165.8	87	1.0000UN	0.00	8.65	5	SOUTH	51	TELANGANA					
TO	514012	HYD TS	400.00	3	-165.3	-12.6	165.8	87	1.0000UN	0.00	8.65	5	SOUTH	51	TELANGANA					
TO	514012	HYD TS	400.00	4	-165.3	-12.6	165.8	87	1.0000UN	0.00	8.65	5	SOUTH	51	TELANGANA					
BUS	512018	VELTOOR	220.00	CKT	MW	MVAR	MVA	%	0.9982PU	-68.58	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512018
									219.60KV											
TO	512012	JURALA SS	220.00	1	-99.9	20.5	102.0	51		0.45	2.42	5	SOUTH	51	TELANGANA					
TO	512079	BHOOTPUR	220.00	1	46.3	10.1	47.4	24		0.16	0.86	5	SOUTH	51	TELANGANA					
TO	512079	BHOOTPUR	220.00	2	46.3	10.1	47.4	24		0.16	0.86	5	SOUTH	51	TELANGANA					
TO	512086	WANPRTHY	220.00	1	153.3	7.1	153.5	81		0.80	4.26	5	SOUTH	51	TELANGANA					
TO	512086	WANPRTHY	220.00	2	153.3	7.1	153.5	81		0.80	4.26	5	SOUTH	51	TELANGANA					
TO	512152	THIMMAJIPET	220.00	1	28.2	12.0	30.6	16		0.02	0.26	5	SOUTH	51	TELANGANA					
TO	512152	THIMMAJIPET	220.00	2	28.2	12.0	30.6	16		0.02	0.26	5	SOUTH	51	TELANGANA					
TO	512163	LOWERJURALA	220.00	1	-108.5	12.2	109.2	55		0.54	2.86	5	SOUTH	51	TELANGANA					
TO	512188	GUDIPALIGATU	220.00	1	169.9	50.4	177.2	92		2.22	11.82	5	SOUTH	58	TEL-LOAD					
TO	512188	GUDIPALIGATU	220.00	2	169.9	50.4	177.2	92		2.22	11.82	5	SOUTH	58	TEL-LOAD					
TO	512227	RENEW_VLT	220.00	1	-74.9	-11.9	75.9	36		0.07	0.45	5	SOUTH	51	TELANGANA					
TO	512228	SUZLON_VLT	220.00	1	-74.9	-14.1	76.3	36		0.06	0.41	5	SOUTH	51	TELANGANA					
TO	512229	TRANFRM_VLT	220.00	1	-75.0	-50.2	90.2	42		0.02	0.15	5	SOUTH	51	TELANGANA					
TO	512230	AKSHAY_VLT	220.00	1	-74.9	-13.7	76.2	36		0.06	0.42	5	SOUTH	51	TELANGANA					
TO	514023	VELTOOR	400.00	1	-71.8	-25.5	76.2	40	1.0000UN	0.00	1.85	5	SOUTH	51	TELANGANA					
TO	514023	VELTOOR	400.00	2	-71.8	-25.5	76.2	40	1.0000UN	0.00	1.85	5	SOUTH	51	TELANGANA					
TO	514023	VELTOOR	400.00	3	-71.8	-25.5	76.2	40	1.0000UN	0.00	1.85	5	SOUTH	51	TELANGANA					
TO	514023	VELTOOR	400.00	4	-71.8	-25.5	76.2	40	1.0000UN	0.00	1.85	5	SOUTH	51	TELANGANA					
BUS	512029	SHANKARPALLY	220.00	CKT	MW	MVAR	MVA	%	0.9973PU	-69.50	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512029
									219.40KV											
TO	512052	YEDDUMAILARA	220.00	1	104.7	3.0	104.8	53		0.26	1.37	5	SOUTH	51	TELANGANA					
TO	512052	YEDDUMAILARA	220.00	2	104.7	3.0	104.8	53		0.26	1.37	5	SOUTH	51	TELANGANA					
TO	512060	GBOWLI	220.00	1	24.8	8.7	26.3	6		0.03	0.17	5	SOUTH	51	TELANGANA					
TO	512060	GBOWLI	220.00	2	30.2	11.4	32.3	7		0.04	0.21	5	SOUTH	51	TELANGANA					
TO	512100	KETHIREDDYPA	220.00	1	27.3	11.6	29.7	16		0.03	0.16	5	SOUTH	51	TELANGANA					
TO	512123	SADASIVPET	220.00	1	41.6	-6.7	42.1	22		0.11	0.56	5	SOUTH	51	TELANGANA					
TO	512123	SADASIVPET	220.00	2	41.6	-6.7	42.1	22		0.11	0.56	5	SOUTH	51	TELANGANA					
TO	512135	TANDUR	220.00	1	118.2	19.2	119.7	63		1.88	10.05	5	SOUTH	51	TELANGANA					
TO	512147	PARIGI	220.00	1	119.0	20.5	120.7	63		1.03	5.48	5	SOUTH	51	TELANGANA					
TO	512147	PARIGI	220.00	2	119.0	20.5	120.7	63		1.03	5.48	5	SOUTH	51	TELANGANA					

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TO 512171	RCPURAM	220.00	1	78.7	16.8	80.4	34		0.22	1.19	5	SOUTH	51	TELANGANA				
TO 512171	RCPURAM	220.00	2	78.7	16.8	80.4	34		0.22	1.19	5	SOUTH	51	TELANGANA				
TO 514035	SHANKARPALLY400.00	1	-193.7	-25.8	195.4	103	1.0000UN		0.00	12.18	5	SOUTH	51	TELANGANA				
TO 514035	SHANKARPALLY400.00	2	-193.7	-25.8	195.4	103	1.0000UN		0.00	12.18	5	SOUTH	51	TELANGANA				
TO 514035	SHANKARPALLY400.00	3	-193.7	-25.8	195.4	103	1.0000UN		0.00	12.18	5	SOUTH	51	TELANGANA				
TO 514035	SHANKARPALLY400.00	4	-307.4	-40.9	310.1	103	1.0000UN		0.00	19.34	5	SOUTH	51	TELANGANA				
BUS 512030	MALKARAM	220.00	CKT	MW	MVAR	MVA	% 0.9950PU	-67.65	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512030
							218.90KV			MW	MVAR		5	SOUTH				
TO 511233	MALKARAM	132.00	1	65.7	8.5	66.2	69	1.0000LK		0.00	2.77		5	SOUTH				
TO 511233	MALKARAM	132.00	2	41.0	5.3	41.4	69	1.0000LK		0.00	1.73		5	SOUTH				
TO 512021	BHONG2	220.00	1	-24.6	9.8	26.5	13			0.09	0.48		5	SOUTH				
TO 512021	BHONG2	220.00	2	-24.6	9.8	26.5	13			0.09	0.48		5	SOUTH				
TO 512053	SHPR	220.00	1	184.0	-2.0	184.0	43			0.96	5.42		5	SOUTH				
TO 512053	SHPR	220.00	2	184.0	-2.0	184.0	43			0.96	5.42		5	SOUTH				
TO 512096	MEDCHAL	220.00	1	115.2	44.5	123.5	73			0.31	1.76		5	SOUTH				
TO 512096	MEDCHAL	220.00	2	115.2	44.5	123.5	73			0.31	1.76		5	SOUTH				
TO 512124	GUNROCK	220.00	1	111.1	13.2	111.9	59			0.31	1.67		5	SOUTH				
TO 512124	GUNROCK	220.00	2	111.1	13.2	111.9	59			0.31	1.67		5	SOUTH				
TO 512153	CHOUTTUPPAL	220.00	1	-79.4	-0.1	79.4	33			0.94	5.03		5	SOUTH				
TO 512153	CHOUTTUPPAL	220.00	2	-79.4	-0.1	79.4	33			0.94	5.03		5	SOUTH				
TO 514036	MALKARM4	400.00	1	-179.8	-36.2	183.4	97	1.0000UN		0.00	10.79		5	SOUTH				
TO 514036	MALKARM4	400.00	2	-179.8	-36.2	183.4	97	1.0000UN		0.00	10.79		5	SOUTH				
TO 514036	MALKARM4	400.00	3	-179.8	-36.2	183.4	97	1.0000UN		0.00	10.79		5	SOUTH				
TO 514036	MALKARM4	400.00	4	-179.8	-36.2	183.4	97	1.0000UN		0.00	10.79		5	SOUTH				
BUS 512047	MIRYALAGUDA	220.00	CKT	MW	MVAR	MVA	% 0.9983PU	-60.71	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512047
							219.62KV			MW	MVAR		5	SOUTH				
TO 511195	MIRYALAGUDA	132.00	1	80.1	17.3	82.0	85	1.0000LK		0.00	4.21		5	SOUTH				
TO 511195	MIRYALAGUDA	132.00	2	80.1	17.3	82.0	85	1.0000LK		0.00	4.21		5	SOUTH				
TO 511195	MIRYALAGUDA	132.00	3	50.1	10.8	51.2	85	1.0000LK		0.00	2.63		5	SOUTH				
TO 511195	MIRYALAGUDA	132.00	4	50.1	10.8	51.2	85	1.0000LK		0.00	2.63		5	SOUTH				
TO 512028	KOTH	220.00	1	-64.2	-7.9	64.7	32			0.96	5.13		5	SOUTH				
TO 512049	SURYAPET2	220.00	1	60.4	-24.2	65.0	34			0.21	1.13		5	SOUTH				
TO 512049	SURYAPET2	220.00	2	60.4	-24.2	65.0	34			0.21	1.13		5	SOUTH				
TO 512129	CHALAKURTY	220.00	1	95.8	-19.0	97.7	51			0.77	4.15		5	SOUTH				
TO 512231	DAMARACHRLA	220.00	1	-206.4	9.5	206.6	43			0.46	6.24		5	SOUTH				
TO 512231	DAMARACHRLA	220.00	2	-206.4	9.5	206.6	43			0.46	6.24		5	SOUTH				
BUS 512049	SURYAPET2	220.00	CKT	MW	MVAR	MVA	% 1.0013PU	-61.72	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512049
							220.28KV			MW	MVAR		5	SOUTH				
TO 511266	SURYAPET	132.00	1	97.8	26.8	101.4	169	1.0000LK		0.00	10.26		5	SOUTH				
TO 511266	SURYAPET	132.00	2	97.8	26.8	101.4	169	1.0000LK		0.00	10.26		5	SOUTH				
TO 512035	CHILAKAL	220.00	1	29.5	13.9	32.6	17			0.12	0.66		5	SOUTH				
TO 512047	MIRYALAGUDA	220.00	1	-60.2	20.6	63.6	33			0.21	1.13		5	SOUTH				
TO 512047	MIRYALAGUDA	220.00	2	-60.2	20.6	63.6	33			0.21	1.13		5	SOUTH				
TO 512068	NARKET	220.00	1	96.0	-2.4	96.0	50			1.02	5.43		5	SOUTH				
TO 512068	NARKET	220.00	2	93.0	-2.6	93.1	44			0.99	5.27		5	SOUTH				
TO 512139	KHAMMAM-TS	220.00	1	-48.4	-4.2	48.6	26			0.23	1.22		5	SOUTH				
TO 512139	KHAMMAM-TS	220.00	2	-48.4	-4.2	48.6	26			0.23	1.22		5	SOUTH				
TO 512157	HUZURANAGAR	220.00	1	2.6	29.5	29.6	14			0.08	0.42		5	SOUTH				
TO 514037	SURYPET4	400.00	1	-99.7	-62.5	117.7	62	1.0000UN		0.00	4.39		5	SOUTH				
TO 514037	SURYPET4	400.00	2	-99.7	-62.5	117.7	62	1.0000UN		0.00	4.39		5	SOUTH				
BUS 512068	NARKET	220.00	CKT	MW	MVAR	MVA	% 0.9907PU	-64.98	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512068
							217.95KV			MW	MVAR		5	SOUTH				
TO 511251	NARKETPALLY	132.00	1	45.4	8.8	46.2	77	1.0000LK		0.00	2.18		5	SOUTH				
TO 511251	NARKETPALLY	132.00	2	72.6	14.0	74.0	77	1.0000LK		0.00	3.48		5	SOUTH				
TO 511251	NARKETPALLY	132.00	3	45.4	8.8	46.2	77	1.0000LK		0.00	2.18		5	SOUTH				

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TO 511251	NARKETPALLY	132.00	4	72.6	14.0	74.0	77	1.0000LK	0.00	3.48	5	SOUTH	51	TELANGANA					
TO 512049	SURYAPET2	220.00	1	-95.0	-2.3	95.0	50		1.02	5.43	5	SOUTH	51	TELANGANA					
TO 512049	SURYAPET2	220.00	2	-92.0	-2.5	92.1	44		0.99	5.27	5	SOUTH	51	TELANGANA					
TO 512153	CHOUTTUPPAL	220.00	1	-40.5	-24.2	47.2	20		0.18	0.95	5	SOUTH	51	TELANGANA					
TO 512153	CHOUTTUPPAL	220.00	2	-40.5	-24.2	47.2	20		0.18	0.95	5	SOUTH	51	TELANGANA					
TO 512209	UDAYASAMUDRM	220.00	1	16.0	3.8	16.4	7		0.00	0.02	5	SOUTH	58	TEL-LOAD					
TO 512209	UDAYASAMUDRM	220.00	2	16.0	3.8	16.4	7		0.00	0.02	5	SOUTH	58	TEL-LOAD					
BUS 512082	MAHESH-TS2	220.00	CKT	MW	MVAR	MVA	%	1.0061PU 221.35KV	-67.37	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512082
											MW	MVAR		5	SOUTH		51	TELANGANA	
TO 512119	FABCITY	220.00	1	156.0	11.6	156.4	81		0.18	0.84	5	SOUTH	51	TELANGANA					
TO 512119	FABCITY	220.00	2	156.0	11.6	156.4	81		0.18	0.84	5	SOUTH	51	TELANGANA					
TO 512120	BONGULURU	220.00	1	69.0	-11.8	70.0	36		0.20	1.02	5	SOUTH	51	TELANGANA					
TO 512120	BONGULURU	220.00	2	69.0	-11.8	70.0	36		0.20	1.02	5	SOUTH	51	TELANGANA					
TO 512180	MADGULA	220.00	1	-10.4	20.6	23.0	12		0.04	0.19	5	SOUTH	51	TELANGANA					
TO 512180	MADGULA	220.00	2	-10.4	20.6	23.0	12		0.04	0.19	5	SOUTH	51	TELANGANA					
TO 514049	MAHESH-TS	400.00	1	-214.6	-20.4	215.5	72	1.0000UN	0.00	9.18	5	SOUTH	51	TELANGANA					
TO 514049	MAHESH-TS	400.00	2	-214.6	-20.4	215.5	72	1.0000UN	0.00	9.18	5	SOUTH	51	TELANGANA					
BUS 512100	KETHIREDDYPA	220.00	CKT	MW	MVAR	MVA	%	0.9941PU 218.70KV	-69.75	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512100
											MW	MVAR		5	SOUTH		51	TELANGANA	
TO 511207	KETHIREDDYPA	132.00	1	14.0	7.5	15.9	26	1.0000LK	0.00	0.25	5	SOUTH	51	TELANGANA					
TO 511207	KETHIREDDYPA	132.00	2	14.0	7.5	15.9	26	1.0000LK	0.00	0.25	5	SOUTH	51	TELANGANA					
TO 512029	SHANKARPALLY	220.00	1	-27.3	-14.4	30.9	16		0.03	0.16	5	SOUTH	51	TELANGANA					
TO 512052	YEDDUMAILARA	220.00	1	28.5	-8.8	29.8	16		0.05	0.25	5	SOUTH	51	TELANGANA					
TO 512098	SHADNGR	220.00	1	28.3	2.3	28.4	15		0.05	0.25	5	SOUTH	51	TELANGANA					
TO 512121	KOTHUR	220.00	1	10.4	-1.0	10.5	5		0.01	0.03	5	SOUTH	51	TELANGANA					
TO 512143	KP LDP LI	220.00	1	119.1	35.2	124.2	52		1.13	6.02	5	SOUTH	58	TEL-LOAD					
TO 512143	KP LDP LI	220.00	2	119.1	35.2	124.2	52		1.13	6.02	5	SOUTH	58	TEL-LOAD					
TO 512220	CHANDANAVALY	220.00	1	35.3	11.6	37.2	16		0.03	0.14	5	SOUTH	51	TELANGANA					
TO 512220	CHANDANAVALY	220.00	2	35.3	11.6	37.2	16		0.03	0.14	5	SOUTH	51	TELANGANA					
TO 514054	KETHIREDDYPA	400.00	1	-188.4	-43.3	193.3	102	1.0000UN	0.00	12.00	5	SOUTH	51	TELANGANA					
TO 514054	KETHIREDDYPA	400.00	2	-188.4	-43.3	193.3	102	1.0000UN	0.00	12.00	5	SOUTH	51	TELANGANA					
BUS 512131	DINDI	220.00	CKT	MW	MVAR	MVA	%	1.0011PU 220.25KV	-66.06	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512131
											MW	MVAR		5	SOUTH		51	TELANGANA	
TO LOAD-PQ				47.4	17.0	50.4													
TO 512027	KLWKRT	220.00	1	148.6	5.0	148.7	78		0.82	4.37	5	SOUTH	51	TELANGANA					
TO 512027	KLWKRT	220.00	2	148.6	5.0	148.7	78		0.82	4.37	5	SOUTH	51	TELANGANA					
TO 512073	SRIS	220.00	1	-50.0	6.2	50.4	21		0.33	1.77	5	SOUTH	50	ANDHRA					
TO 512151	NAGARKURNUL	220.00	1	47.4	5.4	47.7	25		0.04	0.58	5	SOUTH	51	TELANGANA					
TO 512151	NAGARKURNUL	220.00	2	47.4	5.4	47.7	25		0.04	0.58	5	SOUTH	51	TELANGANA					
TO 512154	KMPALLI	220.00	1	-65.0	13.8	66.5	35		0.07	0.92	5	SOUTH	51	TELANGANA					
TO 512154	KMPALLI	220.00	2	-65.0	13.8	66.5	35		0.07	0.92	5	SOUTH	51	TELANGANA					
TO 512180	MADGULA	220.00	1	58.2	-9.0	58.9	31		0.20	1.07	5	SOUTH	51	TELANGANA					
TO 512180	MADGULA	220.00	2	58.2	-9.0	58.9	31		0.20	1.07	5	SOUTH	51	TELANGANA					
TO 512232	DOMALAPANTA	220.00	1	-49.6	6.2	50.0	21		0.32	1.72	5	SOUTH	51	TELANGANA					
TO 514058	DINDI	400.00	1	-108.8	-20.0	110.6	37	1.0000UN	0.00	2.44	5	SOUTH	51	TELANGANA					
TO 514058	DINDI	400.00	2	-108.8	-20.0	110.6	37	1.0000UN	0.00	2.44	5	SOUTH	51	TELANGANA					
TO 514058	DINDI	400.00	3	-108.8	-20.0	110.6	37	1.0000UN	0.00	2.44	5	SOUTH	51	TELANGANA					
BUS 512143	KP LDP LI	220.00	CKT	MW	MVAR	MVA	%	0.9718PU 213.80KV	-72.27	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512143
											MW	MVAR		5	SOUTH		58	TEL-LOAD	
TO LOAD-PQ				236.0	71.0	246.4													
TO 512100	KETHIREDDYPA	220.00	1	-118.0	-35.5	123.2	53		1.13	6.02	5	SOUTH	51	TELANGANA					
TO 512100	KETHIREDDYPA	220.00	2	-118.0	-35.5	123.2	53		1.13	6.02	5	SOUTH	51	TELANGANA					
BUS 512145	HAYAT NAGAR	220.00	CKT	MW	MVAR	MVA	%	1.0102PU 222.25KV	-68.66	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512145
											MW	MVAR		5	SOUTH		51	TELANGANA	

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TO	LOAD-PQ				77.5	25.3	81.5																				
TO	512002	HYD	PGCIL	220.00	1	-35.4	-12.4	37.6	20		0.07	0.39	5	SOUTH							51	TELANGANA					
TO	512159	KACHAVANI	SI	220.00	1	-42.1	-12.9	44.0	23		0.05	0.28	5	SOUTH								51	TELANGANA				
BUS	512147	PARIGI		220.00	CKT					0.9811PU	-71.98	X---	LOSSES	---	X----	AREA	-----	X	----	ZONE	-----	X	512147				
						MW	MVAR	MVA	%	215.84KV																	
TO	511176	PARIGI		132.00	1	73.4	5.4	73.6	123	1.0000LK																	
TO	511176	PARIGI		132.00	2	73.4	5.4	73.6	123	1.0000LK																	
TO	512029	SHANKARPALLY		220.00	1	-117.9	-21.3	119.9	64		1.03	5.48	5	SOUTH													
TO	512029	SHANKARPALLY		220.00	2	-117.9	-21.3	119.9	64		1.03	5.48	5	SOUTH													
TO	512161	KOSIGI		220.00	1	44.5	15.9	47.3	25		0.15	0.82	5	SOUTH													
TO	512161	KOSIGI		220.00	2	44.5	15.9	47.3	25		0.15	0.82	5	SOUTH													
BUS	512148	JANGAON		220.00	CKT					0.9893PU	-64.44	X---	LOSSES	---	X----	AREA	-----	X	----	ZONE	-----	X	512148				
						MW	MVAR	MVA	%	217.64KV																	
TO	512021	BHONG2		220.00	1	76.6	-16.6	78.3	37		0.56	3.05	5	SOUTH													
TO	512021	BHONG2		220.00	2	76.6	-16.6	78.3	37		0.56	3.05	5	SOUTH													
TO	512053	SHPR		220.00	1	96.5	-21.2	98.8	47		1.46	8.23	5	SOUTH													
TO	512055	WADDEKOT		220.00	1	-10.8	37.1	38.6	18		0.21	1.14	5	SOUTH													
TO	512055	WADDEKOT		220.00	2	-10.8	37.1	38.6	18		0.21	1.14	5	SOUTH													
TO	512055	WADDEKOT		220.00	3	-12.5	43.8	45.5	22		0.24	1.31	5	SOUTH													
TO	512150	HUSNABAD		220.00	1	46.5	4.5	46.7	25		0.21	1.13	5	SOUTH													
TO	512150	HUSNABAD		220.00	2	46.5	4.5	46.7	25		0.21	1.13	5	SOUTH													
TO	512193	JANGAON 220		220.00	1	74.7	44.2	86.8	46		0.18	0.96	5	SOUTH													
TO	512193	JANGAON 220		220.00	2	74.7	44.2	86.8	46		0.18	0.96	5	SOUTH													
TO	512204	DEVANNAPET L		220.00	1	48.2	17.8	51.4	22		0.24	1.29	5	SOUTH									58	TEL-LOAD			
TO	512204	DEVANNAPET L		220.00	2	48.2	17.8	51.4	22		0.24	1.29	5	SOUTH										58	TEL-LOAD		
TO	514063	JANAGAON		400.00	1	-184.8	-65.5	196.1	65	1.0000UN	0.00	7.86	5	SOUTH										51	TELANGANA		
TO	514063	JANAGAON		400.00	2	-184.8	-65.5	196.1	65	1.0000UN	0.00	7.86	5	SOUTH											51	TELANGANA	
TO	514063	JANAGAON		400.00	3	-184.8	-65.5	196.1	65	1.0000UN	0.00	7.86	5	SOUTH												51	TELANGANA
BUS	512153	CHOUTTUPPAL		220.00	CKT					1.0036PU	-64.02	X---	LOSSES	---	X----	AREA	-----	X	----	ZONE	-----	X	512153				
						MW	MVAR	MVA	%	220.79KV																	
TO	511272	CHOUTUPPAL		132.00	1	72.7	29.4	78.4	131	1.0000LK																	
TO	511272	CHOUTUPPAL		132.00	2	72.7	29.4	78.4	131	1.0000LK																	
TO	512030	MALKARAM		220.00	1	80.4	-8.3	80.8	34		0.94	5.03	5	SOUTH													
TO	512030	MALKARAM		220.00	2	80.4	-8.3	80.8	34		0.94	5.03	5	SOUTH													
TO	512068	NARKET		220.00	1	40.7	17.4	44.2	18		0.18	0.95	5	SOUTH													
TO	512068	NARKET		220.00	2	40.7	17.4	44.2	18		0.18	0.95	5	SOUTH													
TO	514065	CHOUTTUPPAL		400.00	1	-193.8	-38.4	197.6	66	1.0000UN	0.00	7.75	5	SOUTH													
TO	514065	CHOUTTUPPAL		400.00	2	-193.8	-38.4	197.6	66	1.0000UN	0.00	7.75	5	SOUTH													
BUS	512157	HUZURANAGAR		220.00	CKT					0.9885PU	-61.64	X---	LOSSES	---	X----	AREA	-----	X	----	ZONE	-----	X	512157				
						MW	MVAR	MVA	%	217.47KV																	
TO	511360	HUZURNAGAR		132.00	1	62.6	21.3	66.1	110	1.0000LK																	
TO	511360	HUZURNAGAR		132.00	2	62.6	21.3	66.1	110	1.0000LK																	
TO	512035	CHILAKAL		220.00	2	39.0	-9.7	40.2	19		0.11	0.61	5	SOUTH													
TO	512049	SURYAPET2		220.00	1	-2.5	-35.6	35.7	17		0.08	0.42	5	SOUTH													
TO	512156	PULICHINTALA		220.00	1	34.3	4.4	34.6	16		0.07	0.38	5	SOUTH													
TO	512194	SEETAPURAM		220.00	1	51.8	9.3	52.7	25		0.13	0.69	5	SOUTH													
TO	512231	DAMARACHRLA		220.00	1	-123.9	-5.6	124.0	52		1.09	5.83	5	SOUTH													
TO	512231	DAMARACHRLA		220.00	2	-123.9	-5.6	124.0	52		1.09	5.83	5	SOUTH													
BUS	512231	DAMARACHRLA		220.00	CKT					0.9992PU	-58.98	X---	LOSSES	---	X----	AREA	-----	X	----	ZONE	-----	X	512231				
						MW	MVAR	MVA	%	219.82KV																	
TO	512047	MIRYALAGUDA		220.00	1	206.8	-8.2	207.0	43		0.46	6.24	5	SOUTH													
TO	512047	MIRYALAGUDA		220.00	2	206.8	-8.2	207.0	43		0.46	6.24	5	SOUTH													
TO	512157	HUZURANAGAR		220.00	1	125.0	5.1	125.1	52		1.09	5.83	5	SOUTH													
TO	512157	HUZURANAGAR		220.00	2	125.0	5.1	125.1	52		1.09	5.83	5	SOUTH													

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TO 514072	DAMARACHRLA	400.00	1	-221.2	2.1	221.2	74	1.0000UN	0.00	9.80	5	SOUTH	51	TELANGANA					
TO 514072	DAMARACHRLA	400.00	2	-221.2	2.1	221.2	74	1.0000UN	0.00	9.80	5	SOUTH	51	TELANGANA					
TO 514072	DAMARACHRLA	400.00	3	-221.2	2.1	221.2	74	1.0000UN	0.00	9.80	5	SOUTH	51	TELANGANA					
BUS 514004	KHAM	400.00	CKT	MW	MVAR	MVA	%	1.0187PU 407.46KV	-59.24	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514004
TO 512004	KHAM	220.00	1	59.1	40.7	71.8	38	1.0000LK	0.00	1.58	5	SOUTH	51	TELANGANA					
TO 512004	KHAM	220.00	2	59.1	40.7	71.8	38	1.0000LK	0.00	1.58	5	SOUTH	51	TELANGANA					
TO 512004	KHAM	220.00	3	93.8	64.6	113.9	38	1.0000LK	0.00	2.50	5	SOUTH	51	TELANGANA					
TO 514003	TALAPALLI	400.00	1	191.9	-66.8	203.2	39		0.97	10.86	5	SOUTH	51	TELANGANA					
TO 514003	TALAPALLI	400.00	2	185.6	-67.4	197.4	37		0.94	10.51	5	SOUTH	51	TELANGANA					
TO 514003	TALAPALLI	400.00	3	185.6	-67.4	197.4	37		0.94	10.51	5	SOUTH	51	TELANGANA					
TO 514005	VIJW	400.00	1	-106.0	-20.4	108.0	21		0.24	2.62	5	SOUTH	50	ANDHRA					
TO 514016	VIZPOOL	400.00	1	-304.7	31.6	306.3	58		6.59	73.42	5	SOUTH	50	ANDHRA					
TO 514034	KOTH-VI	400.00	1	-212.0	7.3	212.2	40		0.54	5.75	5	SOUTH	51	TELANGANA					
TO 514043	OGLAPUR PGC	400.00	1	-22.1	20.6	30.2	6		0.01	0.13	5	SOUTH	51	TELANGANA					
TO 514044	KOTH-VII	400.00	1	-198.9	26.4	200.6	38		0.50	5.29	5	SOUTH	51	TELANGANA					
TO 514056	ASUPAKA	400.00	1	-253.1	61.6	260.5	49		1.53	16.31	5	SOUTH	51	TELANGANA					
TO 514065	CHOUTTUPPAL	400.00	1	160.8	-35.7	164.8	31		0.69	7.33	5	SOUTH	51	TELANGANA					
TO 514065	CHOUTTUPPAL	400.00	2	160.8	-35.7	164.8	31		0.69	7.33	5	SOUTH	51	TELANGANA					
BUS 514012	HYD TS	400.00	CKT	MW	MVAR	MVA	%	1.0099PU 403.95KV	-64.86	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514012
TO 512011	HYD TS	220.00	1	165.3	21.3	166.7	88	1.0000LK	0.00	8.65	5	SOUTH	51	TELANGANA					
TO 512011	HYD TS	220.00	2	165.3	21.3	166.7	88	1.0000LK	0.00	8.65	5	SOUTH	51	TELANGANA					
TO 512011	HYD TS	220.00	3	165.3	21.3	166.7	88	1.0000LK	0.00	8.65	5	SOUTH	51	TELANGANA					
TO 512011	HYD TS	220.00	4	165.3	21.3	166.7	88	1.0000LK	0.00	8.65	5	SOUTH	51	TELANGANA					
TO 514002	HYD PGCIL	400.00	1	17.3	-27.6	32.5	6		0.00	0.05	5	SOUTH	51	TELANGANA					
TO 514049	MAHESH-TS	400.00	1	31.5	-35.4	47.4	9		0.01	0.08	5	SOUTH	51	TELANGANA					
TO 514049	MAHESH-TS	400.00	2	31.5	-35.4	47.4	9		0.01	0.08	5	SOUTH	51	TELANGANA					
TO 514065	CHOUTTUPPAL	400.00	1	-370.8	6.7	370.8	71		1.83	19.57	5	SOUTH	51	TELANGANA					
TO 514065	CHOUTTUPPAL	400.00	2	-370.8	6.7	370.8	71		1.83	19.57	5	SOUTH	51	TELANGANA					
BUS 514023	VELTOOR	400.00	CKT	MW	MVAR	MVA	%	1.0066PU 402.63KV	-67.28	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514023
TO 512018	VELTOOR	220.00	1	71.8	27.4	76.8	40	1.0000LK	0.00	1.85	5	SOUTH	51	TELANGANA					
TO 512018	VELTOOR	220.00	2	71.8	27.4	76.8	40	1.0000LK	0.00	1.85	5	SOUTH	51	TELANGANA					
TO 512018	VELTOOR	220.00	3	71.8	27.4	76.8	40	1.0000LK	0.00	1.85	5	SOUTH	51	TELANGANA					
TO 512018	VELTOOR	220.00	4	71.8	27.4	76.8	40	1.0000LK	0.00	1.85	5	SOUTH	51	TELANGANA					
TO 514003	TALAPALLI	400.00	1	-228.1	-63.8	236.9	46		1.77	19.66	5	SOUTH	51	TELANGANA					
TO 514047	MAHESWRM	400.00	1	-190.0	-37.6	193.7	37		0.77	8.22	5	SOUTH	51	TELANGANA					
TO 514047	MAHESWRM	400.00	2	-190.0	-37.6	193.7	37		0.77	8.22	5	SOUTH	51	TELANGANA					
TO 514066	YEDULA	400.00	1	463.3	206.8	507.4	74		1.20	20.73	5	SOUTH	58	TEL-LOAD					
TO 514066	YEDULA	400.00	2	463.3	206.8	507.4	74		1.20	20.73	5	SOUTH	58	TEL-LOAD					
TO 514133	URVKND	400.00	1	-13.5	-200.9	201.3	29		0.29	4.97	5	SOUTH	50	ANDHRA					
TO 514133	URVKND	400.00	2	-13.5	-200.9	201.3	29		0.29	4.97	5	SOUTH	50	ANDHRA					
TO 524003	RAIC	400.00	1	-578.6	17.6	578.9	111		4.58	50.97	5	SOUTH	52	KARNATKA					
BUS 514035	SHANKARPALLY	400.00	CKT	MW	MVAR	MVA	%	1.0074PU 402.94KV	-65.99	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514035
TO 512029	SHANKARPALLY	220.00	1	193.7	38.0	197.3	104	1.0000LK	0.00	12.18	5	SOUTH	51	TELANGANA					
TO 512029	SHANKARPALLY	220.00	2	193.7	38.0	197.3	104	1.0000LK	0.00	12.18	5	SOUTH	51	TELANGANA					
TO 512029	SHANKARPALLY	220.00	3	193.7	38.0	197.3	104	1.0000LK	0.00	12.18	5	SOUTH	51	TELANGANA					
TO 512029	SHANKARPALLY	220.00	4	307.4	60.2	313.3	104	1.0000LK	0.00	19.34	5	SOUTH	51	TELANGANA					
TO 514038	NIZAMABAD	400.00	1	-367.3	-3.2	367.3	71		3.38	36.13	5	SOUTH	51	TELANGANA					
TO 514038	NIZAMABAD	400.00	2	-367.3	-3.2	367.3	71		3.38	36.13	5	SOUTH	51	TELANGANA					
TO 514046	NARSAPUR	400.00	1	-51.8	9.4	52.7	10		0.04	0.40	5	SOUTH	51	TELANGANA					
TO 514046	NARSAPUR	400.00	2	-51.8	9.4	52.7	10		0.04	0.40	5	SOUTH	51	TELANGANA					
TO 514049	MAHESH-TS	400.00	1	-115.2	-37.0	121.0	23		0.20	2.13	5	SOUTH	51	TELANGANA					

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TO 514049	MAHESH-TS	400.00	2	-115.2	-37.0	121.0	23		0.20	2.13	5	SOUTH	51	TELANGANA				
TO 514054	KETHIREDDYPA400.00	400.00	1	90.1	-56.2	106.2	15		0.04	0.64	5	SOUTH	51	TELANGANA				
TO 514054	KETHIREDDYPA400.00	400.00	2	90.1	-56.2	106.2	15		0.04	0.64	5	SOUTH	51	TELANGANA				
BUS 514036	MALKARM4	400.00	CKT	MW	MVAR	MVA	% 1.0082PU	-64.39	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514036
							403.28KV			MW	MVAR	5	SOUTH	51	TELANGANA			
TO 512030	MALKARAM	220.00	1	179.8	47.0	185.9	98	1.0000LK	0.00	10.79	5	SOUTH	51	TELANGANA				
TO 512030	MALKARAM	220.00	2	179.8	47.0	185.9	98	1.0000LK	0.00	10.79	5	SOUTH	51	TELANGANA				
TO 512030	MALKARAM	220.00	3	179.8	47.0	185.9	98	1.0000LK	0.00	10.79	5	SOUTH	51	TELANGANA				
TO 512030	MALKARAM	220.00	4	179.8	47.0	185.9	98	1.0000LK	0.00	10.79	5	SOUTH	51	TELANGANA				
TO 514001	RSTP	400.00	1	-286.1	-22.1	287.0	55		2.95	32.85	5	SOUTH	51	TELANGANA				
TO 514002	HYD PGCIL	400.00	1	86.9	-48.9	99.7	19		0.09	0.96	5	SOUTH	51	TELANGANA				
TO 514037	SURYPET4	400.00	1	-260.0	-58.4	266.5	51		1.92	20.50	5	SOUTH	51	TELANGANA				
TO 514037	SURYPET4	400.00	2	-260.0	-58.4	266.5	51		1.92	20.50	5	SOUTH	51	TELANGANA				
BUS 514037	SURYPET4	400.00	CKT	MW	MVAR	MVA	% 1.0216PU	-59.95	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514037
							408.63KV			MW	MVAR	5	SOUTH	51	TELANGANA			
TO 512049	SURYAPET2	220.00	1	99.7	66.9	120.1	63	1.0000LK	0.00	4.39	5	SOUTH	51	TELANGANA				
TO 512049	SURYAPET2	220.00	2	99.7	66.9	120.1	63	1.0000LK	0.00	4.39	5	SOUTH	51	TELANGANA				
TO 514030	VIJTP-IV	400.00	1	-135.1	-18.8	136.4	26		0.47	5.07	5	SOUTH	50	ANDHRA				
TO 514030	VIJTP-IV	400.00	2	-135.1	-18.8	136.4	26		0.47	5.07	5	SOUTH	50	ANDHRA				
TO 514036	MALKARM4	400.00	1	261.9	-20.3	262.7	50		1.92	20.50	5	SOUTH	51	TELANGANA				
TO 514036	MALKARM4	400.00	2	261.9	-20.3	262.7	50		1.92	20.50	5	SOUTH	51	TELANGANA				
TO 514045	JULURUPADU	400.00	1	-145.4	16.3	146.3	21		0.26	4.55	5	SOUTH	51	TELANGANA				
TO 514045	JULURUPADU	400.00	2	-145.4	16.3	146.3	21		0.26	4.55	5	SOUTH	51	TELANGANA				
TO 514054	KETHIREDDYPA400.00	400.00	1	305.2	-60.1	311.1	45		1.98	34.11	5	SOUTH	51	TELANGANA				
TO 514054	KETHIREDDYPA400.00	400.00	2	305.2	-60.1	311.1	45		1.98	34.11	5	SOUTH	51	TELANGANA				
TO 514111	KVKOTA40	400.00	1	-386.4	16.1	386.7	56		2.78	42.13	5	SOUTH	50	ANDHRA				
TO 514111	KVKOTA40	400.00	2	-386.4	16.1	386.7	56		2.78	42.13	5	SOUTH	50	ANDHRA				
BUS 514047	MAHESWRM	400.00	CKT	MW	MVAR	MVA	% 1.0118PU	-64.82	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514047
							404.73KV			MW	MVAR	5	SOUTH	51	TELANGANA			
TO 514002	HYD PGCIL	400.00	1	22.8	-12.8	26.1	5		0.01	0.06	5	SOUTH	51	TELANGANA				
TO 514013	KURNOOL4	400.00	1	-30.4	-107.2	111.4	21		0.12	1.24	5	SOUTH	50	ANDHRA				
TO 514023	VELTOOR	400.00	1	190.7	-27.8	192.8	37		0.77	8.22	5	SOUTH	51	TELANGANA				
TO 514023	VELTOOR	400.00	2	190.7	-27.8	192.8	37		0.77	8.22	5	SOUTH	51	TELANGANA				
TO 514049	MAHESH-TS	400.00	1	975.7	250.7	1007.4	146		0.14	2.42	5	SOUTH	51	TELANGANA				
TO 514049	MAHESH-TS	400.00	2	975.7	250.7	1007.4	146		0.14	2.42	5	SOUTH	51	TELANGANA				
TO 518001	HYDR_800	765.00	1	-1162.7	-162.9	1174.0	78	1.0000UN	0.00	112.15	5	SOUTH	51	TELANGANA				
TO 518001	HYDR_800	765.00	2	-1162.7	-162.9	1174.0	78	1.0000UN	0.00	112.15	5	SOUTH	51	TELANGANA				
BUS 514049	MAHESH-TS	400.00	CKT	MW	MVAR	MVA	% 1.0111PU	-64.95	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514049
							404.43KV			MW	MVAR	5	SOUTH	51	TELANGANA			
TO 512082	MAHESH-TS2	220.00	1	214.6	29.5	216.6	72	1.0000LK	0.00	9.18	5	SOUTH	51	TELANGANA				
TO 512082	MAHESH-TS2	220.00	2	214.6	29.5	216.6	72	1.0000LK	0.00	9.18	5	SOUTH	51	TELANGANA				
TO 514012	HYD TS	400.00	1	-31.5	19.8	37.2	7		0.01	0.08	5	SOUTH	51	TELANGANA				
TO 514012	HYD TS	400.00	2	-31.5	19.8	37.2	7		0.01	0.08	5	SOUTH	51	TELANGANA				
TO 514035	SHANKARPALLY400.00	400.00	1	115.4	-12.3	116.0	22		0.20	2.13	5	SOUTH	51	TELANGANA				
TO 514035	SHANKARPALLY400.00	400.00	2	115.4	-12.3	116.0	22		0.20	2.13	5	SOUTH	51	TELANGANA				
TO 514047	MAHESWRM	400.00	1	-975.6	-249.4	1007.0	146		0.14	2.42	5	SOUTH	51	TELANGANA				
TO 514047	MAHESWRM	400.00	2	-975.6	-249.4	1007.0	146		0.14	2.42	5	SOUTH	51	TELANGANA				
TO 514058	DINDI	400.00	1	-15.8	35.0	38.4	7		0.03	0.34	5	SOUTH	51	TELANGANA				
TO 514058	DINDI	400.00	2	-15.8	35.0	38.4	7		0.03	0.34	5	SOUTH	51	TELANGANA				
TO 514059	UDDANDAPUR	400.00	1	692.9	177.4	715.2	104		3.04	52.38	5	SOUTH	58	TEL-LOAD				
TO 514059	UDDANDAPUR	400.00	2	692.9	177.4	715.2	104		3.04	52.38	5	SOUTH	58	TEL-LOAD				
BUS 514054	KETHIREDDYPA400.00	400.00	CKT	MW	MVAR	MVA	% 1.0097PU	-66.33	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514054
							403.88KV			MW	MVAR	5	SOUTH	51	TELANGANA			
TO 512100	KETHIREDDYPA220.00	220.00	1	188.4	55.3	196.3	103	1.0000LK	0.00	12.00	5	SOUTH	51	TELANGANA				

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TO 512100	KETHIREDDYPA220.00	2	188.4	55.3	196.3	103	1.0000LK	0.00	12.00	5	SOUTH	51	TELANGANA					
TO 514035	SHANKARPALLY400.00	1	-90.1	25.6	93.6	14		0.04	0.64	5	SOUTH	51	TELANGANA					
TO 514035	SHANKARPALLY400.00	2	-90.1	25.6	93.6	14		0.04	0.64	5	SOUTH	51	TELANGANA					
TO 514037	SURYPET4 400.00	1	-303.3	-86.5	315.4	46		1.98	34.11	5	SOUTH	51	TELANGANA					
TO 514037	SURYPET4 400.00	2	-303.3	-86.5	315.4	46		1.98	34.11	5	SOUTH	51	TELANGANA					
TO 514069	RAIDURG DUMY400.00	1	205.0	5.6	205.0	37		0.33	3.21	5	SOUTH	51	TELANGANA					
TO 514069	RAIDURG DUMY400.00	2	205.0	5.6	205.0	37		0.33	3.21	5	SOUTH	51	TELANGANA					
BUS 514058	DINDI 400.00	CKT	MW	MVAR	MVA	%	1.0054PU	-64.82	X---	LOSSES	---	X----	AREA	-----	X	-----	X	514058
							402.15KV			MW	MVAR		5	SOUTH				
TO 512131	DINDI 220.00	1	108.8	22.4	111.0	37	1.0000LK	0.00	2.44	5	SOUTH	51	TELANGANA					
TO 512131	DINDI 220.00	2	108.8	22.4	111.0	37	1.0000LK	0.00	2.44	5	SOUTH	51	TELANGANA					
TO 512131	DINDI 220.00	3	108.8	22.4	111.0	37	1.0000LK	0.00	2.44	5	SOUTH	51	TELANGANA					
TO 514011	SSLBPH4 400.00	1	-346.8	-176.6	389.2	75		1.87	20.02	5	SOUTH	51	TELANGANA					
TO 514011	SSLBPH4 400.00	2	-346.8	-176.6	389.2	75		1.87	20.02	5	SOUTH	51	TELANGANA					
TO 514049	MAHESH-TS 400.00	1	15.8	-70.4	72.1	14		0.03	0.34	5	SOUTH	51	TELANGANA					
TO 514049	MAHESH-TS 400.00	2	15.8	-70.4	72.1	14		0.03	0.34	5	SOUTH	51	TELANGANA					
TO 514064	DAMARCHLA TP400.00	1	-666.3	61.1	669.1	98		5.78	100.08	5	SOUTH	51	TELANGANA					
TO 514064	DAMARCHLA TP400.00	2	-666.3	61.1	669.1	98		5.78	100.08	5	SOUTH	51	TELANGANA					
TO 514066	YEDULA 400.00	1	834.1	152.2	847.9	124		3.96	68.20	5	SOUTH	58	TEL-LOAD					
TO 514066	YEDULA 400.00	2	834.1	152.2	847.9	124		3.96	68.20	5	SOUTH	58	TEL-LOAD					
BUS 514059	UDDANDAPUR 400.00	CKT	MW	MVAR	MVA	%	0.9889PU	-68.97	X---	LOSSES	---	X----	AREA	-----	X	-----	X	514059
							395.56KV			MW	MVAR		5	SOUTH				
TO LOAD-PQ			678.0	203.0	707.7													
TO 514049	MAHESH-TS 400.00	1	-689.8	-172.6	711.1	106		3.04	52.38	5	SOUTH	51	TELANGANA					
TO 514049	MAHESH-TS 400.00	2	-689.8	-172.6	711.1	106		3.04	52.38	5	SOUTH	51	TELANGANA					
TO 514062	VATTEM 400.00	1	350.8	71.1	358.0	53		0.61	10.60	5	SOUTH	58	TEL-LOAD					
TO 514062	VATTEM 400.00	2	350.8	71.1	358.0	53		0.61	10.60	5	SOUTH	58	TEL-LOAD					
BUS 514062	VATTEM 400.00	CKT	MW	MVAR	MVA	%	0.9805PU	-70.58	X---	LOSSES	---	X----	AREA	-----	X	-----	X	514062
							392.22KV			MW	MVAR		5	SOUTH				
TO LOAD-PQ			1150.0	345.0	1200.6													
TO 514059	UDDANDAPUR 400.00	1	-350.2	-96.1	363.1	54		0.61	10.60	5	SOUTH	58	TEL-LOAD					
TO 514059	UDDANDAPUR 400.00	2	-350.2	-96.1	363.1	54		0.61	10.60	5	SOUTH	58	TEL-LOAD					
TO 514066	YEDULA 400.00	1	-224.8	-76.4	237.4	36		0.31	5.29	5	SOUTH	58	TEL-LOAD					
TO 514066	YEDULA 400.00	2	-224.8	-76.4	237.4	36		0.31	5.29	5	SOUTH	58	TEL-LOAD					
BUS 514063	JANAGAON 400.00	CKT	MW	MVAR	MVA	%	1.0032PU	-62.30	X---	LOSSES	---	X----	AREA	-----	X	-----	X	514063
							401.29KV			MW	MVAR		5	SOUTH				
TO 512148	JANGAON 220.00	1	184.8	73.4	198.8	66	1.0000LK	0.00	7.86	5	SOUTH	51	TELANGANA					
TO 512148	JANGAON 220.00	2	184.8	73.4	198.8	66	1.0000LK	0.00	7.86	5	SOUTH	51	TELANGANA					
TO 512148	JANGAON 220.00	3	184.8	73.4	198.8	66	1.0000LK	0.00	7.86	5	SOUTH	51	TELANGANA					
TO 514045	JULURUPADU 400.00	1	-220.1	-81.2	234.6	34		0.89	15.25	5	SOUTH	51	TELANGANA					
TO 514045	JULURUPADU 400.00	2	-220.1	-81.2	234.6	34		0.89	15.25	5	SOUTH	51	TELANGANA					
TO 514051	TIPPAPUR 400.00	1	367.9	-32.0	369.3	54		0.86	14.89	5	SOUTH	58	TEL-LOAD					
TO 514051	TIPPAPUR 400.00	2	367.9	-32.0	369.3	54		0.86	14.89	5	SOUTH	58	TEL-LOAD					
TO 514064	DAMARCHLA TP400.00	1	-424.9	3.2	424.9	62		2.60	44.88	5	SOUTH	51	TELANGANA					
TO 514064	DAMARCHLA TP400.00	2	-424.9	3.2	424.9	62		2.60	44.88	5	SOUTH	51	TELANGANA					
BUS 514064	DAMARCHLA TP400.00	CKT	MW	MVAR	MVA	%	1.0000PU	-56.29	X---	LOSSES	---	X----	AREA	-----	X	-----	X	514064
							400.00KV			MW	MVAR		5	SOUTH				
FROM GENERATION			3680.0	-474.0R	3710.4	83												
TO 514058	DINDI 400.00	1	672.1	-64.2	675.1	99		5.78	100.08	5	SOUTH	51	TELANGANA					
TO 514058	DINDI 400.00	2	672.1	-64.2	675.1	99		5.78	100.08	5	SOUTH	51	TELANGANA					
TO 514063	JANAGAON 400.00	1	427.5	-72.3	433.6	64		2.60	44.88	5	SOUTH	51	TELANGANA					
TO 514063	JANAGAON 400.00	2	427.5	-72.3	433.6	64		2.60	44.88	5	SOUTH	51	TELANGANA					
TO 514065	CHOUTTUPPAL 400.00	1	408.6	-109.4	423.0	62		2.34	40.31	5	SOUTH	51	TELANGANA					
TO 514065	CHOUTTUPPAL 400.00	2	408.6	-109.4	423.0	62		2.34	40.31	5	SOUTH	51	TELANGANA					
TO 514072	DAMARACHRLA 400.00	1	331.8	8.8	332.0	49		0.05	0.87	5	SOUTH	51	TELANGANA					

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TO 514072	DAMARACHRLA	400.00	2	331.8	8.8	332.0	49			0.05	0.87	5	SOUTH	51	TELANGANA					
BUS 514065	CHOUTTUPPAL	400.00	CKT		MW	MVAR	MVA	%	1.0120PU	-61.83	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514065
									404.80KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 512153	CHOUTTUPPAL	220.00	1	193.8	46.2	199.2	66	1.0000LK		0.00		7.75		5	SOUTH			51	TELANGANA	
TO 512153	CHOUTTUPPAL	220.00	2	193.8	46.2	199.2	66	1.0000LK		0.00		7.75		5	SOUTH			51	TELANGANA	
TO 514004	KHAM	400.00	1	-160.2	-51.3	168.2	32			0.69		7.33		5	SOUTH			51	TELANGANA	
TO 514004	KHAM	400.00	2	-160.2	-51.3	168.2	32			0.69		7.33		5	SOUTH			51	TELANGANA	
TO 514012	HYD TS	400.00	1	372.6	-33.3	374.1	71			1.83		19.57		5	SOUTH			51	TELANGANA	
TO 514012	HYD TS	400.00	2	372.6	-33.3	374.1	71			1.83		19.57		5	SOUTH			51	TELANGANA	
TO 514064	DAMARCHLA TP	400.00	1	-406.2	38.4	408.0	59			2.34		40.31		5	SOUTH			51	TELANGANA	
TO 514064	DAMARCHLA TP	400.00	2	-406.2	38.4	408.0	59			2.34		40.31		5	SOUTH			51	TELANGANA	
BUS 514066	YEDULA	400.00	CKT		MW	MVAR	MVA	%	0.9874PU	-69.34	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514066
									394.96KV			MW	MVAR	5	SOUTH			58	TEL-LOAD	
TO LOAD-PQ				1170.0	351.0	1221.5														
TO 514023	VELTOOR	400.00	1	-462.1	-222.5	512.9	76			1.20		20.73		5	SOUTH			51	TELANGANA	
TO 514023	VELTOOR	400.00	2	-462.1	-222.5	512.9	76			1.20		20.73		5	SOUTH			51	TELANGANA	
TO 514058	DINDI	400.00	1	-830.2	-127.7	840.0	125			3.96		68.20		5	SOUTH			51	TELANGANA	
TO 514058	DINDI	400.00	2	-830.2	-127.7	840.0	125			3.96		68.20		5	SOUTH			51	TELANGANA	
TO 514062	VATTEM	400.00	1	225.1	39.1	228.5	34			0.31		5.29		5	SOUTH			58	TEL-LOAD	
TO 514062	VATTEM	400.00	2	225.1	39.1	228.5	34			0.31		5.29		5	SOUTH			58	TEL-LOAD	
TO 514067	NARLAPUR	400.00	1	482.2	135.6	500.9	74			0.72		12.36		5	SOUTH			58	TEL-LOAD	
TO 514067	NARLAPUR	400.00	2	482.2	135.6	500.9	74			0.72		12.36		5	SOUTH			58	TEL-LOAD	
BUS 514067	NARLAPUR	400.00	CKT		MW	MVAR	MVA	%	0.9793PU	-70.67	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514067
									391.71KV			MW	MVAR	5	SOUTH			58	TEL-LOAD	
TO LOAD-PQ				963.0	289.0	1005.4														
TO 514066	YEDULA	400.00	1	-481.5	-144.5	502.7	75			0.72		12.36		5	SOUTH			58	TEL-LOAD	
TO 514066	YEDULA	400.00	2	-481.5	-144.5	502.7	75			0.72		12.36		5	SOUTH			58	TEL-LOAD	
BUS 514072	DAMARACHRLA	400.00	CKT		MW	MVAR	MVA	%	0.9998PU	-56.44	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514072
									399.91KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 512231	DAMARACHRLA	220.00	1	221.2	7.7	221.3	74	1.0000LK		0.00		9.80		5	SOUTH			51	TELANGANA	
TO 512231	DAMARACHRLA	220.00	2	221.2	7.7	221.3	74	1.0000LK		0.00		9.80		5	SOUTH			51	TELANGANA	
TO 512231	DAMARACHRLA	220.00	3	221.2	7.7	221.3	74	1.0000LK		0.00		9.80		5	SOUTH			51	TELANGANA	
TO 514064	DAMARCHLA TP	400.00	1	-331.8	-11.6	332.0	49			0.05		0.87		5	SOUTH			51	TELANGANA	
TO 514064	DAMARCHLA TP	400.00	2	-331.8	-11.6	332.0	49			0.05		0.87		5	SOUTH			51	TELANGANA	

X-- ZONE --X	FROM GENE- RATION	-----AT FROM GENERATN	ZONE IND TO IND MOTORS	BUSES----- TO LOAD	TO BUS SHUNT	TO GNE BUS DEVICES	TO LINE SHUNT	FROM CHARGING	TO LOSSES	-NET INTERCHANGE- TO TIE LINES	TO TIES + LOADS
51 TELANGANA	11499.2 -1392.8	0.0 0.0	0.0 0.0	13257.9 4549.9	0.0 2035.0	0.0 0.0	0.0 2760.5	0.0 13363.8	267.2 3085.2	-2025.9 -459.7	-2093.0 -492.3
58 TEL-LOAD	0.0 0.0	0.0 0.0	0.0 0.0	177.1 69.6	0.0 901.2	0.0 0.0	0.0 0.0	0.0 1405.4	6.6 82.9	-183.8 351.8	-116.6 384.4
COLUMN TOTALS	11499.2 -1392.8	0.0 0.0	0.0 0.0	13435.0 4619.5	0.0 2936.2	0.0 0.0	0.0 2760.5	0.0 14769.2	273.8 3168.0	-2209.6 -107.9	-2209.6 -107.9

BUS 511176 PARIGI	132.00	CKT	MW	MVAR	MVA	% 0.9986PU	0.53	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511176
						131.81KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 511177 PARIGI	132KV	132.00	1	38.3	-12.7	40.3	60		0.00	0.00	5	SOUTH			51	TELANGANA	
TO 511177 PARIGI	132KV	132.00	2	38.3	-12.7	40.3	60		0.00	0.00	5	SOUTH			51	TELANGANA	
TO 511183 VIKARABAD	132.00	1	10.9	6.3	12.6	19			0.05	0.12	5	SOUTH			51	TELANGANA	
TO 511359 RAKAMCHERLA	132.00	1	28.9	14.1	32.2	38			0.10	0.24	5	SOUTH			51	TELANGANA	
TO 511359 RAKAMCHERLA	132.00	2	28.9	14.1	32.2	38			0.10	0.24	5	SOUTH			51	TELANGANA	
TO 512147 PARIGI	220.00	1	-72.7	-4.5	72.8	121	1.0200UN		0.00	5.53	5	SOUTH			51	TELANGANA	
TO 512147 PARIGI	220.00	2	-72.7	-4.5	72.8	121	1.0200UN		0.00	5.53	5	SOUTH			51	TELANGANA	
BUS 511195 MIRYALAGUDA	132.00	CKT	MW	MVAR	MVA	% 0.9912PU	11.68	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511195
						130.83KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO LOAD-PQ			101.0	29.0	105.1												
TO 511199 MADGULLI	132.00	1	69.7	19.2	72.3	109			1.48	3.85	5	SOUTH			51	TELANGANA	
TO 511200 DISCHINCHERL	132.00	1	71.7	19.9	74.5	112			0.88	2.35	5	SOUTH			51	TELANGANA	
TO 511283 YERRABALLI	132.00	1	41.5	14.9	44.1	53			0.46	1.11	5	SOUTH			51	TELANGANA	
TO 511284 WADPALLI NEW	132.00	1	-12.1	-26.4	29.1	35			0.04	0.10	5	SOUTH			51	TELANGANA	
TO 511284 WADPALLI NEW	132.00	2	-2.8	-6.9	7.5	11			0.01	0.02	5	SOUTH			51	TELANGANA	
TO 511284 WADPALLI NEW	132.00	3	-2.8	-6.9	7.5	11			0.01	0.02	5	SOUTH			51	TELANGANA	
TO 512047 MIRYALAGUDA	220.00	1	-81.9	-13.1	83.0	86	1.0000UN		0.00	4.38	5	SOUTH			51	TELANGANA	
TO 512047 MIRYALAGUDA	220.00	2	-81.9	-13.1	83.0	86	1.0000UN		0.00	4.38	5	SOUTH			51	TELANGANA	
TO 512047 MIRYALAGUDA	220.00	3	-51.2	-8.2	51.9	86	1.0000UN		0.00	2.74	5	SOUTH			51	TELANGANA	
TO 512047 MIRYALAGUDA	220.00	4	-51.2	-8.2	51.9	86	1.0000UN		0.00	2.74	5	SOUTH			51	TELANGANA	
BUS 511233 MALKARAM	132.00	CKT	MW	MVAR	MVA	% 0.9954PU	6.38	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511233
						131.40KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO LOAD-PQ			78.5	7.8	78.9												
TO 511234 LGMPET	132.00	1	28.2	1.4	28.3	42			0.15	0.39	5	SOUTH			51	TELANGANA	
TO 512030 MALKARAM	220.00	1	-65.7	-5.7	65.9	69	1.0000UN		0.00	2.74	5	SOUTH			51	TELANGANA	
TO 512030 MALKARAM	220.00	2	-41.0	-3.6	41.2	69	1.0000UN		0.00	1.71	5	SOUTH			51	TELANGANA	
BUS 511251 NARKETPALLY	132.00	CKT	MW	MVAR	MVA	% 0.9882PU	7.89	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511251
						130.44KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO LOAD-PQ			19.0	2.0	19.1												
TO SHUNT			0.0	-4.9	4.9												
TO 511252 RAMANNAPET	132.00	1	27.5	1.9	27.6	17			0.11	0.29	5	SOUTH			51	TELANGANA	
TO 511252 RAMANNAPET	132.00	2	27.5	1.9	27.6	17			0.11	0.29	5	SOUTH			51	TELANGANA	

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TO 511253	SHALIGOWRM	132.00	1	35.0	10.0	36.3	44	0.23	0.59	5	SOUTH	51	TELANGANA						
TO 511254	NALGONDA-1	132.00	1	65.2	15.3	67.0	81	0.65	1.70	5	SOUTH	51	TELANGANA						
TO 511254	NALGONDA-1	132.00	2	65.2	15.3	67.0	81	0.65	1.70	5	SOUTH	51	TELANGANA						
TO 511256	ATIPAMULA	132.00	1	46.6	17.2	49.7	60	0.57	1.50	5	SOUTH	51	TELANGANA						
TO 511395	PARAMPUJYA	132.00	1	-39.8	-25.0	47.0	57	0.20	0.53	5	SOUTH	51	TELANGANA						
TO 512068	NARKET	220.00	1	-47.3	-6.5	47.8	80	1.0000UN	0.00	2.34	5	SOUTH	51	TELANGANA					
TO 512068	NARKET	220.00	2	-75.8	-10.4	76.5	80	1.0000UN	0.00	3.74	5	SOUTH	51	TELANGANA					
TO 512068	NARKET	220.00	3	-47.3	-6.5	47.8	80	1.0000UN	0.00	2.34	5	SOUTH	51	TELANGANA					
TO 512068	NARKET	220.00	4	-75.8	-10.4	76.5	80	1.0000UN	0.00	3.74	5	SOUTH	51	TELANGANA					
BUS 511252	RAMANNAPET	132.00	CKT	MW	MVAR	MVA	%	0.9835PU	7.31	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511252
								129.82KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO LOAD-PQ				60.0	19.0	62.9													
TO SHUNT				0.0	-19.3	19.3													
TO 511251	NARKETPALLY	132.00	1	-27.4	-2.4	27.5	17		0.11	0.29	5	SOUTH					51	TELANGANA	
TO 511251	NARKETPALLY	132.00	2	-27.4	-2.4	27.5	17		0.11	0.29	5	SOUTH					51	TELANGANA	
TO 511272	CHOUTUPPAL	132.00	3	-2.6	2.5	3.6	4		0.01	0.01	5	SOUTH					51	TELANGANA	
TO 511272	CHOUTUPPAL	132.00	4	-2.6	2.5	3.6	4		0.01	0.01	5	SOUTH					51	TELANGANA	
BUS 511257	CHOTUPPAL132132.00	CKT	MW	MVAR	MVA	%	0.9743PU	7.07	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511257	
								128.61KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO LOAD-PQ				77.0	34.0	84.2													
TO 511272	CHOUTUPPAL	132.00	1	-38.5	-17.0	42.1	51		0.17	0.41	5	SOUTH					51	TELANGANA	
TO 511272	CHOUTUPPAL	132.00	2	-38.5	-17.0	42.1	51		0.17	0.41	5	SOUTH					51	TELANGANA	
BUS 511266	SURYAPET	132.00	CKT	MW	MVAR	MVA	%	0.9841PU	7.80	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511266
								129.90KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 511133	THUNGATURTHI	132.00	1	-3.4	-16.8	17.1	21		0.08	0.18	5	SOUTH					51	TELANGANA	
TO 511133	THUNGATURTHI	132.00	2	-3.4	-16.8	17.1	21		0.08	0.18	5	SOUTH					51	TELANGANA	
TO 511196	SURYAPET	132132.00	1	80.6	31.9	86.7	105		0.51	1.20	5	SOUTH					51	TELANGANA	
TO 511196	SURYAPET	132132.00	2	80.6	31.9	86.7	105		0.51	1.20	5	SOUTH					51	TELANGANA	
TO 511253	SHALIGOWRM	132.00	1	15.8	0.5	15.8	19		0.08	0.20	5	SOUTH					51	TELANGANA	
TO 511253	SHALIGOWRM	132.00	2	15.8	0.5	15.8	19		0.08	0.20	5	SOUTH					51	TELANGANA	
TO 512049	SURYAPET2	220.00	1	-93.0	-15.6	94.3	157	1.0000UN	0.00	9.19	5	SOUTH					51	TELANGANA	
TO 512049	SURYAPET2	220.00	2	-93.0	-15.6	94.3	157	1.0000UN	0.00	9.19	5	SOUTH					51	TELANGANA	
BUS 511271	DANDUMALKAPU132.00	CKT	MW	MVAR	MVA	%	0.9686PU	6.48	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511271	
								127.86KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO LOAD-PQ				67.5	18.6	70.0													
TO 511272	CHOUTUPPAL	132.00	1	-33.8	-9.3	35.0	43		0.30	0.72	5	SOUTH					51	TELANGANA	
TO 511272	CHOUTUPPAL	132.00	2	-33.8	-9.3	35.0	43		0.30	0.72	5	SOUTH					51	TELANGANA	
BUS 511272	CHOUTUPPAL	132.00	CKT	MW	MVAR	MVA	%	0.9818PU	7.48	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511272
								129.60KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 511252	RAMANNAPET	132.00	3	2.6	-4.1	4.9	6		0.01	0.01	5	SOUTH					51	TELANGANA	
TO 511252	RAMANNAPET	132.00	4	2.6	-4.1	4.9	6		0.01	0.01	5	SOUTH					51	TELANGANA	
TO 511257	CHOTUPPAL132132.00	1	38.7	16.9	42.2	51		0.17	0.41	5	SOUTH						51	TELANGANA	
TO 511257	CHOTUPPAL132132.00	2	38.7	16.9	42.2	51		0.17	0.41	5	SOUTH						51	TELANGANA	
TO 511271	DANDUMALKAPU132.00	1	34.1	8.8	35.2	43		0.30	0.72	5	SOUTH						51	TELANGANA	
TO 511271	DANDUMALKAPU132.00	2	34.1	8.8	35.2	43		0.30	0.72	5	SOUTH						51	TELANGANA	
TO 512153	CHOUTTUPPAL	220.00	1	-75.3	-21.6	78.4	131	1.0000UN	0.00	6.37	5	SOUTH					51	TELANGANA	
TO 512153	CHOUTTUPPAL	220.00	2	-75.3	-21.6	78.4	131	1.0000UN	0.00	6.37	5	SOUTH					51	TELANGANA	
BUS 511360	HUZURNAGAR	132.00	CKT	MW	MVAR	MVA	%	0.9707PU	9.58	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511360
								128.13KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 511198	MATTAMPALLY	132.00	1	60.7	20.6	64.1	79		0.62	1.49	5	SOUTH					51	TELANGANA	
TO 511198	MATTAMPALLY	132.00	2	60.7	20.6	64.1	79		0.62	1.49	5	SOUTH					51	TELANGANA	
TO 511202	VERPRM	132.00	1	4.5	-4.4	6.3	8		0.00	0.01	5	SOUTH					51	TELANGANA	
TO 511202	VERPRM	132.00	2	4.5	-4.4	6.3	8		0.00	0.01	5	SOUTH					51	TELANGANA	

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TO	512157	HUZURANAGAR	220.00	1	-65.2	-16.2	67.2	112	1.0000UN	0.00	4.79	5	SOUTH	51	TELANGANA					
TO	512157	HUZURANAGAR	220.00	2	-65.2	-16.2	67.2	112	1.0000UN	0.00	4.79	5	SOUTH	51	TELANGANA					
BUS	512004	KHAM	220.00	CKT	MW	MVAR	MVA	%	1.0101PU 222.23KV	14.20	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512004
TO	512139	KHAMMAM-TS	220.00	1	76.6	71.3	104.7	27		0.00	0.00	5	SOUTH	51	TELANGANA					
TO	512139	KHAMMAM-TS	220.00	2	76.6	71.3	104.7	27		0.00	0.00	5	SOUTH	51	TELANGANA					
TO	514004	KHAM	400.00	1	-42.7	-39.8	58.4	31	1.0000UN	0.00	1.06	5	SOUTH	51	TELANGANA					
TO	514004	KHAM	400.00	2	-42.7	-39.8	58.4	31	1.0000UN	0.00	1.06	5	SOUTH	51	TELANGANA					
TO	514004	KHAM	400.00	3	-67.8	-63.1	92.7	31	1.0000UN	0.00	1.68	5	SOUTH	51	TELANGANA					
BUS	512011	HYD TS	220.00	CKT	MW	MVAR	MVA	%	1.0138PU 223.03KV	8.71	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512011
TO	512022	CHANDRGUTTA	220.00	1	104.7	-23.3	107.3	55		0.34	1.84	5	SOUTH	51	TELANGANA					
TO	512099	SHAMSD	220.00	1	121.1	12.6	121.7	63		0.45	2.39	5	SOUTH	51	TELANGANA					
TO	512119	FABCITY	220.00	1	-78.4	-8.7	78.9	41		0.02	0.21	5	SOUTH	51	TELANGANA					
TO	512119	FABCITY	220.00	2	-78.4	-8.7	78.9	41		0.02	0.21	5	SOUTH	51	TELANGANA					
TO	512121	KOTHUR	220.00	1	81.9	11.1	82.6	42		0.44	2.37	5	SOUTH	51	TELANGANA					
TO	512126	SHIVRAMPALLI	220.00	1	186.1	43.6	191.1	44		0.96	5.42	5	SOUTH	51	TELANGANA					
TO	512127	HIAL-AIRPORT	220.00	1	145.5	10.0	145.9	33		0.08	0.44	5	SOUTH	51	TELANGANA					
TO	512127	HIAL-AIRPORT	220.00	2	145.5	10.0	145.9	33		0.08	0.44	5	SOUTH	51	TELANGANA					
TO	514012	HYD TS	400.00	1	-157.0	-11.7	157.4	83	1.0000UN	0.00	7.66	5	SOUTH	51	TELANGANA					
TO	514012	HYD TS	400.00	2	-157.0	-11.7	157.4	83	1.0000UN	0.00	7.66	5	SOUTH	51	TELANGANA					
TO	514012	HYD TS	400.00	3	-157.0	-11.7	157.4	83	1.0000UN	0.00	7.66	5	SOUTH	51	TELANGANA					
TO	514012	HYD TS	400.00	4	-157.0	-11.7	157.4	83	1.0000UN	0.00	7.66	5	SOUTH	51	TELANGANA					
BUS	512018	VELTOOR	220.00	CKT	MW	MVAR	MVA	%	1.0095PU 222.08KV	9.31	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512018
TO	512012	JURALA SS	220.00	1	31.4	40.1	50.9	25		0.12	0.62	5	SOUTH	51	TELANGANA					
TO	512079	BHOOTPUR	220.00	1	59.8	14.5	61.5	30		0.27	1.42	5	SOUTH	51	TELANGANA					
TO	512079	BHOOTPUR	220.00	2	59.8	14.5	61.5	30		0.27	1.42	5	SOUTH	51	TELANGANA					
TO	512086	WANPRTHY	220.00	1	128.5	-9.6	128.8	67		0.55	2.92	5	SOUTH	51	TELANGANA					
TO	512086	WANPRTHY	220.00	2	128.5	-9.6	128.8	67		0.55	2.92	5	SOUTH	51	TELANGANA					
TO	512152	THIMMAJIPET	220.00	1	53.9	21.7	58.1	30		0.06	0.86	5	SOUTH	51	TELANGANA					
TO	512152	THIMMAJIPET	220.00	2	53.9	21.7	58.1	30		0.06	0.86	5	SOUTH	51	TELANGANA					
TO	512163	LOWERJURALA	220.00	1	3.8	37.3	37.5	19		0.07	0.37	5	SOUTH	51	TELANGANA					
TO	512188	GUDIPALIGATU	220.00	1	51.9	-3.7	52.0	27		0.18	0.98	5	SOUTH	58	TEL-LOAD					
TO	512188	GUDIPALIGATU	220.00	2	51.9	-3.7	52.0	27		0.18	0.98	5	SOUTH	58	TEL-LOAD					
TO	512227	RENEW_VLT	220.00	1	-74.9	24.1	78.7	37		0.07	0.48	5	SOUTH	51	TELANGANA					
TO	512228	SUZLON_VLT	220.00	1	-74.9	24.2	78.7	37		0.07	0.43	5	SOUTH	51	TELANGANA					
TO	512229	TRANFRM_VLT	220.00	1	-75.0	24.8	79.0	37		0.02	0.11	5	SOUTH	51	TELANGANA					
TO	512230	AKSHAY_VLT	220.00	1	-74.9	24.2	78.7	37		0.07	0.45	5	SOUTH	51	TELANGANA					
TO	514023	VELTOOR	400.00	1	-80.9	-55.1	97.9	52	1.0000UN	0.00	2.99	5	SOUTH	51	TELANGANA					
TO	514023	VELTOOR	400.00	2	-80.9	-55.1	97.9	52	1.0000UN	0.00	2.99	5	SOUTH	51	TELANGANA					
TO	514023	VELTOOR	400.00	3	-80.9	-55.1	97.9	52	1.0000UN	0.00	2.99	5	SOUTH	51	TELANGANA					
TO	514023	VELTOOR	400.00	4	-80.9	-55.1	97.9	52	1.0000UN	0.00	2.99	5	SOUTH	51	TELANGANA					
BUS	512029	SHANKARPALLY	220.00	CKT	MW	MVAR	MVA	%	1.0041PU 220.91KV	7.29	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512029
TO	512052	YEDDUMAILARA	220.00	1	90.1	3.0	90.2	45		0.19	1.00	5	SOUTH	51	TELANGANA					
TO	512052	YEDDUMAILARA	220.00	2	90.1	3.0	90.2	45		0.19	1.00	5	SOUTH	51	TELANGANA					
TO	512060	GBOWLI	220.00	1	35.7	11.7	37.6	9		0.06	0.33	5	SOUTH	51	TELANGANA					
TO	512060	GBOWLI	220.00	2	43.5	15.1	46.0	11		0.07	0.41	5	SOUTH	51	TELANGANA					
TO	512100	KETHIREDDYPA	220.00	1	-33.8	-7.3	34.6	18		0.04	0.21	5	SOUTH	51	TELANGANA					
TO	512123	SADASIVPET	220.00	1	39.8	-1.7	39.8	21		0.09	0.51	5	SOUTH	51	TELANGANA					
TO	512123	SADASIVPET	220.00	2	39.8	-1.7	39.8	21		0.09	0.51	5	SOUTH	51	TELANGANA					
TO	512135	TANDUR	220.00	1	118.2	24.5	120.7	63		1.90	10.12	5	SOUTH	51	TELANGANA					
TO	512147	PARIGI	220.00	1	119.3	24.9	121.9	63		1.04	5.52	5	SOUTH	51	TELANGANA					
TO	512147	PARIGI	220.00	2	119.3	24.9	121.9	63		1.04	5.52	5	SOUTH	51	TELANGANA					

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TO 512171	RCPURAM	220.00	1	80.1	17.3	82.0	34	0.23	1.22	5	SOUTH	51	TELANGANA						
TO 512171	RCPURAM	220.00	2	80.1	17.3	82.0	34	0.23	1.22	5	SOUTH	51	TELANGANA						
TO 514035	SHANKARPALLY400.00	400.00	1	-179.2	-28.6	181.5	96	1.0000UN	0.00	10.37	5	SOUTH	51	TELANGANA					
TO 514035	SHANKARPALLY400.00	400.00	2	-179.2	-28.6	181.5	96	1.0000UN	0.00	10.37	5	SOUTH	51	TELANGANA					
TO 514035	SHANKARPALLY400.00	400.00	3	-179.2	-28.6	181.5	96	1.0000UN	0.00	10.37	5	SOUTH	51	TELANGANA					
TO 514035	SHANKARPALLY400.00	400.00	4	-284.5	-45.3	288.1	96	1.0000UN	0.00	16.47	5	SOUTH	51	TELANGANA					
BUS 512030	MALKARAM	220.00	CKT	MW	MVAR	MVA	%	0.9999PU 219.97KV	8.74	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512030
TO 511233	MALKARAM	132.00	1	65.7	8.4	66.2	69	1.0000LK	0.00	2.74	5	SOUTH	51	TELANGANA					
TO 511233	MALKARAM	132.00	2	41.0	5.3	41.4	69	1.0000LK	0.00	1.71	5	SOUTH	51	TELANGANA					
TO 512021	BHONG2	220.00	1	-34.0	7.6	34.8	17	0.14	0.76	5	SOUTH	51	TELANGANA						
TO 512021	BHONG2	220.00	2	-34.0	7.6	34.8	17	0.14	0.76	5	SOUTH	51	TELANGANA						
TO 512053	SHPR	220.00	1	156.9	-3.2	156.9	36	0.69	3.91	5	SOUTH	51	TELANGANA						
TO 512053	SHPR	220.00	2	156.9	-3.2	156.9	36	0.69	3.91	5	SOUTH	51	TELANGANA						
TO 512096	MEDCHAL	220.00	1	67.5	33.6	75.4	44	0.11	0.65	5	SOUTH	51	TELANGANA						
TO 512096	MEDCHAL	220.00	2	67.5	33.6	75.4	44	0.11	0.65	5	SOUTH	51	TELANGANA						
TO 512124	GUNROCK	220.00	1	109.2	12.8	109.9	58	0.30	1.60	5	SOUTH	51	TELANGANA						
TO 512124	GUNROCK	220.00	2	109.2	12.8	109.9	58	0.30	1.60	5	SOUTH	51	TELANGANA						
TO 512153	CHOUTTUPPAL	220.00	1	-68.7	-0.8	68.7	29	0.70	3.73	5	SOUTH	51	TELANGANA						
TO 512153	CHOUTTUPPAL	220.00	2	-68.7	-0.8	68.7	29	0.70	3.73	5	SOUTH	51	TELANGANA						
TO 514036	MALKARM4	400.00	1	-142.1	-28.5	145.0	76	1.0000UN	0.00	6.67	5	SOUTH	51	TELANGANA					
TO 514036	MALKARM4	400.00	2	-142.1	-28.5	145.0	76	1.0000UN	0.00	6.67	5	SOUTH	51	TELANGANA					
TO 514036	MALKARM4	400.00	3	-142.1	-28.5	145.0	76	1.0000UN	0.00	6.67	5	SOUTH	51	TELANGANA					
TO 514036	MALKARM4	400.00	4	-142.1	-28.5	145.0	76	1.0000UN	0.00	6.67	5	SOUTH	51	TELANGANA					
BUS 512047	MIRYALAGUDA	220.00	CKT	MW	MVAR	MVA	%	1.0008PU 220.17KV	14.64	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512047
TO 511195	MIRYALAGUDA	132.00	1	81.9	17.5	83.8	87	1.0000LK	0.00	4.38	5	SOUTH	51	TELANGANA					
TO 511195	MIRYALAGUDA	132.00	2	81.9	17.5	83.8	87	1.0000LK	0.00	4.38	5	SOUTH	51	TELANGANA					
TO 511195	MIRYALAGUDA	132.00	3	51.2	10.9	52.4	87	1.0000LK	0.00	2.74	5	SOUTH	51	TELANGANA					
TO 511195	MIRYALAGUDA	132.00	4	51.2	10.9	52.4	87	1.0000LK	0.00	2.74	5	SOUTH	51	TELANGANA					
TO 512028	KOTH	220.00	1	-43.7	-11.2	45.1	23	0.44	2.36	5	SOUTH	51	TELANGANA						
TO 512049	SURYAPET2	220.00	1	87.2	-31.0	92.5	49	0.43	2.29	5	SOUTH	51	TELANGANA						
TO 512049	SURYAPET2	220.00	2	87.2	-31.0	92.5	49	0.43	2.29	5	SOUTH	51	TELANGANA						
TO 512129	CHALAKURTY	220.00	1	119.1	-30.2	122.9	64	1.21	6.53	5	SOUTH	51	TELANGANA						
TO 512231	DAMARACHRLA	220.00	1	-258.0	23.2	259.0	54	0.72	9.76	5	SOUTH	51	TELANGANA						
TO 512231	DAMARACHRLA	220.00	2	-258.0	23.2	259.0	54	0.72	9.76	5	SOUTH	51	TELANGANA						
BUS 512049	SURYAPET2	220.00	CKT	MW	MVAR	MVA	%	1.0044PU 220.97KV	13.20	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512049
TO 511266	SURYAPET	132.00	1	93.0	24.8	96.3	161	1.0000LK	0.00	9.19	5	SOUTH	51	TELANGANA					
TO 511266	SURYAPET	132.00	2	93.0	24.8	96.3	161	1.0000LK	0.00	9.19	5	SOUTH	51	TELANGANA					
TO 512035	CHILAKAL	220.00	1	50.5	13.7	52.3	27	0.29	1.56	5	SOUTH	50	ANDHRA						
TO 512047	MIRYALAGUDA	220.00	1	-86.7	28.6	91.3	48	0.43	2.29	5	SOUTH	51	TELANGANA						
TO 512047	MIRYALAGUDA	220.00	2	-86.7	28.6	91.3	48	0.43	2.29	5	SOUTH	51	TELANGANA						
TO 512068	NARKET	220.00	1	75.8	-3.2	75.9	40	0.63	3.36	5	SOUTH	51	TELANGANA						
TO 512068	NARKET	220.00	2	73.4	-3.4	73.5	34	0.61	3.26	5	SOUTH	51	TELANGANA						
TO 512139	KHAMMAM-TS	220.00	1	-34.6	-8.7	35.7	19	0.12	0.63	5	SOUTH	51	TELANGANA						
TO 512139	KHAMMAM-TS	220.00	2	-34.6	-8.7	35.7	19	0.12	0.63	5	SOUTH	51	TELANGANA						
TO 512157	HUZURANAGAR	220.00	1	-4.7	36.2	36.5	17	0.11	0.60	5	SOUTH	51	TELANGANA						
TO 514037	SURYPET4	400.00	1	-69.2	-66.3	95.8	50	1.0000UN	0.00	2.89	5	SOUTH	51	TELANGANA					
TO 514037	SURYPET4	400.00	2	-69.2	-66.3	95.8	50	1.0000UN	0.00	2.89	5	SOUTH	51	TELANGANA					
BUS 512068	NARKET	220.00	CKT	MW	MVAR	MVA	%	0.9959PU 219.11KV	10.65	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512068
TO 511251	NARKETPALLY	132.00	1	47.3	8.8	48.2	80	1.0000LK	0.00	2.34	5	SOUTH	51	TELANGANA					
TO 511251	NARKETPALLY	132.00	2	75.8	14.1	77.1	80	1.0000LK	0.00	3.74	5	SOUTH	51	TELANGANA					

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TO 511251	NARKETPALLY	132.00	3	47.3	8.8	48.2	80	1.0000LK	0.00	2.34	5	SOUTH	51	TELANGANA					
TO 511251	NARKETPALLY	132.00	4	75.8	14.1	77.1	80	1.0000LK	0.00	3.74	5	SOUTH	51	TELANGANA					
TO 512049	SURYAPET2	220.00	1	-75.2	-3.6	75.2	40		0.63	3.36	5	SOUTH	51	TELANGANA					
TO 512049	SURYAPET2	220.00	2	-72.8	-3.8	72.9	34		0.61	3.26	5	SOUTH	51	TELANGANA					
TO 512153	CHOUTTUPPAL	220.00	1	-49.1	-18.0	52.3	22		0.22	1.19	5	SOUTH	51	TELANGANA					
TO 512153	CHOUTTUPPAL	220.00	2	-49.1	-18.0	52.3	22		0.22	1.19	5	SOUTH	51	TELANGANA					
TO 512209	UDAYASAMUDRM	220.00	1	0.0	-1.3	1.3	1		0.00	0.00	5	SOUTH	58	TEL-LOAD					
TO 512209	UDAYASAMUDRM	220.00	2	0.0	-1.3	1.3	1		0.00	0.00	5	SOUTH	58	TEL-LOAD					
BUS 512082	MAHESH-TS2	220.00	CKT	MW	MVAR	MVA	%	1.0163PU 223.60KV	9.15	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512082
TO 512119	FABCITY	220.00	1	157.1	26.6	159.3	82		0.19	0.85	5	SOUTH	51	TELANGANA					
TO 512119	FABCITY	220.00	2	157.1	26.6	159.3	82		0.19	0.85	5	SOUTH	51	TELANGANA					
TO 512120	BONGULURU	220.00	1	73.9	-8.2	74.4	38		0.22	1.13	5	SOUTH	51	TELANGANA					
TO 512120	BONGULURU	220.00	2	73.9	-8.2	74.4	38		0.22	1.13	5	SOUTH	51	TELANGANA					
TO 512180	MADGULA	220.00	1	-14.3	24.8	28.6	15		0.05	0.28	5	SOUTH	51	TELANGANA					
TO 512180	MADGULA	220.00	2	-14.3	24.8	28.6	15		0.05	0.28	5	SOUTH	51	TELANGANA					
TO 514049	MAHESH-TS	400.00	1	-216.7	-43.1	221.0	74	1.0000UN	0.00	9.45	5	SOUTH	51	TELANGANA					
TO 514049	MAHESH-TS	400.00	2	-216.7	-43.1	221.0	74	1.0000UN	0.00	9.45	5	SOUTH	51	TELANGANA					
BUS 512100	KETHIREDDYPA	220.00	CKT	MW	MVAR	MVA	%	1.0063PU 221.38KV	7.62	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512100
TO 511207	KETHIREDDYPA	132.00	1	14.0	7.5	15.8	26	1.0000LK	0.00	0.25	5	SOUTH	51	TELANGANA					
TO 511207	KETHIREDDYPA	132.00	2	14.0	7.5	15.8	26	1.0000LK	0.00	0.25	5	SOUTH	51	TELANGANA					
TO 512029	SHANKARPALLY	220.00	1	33.9	4.4	34.2	18		0.04	0.21	5	SOUTH	51	TELANGANA					
TO 512052	YEDDUMAILARA	220.00	1	60.2	3.2	60.2	31		0.19	1.03	5	SOUTH	51	TELANGANA					
TO 512098	SHADNGR	220.00	1	45.1	4.8	45.4	23		0.12	0.61	5	SOUTH	51	TELANGANA					
TO 512121	KOTHUR	220.00	1	35.7	1.2	35.7	18		0.06	0.31	5	SOUTH	51	TELANGANA					
TO 512143	KP LDP LI	220.00	1	0.0	-6.6	6.6	3		0.00	0.00	5	SOUTH	58	TEL-LOAD					
TO 512143	KP LDP LI	220.00	2	0.0	-6.6	6.6	3		0.00	0.00	5	SOUTH	58	TEL-LOAD					
TO 512220	CHANDANAVALY	220.00	1	35.3	11.5	37.2	15		0.03	0.14	5	SOUTH	51	TELANGANA					
TO 512220	CHANDANAVALY	220.00	2	35.3	11.5	37.2	15		0.03	0.14	5	SOUTH	51	TELANGANA					
TO 514054	KETHIREDDYPA	400.00	1	-136.7	-19.2	138.1	73	1.0000UN	0.00	5.98	5	SOUTH	51	TELANGANA					
TO 514054	KETHIREDDYPA	400.00	2	-136.7	-19.2	138.1	73	1.0000UN	0.00	5.98	5	SOUTH	51	TELANGANA					
BUS 512131	DINDI	220.00	CKT	MW	MVAR	MVA	%	1.0100PU 222.21KV	10.64	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512131
TO LOAD-PQ				47.4	17.0	50.4													
TO 512027	KLWKRT	220.00	1	117.3	25.4	120.0	63		0.53	2.81	5	SOUTH	51	TELANGANA					
TO 512027	KLWKRT	220.00	2	117.3	25.4	120.0	63		0.53	2.81	5	SOUTH	51	TELANGANA					
TO 512073	SRIS	220.00	1	7.0	7.9	10.5	4		0.03	0.16	5	SOUTH	50	ANDHRA					
TO 512151	NAGARKURNUL	220.00	1	45.7	6.1	46.1	24		0.04	0.54	5	SOUTH	51	TELANGANA					
TO 512151	NAGARKURNUL	220.00	2	45.7	6.1	46.1	24		0.04	0.54	5	SOUTH	51	TELANGANA					
TO 512154	KMPALLI	220.00	1	13.6	16.7	21.6	11		0.01	0.12	5	SOUTH	51	TELANGANA					
TO 512154	KMPALLI	220.00	2	13.6	16.7	21.6	11		0.01	0.12	5	SOUTH	51	TELANGANA					
TO 512180	MADGULA	220.00	1	64.5	-11.3	65.5	34		0.24	1.30	5	SOUTH	51	TELANGANA					
TO 512180	MADGULA	220.00	2	64.5	-11.3	65.5	34		0.24	1.30	5	SOUTH	51	TELANGANA					
TO 512232	DOMALAPANTA	220.00	1	7.3	7.9	10.8	4		0.03	0.16	5	SOUTH	51	TELANGANA					
TO 514058	DINDI	400.00	1	-181.3	-35.6	184.7	62	1.0000UN	0.00	6.69	5	SOUTH	51	TELANGANA					
TO 514058	DINDI	400.00	2	-181.3	-35.6	184.7	62	1.0000UN	0.00	6.69	5	SOUTH	51	TELANGANA					
TO 514058	DINDI	400.00	3	-181.3	-35.6	184.7	62	1.0000UN	0.00	6.69	5	SOUTH	51	TELANGANA					
BUS 512143	KP LDP LI	220.00	CKT	MW	MVAR	MVA	%	1.0075PU 221.65KV	7.61	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512143
TO 512100	KETHIREDDYPA	220.00	1	-0.0	0.0	0.0	0		0.00	0.00	5	SOUTH	58	TEL-LOAD					
TO 512100	KETHIREDDYPA	220.00	2	-0.0	0.0	0.0	0		0.00	0.00	5	SOUTH	51	TELANGANA					
BUS 512145	HAYAT NAGAR	220.00	CKT	MW	MVAR	MVA	%	1.0172PU 223.79KV	7.61	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512145

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TO LOAD-PQ				77.5	25.3	81.5														
TO 512002 HYD PGCIL	220.00	1		-34.7	-12.3	36.8	19		0.07	0.37	5	SOUTH			51	TELANGANA				
TO 512159 KACHAVANI SI	220.00	1		-42.8	-13.0	44.8	23		0.05	0.28	5	SOUTH			51	TELANGANA				
BUS 512147 PARIGI	220.00	CKT		MW	MVAR	MVA	%	0.9864PU	4.85	X---	LOSSES	---	X----	AREA	-----	X----	ZONE	-----	X	512147
								217.01KV			MW	MVAR		5	SOUTH					
TO 511176 PARIGI	132.00	1		72.7	10.0	73.4	122	1.0000LK			0.00	5.53		5	SOUTH					
TO 511176 PARIGI	132.00	2		72.7	10.0	73.4	122	1.0000LK			0.00	5.53		5	SOUTH					
TO 512029 SHANKARPALLY	220.00	1		-118.3	-25.7	121.0	64				1.04	5.52		5	SOUTH					
TO 512029 SHANKARPALLY	220.00	2		-118.3	-25.7	121.0	64				1.04	5.52		5	SOUTH					
TO 512161 KOSIGI	220.00	1		45.6	15.6	48.2	25				0.16	0.84		5	SOUTH					
TO 512161 KOSIGI	220.00	2		45.6	15.6	48.2	25				0.16	0.84		5	SOUTH					
BUS 512148 JANGAON	220.00	CKT		MW	MVAR	MVA	%	0.9992PU	12.50	X---	LOSSES	---	X----	AREA	-----	X----	ZONE	-----	X	512148
								219.83KV			MW	MVAR		5	SOUTH					
TO 512021 BHONG2	220.00	1		88.0	-12.8	88.9	42				0.71	3.89		5	SOUTH					
TO 512021 BHONG2	220.00	2		88.0	-12.8	88.9	42				0.71	3.89		5	SOUTH					
TO 512053 SHPR	220.00	1		104.7	-17.2	106.1	50				1.66	9.39		5	SOUTH					
TO 512055 WADDEKOT	220.00	1		22.7	34.6	41.3	19				0.23	1.24		5	SOUTH					
TO 512055 WADDEKOT	220.00	2		22.7	34.6	41.3	19				0.23	1.24		5	SOUTH					
TO 512055 WADDEKOT	220.00	3		25.8	41.0	48.5	23				0.26	1.42		5	SOUTH					
TO 512150 HUSNABAD	220.00	1		48.8	1.5	48.8	26				0.22	1.20		5	SOUTH					
TO 512150 HUSNABAD	220.00	2		48.8	1.5	48.8	26				0.22	1.20		5	SOUTH					
TO 512193 JANGAON 220	220.00	1		85.8	44.1	96.5	50				0.22	1.17		5	SOUTH					
TO 512193 JANGAON 220	220.00	2		85.8	44.1	96.5	50				0.22	1.17		5	SOUTH					
TO 512204 DEVANNAPET L	220.00	1		0.0	-7.8	7.8	3				0.00	0.01		5	SOUTH					58 TEL-LOAD
TO 512204 DEVANNAPET L	220.00	2		0.0	-7.8	7.8	3				0.00	0.01		5	SOUTH					58 TEL-LOAD
TO 514063 JANAGAON	400.00	1		-207.0	-47.6	212.4	71	1.0000UN			0.00	9.04		5	SOUTH					51 TELANGANA
TO 514063 JANAGAON	400.00	2		-207.0	-47.6	212.4	71	1.0000UN			0.00	9.04		5	SOUTH					51 TELANGANA
TO 514063 JANAGAON	400.00	3		-207.0	-47.6	212.4	71	1.0000UN			0.00	9.04		5	SOUTH					51 TELANGANA
BUS 512153 CHOOTTUPPAL	220.00	CKT		MW	MVAR	MVA	%	1.0068PU	11.85	X---	LOSSES	---	X----	AREA	-----	X----	ZONE	-----	X	512153
								221.49KV			MW	MVAR		5	SOUTH					
TO 511272 CHOUTUPPAL	132.00	1		75.3	28.0	80.4	134	1.0000LK			0.00	6.37		5	SOUTH					
TO 511272 CHOUTUPPAL	132.00	2		75.3	28.0	80.4	134	1.0000LK			0.00	6.37		5	SOUTH					
TO 512030 MALKARAM	220.00	1		69.4	-9.1	70.0	29				0.70	3.73		5	SOUTH					
TO 512030 MALKARAM	220.00	2		69.4	-9.1	70.0	29				0.70	3.73		5	SOUTH					
TO 512068 NARKET	220.00	1		49.3	11.4	50.6	21				0.22	1.19		5	SOUTH					
TO 512068 NARKET	220.00	2		49.3	11.4	50.6	21				0.22	1.19		5	SOUTH					
TO 514065 CHOOTTUPPAL	400.00	1		-194.1	-30.3	196.4	65	1.0000UN			0.00	7.61		5	SOUTH					
TO 514065 CHOOTTUPPAL	400.00	2		-194.1	-30.3	196.4	65	1.0000UN			0.00	7.61		5	SOUTH					
BUS 512157 HUZURANAGAR	220.00	CKT		MW	MVAR	MVA	%	0.9896PU	13.47	X---	LOSSES	---	X----	AREA	-----	X----	ZONE	-----	X	512157
								217.72KV			MW	MVAR		5	SOUTH					
TO 511360 HUZURNAGAR	132.00	1		65.2	21.0	68.5	114	1.0000LK			0.00	4.79		5	SOUTH					
TO 511360 HUZURNAGAR	132.00	2		65.2	21.0	68.5	114	1.0000LK			0.00	4.79		5	SOUTH					
TO 512035 CHILAKAL	220.00	2		75.8	-16.4	77.6	37				0.43	2.30		5	SOUTH					50 ANDHRA
TO 512049 SURYAPET2	220.00	1		4.9	-42.2	42.5	20				0.11	0.60		5	SOUTH					51 TELANGANA
TO 512156 PULICHINTALA	220.00	1		38.7	4.5	39.0	18				0.09	0.48		5	SOUTH					51 TELANGANA
TO 512194 SEETAPURAM	220.00	1		58.5	9.5	59.2	28				0.16	0.87		5	SOUTH					51 TELANGANA
TO 512231 DAMARACHRLA	220.00	1		-154.1	1.3	154.1	65				1.69	9.01		5	SOUTH					51 TELANGANA
TO 512231 DAMARACHRLA	220.00	2		-154.1	1.3	154.1	65				1.69	9.01		5	SOUTH					51 TELANGANA
BUS 512231 DAMARACHRLA	220.00	CKT		MW	MVAR	MVA	%	1.0005PU	16.80	X---	LOSSES	---	X----	AREA	-----	X----	ZONE	-----	X	512231
								220.11KV			MW	MVAR		5	SOUTH					
TO 512047 MIRYALAGUDA	220.00	1		258.7	-18.4	259.4	54				0.72	9.76		5	SOUTH					
TO 512047 MIRYALAGUDA	220.00	2		258.7	-18.4	259.4	54				0.72	9.76		5	SOUTH					
TO 512157 HUZURANAGAR	220.00	1		155.8	1.4	155.8	65				1.69	9.01		5	SOUTH					
TO 512157 HUZURANAGAR	220.00	2		155.8	1.4	155.8	65				1.69	9.01		5	SOUTH					

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TO	514072	DAMARACHRLA	400.00	1	-276.4	11.4	276.6	92	1.0000UN	0.00	15.29	5	SOUTH	51	TELANGANA							
TO	514072	DAMARACHRLA	400.00	2	-276.4	11.4	276.6	92	1.0000UN	0.00	15.29	5	SOUTH	51	TELANGANA							
TO	514072	DAMARACHRLA	400.00	3	-276.4	11.4	276.6	92	1.0000UN	0.00	15.29	5	SOUTH	51	TELANGANA							
BUS	514004	KHAM	400.00	CKT	MW	MVAR	MVA	%	1.0227PU 409.09KV	14.95	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514004		
												MW	MVAR	5	SOUTH					51	TELANGANA	
TO	512004	KHAM	220.00	1	42.7	40.8	59.1	31	1.0000LK	0.00	1.06	5	SOUTH	51	TELANGANA							
TO	512004	KHAM	220.00	2	42.7	40.8	59.1	31	1.0000LK	0.00	1.06	5	SOUTH	51	TELANGANA							
TO	512004	KHAM	220.00	3	67.8	64.8	93.8	31	1.0000LK	0.00	1.68	5	SOUTH	51	TELANGANA							
TO	514003	TALAPALLI	400.00	1	184.9	-73.6	199.0	38		0.91	10.12	5	SOUTH	51	TELANGANA							
TO	514003	TALAPALLI	400.00	2	178.8	-74.0	193.5	37		0.88	9.79	5	SOUTH	51	TELANGANA							
TO	514003	TALAPALLI	400.00	3	178.8	-74.0	193.5	37		0.88	9.79	5	SOUTH	51	TELANGANA							
TO	514005	VIJW	400.00	1	-2.1	-49.9	50.0	9		0.01	0.06	5	SOUTH	50	ANDHRA							
TO	514016	VIZPOOL	400.00	1	-225.2	12.4	225.6	43		3.61	40.27	5	SOUTH	50	ANDHRA							
TO	514034	KOTH-VI	400.00	1	-230.6	20.8	231.5	44		0.64	6.85	5	SOUTH	51	TELANGANA							
TO	514043	OGLAPUR PGCI	400.00	1	45.5	-3.4	45.7	9		0.05	0.54	5	SOUTH	51	TELANGANA							
TO	514044	KOTH-VII	400.00	1	-230.3	40.5	233.9	44		0.67	7.14	5	SOUTH	51	TELANGANA							
TO	514056	ASUPAKA	400.00	1	-171.1	96.5	196.5	37		0.85	9.03	5	SOUTH	51	TELANGANA							
TO	514065	CHOUTTUPPAL	400.00	1	59.1	-20.8	62.6	12		0.11	1.18	5	SOUTH	51	TELANGANA							
TO	514065	CHOUTTUPPAL	400.00	2	59.1	-20.8	62.6	12		0.11	1.18	5	SOUTH	51	TELANGANA							
BUS	514012	HYD TS	400.00	CKT	MW	MVAR	MVA	%	1.0186PU 407.45KV	11.47	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514012		
												MW	MVAR	5	SOUTH					51	TELANGANA	
TO	SHUNT				0.0	129.7	129.7															
TO	512011	HYD TS	220.00	1	157.0	19.3	158.2	83	1.0000LK	0.00	7.66	5	SOUTH	51	TELANGANA							
TO	512011	HYD TS	220.00	2	157.0	19.3	158.2	83	1.0000LK	0.00	7.66	5	SOUTH	51	TELANGANA							
TO	512011	HYD TS	220.00	3	157.0	19.3	158.2	83	1.0000LK	0.00	7.66	5	SOUTH	51	TELANGANA							
TO	512011	HYD TS	220.00	4	157.0	19.3	158.2	83	1.0000LK	0.00	7.66	5	SOUTH	51	TELANGANA							
TO	514002	HYD PGCIL	400.00	1	68.0	-0.6	68.0	13		0.04	0.43	5	SOUTH	51	TELANGANA							
TO	514049	MAHESH-TS	400.00	1	-35.1	-152.1	156.1	30		0.10	1.04	5	SOUTH	51	TELANGANA							
TO	514049	MAHESH-TS	400.00	2	-35.1	-152.1	156.1	30		0.10	1.04	5	SOUTH	51	TELANGANA							
TO	514065	CHOUTTUPPAL	400.00	1	-312.9	48.9	316.6	60		1.34	14.33	5	SOUTH	51	TELANGANA							
TO	514065	CHOUTTUPPAL	400.00	2	-312.9	48.9	316.6	60		1.34	14.33	5	SOUTH	51	TELANGANA							
BUS	514023	VELTOOR	400.00	CKT	MW	MVAR	MVA	%	1.0271PU 410.84KV	10.73	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514023		
												MW	MVAR	5	SOUTH					51	TELANGANA	
TO	SHUNT				0.0	131.9	131.9															
TO	512018	VELTOOR	220.00	1	80.9	58.1	99.6	52	1.0000LK	0.00	2.99	5	SOUTH	51	TELANGANA							
TO	512018	VELTOOR	220.00	2	80.9	58.1	99.6	52	1.0000LK	0.00	2.99	5	SOUTH	51	TELANGANA							
TO	512018	VELTOOR	220.00	3	80.9	58.1	99.6	52	1.0000LK	0.00	2.99	5	SOUTH	51	TELANGANA							
TO	512018	VELTOOR	220.00	4	80.9	58.1	99.6	52	1.0000LK	0.00	2.99	5	SOUTH	51	TELANGANA							
TO	514003	TALAPALLI	400.00	1	-54.9	-52.4	75.9	14		0.10	1.09	5	SOUTH	51	TELANGANA							
TO	514047	MAHESWRM	400.00	1	-65.1	-29.4	71.4	13		0.09	0.94	5	SOUTH	51	TELANGANA							
TO	514047	MAHESWRM	400.00	2	-65.1	-29.4	71.4	13		0.09	0.94	5	SOUTH	51	TELANGANA							
TO	514066	YEDULA	400.00	1	-195.7	76.6	210.2	30		0.21	3.56	5	SOUTH	58	TEL-LOAD							
TO	514066	YEDULA	400.00	2	-195.7	76.6	210.2	30		0.21	3.56	5	SOUTH	58	TEL-LOAD							
TO	514133	URVKND	400.00	1	141.5	-192.7	239.0	34		0.58	9.86	5	SOUTH	50	ANDHRA							
TO	514133	URVKND	400.00	2	141.5	-192.7	239.0	34		0.58	9.86	5	SOUTH	50	ANDHRA							
TO	524003	RAIC	400.00	1	-30.0	-20.9	36.5	7		0.01	0.13	5	SOUTH	52	KARNATKA							
BUS	514035	SHANKARPALLY	400.00	CKT	MW	MVAR	MVA	%	1.0147PU 405.90KV	10.50	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514035		
												MW	MVAR	5	SOUTH					51	TELANGANA	
TO	SHUNT				0.0	128.7	128.7															
TO	512029	SHANKARPALLY	220.00	1	179.2	38.9	183.4	97	1.0000LK	0.00	10.37	5	SOUTH	51	TELANGANA							
TO	512029	SHANKARPALLY	220.00	2	179.2	38.9	183.4	97	1.0000LK	0.00	10.37	5	SOUTH	51	TELANGANA							
TO	512029	SHANKARPALLY	220.00	3	179.2	38.9	183.4	97	1.0000LK	0.00	10.37	5	SOUTH	51	TELANGANA							
TO	512029	SHANKARPALLY	220.00	4	284.5	61.8	291.2	97	1.0000LK	0.00	16.47	5	SOUTH	51	TELANGANA							
TO	514038	NIZAMABAD	400.00	1	-192.1	-98.7	216.0	41		0.98	10.43	5	SOUTH	51	TELANGANA							
TO	514038	NIZAMABAD	400.00	2	-192.1	-98.7	216.0	41		0.98	10.43	5	SOUTH	51	TELANGANA							

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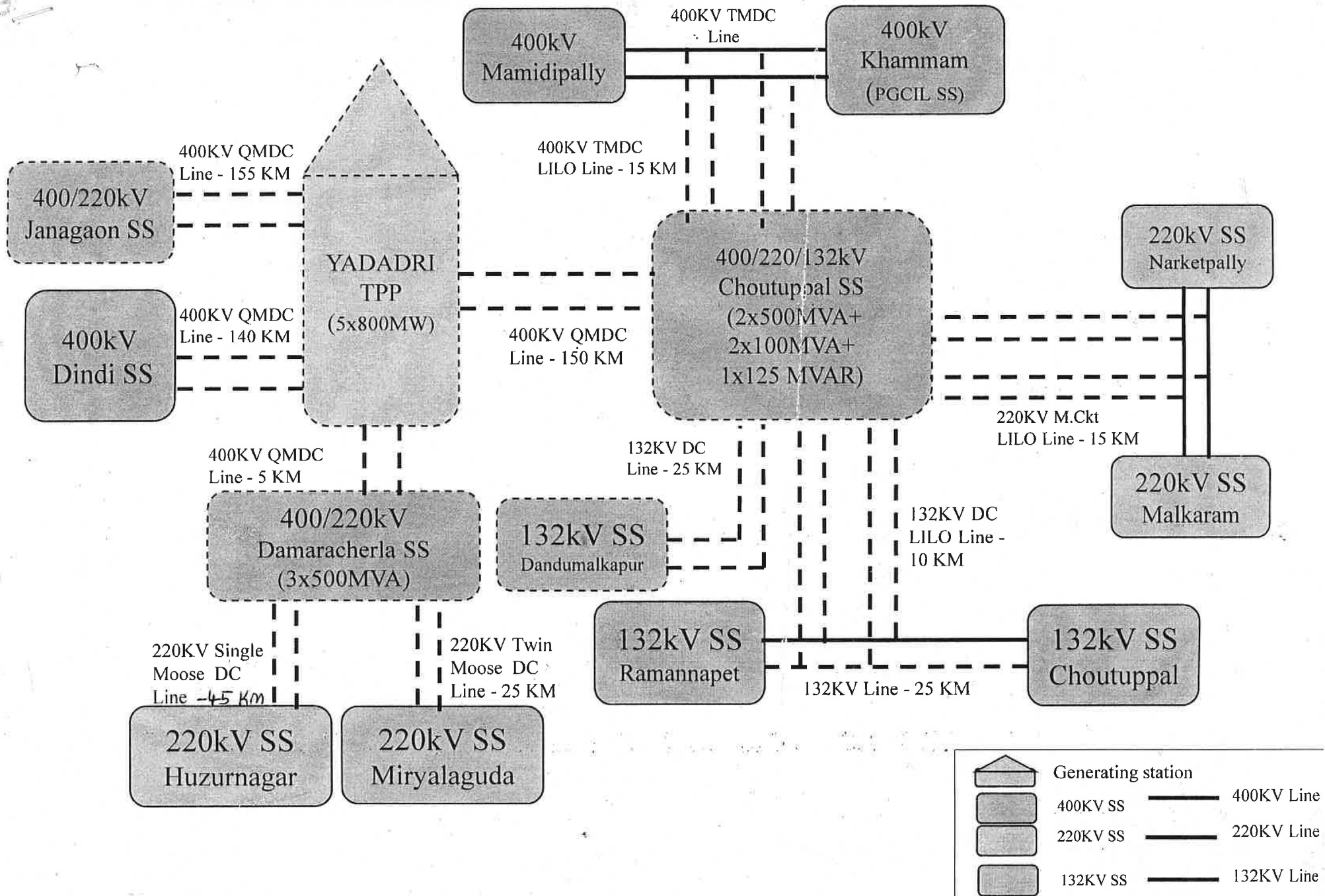
TO 514046	NARSAPUR	400.00	1	-215.6	26.9	217.3	41	0.52	5.53	5	SOUTH	51	TELANGANA						
TO 514046	NARSAPUR	400.00	2	-215.6	26.9	217.3	41	0.52	5.53	5	SOUTH	51	TELANGANA						
TO 514049	MAHESH-TS	400.00	1	-121.9	-82.5	147.2	28	0.27	2.83	5	SOUTH	51	TELANGANA						
TO 514049	MAHESH-TS	400.00	2	-121.9	-82.5	147.2	28	0.27	2.83	5	SOUTH	51	TELANGANA						
TO 514054	KETHIREDDYPA	400.00	1	118.6	0.6	118.6	17	0.05	0.92	5	SOUTH	51	TELANGANA						
TO 514054	KETHIREDDYPA	400.00	2	118.6	0.6	118.6	17	0.05	0.92	5	SOUTH	51	TELANGANA						
BUS 514036	MALKARM4	400.00	CKT	MW	MVAR	MVA	%	1.0099PU	11.30	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514036
								403.97KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO SHUNT				0.0	127.5	127.5													
TO 512030	MALKARAM	220.00	1	142.1	35.1	146.4	77	1.0000LK			0.00	6.67	5	SOUTH			51	TELANGANA	
TO 512030	MALKARAM	220.00	2	142.1	35.1	146.4	77	1.0000LK			0.00	6.67	5	SOUTH			51	TELANGANA	
TO 512030	MALKARAM	220.00	3	142.1	35.1	146.4	77	1.0000LK			0.00	6.67	5	SOUTH			51	TELANGANA	
TO 512030	MALKARAM	220.00	4	142.1	35.1	146.4	77	1.0000LK			0.00	6.67	5	SOUTH			51	TELANGANA	
TO 514001	RSTP	400.00	1	-217.6	-31.1	219.8	42				1.70	18.92	5	SOUTH			51	TELANGANA	
TO 514002	HYD PGCIL	400.00	1	21.4	-80.5	83.3	16				0.05	0.52	5	SOUTH			51	TELANGANA	
TO 514037	SURYPET4	400.00	1	-186.2	-78.2	201.9	39				1.00	10.71	5	SOUTH			51	TELANGANA	
TO 514037	SURYPET4	400.00	2	-186.2	-78.2	201.9	39				1.00	10.71	5	SOUTH			51	TELANGANA	
BUS 514037	SURYPET4	400.00	CKT	MW	MVAR	MVA	%	1.0256PU	14.42	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514037
								410.25KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO SHUNT				0.0	131.5	131.5													
TO 512049	SURYAPET2	220.00	1	69.2	69.2	97.8	51	1.0000LK			0.00	2.89	5	SOUTH			51	TELANGANA	
TO 512049	SURYAPET2	220.00	2	69.2	69.2	97.8	51	1.0000LK			0.00	2.89	5	SOUTH			51	TELANGANA	
TO 514030	VIJTP-IV	400.00	1	-35.6	-47.0	58.9	11				0.03	0.34	5	SOUTH			50	ANDHRA	
TO 514030	VIJTP-IV	400.00	2	-35.6	-47.0	58.9	11				0.03	0.34	5	SOUTH			50	ANDHRA	
TO 514036	MALKARM4	400.00	1	187.2	-10.8	187.5	35				1.00	10.71	5	SOUTH			51	TELANGANA	
TO 514036	MALKARM4	400.00	2	187.2	-10.8	187.5	35				1.00	10.71	5	SOUTH			51	TELANGANA	
TO 514045	JULURUPADU	400.00	1	-192.7	13.3	193.2	28				0.43	7.34	5	SOUTH			51	TELANGANA	
TO 514045	JULURUPADU	400.00	2	-192.7	13.3	193.2	28				0.43	7.34	5	SOUTH			51	TELANGANA	
TO 514054	KETHIREDDYPA	400.00	1	210.8	-62.8	220.0	31				0.94	16.28	5	SOUTH			51	TELANGANA	
TO 514054	KETHIREDDYPA	400.00	2	210.8	-62.8	220.0	31				0.94	16.28	5	SOUTH			51	TELANGANA	
TO 514111	KVKOTA40	400.00	1	-238.8	-27.6	240.4	34				1.04	15.67	5	SOUTH			50	ANDHRA	
TO 514111	KVKOTA40	400.00	2	-238.8	-27.6	240.4	34				1.04	15.67	5	SOUTH			50	ANDHRA	
BUS 514047	MAHESWRM	400.00	CKT	MW	MVAR	MVA	%	1.0266PU	11.56	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514047
								410.66KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 514002	HYD PGCIL	400.00	1	80.0	67.1	104.5	20				0.13	1.40	5	SOUTH			51	TELANGANA	
TO 514013	KURNOOL4	400.00	1	107.5	-115.2	157.5	30				0.45	4.82	5	SOUTH			50	ANDHRA	
TO 514023	VELTOOR	400.00	1	65.2	-45.8	79.7	15				0.09	0.94	5	SOUTH			51	TELANGANA	
TO 514023	VELTOOR	400.00	2	65.2	-45.8	79.7	15				0.09	0.94	5	SOUTH			51	TELANGANA	
TO 514049	MAHESH-TS	400.00	1	197.1	375.0	423.7	61				0.02	0.42	5	SOUTH			51	TELANGANA	
TO 514049	MAHESH-TS	400.00	2	197.1	375.0	423.7	61				0.02	0.42	5	SOUTH			51	TELANGANA	
TO 518001	HYDR_800	765.00	1	-356.0	-305.2	469.0	31	1.0000UN			0.00	17.38	5	SOUTH			51	TELANGANA	
TO 518001	HYDR_800	765.00	2	-356.0	-305.2	469.0	31	1.0000UN			0.00	17.38	5	SOUTH			51	TELANGANA	
BUS 514049	MAHESH-TS	400.00	CKT	MW	MVAR	MVA	%	1.0257PU	11.53	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514049
								410.29KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO SHUNT				0.0	131.5	131.5													
TO 512082	MAHESH-TS2	220.00	1	216.7	52.6	223.0	74	1.0000LK			0.00	9.45	5	SOUTH			51	TELANGANA	
TO 512082	MAHESH-TS2	220.00	2	216.7	52.6	223.0	74	1.0000LK			0.00	9.45	5	SOUTH			51	TELANGANA	
TO 514012	HYD TS	400.00	1	35.2	137.1	141.5	27				0.10	1.04	5	SOUTH			51	TELANGANA	
TO 514012	HYD TS	400.00	2	35.2	137.1	141.5	27				0.10	1.04	5	SOUTH			51	TELANGANA	
TO 514035	SHANKARPALLY	400.00	1	122.2	32.7	126.5	24				0.27	2.83	5	SOUTH			51	TELANGANA	
TO 514035	SHANKARPALLY	400.00	2	122.2	32.7	126.5	24				0.27	2.83	5	SOUTH			51	TELANGANA	
TO 514047	MAHESWRM	400.00	1	-197.1	-375.8	424.3	61				0.02	0.42	5	SOUTH			51	TELANGANA	
TO 514047	MAHESWRM	400.00	2	-197.1	-375.8	424.3	61				0.02	0.42	5	SOUTH			51	TELANGANA	
TO 514058	DINDI	400.00	1	-173.8	72.6	188.3	36				0.38	4.11	5	SOUTH			51	TELANGANA	
TO 514058	DINDI	400.00	2	-173.8	72.6	188.3	36				0.38	4.11	5	SOUTH			51	TELANGANA	

Revised Yadadri TPP and Palamuru Rangareddy LI Schemes without LI Loads

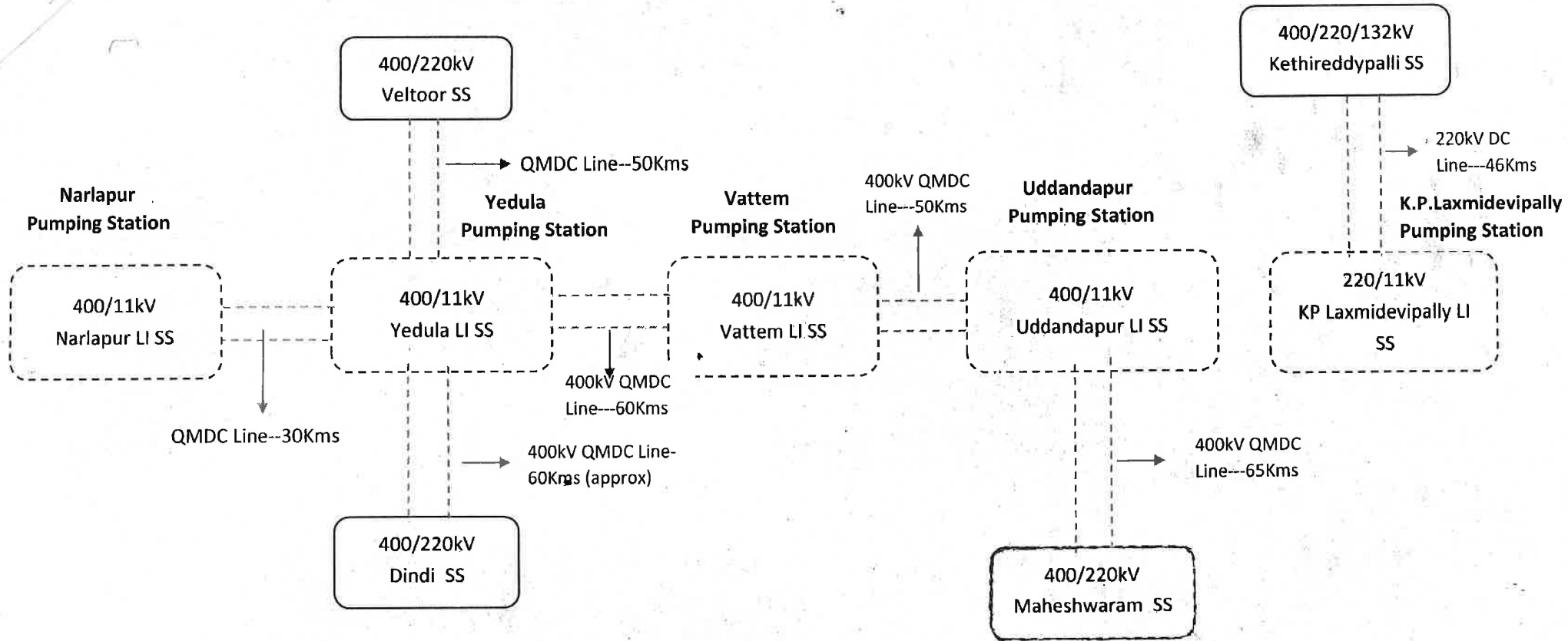
TO 514059 UDDANDAPUR	400.00	1	-3.3	15.0	15.4	2		0.01	0.16	5	SOUTH	58	TEL-LOAD					
TO 514059 UDDANDAPUR	400.00	2	-3.3	15.0	15.4	2		0.01	0.16	5	SOUTH	58	TEL-LOAD					
BUS 514054 KETHIREDDYPA400.00	CKT		MW	MVAR	MVA	%	1.0132PU	10.06	X---	LOSSES	---	X----	AREA	-----X	X----	ZONE	-----X	514054
							405.30KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO SHUNT			0.0	128.3	128.3													
TO 512100 KETHIREDDYPA220.00	1		136.7	25.2	139.0	73	1.0000LK			0.00	5.98	5	SOUTH			51	TELANGANA	
TO 512100 KETHIREDDYPA220.00	2		136.7	25.2	139.0	73	1.0000LK			0.00	5.98	5	SOUTH			51	TELANGANA	
TO 514035 SHANKARPALLY400.00	1		-118.5	-31.3	122.6	18				0.05	0.92	5	SOUTH			51	TELANGANA	
TO 514035 SHANKARPALLY400.00	2		-118.5	-31.3	122.6	18				0.05	0.92	5	SOUTH			51	TELANGANA	
TO 514037 SURYPET4	400.00	1	-209.8	-103.0	233.7	34				0.94	16.28	5	SOUTH			51	TELANGANA	
TO 514037 SURYPET4	400.00	2	-209.8	-103.0	233.7	34				0.94	16.28	5	SOUTH			51	TELANGANA	
TO 514069 RAIDURG DUMY400.00	1		191.6	44.9	196.8	35				0.31	3.01	5	SOUTH			51	TELANGANA	
TO 514069 RAIDURG DUMY400.00	2		191.6	44.9	196.8	35				0.31	3.01	5	SOUTH			51	TELANGANA	
BUS 514058 DINDI	400.00	CKT	MW	MVAR	MVA	%	1.0177PU	12.66	X---	LOSSES	---	X----	AREA	-----X	X----	ZONE	-----X	514058
							407.09KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO SHUNT			0.0	258.9	258.9													
TO 512131 DINDI	220.00	1	181.3	42.3	186.2	62	1.0000LK			0.00	6.69	5	SOUTH			51	TELANGANA	
TO 512131 DINDI	220.00	2	181.3	42.3	186.2	62	1.0000LK			0.00	6.69	5	SOUTH			51	TELANGANA	
TO 512131 DINDI	220.00	3	181.3	42.3	186.2	62	1.0000LK			0.00	6.69	5	SOUTH			51	TELANGANA	
TO 514011 SSLBPH4	400.00	1	-54.8	-124.7	136.2	26				0.17	1.81	5	SOUTH			51	TELANGANA	
TO 514011 SSLBPH4	400.00	2	-54.8	-124.7	136.2	26				0.17	1.81	5	SOUTH			51	TELANGANA	
TO 514049 MAHESH-TS	400.00	1	174.2	-105.2	203.5	39				0.38	4.11	5	SOUTH			51	TELANGANA	
TO 514049 MAHESH-TS	400.00	2	174.2	-105.2	203.5	39				0.38	4.11	5	SOUTH			51	TELANGANA	
TO 514064 DAMARCHLA TP400.00	1		-590.8	101.7	599.5	86				4.61	79.77	5	SOUTH			51	TELANGANA	
TO 514064 DAMARCHLA TP400.00	2		-590.8	101.7	599.5	86				4.61	79.77	5	SOUTH			51	TELANGANA	
TO 514066 YEDULA	400.00	1	199.5	-64.6	209.7	30				0.22	3.81	5	SOUTH			58	TEL-LOAD	
TO 514066 YEDULA	400.00	2	199.5	-64.6	209.7	30				0.22	3.81	5	SOUTH			58	TEL-LOAD	
BUS 514059 UDDANDAPUR	400.00	CKT	MW	MVAR	MVA	%	1.0217PU	11.56	X---	LOSSES	---	X----	AREA	-----X	X----	ZONE	-----X	514059
							408.69KV			MW	MVAR	5	SOUTH			58	TEL-LOAD	
TO SHUNT			0.0	130.5	130.5													
TO 514049 MAHESH-TS	400.00	1	3.3	-64.8	64.9	9				0.01	0.16	5	SOUTH			51	TELANGANA	
TO 514049 MAHESH-TS	400.00	2	3.3	-64.8	64.9	9				0.01	0.16	5	SOUTH			51	TELANGANA	
TO 514062 VATTEM	400.00	1	-3.3	-0.4	3.4	0				0.00	0.03	5	SOUTH			58	TEL-LOAD	
TO 514062 VATTEM	400.00	2	-3.3	-0.4	3.4	0				0.00	0.03	5	SOUTH			58	TEL-LOAD	
BUS 514062 VATTEM	400.00	CKT	MW	MVAR	MVA	%	1.0203PU	11.58	X---	LOSSES	---	X----	AREA	-----X	X----	ZONE	-----X	514062
							408.11KV			MW	MVAR	5	SOUTH			58	TEL-LOAD	
TO SHUNT			0.0	130.1	130.1													
TO 514059 UDDANDAPUR	400.00	1	3.3	-37.8	37.9	5				0.00	0.03	5	SOUTH			58	TEL-LOAD	
TO 514059 UDDANDAPUR	400.00	2	3.3	-37.8	37.9	5				0.00	0.03	5	SOUTH			58	TEL-LOAD	
TO 514066 YEDULA	400.00	1	-3.3	-27.3	27.5	4				0.00	0.00	5	SOUTH			58	TEL-LOAD	
TO 514066 YEDULA	400.00	2	-3.3	-27.3	27.5	4				0.00	0.00	5	SOUTH			58	TEL-LOAD	
BUS 514063 JANAGAON	400.00	CKT	MW	MVAR	MVA	%	1.0096PU	14.86	X---	LOSSES	---	X----	AREA	-----X	X----	ZONE	-----X	514063
							403.85KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO SHUNT			0.0	127.4	127.4													
TO 512148 JANGAON	220.00	1	207.0	56.7	214.7	72	1.0000LK			0.00	9.04	5	SOUTH			51	TELANGANA	
TO 512148 JANGAON	220.00	2	207.0	56.7	214.7	72	1.0000LK			0.00	9.04	5	SOUTH			51	TELANGANA	
TO 512148 JANGAON	220.00	3	207.0	56.7	214.7	72	1.0000LK			0.00	9.04	5	SOUTH			51	TELANGANA	
TO 514045 JULURUPADU	400.00	1	-92.4	-92.6	130.8	19				0.16	2.75	5	SOUTH			51	TELANGANA	
TO 514045 JULURUPADU	400.00	2	-92.4	-92.6	130.8	19				0.16	2.75	5	SOUTH			51	TELANGANA	
TO 514051 TIPPAPUR	400.00	1	157.6	-77.2	175.4	26				0.17	2.98	5	SOUTH			58	TEL-LOAD	
TO 514051 TIPPAPUR	400.00	2	157.6	-77.2	175.4	26				0.17	2.98	5	SOUTH			58	TEL-LOAD	
TO 514064 DAMARCHLA TP400.00	1		-375.8	21.1	376.3	55				2.06	35.47	5	SOUTH			51	TELANGANA	
TO 514064 DAMARCHLA TP400.00	2		-375.8	21.1	376.3	55				2.06	35.47	5	SOUTH			51	TELANGANA	

Revised Yadadri TPP and Palamuru Rangareddy LI Schemes Without LI Loads													
BUS	TO	FROM	TP	CT	MW	MVAR	MVA	%	LI	LOSSES	AREA	ZONE	514064
									PU	MW	MVAR		
BUS 514064	DAMARCHLA	TP400.00	CKT		3680.0	-424.3R	3704.4	83	1.0000PU	20.16	X---	X---	51 TELANGANA
	TO SHUNT				0.0	250.0	250.0		400.00KV			5 SOUTH	
	TO 514058	DINDI	400.00	1	595.4	-126.4	608.7	89		4.61	79.77	5 SOUTH	51 TELANGANA
	TO 514058	DINDI	400.00	2	595.4	-126.4	608.7	89		4.61	79.77	5 SOUTH	51 TELANGANA
	TO 514063	JANAGAON	400.00	1	377.8	-100.3	390.9	57		2.06	35.47	5 SOUTH	51 TELANGANA
	TO 514063	JANAGAON	400.00	2	377.8	-100.3	390.9	57		2.06	35.47	5 SOUTH	51 TELANGANA
	TO 514065	CHOUTTUPPAL	400.00	1	452.2	-114.0	466.3	68		2.87	49.34	5 SOUTH	51 TELANGANA
	TO 514065	CHOUTTUPPAL	400.00	2	452.2	-114.0	466.3	68		2.87	49.34	5 SOUTH	51 TELANGANA
	TO 514072	DAMARACHRLA	400.00	1	414.6	3.6	414.6	61		0.08	1.36	5 SOUTH	51 TELANGANA
	TO 514072	DAMARACHRLA	400.00	2	414.6	3.6	414.6	61		0.08	1.36	5 SOUTH	51 TELANGANA
BUS 514065	CHOUTTUPPAL	400.00	CKT						1.0135PU	14.03	X---	X---	51 TELANGANA
	TO SHUNT				0.0	128.4	128.4		405.42KV			5 SOUTH	
	TO 512153	CHOUTTUPPAL	220.00	1	194.1	37.9	197.7	66	1.0000LK	0.00	7.61	5 SOUTH	51 TELANGANA
	TO 512153	CHOUTTUPPAL	220.00	2	194.1	37.9	197.7	66	1.0000LK	0.00	7.61	5 SOUTH	51 TELANGANA
	TO 514004	KHAM	400.00	1	-59.0	-72.8	93.7	18		0.11	1.18	5 SOUTH	51 TELANGANA
	TO 514004	KHAM	400.00	2	-59.0	-72.8	93.7	18		0.11	1.18	5 SOUTH	51 TELANGANA
	TO 514012	HYD TS	400.00	1	314.2	-81.2	324.5	62		1.34	14.33	5 SOUTH	51 TELANGANA
	TO 514012	HYD TS	400.00	2	314.2	-81.2	324.5	62		1.34	14.33	5 SOUTH	51 TELANGANA
	TO 514064	DAMARCHLA	TP400.00	1	-449.3	51.9	452.3	66		2.87	49.34	5 SOUTH	51 TELANGANA
	TO 514064	DAMARCHLA	TP400.00	2	-449.3	51.9	452.3	66		2.87	49.34	5 SOUTH	51 TELANGANA
BUS 514066	YEDULA	400.00	CKT						1.0207PU	11.60	X---	X---	58 TEL-LOAD
	TO SHUNT				0.0	130.2	130.2		408.29KV			5 SOUTH	
	TO 514023	VELTOOR	400.00	1	195.9	-111.5	225.4	32		0.21	3.56	5 SOUTH	51 TELANGANA
	TO 514023	VELTOOR	400.00	2	195.9	-111.5	225.4	32		0.21	3.56	5 SOUTH	51 TELANGANA
	TO 514058	DINDI	400.00	1	-199.2	22.8	200.5	29		0.22	3.81	5 SOUTH	51 TELANGANA
	TO 514058	DINDI	400.00	2	-199.2	22.8	200.5	29		0.22	3.81	5 SOUTH	51 TELANGANA
	TO 514062	VATTEM	400.00	1	3.3	-18.5	18.8	3		0.00	0.00	5 SOUTH	58 TEL-LOAD
	TO 514062	VATTEM	400.00	2	3.3	-18.5	18.8	3		0.00	0.00	5 SOUTH	58 TEL-LOAD
	TO 514067	NARLAPUR	400.00	1	0.0	42.1	42.1	6		0.01	0.13	5 SOUTH	58 TEL-LOAD
	TO 514067	NARLAPUR	400.00	2	0.0	42.1	42.1	6		0.01	0.13	5 SOUTH	58 TEL-LOAD
BUS 514067	NARLAPUR	400.00	CKT						1.0182PU	11.61	X---	X---	58 TEL-LOAD
	TO SHUNT				0.0	129.6	129.6		407.29KV			5 SOUTH	
	TO 514066	YEDULA	400.00	1	-0.0	-64.8	64.8	9		0.01	0.13	5 SOUTH	58 TEL-LOAD
	TO 514066	YEDULA	400.00	2	-0.0	-64.8	64.8	9		0.01	0.13	5 SOUTH	58 TEL-LOAD
BUS 514072	DAMARACHRLA	400.00	CKT						0.9998PU	19.97	X---	X---	51 TELANGANA
	TO 512231	DAMARACHRLA	220.00	1	276.4	3.9	276.4	92	399.91KV	0.00	15.29	5 SOUTH	51 TELANGANA
	TO 512231	DAMARACHRLA	220.00	2	276.4	3.9	276.4	92	1.0000LK	0.00	15.29	5 SOUTH	51 TELANGANA
	TO 512231	DAMARACHRLA	220.00	3	276.4	3.9	276.4	92	1.0000LK	0.00	15.29	5 SOUTH	51 TELANGANA
	TO 514064	DAMARCHLA	TP400.00	1	-414.5	-5.9	414.6	61		0.08	1.36	5 SOUTH	51 TELANGANA
	TO 514064	DAMARCHLA	TP400.00	2	-414.5	-5.9	414.6	61		0.08	1.36	5 SOUTH	51 TELANGANA

YADADRI POWER EVACUATION SCHEME (revised as per studies)



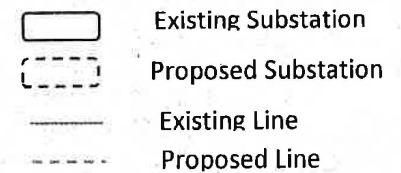
PALAMURU RANGAREDDY LIFT IRRIGATION SCHEME (Revised as per studies)




Note:

PTR Capacities at the LI substations are as follows:

1. 400/11kV Narlapur SS—9 Nosx160MVA+2Nos x25 MVA PTRs+1Nox125MVAR
2. 400/11kV Yedula SS--10 Nosx160MVA+2Nos x25 MVA PTRs+1Nox125MVAR
3. 400/11kV Vattem SS--10 Nosx160MVA+2Nosx25 MVA PTRs+1Nox125MVAR
4. 400/11kV Uddandapur SS--6 Nosx160MVA+2Nosx25 MVA PTRs+1Nox125MVAR
5. 220/11kV KP Laxmidevipally SS—4Nosx80MVA+2Nosx25MVA PTRs



फैक्स/स्पीड पोस्ट /FAX/SPEEDPOST

भारत सरकार केंद्रीय विद्युत प्राधिकरण दक्षिण क्षेत्रीय विद्युत समिति बेंगलूरु - 560 009				Government of India Central Electricity Authority Southern Regional Power Committee Bengaluru - 560 009	
Web site: www.srpc.kar.nic.in		e-mail: mssrpc-ka@nic.in		Ph: 080-22287205	Fax: 080-22259343
सं/No.	SRPC/SE-II/2019/ 1571			दिनांक / Date	22.03.2019

Chief Engineer
PSPA-II
CEA
New Delhi

Sir,

Sub: Transmission planning related issues

Ref: Your letter No.CEA-PS-12-15/2/2018-PSPA-II Division dated 08.03.2019

As desired vide letter cited under reference, the following issues related to Transmission Planning are brought to kind attention. These issues were informed during the 153rd OCC meeting held on 11.03.2019.

N-1 criteria getting violated for 400/220 kV ICTs at UPCL, Karnataka

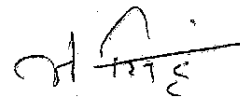
It was pointed out by UPCL and SRLDC that the flow on 400/220 kV ICTs (2 x 315 MVA) was high and on many occasions the N-1 criteria was getting violated. As a consequence, during certain load generation balance conditions, UPCL is unable to take out one ICT for maintenance since the flow on other ICT would be beyond the capacity. As a long term measure, possibility of third ICT can be examined.

220 kV connectivity to Bhadradri, TSGENCO, Telangana

TS SLDC had observed that during black start condition extension of startup power to 4 x 270 MW Bhadradri TPS is not feasible through 400 kV Julurupadu due to expected high voltage at KTPS complex and Julurupadu. TS SLDC had suggested connectivity at 220 kV level for startup power. It was also pointed out that startup supply is available from N'Sagar upto 220 kV heavy water plant as per the existing procedure.

धन्यवाद /Thanking you,

भवदीय / Yours faithfully



(असित सिंह / Asit Singh)

अधीक्षक अभियंता / Superintending Engineer

Sh. Ishan, Del (TS&AT)
1. Pl. discuss
2. Are we preparing agenda for Important
next RSCG & SR
Jelly
25/3/19
-(20)

TRANSMISSION CORPORATION OF TELANGANA LIMITED

From
Chief Engineer/ Power Systems,
TSTRANSCO,
Vidyut Soudha,
Hyderabad, Telangana - 500082.

To
The Chief Engineer/ PS P&A-II,
Central Electricity Authority (CEA),
RK Puram, Sewa Bhavan,
New Delhi-110066.

Lr. No. CE(PS)/SE(PS)/DE(SS II)/ADE/AE/F. /D.No. 24 /19, Dt. 24/05/2019

Sir,

Sub: TSTRANSCO - Proposal for erection of 400/220kV 1x315 MVA ICT at BTPS Switchyard, Manuguru, TSGENCO and 220kV DC line from 220/132kV Manuguru SS to BTPS Switchyard to provide startup supply to BTPS (4x270 MW) under Black start restoration procedure and alternate evacuation of power from BTPS (4x270 MW) - Approval requested - Regarding.

The load flow studies for the proposal for erection of i) 400/220kV 1x315 MVA ICT at BTPS Switchyard, Manuguru, TSGENCO and ii) 220kV DC line from 220/132kV Manuguru SS to BTPS Switchyard (22km) to provide startup supply to BTPS (4x270 MW) under Black start restoration procedure and alternate evacuation of power from BTPS (4x270 MW) is carried out based on the field feasibility report.

The load flow studies duly incorporating the above proposal along with study results are herewith furnished.

The same was discussed in the meeting held in Bengaluru on May 1st & 2nd wherein joint studies on transmission planning in Southern Region were conducted.

It is requested to include the above proposal in the agenda of forth coming Southern Region Standing Committee on Transmission (SRST) to be held on 10.06.2019 at Bengaluru along with the proposals already furnished.

Encl: 1. PSSE converged case through email
2. Study Results


Chief Engineer/ Power Systems

Copy to:

1. Dr. Subir Sen/ COO/ CTU, Smart Grid, PGCIL Corporate Office, Saudamini, Plot No. 2, Sector 29, Near IFFCO Chowk, Gurgaon (Haryana) - 122001, INDIA
2. The General Manager/ SRLDC, 29, Race Course Cross Road, Bengaluru - 560009
3. Chief Engineer/ 400kV/ TSTRANSCO/ Vidyut Soudha/ Hyderabad
4. Chief Engineer/ SLDC/ TSTRANSCO/ Vidyut Soudha/ Hyderabad
5. Chief Engineer/ Construction/ TSTRANSCO/ Vidyut Soudha/ Hyderabad
6. Chief Engineer/ TPC/ TSGENCO/ Vidyut Soudha/ Hyderabad
7. SE(T) to Chairman and Managing Director/ TSTRANSCO
8. DE(T) to Director/ Projects
9. DE(T) to Director/ Transmission
10. ADE(T) to Director/ Lift Irrigation Schemes
11. AE(T) to Director/ Grid Operation

ZONE TOTALS
 IN MW/MVAR

X-- ZONE --X	FROM -----AT ZONE BUSES-----			TO			-NET INTERCHANGE-				
	GENE- FROM IND TO IND TO TO BUS GNE BUS TO LINE FROM TO TO TIE TO TIES	RATION GENERATN MOTORS LOAD SHUNT DEVICES SHUNT CHARGING LOSSES LINES + LOADS									
51 TELANGANA	14272.7 589.0	0.0 0.0	0.0 0.0	13357.4 4526.4	0.0 -1480.8	0.0 0.0	0.0 2651.6	0.0 13027.9	385.3 5320.5	530.0 2599.2	462.4 2566.4
58 TEL-LOAD	0.0 0.0	0.0 0.0	0.0 0.0	9814.8 3237.7	0.0 -9.5	0.0 0.0	0.0 0.0	0.0 1354.8	30.4 381.8	-9845.3 -2255.2	-9777.6 -2222.3
COLUMN TOTALS	14272.7 589.0	0.0 0.0	0.0 0.0	23172.2 7764.0	0.0 -1490.3	0.0 0.0	0.0 2651.6	0.0 14382.7	415.7 5702.3	-9315.2 344.1	-9315.2 344.1

RATING SET A %MVA FOR TRANSFORMERS
 % I FOR NON-TRANSFORMER BRANCHES

BUS 511010 MANUGURU	132.00	CKT	MW	MVAR	MVA	% 1.0096PU	-64.96	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511010
						133.26KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO LOAD-PQ			19.1	5.0	19.8												
TO SHUNT			0.0	-7.3	7.3												
TO 511100 KAMALAPUR WA	132.00	1	44.7	-8.3	45.5	67			1.05	2.50	5	SOUTH			51	TELANGANA	
TO 511100 KAMALAPUR WA	132.00	2	44.7	-8.3	45.5	67			1.05	2.50	5	SOUTH			51	TELANGANA	
TO 511397 SCCL_MANUGR	132.00	1	10.1	2.8	10.5	12			0.00	0.01	5	SOUTH			51	TELANGANA	
TO 512033 MANG	220.00	1	-59.4	8.1	59.9	62	1.0000UN		0.00	2.20	5	SOUTH			51	TELANGANA	
TO 512033 MANG	220.00	2	-59.4	8.1	59.9	62	1.0000UN		0.00	2.20	5	SOUTH			51	TELANGANA	
BUS 511030 KALLUR	132.00	CKT	MW	MVAR	MVA	% 0.9976PU	-69.61	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511030
						131.69KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO LOAD-PQ			19.0	10.4	21.6												
TO 511026 KHAMMAM TS	132.00	1	-1.8	-0.3	1.8	2			0.00	0.00	5	SOUTH			51	TELANGANA	
TO 511046 THALLADA	132.00	1	36.8	9.6	38.0	45			0.40	0.95	5	SOUTH			51	TELANGANA	
TO 511047 PENUBALLI	132.00	1	12.7	-3.3	13.1	16			0.02	0.04	5	SOUTH			51	TELANGANA	
TO 511047 PENUBALLI	132.00	2	12.7	-3.3	13.1	16			0.02	0.04	5	SOUTH			51	TELANGANA	
TO 512149 KALLUR	220.00	1	-39.7	-6.5	40.2	67	1.0000UN		0.00	1.62	5	SOUTH			51	TELANGANA	
TO 512149 KALLUR	220.00	2	-39.7	-6.5	40.2	67	1.0000UN		0.00	1.62	5	SOUTH			51	TELANGANA	
BUS 511034 PEDAGOPATHI	132.00	CKT	MW	MVAR	MVA	% 0.9791PU	-71.21	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511034
						129.24KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO LOAD-PQ			68.7	42.3	80.7												
TO 511045 MADHIRA	132.00	1	12.7	-3.3	13.1	16			0.07	0.16	5	SOUTH			51	TELANGANA	
TO 511045 MADHIRA	132.00	2	12.7	-3.3	13.1	16			0.07	0.16	5	SOUTH			51	TELANGANA	
TO 511046 THALLADA	132.00	1	-14.4	0.6	14.4	18			0.04	0.09	5	SOUTH			51	TELANGANA	
TO 511046 THALLADA	132.00	2	-14.4	0.6	14.4	18			0.04	0.09	5	SOUTH			51	TELANGANA	
TO 511049 KUSUMANCHI	132.00	1	14.6	-4.9	15.4	19			0.06	0.15	5	SOUTH			51	TELANGANA	
TO 511050 KHAMMAM 132	132.00	1	-13.5	-4.3	14.2	17			0.08	0.18	5	SOUTH			51	TELANGANA	
TO 511260 CHILAKALLU	132.00	1	14.1	-0.0	14.1	17			0.10	0.23	5	SOUTH			50	ANDHRA	
TO 511260 CHILAKALLU	132.00	2	14.1	-0.0	14.1	17			0.10	0.23	5	SOUTH			50	ANDHRA	
TO 512155 PEDAGOPATHI	220.00	1	-47.2	-13.9	49.2	82	1.0000UN		0.00	2.53	5	SOUTH			51	TELANGANA	
TO 512155 PEDAGOPATHI	220.00	2	-47.2	-13.9	49.2	82	1.0000UN		0.00	2.53	5	SOUTH			51	TELANGANA	
BUS 511098 CHELPUR	132.00	CKT	MW	MVAR	MVA	% 1.0028PU	-72.15	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511098
						132.36KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO LOAD-PQ			40.3	13.1	42.4												

With 400kv Manuguru SS with LI loads

TO SHUNT			0.0	-14.5	14.5														
TO 511062 CHITYALA	132.00	1	33.5	13.6	36.2	54		0.26	0.62	5	SOUTH		51	TELANGANA					
TO 511100 KAMALAPUR WA	132.00	1	-25.8	11.3	28.1	33		0.68	1.82	5	SOUTH		51	TELANGANA					
TO 511342 KTHP_BHPLLY	132.00	1	2.2	0.6	2.3	3		0.00	0.00	5	SOUTH		51	TELANGANA					
TO 511343 REGONDA	132.00	1	36.1	12.3	38.1	45		0.20	0.48	5	SOUTH		51	TELANGANA					
TO 511344 RANGARAOPALY	132.00	1	18.1	33.4	38.0	45		0.46	1.10	5	SOUTH		58	TEL-LOAD					
TO 511345 SCCL_CHELPU	132.00	1	43.3	22.8	49.0	58		0.11	0.26	5	SOUTH		51	TELANGANA					
TO 511346 KTHP	132.00	1	-73.9	-46.3	87.2	60		0.06	0.33	5	SOUTH		51	TELANGANA					
TO 511346 KTHP	132.00	2	-73.9	-46.3	87.2	60		0.06	0.33	5	SOUTH		51	TELANGANA					
BUS 511099 MULUGU	132.00	CKT	MW	MVAR	MVA	%	0.9700PU	-72.27	X---	LOSSES	---	X----	AREA	-----	X----	ZONE	-----	X	511099
							128.04KV			MW	MVAR	5	SOUTH		51	TELANGANA			
TO LOAD-PQ			38.3	33.3	50.7														
TO SHUNT			0.0	-6.8	6.8														
TO 511100 KAMALAPUR WA	132.00	1	-35.7	0.1	35.7	55		1.04	2.47	5	SOUTH		51	TELANGANA					
TO 511344 RANGARAOPALY	132.00	2	-2.6	-26.6	26.7	33		0.02	0.05	5	SOUTH		58	TEL-LOAD					
BUS 511100 KAMALAPUR WA	132.00	CKT	MW	MVAR	MVA	%	0.9966PU	-68.33	X---	LOSSES	---	X----	AREA	-----	X----	ZONE	-----	X	511100
							131.55KV			MW	MVAR	5	SOUTH		51	TELANGANA			
TO LOAD-PQ			24.2	7.1	25.2														
TO SHUNT			0.0	-7.2	7.2														
TO 511010 MANUGURU	132.00	1	-43.7	7.9	44.4	67		1.05	2.50	5	SOUTH		51	TELANGANA					
TO 511010 MANUGURU	132.00	2	-43.7	7.9	44.4	67		1.05	2.50	5	SOUTH		51	TELANGANA					
TO 511098 CHELPU	132.00	1	26.5	-14.1	30.0	36		0.68	1.82	5	SOUTH		51	TELANGANA					
TO 511099 MULUGU	132.00	1	36.7	-1.7	36.8	55		1.04	2.47	5	SOUTH		51	TELANGANA					
BUS 511397 SCCL_MANUGR	132.00	CKT	MW	MVAR	MVA	%	1.0088PU	-65.01	X---	LOSSES	---	X----	AREA	-----	X----	ZONE	-----	X	511397
							133.17KV			MW	MVAR	5	SOUTH		51	TELANGANA			
TO LOAD-PQ			10.1	3.0	10.5														
TO 511010 MANUGURU	132.00	1	-10.1	-3.0	10.5	12		0.00	0.01	5	SOUTH		51	TELANGANA					
BUS 512028 KOTH	220.00	CKT	MW	MVAR	MVA	%	1.0130PU	-62.20	X---	LOSSES	---	X----	AREA	-----	X----	ZONE	-----	X	512028
FROM GENERATION			376.8	60.3R	381.6	68	222.86KV			MW	MVAR	5	SOUTH		51	TELANGANA			
TO 511009 KTPS	132.00	1	29.5	-6.0	30.1	60	1.0000LK		0.00	1.71	5	SOUTH		51	TELANGANA				
TO 511009 KTPS	132.00	2	29.5	-6.0	30.1	60	1.0000LK		0.00	1.71	5	SOUTH		51	TELANGANA				
TO 512005 VIJA	220.00	1	85.9	-8.9	86.4	43		1.41	7.54	5	SOUTH		50	ANDHRA					
TO 512033 MANG	220.00	2	31.1	9.8	32.6	16		0.09	0.46	5	SOUTH		51	TELANGANA					
TO 512047 MIRYALAGUDA	220.00	1	76.6	-8.9	77.1	38		1.33	7.08	5	SOUTH		51	TELANGANA					
TO 512050 LISLRU	220.00	1	-112.8	31.5	117.1	58		2.87	15.30	5	SOUTH		50	ANDHRA					
TO 512055 WADDEKOT	220.00	1	125.8	20.1	127.4	59		3.23	18.37	5	SOUTH		51	TELANGANA					
TO 512198 KOTH V	220.00	1	39.4	-3.0	39.5	8		0.00	0.01	5	SOUTH		51	TELANGANA					
TO 512198 KOTH V	220.00	2	39.4	-3.0	39.5	8		0.00	0.01	5	SOUTH		51	TELANGANA					
TO 512199 B.G.KOTHUR	220.00	1	32.4	34.9	47.7	20		0.11	0.59	5	SOUTH		58	TEL-LOAD					
BUS 512033 MANG	220.00	CKT	MW	MVAR	MVA	%	1.0052PU	-62.87	X---	LOSSES	---	X----	AREA	-----	X----	ZONE	-----	X	512033
							221.15KV			MW	MVAR	5	SOUTH		51	TELANGANA			
TO 511010 MANUGURU	132.00	1	59.4	-5.9	59.6	62	1.0000LK		0.00	2.20	5	SOUTH		51	TELANGANA				
TO 511010 MANUGURU	132.00	2	59.4	-5.9	59.6	62	1.0000LK		0.00	2.20	5	SOUTH		51	TELANGANA				
TO 512028 KOTH	220.00	2	-31.0	-16.6	35.2	17		0.09	0.46	5	SOUTH		51	TELANGANA					
TO 512088 HWP	220.00	1	7.1	-0.6	7.1	4		0.00	0.01	5	SOUTH		51	TELANGANA					
TO 512088 HWP	220.00	2	7.1	-0.6	7.1	4		0.00	0.01	5	SOUTH		51	TELANGANA					
TO 512199 B.G.KOTHUR	220.00	1	-29.7	22.6	37.3	15		0.04	0.23	5	SOUTH		58	TEL-LOAD					
TO 512234 MANUGURU4/2	220.00	1	-36.0	3.4	36.2	15		0.04	0.24	5	SOUTH		51	TELANGANA					
TO 512234 MANUGURU4/2	220.00	2	-36.0	3.4	36.2	15		0.04	0.24	5	SOUTH		51	TELANGANA					
BUS 512069 JULURUPADU	220.00	CKT	MW	MVAR	MVA	%	1.0113PU	-66.07	X---	LOSSES	---	X----	AREA	-----	X----	ZONE	-----	X	512069
							222.48KV			MW	MVAR	5	SOUTH		51	TELANGANA			
TO 512149 KALLUR	220.00	1	39.8	-1.1	39.8	21		0.17	0.90	5	SOUTH		51	TELANGANA					
TO 512149 KALLUR	220.00	2	39.8	-1.1	39.8	21		0.17	0.90	5	SOUTH		51	TELANGANA					

with 400kv Manuguru SS with LI loads

TO 512155	PEDAGOPATHI	220.00	1	47.6	2.8	47.7	25	0.40	2.12	5	SOUTH	51	TELANGANA						
TO 512155	PEDAGOPATHI	220.00	2	47.6	2.8	47.7	25	0.40	2.12	5	SOUTH	51	TELANGANA						
TO 514045	JULURUPADU	400.00	1	-87.5	-1.7	87.5	46	1.0000UN	0.00	2.38	5	SOUTH	51	TELANGANA					
TO 514045	JULURUPADU	400.00	2	-87.5	-1.7	87.5	46	1.0000UN	0.00	2.38	5	SOUTH	51	TELANGANA					
BUS 512088	HWP	220.00	CKT	MW	MVAR	MVA	%	1.0049PU	-62.93	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512088
								221.07KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO LOAD-PQ				14.1	4.5	14.8													
TO 512033	MANG	220.00	1	-7.1	-2.3	7.4	4		0.00	0.01	5	SOUTH	51	TELANGANA					
TO 512033	MANG	220.00	2	-7.1	-2.3	7.4	4		0.00	0.01	5	SOUTH	51	TELANGANA					
BUS 512149	KALLUR	220.00	CKT	MW	MVAR	MVA	%	1.0049PU	-67.35	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512149
								221.09KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 511030	KALLUR	132.00	1	39.7	8.1	40.5	67	1.0000LK	0.00	1.62	5	SOUTH	51	TELANGANA					
TO 511030	KALLUR	132.00	2	39.7	8.1	40.5	67	1.0000LK	0.00	1.62	5	SOUTH	51	TELANGANA					
TO 512069	JULURUPADU	220.00	1	-39.7	-8.1	40.5	21		0.17	0.90	5	SOUTH	51	TELANGANA					
TO 512069	JULURUPADU	220.00	2	-39.7	-8.1	40.5	21		0.17	0.90	5	SOUTH	51	TELANGANA					
BUS 512155	PEDAGOPATHI	220.00	CKT	MW	MVAR	MVA	%	0.9944PU	-68.43	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512155
								218.77KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 511034	PEDAGOPATHI	132.00	1	47.2	16.4	50.0	83	1.0000LK	0.00	2.53	5	SOUTH	51	TELANGANA					
TO 511034	PEDAGOPATHI	132.00	2	47.2	16.4	50.0	83	1.0000LK	0.00	2.53	5	SOUTH	51	TELANGANA					
TO 512069	JULURUPADU	220.00	1	-47.2	-16.4	50.0	26		0.40	2.12	5	SOUTH	51	TELANGANA					
TO 512069	JULURUPADU	220.00	2	-47.2	-16.4	50.0	26		0.40	2.12	5	SOUTH	51	TELANGANA					
BUS 512198	KOTH V	220.00	CKT	MW	MVAR	MVA	%	1.0130PU	-62.21	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512198
FROM GENERATION				392.5	3.8R	392.5	67	222.86KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 512028	KOTH	220.00	1	-39.4	2.8	39.5	8		0.00	0.01	5	SOUTH	51	TELANGANA					
TO 512028	KOTH	220.00	2	-39.4	2.8	39.5	8		0.00	0.01	5	SOUTH	51	TELANGANA					
TO 512089	SITARMN	220.00	1	45.6	-14.3	47.8	24		0.07	0.36	5	SOUTH	51	TELANGANA					
TO 512089	SITARMN	220.00	2	45.6	-14.3	47.8	24		0.07	0.36	5	SOUTH	51	TELANGANA					
TO 512139	KHAMMAM-TS	220.00	1	192.0	5.8	192.0	47		1.33	14.83	5	SOUTH	51	TELANGANA					
TO 512139	KHAMMAM-TS	220.00	2	192.0	5.8	192.0	47		1.33	14.83	5	SOUTH	51	TELANGANA					
TO 512199	B.G.KOTHUR	220.00	1	28.0	30.7	41.5	17		0.10	0.51	5	SOUTH	58	TEL-LOAD					
TO 514034	KOTH-VI	400.00	1	-31.9	-15.3	35.4	19	1.0000UN	0.00	0.39	5	SOUTH	51	TELANGANA					
BUS 512199	B.G.KOTHUR	220.00	CKT	MW	MVAR	MVA	%	1.0024PU	-62.56	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512199
								220.53KV			MW	MVAR	5	SOUTH			58	TEL-LOAD	
TO LOAD-PQ				150.0	75.0	167.7													
TO 512028	KOTH	220.00	1	-32.3	-38.7	50.4	21		0.11	0.59	5	SOUTH	51	TELANGANA					
TO 512033	MANG	220.00	1	29.8	-25.1	38.9	16		0.04	0.23	5	SOUTH	51	TELANGANA					
TO 512050	LISLRU	220.00	1	-119.5	23.8	121.9	51		3.11	16.57	5	SOUTH	50	ANDHRA					
TO 512198	KOTH V	220.00	1	-27.9	-35.0	44.8	19		0.10	0.51	5	SOUTH	51	TELANGANA					
BUS 512234	MANUGURU4/2	220.00	CKT	MW	MVAR	MVA	%	1.0056PU	-62.49	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512234
								221.23KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 512033	MANG	220.00	1	36.1	-6.4	36.6	15		0.04	0.24	5	SOUTH	51	TELANGANA					
TO 512033	MANG	220.00	2	36.1	-6.4	36.6	15		0.04	0.24	5	SOUTH	51	TELANGANA					
TO 514055	MANUGURU	400.00	2	-72.1	12.7	73.2	39	1.0000UN	0.00	1.68	5	SOUTH	51	TELANGANA					
BUS 514034	KOTH-VI	400.00	CKT	MW	MVAR	MVA	%	1.0179PU	-63.85	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514034
FROM GENERATION				392.5	225.0H	452.4	86	407.14KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 512198	KOTH V	220.00	1	31.9	15.7	35.5	19	1.0000LK	-2.20LO	0.00	0.39	5	SOUTH	51	TELANGANA				
TO 514004	KHAM	400.00	1	224.0	-38.4	227.2	43		0.59	6.35	5	SOUTH	51	TELANGANA					
TO 514044	KOTH-VII	400.00	1	136.7	247.7	282.9	54		0.07	0.80	5	SOUTH	51	TELANGANA					
BUS 514044	KOTH-VII	400.00	CKT	MW	MVAR	MVA	%	1.0152PU	-63.92	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514044
FROM GENERATION				628.0	-200.0L	659.1	70	406.09KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 514004	KHAM	400.00	1	211.0	-57.8	218.8	42		0.55	5.84	5	SOUTH	51	TELANGANA					

with 400kv Manuguru SS with LI loads																				
TO	514034	KOTH-VI	400.00	1	-136.6	-250.2	285.1	54		0.07	0.80	5	SOUTH	51	TELANGANA					
TO	514045	JULURUPADU	400.00	1	276.8	54.0	282.0	41		0.18	3.10	5	SOUTH	51	TELANGANA					
TO	514045	JULURUPADU	400.00	2	276.8	54.0	282.0	41		0.18	3.10	5	SOUTH	51	TELANGANA					
BUS	514045	JULURUPADU	400.00	CKT	MW	MVAR	MVA	%	1.0122PU	-64.52	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514045
									404.87KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO	512069	JULURUPADU	220.00	1	87.5	4.1	87.6	46	1.0000LK			0.00	2.38	5	SOUTH			51	TELANGANA	
TO	512069	JULURUPADU	220.00	2	87.5	4.1	87.6	46	1.0000LK			0.00	2.38	5	SOUTH			51	TELANGANA	
TO	514037	SURYPET4	400.00	1	152.1	-96.5	180.1	26				0.28	4.78	5	SOUTH			51	TELANGANA	
TO	514037	SURYPET4	400.00	2	152.1	-96.5	180.1	26				0.28	4.78	5	SOUTH			51	TELANGANA	
TO	514044	KOTH-VII	400.00	1	-276.6	-69.7	285.3	41				0.18	3.10	5	SOUTH			51	TELANGANA	
TO	514044	KOTH-VII	400.00	2	-276.6	-69.7	285.3	41				0.18	3.10	5	SOUTH			51	TELANGANA	
TO	514055	MANUGURU	400.00	1	-459.1	92.9	468.4	68				1.61	27.92	5	SOUTH			51	TELANGANA	
TO	514055	MANUGURU	400.00	2	-459.1	92.9	468.4	68				1.61	27.92	5	SOUTH			51	TELANGANA	
TO	514063	JANAGAON	400.00	1	244.7	-51.7	250.1	36				1.08	18.65	5	SOUTH			51	TELANGANA	
TO	514063	JANAGAON	400.00	2	244.7	-51.7	250.1	36				1.08	18.65	5	SOUTH			51	TELANGANA	
TO	514071	KAMALAPURAM	400.00	1	251.5	120.9	279.0	53				0.72	7.68	5	SOUTH			51	TELANGANA	
TO	514071	KAMALAPURAM	400.00	2	251.5	120.9	279.0	53				0.72	7.68	5	SOUTH			51	TELANGANA	
BUS	514055	MANUGURU	400.00	CKT	MW	MVAR	MVA	%	1.0018PU	-61.18	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514055
		FROM GENERATION			993.6	-260.0L	1027.1	81	400.72KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO	512234	MANUGURU4/2	220.00	2	72.1	-11.0	73.0	38	1.0000LK			0.00	1.68	5	SOUTH			51	TELANGANA	
TO	514045	JULURUPADU	400.00	1	460.7	-124.5	477.3	70				1.61	27.92	5	SOUTH			51	TELANGANA	
TO	514045	JULURUPADU	400.00	2	460.7	-124.5	477.3	70				1.61	27.92	5	SOUTH			51	TELANGANA	

X-- ZONE --X	FROM GENE- RATION	-----AT FROM GENERATN	ZONE IND TO IND MOTORS	BUSES----- TO LOAD	TO BUS SHUNT	TO GNE BUS DEVICES	TO LINE SHUNT	FROM CHARGING	TO LOSSES	-NET INTERCHANGE- TO TIE LINES	TO TIES + LOADS
51 TELANGANA	10380.8 -1457.1	0.0 0.0	0.0 0.0	13357.4 4526.4	0.0 2028.1	0.0 0.0	0.0 2748.1	0.0 13339.9	259.6 2999.5	-3236.2 -419.2	-3303.8 -452.1
58 TEL-LOAD	0.0 0.0	0.0 0.0	0.0 0.0	77.6 35.9	0.0 900.9	0.0 0.0	0.0 0.0	0.0 1405.4	6.5 75.3	-84.1 393.4	-16.5 426.3
COLUMN TOTALS	10380.8 -1457.1	0.0 0.0	0.0 0.0	13435.0 4562.2	0.0 2929.0	0.0 0.0	0.0 2748.1	0.0 14745.3	266.1 3074.7	-3320.3 -25.8	-3320.3 -25.8

BUS	MANUGURU	132.00	CKT	MW	MVAR	MVA	%	1.0174PU	3.75	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511010
TO LOAD-PQ				19.1	5.0	19.8		134.30KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO SHUNT				0.0	-7.5	7.5													
TO 511100 KAMALAPUR WA	132.00	1		38.4	-10.9	40.0	59				0.79	1.88	5	SOUTH			51	TELANGANA	
TO 511100 KAMALAPUR WA	132.00	2		38.4	-10.9	40.0	59				0.79	1.88	5	SOUTH			51	TELANGANA	
TO 511397 SCCL_MANUGR	132.00	1		10.1	2.8	10.5	12				0.00	0.01	5	SOUTH			51	TELANGANA	
TO 512033 MANG	220.00	1		-53.1	10.8	54.1	56	1.0000UN			0.00	1.77	5	SOUTH			51	TELANGANA	
TO 512033 MANG	220.00	2		-53.1	10.8	54.1	56	1.0000UN			0.00	1.77	5	SOUTH			51	TELANGANA	
BUS 511030 KALLUR	132.00	CKT		MW	MVAR	MVA	%	1.0000PU	-1.11	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511030
TO LOAD-PQ				19.0	10.4	21.6		132.00KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 511026 KHAMMAM TS	132.00	1		1.4	-2.6	3.0	4				0.00	0.00	5	SOUTH			51	TELANGANA	
TO 511046 THALLADA	132.00	1		40.9	7.0	41.5	49				0.47	1.12	5	SOUTH			51	TELANGANA	
TO 511047 PENUBALLI	132.00	1		12.7	-0.3	12.7	15				0.02	0.04	5	SOUTH			51	TELANGANA	
TO 511047 PENUBALLI	132.00	2		12.7	-0.3	12.7	15				0.02	0.04	5	SOUTH			51	TELANGANA	
TO 512149 KALLUR	220.00	1		-43.3	-7.1	43.9	73	1.0000UN			0.00	1.92	5	SOUTH			51	TELANGANA	
TO 512149 KALLUR	220.00	2		-43.3	-7.1	43.9	73	1.0000UN			0.00	1.92	5	SOUTH			51	TELANGANA	
BUS 511034 PEDAGOPATHI	132.00	CKT		MW	MVAR	MVA	%	0.9823PU	-2.94	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511034
TO LOAD-PQ				68.7	42.3	80.7		129.66KV			MW	MVAR	5	SOUTH			51	TELANGANA	
TO 511045 MADHIRA	132.00	1		12.7	-3.3	13.1	16				0.07	0.16	5	SOUTH			51	TELANGANA	
TO 511045 MADHIRA	132.00	2		12.7	-3.3	13.1	16				0.07	0.16	5	SOUTH			51	TELANGANA	
TO 511046 THALLADA	132.00	1		-15.7	1.4	15.7	19				0.05	0.11	5	SOUTH			51	TELANGANA	
TO 511046 THALLADA	132.00	2		-15.7	1.4	15.7	19				0.05	0.11	5	SOUTH			51	TELANGANA	
TO 511049 KUSUMANCHI	132.00	1		14.6	-5.3	15.5	19				0.07	0.16	5	SOUTH			51	TELANGANA	
TO 511050 KHAMMAM 132	132.00	1		-12.5	-4.8	13.4	16				0.07	0.16	5	SOUTH			51	TELANGANA	
TO 511260 CHILAKALLU	132.00	1		19.9	-0.8	19.9	24				0.19	0.45	5	SOUTH			50	ANDHRA	
TO 511260 CHILAKALLU	132.00	2		19.9	-0.8	19.9	24				0.19	0.45	5	SOUTH			50	ANDHRA	
TO 512155 PEDAGOPATHI	220.00	1		-52.3	-13.4	54.0	90	1.0000UN			0.00	3.02	5	SOUTH			51	TELANGANA	
TO 512155 PEDAGOPATHI	220.00	2		-52.3	-13.4	54.0	90	1.0000UN			0.00	3.02	5	SOUTH			51	TELANGANA	
BUS 511098 CHELPUR	132.00	CKT		MW	MVAR	MVA	%	1.0205PU	-2.38	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511098
TO LOAD-PQ				40.3	13.1	42.4		134.71KV			MW	MVAR	5	SOUTH			51	TELANGANA	

with 400kv Manuguru SS without LI loads

TO SHUNT				0.0	-15.0	15.0													
TO 511062 CHITYALA	132.00	1		33.5	13.6	36.2	53		0.25	0.60	5	SOUTH		51	TELANGANA				
TO 511100 KAMALAPUR WA	132.00	1		-21.6	11.2	24.3	28		0.51	1.35	5	SOUTH		51	TELANGANA				
TO 511342 KTPP_BHPLLY	132.00	1		2.2	0.6	2.3	3		0.00	0.00	5	SOUTH		51	TELANGANA				
TO 511343 REGONDA	132.00	1		36.1	12.3	38.1	44		0.20	0.47	5	SOUTH		51	TELANGANA				
TO 511344 RANGARAOPALY	132.00	1		10.2	27.1	28.9	34		0.26	0.63	5	SOUTH		58	TEL-LOAD				
TO 511345 SCCL_CHELPU	132.00	1		43.3	22.7	48.9	57		0.11	0.26	5	SOUTH		51	TELANGANA				
TO 511346 KTPP	132.00	1		-72.0	-42.8	83.8	57		0.06	0.30	5	SOUTH		51	TELANGANA				
TO 511346 KTPP	132.00	2		-72.0	-42.8	83.8	57		0.06	0.30	5	SOUTH		51	TELANGANA				
BUS 511099 MULUGU	132.00	CKT		MW	MVAR	MVA	%	0.9950PU	-2.31	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511099
								131.34KV			MW	MVAR		5	SOUTH		51	TELANGANA	
TO LOAD-PQ				38.3	33.3	50.7													
TO SHUNT				0.0	-7.1	7.1													
TO 511100 KAMALAPUR WA	132.00	1		-28.4	2.1	28.5	43		0.63	1.51	5	SOUTH		51	TELANGANA				
TO 511344 RANGARAOPALY	132.00	2		-9.9	-28.3	30.0	36		0.03	0.06	5	SOUTH		58	TEL-LOAD				
BUS 511100 KAMALAPUR WA	132.00	CKT		MW	MVAR	MVA	%	1.0106PU	0.81	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511100
								133.39KV			MW	MVAR		5	SOUTH		51	TELANGANA	
TO LOAD-PQ				24.2	7.1	25.2													
TO SHUNT				0.0	-7.4	7.4													
TO 511010 MANUGURU	132.00	1		-37.7	9.9	38.9	58		0.79	1.88	5	SOUTH		51	TELANGANA				
TO 511010 MANUGURU	132.00	2		-37.7	9.9	38.9	58		0.79	1.88	5	SOUTH		51	TELANGANA				
TO 511098 CHELPU	132.00	1		22.1	-14.6	26.5	31		0.51	1.35	5	SOUTH		51	TELANGANA				
TO 511099 MULUGU	132.00	1		29.0	-4.8	29.4	43		0.63	1.51	5	SOUTH		51	TELANGANA				
BUS 511397 SCCL_MANUGR	132.00	CKT		MW	MVAR	MVA	%	1.0167PU	3.70	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	511397
								134.20KV			MW	MVAR		5	SOUTH		51	TELANGANA	
TO LOAD-PQ				10.1	3.0	10.5													
TO 511010 MANUGURU	132.00	1		-10.1	-3.0	10.5	12		0.00	0.01	5	SOUTH		51	TELANGANA				
BUS 512028 KOTH	220.00	CKT		MW	MVAR	MVA	%	1.0130PU	5.46	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512028
FROM GENERATION				257.8	10.9R	258.0	46	222.86KV			MW	MVAR		5	SOUTH		51	TELANGANA	
TO 511009 KTPS	132.00	1		28.7	-6.7	29.5	59	1.0000LK	0.00	1.65	5	SOUTH		51	TELANGANA				
TO 511009 KTPS	132.00	2		28.7	-6.7	29.5	59	1.0000LK	0.00	1.65	5	SOUTH		51	TELANGANA				
TO 512005 VIJA	220.00	1		98.3	-10.0	98.8	49		1.85	9.87	5	SOUTH		50	ANDHRA				
TO 512033 MANG	220.00	2		-4.9	1.4	5.1	3		0.00	0.02	5	SOUTH		51	TELANGANA				
TO 512047 MIRYALAGUDA	220.00	1		71.6	-10.3	72.3	36		1.16	6.18	5	SOUTH		51	TELANGANA				
TO 512050 LISLRU	220.00	1		-99.4	27.2	103.1	51		2.23	11.93	5	SOUTH		50	ANDHRA				
TO 512055 WADDEKOT	220.00	1		101.1	13.9	102.0	47		2.08	11.84	5	SOUTH		51	TELANGANA				
TO 512198 KOTH V	220.00	1		32.0	-2.5	32.1	7		0.00	0.01	5	SOUTH		51	TELANGANA				
TO 512198 KOTH V	220.00	2		32.0	-2.5	32.1	7		0.00	0.01	5	SOUTH		51	TELANGANA				
TO 512199 B.G.KOTHUR	220.00	1		-30.3	7.1	31.1	13		0.05	0.24	5	SOUTH		58	TEL-LOAD				
BUS 512033 MANG	220.00	CKT		MW	MVAR	MVA	%	1.0113PU	5.60	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512033
								222.49KV			MW	MVAR		5	SOUTH		51	TELANGANA	
TO 511010 MANUGURU	132.00	1		53.1	-9.0	53.8	56	1.0000LK	0.00	1.77	5	SOUTH		51	TELANGANA				
TO 511010 MANUGURU	132.00	2		53.1	-9.0	53.8	56	1.0000LK	0.00	1.77	5	SOUTH		51	TELANGANA				
TO 512028 KOTH	220.00	2		4.9	-8.7	10.0	5		0.00	0.02	5	SOUTH		51	TELANGANA				
TO 512088 HWP	220.00	1		7.1	-0.6	7.1	4		0.00	0.01	5	SOUTH		51	TELANGANA				
TO 512088 HWP	220.00	2		7.1	-0.6	7.1	4		0.00	0.01	5	SOUTH		51	TELANGANA				
TO 512199 B.G.KOTHUR	220.00	1		-35.2	0.1	35.2	15		0.04	0.19	5	SOUTH		58	TEL-LOAD				
TO 512234 MANUGURU4/2	220.00	1		-45.0	13.9	47.1	19		0.08	0.40	5	SOUTH		51	TELANGANA				
TO 512234 MANUGURU4/2	220.00	2		-45.0	13.9	47.1	19		0.08	0.40	5	SOUTH		51	TELANGANA				
BUS 512069 JULURUPADU	220.00	CKT		MW	MVAR	MVA	%	1.0152PU	2.72	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512069
								223.35KV			MW	MVAR		5	SOUTH		51	TELANGANA	
TO 512149 KALLUR	220.00	1		43.5	-0.1	43.5	23		0.20	1.07	5	SOUTH		51	TELANGANA				
TO 512149 KALLUR	220.00	2		43.5	-0.1	43.5	23		0.20	1.07	5	SOUTH		51	TELANGANA				

with 400kv Manuguru SS without LI loads

TO 512155	PEDAGOPATHI	220.00	1	52.8	3.2	52.9	27	0.48	2.56	5	SOUTH	51	TELANGANA					
TO 512155	PEDAGOPATHI	220.00	2	52.8	3.2	52.9	27	0.48	2.56	5	SOUTH	51	TELANGANA					
TO 514045	JULURUPADU	400.00	1	-96.3	-3.1	96.3	51	1.0000UN	0.00	2.86	5	SOUTH	51	TELANGANA				
TO 514045	JULURUPADU	400.00	2	-96.3	-3.1	96.3	51	1.0000UN	0.00	2.86	5	SOUTH	51	TELANGANA				
BUS 512088	HWP	220.00	CKT	MW	MVAR	MVA	% 1.0110PU	5.53	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512088
							222.41KV			MW	MVAR	5	SOUTH					
TO LOAD-PQ				14.1	4.5	14.8												
TO 512033	MANG	220.00	1	-7.1	-2.3	7.4	4	0.00	0.01	5	SOUTH	51	TELANGANA					
TO 512033	MANG	220.00	2	-7.1	-2.3	7.4	4	0.00	0.01	5	SOUTH	51	TELANGANA					
BUS 512149	KALLUR	220.00	CKT	MW	MVAR	MVA	% 1.0080PU	1.35	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512149
							221.77KV			MW	MVAR	5	SOUTH					
TO 511030	KALLUR	132.00	1	43.3	9.0	44.2	74	1.0000LK	0.00	1.92	5	SOUTH	51	TELANGANA				
TO 511030	KALLUR	132.00	2	43.3	9.0	44.2	74	1.0000LK	0.00	1.92	5	SOUTH	51	TELANGANA				
TO 512069	JULURUPADU	220.00	1	-43.3	-9.0	44.2	23	0.20	1.07	5	SOUTH	51	TELANGANA					
TO 512069	JULURUPADU	220.00	2	-43.3	-9.0	44.2	23	0.20	1.07	5	SOUTH	51	TELANGANA					
BUS 512155	PEDAGOPATHI	220.00	CKT	MW	MVAR	MVA	% 0.9974PU	0.12	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512155
							219.42KV			MW	MVAR	5	SOUTH					
TO 511034	PEDAGOPATHI	132.00	1	52.3	16.5	54.8	91	1.0000LK	0.00	3.02	5	SOUTH	51	TELANGANA				
TO 511034	PEDAGOPATHI	132.00	2	52.3	16.5	54.8	91	1.0000LK	0.00	3.02	5	SOUTH	51	TELANGANA				
TO 512069	JULURUPADU	220.00	1	-52.3	-16.5	54.8	29	0.48	2.56	5	SOUTH	51	TELANGANA					
TO 512069	JULURUPADU	220.00	2	-52.3	-16.5	54.8	29	0.48	2.56	5	SOUTH	51	TELANGANA					
BUS 512198	KOTH V	220.00	CKT	MW	MVAR	MVA	% 1.0130PU	5.45	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512198
FROM GENERATION				268.5	-49.5R	273.0	46	222.86KV		MW	MVAR	5	SOUTH					
TO 512028	KOTH	220.00	1	-32.0	2.3	32.1	7	0.00	0.01	5	SOUTH	51	TELANGANA					
TO 512028	KOTH	220.00	2	-32.0	2.3	32.1	7	0.00	0.01	5	SOUTH	51	TELANGANA					
TO 512089	SITARMN	220.00	1	44.2	-15.4	46.7	23	0.06	0.34	5	SOUTH	51	TELANGANA					
TO 512089	SITARMN	220.00	2	44.2	-15.4	46.7	23	0.06	0.34	5	SOUTH	51	TELANGANA					
TO 512139	KHAMMAM-TS	220.00	1	169.9	-4.1	170.0	42	1.04	11.58	5	SOUTH	51	TELANGANA					
TO 512139	KHAMMAM-TS	220.00	2	169.9	-4.1	170.0	42	1.04	11.58	5	SOUTH	51	TELANGANA					
TO 512199	B.G.KOTHUR	220.00	1	-27.6	5.9	28.2	12	0.04	0.23	5	SOUTH	58	TEL-LOAD					
TO 514034	KOTH-VI	400.00	1	-68.1	-21.0	71.3	38	1.0000UN	0.00	1.57	5	SOUTH	51	TELANGANA				
BUS 512199	B.G.KOTHUR	220.00	CKT	MW	MVAR	MVA	% 1.0121PU	5.91	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512199
							222.67KV			MW	MVAR	5	SOUTH					
TO 512028	KOTH	220.00	1	30.4	-11.3	32.4	13	0.05	0.24	5	SOUTH	58	TEL-LOAD					
TO 512033	MANG	220.00	1	35.3	-2.7	35.4	15	0.04	0.19	5	SOUTH	51	TELANGANA					
TO 512050	LISLRU	220.00	1	-93.2	24.6	96.4	40	1.95	10.42	5	SOUTH	50	ANDHRA					
TO 512198	KOTH V	220.00	1	27.6	-10.7	29.6	12	0.04	0.23	5	SOUTH	51	TELANGANA					
BUS 512234	MANUGURU4/2	220.00	CKT	MW	MVAR	MVA	% 1.0101PU	6.08	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	512234
							222.22KV			MW	MVAR	5	SOUTH					
TO 512033	MANG	220.00	1	45.0	-16.7	48.0	20	0.08	0.40	5	SOUTH	51	TELANGANA					
TO 512033	MANG	220.00	2	45.0	-16.7	48.0	20	0.08	0.40	5	SOUTH	51	TELANGANA					
TO 514055	MANUGURU	400.00	2	-90.1	33.4	96.1	51	1.0000UN	0.00	2.87	5	SOUTH	51	TELANGANA				
BUS 514034	KOTH-VI	400.00	CKT	MW	MVAR	MVA	% 1.0198PU	4.45	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514034
FROM GENERATION				268.5	225.0H	350.3	66	407.92KV		MW	MVAR	5	SOUTH					
TO 512198	KOTH V	220.00	1	68.1	22.5	71.7	38	1.0000LK	-2.20LO	0.00	1.57	5	SOUTH	51	TELANGANA			
TO 514004	KHAM	400.00	1	274.2	-56.6	280.0	53	0.90	9.58	5	SOUTH	51	TELANGANA					
TO 514044	KOTH-VII	400.00	1	-73.8	259.1	269.4	51	0.07	0.72	5	SOUTH	51	TELANGANA					
BUS 514044	KOTH-VII	400.00	CKT	MW	MVAR	MVA	% 1.0173PU	4.51	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514044
FROM GENERATION				429.6	-200.0L	473.9	50	406.90KV		MW	MVAR	5	SOUTH					
TO SHUNT				0.0	129.4	129.4												
TO 514004	KHAM	400.00	1	277.1	-76.2	287.4	55	0.95	10.13	5	SOUTH	51	TELANGANA					

with 400kv Manuguru SS without LI loads																		
TO 514034	KOTH-VI	400.00	1	73.9	-261.7	271.9	52	0.07	0.72	5	SOUTH	51	TELANGANA					
TO 514045	JULURUPADU	400.00	1	39.3	4.2	39.5	6	0.00	0.07	5	SOUTH	51	TELANGANA					
TO 514045	JULURUPADU	400.00	2	39.3	4.2	39.5	6	0.00	0.07	5	SOUTH	51	TELANGANA					
BUS 514045	JULURUPADU	400.00	CKT	MW	MVAR	MVA	% 1.0166PU 406.65KV	4.42	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514045
TO 512069	JULURUPADU	220.00	1	96.3	5.9	96.5	51 1.0000LK			0.00	2.86	5	SOUTH	51	TELANGANA			
TO 512069	JULURUPADU	220.00	2	96.3	5.9	96.5	51 1.0000LK			0.00	2.86	5	SOUTH	51	TELANGANA			
TO 514037	SURYPET4	400.00	1	226.8	-94.4	245.7	35			0.57	9.89	5	SOUTH	51	TELANGANA			
TO 514037	SURYPET4	400.00	2	226.8	-94.4	245.7	35			0.57	9.89	5	SOUTH	51	TELANGANA			
TO 514044	KOTH-VII	400.00	1	-39.3	-23.1	45.6	7			0.00	0.07	5	SOUTH	51	TELANGANA			
TO 514044	KOTH-VII	400.00	2	-39.3	-23.1	45.6	7			0.00	0.07	5	SOUTH	51	TELANGANA			
TO 514055	MANUGURU	400.00	1	-450.1	142.4	472.1	68			1.64	28.47	5	SOUTH	51	TELANGANA			
TO 514055	MANUGURU	400.00	2	-450.1	142.4	472.1	68			1.64	28.47	5	SOUTH	51	TELANGANA			
TO 514063	JANAGAON	400.00	1	166.3	-60.5	177.0	26			0.50	8.54	5	SOUTH	51	TELANGANA			
TO 514063	JANAGAON	400.00	2	166.3	-60.5	177.0	26			0.50	8.54	5	SOUTH	51	TELANGANA			
TO 514071	KAMALAPURAM	400.00	1	0.0	29.6	29.6	6			0.02	0.19	5	SOUTH	51	TELANGANA			
TO 514071	KAMALAPURAM	400.00	2	0.0	29.6	29.6	6			0.02	0.19	5	SOUTH	51	TELANGANA			
BUS 514055	MANUGURU	400.00	CKT	MW	MVAR	MVA	% 1.0000PU 400.00KV	7.71	X---	LOSSES	---X	X----	AREA	-----X	X----	ZONE	-----X	514055
FROM GENERATION				993.6	-252.7R	1025.2	81					5	SOUTH	51	TELANGANA			
TO SHUNT				0.0	125.0	125.0												
TO 512234	MANUGURU4/2	220.00	2	90.1	-30.5	95.1	50 1.0000LK			0.00	2.87	5	SOUTH	51	TELANGANA			
TO 514045	JULURUPADU	400.00	1	451.8	-173.6	484.0	71			1.64	28.47	5	SOUTH	51	TELANGANA			
TO 514045	JULURUPADU	400.00	2	451.8	-173.6	484.0	71			1.64	28.47	5	SOUTH	51	TELANGANA			

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

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Office of the
Chief Engineer Electy.,
Planning & Co-ordination,
Kaveri Bhavan, Bangalore-9

No. CEE (P&C)/SEE(Plg)/EE(PSS)KCO-97/100330/2018-19

Date:

File No.

34276-281

26 FEB 2019

**The Member (Power systems),
Central Electricity Authority,
Sewa Bhavan, R.K.Puram,
New Delhi-110 066.**

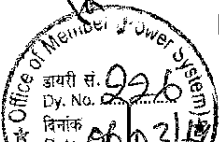
**Sub: Intra-state proposals for network strengthening of Karnataka - Reg.
Ref:**

Adverting to above subject, the following intra-state transmission proposals of KPTCL are proposed for conducting joint studies with CEA and CTU for finalization of scheme and to obtain approval of Southern Region Standing Committee on Transmission.

- I. Establishment of 2x500 MVA, 400/220 kV Sub-station at Dommasandra in Bengaluru**
- II. Providing additional feed to 3x500 MVA, 400/220kV substation at Mylasandra (Electronic City)**

The proposal of establishing 3X500MVA, 400/220kV substation at Mylsandra (Electronic city) in Bangalore was approved with SC LILO of 400kV Kolar-Somanhalli Twin Moose line in the 27th Meeting of Standing Committee on Power System Planning of Southern Region (SCPSPSR). Further, in the 41st SCPSPSR, it was requested for re-conductoring of 400kV Kolar-Somanahalli SC Twin Moose to DC Quad Moose conductor in view of providing additional source to proposed 400/220kV Mylsandra. However, due to the difficulty in obtaining line clear for a long duration of the 400kV Kolar-Somanahalli line, it was decided to carry out Joint Study with CEA, CTU, POSOCO and KPTCL to arrive at another alternative.

In the 42nd SCPSPSR, KPTCL proposed to construct SC LILO of proposed DC 400kV Somanahalli- Dharamapuri (PGCIL) line. Also, in the 42nd SCPSPSR, KPTCL proposed to establish 2X500MVA, 400/220kV substation at Dommasandra in



Director (R&A-D/IS)
Ch. Prasad, AD-I

Bangalore city to relieve loading of proposed 400/220kV Mysandra substation was discussed and the following scheme was agreed.

Additional connectivity to 400/220kV Mysandra substation:

400kV SC Twin Moose line to link proposed 400/220kV Mysandra to proposed 400/220kV Dommasandra substation.

Connectivity to 400/220kV Dommasandra substation:

- i. 2x500MVA, 400/220kV ICTs
- ii. SC LILO of 400kV Dharampuri – Somanhalli D/C line (with Quad moose ACSR Conductor) at proposed 400/220 kV substation at Dommsandra.
- iii. 400kV SC Twin Moose line to link proposed 400/220kV Mysandra to proposed 400/220kV Dommasandra substation. (As approved as additional connectivity to 400/220kV Mysandra substation)

Further, in the 1st Meeting of Southern Region Standing Committee on Transmission (SRST) held on 7th September 2018 at Chennai, Tamil Nadu, KPTCL stated that as per discussion with field officers, execution of the project at the LILO point of proposed 400/220kV Mysandra is of concern. As per the approved scheme, 5 circuits of 400kV lines have to pass through a single tower and design of the same is not available. Further, it was also stated that 400kV Somanhalli-Dharampuri line proposed to be made LILO to Dommasandra substation, crosses the existing 220kV Peenya-Singarpet line. In view of this KPTCL requested for revision in connectivity of Mysandra 400/220kV and Dommasandra 400/220kV S/S as follows:

Connectivity at Mysandra 400/220kV substation:

- i. 3x500MVA, 400/220kV ICTs
- ii. LILO of Kolar – Somanhalli 400kV S/C line at Mysandara 400/220 kV substation (already agreed)
- iii. Mysandra – Dommasandra 400kV S/C line (with twin Moose ACSR conductor)

Connectivity at Dommasandra 400/220kV substation

- i. 2x500MVA, 400/220kV ICTs,
- ii. LILO of one circuit of Dharampuri – Somanhalli 400kV D/C line (with Quad moose ACSR Conductor) at proposed 400/220 kV substation at Dommsandra.
- iii. LILO of Mysandra – Kolar 400kV S/C line at proposed 400/220 kV substation at Dommsandra. (with twin moose ACSR Conductor).

After deliberations it was decided that the issue may be discussed in a separate meeting of CEA, CTU and KPTCL.

III. Establishing 2x500 MVA, 400/220 kV sub-station at Kadakola, Mysuru District:

KPTCL has planned to establish a 400/220 kV sub-station at Kadakola in Mysore District in view of relieving loads on 400/220 kV Bastipura sub-station (Mysore) and to provide alternate source of power supply to 220 kV stations in and around Mysore. The proposed transmission scheme for 400/220 kV Kadakola sub-station is as follows. (Refer Sketch -1)

- Double LILO of 400 kV Shantigrama – Bastipura DC Twin Moose line to the proposed 400/220 kV Kadakola sub-station.
- 2 X 500 MVA, 400/220 kV transformers with provision for additional 500 MVA transformer in future.
- 2X125 MVAR bus reactors.
- 220 kV bus extension to existing 220/66 kV Kadakola sub-station with the following 220 kV lines emanating from existing 220 kV Kadakola.
 - i. 220 kV DC line towards Chamarajanagar.
 - ii. 220 kV DC line from Bastipura.
 - iii. 220 kV SC line Towards Hootagalli.
 - iv. 220 kV SC line towards Kaniyambetta.
 - v. Proposed 220 kV DC line towards Vajamangala.

IV. Permanent de-linking of existing 400kV RTPS-BTPS-JSW-Guttur Twin Moose line between BTPS and JSW

M/s JSW in their letter dated 3rd September 2018 has requested for permanent de-linking of existing 400kV RTPS-BTPS-JSW-Guttur Twin Moose line between BTPS and JSW and will undertake action to retain direct connectivity between BTPS and Guttur.

In Joint meeting of Standing Committee of Power System Planning of SR and WR held on 26th December 2013 Transmission system of KPTCL for evacuation of power from Yeramarus (2x800 MW) and Edlapur (1x800 MW) Thermal Power generation the following scheme was approved.

- i) Bellary 400 kV Pooling station near BTPS.
- ii) Gulbarga 400/220 kV sub-station with 7x167 MVA or 2x500 MVA.
- iii) Yeramarus TPS-Gulbarga 400 kV D/C line with Quad Moose conductor.
- iv) Establish 400 kV switching station near Chikkanayakanahalli (CN Halli) near Loop in Loop out (LILO) point of 400 kV Nelamangala-Talaguppa lines to Hassan.

- v) LILO of both the Nelamangala-Talaguppa 400 kV lines to the proposed pooling station near CN Halli.
- vi) Terminate 400 kV D/C line feeding 400/220 kV Hassan sub-station from Nelamangala-Talaguppa line at CN Halli 400 kV pooling station.
- vii) Yeramarus TPS-BPS 400 kV D/C line with Quad Moose conductor.
- viii) Bellary Pooling station -CN Halli 400 kV D/C line with Quad Moose conductor.
- ix) Bellary Pooling station -New Madhugiri (Near Tumkur) 400 kV D/C line with Quad Moose conductor.
- x) Bellary TPS-Bellary Pooling station 400 kV D/C line with Quad Moose conductor.
- xi) De-link 400 kV S/C line running between RTPS-BTPS-JSW-Guttur with BTPS and JSW bus so as to retain direct connectivity between RTPS and Guttur
- xii) JSW TPS-BPS 400 kV D/C line with Quad Moose conductor

It was approved that KPTCL would plan an additional 400 kV DC transmission line from JSW TPS or would configure the JSW-Bellary link in such a way that in case of contingency the LILO of RTPS-Guttur at JSW would be re-established. If there is any constraint/congestion in the system beyond Bellary Pooling Station/or New Madhugiri S/S then JSW or other generators connected to Bellary P.S. may have to be backed down.

Further, in the 39th Meeting of Standing Committee on Power System Planning of Southern Region held on 28th & 29th December 2015, the following changes were agreed

- a) BTPS-Guttur 400 kV Quad Moose DC line.
- b) Retain the LILO to BTPS only from the existing 400 kV SC line running between 'RTPS-BTPS-JSW-Guttur'.
- c) BPS to BTPS 400 kV DC Quad Moose line link may be dropped.
- d) JSW would be connected with Bellari Pooling station by additional two nos 400kV Quad DC line.
- e) Switching station at 'Chikkanayakanahalli' (CN Halli) will be converted into a step down station with 2x500 MVA, 400/220 kV ICT's.

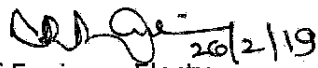
M/s JSW in their letter dated 3rd September 2018 has requested for permanent de-linking of existing 400kV RTPS-BTPS-JSW-Guttur Twin Moose line between BTPS and JSW and will undertake action to retain direct connectivity between BTPS and Guttur.

In this regard, in house, load flow study is conducted and is observed that by delinking JSW from the 400 kV LILO connectivity, the entire 1100 MW

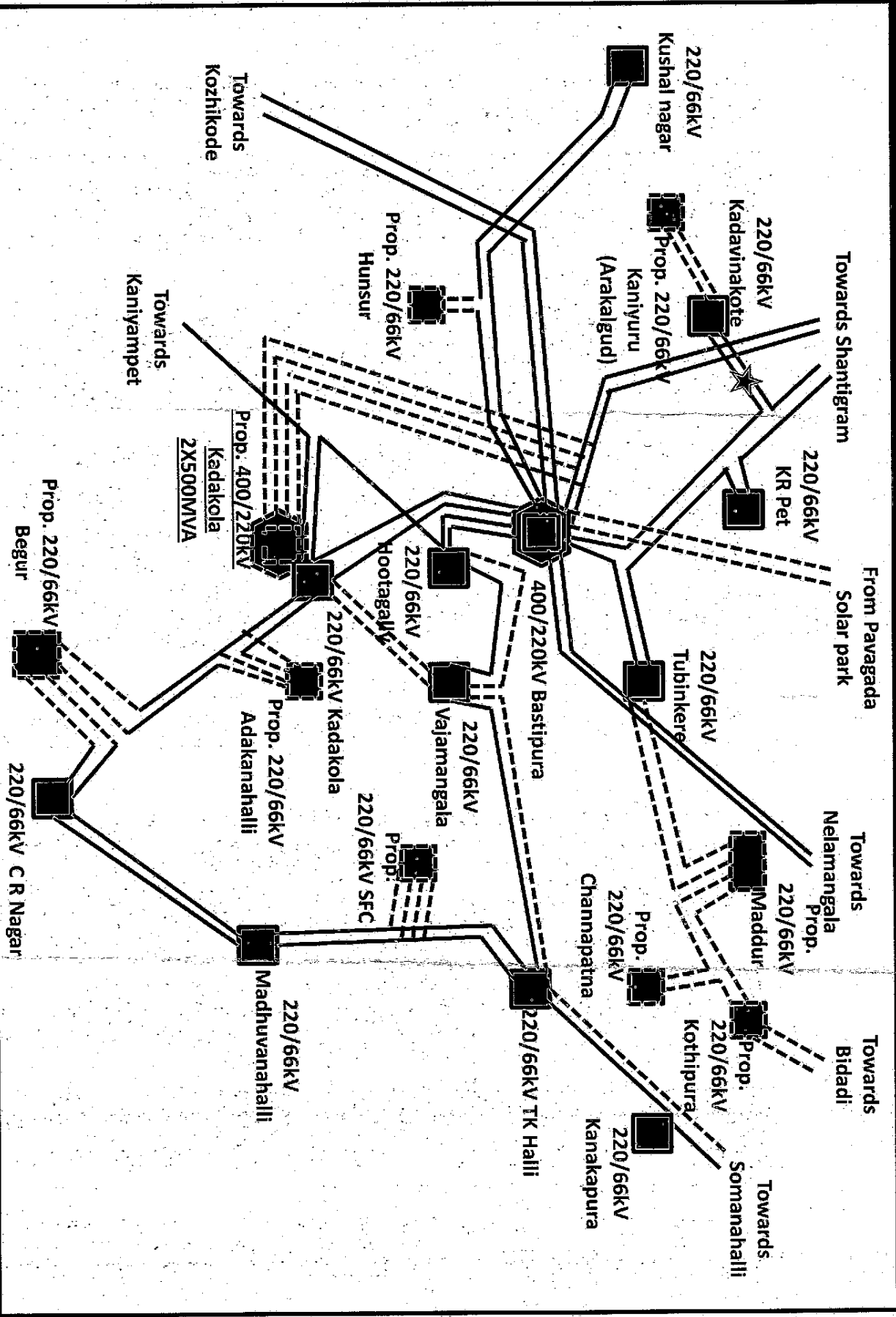
generation of JSW may not be exported in the existing network condition without completion of the associated transmission scheme of YTPS (400 kV Gulbarga and CN Halli). In the above condition, if there is outage of 400 kV DC Quad line between JSW & BPS, the 220kV JSW-Lingapura DC line is overloaded. Hence the generation at JSW needs to be restricted to the line loading capacity to 220 JSW-Lingapura DC Drake line.

In light of above, it is requested to arrange to conduct necessary Joint studies along with CEA & PGCIL officials so as to finalise the transmission schemes for the said projects in view of placing it before the ensuing Southern Region Standing Committee on Transmission for discussion and approval.

Yours faithfully

 26/2/19
Chief Engineer Electy.,
(Planning & Co-ordination)

Establishing 2X500MVA, 400/220 kV sub-station at Kadakola, Mysuru District





JSW Energy Limited

Works :
P. B. No. 9, Toranagallu
Dist. Bellary - 583 123, Karnataka, India
CIN. : L74999MH1994PLC077041
Phone : 08395 - 252 124
Fax : 08395 - 250 757
Website : www.jsw.in

Ref: JSW/400KV /LILO/01
Date: 3rd September 2018

To,
The Chief Engineer (Planning & Co-ordination),
Karnataka Power Transmission Corporation Limited
2nd Floor, Kaveri Bhavan,
K.G.Road,
Bangalore – 560 009

Dear Sir,

SUB: -De-Linking of 400kv LILO Line between BTPS –JSWEL and JSWEL-GUTTUR

REF: 1) CEA letter no 54/1/2013-SP&PA/2052-54 dated 19th Nov 2013.
2) CEE (P&C)/SEE (plg)/EE (PSS)/KCO-94/81183/F-8899/9/9426-40 Dated 7thAug17.

As you are aware, JSW constructed 400 kv Bellary Pooling Station (BPS) which was commissioned in all respects in the month of March 2018 and it has been operational since then successfully without any technical constraints and transmitting reliable power. As per the Evacuation scheme, BPS is connected with the incoming lines from JSW to BPS dedicated transmission lines; Yaramaras to BPS and outgoing lines from BPS to Vasant Narasapura (VN pura). All these transmission lines were also successfully commissioned and ensured reliable flow of power to the load center by JSW.

Prior to BPS, the power flow from JSW was established through dedicated 400kv LILO transmission Line passing through JSW premises from JSWEL to BTPS and JSWEL to Guttur which was constructed under Self-execution scheme by JSW. As per the letter under reference no-1&2, it was directed to delink 400kv LILO Line from JSWEL to BTPS and JSWEL to Guttur so as to retain direct connectivity between RTPS & Guttur with a provision to normalize in case of any contingencies.

In view of stabilized JSW-BPS line, the LILO line between BTPS-JSW-Guttur are of not much in use. Hence, we propose to permanently delink this LILO connectivity and we will undertake to normalize the connectivity between RTPS-Guttur as envisaged in your Evacuation scheme.

*KCO-97
A PU the proposal
for approval*

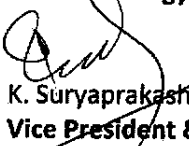


Considering the successful commissioning and stabilization of BPS and also dedicated transmission line from JSW to BPS, we kindly request you to accord your approval to following

- 1) Permanently delink the LILO line between BTPS-JSW-Guttur and to normalize the connectivity between RTPS & Guttur as envisaged in your Evacuation scheme.
- 2) Since JSW constructed this dedicated transmission LILO line between BTPS-JSW-Guttur at our cost, JSW may please be permitted to utilize/use this line at their disposal.

Thanking You,

Yours faithfully,
For JSW Energy limited


K. Suryaprakash 3/9/18
Vice President & Head of the Plant.

Copies to:

1. The Director-Transmission, KPTCL, Kaveri Bhavan, Bengaluru.
2. The superintending Engineer Ele., Transmission (W & M) Circle, KPTCL, Munirabad.
3. The Executive Engineer (Ele.), Major works division Ballari.

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

Telephone: 080-22210416
Fax : 080-22292204



Office of the
Chief Engineer Electy.,
Planning & Co-ordination,
Kaveri Bhavan, Bangalore-9

No. CEE (P&C)/SEE(Plg)/EE(PSS)KCO-97/100330/2018-19

Date:

35545-550

15 MAR 2019

**The Member (Power systems),
Central Electricity Authority,
Sewa Bhavan, R.K.Puram,
New Delhi-110 066.**

Sub: Power evacuation scheme for the proposed 2000MW Sharavathy Pumped Storage Project- Reg.

Ref: KPCL Letter no. LOT/PSP/Sharavathy/1574 dated 25th Oct, 2017.

M/s Karnataka Power Corporation Limited (KPCL) has proposed to implement a pumped storage scheme near the existing Sharavathy generating station with installed capacity of 2000 MW. It is informed that the work of preparation of DPR for has been entrusted to M/s Water and Power consultancy services (WAPCOS) Ltd., In this regard, M/s KPCL has requested to furnish the evacuation scheme for proposed 2000MW Pumped Storage Project.

Further, meeting was held along with M/s KPCL to discuss the issues on power evacuation scheme for the subject project and various alternate transmission scheme proposals were deliberated. Based on the field inputs by concerned officials and detailed load flow study conducted in-house, the following transmission scheme for 2000MW pumped storage project is proposed.

- a) Construction of 400kV MC line with Quad Moose conductor from proposed Sharavathy Pumped Storage Station to 400/220 kV Talaguppa sub-station by utilizing the existing 220 kV S1, S2 or S3, S4 corridor with 4 Nos of 400kV TBs at Talaguppa.
- b) Strengthening of 400 kV Talaguppa - proposed C.N.Halli DC Twin Moose line by higher ampacity conductor (Twin Moose equivalent HTLS).

- 15
- c) Augmentation of existing 1x315 MVA (out of 3X315) transformers by 1x500 MVA, 400/220 kV transformers at Talaguppa.
 - d) Strengthening of 220 kV Talaguppa-Sharavathy DC line by higher ampacity conductor (Drake equivalent HTLS).
 - e) By utilizing the existing corridor of S1-S2 or S3-S4, replacing the S1-S2 & S3-S4 DC lines with Drake conductor by 220 kV MC line between Sharavathy-Shimoga (S1, S2, S3, S4) with AAAC Moose conductor.

In light of above, it is requested to arrange to conduct necessary Joint studies along with CEA & PGCIL officials so as to finalise the transmission schemes for the above projects in view of placing it before the ensuing Southern Region Standing Committee on Transmission for discussion and approval.

Yours faithfully

CAJ 14/3/19
Chief Engineer-Electy.,

(Planning & Co-ordination)

Copy to:

1. The Director(SP&PA), Central Electricity Authority, Sewa Bhavan, RK Puram, New Delhi-110066.
2. The Chief Engineer (SP&PA), Central Electricity Authority, SewaBhavan, RK Puram, New Delhi-110066.
3. C.O.O (CTU), PGCIL, Saudamini, Plot No.2, Sector 29, Gurgaon-122001.
4. E.A to Director (Transmission), KPTCL, KaveriBhavan, Bangalore to place it before The Director (Transmission).
5. P.S to The Chairperson, CEA, to place it before The Chairperson, CEA.

St. Ishan, Dir
ll division
25/2/19

SEM
25/2/19
Transmission (PE)

KARNATAKA POWER TRANSMISSION CORPORATION LTD

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Office Of The
 Chief Engineer, Elec.,
 Planning & Co-ordination
 Kaveri Bhavan
 Bangalore-560 009.

No. : CEE (P&C)/SEE(PLG)/EE(PSS)/KCO-97/100329/18-19

Date :

14 JAN 2019

30303-305

|| FAX ||

The Director,
 System Planning & Project Appraisal Division
 Central Electricity Authority
 Sewa Bhavan, R.K.Puram,
 New Delhi-110 066.

- Sub:** Installation of 2X125 MVAR bus reactor at UPCL Switch yard-reg
Ref: 1. Minutes of the 39th Standing Committee Meeting of Power System Planning of Southern Region.
 2. PCKL letter No: PCKL/A1/12/2005-06/3905-08 Dated 20th Dec 2018.

M/s PCKL vide letter cited under reference has sought KPTCL to furnish the study report regarding the necessity of 2x125MVAR bus reactors at UPCL switchyard to file statement of objection before CERC w.r.t. tariff petition no.251/GT/2017 filed by M/s UPCL before CERC wherein the firm has claimed additional capital expenditure due to bus reactors at UPCL switchyard.

The subject of providing 2 x 125 MVAR bus reactors to control prevailing system over voltages was approved in 39th Standing Committee meeting of Power System Planning of Southern Region held on 28th-29th December, 2015 at New Delhi. Since installation of reactors will have significant impact on tariff, it is requested to relook on the decision of Standing Committee meeting for installing 2X125 MVAR at UPCL by proposing lower capacity bus reactors at UPCL by conducting necessary joint studies.

Yours faithfully,

Chief Engineer, Electricity,
 (Planning & Co-ordination)

→ Director (IC)
 Director (BSP)
 27/1/19

39th Study Committee Meeting

400/220kV 2X500 MVA ICTs at Somanahalli,v) 400/230kV 2X315MVA ICTs at Arasur, vi) 400/220kV 3 X 315 MVA ICTs at Mamidipally,vii) 400/220kV 2X315MVA ICTs at Mysore.

In this regard, CEA stated that there is space constraint at Gazuwaka. With KV Kota 400/220kV S/s of APTRANSCO, ICTs at Vemagiri SS is likely to be relieved. He further stated that redistribution/ reconfiguration of 220kV transmission lines required for ICTs at Somanahalli, augmentation at Arasur was agreed in 38th SCPSPSR and Newly planned substation at Maheshwaram, Gajwel, Yeddu will relieve loading at Mamidipally.


36.4 AGM, POSOCO pointed out high voltage on number of 400kV nodes as given in the POSOCO reports. In this regard PGCIL stated that the planned augmentation of bus reactors, including SVC/STATCOMs would help in bringing down the voltages. Further, regulating generation voltages and reactive absorption limits of generators need to be undertaken. He further said that based on the inputs from POSOCO study has been carried out for identify locations where reactive compensation is required. PGCIL said that Based on the MVAR generation following reactive compensation was simulated.

S/S	Existing/ Approved	Proposed	S/S	Existing/ Approved	Proposed
Cuddapah (PG)	50	125	Davanagere(KTK)	0	125
Srisaillam(LB)(T S)	0	125	Talaguppa(Ktk)	0	125
Chittoor(AP)	0	125	Raichur(765kV)(PG)	240	240
Vijayawada -AP	0	125	Almati(TN)	0	125
VTPS stage IV(AP)	0	125	Kaythar(TN)	0	125
Kurnool(765 kV)(PG)	240	240	Mettur(TN)	0	125
Nellore PS (765 kV)(PG)	240	240	Thiruvallam (765kV)(PG)	0	2X 240

36.5 Director, CEA informed that UPCL has also proposed to install 2x125 MVAR bus reactor at their switchyard to control prevailing system over-voltages. Accordingly, the same was agreed.

36.6 Director(Trans), TANTRANSCO informed that at Thiruvallam end 2X125MVAR line reactors has been commissioned; at MTPS switchyard, 1X125MVAR bus

फैक्स/स्पीड पोस्ट /FAX/SPEEDPOST

भारत सरकार केंद्रीय विद्युत प्राधिकरण दक्षिण क्षेत्रीय विद्युत समिति बेंगलूरु - 560 009	 सत्यमेव जयते	Government of India Central Electricity Authority Southern Regional Power Committee Bengaluru - 560 009
Web site: www.srpc.kar.nic.in	e-mail: mssrpc-ka@nic.in	Ph: 080-22287205 Fax: 080-22259343
सं/No. SRPC/SE-II/2019/ 1571		दिनांक / Date 22.03.2019

Chief Engineer
PSPA-II
CEA
New Delhi

Sir,

Sub: Transmission planning related issues

Ref: Your letter No.CEA-PS-12-15/2/2018-PSPA-II Division dated 08.03.2019

As desired vide letter cited under reference, the following issues related to Transmission Planning are brought to kind attention. These issues were informed during the 153rd OCC meeting held on 11.03.2019.

N-1 criteria getting violated for 400/220 kV ICTs at UPCL, Karnataka

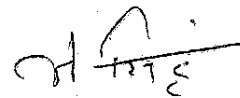
It was pointed out by UPCL and SRLDC that the flow on 400/220 kV ICTs (2 x 315 MVA) was high and on many occasions the N-1 criteria was getting violated. As a consequence, during certain load generation balance conditions, UPCL is unable to take out one ICT for maintenance since the flow on other ICT would be beyond the capacity. As a long term measure, possibility of third ICT can be examined.

220 kV connectivity to Bhadradri, TSGENCO, Telangana

TS SLDC had observed that during black start condition extension of startup power to 4 x 270 MW Bhadradri TPS is not feasible through 400 kV Julurupadu due to expected high voltage at KTPS complex and Julurupadu. TS SLDC had suggested connectivity at 220 kV level for startup power. It was also pointed out that startup supply is available from N'Sagar upto 220 kV heavy water plant as per the existing procedure.

धन्यवाद /Thanking you,

भवदीय / Yours faithfully



(असित सिंह / Asit Singh)

अधीक्षक अभियंता / Superintending Engineer

Sh. Ishan, Del (TS&AT)
1. Pl. discuss
2. Are we preparing agenda for Important
next RSCG of SR
Jelly
25/3/19
-(20)

TAMILNADU TRANSMISSION CORPORATION LTD.
(Subsidiary of TNEB Ltd.)

From

Shri. T.Senthilvelan, B.E.,
Director/Transmission Projects,
TANTRANSCO,
144, Anna Salai,
Chennai -2.

To

The Member (Power System),
Central Electricity Authority,
Sewa Bhavan, R.K.Puram,
New Delhi 110 066.

Lr.No.CE/Plg.&R.C/SE/SS/EE1/AEE1/F.SRSCT -Agenda/D. 96 /19 dt.29.04.19

Dear Sir,

Sub: TANTRANSCO – Enhancement of 400/110 kV ICT capacity from 2 X 200 MVA to 3 X 200 MVA at the existing Alamathy 400/230-110KV SS - To be included as an agenda point in the forthcoming 2nd meeting of SRSCT - reg.

The Alamathy 400/230-110 kV substation is situated nearer to the load centres of both urban and sub-urban area in Chennai. The total Interconnecting transformer capacity at Alamathy 400/230-110 kV SS is 1345 MVA with 3 nos. of 400/230 kV, 315 MVA ICT and 2 nos. 400/110 kV, 200 MVA ICT. The two nos. 200 MVA, 400/110 kV ICT at Alamathy 400/230-110 kV substation were commissioned during 2006 & 2017.

i. The peak reached in the ICTs at Alamathy 400/230-110 kV SS are as follows.

200 MVA, 400/110 kV ICT - 1	-	123 MVA
200 MVA, 400/110 kV ICT - 2	-	115 MVA
315 MVA, 400/230 kV ICT - 3	-	264 MVA
315 MVA, 400/230 kV ICT - 4	-	246 MVA
315 MVA, 400/230 kV ICT - 5	-	246 MVA

- ii. In order to accommodate all the existing & future load demands, it is essential to enhance 400/110 kV ICT capacity from 2 X 200 MVA to 3 X 200 MVA at Alamathy 400/230-110 kV SS.
- iii. The space for erection of 400/110 kV, 200 MVA ICT is available at Alamathy 400/230-110 kV SS.

2.0 Based on the above, load Flow study has been carried out for 2020 - 21 year condition and from the study results, the following have been observed:

- The existing 2 X 200 MVA, 400/110 kV ICTs are loaded upto 157 MW each at Alamathy 400/230-110 kV SS in Base case.
- After enhancement of 400/110 kV ICT capacity from 2 X 200 MVA to 3 X 200 MVA at Alamathy 400/230-110 kV SS, the ICT loadings are found to be 120 MW each in Case 1.

The 400 kV line loadings are also found to be normal in case 1.

3.0 It is requested to include the enhancement of 400/110 kV ICT capacity from 2 X 200 MVA to 3 X 200 MVA at Alamathy 400/230-110 kV SS as an agenda point in the forthcoming 2nd meeting of Southern Region Standing Committee on Transmission (SRSCT).

Sd/- 29.04.19.

(R.S.Usha)

Chief Engineer / Planning & RC
For Director/Transmission Projects
Chennai

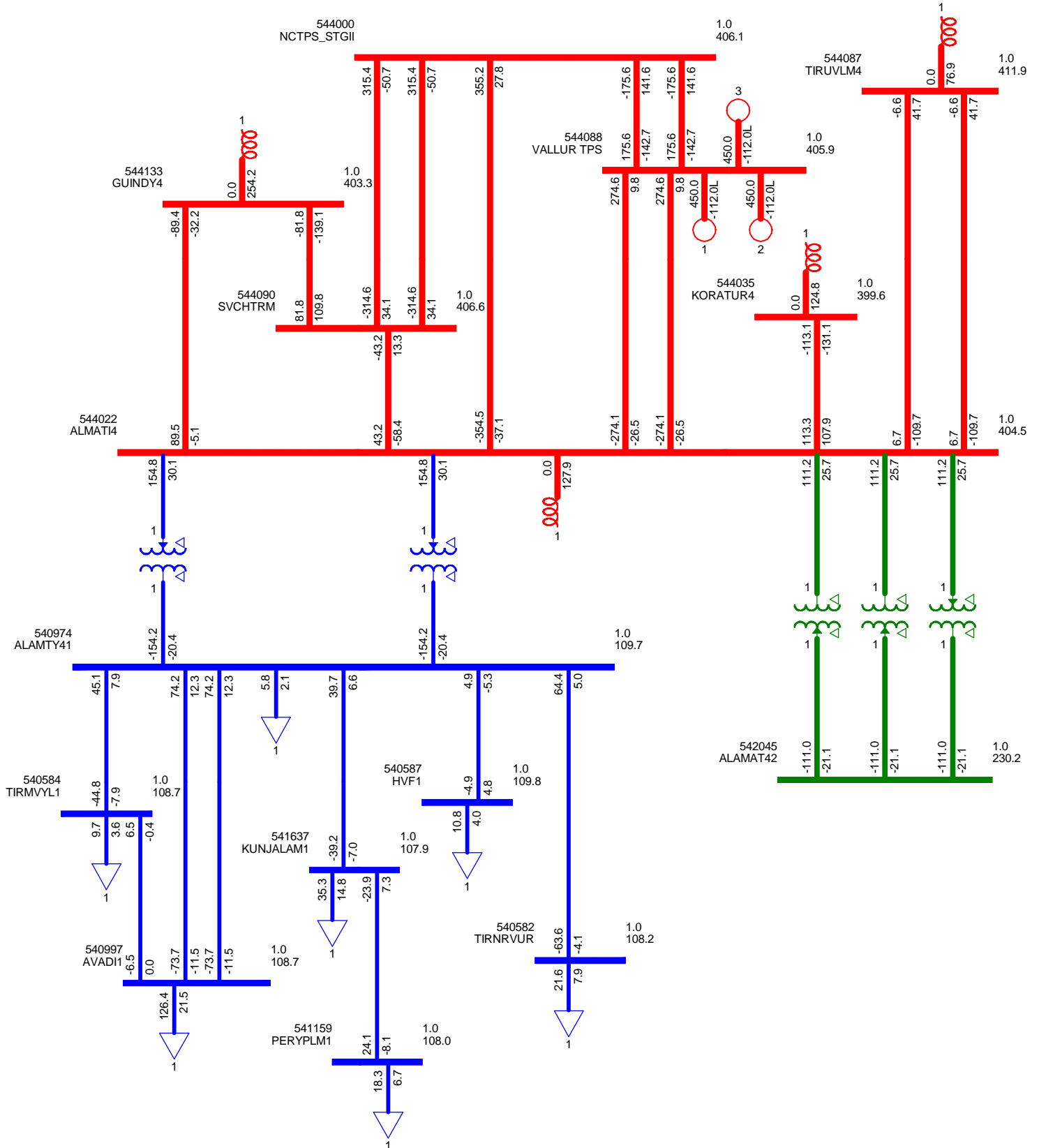
Enclosures:

1. Study results in .sav File - by email.

ENHANCEMENT OF ICT FROM 2 X 200 MVA TO 3 X 300 MVA, 400/110 KV ICT AT ALAMATHY 400/230-110 KV SS.

BASECASE : WITH THE EXISTING 2 X 100 MVA, 400/110 KV ICT

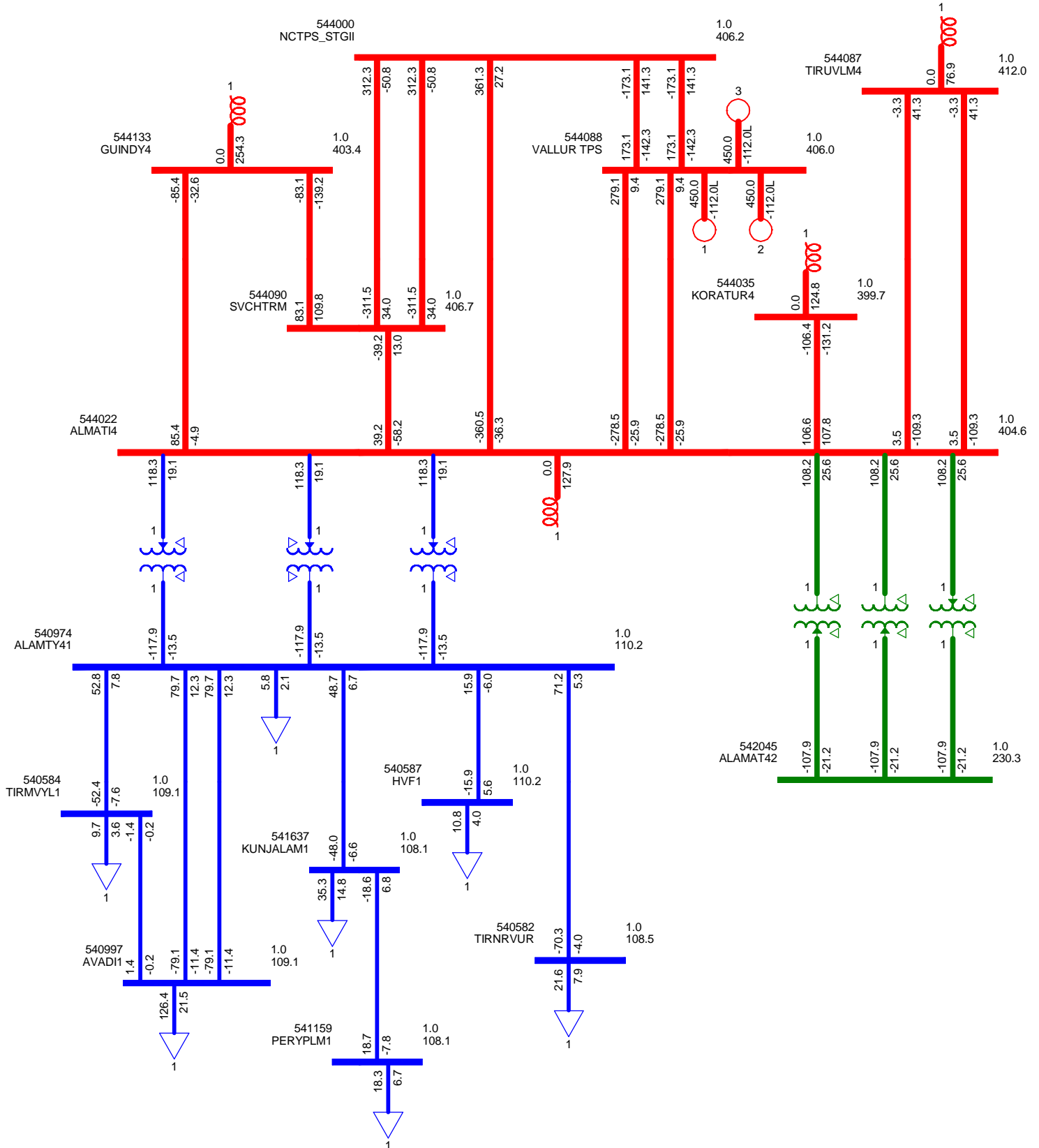
NETWORK YEAR CONDITION : 2020-2021



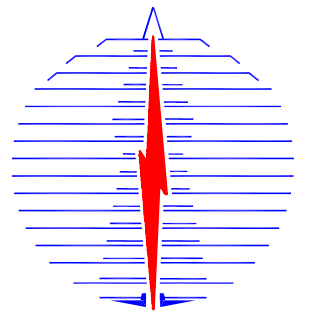
ENHANCEMENT OF ICT FROM 2 X 200 MVA TO 3 X 300 MVA, 400/110 KV ICT AT ALAMATHY 400/230-110 KV SS.

CASE 1 : BASECASE + ADDITIONAL 1 X 100 MVA, 400/110 KV ICT

NETWORK YEAR CONDITION : 2020-2021

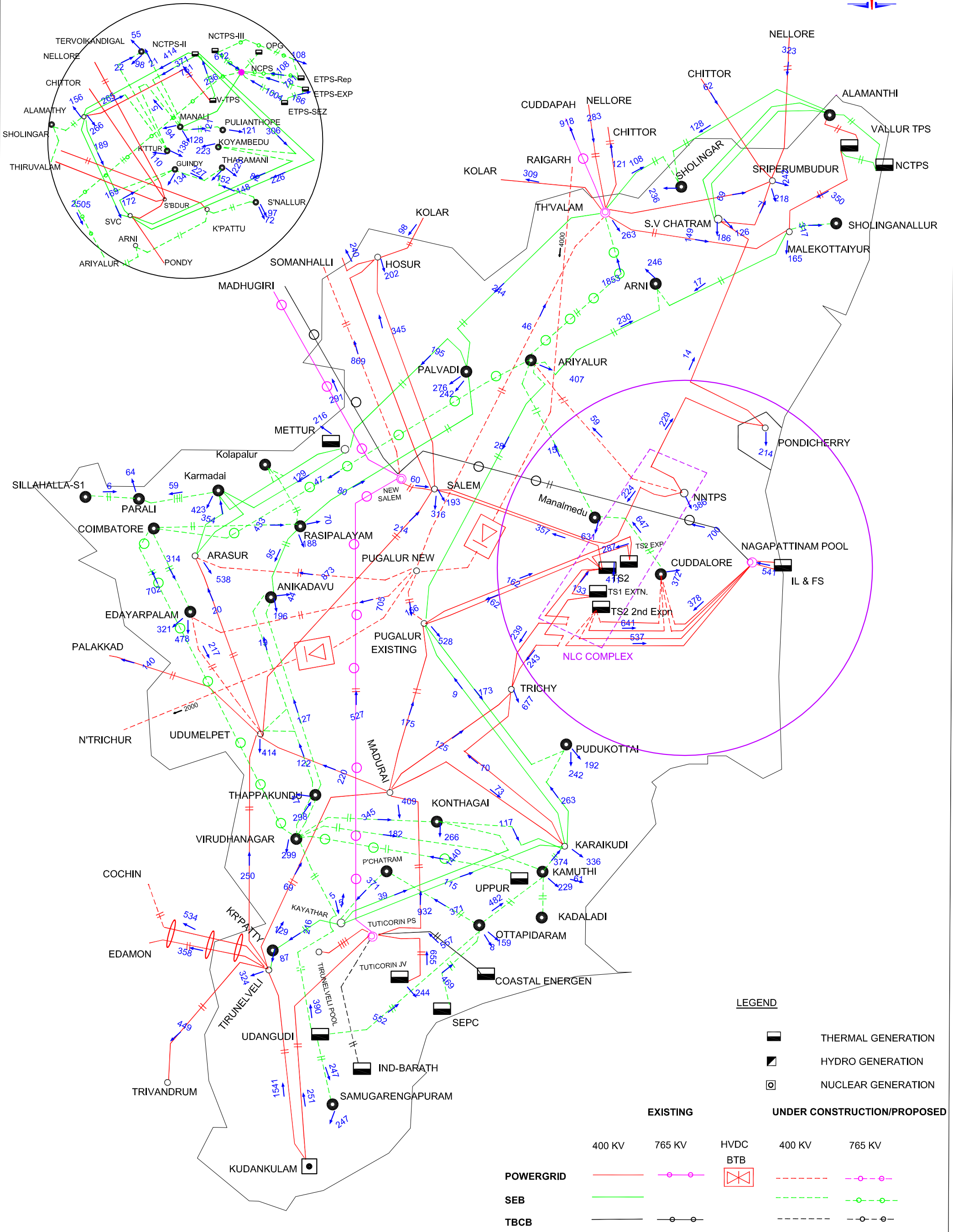


POWER MAP OF TAMIL NADU (765/400 KV LINES)



CHENNAI - INSET

Exhibit I a : Alt 1 Without RE

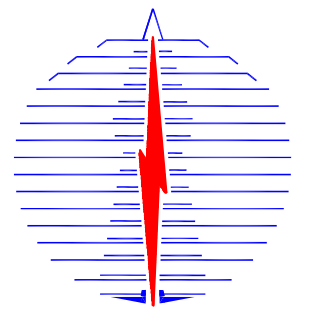


LEGEND

	THERMAL GENERATION
	HYDRO GENERATION
	NUCLEAR GENERATION

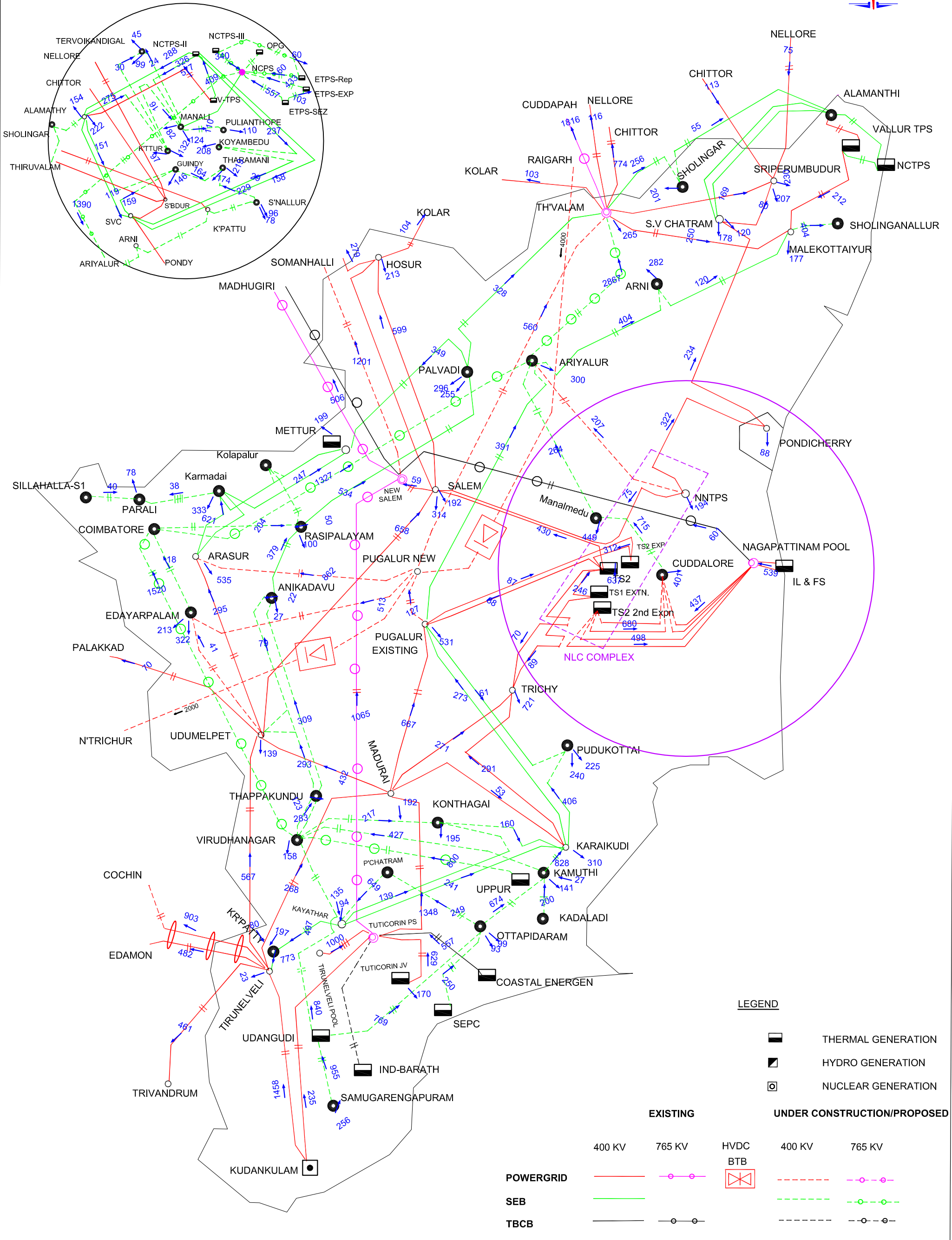
EXISTING	UNDER CONSTRUCTION/PROPOSED
400 KV	400 KV
765 KV	765 KV
HVDC BTB	
POWERGRID	
SEB	
TBCB	

POWER MAP OF TAMIL NADU (765/400 KV LINES)



CHENNAI - INSET

Exhibit I b : Alt 1 With RE



POWER MAP OF TAMIL NADU (765/400 KV LINES)

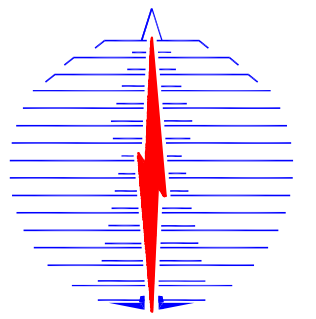
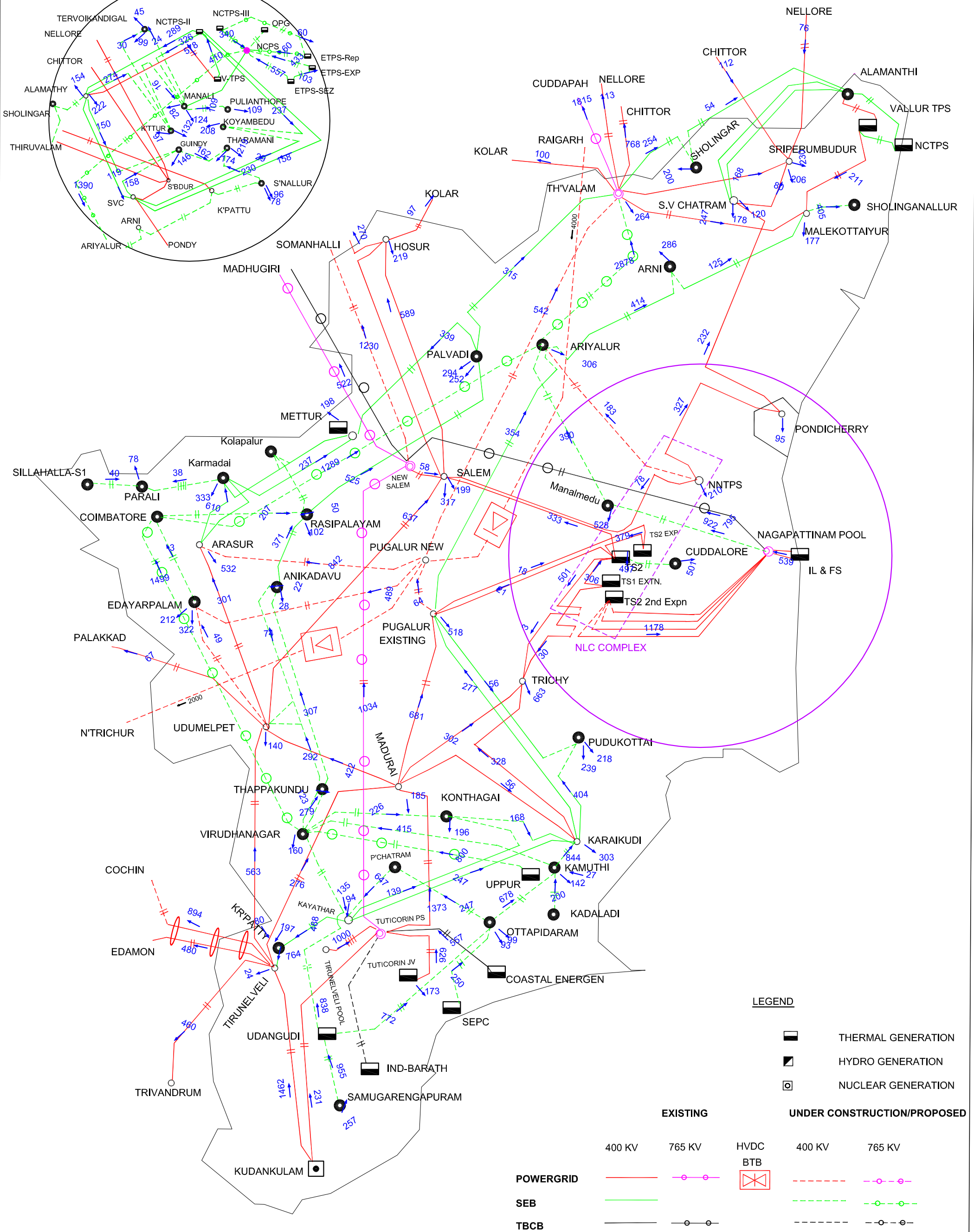
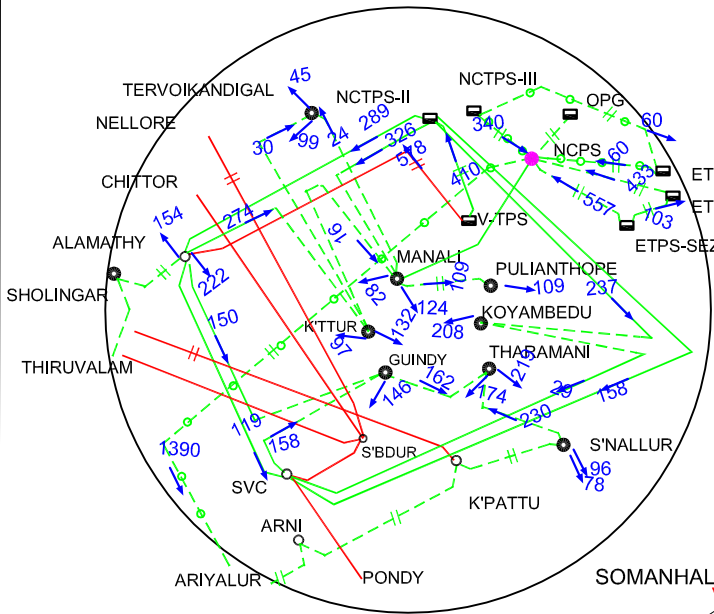


Exhibit-II a1- Alt.2 - With RE

CHENNAI - INSET



POWER MAP OF TAMIL NADU (765/400 KV LINES)

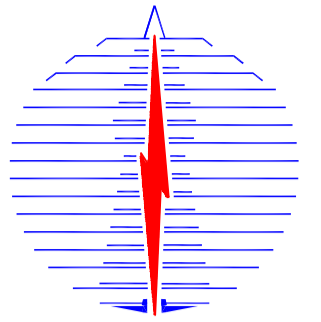
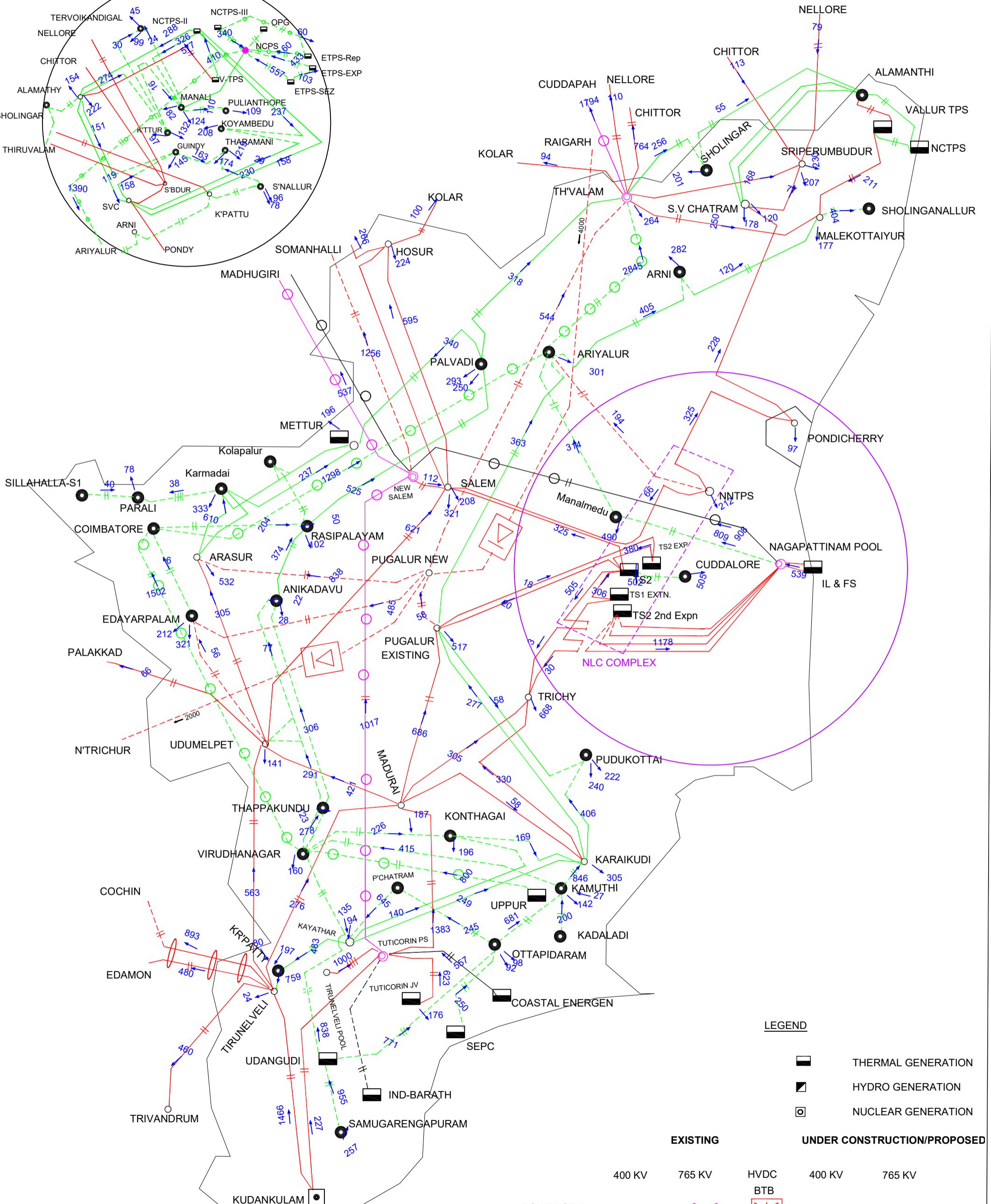
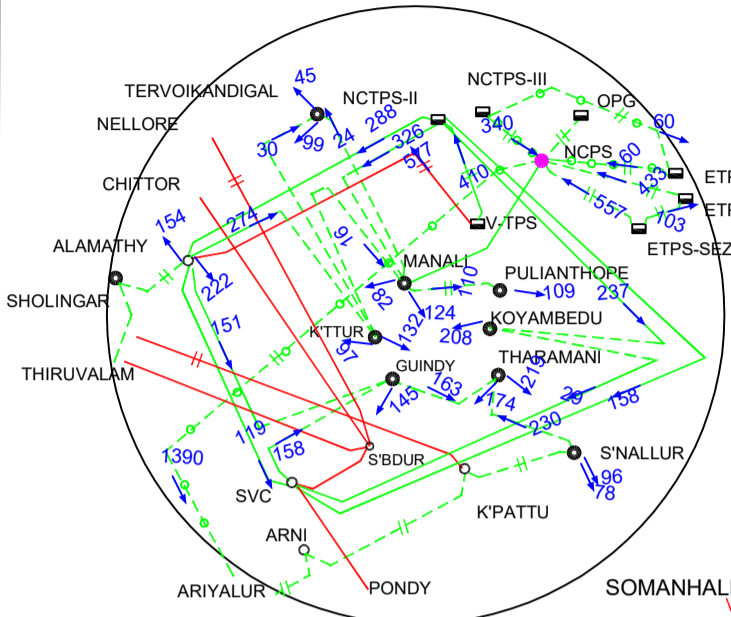


Exhibit-II a2 - Alt.2 - With RE + N-1 of Manalmedu-Nagapattinam 400kV D/c line

CHENNAI - INSET



LEGEND

- THERMAL GENERATION
- HYDRO GENERATION
- NUCLEAR GENERATION

EXISTING

UNDER CONSTRUCTION/PROPOSED

	400 KV	765 KV	HVDC BTB	400 KV	765 KV
POWERGRID					
SEB					
TBCB					

POWER MAP OF TAMIL NADU (765/400 KV LINES)

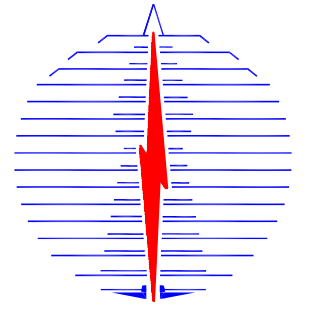
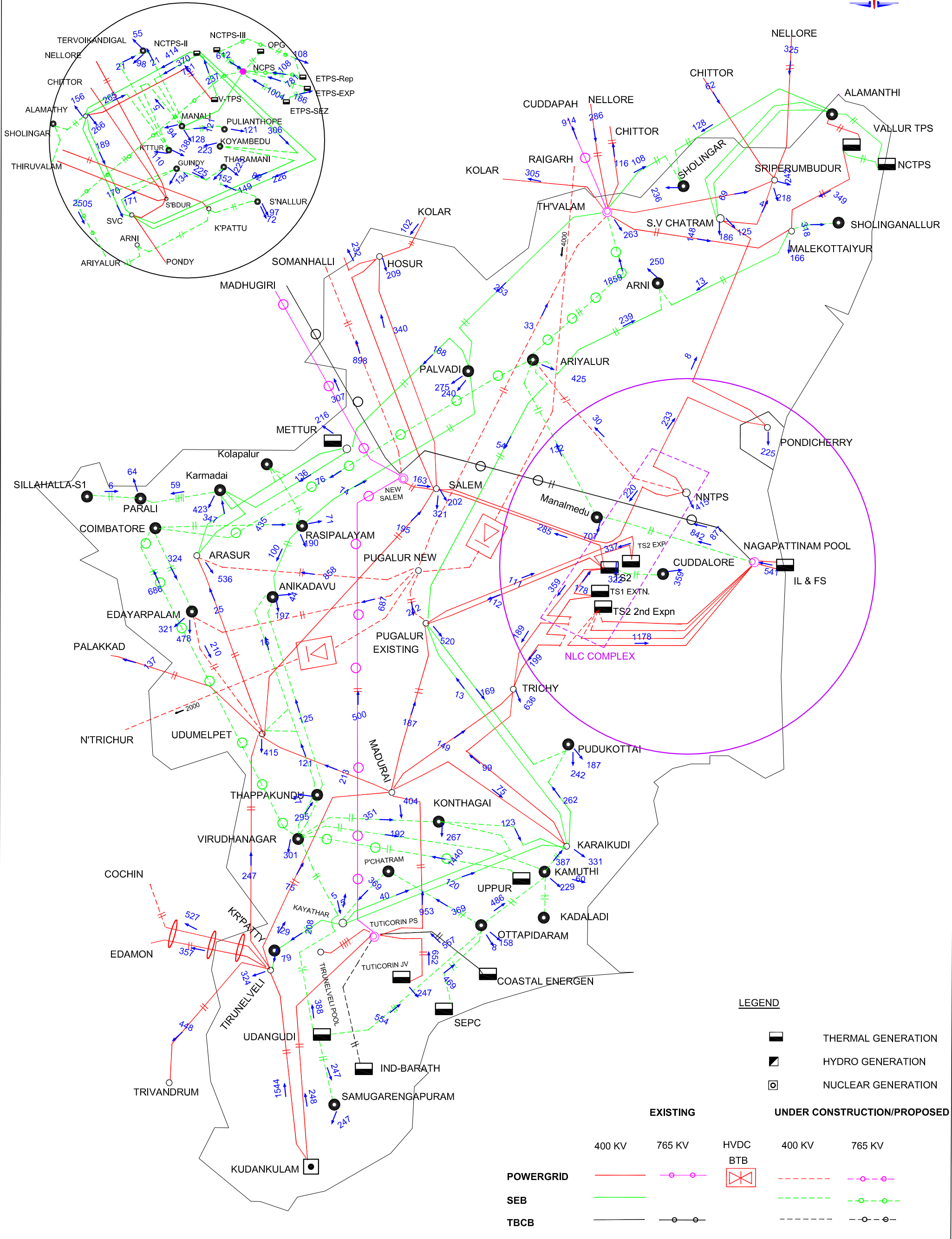
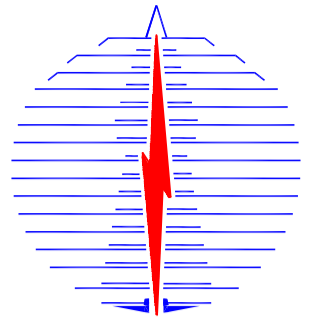


Exhibit-II b1- Alt.2 - Without RE

CHENNAI - INSET

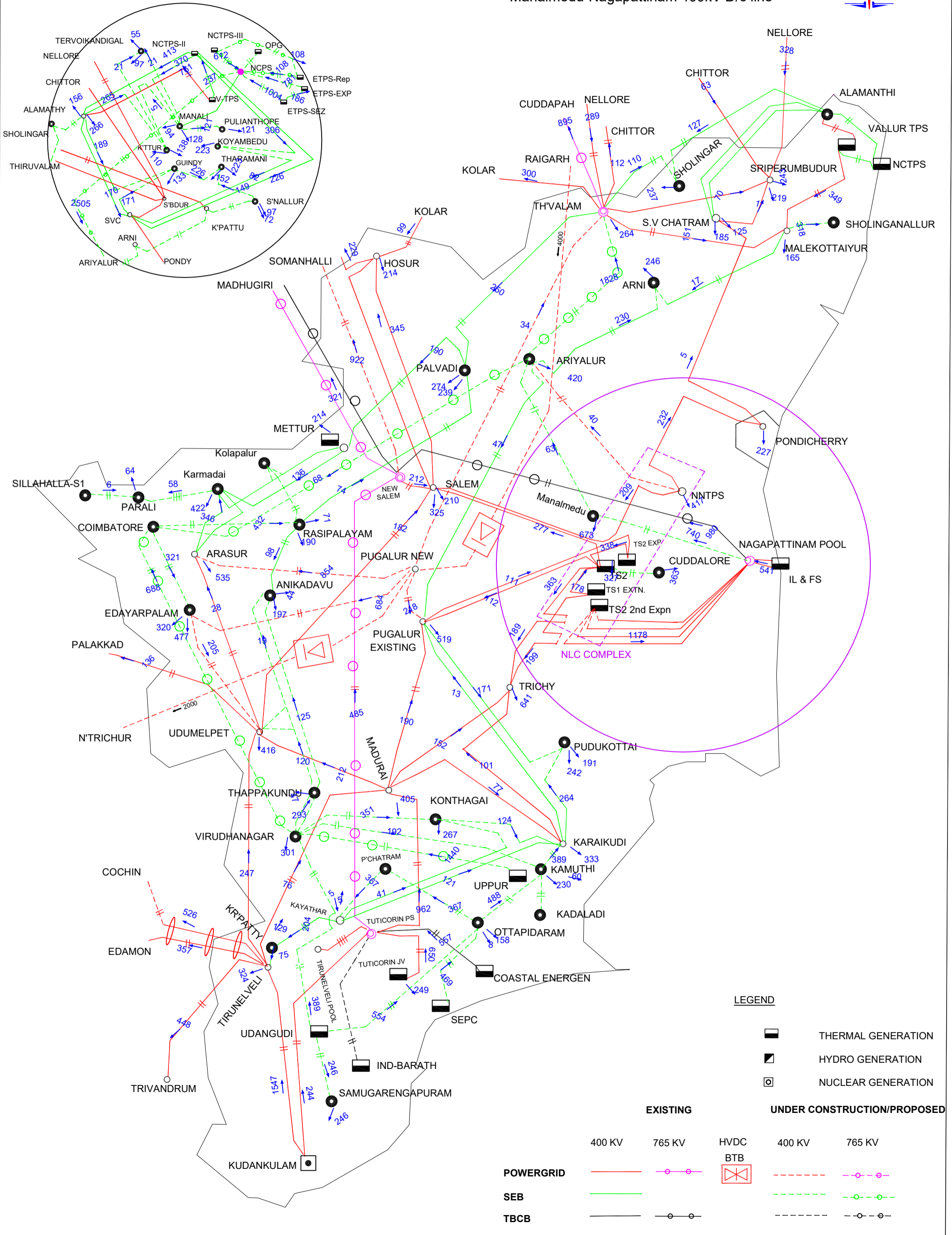


POWER MAP OF TAMIL NADU (765/400 KV LINES)



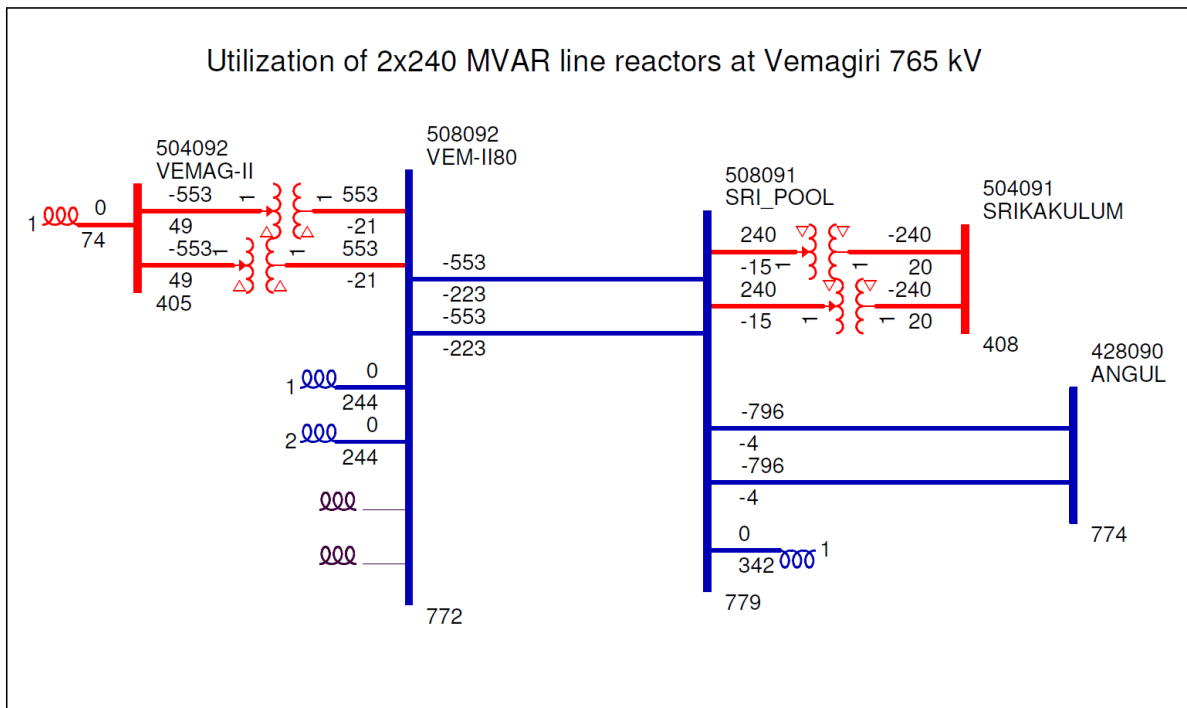
CHENNAI - INSET

Exhibit-II b2 - Alt.2 - Without RE + N-1 of Manalmedu-Nagapattinam 400kV D/c line

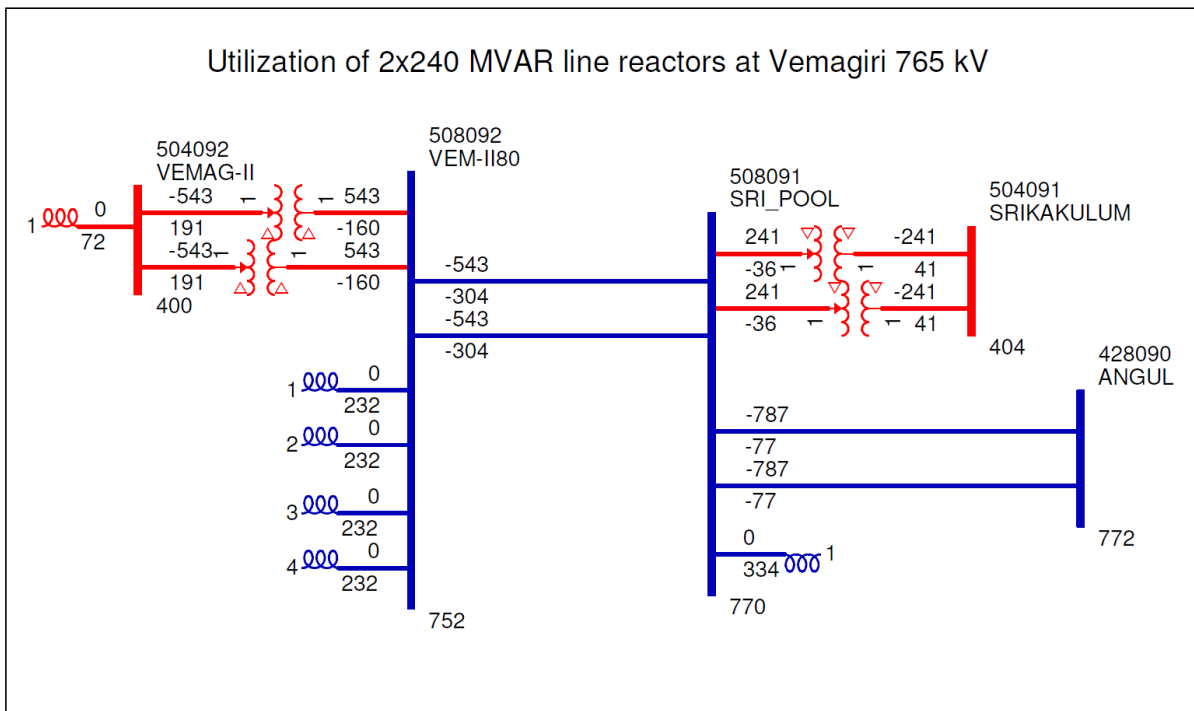


Annexure-I


Base case



With reactors



फैक्स/स्पीड पोस्ट /FAX/SPEEDPOST

भारत सरकार केंद्रीय विद्युत प्राधिकरण दक्षिण क्षेत्रीय विद्युत समिति बेंगलूरु - 560 009	 सत्यमेव जयते	Government of India Central Electricity Authority Southern Regional Power Committee Bengaluru - 560 009	
Web site: www.srpc.kar.nic.in	e-mail: mssrpc-ka@nic.in	Ph: 080-22287205	Fax: 080-22259343
सं/No. SRPC/SE-II/2019/ 2989-990		दिनांक / Date	24.05.2019

Chief Engineer
PSPA-II
CEA
New Delhi

Sir,

Sub: Transmission planning related issues

Ref: Your letter No.CEA-PS-12-15/2/2018-PSPA-II Division dated 08.03.2019

As desired vide letter cited under reference, the following issues related to Transmission Planning are brought to kind attention. These issues were raised by SRLDC in the 155th OCC meeting held on 09.05.2019 (subsequently communicated by SRLDC vide letter dated 23.05.2019 (copy enclosed)).

A Highly loaded transmission line / Corridor

a. 400 kV Hiriyur-Nelamangala D/C lines

- Touched peak of 775 MW each
- N-1 security violation of about 7% (Feb 19) and 10% (Mar 19)
- Commissioning of 400 kV Hiriyur-Mysore D/C line and 400 kV Bellary PS – C N Halli D/C line

b. 400 kV Gooty-Nelamangala and 400 kV Gooty-Somanahalli line

- Highly loaded, Gooty-Nelamangala touched thermal limit (875 MVA) on few occasions in Feb and Mar 19
- N-1 security violation of about 15% (Mar 19) on Gooty-Nelamangala
- Implementation of bypass at Nellore to alleviate Nellore PS – Nellore D/C lines would affect the flows on these two lines
- Commissioning of Tumkur-Yelahanka D/C lines needs to be expedited

c. 400 kV NP Kunta-Kolar S/C line

- Flow as high as 800 MW due to Solar power evacuation at NP Kunta
- 400 kV Urvakonda-Hindupur-NP Kunta D/C lines kept open to mitigate the flow on NP Kunta-Kolar lines
- Outage of this line increases the flow on 400 kV Gooty-Nelamangala / Somanahalli lines and also result in low voltages Bengaluru Area

No. 93/PSPA-II
28/5/2019

B. KKNPP High Voltage issues

KKNPP voltages are generally high during off peak conditions. In addition to this, KKNPP U-II (1000 MW) is generating reactive power as high as 380 MVAR resulting in further increase in voltage. One 80 MVAR bus reactor at 400 kV KKNPP is out of service since 14.12.2016. The present committed date of December 2019 (though postponed few times) needs to be ensured by KKNPP.

KKNPP units to provide sufficient reactive compensation by absorbing reactive power or else by installing additional reactors.

In the meetings held with NPCIL / KKNPP, it was assured that upto 150 MVAR reactive power absorption would be ensured by each of the KKNPP units (though the capability was much higher).

C. ICT loadings

The following ICT's are violating N-1 security criteria

Andhra Pradesh: 400/220 kV Nellore SS, 400/220 kV Mardam SS, 400/220 kV Vemagiri SS

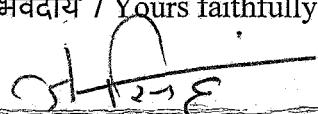
Karnataka: 400/220 kV Nelamangala SS, 400/220 kV Hoody SS, 400/220 kV Hiriyur SS, 400/220 kV Kaiga SS, 400/220 kV Mysore SS and 400/220 kV UPCL SS

It is kindly requested examine the above for remedial actions.

धन्यवाद /Thanking you,

Encl: As above

भवदीय / Yours faithfully


(असित सिंह / Asit Singh)

प्रभारी सदस्य सचिव/ Member Secretary I/c

Copy for kind information to – Executive Director, SRLDC, Bengaluru



पावर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Govt. of India Enterprise)



दक्षिण क्षेत्रीय भार प्रेषण केंद्र, 29, रेस कोर्स क्रॉस रोड, बेंगलूर - 560 009

दूरभाष : कार्यालय : 080-2225 0047, 2235 2850, 2225 4525, 2225 1169, 2225 5962 फैक्स : 080 2226 8725, 2225 9219

CIN No. : U40105DL2009GOI188682 Southern Regional Load Despatch Centre, 29 Race Course Cross Road, Bangalore - 560 009

Tel : Off : 080 2225 0047, 2235 2850, 2225 4525, 2225 1169, 2225 5962 Fax : 080 2226 8725, 2225 9219 Website : www.srlcdc.org / www.posoco.in

संदर्भ संख्या / Ref. No.

SRLDC/Sr.GM/SO-II/2019-20/

दिनांक / Date :

23rd May 2019

To,

Member Secretary, SRPC, Bengaluru

Sub: Feedback on Transmission Issues in Southern Region-Reg.

Sir,

As discussed in the 155th OCCM held at SRPC Bengaluru on 09th May 2019, it was agreed that SRLDC would provide feedback regarding the highly loaded transmission corridors and highly loaded Inter connecting transformers in Southern Regional Grid to SRPC. Accordingly, the transmission loading issues are as given below,

A. Highly Loaded Transmission Line/Corridor:

During the months from February to May, Southern region normally meets its peak demand. During these months, the following transmission lines are getting severely loaded and violating N-1 security criteria for considerable amount of time. The flow duration graphs for the last quarter (January-April 2019) are enclosed at Annexure-I.

a. 400kV Hiriyur-Nelamangala DC line

400kV Hiriyur-Nelamangala DC line is getting severely loaded & violating N-1 security criteria for considerable time and touched a peak of 775MW each. During the months of February-19 and March-19, for about 7% & 10% of the time N-1 security violation was observed on these lines. The high loading is due to low generation at UPCL and High wind & solar generation in Hiriyur & Chitradurga area and High Demand in BESCOM area. The situation would further aggravate if Yeramarus TPS, BTPS and Kudgi TPS Generation is in service. The situation would worsen with addition of upstream RE generation.

These Transmission lines will get relieved only after commissioning of 400kV Hiriyur-Mysore DC line and 400kV Ballery PS-Chikkanayakanahalli DC line. These transmission lines have to be expedited.

b. 400kV Gooty-Nelamangala line & 400kV Gooty - Somanahalli line

400kV Gooty-Nelamangala line & 400kV Gooty-Somanahalli lines are getting highly loaded. 400kV Gooty-Nelamangala line flow touched thermal limit(875 MVA) for few of occasions in February and March 2019. During March-2019, 400kV Gooty-Nelamangala line flow violated N-1 security criteria for about 15% of the time. The flow is high mainly due to heavy drawl in BESCOM area and low generation at UPCL.

(1/2)

Implementing the bypass arrangement at 400kV Nellore SS to alleviate 400kV Nellore PS-Nellore D/C line loading would also impact the loading on this corridor. At present FSC of 400kV Gooty-Nelamangala line is kept out of service to control line loading.

These Transmission lines will get relieved to some extent after commissioning of 400kV Tumkur-Yelahanka DC line. The transmission line has to be expedited.

c. 400kV N.P.Kunta-Kolar line

The associated evacuation system of N.P.Kunta Solar Park has been commissioned fully but in real time operation the following transmission constraints are being faced even with Partial generation at N.P.Kunta,

- i. Solar power at N.P.Kunta is mostly evacuating through 400kV N.P.Kunta-Kolar S/C line and flow is as high as 800MW.
- ii. 400kV Uravakonda-Hidupur-N.P.Kunta DC line is also kept open continuously to mitigate high the flow on 400kV N.P.Kunta-Kolar line.

Outage of this line will increase the flow on 400kV Gooty – Nelamangala/Somanahalli lines and also result in low voltages in Bengaluru area.

B. KKNPP High Voltage Issue:

Normally, the voltage at 400/230kV KKNPP S/S is high during off-peak condition. In addition to this, Kudankulam Unit – 2 (1000 MW) is generating reactive power as high as 380 MVAR, resulting further increase in voltage. Also 80 MVAR Bus Reactor at 400kV KKNPP is out of service since 14-12-2016.

KKNPP units have to provide sufficient reactive compensation by installing reactors and absorbing reactive power.

C. ICT Loading

The following ICT's are violating N-1 security criteria

i. Andhra Pradesh:

Sr.No.	Substation	Transformer Capacity
1	400/220kV Nellore SS	3x315 MVA
2	400/220kV Maradam SS	2x315 MVA
3	400/220kV Vemagiri SS	3x315 MVA

ii. Karnataka:

Sr.No.	Substation	Transformer Capacity
1	400/220kV Nelamangala SS	3x500 MVA
2	400/220kV Hoody SS	3x500 MVA
3	400/220kV Hiriyur SS	2x315 MVA
4	400/220kV Kaiga SS	2x500 MVA
5	400/220kV Mysore SS	2x315 + 1x500 MVA
6	400/220kV UPCL SS	2x315 MVA

(S P Kumar)
Sr. General Manager (SO-II)
SRLDC, Bangalore

Power System Operation Corporation Limited

**Operational Feedback on
Transmission Constraints
*(Southern Region)***

APRIL 2019

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Quarterly Operational Feedback on Transmission Constraints

Quarter 1: Jan'19 to Mar'19

Region: Southern Region

Section 1: Operational Constraints

1.1. Transmission Line Constraints

S. No	Corridor	Season/ Antecedent Conditions	Description of the constraints	Figure / table no.	Has the constraint occurred in earlier quarter?
1	400kV Nellore Pooling Station - Nellore DC line	Whole Year	<p>With Full Generation at SGPL (2x660 MW) & SEIL (2x660 MW), the 400kV NPS-Nellore D/C flow is high and loading is more than 2000 MW for 50% of time in March 2019. With commissioning of Units at MEPL (stage-2-2x350MW), the problem will aggravate.</p> <p>Remarks: In the 42nd SCM dated 27th April 2018 the re-arrangement to bypass 400kV Nellore PS – Nellore D/C at Nellore (PG) for making 400kV Nellore PS – Thiruvallam D/C has been approved. The same maybe commissioned at the earliest as it would relieve the line-loading problem. But this will increase further loading on 400kV Gooty – Nelamangala/Somnahalli</p>	Figure - A1	Yes
2	400kV Udumalpet-Palakkad DC line	Whole year	<p>Kerala drawl is mainly through 400kV Udumalpet-Palakkad D/C line. Present loading on these lines is in the range of 450-550 MW. N-1 violation of around 8% has happened during March 2019.</p> <p>Remarks: At present this is the limiting constraint for the Import of Kerala. The 400kV Tirunelveli – Cochin will relieve this constraint to some extent. Commissioning of the same to be expedited.</p>	Figure -A2	Yes
3	400kV Hiriya-Nelamangala DC line	Whole year	<p>With Less generation at UPCL and high wind and Solar generation, the flow on 400kV Hiriya-Nelamangala D/C line is severely high and Will further increase if Yeramarus TPS & BTPS Generation is full.</p> <p>Remarks: 400kV Hiriya – Mysore D/C line and 400kV Bellary Pooling station – C N Halli D/C would relieve the line loading of 400kV Hiriya – Nelamangala D/C. The same maybe commissioned at the earliest.</p>	Figure -A3	Yes

S. No	Corridor	Season/ Antecedent Conditions	Description of the constraints	Figure / table no.	Has the constraint occurred in earlier quarter?
4	400kV Gooty-Nelamangala line & 400kV Gooty-Somanahalli line	Whole Year	During peak demand period and heavy Drawl by BESCOM area, the flow on 400kV Gooty-Nelamangala & 400kV Gooty-Somanahalli line are high and touched thermal Limit for few occasions, this is resulting in severe low voltages in Bangalore area. Remarks: Commissioning of downstream of 400kV Tumkur, 400kV Yelhanka & 400kV Tumkur – Yelhanka D/C line to be expedited.	Figure – A4	Yes
5	400kV N.P.Kunta-Kolar line	During Solar Peak period	Solar power at N.P.Kunta is mostly evacuating through 400kV N.P.Kunta-Kolar S/C line and flow is as high as 800MW. The N-1 of this line will cause severe overloading of 400kV Gooty – Nelamangala/Somnahalli and also low voltages in Bengaluru area. At present the 400kV Urvakonda – Hindupur – N P Kunta D/C section is kept open to avoid further over-loading of this line. Remarks: Strengthening of 400kV N P Kunta – Kolar or additional transmission line from 400kV N P Kunta say, 400kV N P Kunta – Hosur D/C line may be explored.	Figure -A5	No
6	Overloading of 220 kV Shoolagiri-Hosur(TN)-Yerrandahalli-Somanahalli SC line	Whole Year	Somanahalli, Yerrandahalli and Hosur are Industrial areas. 220kV Yerrandahalli is split and load is partly fed from Hosur (TN) and partly met from Somanahalli side. Entire load cannot be met from either side (Somanahalli or Hosur) due to high loading on upstream lines. The line flow on this line is also causing high flows on Shoolagiri-Hosur 230 kV S/C line. Remarks: The commissioning of 400kV Dommasandra and Mylassandra alongwith 2nd circuit of 230kV Soolagiri-Hosur at the earliest to relieve the line-loading problem	-	Yes
7	Constraints in Nagjheri PH evacuation	Whole Year	The 220kV Nagjheri – Ambewadi DC, 220kV Ambewadi – Narendra DC, 220kV Kaiga – Kodasally SC & 220kV Kadra – Kodasally SC lines are severely overloaded. In 1 st meeting of Standing Committee on Transmission, committee recommended for Re-conductoring of the the lines with HTLS conductor. KPTCL has to expedite the same.	-	Yes

S. No	Corridor	Season/ Antecedent Condition s	Description of the constraints	Figure / table no.	Has the constraint occurred in earlier quarter?
8	Overloaded 220kV Lines in Tamil Nadu	Whole Year	The following lines are heavily loaded in Southern Tamil Nadu 230kV Madurai - Sembatty S/c, 230kV Pugalur - Mywadi S/c, 230kV Pudanchandai-Pugalur line	-	Yes
9	220 kV Hyderabad Metro Network	Whole Year	220kV Shankarpally – Gachibowli D/C & 220kV Ghanapur - Moulali are getting heavily loaded. TSTRANSCO is in the process of re-conductoring. TSTRANSCO may expedite the same.	-	Yes
10	220 kV Bangalore Metro Network	Whole Year	Most of the 220 kV network in Bengaluru is radialised during peak season to prevent overloading of lines. The radialisation of lines decreases the reliability of supply & thus resulting in Low Voltage situation during peak period and High Voltage during Off-Peak period of the day, thus making it an Ideal station for STATCOM. There is no sufficient Capacitor Compensation at distribution level in BESCO area.	-	Yes

1.2. 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 3x315MVA ICTs at Vemagiri SS	Whole Year	N-1 condition not satisfied in few occasions	Figure-B1	Yes
2	400/220kV 2x315MVA ICTs at Maradam SS	Whole Year	N-1 condition not satisfied for 80% of time in March 2019. N-1-1 of this ICTs will overload ICTs at Gazuwaka and Kalpakka SS.	Figure-B2	Yes
3	400/220kV 3x315MVA ICTs at Nellore SS	Whole Year	N-1 condition not satisfied in few occasions	Figure-B3	Yes
4	400/220 kV 3X500 MVA ICTs at Nelamangala	Whole Year	N-1 condition not satisfied in few occasions	Figure-B4	Yes
5	400/220kV 3X500 MVA ICTs at Hoody	Whole Year	N-1 condition not satisfied in few occasions.	Figure-B5	Yes
6	400/220kV 2X315 MVA ICTs at Hiriyur*	Whole Year	N-1 condition is violated for both the directions due to Heavy MVAR drawl.	Figure-B6	Yes
7	400/220 kV 2X500 MVA ICTs at Kaiga	Whole Year	N-1 condition not satisfied in few occasions	Figure-B7	Yes
8	400/220 kV 2X315 + 1x500 MVA ICTs at Mysore	Whole Year	N-1 condition not satisfied for most of the occasions	Figure-B8	No
9	400/220 kV 2X315 MVA ICTs at UPCL	Whole Year	N-1 condition not satisfied in few occasions	Figure-B9	Yes
10	400/230kV 2X315MVA ICTs at Thiruvallam	Whole Year	N-1 condition not satisfied in few occasions	Figure-B10	Yes

1.3. Nodes Experiencing Low Voltage

S. No	Nodes	Season/ Antecedent Conditions	Description of the constraints	Figure/ table no.	Has the constraint occurred in earlier quarter?
1	400kV Somnahally SS	During peak load condition	Voltages are low during the peak load condition	Figure-C1	Yes
2	400kV Nelamangala SS	During peak load condition	Voltages are low during the peak load condition	Figure-C2	Yes
3	400kV Bidadi SS	During peak load condition	Voltages are low during the peak load condition	Figure-C3	No
4	400kV Hoody SS	During peak load condition	Voltages are low during the peak load condition	Figure-C4	No
5	400Kv Mysore SS	During peak load condition	Voltages are low during the peak load condition	Figure-C5	No
6	400kV Hosur SS	During peak load condition	Voltages are low during the peak load condition	Figure-C6	No
7	400kV Arasur SS	During peak load condition & high wind period	Voltages are low during the peak load condition	Figure-C7	Yes
8	400kV Karamadai SS	During peak load condition	Voltages are low during the peak load condition	Figure-C8	Yes
9	400kV Trichur SS	During peak load condition	Voltages are low during the peak load condition	Figure-C9	Yes
10	400kV Palakkad SS	During peak load condition	Voltages are low during the peak load condition	Figure-C10	Yes
11	400kV Cochin SS	During peak load condition	Voltages are low during the peak load condition	Figure-C11	Yes

1.4. 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	400kV Gooty SS	Monsoon period and off peak period	Voltages remain very high most of the time	Figure-D1	Yes
2	400kV Nunna SS	Whole Year	Voltages remain very high most of the time	Figure-D2	Yes
3	400kV Sattenapally	Whole Year	Voltages remain very high most of the time Remarks: 1x125 MVAR approved in 42 nd SCPSPSR, the same maybe expedited.	Figure-D3	Yes
4	400kV Ghani SS	Whole year	Voltages remain very high most of the time	Figure-D4	Yes
5	400kV Jamalamadugu SS	Whole year	Voltages remain very high most of the time. Remarks: 1x80 MVAR approved in 42 nd SCPSPSR, the same maybe expedited	Figure-D5	Yes
6	400kV Uravakonda SS	Whole year	Voltages remain very high most of the time. Remarks: 1x125 MVAR approved in 42 nd SCPSPSR, the same maybe expedited	Figure-D6	Yes
7	400kV KV Kota SS	Whole Year	Voltages remain very high most of the time	Figure-D7	Yes
8	400kV Hinduja SS	Whole Year	Voltages remain very high most of the time	Figure-D8	No
9	400kV Kalikiri SS	Whole Year	Voltages remain very high most of the time	Figure-D9	No
10	400kV Podili SS	Whole Year	Voltages remain very high most of the time	Figure-D10	No
11	400kV Dindi SS	Whole year	Voltages remain very high most of the time Additional reactor of 125 MVAR approved 1 st SRSCT. May be expedited	Figure-D11	Yes
12	400kV Suryapet SS	Whole year	Voltages remain very high most of the time. Remarks: 1x125 MVAR approved in 42 nd SCPSPSR, the same maybe expedited	Figure-D12	Yes
13	400kV Malkaram SS	During off peak	Voltages remain very high most of the time	Figure-D13	Yes
14	400kV Mamidipally SS	Whole year	Voltages remain very high most of the time	Figure-D14	Yes

S. No	Nodes	Season/ Antecedent Conditions	Description of the constraints	Figure/ table no.	Has the constraint occurred in earlier quarter?
15	400kV Asupaka SS	Monsoon period and off peak period	Voltages remain very high most of the time. Remarks: 1x80 MVAR approved in 42nd SCPSPSR, the same maybe expedited	Figure-D15	No
16	400kV Srisailam LB SS	Whole year	Voltages remain very high most of the time. Remarks: 1x125 MVAR approved in 39th SCPSPSR, the same maybe expedited	Figure-D16	Yes
17	400kV Ramadagu SS	Whole Year	Voltages remain very high most of the time.	Figure-D17	No
18	400kV Jegurupadu SS	Whole Year	Voltages remain very high most of the time.	Figure-D18	No
19	400kV Nirmal SS	Whole Year	Voltages remain very high most of the time	Figure-D19	No
20	400kV Hassan SS	During off peak	Voltages remain very high most of the time	Figure-D20	Yes
21	400kV Narendra SS	During off peak	Voltages remain very high most of the time	Figure-D21	Yes
22	400kV Mysore SS	During off peak	Voltages remain very high during off-peak hours	Figure-D22	No
23	400kV Tumkur SS	During off peak	Voltages remain very high most of the time	Figure-D23	Yes
24	400kV Karaikudi SS	During off peak	During Low wind condition and off-peak condition Voltages are very High	Figure-D24	Yes
25	400kV Udumalpet SS	During off peak	During Low wind condition and off-peak condition Voltages are very High	Figure-D25	Yes
26	400kV Anaikaduvu SS	During off peak	Voltages remain very high most of the time	Figure-D26	Yes
27	765kV Cuddappa SS	Whole Year	Voltages remain very high most of the time	Figure-D27	Yes
28	765kV Nizambad SS	Whole Year	Voltages remain very high most of the time	Figure-D28	Yes
29	765kV Thiruvallam SS	Whole Year	Voltages remain very high most of the time. Remarks: 2x240 MVAR approved in 42 nd SCPSPSR, the same maybe expedited	Figure-D29	Yes

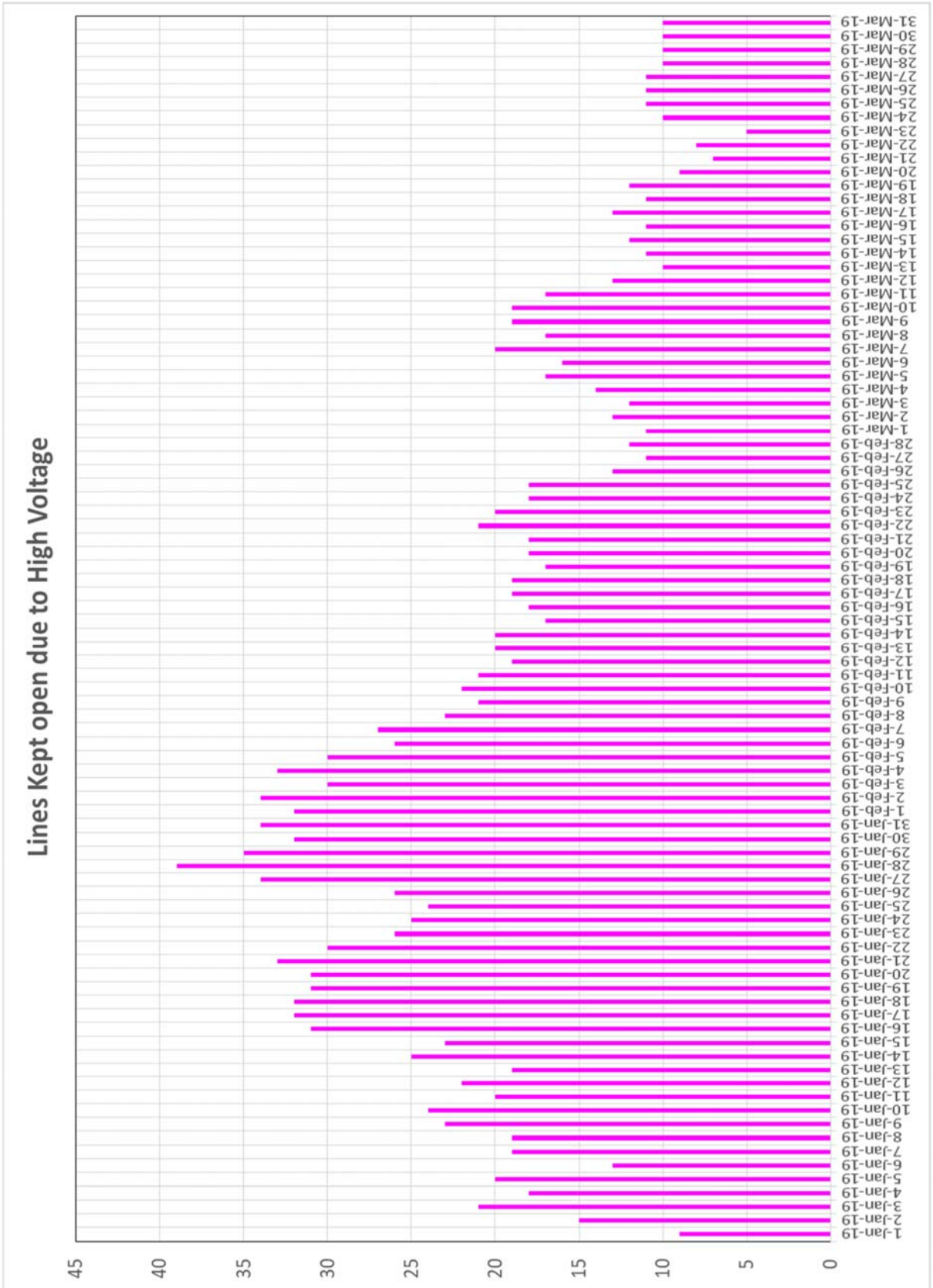


Fig. 1: Lines opened on high Voltage

Section 2: Action taken in real-time to mitigate constraint

2.1. Lines opened on High Voltage

A list of Lines that were tripped on Over-Voltage and physically opened by Real-time operators to control overvoltages in the Grid is shown below:

S. No.	Name of Element	Owner Name	Total No. of Outages	Total No. of Hours of Outage during this quarter
1	400KV-URAVAKONDA-MEHBOOBNAGAR-2	TSTRANSCO	80	1864
2	400KV-NIRMAL-SUNDILA-2	TSTRANSCO	63	1425
3	400KV-GVK-VEMAGIRI_AP-1	APTRANSCO	61	1424
4	400KV-KARAIKUDI-PUGALUR-2	POWERGRID	53	1256
5	400KV-TALARCHEVU-URAVAKONDA-2	ANDHRA PRADESH	49	1161
6	400KV-MALKARAM-SURYAPET-1	TSTRANSCO	56	1105
7	400KV-PAVAGADA-TUMKUR-2	POWERGRID	81	1105
8	400KV-TALARCHEVU-JAMMALAMADUGU-2	ANDHRA PRADESH	45	1048
9	400KV-MALKARAM-SURYAPET-2	TSTRANSCO	48	1029
10	400KV-SRISAILAM_LEFT_BANK-DINDI-2	TSTRANSCO	42	971
11	400KV-HINDUPUR-NP_KUNTA-2	APTRANSCO	41	968
12	400KV-GAUTAMI-VEMAGIRI_AP-1	APTRANSCO	43	955
13	400KV-SURYAPET-KV_KOTA-2	APTRANSCO	41	930
14	400KV-MAMIDAPALLI-DINDI-2	TSTRANSCO	39	902
15	400KV-VTPS_IV-SURYAPET-2	TSTRANSCO	41	861
16	400KV-LKPPL_STG2-VIJAYAWADA-2	POWERGRID	35	830
17	400KV-SURYAPET-SHANKARAPALLY-2	TANTRANSCO	39	807
18	400KV-JULURUPADU-MANUGURU-1	TELENGANA	33	712
19	400KV-KHAMMAM-NAGARJUNASAGAR_PG-3	PVTL	31	704
20	400KV-GVK-VEMAGIRI_AP-2	APTRANSCO	29	670
21	400KV-SRISAILAM_LEFT_BANK-SATTENPALLY-2	APTRANSCO	31	667
22	400KV-PAVAGADA-HIRIYUR-2	POWERGRID	26	574
23	400KV-PAVAGADA-TUMKUR-1	POWERGRID	53	527
24	765KV-CUDDAPAH-THIRUVALAM-1	POWERGRID	38	497
25	400KV-SINGARENI-SUNDILA-2	TSTRANSCO	26	489
26	400KV-NIRMAL-SUNDILA-1	TSTRANSCO	22	486
27	765KV-KURNOOL_PG-NPS-2	POWERGRID	24	480
28	400KV-RAYALSEEMA TPP-KALIKIRI-2	APTRANSCO	23	475
29	400KV-KALPAKKA-ASUPAKA-1	TSTRANSCO	21	442
30	400KV-KARAIKUDI-KAYATHAR-2	TANTRANSCO	23	436
31	400KV-MADURAI-TIRUNELVELI-1	POWERGRID	19	427
32	400KV-SURYAPET-KV_KOTA-1	APTRANSCO	19	421
33	765KV-KURNOOL_PG-CUDDAPAH-1	POWERGRID	43	420

S. No.	Name of Element	Owner Name	Total No. of Outages	Total No. of Hours of Outage during this quarter
34	400KV-SURYAPET-KETHIREDDYPALLY-1	TELENGANA	21	420
35	765KV-CUDDAPAH-THIRUVALAM-2	POWERGRID	34	414
36	400KV-ANAIKADAVU-THAPPUKUNDU-2	TANTRANSCO	25	409
37	400KV-KUDANKULAM-TUTICORIN_PS-1	POWERGRID	16	360
38	400KV-KUDANKULAM-TUTICORIN_PS-2	POWERGRID	17	356
39	400KV-NARNOOR-JAMMALAMADUGU-2	APTRANSCO	15	336
40	400KV-URAVAKONDA-MEHBOOBNAGAR-1	TSTRANSCO	14	329
41	400KV-TUTICORIN_PS-TTGS-2	POWERGRID	14	323
42	400KV-BHOOPALAPALLY-WARANGAL-1	POWERGRID	14	298
43	400KV-MAMIDAPALLI-KHAMMAM-2	POWERGRID	13	278
44	400KV-MADURAI-PUGALUR-2	POWERGRID	10	223
45	400KV-BHOOPALAPALLY-GAJWEL-2	TSTRANSCO	10	204
46	400KV-HINDUPUR-URAVAKONDA-1	ANDHRA PRADESH	10	197
47	765KV-NIZAMABAD-MAHESHWARAM_PG-2	POWERGRID	36	196
48	400KV-GAUTAMI-VEMAGIRI_AP-2	APTRANSCO	9	194
49	765KV-KURNOOL_PG-CUDDAPAH-2	POWERGRID	21	192
50	400KV-KARAIKUDI-KAYATHAR-1	TANTRANSCO	10	177
51	765KV-KURNOOL_PG-NPS-1	POWERGRID	12	175
52	400KV-KETHIREDDYPALLY-SHANKARAPALLY-2	TELENGANA	7	159
53	765KV-NIZAMABAD-MAHESHWARAM_PG-1	POWERGRID	29	150
54	400KV-KHAMMAM-NAGARJUNASAGAR_PG-2	PVTL	7	132
55	400KV-ANAIKADAVU-THAPPUKUNDU-1	TANTRANSCO	12	132
56	400KV-PALAVADI-RASIPALYAM-1	TNEB	6	130
57	400KV-KARAIKUDI-KAMUDHI-2	TNEB	8	108
58	400KV-TALARCHEVU-JAMMALAMADUGU-1	ANDHRA PRADESH	5	104
59	400KV-UPCL-HASSAN-1	POWERGRID	13	75
60	400KV-UPCL-HASSAN-2	KARNATAKA	6	71
61	400KV-SURYAPET-JULURUPADU-1	TSTRANSCO	4	67
62	400KV-RAYALSEEMA TPP-KALIKIRI-1	APTRANSCO	4	66
63	400KV-VTPS_IV-SURYAPET-1	TSTRANSCO	4	62
64	400KV-ARASUR-UDUMALPET-2	POWERGRID	3	59
65	400KV-JULURUPADU-MANUGURU-2	TELENGANA	4	58
66	400KV-TUMKUR-KUDGI_PG-2	POWERGRID	4	43
67	400KV-SINGARENI-SUNDILA-1	TSTRANSCO	3	38
68	400KV-SURYAPET-JULURUPADU-2	TSTRANSCO	3	35
69	400KV-CUDDAPAH-NP_KUNTA-3	POWERGRID	3	34
70	400KV-PAVAGADA-TUMKUR-4	POWERGRID	3	33
71	400KV-KALPAKKA-KHAMMAM-1	POWERGRID	3	33
72	400KV-KTPS_VII-JULURUPADU-2	TSTRANSCO	3	30

S. No.	Name of Element	Owner Name	Total No. of Outages	Total No. of Hours of Outage during this quarter
73	400KV-NARENDRA-GUTTUR-1	KPTCL	2	21
74	400KV-TUTICORIN_PS-DHARMAPURI-2	POWERGRID	2	20
75	400KV-HASSAN-MYSORE-1	POWERGRID	4	19
76	400KV-KTPS_VI-KHAMMAM-1	POWERGRID	2	18
77	400KV-VEMAGIRI_AP-SATTENPALLY-1	APTRANSCO	3	16
78	400KV-KALPAKKA-VEMAGIRI_AP-1	APTRANSCO	3	15
79	400KV-HINDUJA-KV_KOTA-2	APTRANSCO	1	14
80	400KV-SATTENPALLY-VTPS_IV-1	APGENCO	2	12
81	400KV-KTPS_VII-KHAMMAM-1	TSTRANSCO	2	10
82	400KV-NELLORE_PG-SRIPERUMBADUR-2	POWERGRID	1	8
83	400KV-NELLORE_PG-VIJAYAWADA-2	POWERGRID	1	7
84	400KV-TIRUNELVELI-KANARPATTI-1	TANTRANSCO	1	7
85	400KV-HINDUPUR-URAVAKONDA-2	ANDHRA PRADESH	1	6
86	220KV-POTHENCODE-TRIVANDRUM-1	KSEB	1	6
87	400KV-HASSAN-MYSORE-2	POWERGRID	1	5
88	400KV-GHANAPUR-MALKARAM-1	TSTRANSCO	1	4
89	400KV-NELAMANGALA-HASSAN-1	POWERGRID	2	2
90	400KV-SATTENPALLY-PODILI-2	APTRANSCO	1	2
91	400KV-TALGUPPA-HASSAN-1	POWERGRID	2	1
92	400KV-VIJAYAWADA-NELLORE_AP-1	APTRANSCO	2	1
93	765KV-KURNOOL_PG-RAICHUR_PG-2	POWERGRID	1	1

2.2. Lines / ICTs opened to control overloading

Sl. No	Transmission Element (s) opened	Overloaded corridor	Remarks/Corrective Action
	NIL		

Section 3: Delay in Transmission / Generation

3.1. Delay in transmission lines affecting grid operation adversely

S. No.	Transmission Corridor	Proposed Commissioning Date/ Original Target date	Actual/ Likely Commissioning Date	Transmission Constraint Caused
1	400kV Tirunelveli- Cochin DC line	Nov-08	RoW issues	400kV Udumalpet-Palakkad DC line getting heavily loaded & Kerala Drawl limitation
2	400kV Thrissur – Kozhikode DC line	---	RoW issues	Low voltages in North Kerala & 220kV North - South corridor of Kerala
3	400kV Tumkur-Yelahanka DC line	April-19	RoW issues	High loading on 400kV Gooty-Nelamangala line
4	400kV Hiriyur-Mysore DC line	July-19	RoW issues	High lading on 400kV Hiriyur-Nelamangala DC line
5	400kV Ballery PS- Chikkanayakanahalli DC line	--	Tendering stage	High lading on 400kV Hiriyur-Nelamangala DC line

3.2. Delay in Generation affecting grid operation adversely

Sl. No	Generating Unit	Area/ State	Proposed Commissioning Date	Actual/ Likely Commissioning Date	Operational Constraint Caused
1	NIL				

Section 4: Outage of FSCs, Oscillations in the Grid, Tower Collapse

4.1. Outage of Fixed Series Capacitors (FSCs) and FACTS Devices

S. No.	Region	Total No. of FSCs	No. of FSCs under outage	Percentage outage

4.2. Oscillations observed through Phasor Measurement Units (PMUs) during Jan to Mar 2019

In the Second Quarter of 2018-2019, the following are the oscillations observed by PMUs:

Sl. No.	PMU Observed	Region	Date	Time		Dominant Mode (Hz)	Damping factor (%)	Remarks
				Start	End			

4.3. Transmission Tower Collapses

Sl. No	Line	Voltage (in kV)	Region	Outage Date	Revival Date	No. of days taken for revival	Impact on Grid and System Operation during 2 nd Quarter of 2018 - 19

***Note:** As per regulation 5b of CERC (Standards of Performance of inter-State transmission licensees) Regulations, 2012, any line going under outage due to tower collapse should be restored back on emergency restoration tower within 12 days and on normal tower within 50 days in case of river bed.

Section 5:

5.1. Transmission Elements under long outage :

Sl No	Transmission Elements	Affected Areas	Expected Revival date
1	220kV Upper Sileru - Balimela	Inter-regional line. ER-SR. Out since 21 st April 2014	Line had been idle charged from 8th January 2015 from Upper Sileru end.
2	220kV Chikkodi – Mudshingi & 220kV Chikkodi – Talangade	Inter-regional line WR-SR.	Line had been idle charged

5.2. Important lines / ICTs under construction from Transfer Capability and Reliability view point

These envisaged lines would enhance the reliability or increase the inter-regional transfer capability between different regions as per the present conditions and can be expedited.

Sl. no	Name of the transmission element (Line / ICT)	Implementing agency	Remarks
1	765kV Vemagiri – Chilkaluraipeta D/C and downstream network	POWERGRID	NEW-SR transfer capability will improve
2	500MVA,400/220kV ICT-3 at Maradam SS	APTRANSCO	NEW-SR transfer capability will improve
3	400kV Hiriyur – Mysore DC line	POWERGRID	Will relieve 400kV Hiriyur – Nelamangala D/C line.
4	400kV Tumkur-Yelahanka DC line	POWERGRID	Will relieve 400kV Gooty-Nelamangala line
5	400kV Tirunelveli- Cochin DC line	POWERGRID	S3 transfer capability will improve.

5.3. Substations with High Fault level:

The substations where fault level exceeds 40kA are as mentioned below:

- 400kV Tiruvallam PG
- 400kV Tiruvallam TN
- 400kV Nellore PG
- 400kV Nellore AP
- 400kV Nellore PS
- 400kV Chittoor
- 400kV Raichur – PG
- 400kV Kurnool – AP
- 400kV Kurnool – PG
- 400kV Raichur TPS
- 400kV Gooty
- 400kV Krishnapatnam
- 400kV Maheshwram PG
- 400kV Khammam
- 400kV Maheswaram TS
- 400kV Ramagundam NTPC
- 400kV Alamatty SS

Section 6: Markets

6.1. Congestion observed while processing STOA Applications

Month	Transmission corridor	Congestion Period				Congestion in MW
		Date		Hrs		
		From	To	From	To	
Jan'19	No congestion	-	-	-	-	-
Feb'19	No congestion	-	-	-	-	-
Mar'19	No congestion	-	-	-	-	-

Section 7: Other Issues in Southern Region

7.1. Other Issues in Southern Region

- **During Monsoon with less demand coupled with High RE penetration, many of the transmission lines are under-loaded and thus resulting in high voltages across the grid.**
- **If the fault level has crossed 32 kA, the buses may also be highlighted. DR outputs, if any, for actual event illustrating this to be attached.**
 - With Full generation at MAPS & Bhavni and with interconnection, the Fault MVA touching 25kA, the rated capacity of breaker.
- **Any substation layout which affected grid operation adversely could also be highlighted.**
 - It is recommended to have uniform rating of LV/400kV for Generator Transformers connected to 400kV grid directly then only optimization of tap position give fruitful results.
 - Substations where parallel circuits are on the same diameter are as mentioned below:
 - **At 400kV Alamatty SS, Vallur D/C, Thiruvallur D/C, SV Chatram D/C, NCTPS -1 & Manali-1 and 400/220kV ICT-1&2 400/132kV ICT-4&5 are on the same diameter.**
 - **At 400kV Alundur SS, 400/220kV ICT-1&2 are on the same diameter.**
 - **At 400kV Hinduja SS, 400kV KV Kota D/C and 400kV Kalpakka D/C are on the same diameter.**
 - **At 400kV Kayathar SS, 400kV Karaikudi D/C and 400/230kV ICT-1&2 are on the same diameter.**
 - **At 400kV Kudamkulam SS, 400kV Thirunelveli D/C are on the same diameter.**
 - **At Kakatiya TPS, 400kV Warangal D/C and 400kV Gajwel D/C are on the same diameter.**
 - **At 400kV KTPS SS, 400kV Khammam D/C and 400/220kv, 80MVA ICT & 400/11kV, 50MVA ICT are on same diameter.**
 - **At Mettur-III SS, 400kV Palavadi D/C, 400kV Karamadai D/C and 400/230kV ICT-1 & 2 are on same diameter.**
 - **At 400kV Udumalpet SS, 400/220kV ICT 1 & 2 is on same diameter.**
 - **At 400kV Sholinganalur, 400kV Kalivendapattu – Sholinganalur D/C and 400/230kV Sholinganalur ICT 1 & 2 are on the same diameter.**
 - **At 400kV Nunna SS, 400kV Vemagiri Ckt-III&IV are on the same diameter.**
 - **At 400kV RTPP SS , 400kV CHitoor D/C are on the same diameter**
 - **At 400kV Kanarapatti SS, 400kV Kayathar D/C, 400kV Tirunelveli D/C lines are on the same diameter.**
 - **At 400kV Salem (TN) SS, 400/110kV ICT-1&2 and 400/230kV ICT-1&2 are on the same diameter.**
 - **At 400kV Simhadri (AP) SS, 400kV Kalpakka ckt-1&2 and Kalpakka ckt-3&4 are on the same diameter.**
 - **At 400kV Simhadri Stg-2 SS, 400kV Vemagiri D/C and 400kV Gazuwaka D/C are on the same diameter.**
 - **At 400kV SV Chatram SS, 400/110kV ICT-1&2, 400kV NCTPS D/C, 400kV Alamy D/C and 400/230kV ICT 1&2 are on the same diameter.**
 - **At 400kV VTS-IV SS, 400kV Sattenpalli D/C on same diameter.**
 - **At 400kV Ramagundam SS, both Chandrapur circuits are on same Dia.**
 - **At 400kV Gooty SS, both Nellore PS circuits are on same Dia.**
 - In future, it is recommended to avoid parallel circuits on the same Dia for reliability purposes.

- Many KPTCL Stations at 220 kV level are operated as single bus. Many State 220 kV stations do not have bus bar protection. These issues are being taken up at PCC meetings.
- **Vallur TPS (1500 MW) and NCTPS-II (1200MW) generation is connected at 400kV Bus and No 230kV path is available to give start up supply in case of Blackout. So there is a need to provide 230kV path.**
- **The following Interregional links has to be explored for import of power by Southern Region,**
 - 220kV Upper Sileru-Balimela S/C line
- **National HVDC project of Lower Sileru-Barasoor line right of way has to be used for New inter connection between SR & NEW Grids.**
- **Presently one line each of 765 kV Kurnool-NPS DC and 765 kV Kurnool-Cudapah-Thiruvalem DC are kept open due to high voltage. Some of the 765kV transmission lines in Southern Region are not fully compensated for Reactive power and thus resulting in High Bus Voltages.**
- **230kV MAPS – Bhavini line (80 MVA) is used for only startup purpose is always kept open. 230kV Acharapakkam – Villupuram is open to avoid over-loading of 230kV Kalpakkam – Acharapakam S/C line. 230kV MAPS is left with only two sources i.e. 230kV MAPS - Arni SC & 230kV MAPS - SP Koil DC.**

Annexure I: Uncertainty in Load Growth

1. Yearly Peak Demand Met: Southern Region

S. No	Year	Constituent	Peak Demand Met (MW)	Latest EPS projection (MW)	Yearly growth rate in peak demand met (%age)	Yearly projected growth in EPS (%age)
1	2012-13	Andhra Pradesh	11630	15553	-3%	10%
		Karnataka	8761	9742	2%	8%
		Kerala	3262	3701	-2%	6%
		Tamil Nadu	11053	14174	5%	11%
		Puducherry	320	533	0%	4%
		SR	31586	39850	-2%	9%
2	2013-14	Andhra Pradesh	13162	17044	13%	10%
		Karnataka	9223	10473	5%	8%
		Kerala	3573	3922	10%	6%
		Tamil Nadu	12492	15736	13%	11%
		Puducherry	333	555	4%	4%
		SR	36048	43623	14%	9%
3	2014-15	Andhra Pradesh	6784	18681	3%	10%
		Telangana	6755			
		Karnataka	9549	11258	4%	8%
		Kerala	3594	4157	1%	6%
		Tamil Nadu	13498	17497	8%	11%
		Puducherry	348	579	5%	4%
		SR	37047	47752	3%	9%
4	2015-16	Andhra Pradesh	7391	20476	9%	10%
		Telangana	6849		1%	
		Karnataka	9508	12102	0%	8%
		Kerala	3856	4405	7%	6%
		Tamil Nadu	14171	19489	5%	11%
		Puducherry	352	604	1%	4%
		SR	39875	52273	8%	9%
5	2016-17	Andhra Pradesh	7965	22445	8%	10%
		Telangana	9187		34%	
		Karnataka	10242	13010	8%	8%
		Kerala	3996	4669	4%	6%
		Tamil Nadu	14823	20816	5%	7%
		Puducherry	368	630	5%	4%
		SR	42232	57221	6%	9%

S. No	Year	Constituent	Peak Demand Met (MW)	Latest EPS projection (MW)	Yearly growth rate in peak demand met (%age)	Yearly projected growth in EPS (%age)
6	2017-18	Andhra Pradesh	8983	8874	13%	8%
		Telangana	10284	10011	12%	21%
		Karnataka	10802	11517	5%	6%
		Kerala	3884	4341	-3%	5%
		Tamil Nadu	15193	16299	3%	6%
		Puducherry	387	497	5%	4%
		SR	47210	48635	12%	9%
7	2018-19	Andhra Pradesh	9453	9544	5%	7%
		Telangana	10818	11262	5%	11%
		Karnataka	12881	12169	19%	5%
		Kerala	4242	4561	9%	5%
		Tamil Nadu	16129	17230	6%	5%
		Puducherry	412	518	6%	4%
		SR	49534	52171	5%	7%

Note: 'Latest EPS projection' data taken from 18th EPS for the FY 2011-12 to 2016-17 and data taken from 19th EPS for the FY 2017-18 & FY 2018-19.

2. Yearly Energy Met: Southern Region

S. No	Year	Constituent	Energy Met (MU)	Latest EPS projection (MU)	Yearly growth rate in Energy met (%age)	Yearly projected growth in EPS (%age)
1	2012-13	Andhra Pradesh	82171	93189	9%	9%
		Karnataka	57044	58513	6%	8%
		Kerala	20391	20516	5%	7%
		Tamil Nadu	76161	91625	-1%	7%
		Puducherry	2291	3024	7%	4%
		SR	238058	266867	0%	8%
2	2013-14	Andhra Pradesh	89036	101231	8%	9%
		Karnataka	58052	63001	2%	8%
		Kerala	21052	21889	3%	7%
		Tamil Nadu	87980	97865	16%	7%
		Puducherry	2320	3155	1%	4%
		SR	258444	287141	9%	8%
3	2014-15	Andhra Pradesh	56313	109968	9%	9%
		Telangana	40644			
		Karnataka	59926	67833	3%	8%
		Kerala	22127	23354	5%	7%
		Tamil Nadu	92750	104529	5%	7%
		Puducherry	2376	3293	2%	4%
		SR	274136	308977	6%	8%
4	2015-16	Andhra Pradesh	50366	119458	-11%	9%
		Telangana	49948		23%	
		Karnataka	60971	73036	2%	8%
		Kerala	23194	24917	5%	7%
		Tamil Nadu	96586	111648	4%	7%
		Puducherry	2429	3436	2%	4%
		SR	283494	332495	3%	8%
5	2016-17	Andhra Pradesh	54257	129767	8%	9%
		Telangana	53017		6%	
		Karnataka	66538	78637	9%	8%
		Kerala	24261	26584	5%	7%

S. No	Year	Constituent	Energy Met (MU)	Latest EPS projection (MU)	Yearly growth rate in Energy met (%age)	Yearly projected growth in EPS (%age)
		Tamil Nadu	104488	119251	8%	7%
		Puducherry	2546	3586	5%	4%
		SR	305107	357826	8%	8%
6	2017-18	Andhra Pradesh	58299	58846	7.45%	8%
		Telangana	60475	61102	14.07%	16%
		Karnataka	68949	69808	3.62%	6%
		Kerala	24502	25875	0.99%	5%
		Tamil Nadu	106732	111583	2.15%	5%
		Puducherry	2544	3121	-0.08%	4%
		SR	321514	330336	5.38%	8%
7	2018-19	Andhra Pradesh	63535	63290	9%	7%
		Telangana	66423	67680	10%	10%
		Karnataka	71785	73636	4%	5%
		Kerala	24826	27184	1%	5%
		Tamil Nadu	110137	117505	3%	5%
		Puducherry	2671	3254	5%	4%
		SR	339382	352549	6%	6%

3. Monthly Peak Demand met in the Quarter: Southern Region

S. No	Month	Constituent	Peak Demand Met (MW)	RPC LGB projection (MW)	Growth rate in peak demand met over same month of last year (%age)	Projected growth over same month of last year as per RPC LGB projection (%age)	Peak Demand Met (MW) in 2017	RPC LGB projection (MW) in 2017
1	Jan'19	Andhra Pradesh	8461	8475	-1.1%	8.7%	8558	7800
		Telangana	9323	9537	-0.8%	-4.2%	9399	9951
		Karnataka	11783	11819	13.9%	17.6%	10346.99	10052
		Kerala	3704	3700	4.2%	-2.6%	3553.062	3800
		Tamil Nadu	14462	14100	0.6%	0.9%	14372.8	13974
		Puducherry	387	400	11.9%	18.7%	345.9	337
		SR	44771	45910	3.8%	4.6%	43115	43894
2	Feb'19	Andhra Pradesh	8969	9100	-0.1%	12.3%	8982	8100
		Telangana	10196	10918	0.9%	0.5%	10109	10869
		Karnataka	12012	12132	17.6%	15.8%	10212.17	10481
		Kerala	3845	4000	3.3%	2.1%	3720.634	3916
		Tamil Nadu	15562	14825	6.0%	2.5%	14680.6	14469
		Puducherry	399	417	10.2%	12.7%	362	370
		SR	47959	49109	5.8%	6.6%	45325	46077
3	Mar'19	Andhra Pradesh	8984	9385	0.0%	2.4%	8983	9166
		Telangana	10505	11102	2.1%	4.6%	10284	10616
		Karnataka	12881	12244	19.2%	11.3%	10801.73	11000
		Kerala	4242	4200	9.2%	2.9%	3884.28	4081
		Tamil Nadu	16129	15300	6.2%	2.0%	15193.4	15000
		Puducherry	412	429	12.0%	15.3%	367.7	372
		SR	49534	50237	4.9%	6.0%	47210	47375

4. Monthly Energy met in the Quarter: Southern Region

S. No	Month	Constituent	Energy Met (MU)	RPC LGB projection (MU)	Growth rate in Energy met over same month of last year (%age)	Projected growth over same month of last year as per RPC LGB projection (%age)	Energy Met (MU) in 2017	RPC LGB projection (MU) in 2017
1	Jan'19	Andhra Pradesh	4995	5017	-1.5%	-1.2%	5069	5077
		Telangana	5450	5456	-2.2%	-5.6%	5574	5778
		Karnataka	6467	6489	2.0%	3.6%	6342	6262
		Kerala	2012	2029	-2.0%	-1.5%	2053	2059
		Tamil Nadu	8684	8700	0.8%	-6.5%	8611	9300
		Puducherry	218	220	10.8%	11.7%	197	197
		SR	27825.6	28036	0.0%	-2.5%	27839	28769
2	Feb'19	Andhra Pradesh	5011	5227	4.7%	5.4%	4788	4957
		Telangana	5453	5705	0.6%	-1.3%	5420	5782
		Karnataka	6223	6128	5.0%	-0.5%	5927	6160
		Kerala	2058	2033	5.8%	2.6%	1945	1981
		Tamil Nadu	8747	8863	5.9%	0.7%	8257	8800
		Puducherry	207	246	6.6%	23.0%	194	200
		SR	27698.5	28314	4.4%	1.2%	26530	27967
3	Mar'19	Andhra Pradesh	6071	6060	10.1%	7.4%	5512	5645
		Telangana	6929	7093	3.9%	9.8%	6669	6462
		Karnataka	7578	7178	10.2%	4.4%	6875	6878
		Kerala	2495	2415	7.3%	3.7%	2324	2329
		Tamil Nadu	10546	10175	7.0%	1.8%	9859	10000
		Puducherry	251	280	10.1%	16.2%	228	241
		SR	33869.4	33325	7.7%	5.3%	31462	31652

Annexure II: Details of Grid Disturbances and Grid Incidences

S. No.	Region	Outage Date	Outage Time	Event	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards
SR/GD-1	SR	09-Jan-19	05:39	Complete outage of 230kV Siruseri station: Triggering incident was Y-phase fault in 230kV Siruseri Sholinganallur line. Distance relay picked up at Siruseri end opening Y-phase pole. However, R and B phase poles also got tripped due to maloperation of Bus-1 Bus-Bar Protection (BBP) at Siruseri end. At Sholinganallur end, A/r was blocked due to another Y- B Phase fault during reclaim time. 230kV Siruseri Station was under single bus operation, hence operation of Bus-bar protection resulted in tripping of all elements resulting in the complete outage.	NIL	74 MW	GD-1
SR/GD-2	SR	28-Jan-19	01:15	Complete outage of 400kV Sriperumbudur station: Triggering incident was failure of 'R-phase' HV side Current transformer (CT) of 315MVA 400/230kV ICT-3 at 400kV Sriperumbudur substation (400kV TANTRANSCO switchyard). Bus Bar protection of Bus-1 in TANTRANSCO switchyard operated. However, the fault feed continued from POWERGRID Sriperumbudur Bus. At POWERGRID Sriperumbudur end, fault was cleared due to reverse zone operation of the connected feeders. This resulted in complete outage of 400kV Sriperumbudur station.	NIL	116 MW	GD-1
SR/GD-3	SR	03-Feb-16	20:26	Complete Outage of 220kV Hootagalli SS of KPTCL: Triggering incident was B-ph fault due to failure of B-ph CT of Bus Coupler at 220kV Hootagalli Station. Since	NIL	101 MW	GD-1

S. No.	Region	Outage Date	Outage Time	Event	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards
				bus bar protection is not available at 220kV Hootagalli, fault was cleared by tripping of all connected lines at remote end on Zone 2 Distance Protection operation. This resulted in the complete outage at 220kV Hootagalli Station.			
SR/GD-4	SR	04-Feb-19	20:19	Complete Outage of 220kV Kadra Power House of KPCL & 220kV Karwar SS of KPTCL: During de-synchronising of Kadra unit#2, R-pole didn't open due to struck breaker condition. Pole Discrepancy operated. All the connected 220kV lines at Kadra end were hand tripped. This resulted in complete outage at 220kV Kadra Power House. Since 220kV Karwar was radially fed from 220kV Kadra power house, there was complete loss of supply at 220kV Karwar station.	NIL	64 MW	GD-1
SR/GD-5	SR	06-Feb-19	14:51	Complete Outage of 220kV Ambewadi Station of KPTCL: 220kV Ambewadi-Nagjheri line-2 had tripped in the antecedent at 14:21 hrs due to B- phase to ground fault. While test charging 220kV Ambewadi – Nagjheri Line -2 from Ambewadi end at 14:51 Hrs, the other connected lines 220kV Ambewadi – Nagjheri line-1 and 220kV Ambewadi – Narendra Line-2 tripped due to suspected stuck breaker condition at Ambewadi end. Fault was cleared by remote end breaker in Zone-2 as LBB protection was not active at 220kV Ambewadi station. This resulted in complete outage of 220kV Ambewadi station. During the incident Generation Loss of 90MW occurred at Supa Generating station	90 MW	6 MW	GD-1
SR/GD-6	SR	08-Feb-19	10:28	Complete Outage of 220kV Brahmapuram SS of KSEB: Complete outage of 220kV Brahmapuram SS occurred due to suspected mal operation of Bus Bar protection.	7 MW	200 MW	GD-1

S. No.	Region	Outage Date	Outage Time	Event	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards
SR/GD-7	SR	17-Feb-19	23:22	Complete Outage of 220kV N'Sagar Main Power House of TSGENCO: During change over to Pump Condenser mode, bus fault occurred at 220kV N'Sagar Main Power House. Due to non-operation of BBP (Bus Bar Protection), fault was cleared by tripping of 220kV connected feeders on Zone 2 Distance Protection operation. This resulted in the complete loss of supply at 220kV N'Sagar Main Power House. Antecedent generation at N'Sagar was Nil during this event	NIL	NIL	GD-1
SR/GD-8	SR	19-Feb-19	04:15	Complete Outage of 220kV Gooty Switching Station (SWS) of APTRANSCO: Triggering incident was failure of B-ph CT of 220kV Gooty PG to Gooty SWS line-1. Bus-1 and Bus-2 Bus Bar Protection (BBP) operated resulting in the tripping of all the connected elements at 220kV Gooty SWS. 400kV/220kV ICT#1, 2 and 3 at Gooty also got tripped during this event.	NIL	NIL	GD-1
SR/GD-9	SR	22-Feb-19	11:35	Complete Outage of 220kV NIMHANS and 220kV East DV Compound (EDC) SS of KPTCL: Triggering incident was R-ph to Y-ph fault in 220kV Hoody to HSR line-1. Line tripped due to DPR (Distance Protection) operation. After the tripping of 220kV Hoody to HSR line-1, 220kV HSR EPIP line got overloaded and tripped at HSR end only on Overcurrent protection. At the same time, 220kV HSR NIMHANS line was hand tripped at HSR end. 220kV EDC and 220kV NIMHANS were fed from HSR and Hoody SS. Tripping of 220kV Hoody to HSR line-1 and 220kV HSR NIMHANS line resulted in complete loss of supply at 220kV NIMHANS and 220kV EDC.	NIL	240 MW	GD-1
SR/GD-10	SR	04-Mar-19	11:25	Complete outage of 230kV Mywadi substation of TANTRANSCO: Triggering incident was B-ph fault (Peacock fault) between CT and breaker of 220kV Mywadi	NIL	NIL	GD-1

S. No.	Region	Outage Date	Outage Time	Event	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards
				Annaikadavu line at 230kV Mywadi end. Distance protection operated in Zone -1 at Mywadi end. Since the breaker was already in open condition and the fault was between CT and breaker, LBB operated resulting in the tripping of all the elements connected to the bus. This resulted in the complete outage of 230kV Mywadi SS since it was under single bus operation due to non-availability of bus coupler CT.			
SR/GD-11	SR	11-Mar-19	00:55	Complete outage of 230kV Veeranam substation of TANTRANSKO: Triggering incident was Y-phase CT blast in 230kV Tirunelveli (Abhishekpatty) – Veeranam Ckt-1. 230kV Tirunelveli – Veeranam Ckt-1 and 2 tripped. Two faults were observed from the PMU plot. During the second fault, delayed fault clearance of 400ms was observed. As reported, other connected feeders 230kV Veeranam – Kodikur ckt-1&2 and 230kV Veeranam – Kayathar tripped on Zone -2 protection.	NIL	NIL	GD-1
SR/GD-12	SR	12-Mar-19	17:03	Complete Outage of 400kV Singareni Generating Station of TSGENCO, 400kV Ramadugu SS and 400kV Medaram SS of TSTRANSKO: During testing of Thippapur bay (New Element) at 400kV Ramadugu, all connected 6 feeders of 400kV Ramadugu got tripped due to spurious DT (Direct Trip) Receive. 400kV Medaram SS is connected only to 400kV Ramadugu SS. Hence this resulted in complete loss of supply at 400kV Medaram SS and 400kV Ramadugu SS. After the tripping of 400kV Ramadugu - Singareni 1&2, running unit#1 and 2 of 400kV Singareni Generating Station got tripped. 400kV Singareni Sundilla 1&2 were hand tripped at Singareni end.	1135 MW	250 MW	GD-1
SR/GD-13	SR	25-Mar-19	04:13	Complete outage of 220kV/132kV Chinakampalli Substation of APTRANSKO: Triggering incident was failure of B-ph CT of Bus Coupler at 220kV Chinakampalli SS. Bus bar protection of Bus-1 and Bus-2 operated resulting in the	NIL	285 MW	GD-1

S. No.	Region	Outage Date	Outage Time	Event	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards
				tripping of all the connected elements at 220kV Chinakampalli SS. 400kV/220kV ICT#1, 2 and 3 at Cuddapah also got tripped during this event.			
SR/GI-1	SR	11-Feb-19	11:46	Multiple trippings at Kaiga: Bus-2 at 400kV Kaiga got deenergised due to LBB operation.	NIL	NIL	GI-2
SR/GI-2	SR	19-Feb-19	14:15	Complete outage of 230kV side of 400/220kV Karamadai station: Triggering incident was failure of B-ph CT of 230kV Karamadai Ingur line at Karamadai end. Bus-1 Bus Bar Protection (BBP) operated. After 500ms, Bus-2 Bus Bar Protection (BBP) also operated resulting in the tripping of all the connected elements at 230kV Karamadai SS. A reported operation of Bus-2 BBP was due to fire in the failed CT.	NIL	NIL	GI-1
SR/GI-3	SR	14-Mar-19	13:24	230kV Bus dead at 400/230kV Pugalur: Triggering incident was R-phase breaker failure in 230kV Pugalur end of Budansandhai feeder. LBB operated resulting in tripping of all connected elements. As reported, c230kV side was on single bus operation since bus sectionalizer provision is not there. 400kV side connected feeders did not trip.	66 MW	NIL	GI-1

Annexure IIIA: Details of SPS operations

Sl. No.	Month	SPS Operated	Details of SPS operated	No. of times operated in Month	No. of correct operations	No. of times failed to operate
1	Jan-19	NIL				
2	Feb-19	SPS for Talcher – Kolar HVDC Bipole	HVDC Talcher-Kolar pole-1 tripped due to line fault. SPS TS1 operated. ESOF sent to Talcher end.	1 (07-02-2019 at 15:15 Hrs)	1	--
3		SPS at Kudankulam Nuclear Power Station Unit#2	KKNPP U#2 tripped due to spurious process sensor actuation. Antecedent generation was 750MW. SPS Trip signal 2 operated.	1 (08-02-2019 at 17:33 Hrs)	1	--
4		SPS at UPCL	SPS operated due to Overloading of 400/220kV ICT-1 at UPCL. ICT-2 was under shutdown. Generation back down at UPCL. Operation of SPS is as per logic.	1 (18-02-2019 at 08:28 Hrs)	1	--
5		SPS at UPCL	SPS operated due to Overloading of 400/220kV ICT-1 at UPCL. ICT-2 was under shutdown. UPCL Unit-2 tripped during backing down. Tripping of unit is not designed in the logic.	1 (19-02-2019 at 08:39 Hrs)	1	--
6	Mar-19	SPS for Talcher – Kolar HVDC Bipole	HVDC talcher-Kolar Pole-2 tripped due to DC line fault. Pole -1 went to ground return mode. SPS operated. Trip signal-1 (TS-1) and Trip signal-2 (TS-2) operated.	1 (12-03-2019 at 13:02 Hrs)	1	--

Annexure IIIB: Details of Islanding system operations

Sl. No.	Month	Islanding system operated	Details of Islanding System operated	No. of times operated in Month	No. of correct operations	No. of times failed to operate
1	Jan-19					
2	Feb-19		NIL			
3	Mar-19					

Annexure IV: Details of Fault Level calculations

Note: The calculation of short circuit levels has been done using IEC 60909 Fault calculation method in PSS/E platform.

Voltage Level	Bus Name	3-phase Short circuit MVA	3-phase Short Circuit current (kA)
400 kV	TIRUVALAM-PG	37546	54
	TIRUVALAM-TN	37546	54
	NELLORE-PG	36429	53
	NELLORE-AP	36429	53
	NELLORE-PS	35326	51
	CHITTOOR	31363	45
	RAICHUR-PG	30974	45
	KURNOOL	30560	44
	KURNOOL-PG	30556	44
	RAICHUR TPS	30157	44
	GOOTY	29655	43
	SDSTPS	29506	43
	MHSWRM-PG	28392	41
	KHAMMAM	28227	41
	MAHES-TS	28086	41
	RSTPS NTPC	27672	40
ALAMATTY	27391	40	

Annexure V.A: Graphs indicating Transmission Line Constraints in Southern Region

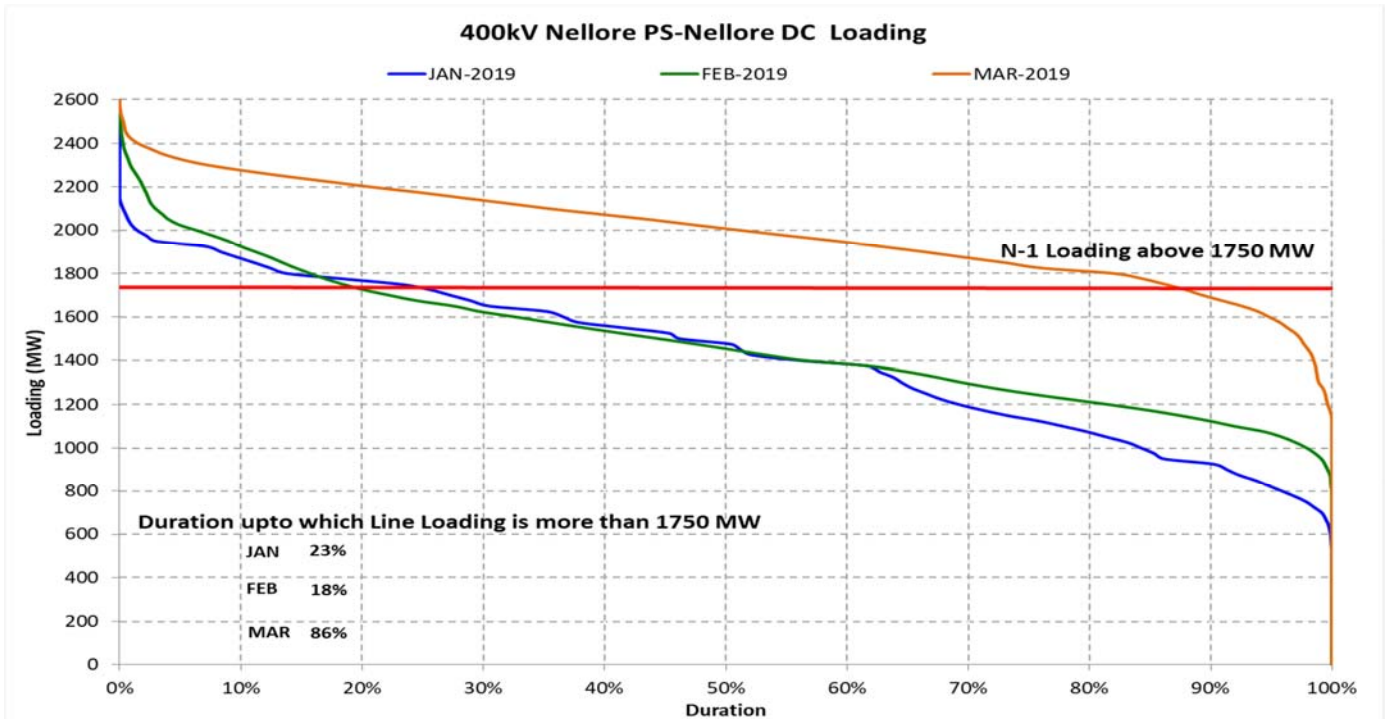


Figure-A1

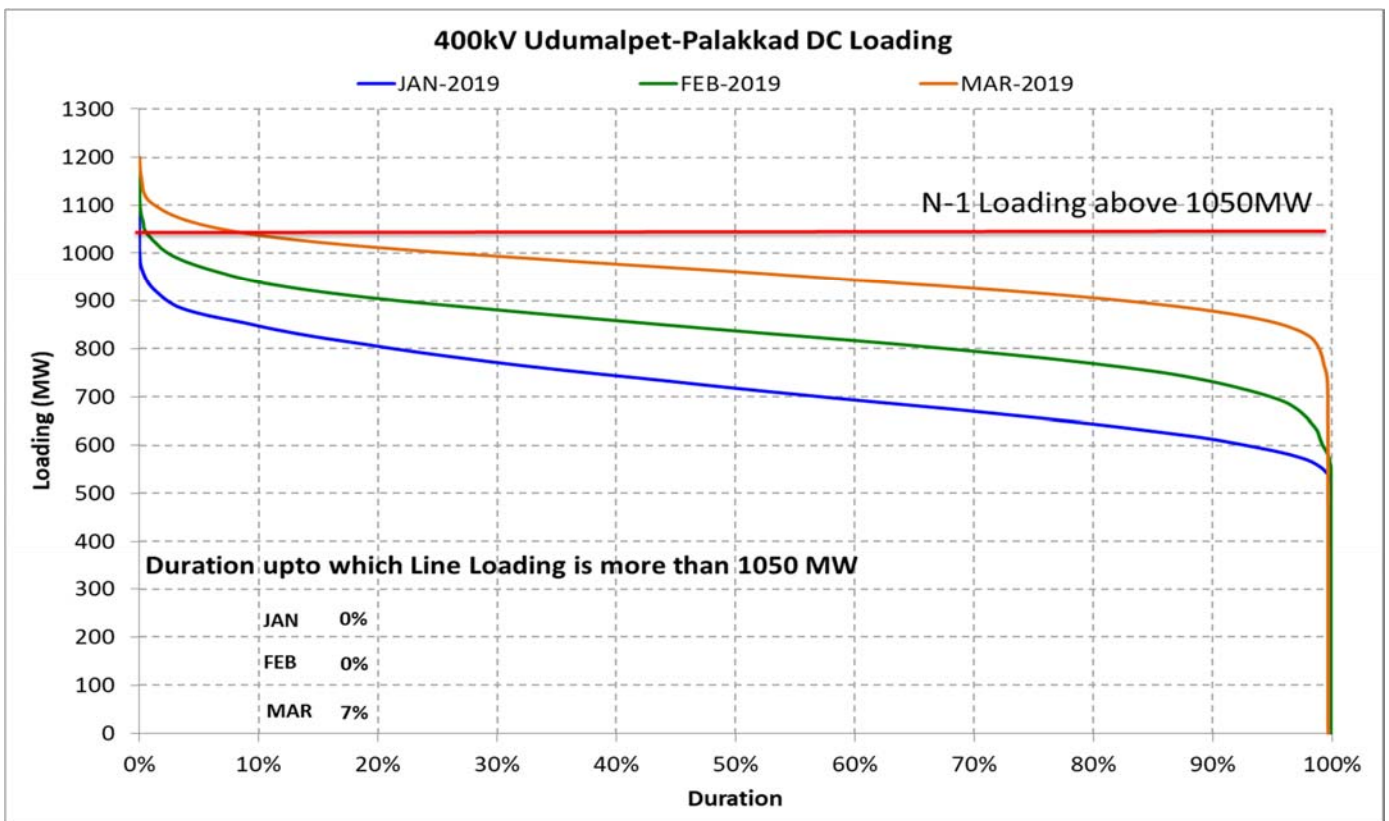


Figure-A2

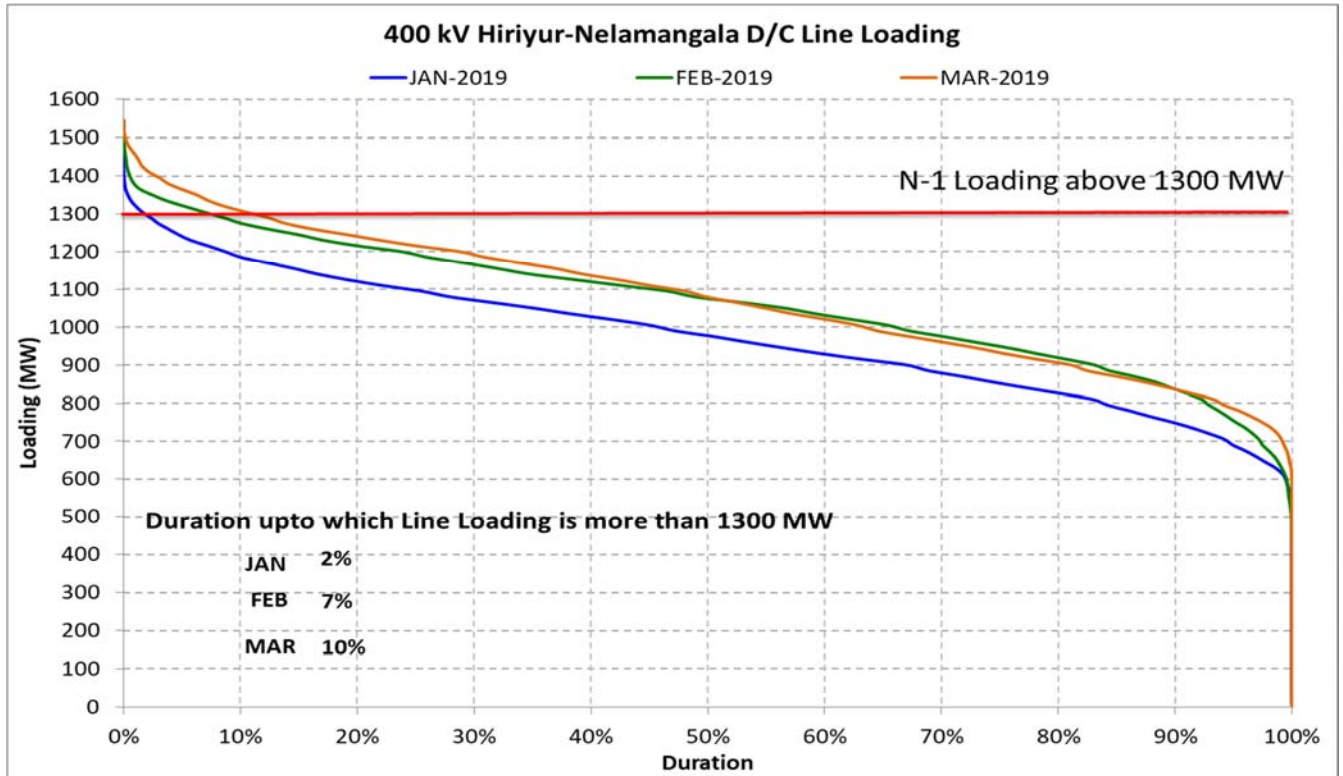


Figure: A3

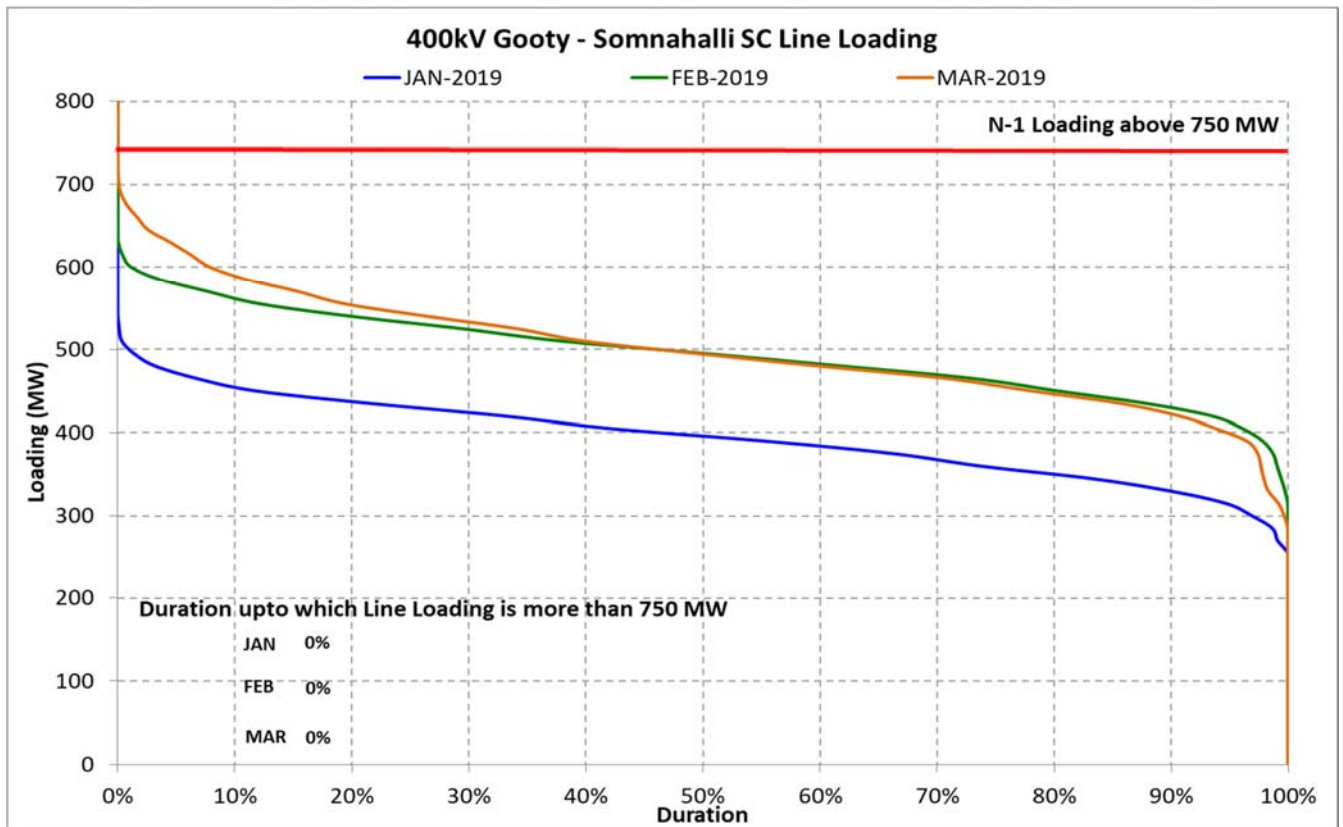


Figure: A4

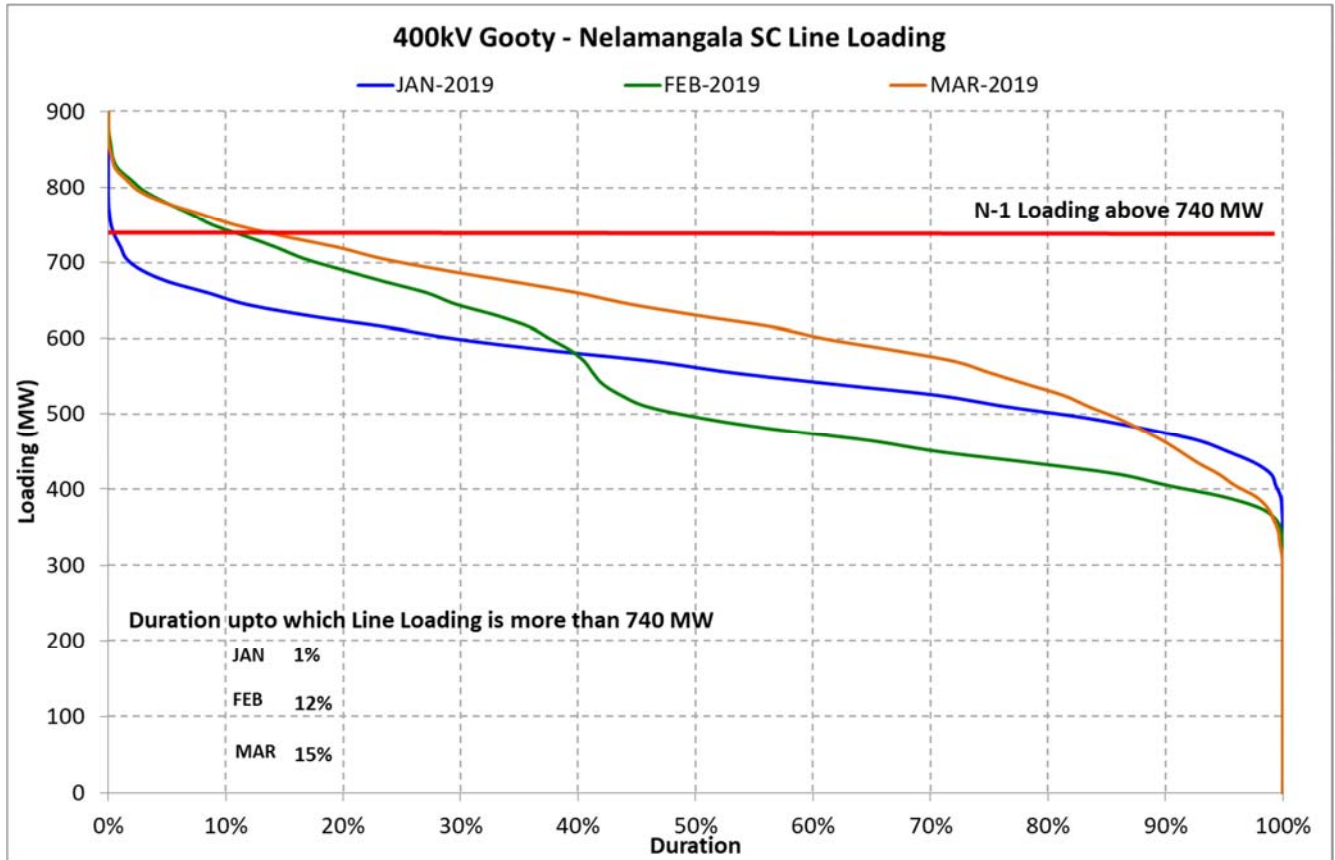


Figure: A4

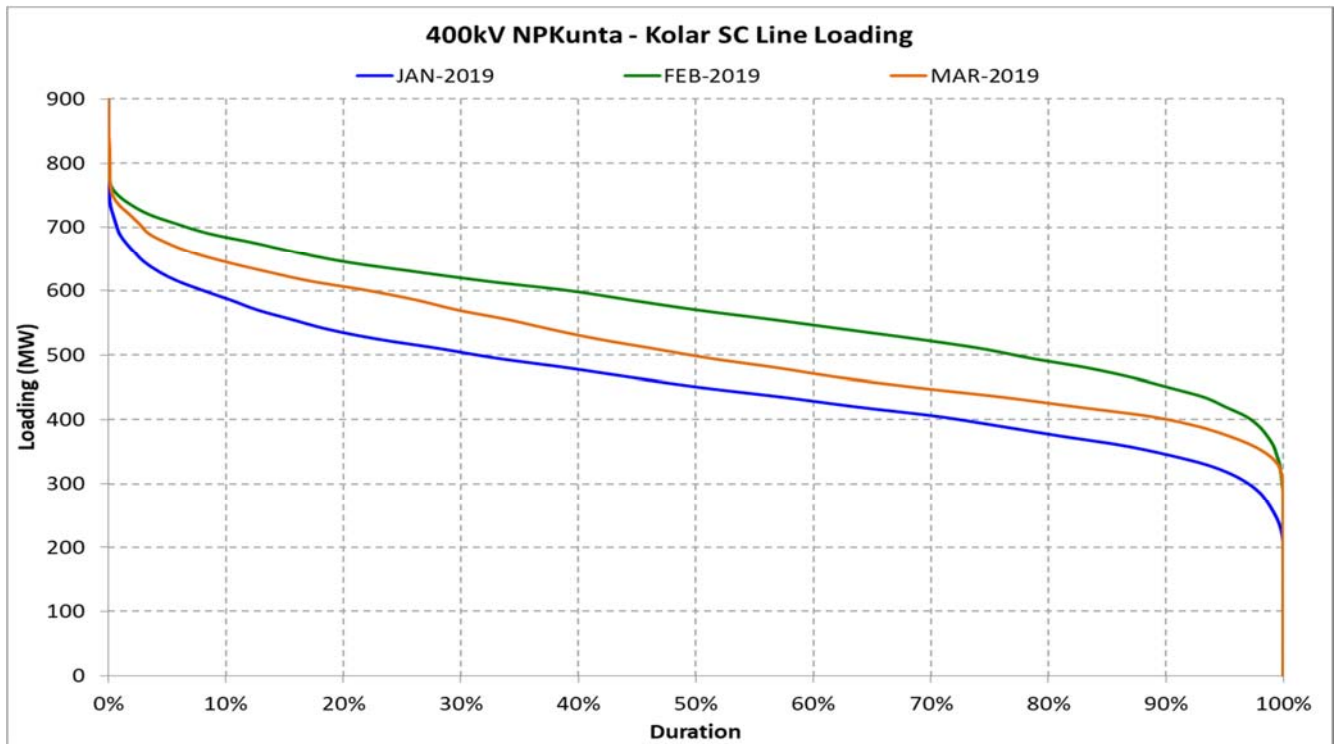


Figure: A5

Annexure V.B: Graphs indicating ICT Constraints in Southern Region

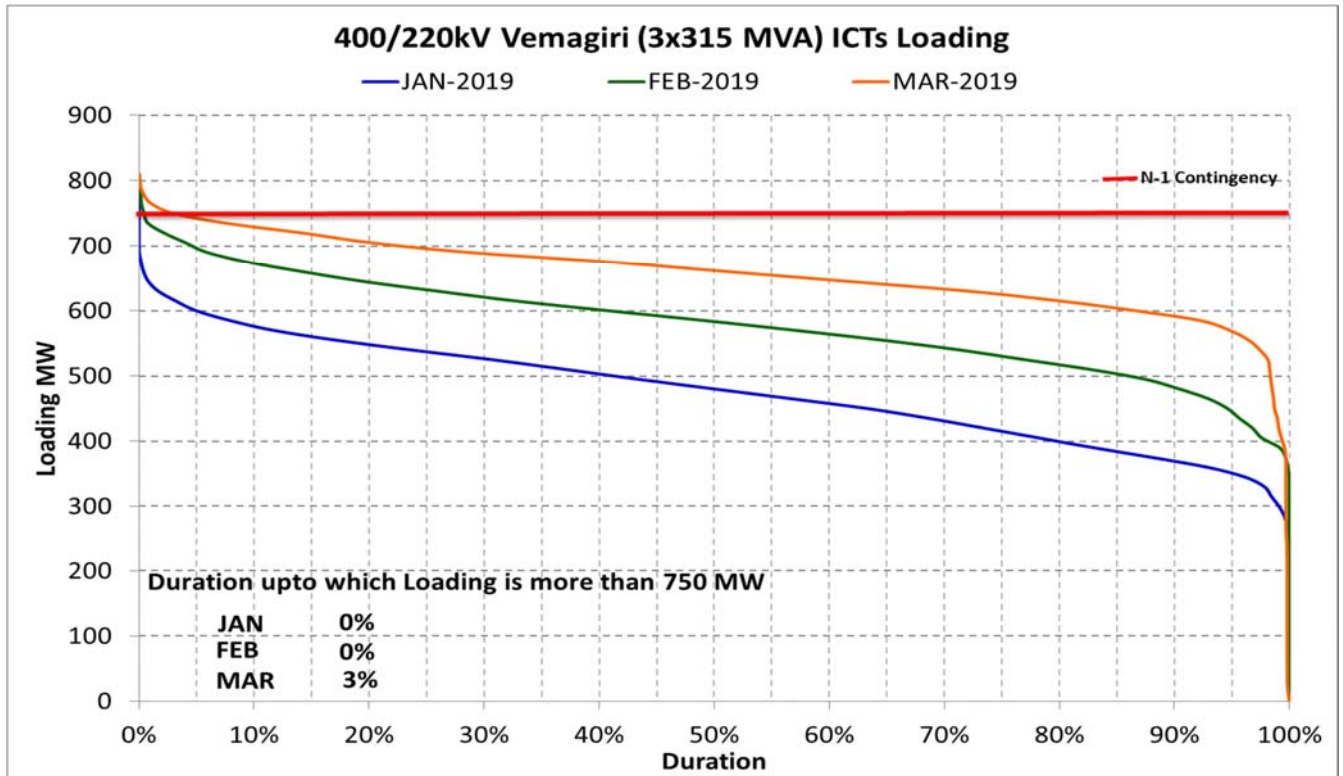


Figure-B1

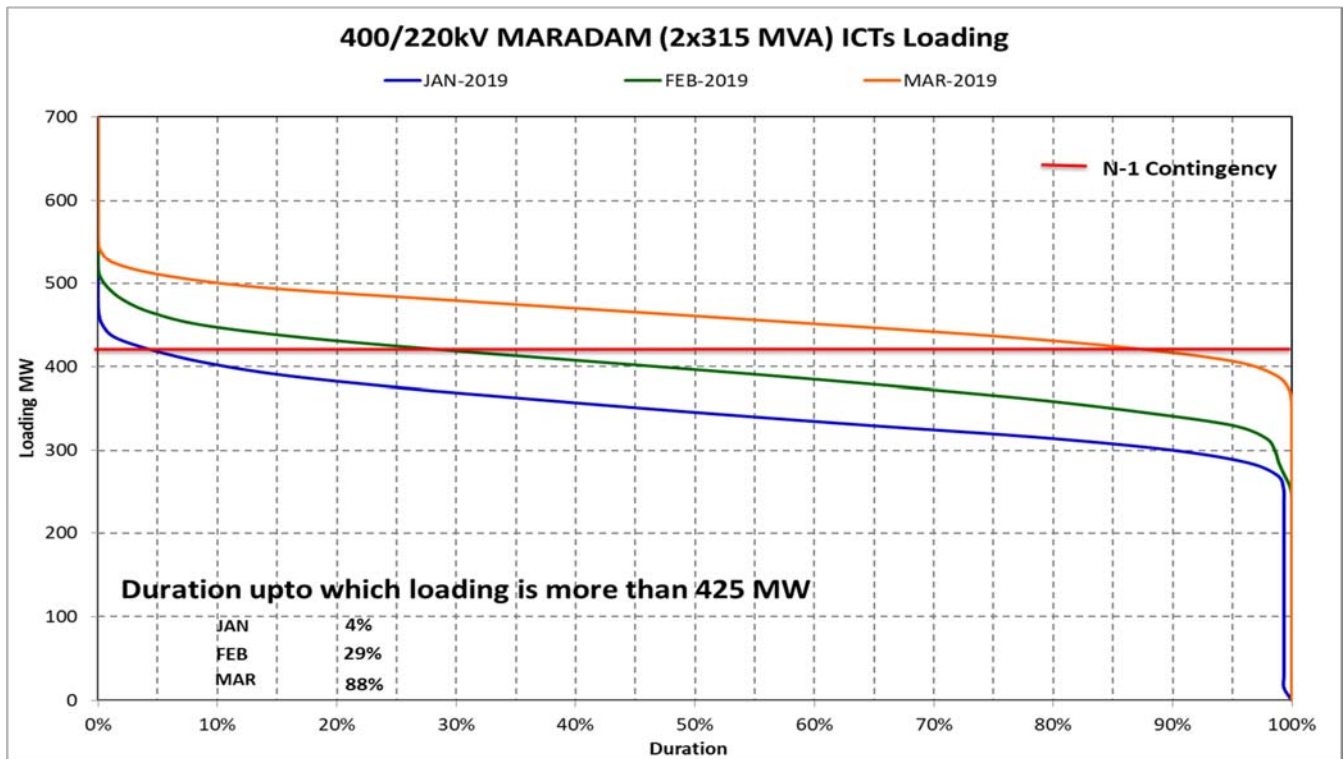


Figure-B2

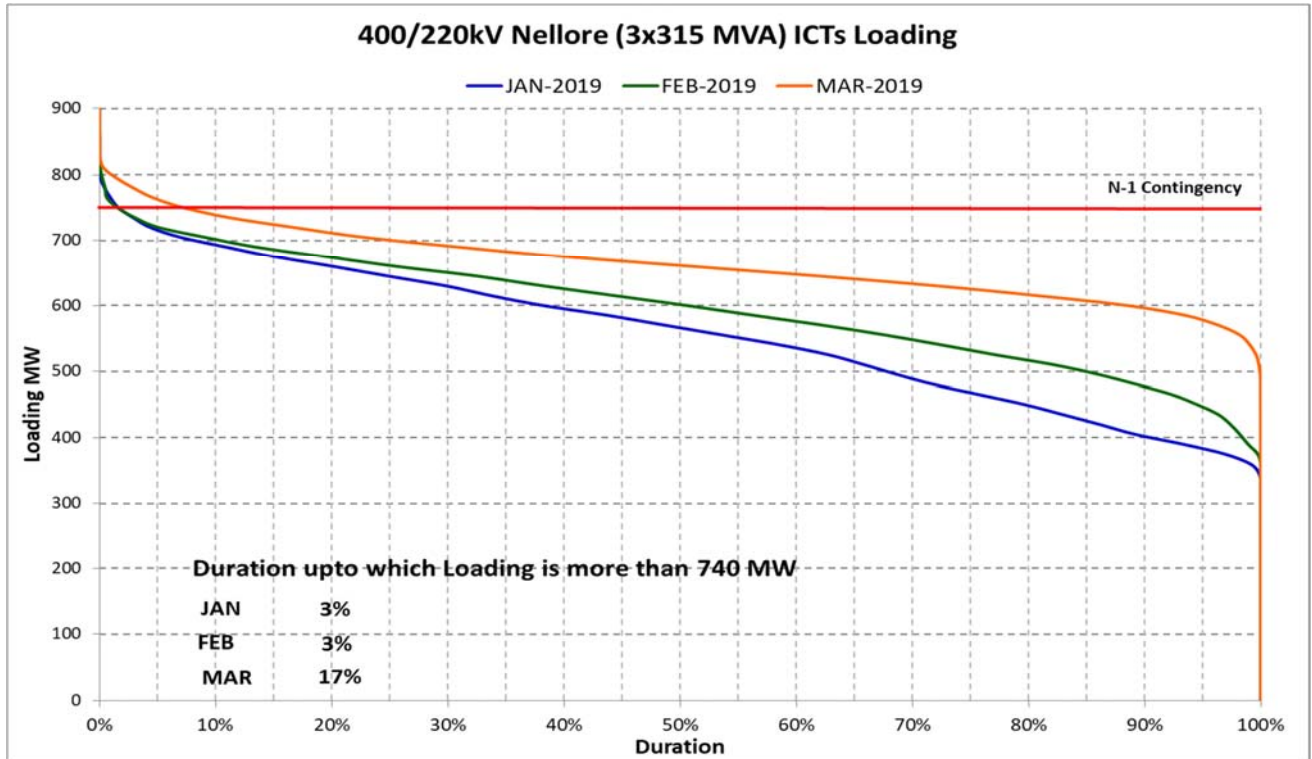


Figure-B3

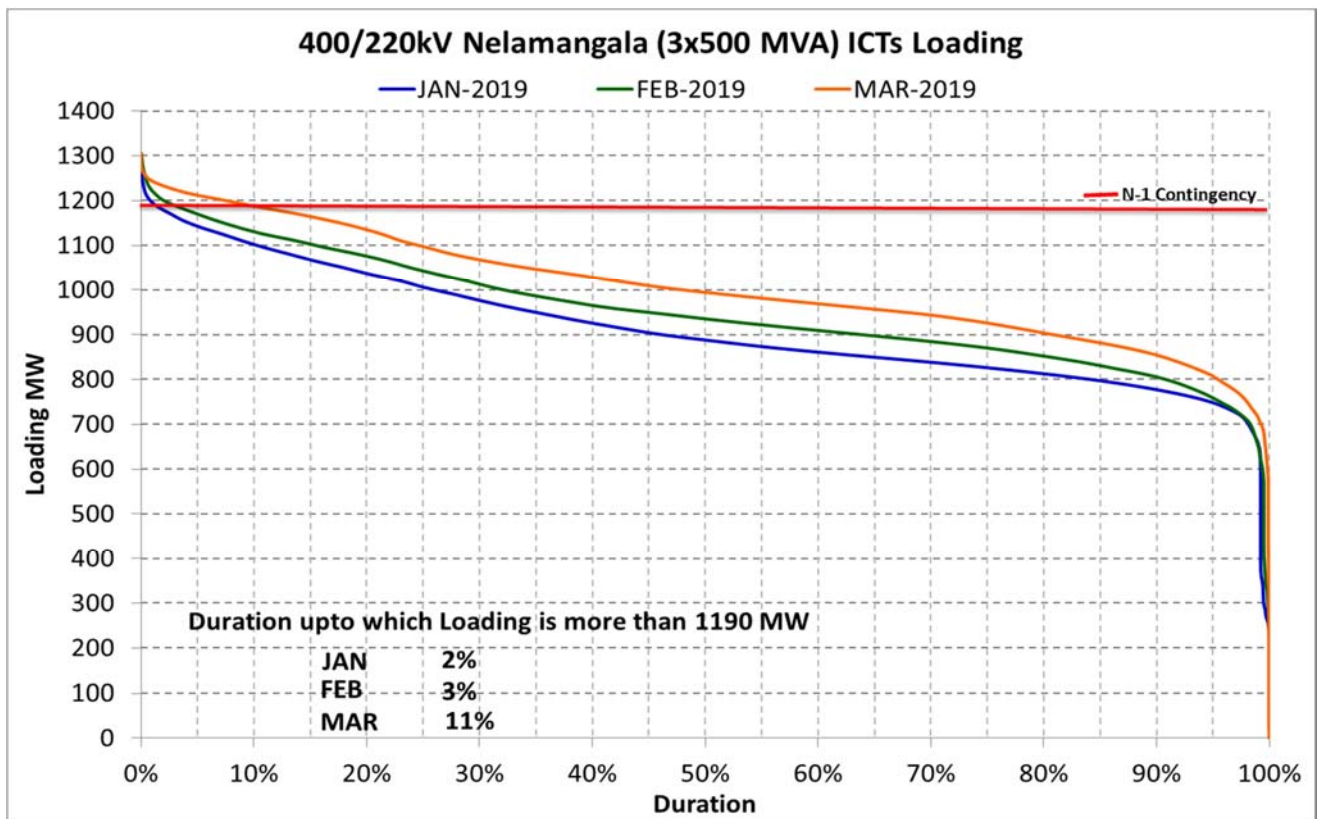


Figure-B4

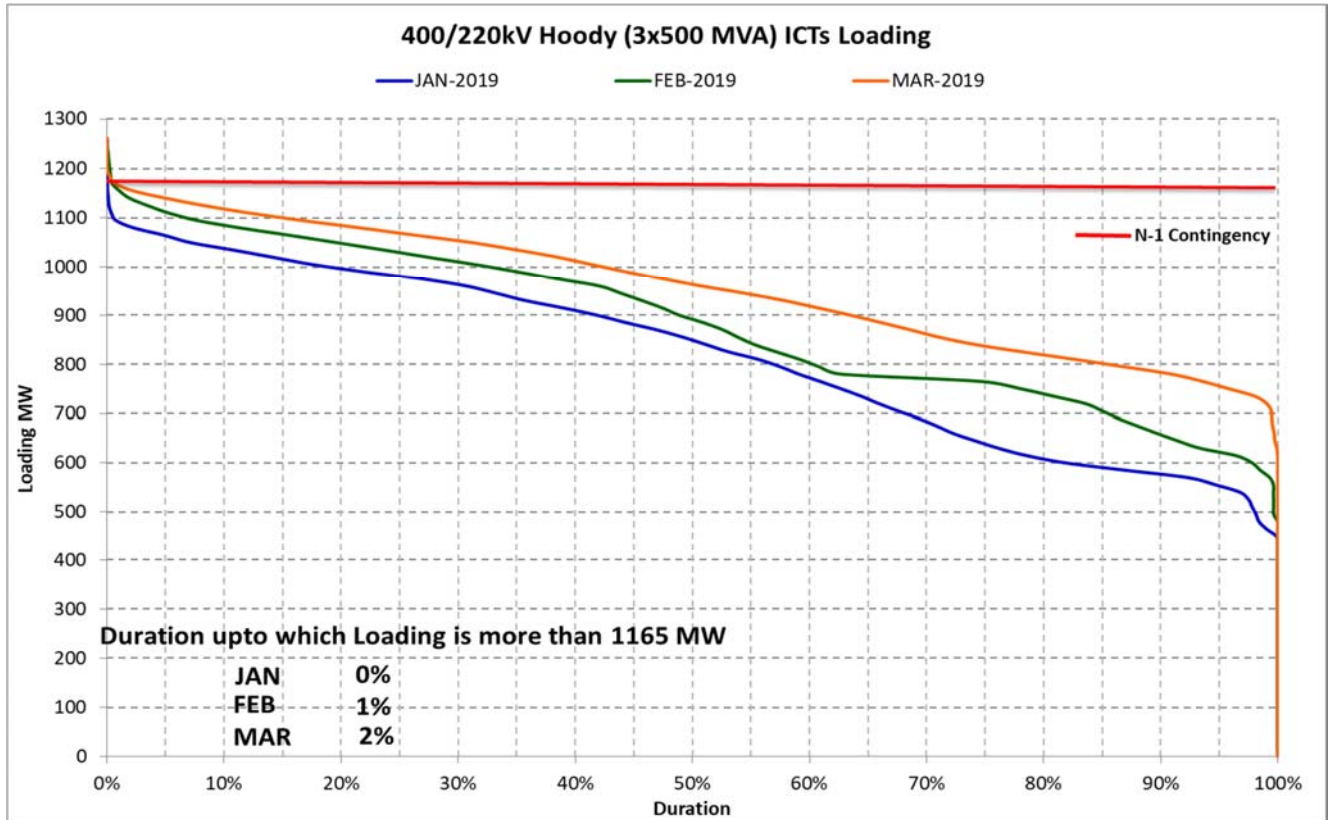


Figure-B5

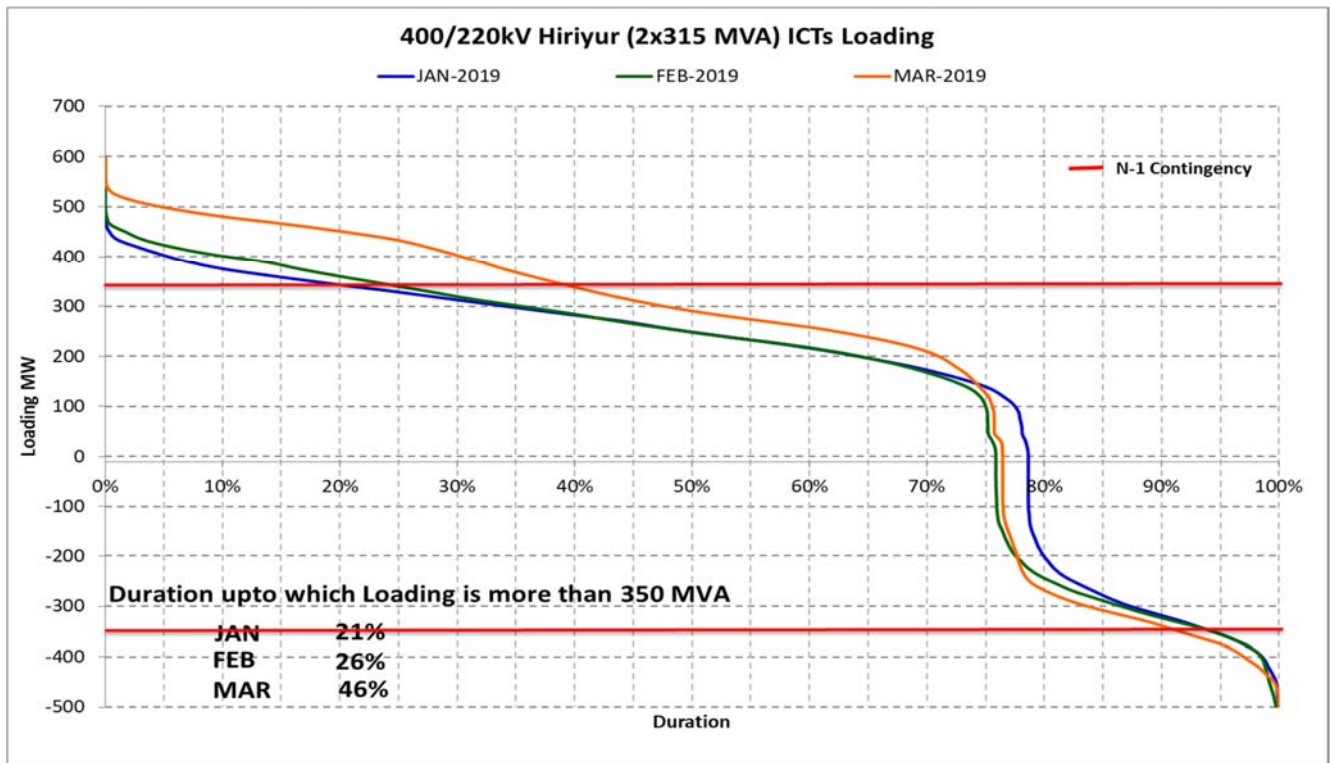


Figure-B6

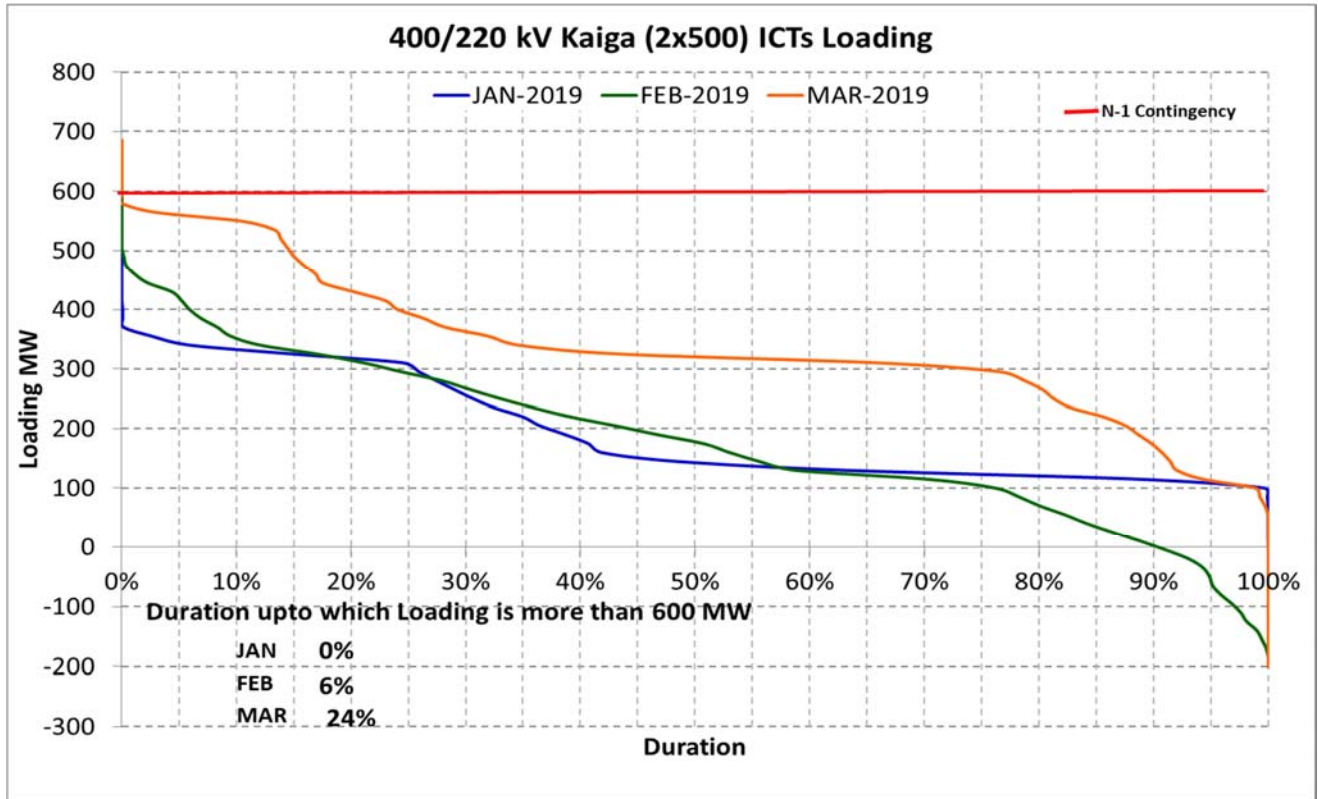


Figure-B7

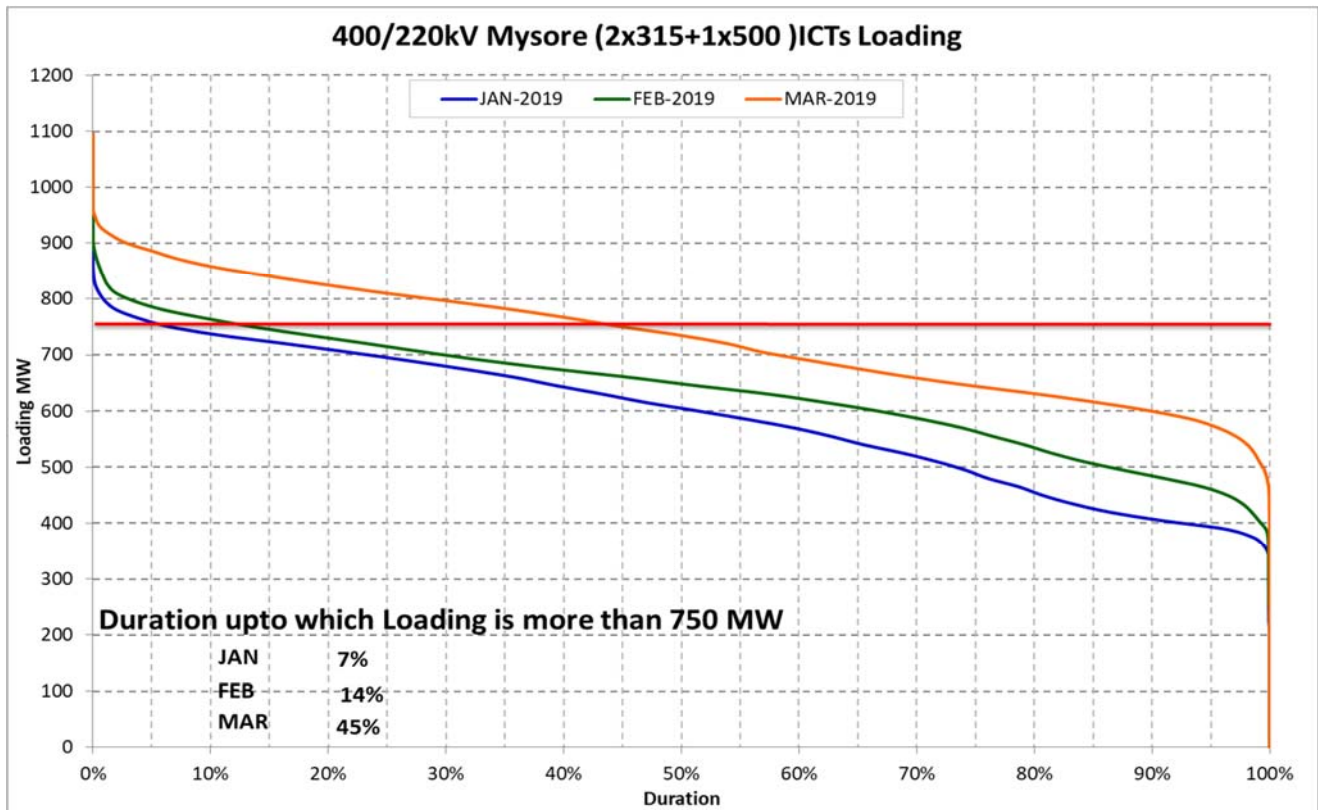


Figure-B8

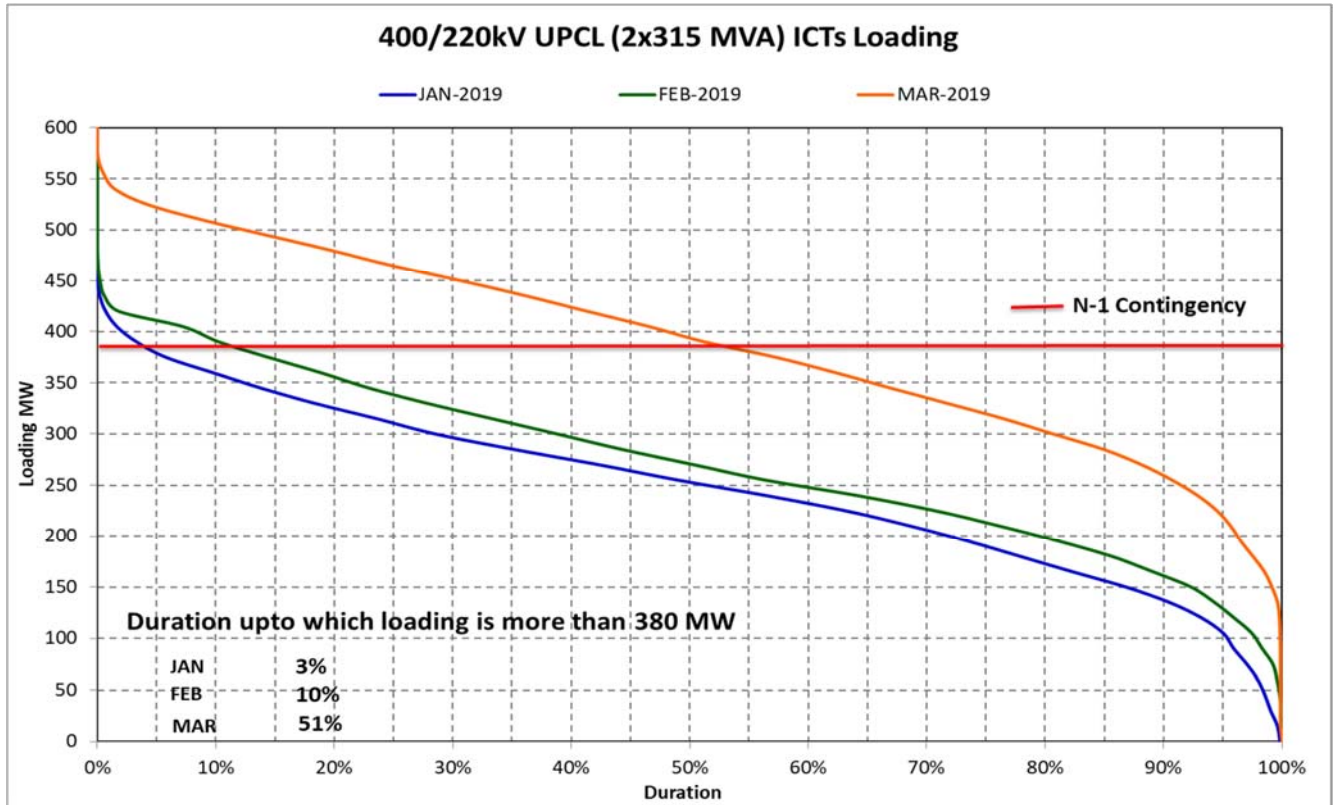


Figure-B9

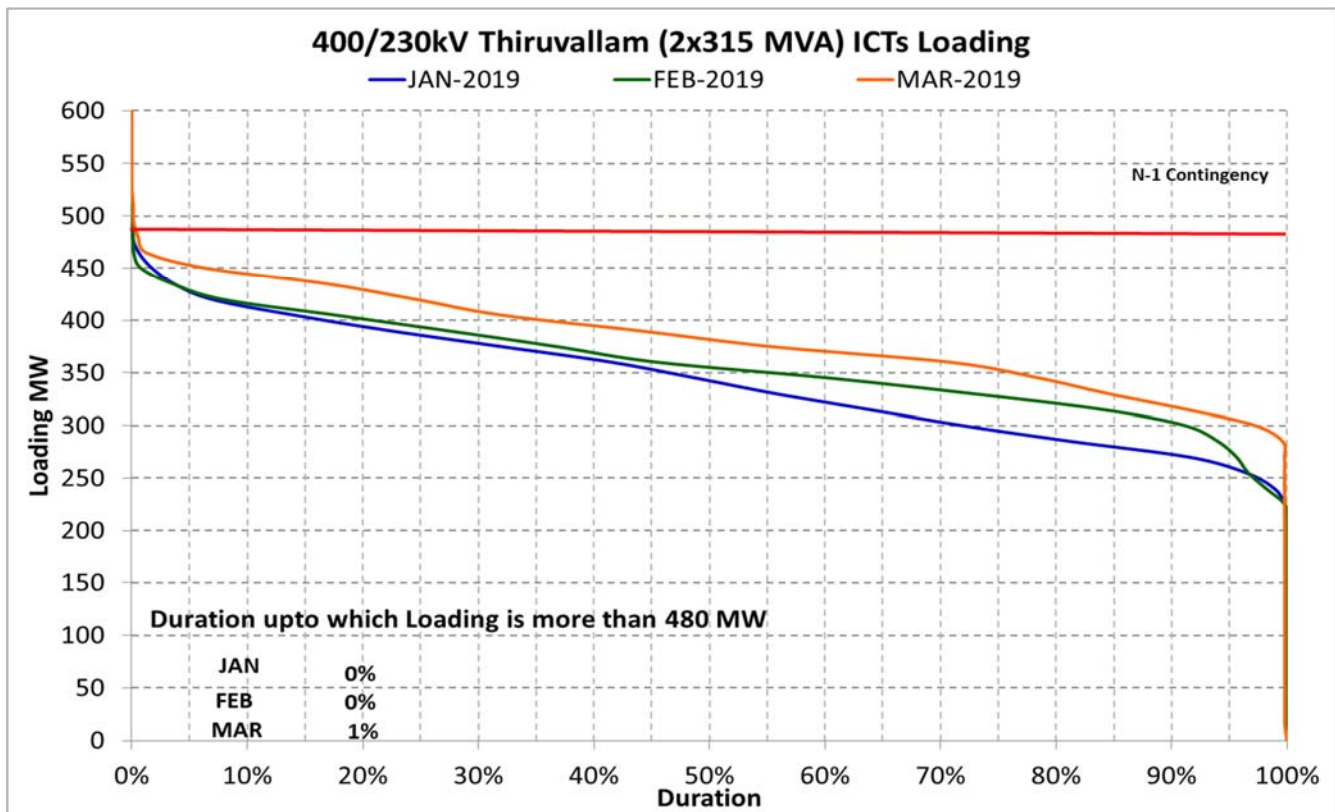


Figure-B10

Annexure V.C: Graphs Indicating Nodes Experiencing Low Voltage in Southern Region

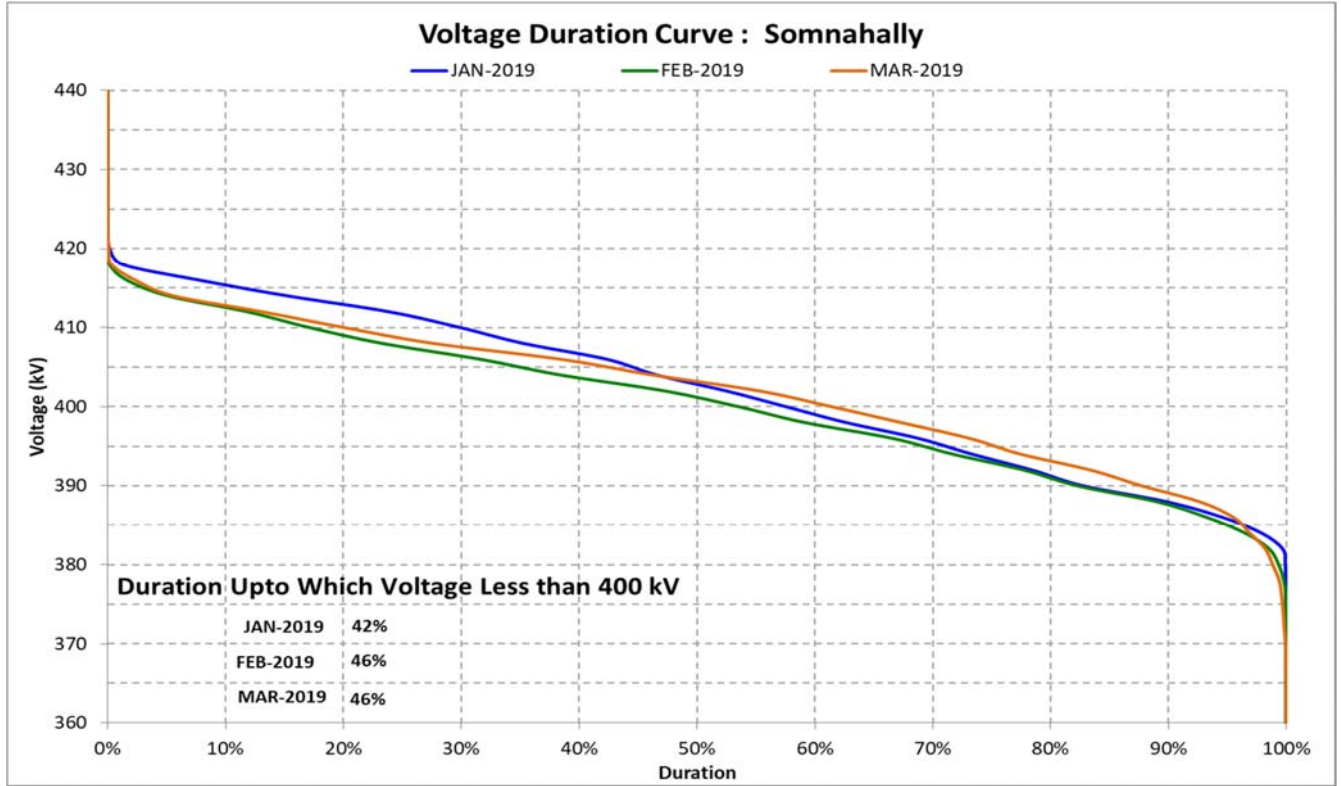


Figure-C1

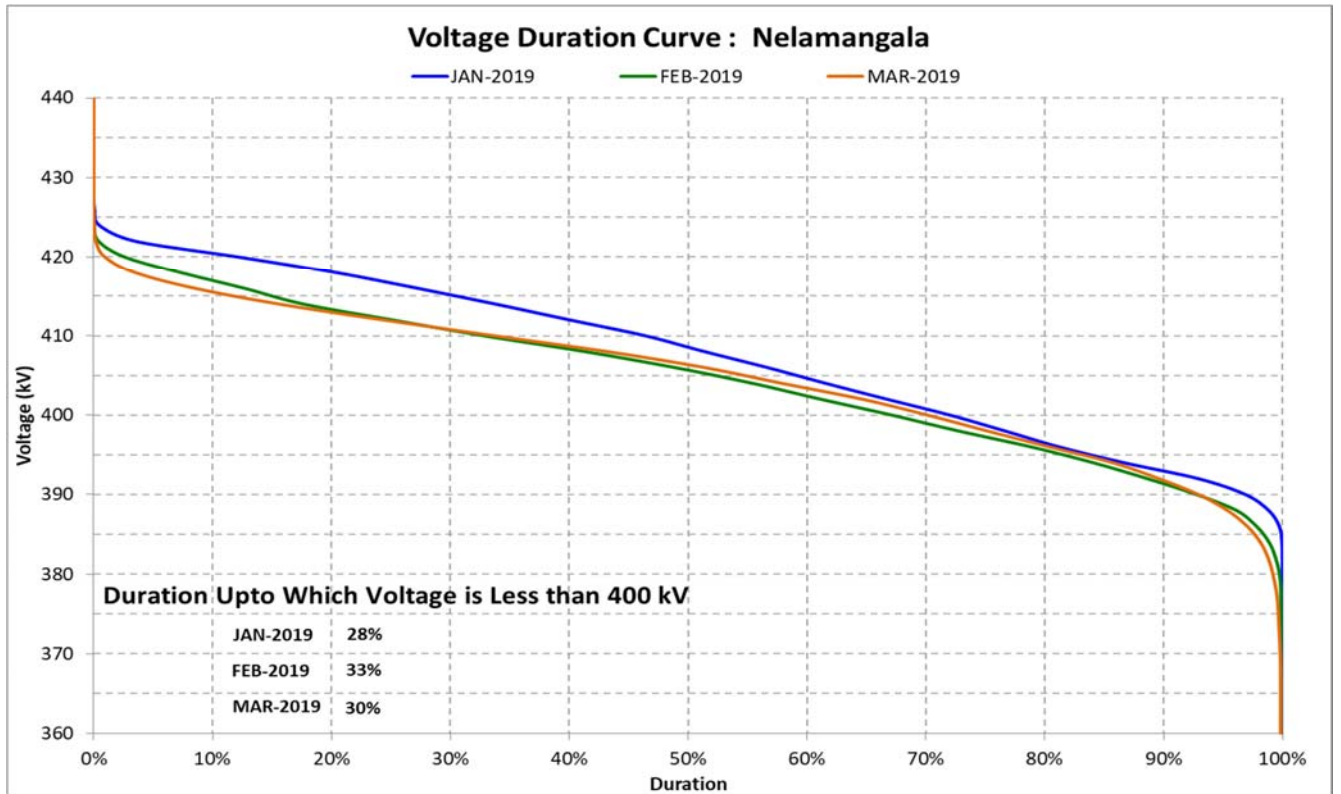


Figure-C2

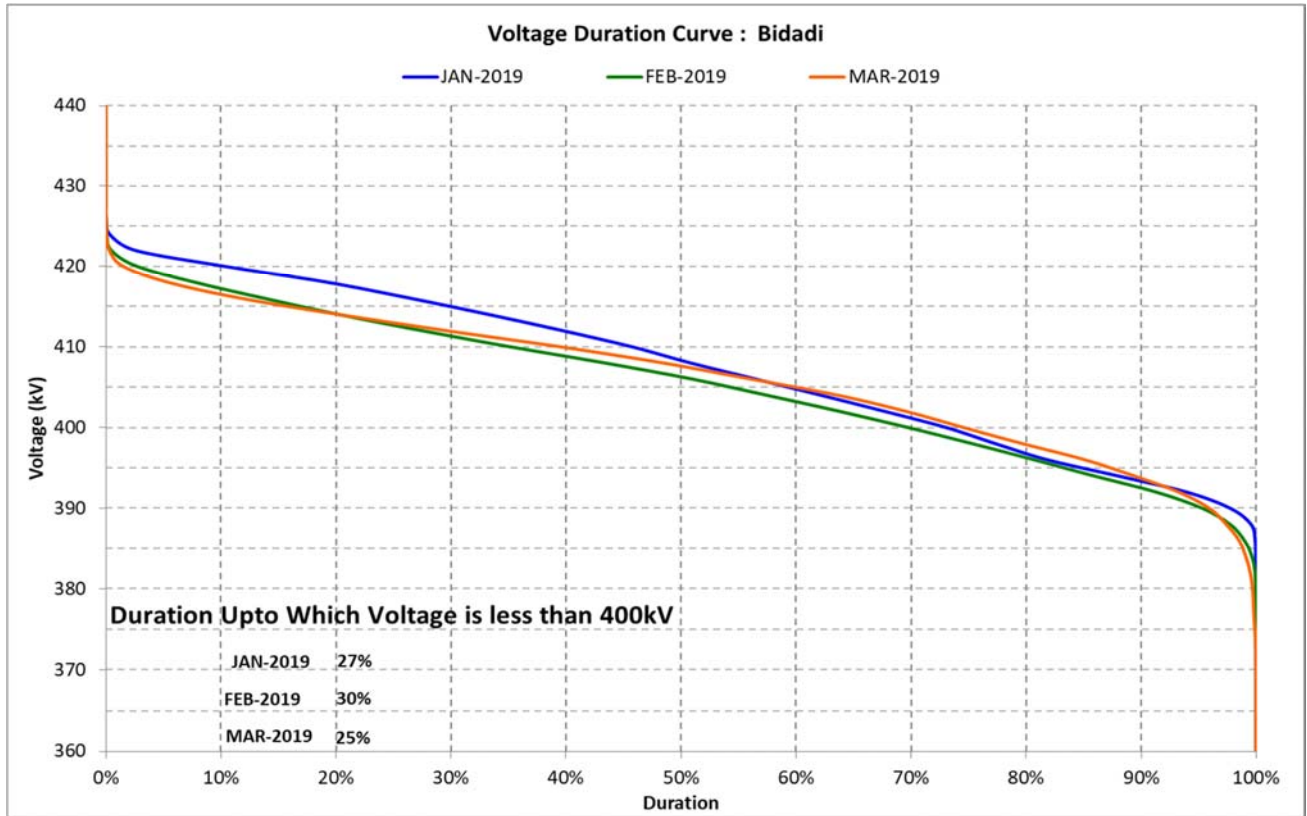


Figure-C3

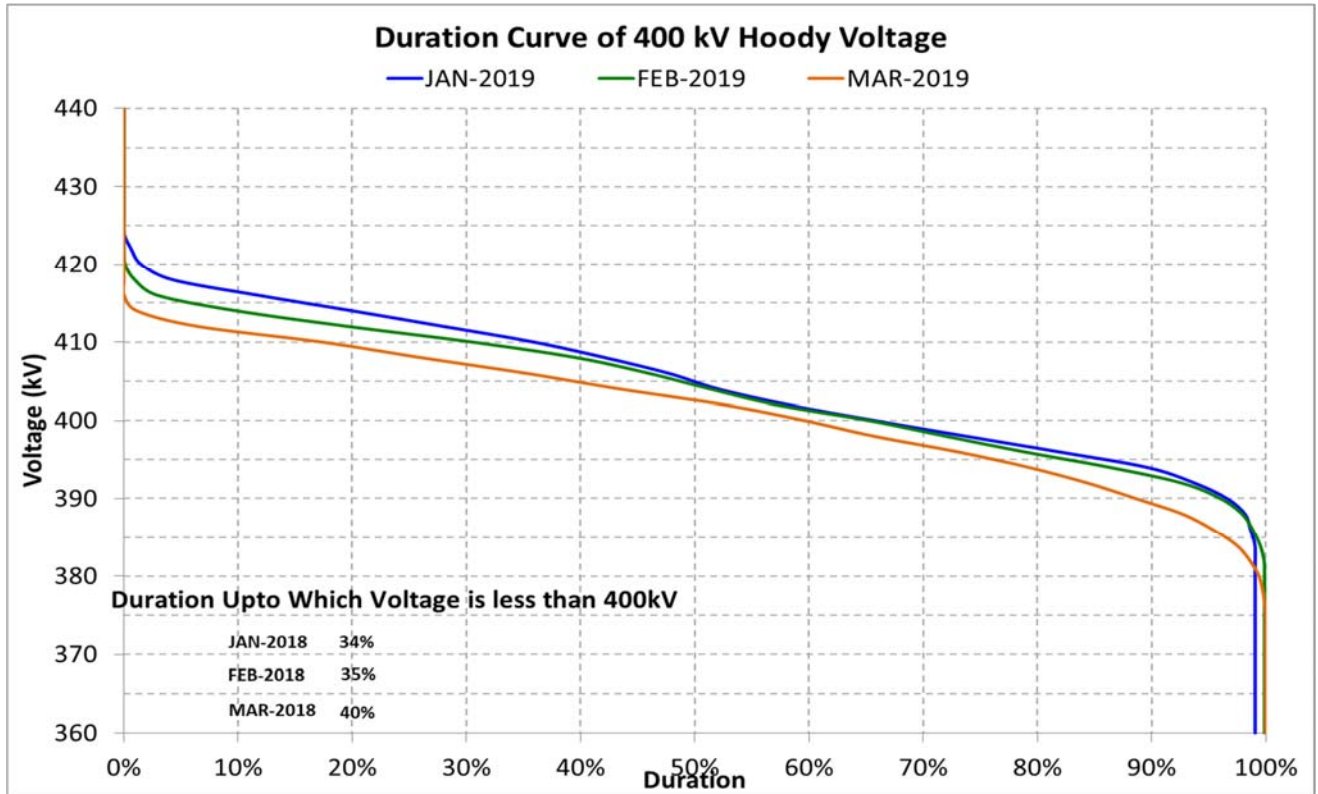


Figure-C4

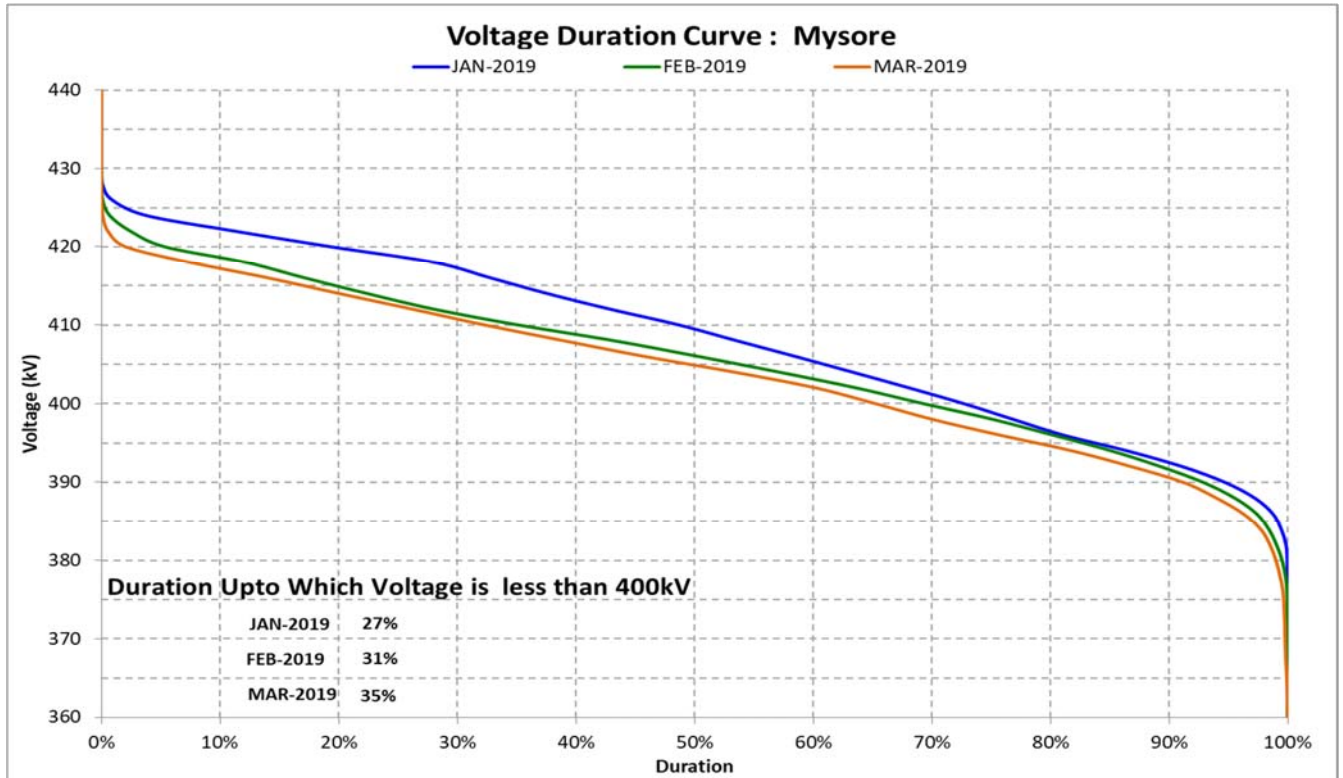


Figure-C5

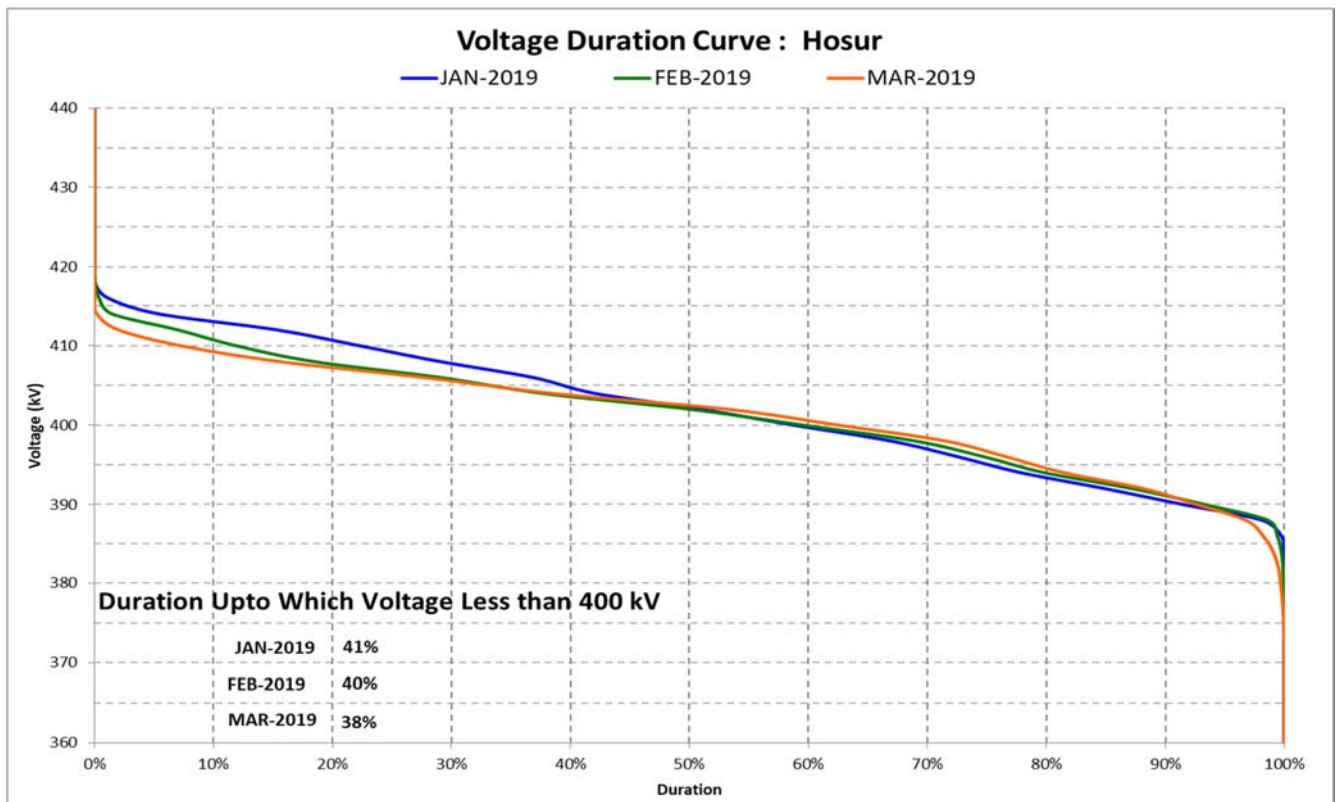


Figure-C6

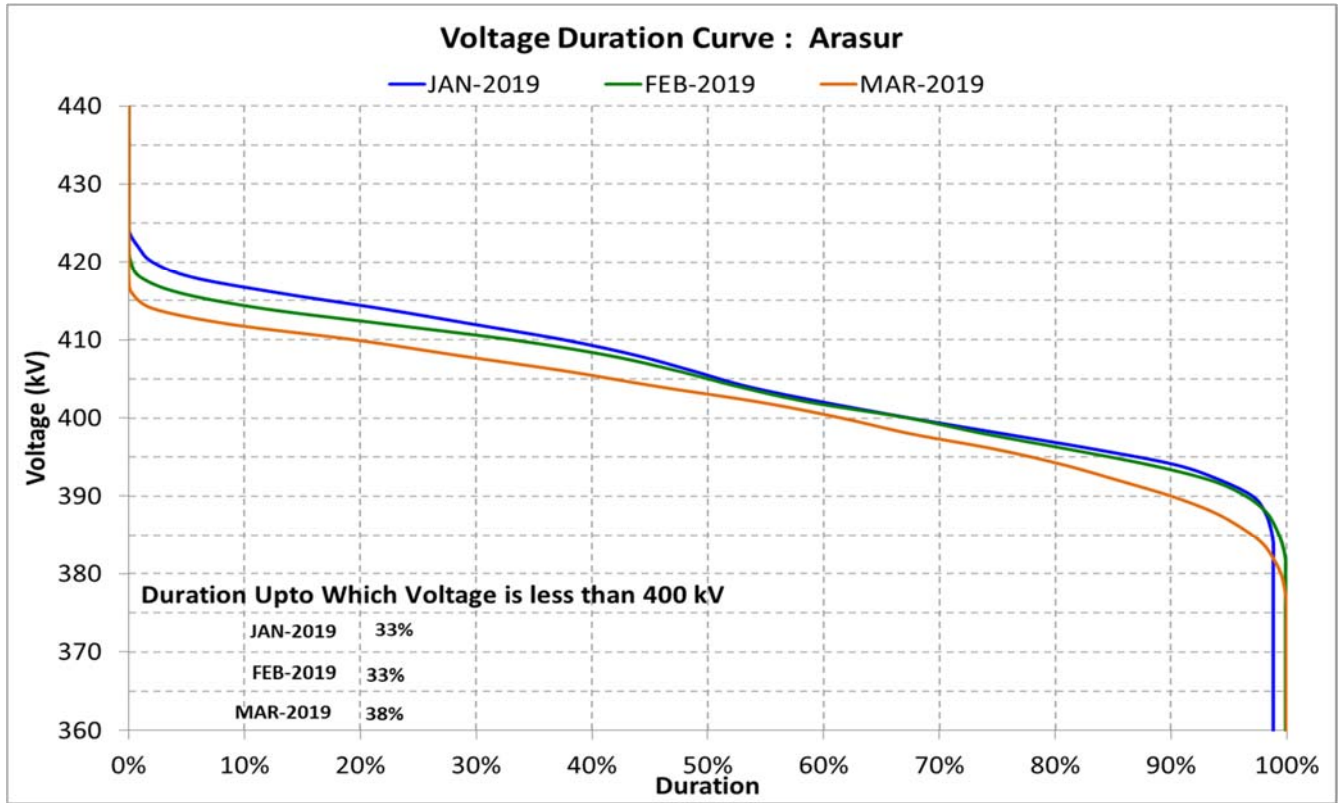


Figure-C7

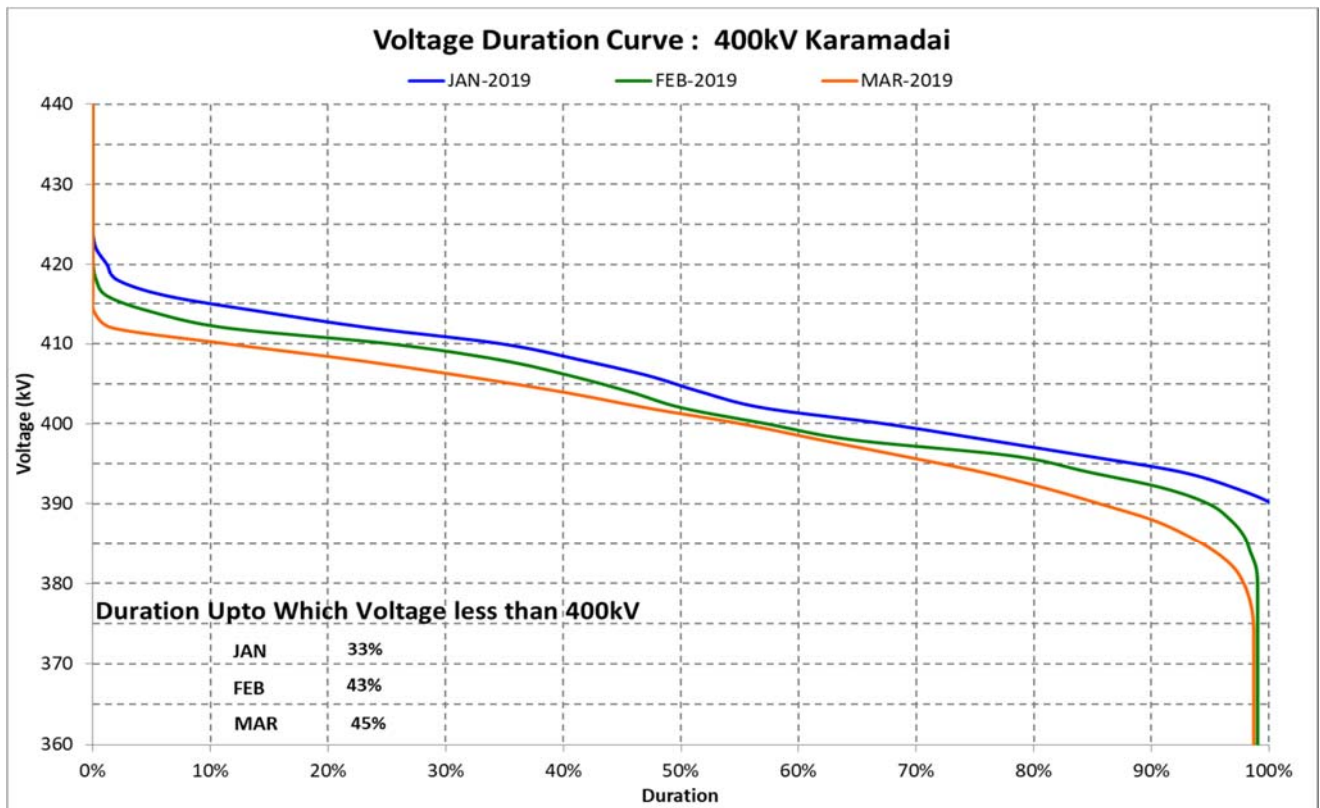


Figure-C8

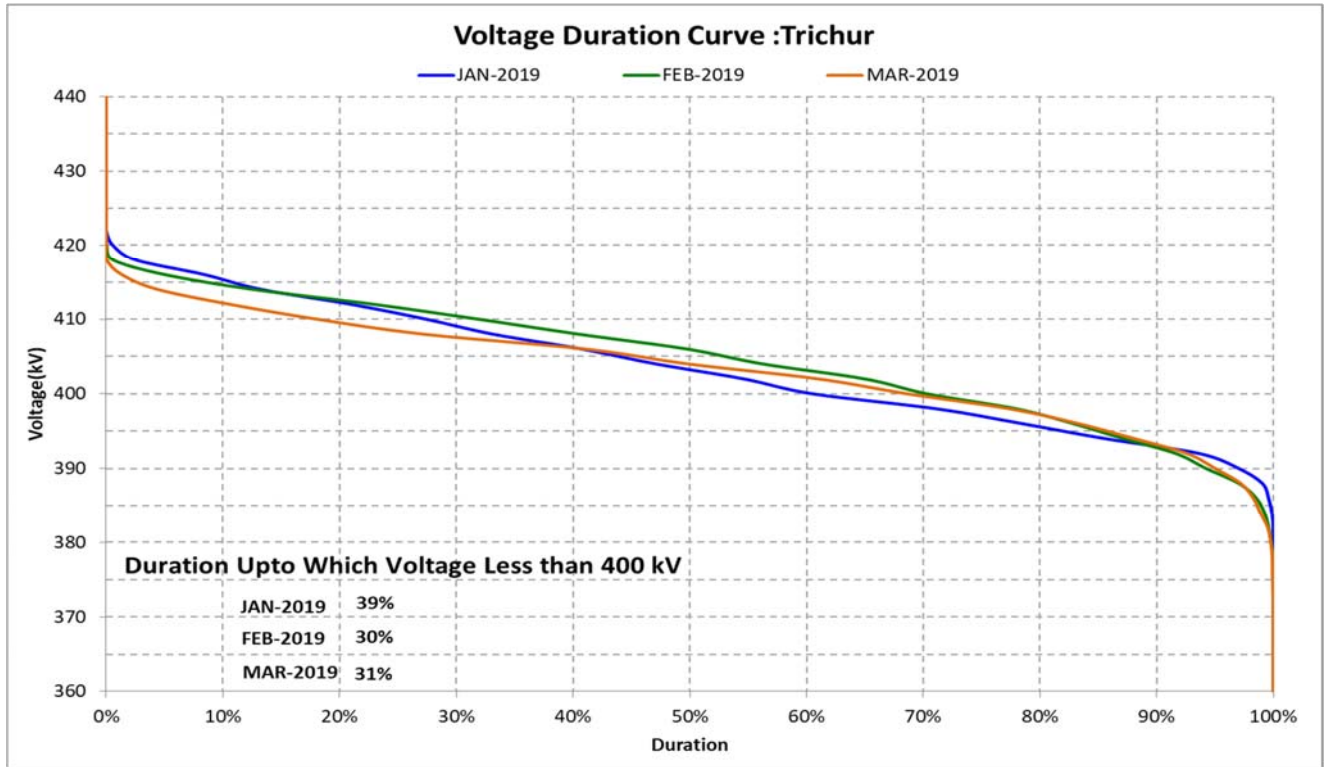


Figure-C9

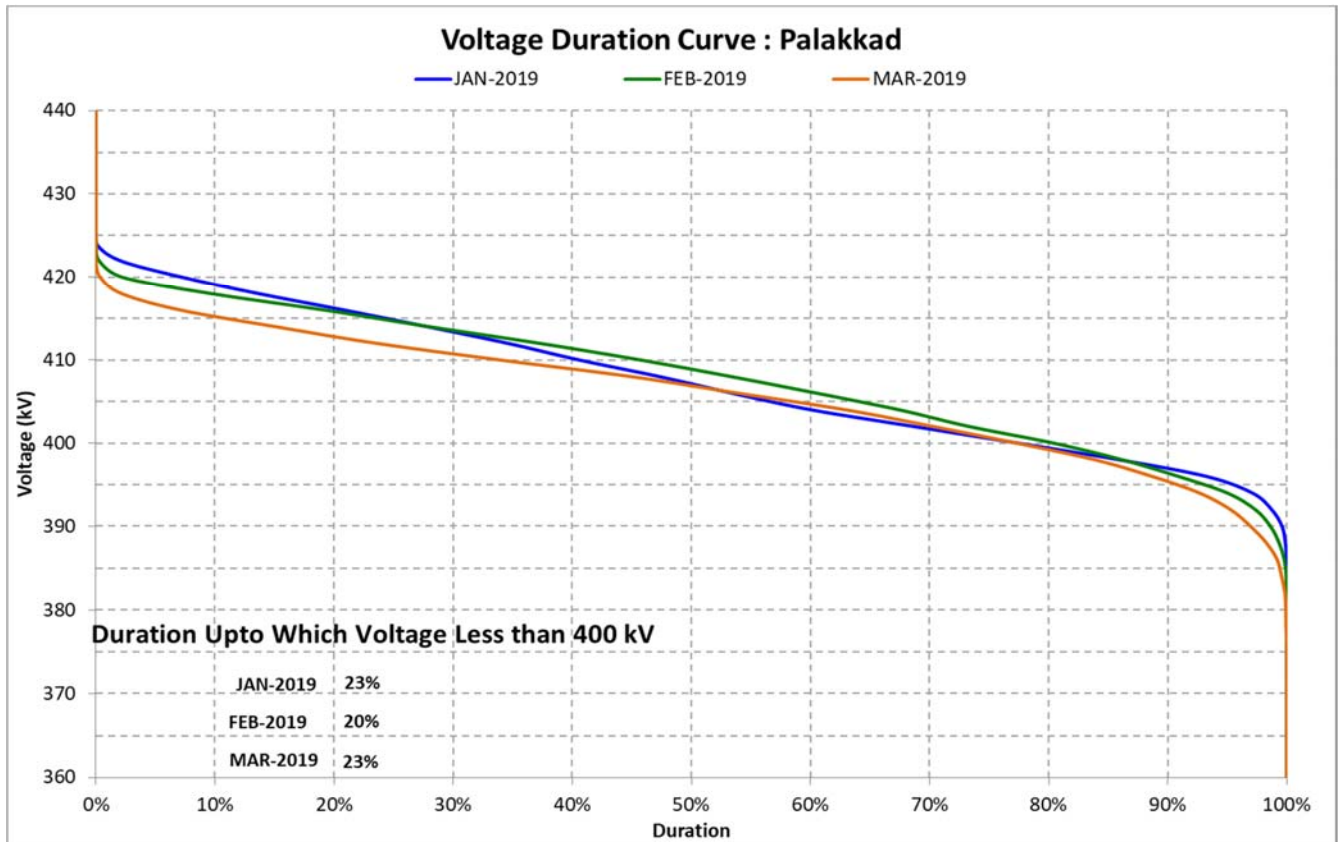


Figure-C10

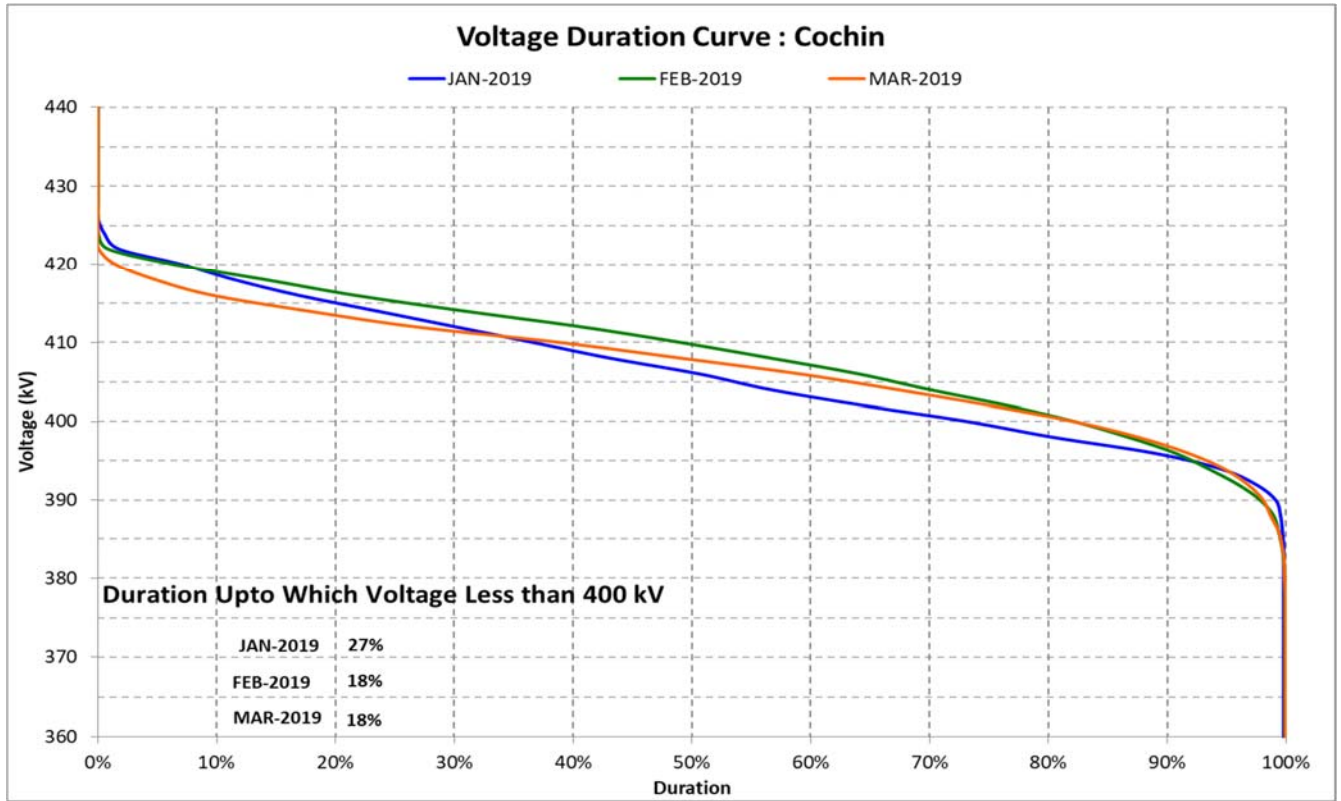


Figure-C11

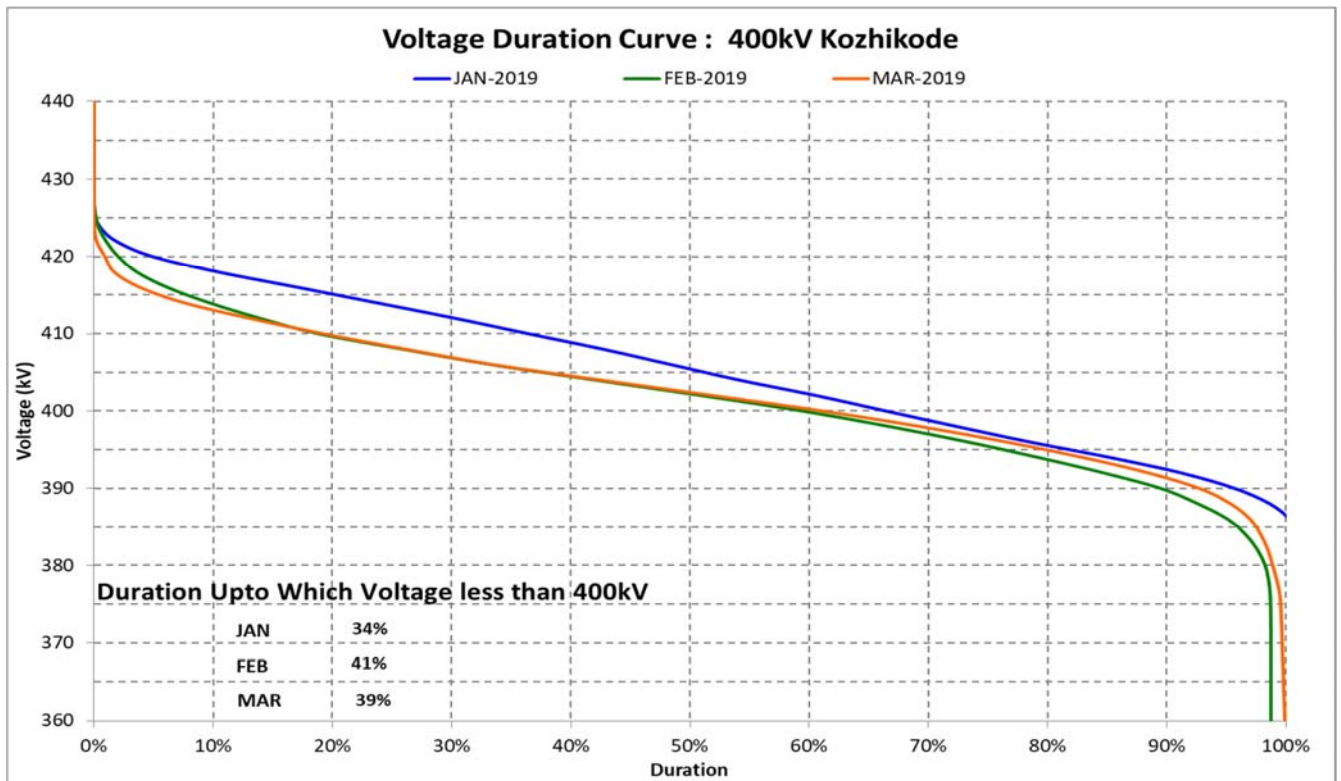


Figure-C12

Annexure V.D: Graphs Indicating Nodes Experiencing High Voltage in Southern Region

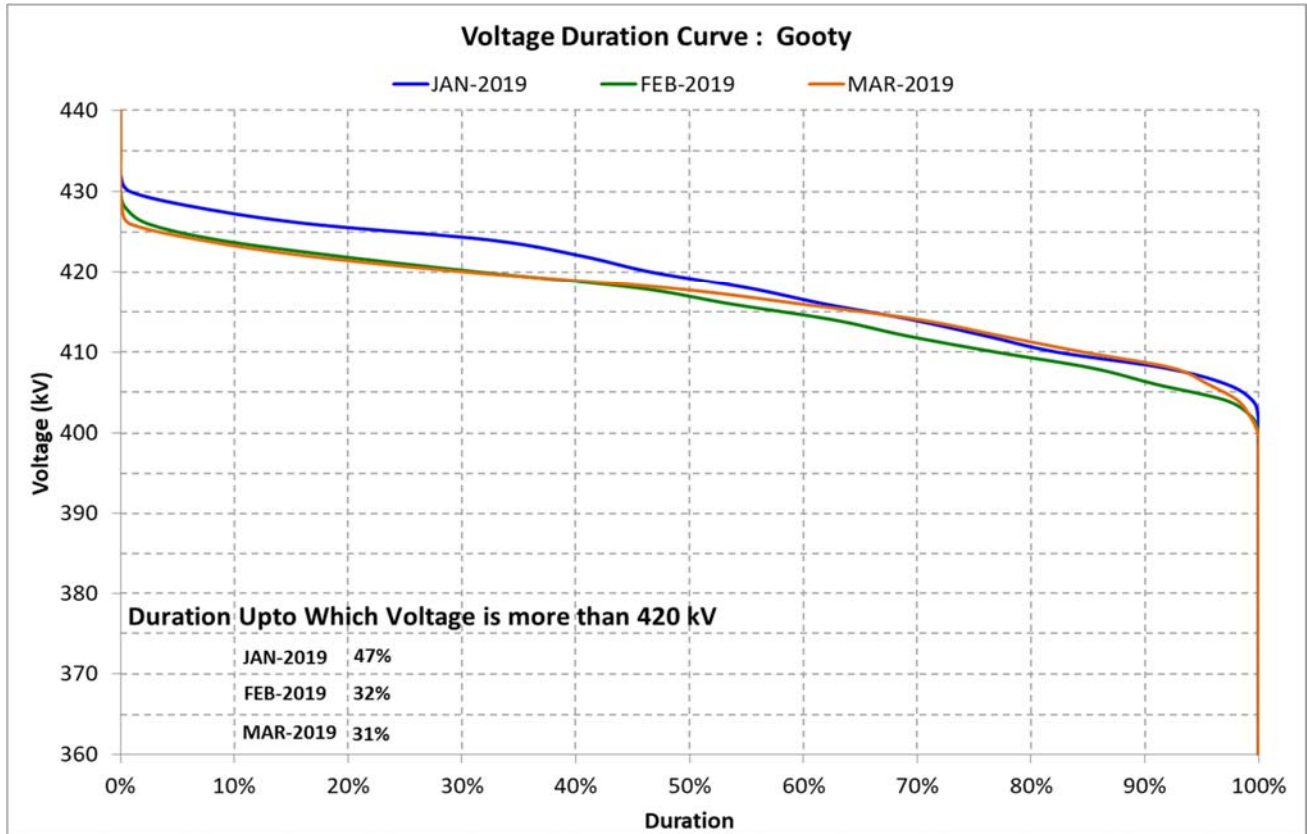


Figure-D1

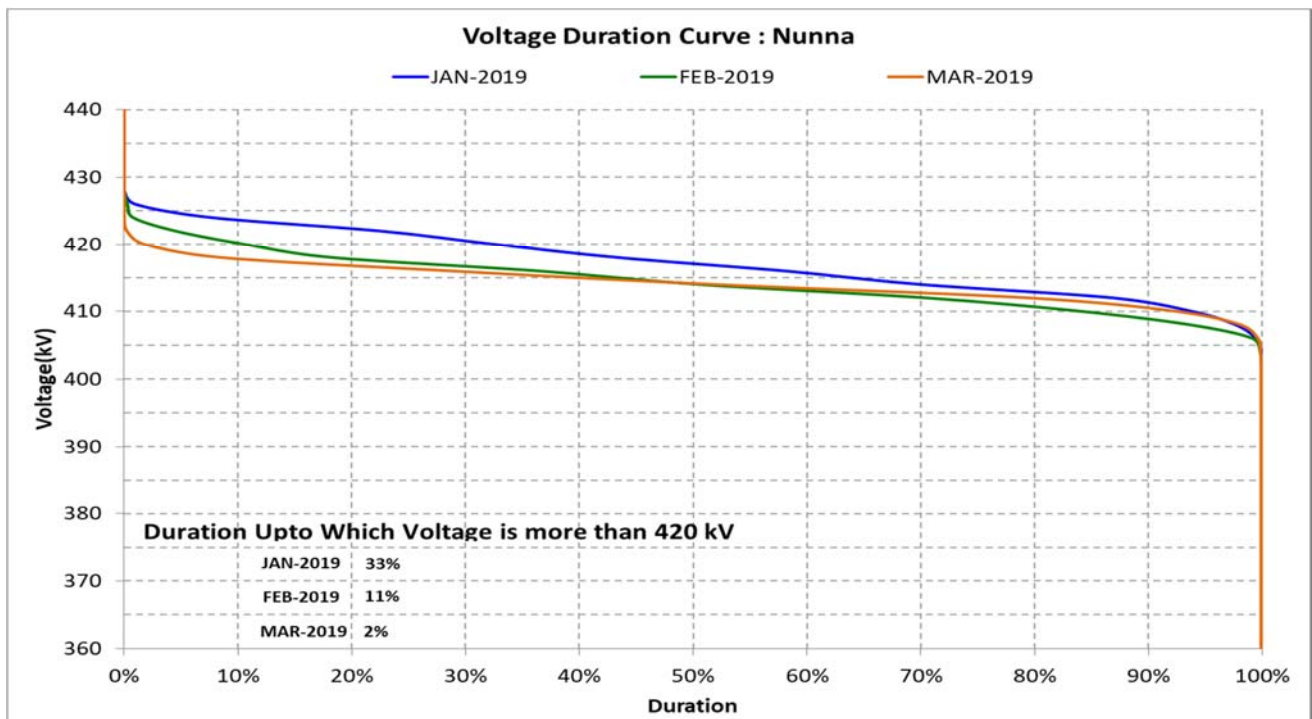


Figure-D2

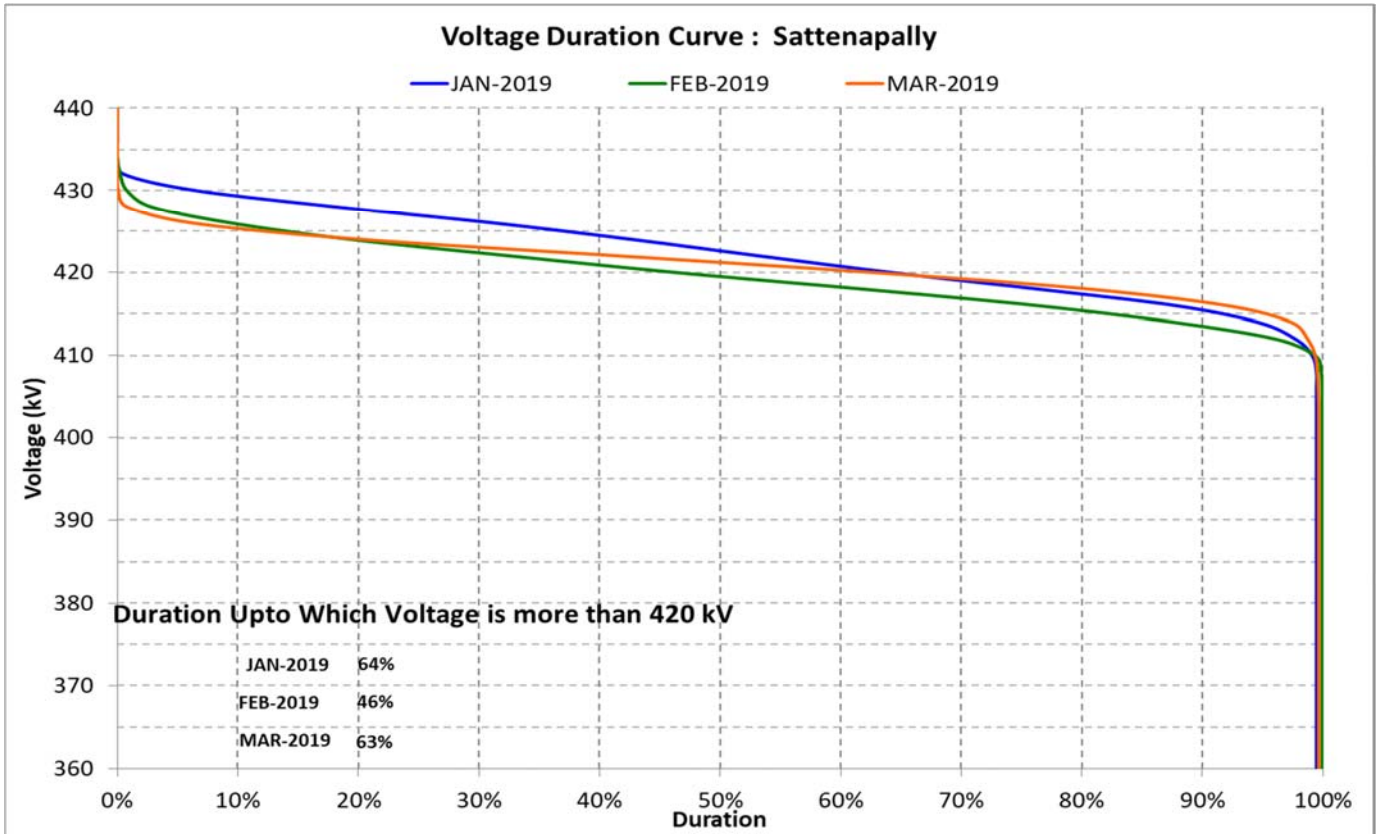


Figure-D3

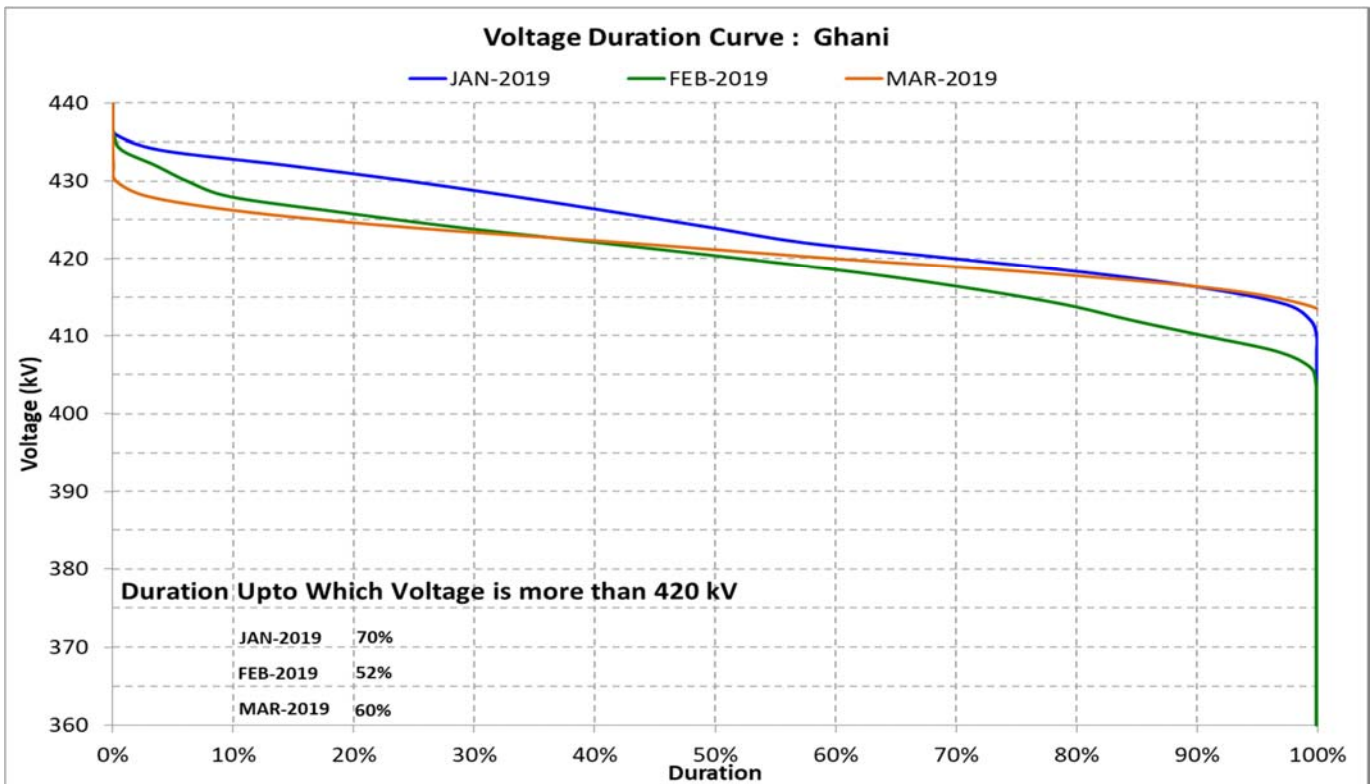


Figure-D4

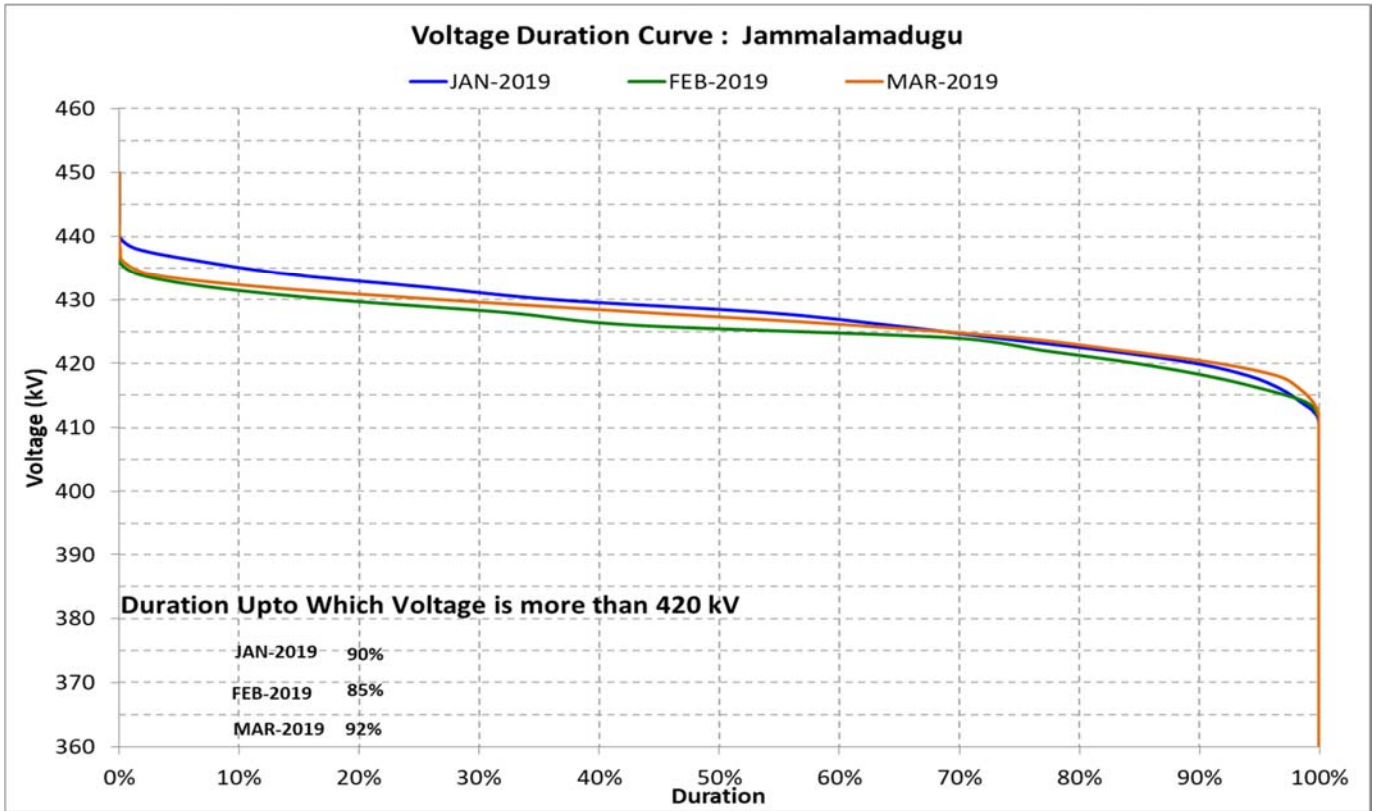


Figure-D5

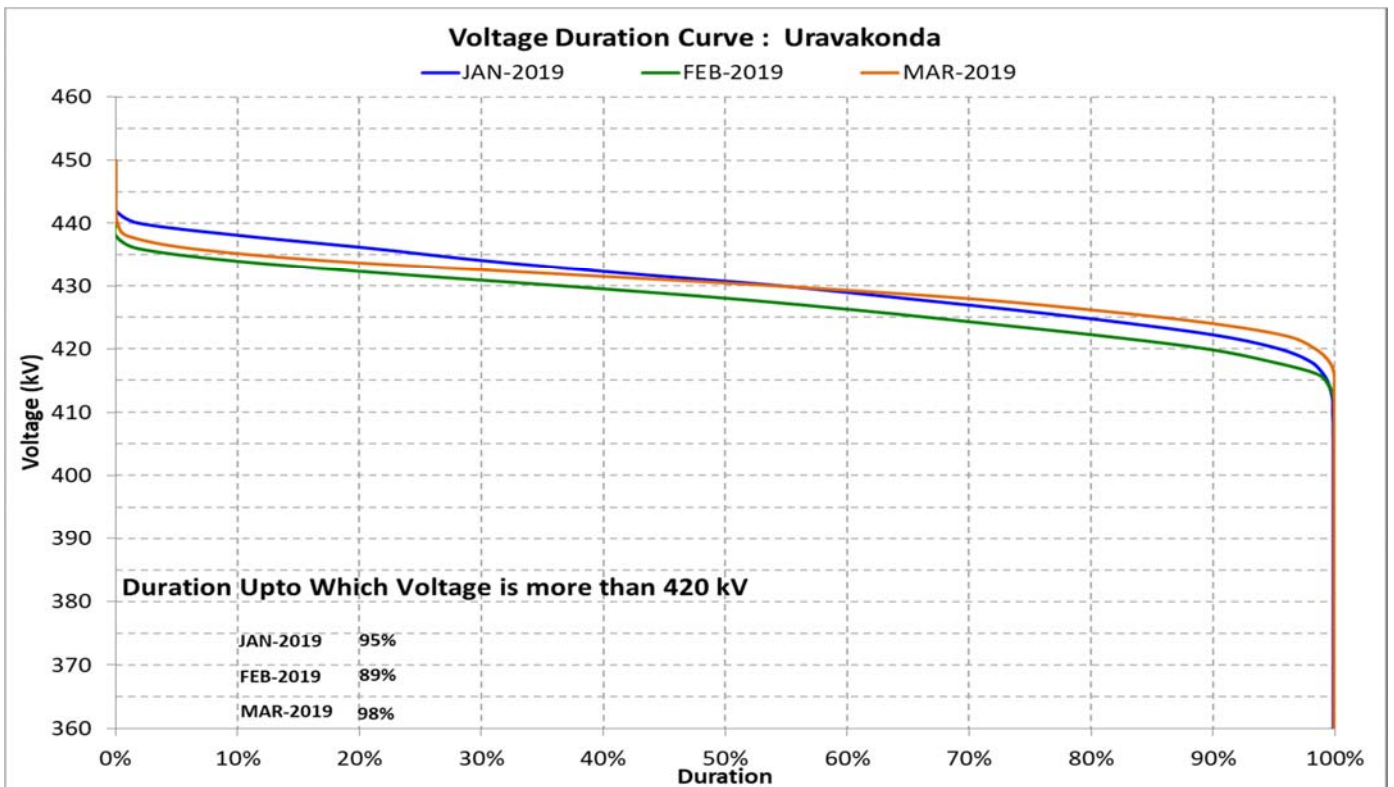


Figure-D6

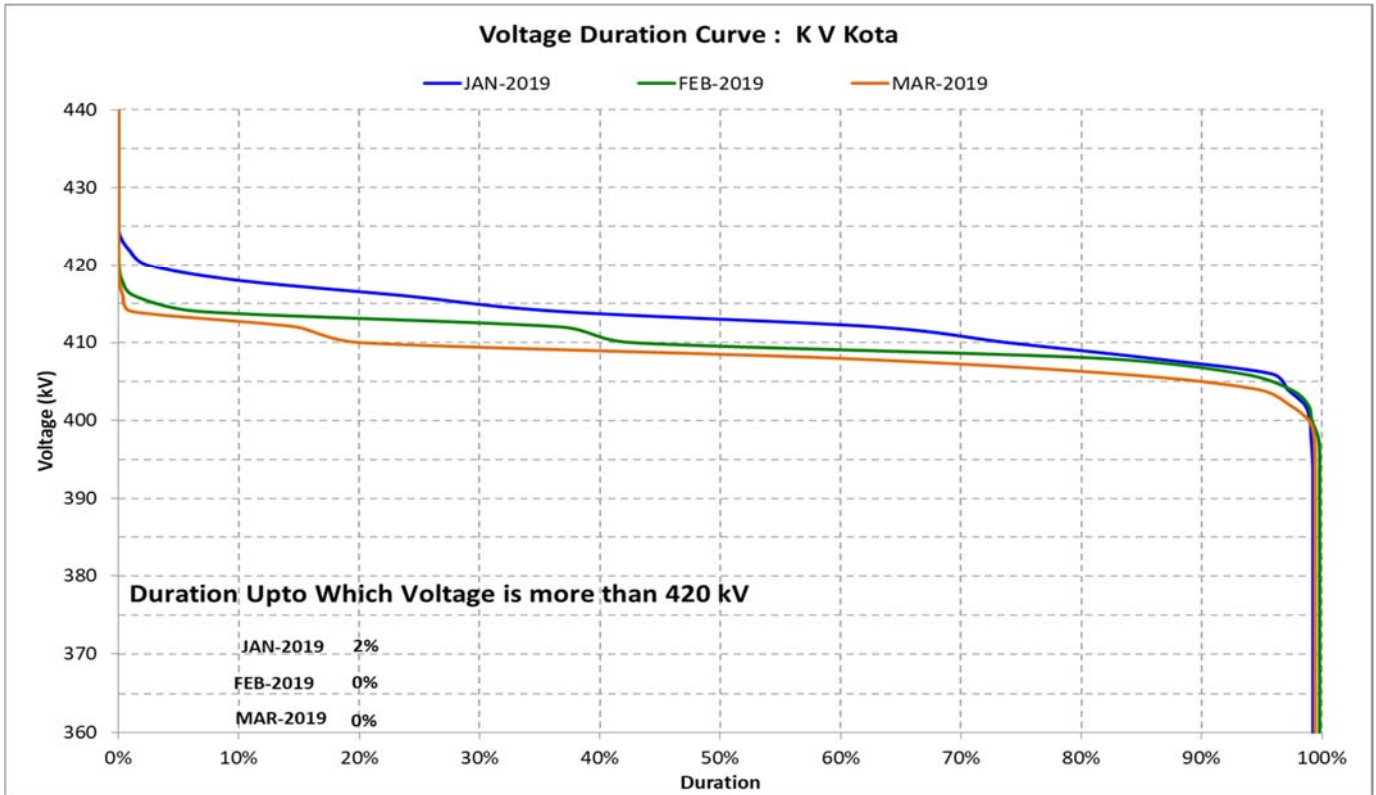


Figure-D7

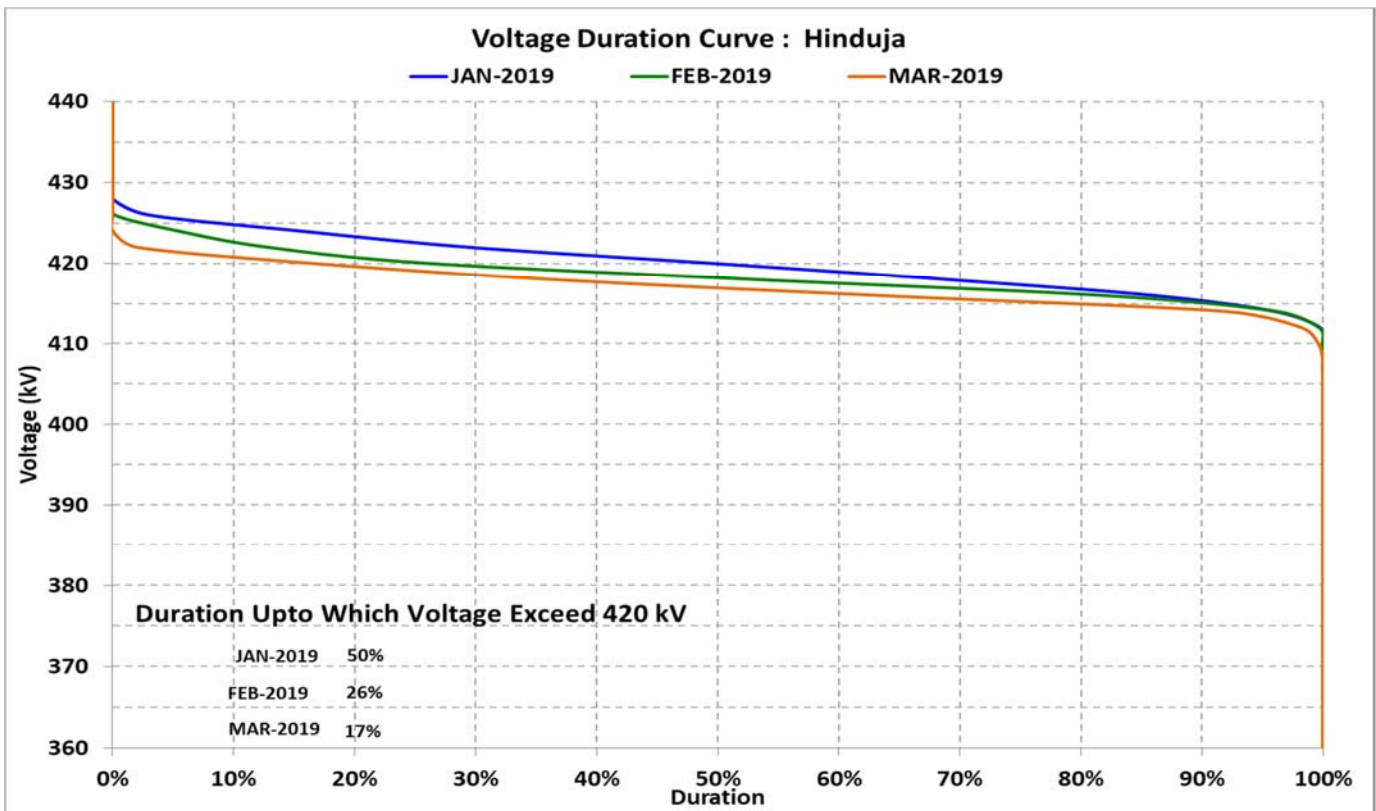


Figure-D8

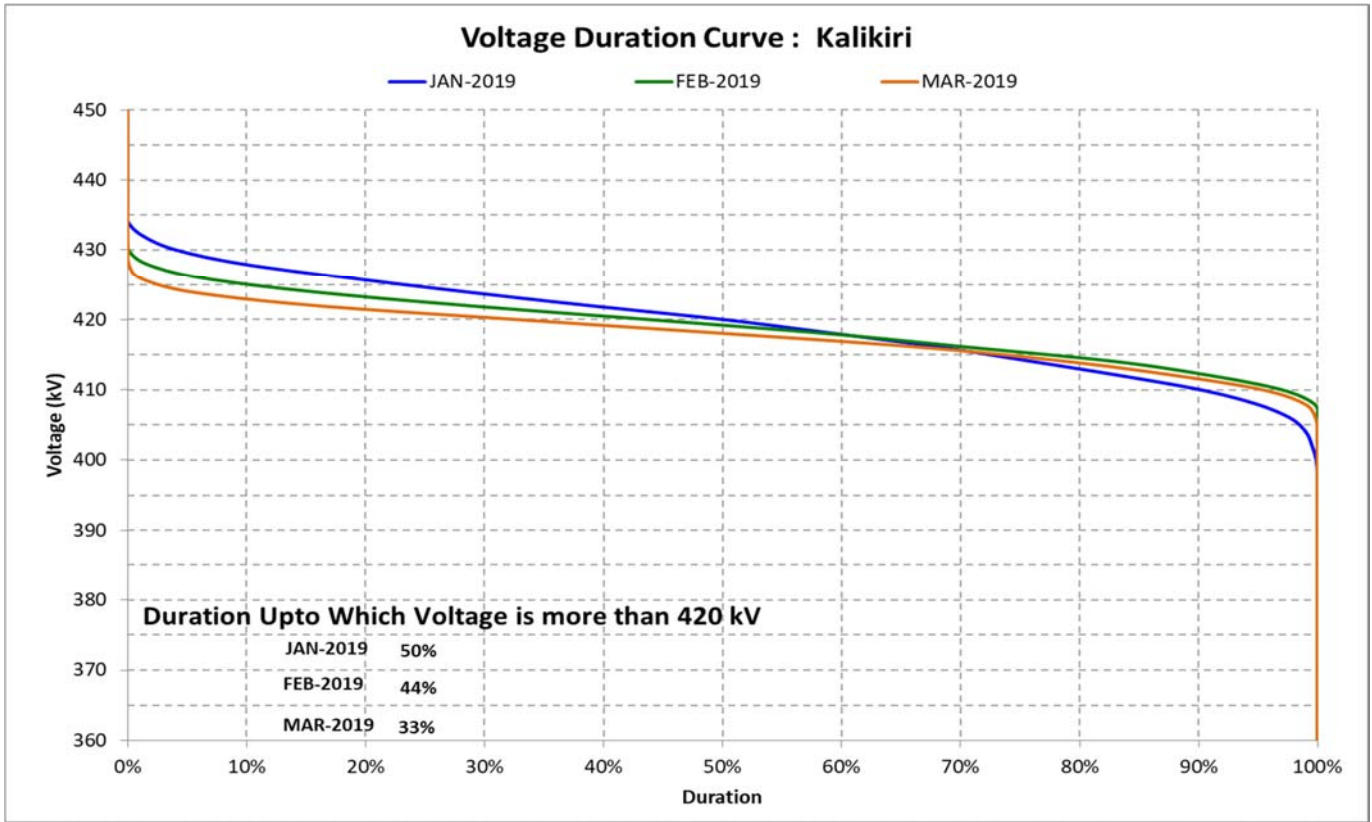


Figure-D9

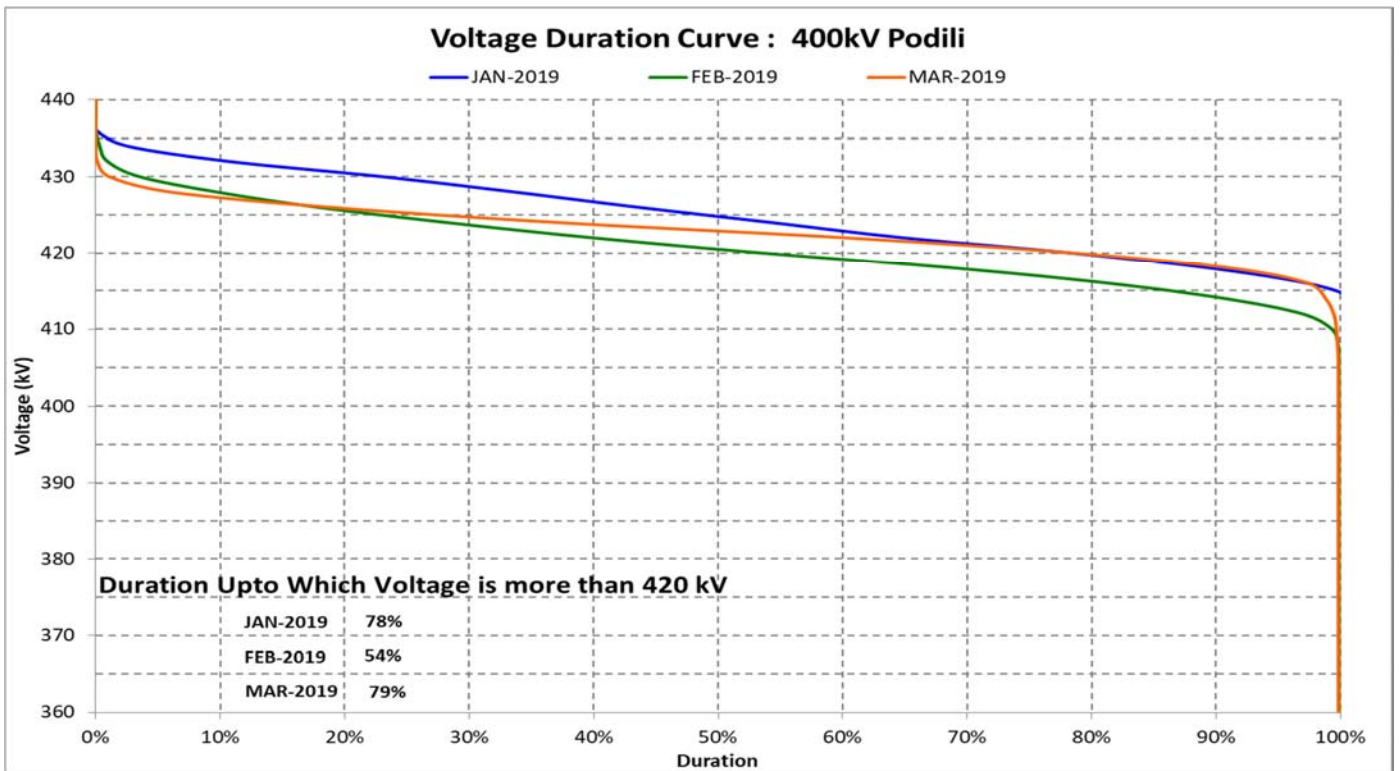


Figure-D10

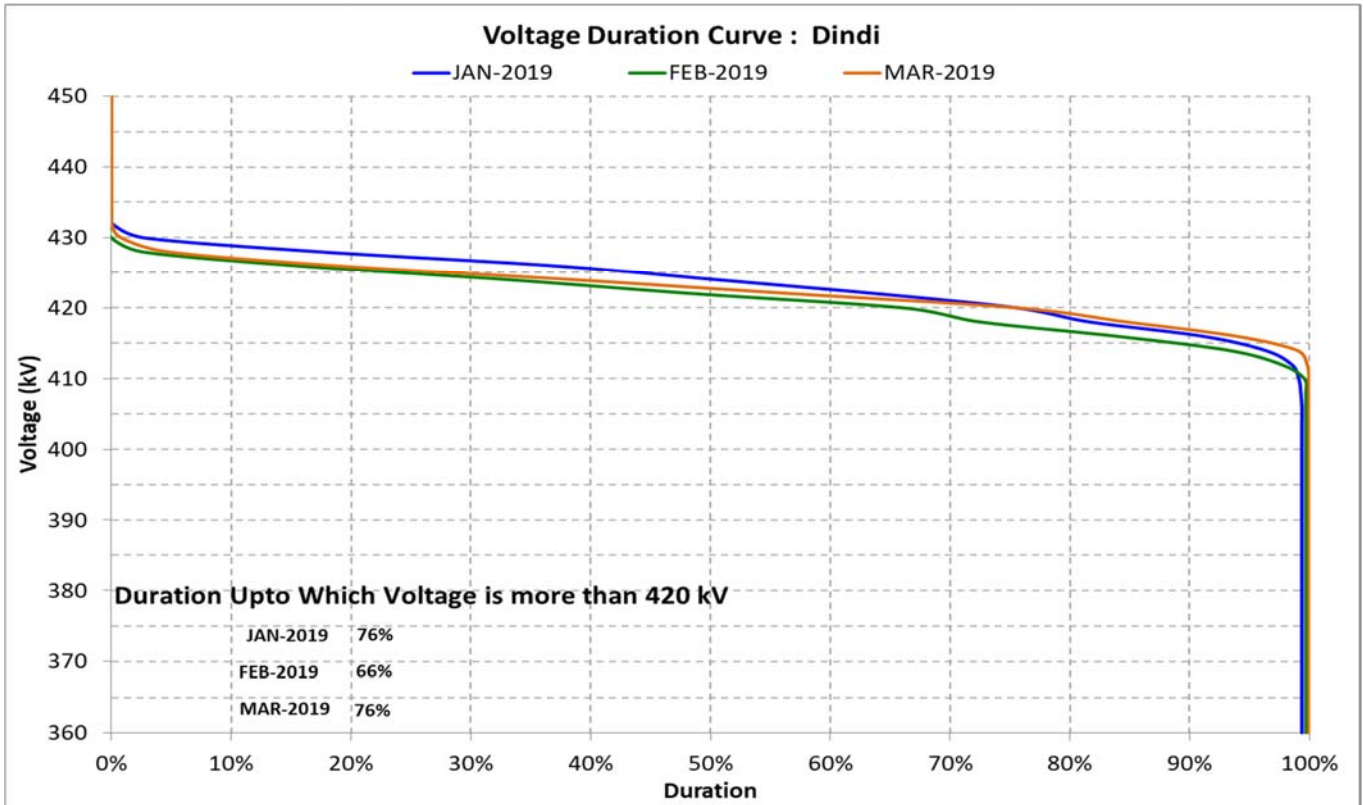


Figure-D11

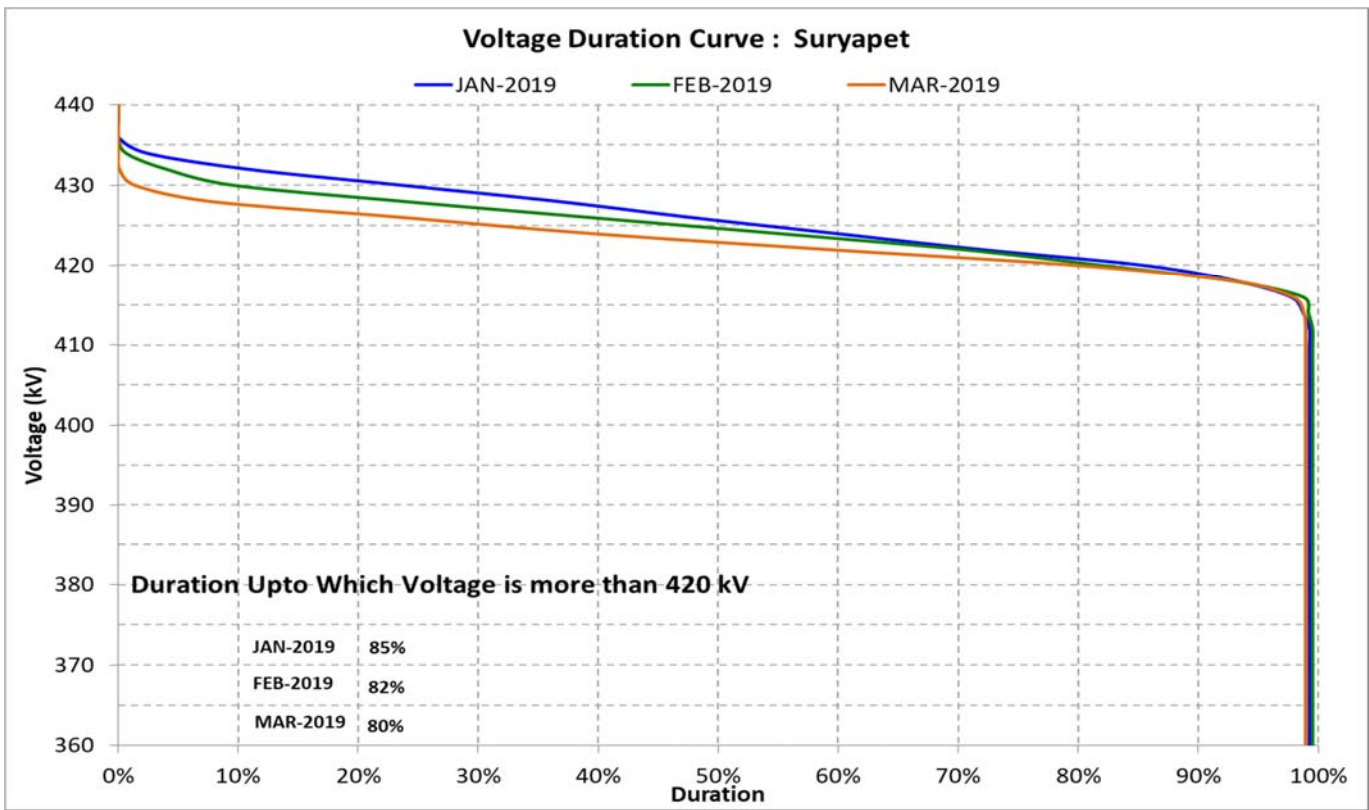


Figure-D12

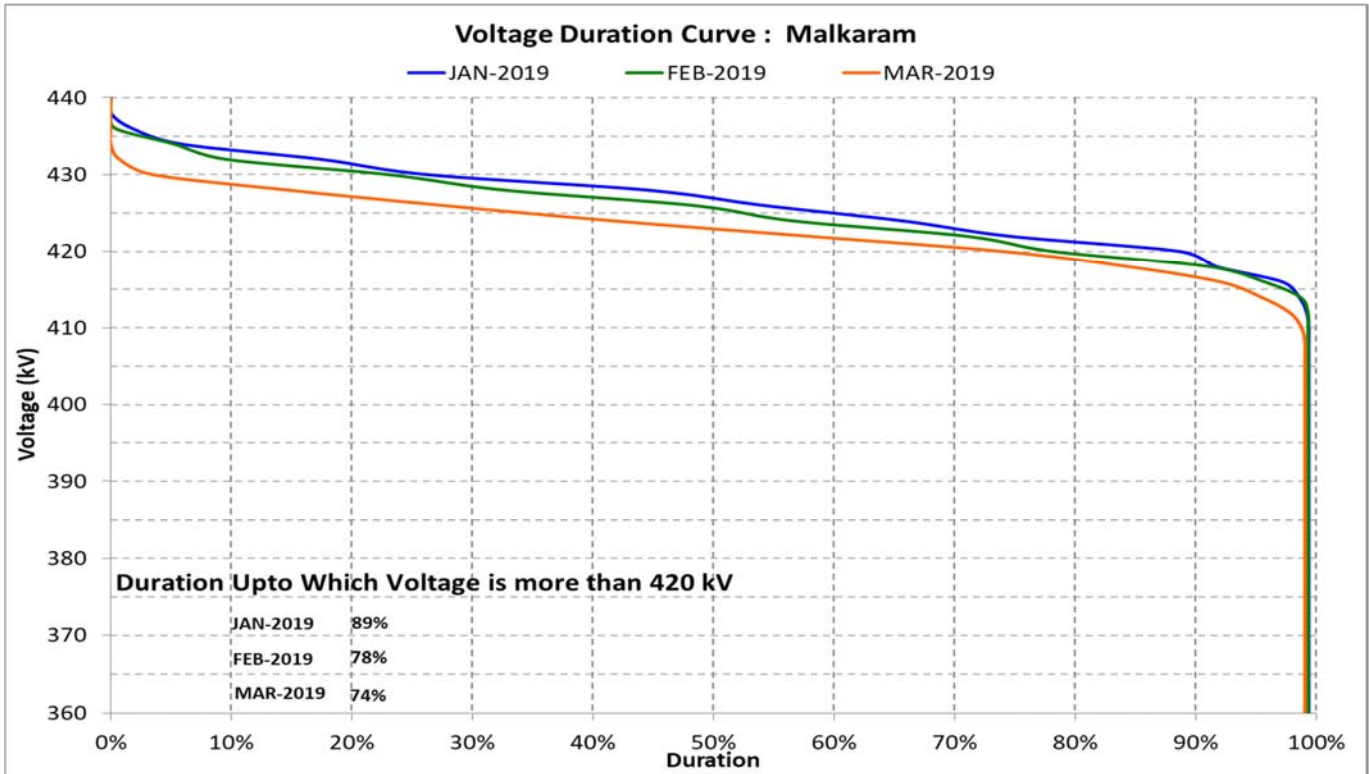


Figure-D13

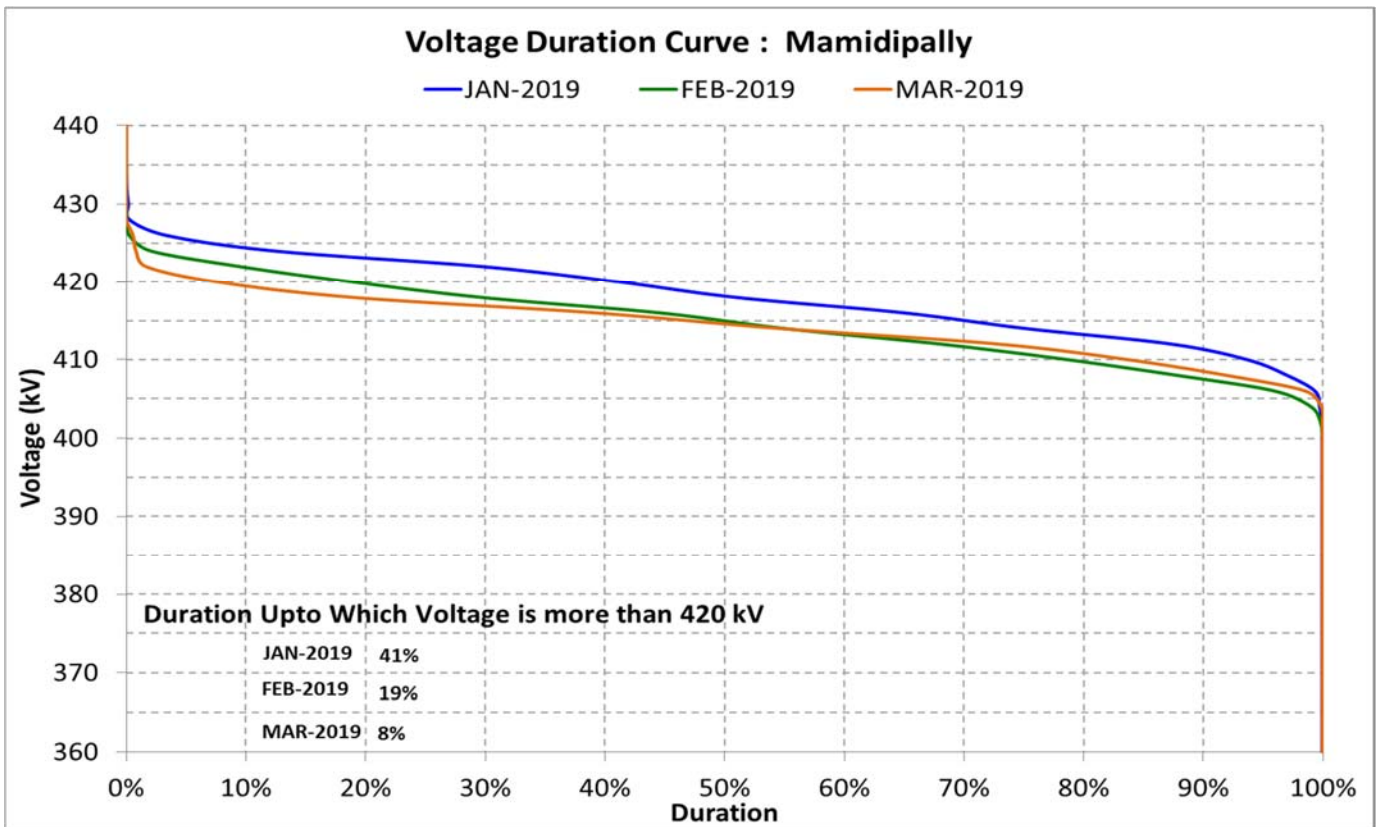


Figure-D14

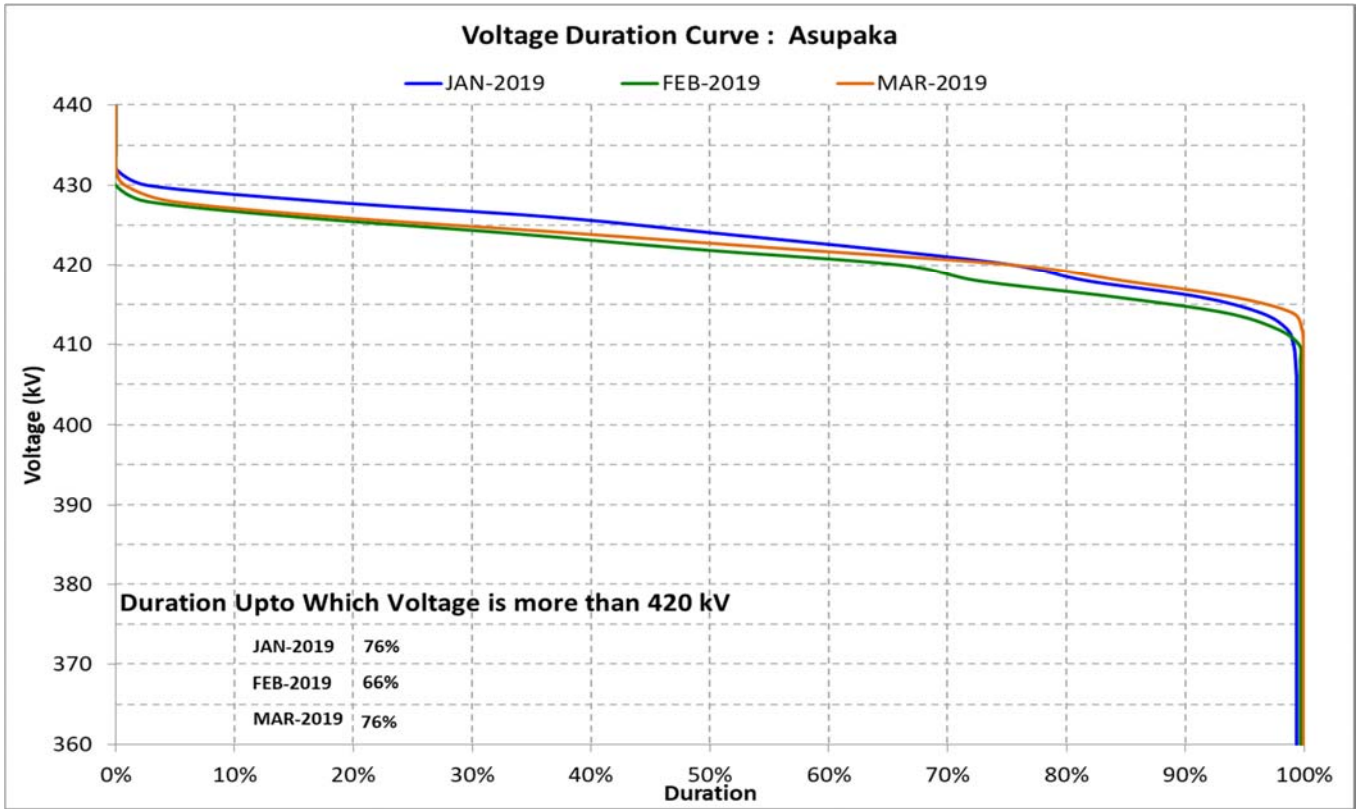


Figure-D15

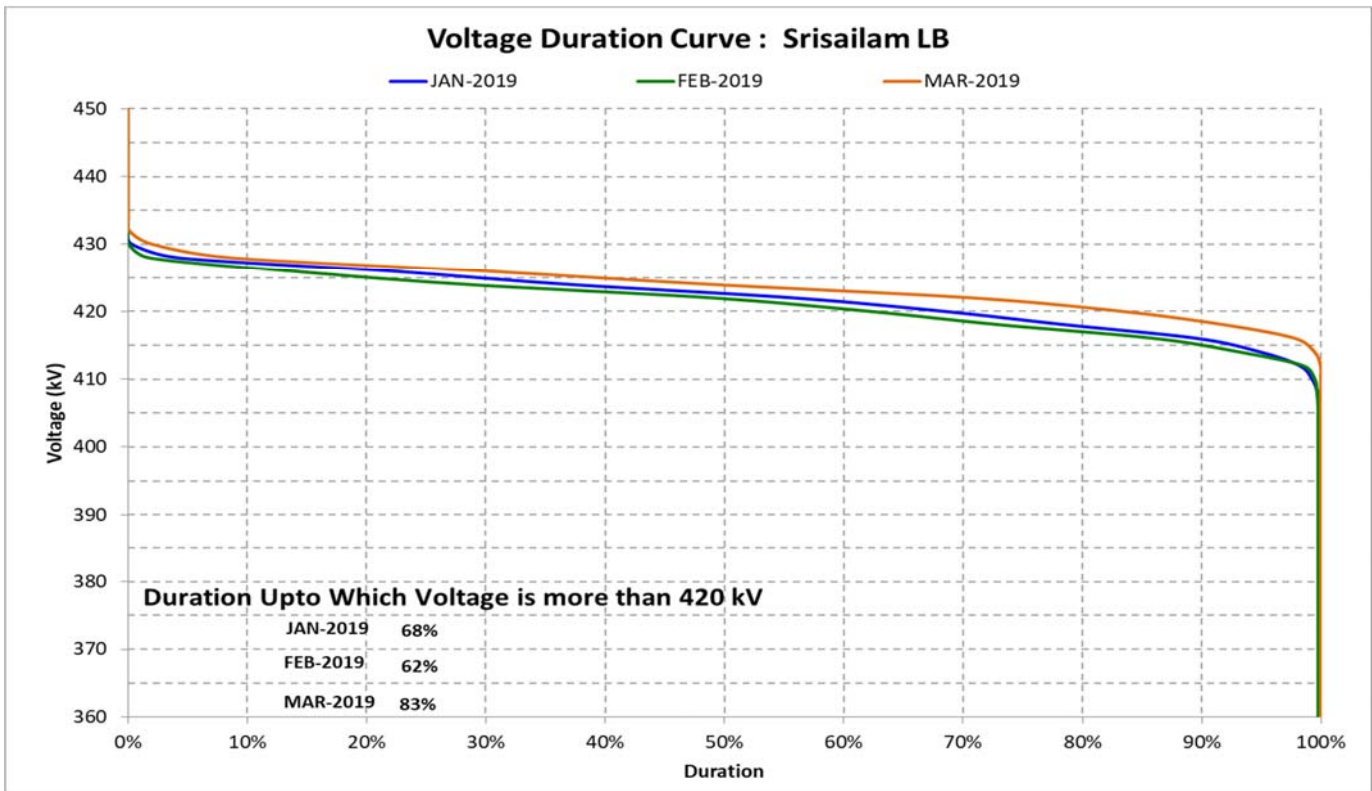


Figure-D16

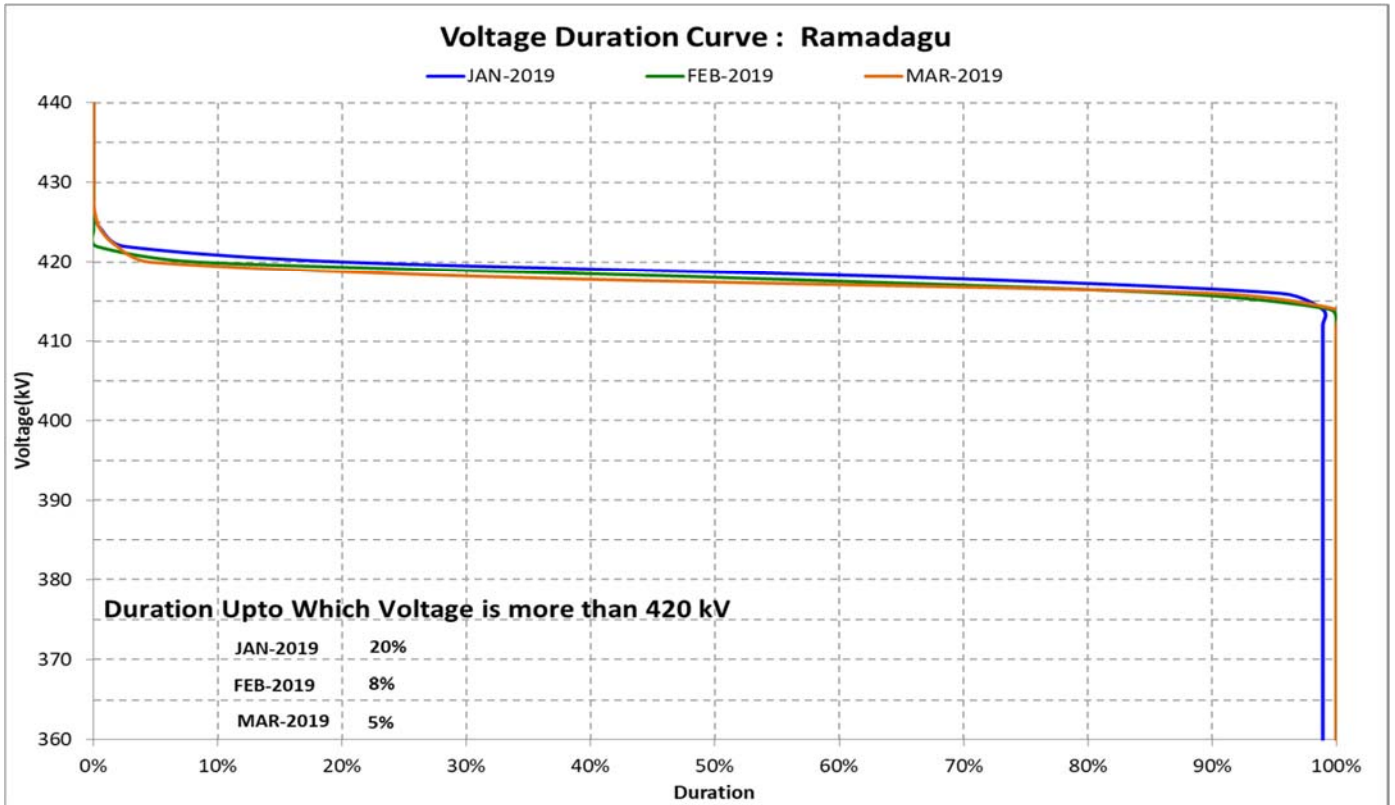


Figure-D17

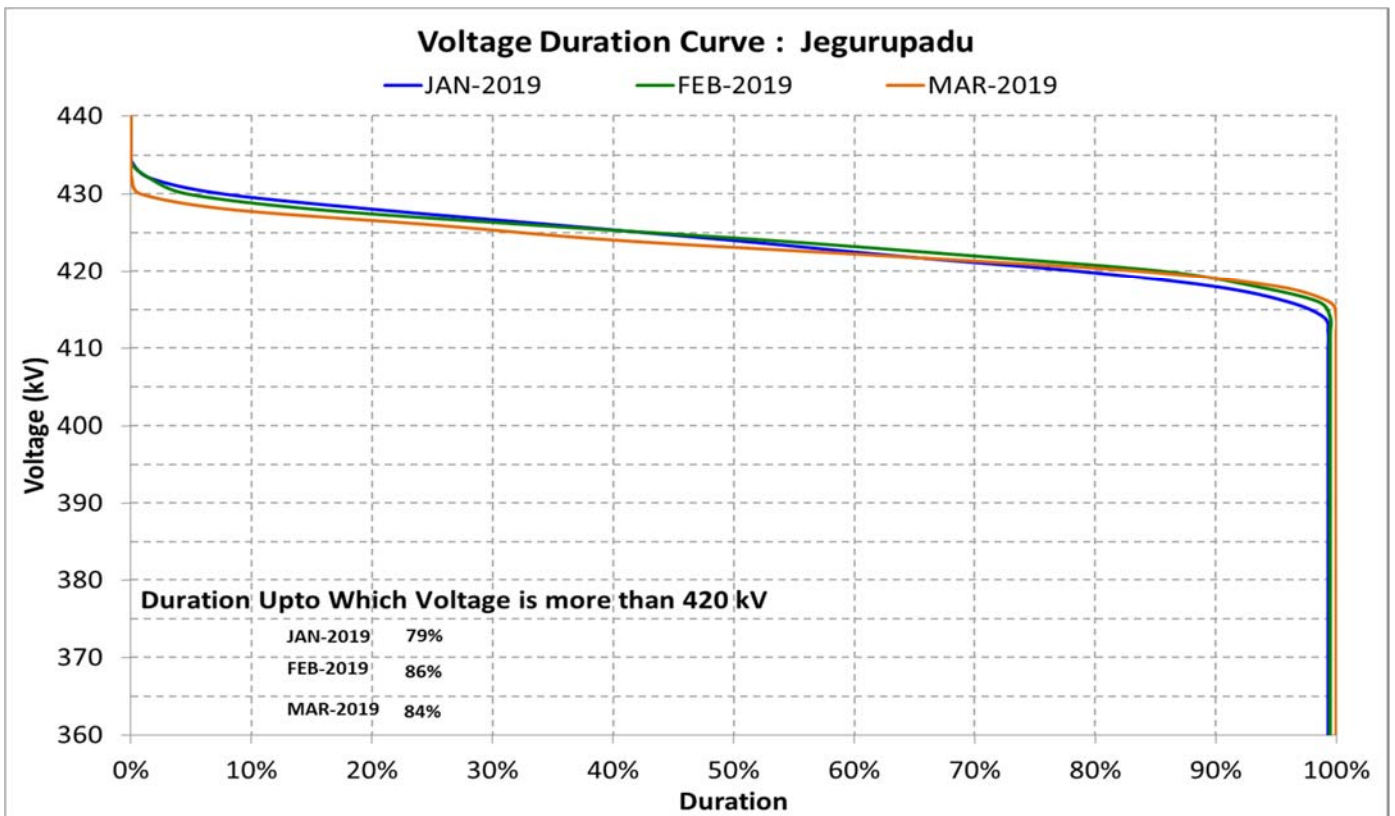


Figure-D18

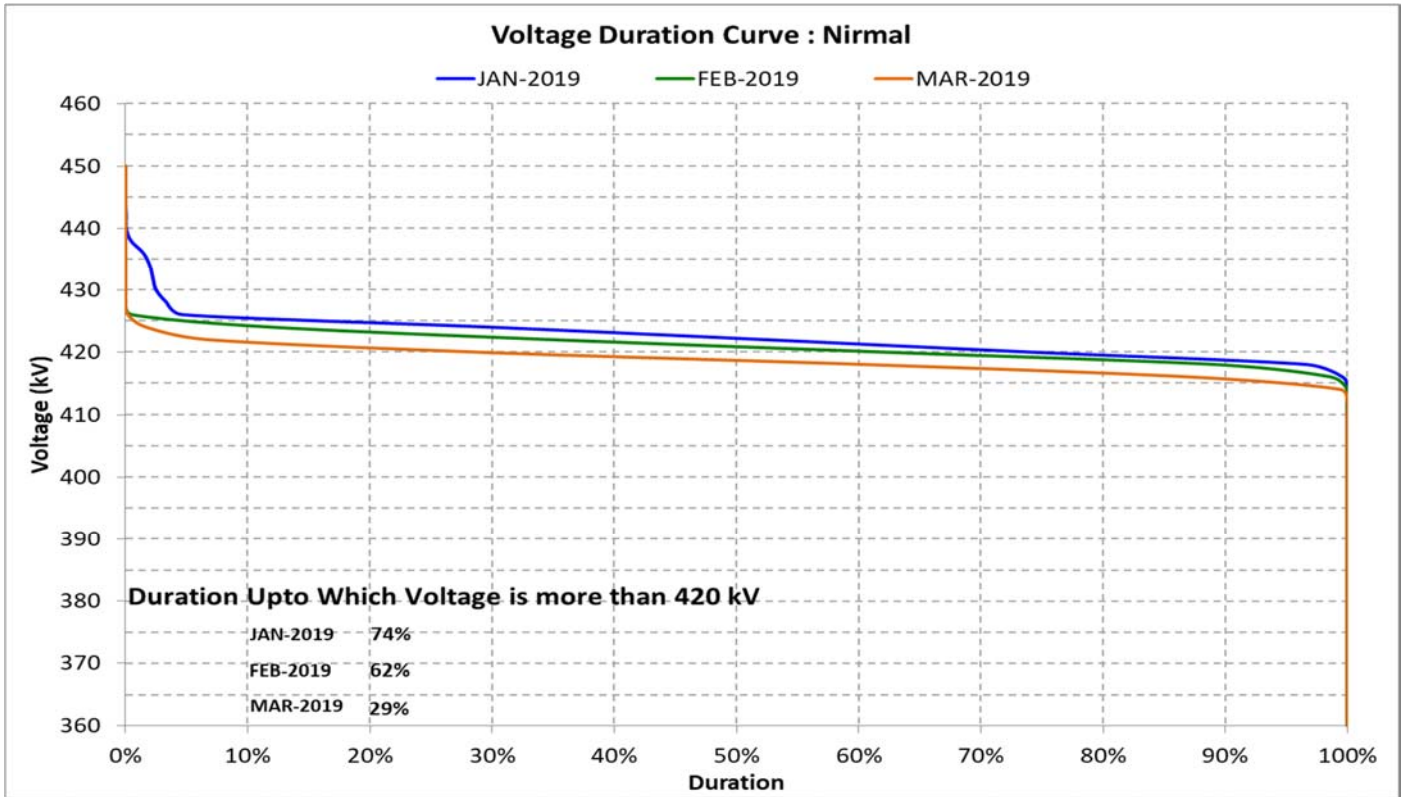


Figure-D19

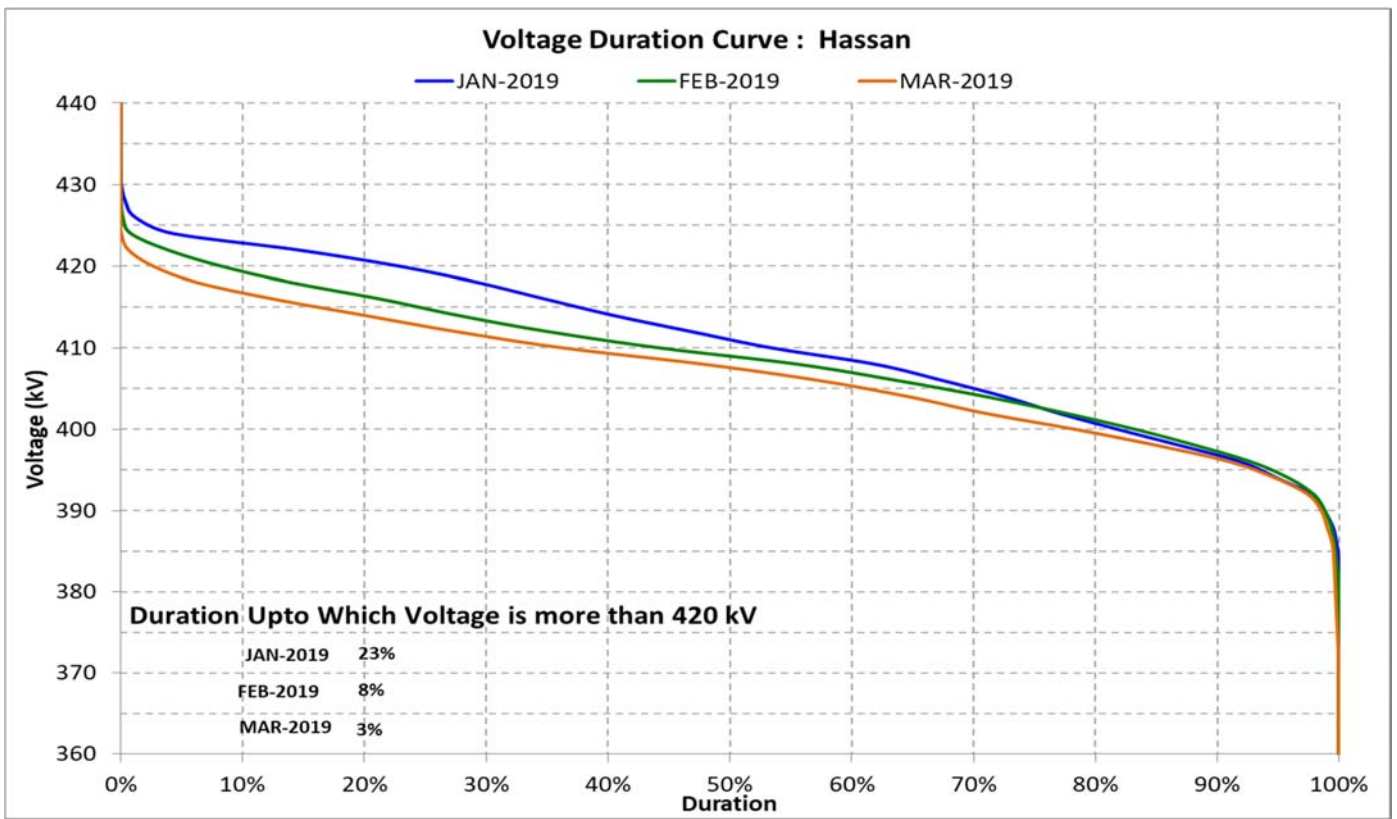


Figure-D20

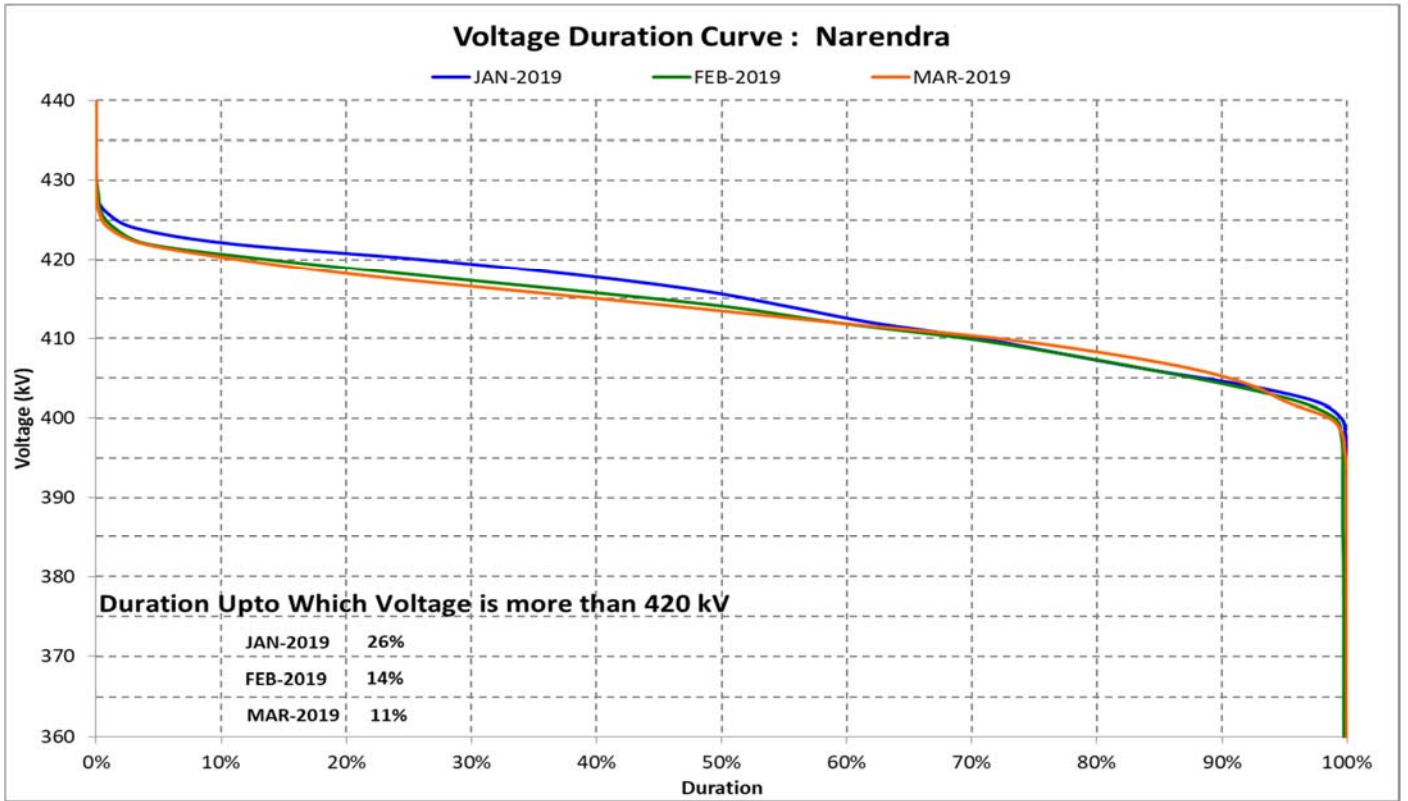


Figure-D21

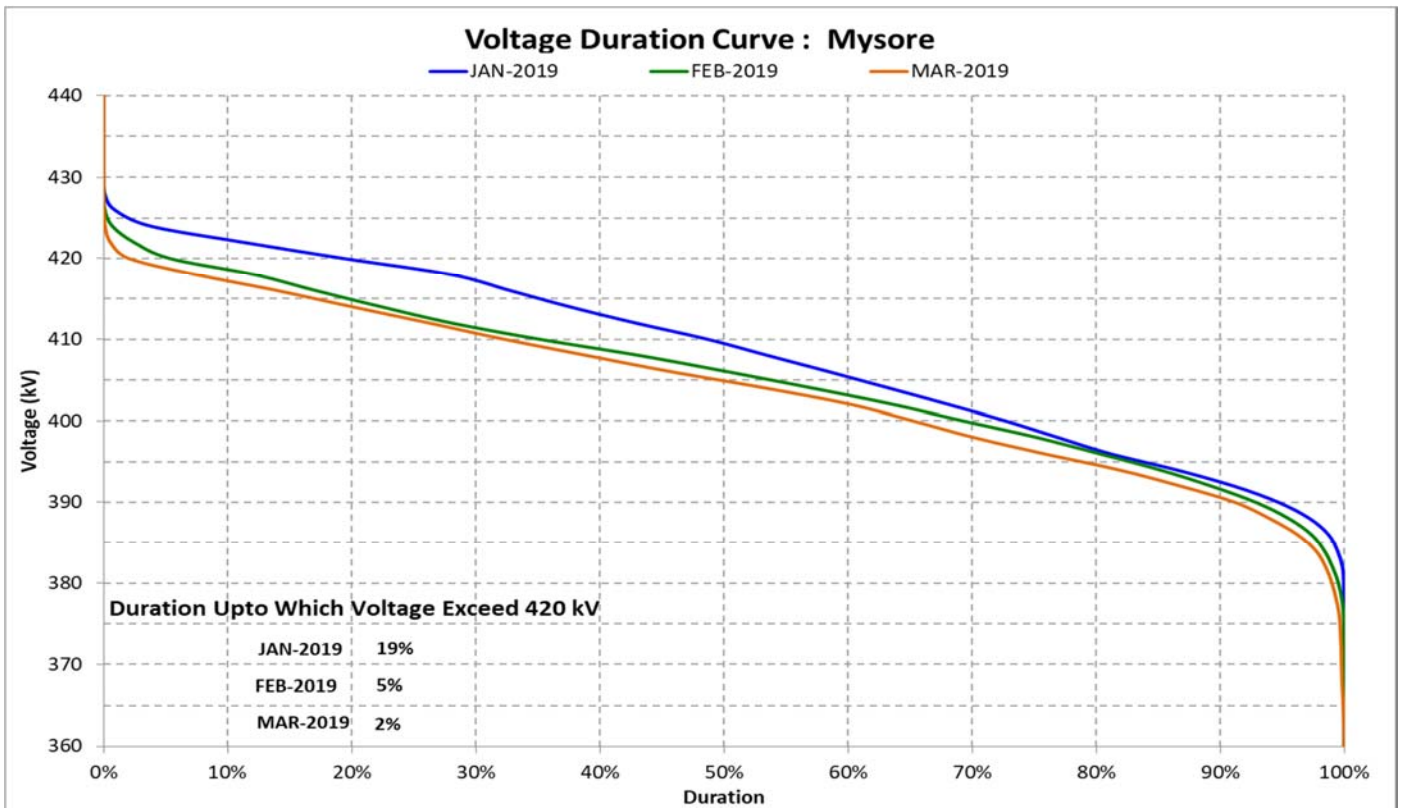


Figure-D22

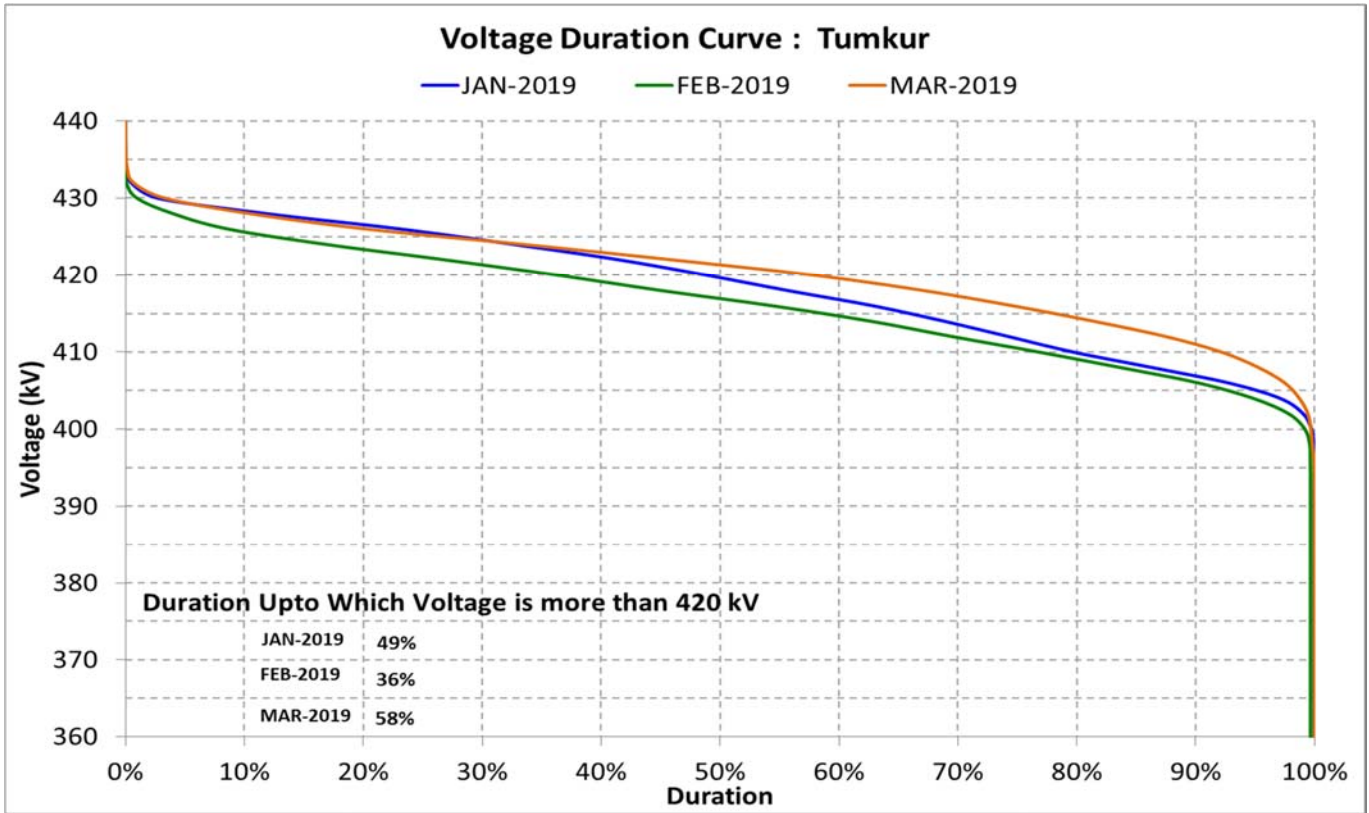


Figure-D23

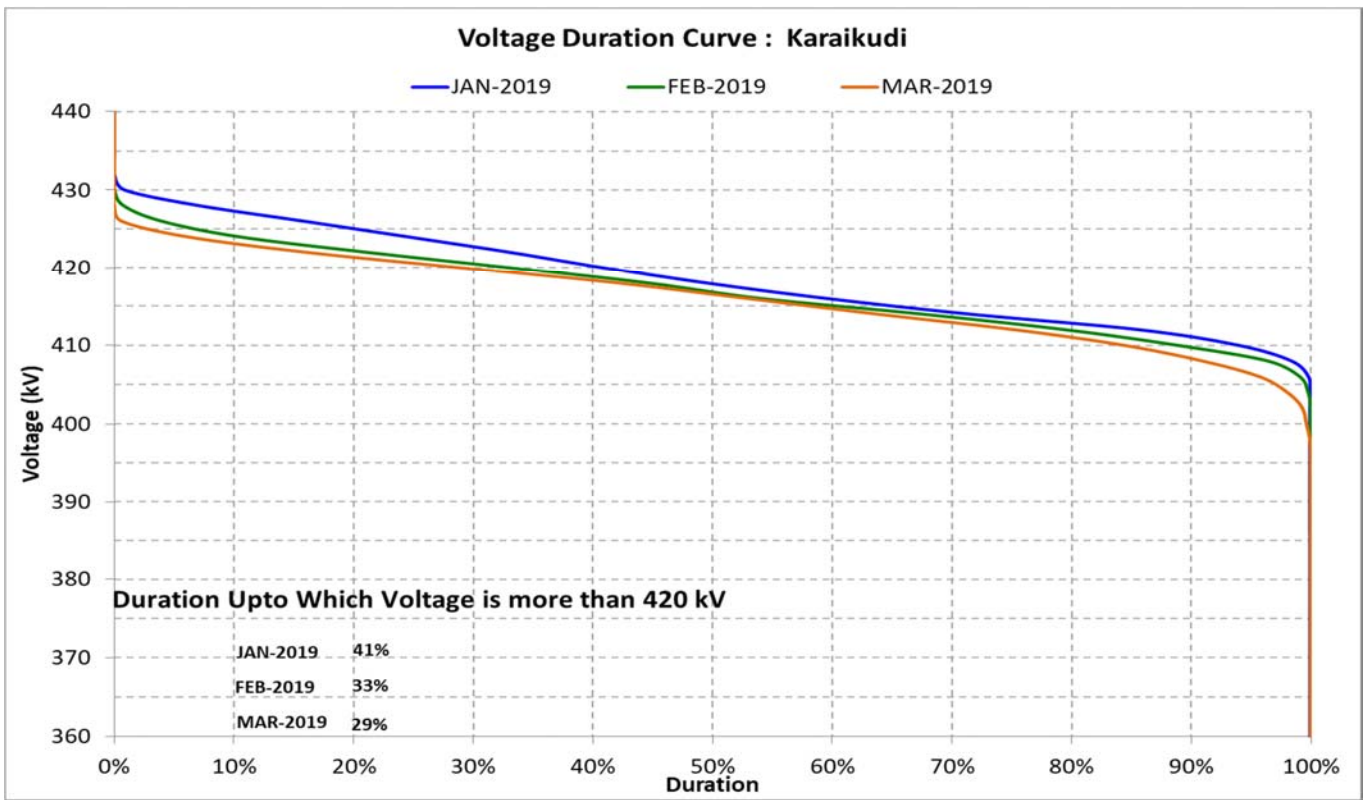


Figure-D24

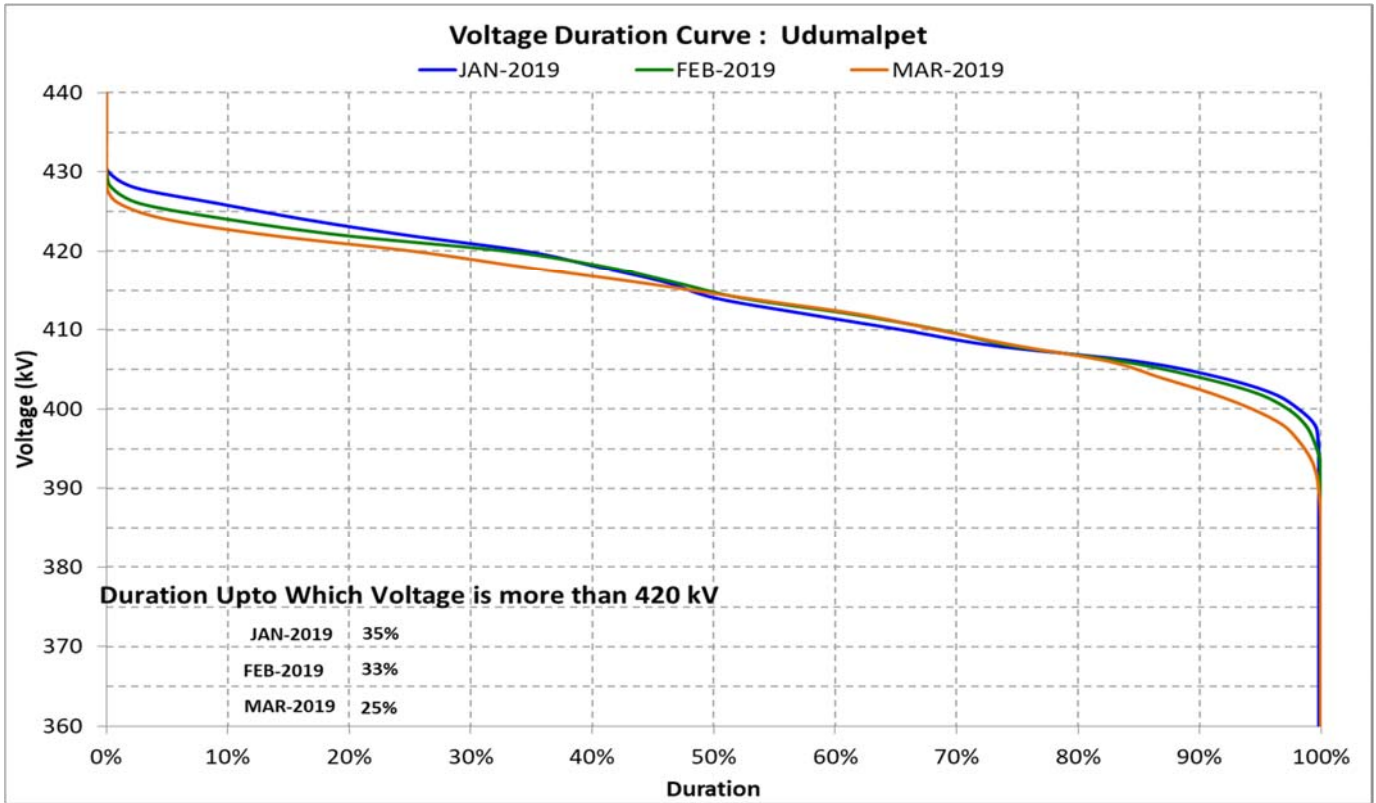


Figure-D25

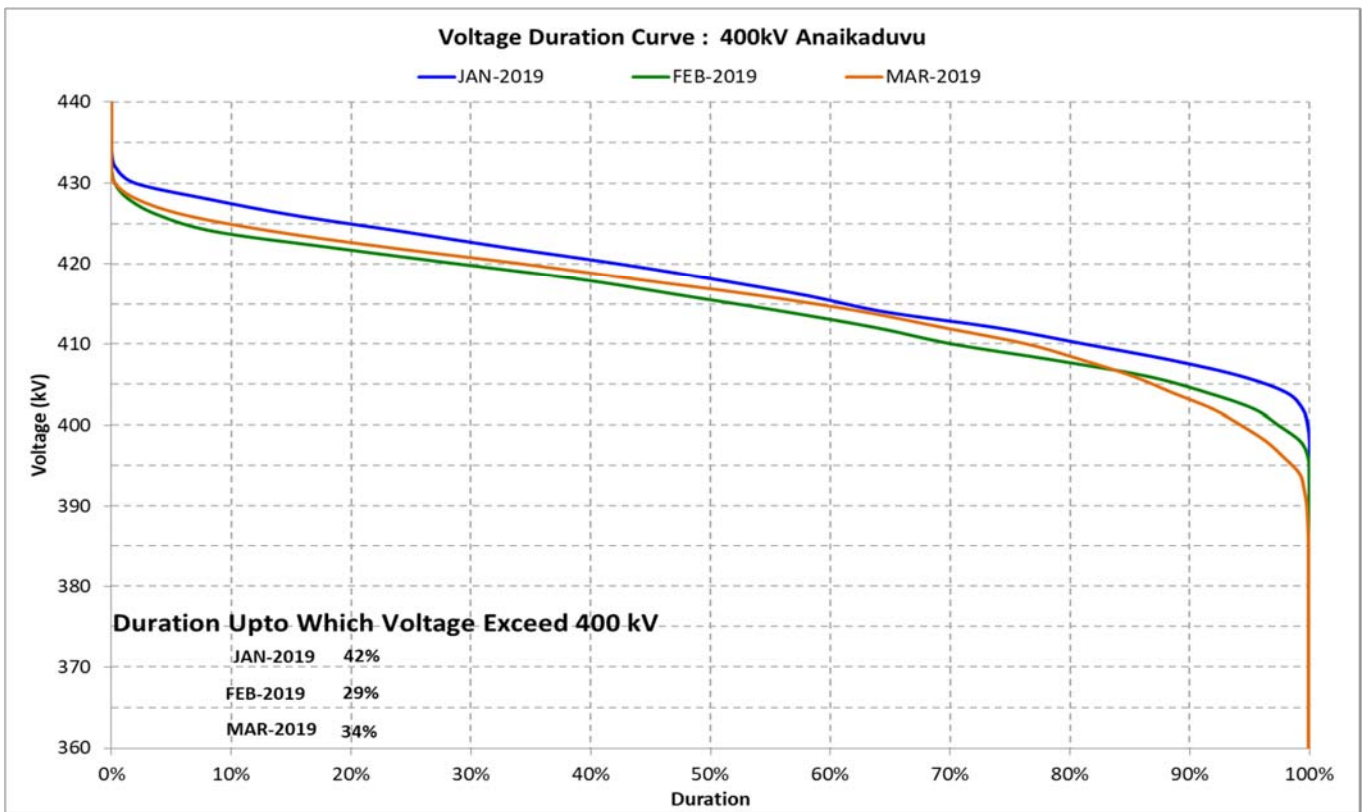


Figure-D26

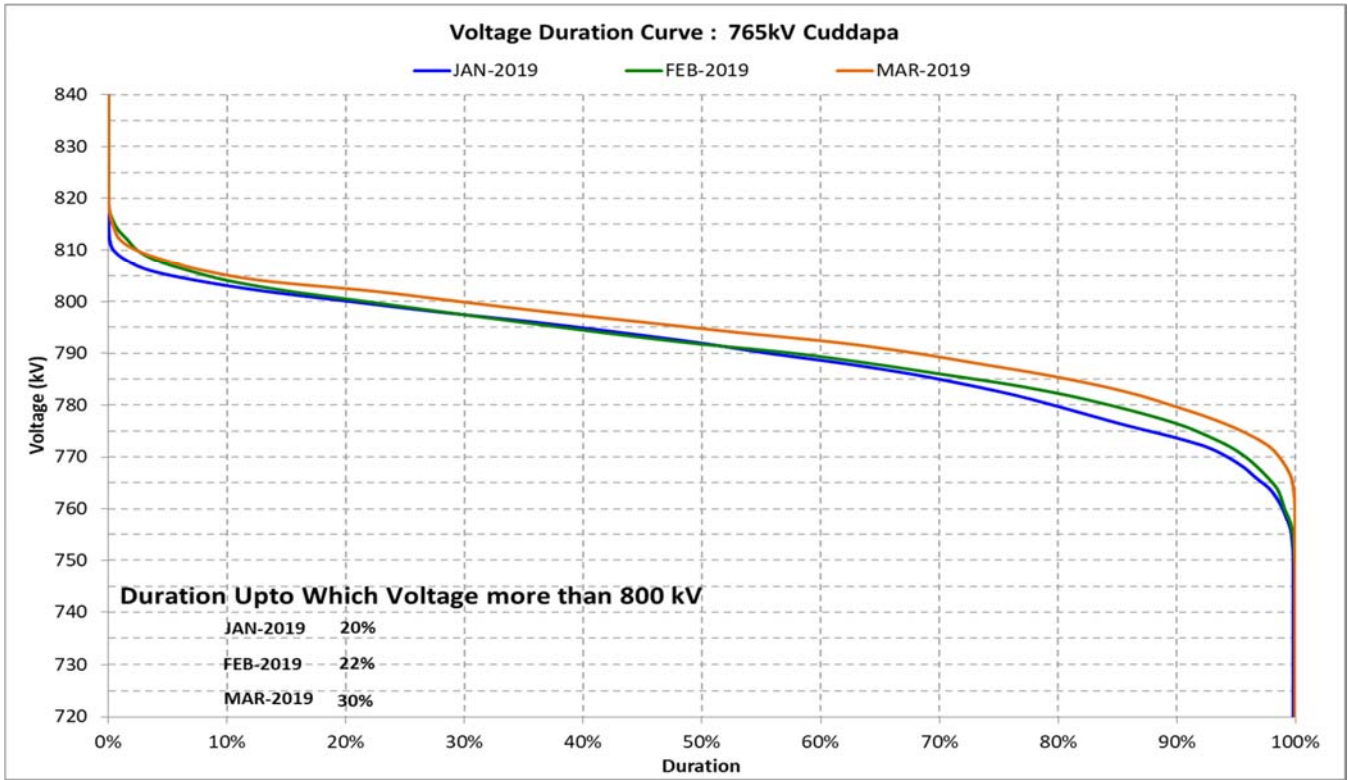


Figure-D27

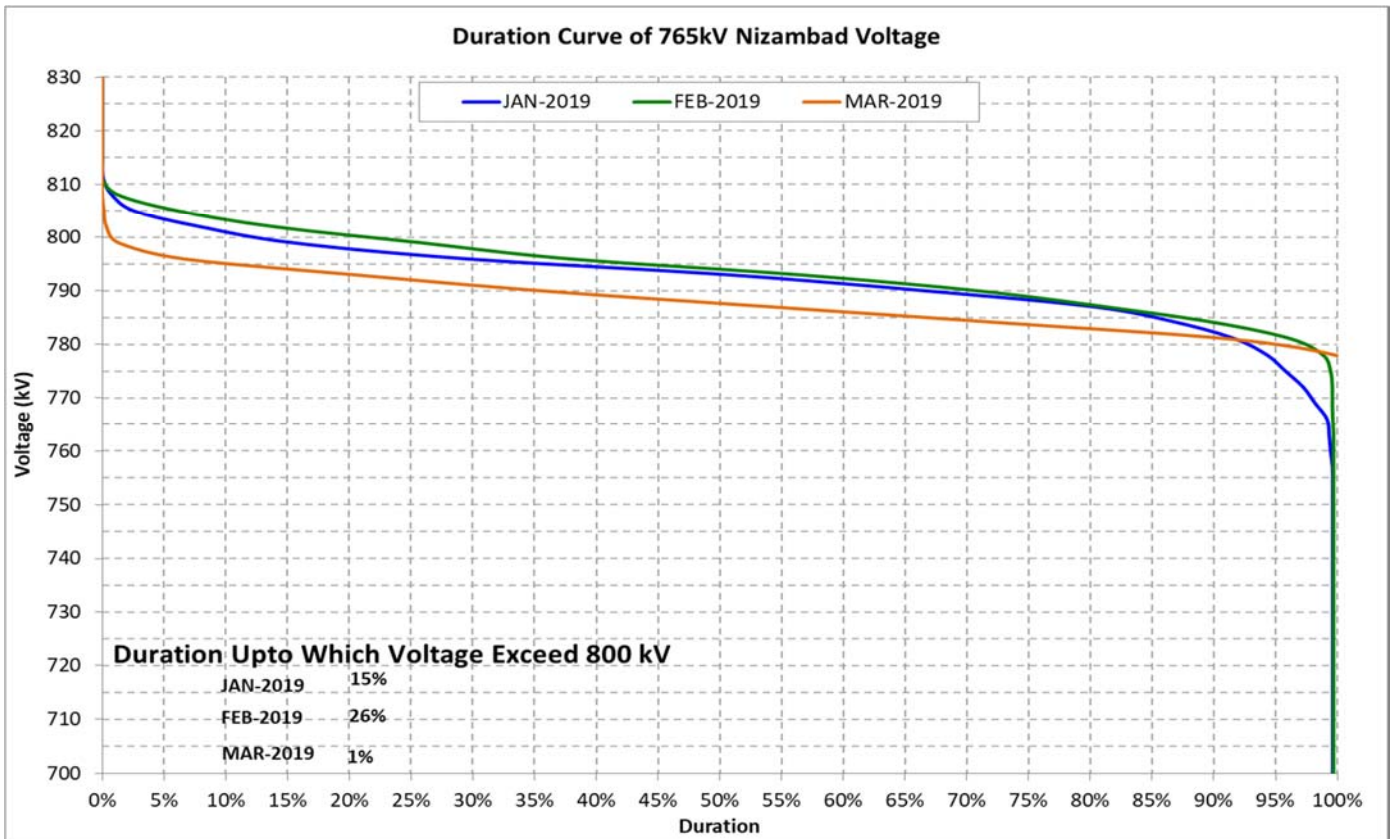


Figure-D28

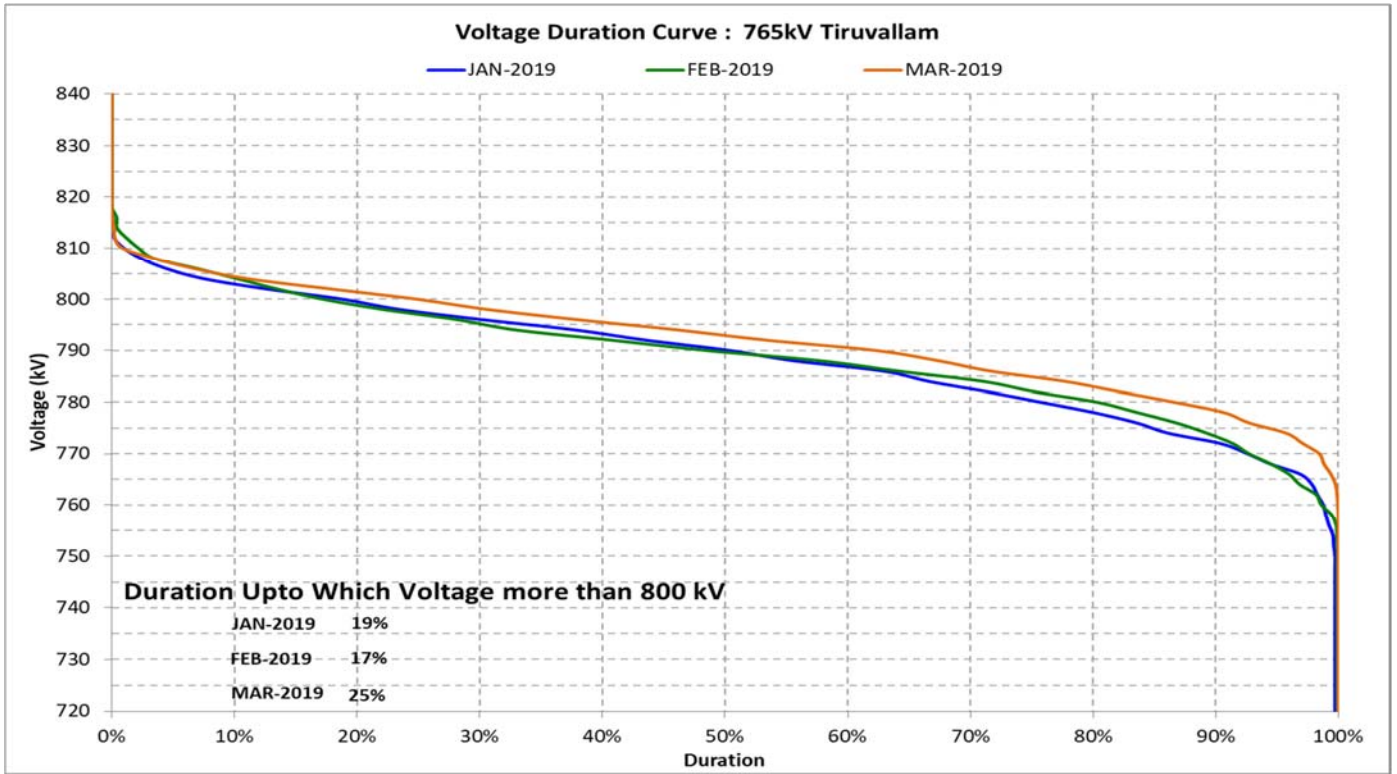


Figure-D29

BUS/LINE REACTORS TO BE COMMISSIONED IN SR AS PER 35TH SRPC MINUTES

Entity	Bus Name	Status	REMARKS
KPTCL	Hoody	Reactor erected on platform.	34 th TCC: March 2019
	Nelamangala	Reactor erected on platform.	34 th TCC: March 2019

Entity	Bus Name	Capacity in MVAR	Approved in	Type	Remarks
PGCIL	Yelahanka	2x63	40 th SC	Bus	PGCIL (Nov 18): Award placed in May 2018; expected by June 2019
	Cuddapah	50 to 125	39 th SC		Commissioned in Oct 2018
	Kurnool 765 kV	2 x 240			2 nd reactor commissioned on 31.10.2018
	Raichur 765 kV	2 x 240			2 nd reactor commissioned on 31.10.2018
	Nellore 765 kV				2 nd reactor commissioned on 31.10.2018
	Thiruvalam 765 kV	2 x 240			42 nd SCPSR. 27 months from April 2017.
	Pavagada	2 x 125			42 nd SCPSR.
	Nellore (PG)	2 x 50	42 nd SC	Line to Bus	
	Hosur	63 to 125	42 nd SC/1 st SRSCT	Bus	1 st SRSCT: agreed for implementation.
	Madhugiri	63 to 125	42 nd SC/1 st SRSCT	Bus	1 st SRSCT: agreed for implementation.
	Dharmapuri	125	42 nd SC/1 st SRSCT	Bus	1 st SRSCT: agreed for implementation.
	Hiriyur	125	42 nd SC/1 st SRSCT	Bus	1 st SRSCT: agreed for implementation.
	Pugalur	125	42 nd SC/1 st SRSCT	Bus	1 st SRSCT: agreed for implementation.
	Pugalur HVDC	2 x 125	42 nd SC/1 st SRSCT	Bus	1 st SRSCT: agreed for implementation.
APTRANS C O	Vemagiri	125	36 th SC	Bus	December 2017 – LOA issued on 18.06.2017
	Kurnool	125		Bus	December 2017 – LOA issued on 18.06.2017
	Kalpaka	125		Bus	2018-19. PO issued on 18.06.2016
	Chittoor	125	39 th SC	Bus	34 th TCC: By Dec 2019
	Vijayawada	125	39 th SC		34 th TCC: By Dec 2019
	Uravakonda	125	42 nd SC	Bus	34 th TCC: By Dec 2019
	Uravakonda	80			42 nd SCPSR
	Jammalmadugu	80			34 th TCC: By Dec 2019 Noted in 42 nd SCPSR
	Sattenapalli	125			34 th TCC: By Dec 2019 Noted in 42 nd SCPSR
	Aspiri	2 x 125		Bus	
	Mylavaram (Kadapa)	125		Bus	

Entity	Bus Name	Capacity in MVAR	Approved in	Type	Remarks
	Talaricheruvu	125		Bus	
	Rachagunne ri	125	42 nd SC/1 st SRSCT	Bus	34 th TCC: By Dec 2019 1 st SRSCT: agreed for implementation.
	Hindupur	80 to 125	42 nd SC/1 st SRSCT	Bus	34 th TCC: By Dec 2019 1 st SRSCT: agreed for implementation.
APGENCO	VTPS Stage IV	125	39 th SC	Bus	34 th TCC: PSDF approval awaited
	Polavram HEP	2 x 125	42 nd SC	Bus	34 th TCC: Included in EPC contract
KPTCL	Davanagere	125	39 th SC		34 th TCC: Estimate under preparation.
	Talaguppa	125	39 th SC		
	C N Halli	2 x 125	42 nd SC/ 1 st SRSCT	Bus	1 st SRSCT: KPTCL consent for the reactor implementation. 34 th TCC: C N Halli – Land to be identified. Jagalur – Work under progress.
	Jagalur	2 x 125	42 nd SC/ 1 st SRSCT	Bus	
KPCL	Yeramarus	125	42 nd SC/ 1 st SRSCT	Bus	
	Bellary	2 x 125	42 nd SC/ 1 st SRSCT	Bus	
KSEBL	Wayanad	125	42 nd SC/ 1 st SRSCT	Bus	1 st SRSCT: agreed for implementation.
		34 th TCC: KSEBL stated that Wayanad is proposed as switching station in the long term transmission plan of KSEBL. This is envisaged as a part of Areakode - Kasargode 400 kV link. Since reactors are planned as part of 400 kV S/S Kasargode, the same may not be required at Wayanad. KSEBL was suggested to take up this issue in SRSCT.			
TANTRANS CO	Almathy	125	39 th SC		Specification under process
	Manali	125	39 th SC		
	Kayathar	125	39 th SC		
	Kamuthi	2 x 80			42 nd SCSPSR
	Virudhnagar (765 kV)	2 x 330	42 nd SC	Bus	
		2 x 330	42 nd SC	Line	
	Coimbatore (765 kV)	2 x 240	42 nd SC	Line	
	Kayathar	125	42 nd SC	Bus	
	Kamuthi	125	42 nd SC	Bus	
	Thappagund	125	42 nd SC	Bus	
	Kadaladi	125	42 nd SC	Bus	
	Parali	125	42 nd SC	Bus	
	Arni	2 x 125	42 nd SC	Bus	
Velalividu	125	1 st SRSCT: agreed for implementation.	Bus	1 st SRSCT: agreed for implementation.	

Entity	Bus Name	Capacity in MVAR	Approved in	Type	Remarks
	Rasipalaya	63		Bus	2018-19
	Edayarpalay	2 x 125		Bus	
TSGENCO	KTPP	125	1 st SRSCT: agreed for implementation.	Bus	
TANTRANS CO/ TANGEDCO	Mettur	125	39 th SC		2018-19. To be diverted from Palavadi and works to be taken up.
TSTRANS CO	Asupaka	80			42 nd SCPSPSR
	Suryapet	125	42 nd SC/1 st SRSCT	Bus	34th TCC: Management approval for 10 reactors under process. 1 st SRSCT: agreed for implementation. TSTRANSCO may implement reactors at Tippapur, Kamalapuram, Manikonda and Yellampalli in first phase
	Raidurg	125	42 nd SC/1 st SRSCT	Bus	
	Kamalapuram	125	42 nd SC/1 st SRSCT	Bus	
	Narsapur	125	42 nd SC/1 st SRSCT	Bus	
	Maheshwararam	125	42 nd SC/1 st SRSCT	Bus	
	Tippapur	125	42 nd SC/1 st SRSCT	Bus	
	Manikonda	125	42 nd SC/1 st SRSCT	Bus	
	Jangaon	125	42 nd SC/1 st SRSCT	Bus	
	Choutuppal	125	42 nd SC/1 st SRSCT	Bus	
	Yellampalli	125	42 nd SC/1 st SRSCT	Bus	
TSTRANS CO	2nd Reactor at Dindi in place	125	1st SRSCT	Bus	
NPCIL	Kaiga	2 x 125		Bus	FS received for both reactors. 1 st reactor will be retendered. Tendering for 2 nd reactor will be taken up.
UPCL	Udupi	2 x 125	39 th SC		41 st SCPSPSR: It was informed that the requirement was assessed based on system studies, therefore, it was decided that the decision taken in 39 th SC Meeting may be implemented.
	In the OCCM, KPTCL had informed that Planning section had communicated to PCKL in this regard and PCKL would take a call.				
NLC	NLC TPS-II 2 nd	125	42 nd SC	Bus	

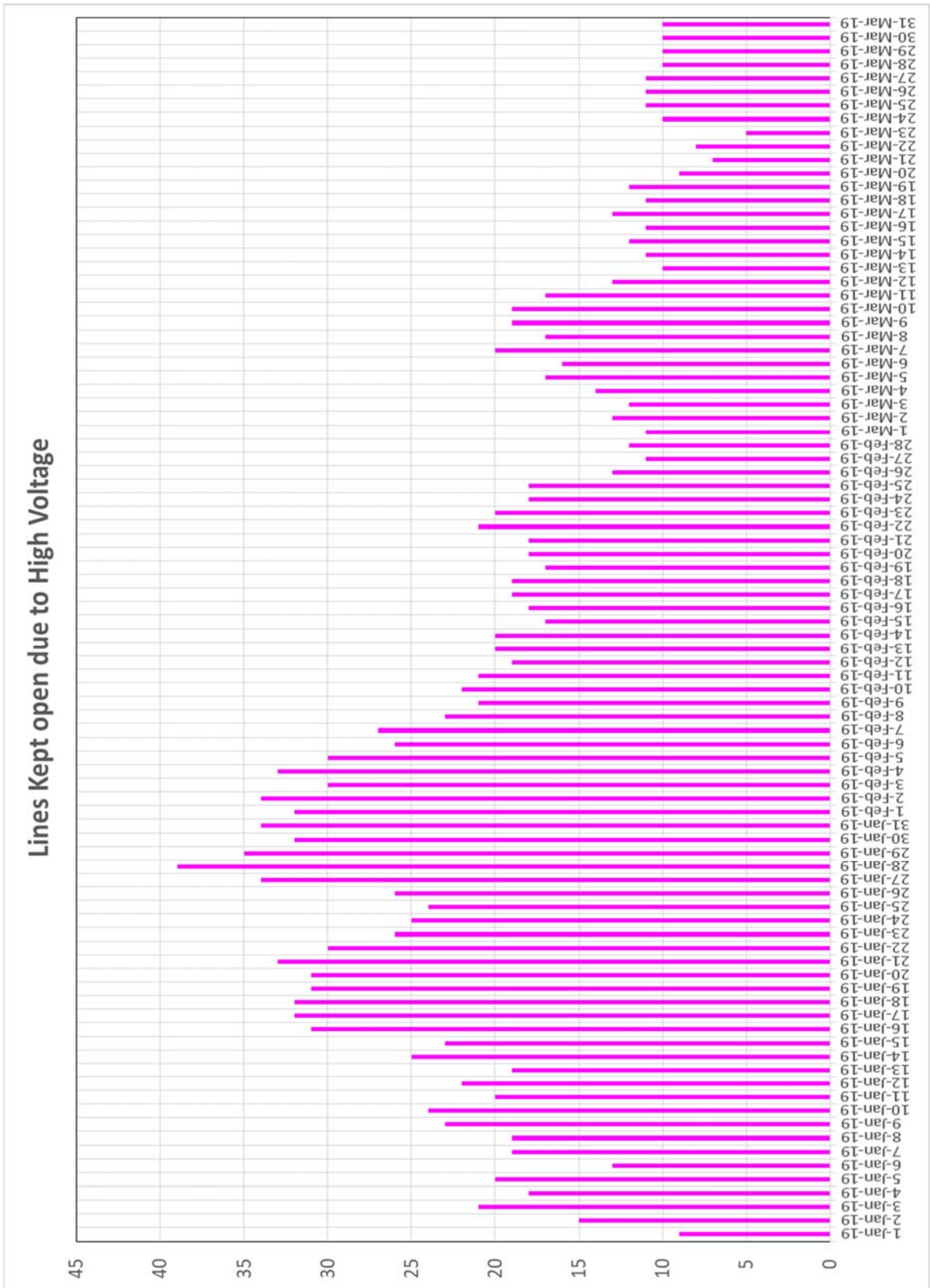


Fig. 1: Lines opened on high Voltage

Section 2: Action taken in real-time to mitigate constraint

2.1. Lines opened on High Voltage

A list of Lines that were tripped on Over-Voltage and physically opened by Real-time operators to control overvoltages in the Grid is shown below:

S. No.	Name of Element	Owner Name	Total No. of Outages	Total No. of Hours of Outage during this quarter
1	400KV-URAVAKONDA-MEHBOOBNAGAR-2	TSTRANSCO	80	1864
2	400KV-NIRMAL-SUNDILA-2	TSTRANSCO	63	1425
3	400KV-GVK-VEMAGIRI_AP-1	APTRANSCO	61	1424
4	400KV-KARAIKUDI-PUGALUR-2	POWERGRID	53	1256
5	400KV-TALARCHEVU-URAVAKONDA-2	ANDHRA PRADESH	49	1161
6	400KV-MALKARAM-SURYAPET-1	TSTRANSCO	56	1105
7	400KV-PAVAGADA-TUMKUR-2	POWERGRID	81	1105
8	400KV-TALARCHEVU-JAMMALAMADUGU-2	ANDHRA PRADESH	45	1048
9	400KV-MALKARAM-SURYAPET-2	TSTRANSCO	48	1029
10	400KV-SRISAILAM_LEFT_BANK-DINDI-2	TSTRANSCO	42	971
11	400KV-HINDUPUR-NP_KUNTA-2	APTRANSCO	41	968
12	400KV-GAUTAMI-VEMAGIRI_AP-1	APTRANSCO	43	955
13	400KV-SURYAPET-KV_KOTA-2	APTRANSCO	41	930
14	400KV-MAMIDAPALLI-DINDI-2	TSTRANSCO	39	902
15	400KV-VTPS_IV-SURYAPET-2	TSTRANSCO	41	861
16	400KV-LKPPL_STG2-VIJAYAWADA-2	POWERGRID	35	830
17	400KV-SURYAPET-SHANKARAPALLY-2	TANTRANSCO	39	807
18	400KV-JULURUPADU-MANUGURU-1	TELENGANA	33	712
19	400KV-KHAMMAM-NAGARJUNASAGAR_PG-3	PVTL	31	704
20	400KV-GVK-VEMAGIRI_AP-2	APTRANSCO	29	670
21	400KV-SRISAILAM_LEFT_BANK-SATTENPALLY-2	APTRANSCO	31	667
22	400KV-PAVAGADA-HIRIYUR-2	POWERGRID	26	574
23	400KV-PAVAGADA-TUMKUR-1	POWERGRID	53	527
24	765KV-CUDDAPAH-THIRUVALAM-1	POWERGRID	38	497
25	400KV-SINGARENI-SUNDILA-2	TSTRANSCO	26	489
26	400KV-NIRMAL-SUNDILA-1	TSTRANSCO	22	486
27	765KV-KURNOOL_PG-NPS-2	POWERGRID	24	480
28	400KV-RAYALSEEMA TPP-KALIKIRI-2	APTRANSCO	23	475
29	400KV-KALPAKKA-ASUPAKA-1	TSTRANSCO	21	442
30	400KV-KARAIKUDI-KAYATHAR-2	TANTRANSCO	23	436
31	400KV-MADURAI-TIRUNELVELI-1	POWERGRID	19	427
32	400KV-SURYAPET-KV_KOTA-1	APTRANSCO	19	421
33	765KV-KURNOOL_PG-CUDDAPAH-1	POWERGRID	43	420

S. No.	Name of Element	Owner Name	Total No. of Outages	Total No. of Hours of Outage during this quarter
34	400KV-SURYAPET-KETHIREDDYPALLY-1	TELENGANA	21	420
35	765KV-CUDDAPAH-THIRUVALAM-2	POWERGRID	34	414
36	400KV-ANAIKADAVU-THAPPUKUNDU-2	TANTRANSCO	25	409
37	400KV-KUDANKULAM-TUTICORIN_PS-1	POWERGRID	16	360
38	400KV-KUDANKULAM-TUTICORIN_PS-2	POWERGRID	17	356
39	400KV-NARNOOR-JAMMALAMADUGU-2	APTRANSCO	15	336
40	400KV-URAVAKONDA-MEHBOOBNAGAR-1	TSTRANSCO	14	329
41	400KV-TUTICORIN_PS-TTGS-2	POWERGRID	14	323
42	400KV-BHOOPALAPALLY-WARANGAL-1	POWERGRID	14	298
43	400KV-MAMIDAPALLI-KHAMMAM-2	POWERGRID	13	278
44	400KV-MADURAI-PUGALUR-2	POWERGRID	10	223
45	400KV-BHOOPALAPALLY-GAJWEL-2	TSTRANSCO	10	204
46	400KV-HINDUPUR-URAVAKONDA-1	ANDHRA PRADESH	10	197
47	765KV-NIZAMABAD-MAHESHWARAM_PG-2	POWERGRID	36	196
48	400KV-GAUTAMI-VEMAGIRI_AP-2	APTRANSCO	9	194
49	765KV-KURNOOL_PG-CUDDAPAH-2	POWERGRID	21	192
50	400KV-KARAIKUDI-KAYATHAR-1	TANTRANSCO	10	177
51	765KV-KURNOOL_PG-NPS-1	POWERGRID	12	175
52	400KV-KETHIREDDYPALLY-SHANKARAPALLY-2	TELENGANA	7	159
53	765KV-NIZAMABAD-MAHESHWARAM_PG-1	POWERGRID	29	150
54	400KV-KHAMMAM-NAGARJUNASAGAR_PG-2	PVTL	7	132
55	400KV-ANAIKADAVU-THAPPUKUNDU-1	TANTRANSCO	12	132
56	400KV-PALAVADI-RASIPALYAM-1	TNEB	6	130
57	400KV-KARAIKUDI-KAMUDHI-2	TNEB	8	108
58	400KV-TALARCHEVU-JAMMALAMADUGU-1	ANDHRA PRADESH	5	104
59	400KV-UPCL-HASSAN-1	POWERGRID	13	75
60	400KV-UPCL-HASSAN-2	KARNATAKA	6	71
61	400KV-SURYAPET-JULURUPADU-1	TSTRANSCO	4	67
62	400KV-RAYALSEEMA TPP-KALIKIRI-1	APTRANSCO	4	66
63	400KV-VTPS_IV-SURYAPET-1	TSTRANSCO	4	62
64	400KV-ARASUR-UDUMALPET-2	POWERGRID	3	59
65	400KV-JULURUPADU-MANUGURU-2	TELENGANA	4	58
66	400KV-TUMKUR-KUDGI_PG-2	POWERGRID	4	43
67	400KV-SINGARENI-SUNDILA-1	TSTRANSCO	3	38
68	400KV-SURYAPET-JULURUPADU-2	TSTRANSCO	3	35
69	400KV-CUDDAPAH-NP_KUNTA-3	POWERGRID	3	34
70	400KV-PAVAGADA-TUMKUR-4	POWERGRID	3	33
71	400KV-KALPAKKA-KHAMMAM-1	POWERGRID	3	33
72	400KV-KTPS_VII-JULURUPADU-2	TSTRANSCO	3	30

S. No.	Name of Element	Owner Name	Total No. of Outages	Total No. of Hours of Outage during this quarter
73	400KV-NARENDRA-GUTTUR-1	KPTCL	2	21
74	400KV-TUTICORIN_PS-DHARMAPURI-2	POWERGRID	2	20
75	400KV-HASSAN-MYSORE-1	POWERGRID	4	19
76	400KV-KTPS_VI-KHAMMAM-1	POWERGRID	2	18
77	400KV-VEMAGIRI_AP-SATTENPALLY-1	APTRANSCO	3	16
78	400KV-KALPAKKA-VEMAGIRI_AP-1	APTRANSCO	3	15
79	400KV-HINDUJA-KV_KOTA-2	APTRANSCO	1	14
80	400KV-SATTENPALLY-VTPS_IV-1	APGENCO	2	12
81	400KV-KTPS_VII-KHAMMAM-1	TSTRANSCO	2	10
82	400KV-NELLORE_PG-SRIPERUMBADUR-2	POWERGRID	1	8
83	400KV-NELLORE_PG-VIJAYAWADA-2	POWERGRID	1	7
84	400KV-TIRUNELVELI-KANARPATTI-1	TANTRANSCO	1	7
85	400KV-HINDUPUR-URAVAKONDA-2	ANDHRA PRADESH	1	6
86	220KV-POTHENCODE-TRIVANDRUM-1	KSEB	1	6
87	400KV-HASSAN-MYSORE-2	POWERGRID	1	5
88	400KV-GHANAPUR-MALKARAM-1	TSTRANSCO	1	4
89	400KV-NELAMANGALA-HASSAN-1	POWERGRID	2	2
90	400KV-SATTENPALLY-PODILI-2	APTRANSCO	1	2
91	400KV-TALGUPPA-HASSAN-1	POWERGRID	2	1
92	400KV-VIJAYAWADA-NELLORE_AP-1	APTRANSCO	2	1
93	765KV-KURNOOL_PG-RAICHUR_PG-2	POWERGRID	1	1

2.2. Lines / ICTs opened to control overloading

Sl. No	Transmission Element (s) opened	Overloaded corridor	Remarks/Corrective Action
	NIL		

TAMILNADU TRANSMISSION CORPORATION LTD.
(Subsidiary of TNEB Ltd.)

From

Er.T.Senthilvelan, B.E.,
Director/Transmission Projects,
TANTRANSCO,
144, Anna Salai,
Chennai -2.

The Member (Power System),
Central Electricity Authority,
Sewa Bhavan, R.K.Puram,
New Delhi 110 066.

Lr.No.CE/Plg.&R.C/SE/SS/EE-II/AEE1/F. 2nd SRSCT/D. 115 /19 dt. 24.05.19

Dear Sir,

Sub: 2nd Southern Region Standing Committee on Transmission
– Agenda points - reg.

Ref: Joint study meeting held on 01.5.19 & 02.05.19 at SRPC/Bangalore.

The proposals in respect of TANTRANSCO, TamilNadu have been furnished below for including in the forthcoming Southern Region Standing Committee on Transmission (SRSCT) as the Agenda items for deliberations:

1.Vembakkam 230/110 kV SS:

Administrative approval was accorded by TANTRANSCO for establishing a 230/110 kV SS at Vembakkam by LILO of 230 kV MAPS – Echur line and the work is to be commenced soon. Hence approval for making LILO of 230 kV MAPS – Echur line at Vembakkam 230 kV SS is required as MAPS is a central generating station.

2. Bus Reactors:

Approval for erecting 400 kV Bus reactors are requested at the following locations :

1	Korattur	400KV	2x125 MVar
2	Manali	400KV	2x125 MVar
3	Guindy	400KV	2x125 MVar
4	Ottiapakkam	400KV	2x125 MVar
5	Pulianthope	400KV	1x125 MVar
6	Alamathy	400KV	1x125 MVar
7	Vellalaviduthi	400 kV	1x63 MVar

(WORK UNDER PROGRESS)



No - 107 / PSPD - II
24/5/2019

3. Alagarkoil 400/230-110 kV SS (in place of Kondagai) :

Konthagai 400/230-110 kV substation proposal was approved by CEA in the 41st and 42nd meeting of Standing Committee on Power System Planning with the following 400 kV connectivity :

- i) LILO of one circuit of 400 kV Kayathar-Karaikudi DC line by erecting 25 Km of DC line to Konthagai 400 kV SS.
- ii) 400 KV DC Link line from the proposed Virudhunagar 765/400 kV SS to Konthagai 400 kV SS.
- iii) Provision of 2x500 MVA 400/230 kV ICT & 2x200 MVA 400/110kV capacity.

As the identified land at Konthagai is only sufficient to establish a 400 kV GIS SS, as a cost effective measure, it has been decided to establish a 400 kV AIS SS in the premises of the existing Alagarkoil 230 kV SS by retaining the same 400 kV connectivity of Konthagai SS at Alagarkoil . System studies has been conducted for the same and the study results are enclosed herewith.

Hence approval may be accorded for establishing Alagarkoil 400/230-110 kV substation in place of Kondagai 400 kV SS with the following connectivity:

400 kV connectivity:

- i) LILO of one circuit of 400 kV Kayathar-Karaikudi DC line by erecting 25 Km of DC line to Konthagai 400 kV SS.
- ii) 400 KV DC Link line from the proposed Virudhunagar 765/400 kV SS to Konthagai 400 kV SS.
- iii) Provision of 2x500 MVA 400/230 kV ICT & 2x200 MVA 400/110kV capacity.
- iv) 230kV and 110 kV connectivity of the existing Alagarkoil 230 kV SS will be retained. Additional 230 kV connectivity to the proposed new 230 kV SS at Thirupalai near Alagarkoil.

4. Vishwanathapuram 400/230-110kV SS:

Vishwanathapuram 400/230-110 kV SS has been envisaged for the following reasons:

- 1) Hosur area is a fastly developing industrial area. Industrial expansion is expected by way of proposed establishment of SEZ in future. Presently, EHT/HT service applications for around 90 MVA is pending with the distribution circle.

- 2) Due to overloading of auto transformers of the existing Hosur 230 kV SS & the upcoming Uddanapally 230 kV SS and certain 110 kV lines in that area , there is no feasibility to accommodate any additional loads.
- 3) There is no redundancy in the network for reliable operation in the event of contingency conditions.
- 4) Ensuring reliability of source in this area will reduce power interruption and avoid major revenue loss.

In view of the above, establishment of a 400 kV SS is necessitated to ensure reliability and source adequacy.

The proposal for establishment of Vishwanathapuram 400/110kV SS was discussed in the 1st meeting of Southern Region Standing Committee on Transmission (SRST) and it was decided to carry out joint system studies of Southern Region. Subsequently the proposal for establishment of Vishwanathapuram 400/230-110kV SS was discussed in the joint study meeting held on May 1st to 2nd 2019 at SRPC, Bengaluru.

ICTs:

2 x 500 MVA , 400/230 kV ICTs

3 x 200 MVA , 400/110 kV ICTs.

Provision of 1 x 125 MVA Bus Reactor.

Provision of 2 X 50 MVA Line reactor one on each line of 400kV Vishwanathapuram –Thiruvalem line at Vishwanathapuram SS end.

400 KV connectivity:

LILO of 400 kV Thiruvalem – Palavady Quad moose D/C line at the proposed Vishwanathapuram 400/ 230-110 kV SS.

230 KV connectivity:

- i. 230kV S/C line to the existing Hosur 230 kV SS.
- ii. 230kV D/C line to the proposed 230kV SS near Bagalur.
- iii. 230kV S/C line to the proposed Kalukondapally 230 kV SS.

110 KV connectivity:

- i. 110kV D/C line to Shoolagiri 110kV SS.
- ii. 110kV S/C line to Uddanapally 230kV SS
- iii. 110kV S/C line to proposed Alur 110kV SS.
- iv. 110kV D/C line to proposed Hosur SEZ 110kV SS.
- v. 110kV S/C line to proposed Vishwanathapuram 110kV SS.

System studies has been conducted for the same and the study results are enclosed herewith.

Hence approval may be accorded for establishing Vishwanathapuram 400/230-110kV substation with the above mentioned connectivity.

5. Thiruvalem 400/110kV Ratio Introduction:

There is a tremendous demand growth due to Industrial development in and around Ranipet area. Hence, it is very essential to have a strengthened and reliable transmission network for providing uninterrupted power supply.

The proposed 400/110kV ratio introduction at Thiruvalem 400/230kV substation will give relief to the existing Thiruvalem 230 kV substation and will be useful for transferring the existing 110kV loads of Thiruvalem 230/110kV substation to the now proposed 400/110kV bus , during execution of the already sanctioned 110kV feeders strengthening work (fed from Thiruvalem 230KV SS) which is pending for execution due to non feasibility of transferring of loads of existing fully loaded feeders.

Hence, approval may be accorded for the proposed 400/110kV ratio introduction at Thiruvalem 400/230kV substation with the following connectivity.

400/110 kV ratio introduction at Thiruvalem 400/230 kV SS:

ICT : 2x200 MVA 400/110kV ICTs.

110 kV Connectivity:

- i) 110 kV Thiruvalem - M.V.Puram DC line.
- ii) 110 kV Thiruvalem - SIPCOT DC line.
- iii) 110kV Thiruvalem - Vaduganthangal SC line.

It is requested that the above points may be included in the agenda for the ensuing 2nd meeting of the SRSCT.


(D.Ravichandran)
Chief Engineer/Planning & R.C (i/c)
For Director/Transmission Projects

Encl :

Study results in sav. File - by email.

TAMILNADU TRANSMISSION CORPORATION LTD.
(Subsidiary of TNEB Ltd.)

From

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Dear Sir,

Sub: 2nd Southern Region Standing Committee on Transmission
- Agenda points - reg.

Ref: Joint study meeting held on 01.5.19 & 02.05.19 at SRPC/Bangalore.

The proposals in respect of TANTRANSCO, TamilNadu have been furnished below for including in the forthcoming Southern Region Standing Committee on Transmission (SRSCT) as the Agenda items for deliberations:

1.Vembakkam 230/110 kV SS:

Administrative approval was accorded by TANTRANSCO for establishing a 230/110 kV SS at Vembakkam by LILO of 230 kV MAPS – Echur line and the work is to be commenced soon. Hence approval for making LILO of 230 kV MAPS – Echur line at Vembakkam 230 kV SS is required as MAPS is a central generating station.

2. Bus Reactors:

Approval for erecting 400 kV Bus reactors are requested at the following locations :

1	Korattur	400KV	2x125 MVar
2	Manali	400KV	2x125 MVar
3	Guindy	400KV	2x125 MVar
4	Ottiapakkam	400KV	2x125 MVar
5	Pulianthope	400KV	1x125 MVar
6	Alamathy	400KV	1x125 MVar
7	Vellalaviduthi	400 kV	1x63 MVar

(WORK UNDER PROGRESS)



No - 107 / PSPD - II
24/5/2019

3. Alagarkoil 400/230-110 kV SS (in place of Kondagai) :

Konthagai 400/230-110 kV substation proposal was approved by CEA in the 41st and 42nd meeting of Standing Committee on Power System Planning with the following 400 kV connectivity :

- i) LILO of one circuit of 400 kV Kayathar-Karaikudi DC line by erecting 25 Km of DC line to Konthagai 400 kV SS.
- ii) 400 KV DC Link line from the proposed Virudhunagar 765/400 kV SS to Konthagai 400 kV SS.
- iii) Provision of 2x500 MVA 400/230 kV ICT & 2x200 MVA 400/110kV capacity.

As the identified land at Konthagai is only sufficient to establish a 400 kV GIS SS, as a cost effective measure, it has been decided to establish a 400 kV AIS SS in the premises of the existing Alagarkoil 230 kV SS by retaining the same 400 kV connectivity of Konthagai SS at Alagarkoil . System studies has been conducted for the same and the study results are enclosed herewith.

Hence approval may be accorded for establishing Alagarkoil 400/230-110 kV substation in place of Kondagai 400 kV SS with the following connectivity:

400 kV connectivity:

- i) LILO of one circuit of 400 kV Kayathar-Karaikudi DC line by erecting 25 Km of DC line to Konthagai 400 kV SS.
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- iii) Provision of 2x500 MVA 400/230 kV ICT & 2x200 MVA 400/110kV capacity.
- iv) 230kV and 110 kV connectivity of the existing Alagarkoil 230 kV SS will be retained. Additional 230 kV connectivity to the proposed new 230 kV SS at Thirupalai near Alagarkoil.

4. Vishwanathapuram 400/230-110kV SS:

Vishwanathapuram 400/230-110 kV SS has been envisaged for the following reasons:

- 1) Hosur area is a fastly developing industrial area. Industrial expansion is expected by way of proposed establishment of SEZ in future. Presently, EHT/HT service applications for around 90 MVA is pending with the distribution circle.

- 2) Due to overloading of auto transformers of the existing Hosur 230 kV SS & the upcoming Uddanapally 230 kV SS and certain 110 kV lines in that area , there is no feasibility to accommodate any additional loads.
- 3) There is no redundancy in the network for reliable operation in the event of contingency conditions.
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In view of the above, establishment of a 400 kV SS is necessitated to ensure reliability and source adequacy.

The proposal for establishment of Vishwanathapuram 400/110kV SS was discussed in the 1st meeting of Southern Region Standing Committee on Transmission (SRST) and it was decided to carry out joint system studies of Southern Region. Subsequently the proposal for establishment of Vishwanathapuram 400/230-110kV SS was discussed in the joint study meeting held on May 1st to 2nd 2019 at SRPC, Bengaluru.

ICTs:

2 x 500 MVA , 400/230 kV ICTs

3 x 200 MVA , 400/110 kV ICTs.

Provision of 1 x 125 MVA Bus Reactor.

Provision of 2 X 50 MVA Line reactor one on each line of 400kV Vishwanathapuram –Thiruvalem line at Vishwanathapuram SS end.

400 KV connectivity:

LILO of 400 kV Thiruvalem – Palavady Quad moose D/C line at the proposed Vishwanathapuram 400/ 230-110 kV SS.

230 KV connectivity:

- i. 230kV S/C line to the existing Hosur 230 kV SS.
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- v. 110kV S/C line to proposed Vishwanathapuram 110kV SS.

System studies has been conducted for the same and the study results are enclosed herewith.

Hence approval may be accorded for establishing Vishwanathapuram 400/230-110kV substation with the above mentioned connectivity.

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Hence, approval may be accorded for the proposed 400/110kV ratio introduction at Thiruvalem 400/230kV substation with the following connectivity.

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ICT : 2x200 MVA 400/110kV ICTs.

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(D. Ravichandran)
Chief Engineer/Planning & R.C (i/c)
For Director/Transmission Projects

Encl :

Study results in sav. File - by email.

VOLTAGE PROFILE OF 400 KV SUBSTATIONS IN CHENNAI

Sl. No.	400 KV Substation	Voltage in KV			
		Basecase		Case 1	Case 2
		Peak Load	Off Peak	Off Peak	Off Peak
1	MANALI	411	426	409	402
2	ALAMATHY	413	429	415	410
3	KORATTUR	412	427	409	402
4	GUINDY	414	430	414	408
5	PULIANTHOPE	410	426	408	401
6	SHOLINGANALLUR	413	429	414	408

Peak Load: 100%

Off Peak : 70 %

BASECASE : WITH OUT THE PROPOSED BUS REACTORS AT THE 400 KV SUBSTATIONS

CASE1 : BASECASE + WITH THE PROPOSED 1 X 125 MVAR BUS REACTORS AT THE 400 KV SUBSTATIONS

CASE2 : CASE1 + WITH THE PROPOSED 2 X 125 MVAR BUS REACTORS AT THE 400 KV SUBSTATIONS
AND 1 X 125 MVAR BUS REACTOR AT THE ALAMATHY & PULIANTHOPE 400 KV SUBSTATION

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1.Vembakkam 230/110 kV SS:

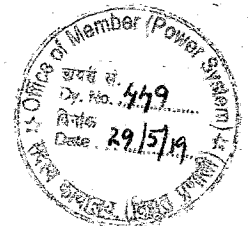
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(WORK UNDER PROGRESS)



No - 107 / PSPD - II
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Vishwanathapuram 400/230-110 kV SS has been envisaged for the following reasons:

- 1) Hosur area is a fastly developing industrial area. Industrial expansion is expected by way of proposed establishment of SEZ in future. Presently, EHT/HT service applications for around 90 MVA is pending with the distribution circle.

- 2) Due to overloading of auto transformers of the existing Hosur 230 kV SS & the upcoming Uddanapally 230 kV SS and certain 110 kV lines in that area , there is no feasibility to accommodate any additional loads.
- 3) There is no redundancy in the network for reliable operation in the event of contingency conditions.
- 4) Ensuring reliability of source in this area will reduce power interruption and avoid major revenue loss.

In view of the above, establishment of a 400 kV SS is necessitated to ensure reliability and source adequacy.

The proposal for establishment of Vishwanathapuram 400/110kV SS was discussed in the 1st meeting of Southern Region Standing Committee on Transmission (SRST) and it was decided to carry out joint system studies of Southern Region. Subsequently the proposal for establishment of Vishwanathapuram 400/230-110kV SS was discussed in the joint study meeting held on May 1st to 2nd 2019 at SRPC, Bengaluru.

ICTs:

2 x 500 MVA , 400/230 kV ICTs

3 x 200 MVA , 400/110 kV ICTs.

Provision of 1 x 125 MVA Bus Reactor.

Provision of 2 X 50 MVA Line reactor one on each line of 400kV Vishwanathapuram –Thiruvalem line at Vishwanathapuram SS end.

400 KV connectivity:

LILO of 400 kV Thiruvalem – Palavady Quad moose D/C line at the proposed Vishwanathapuram 400/ 230-110 kV SS.

230 KV connectivity:

- i. 230kV S/C line to the existing Hosur 230 kV SS.
- ii. 230kV D/C line to the proposed 230kV SS near Bagalur.
- iii. 230kV S/C line to the proposed Kalukondapally 230 kV SS.

110 KV connectivity:

- i. 110kV D/C line to Shoolagiri 110kV SS.
- ii. 110kV S/C line to Uddanapally 230kV SS
- iii. 110kV S/C line to proposed Alur 110kV SS.
- iv. 110kV D/C line to proposed Hosur SEZ 110kV SS.
- v. 110kV S/C line to proposed Vishwanathapuram 110kV SS.

System studies has been conducted for the same and the study results are enclosed herewith.

Hence approval may be accorded for establishing Vishwanathapuram 400/230-110kV substation with the above mentioned connectivity.

5. Thiruvalem 400/110kV Ratio Introduction:

There is a tremendous demand growth due to Industrial development in and around Ranipet area. Hence, it is very essential to have a strengthened and reliable transmission network for providing uninterrupted power supply.

The proposed 400/110kV ratio introduction at Thiruvalem 400/230kV substation will give relief to the existing Thiruvalem 230 kV substation and will be useful for transferring the existing 110kV loads of Thiruvalem 230/110kV substation to the now proposed 400/110kV bus , during execution of the already sanctioned 110kV feeders strengthening work (fed from Thiruvalem 230KV SS) which is pending for execution due to non feasibility of transferring of loads of existing fully loaded feeders.

Hence, approval may be accorded for the proposed 400/110kV ratio introduction at Thiruvalem 400/230kV substation with the following connectivity.

400/110 kV ratio introduction at Thiruvalem 400/230 kV SS:

ICT : 2x200 MVA 400/110kV ICTs.

110 kV Connectivity:

- i) 110 kV Thiruvalem - M.V.Puram DC line.
- ii) 110 kV Thiruvalem - SIPCOT DC line.
- iii) 110kV Thiruvalem - Vaduganthangal SC line.

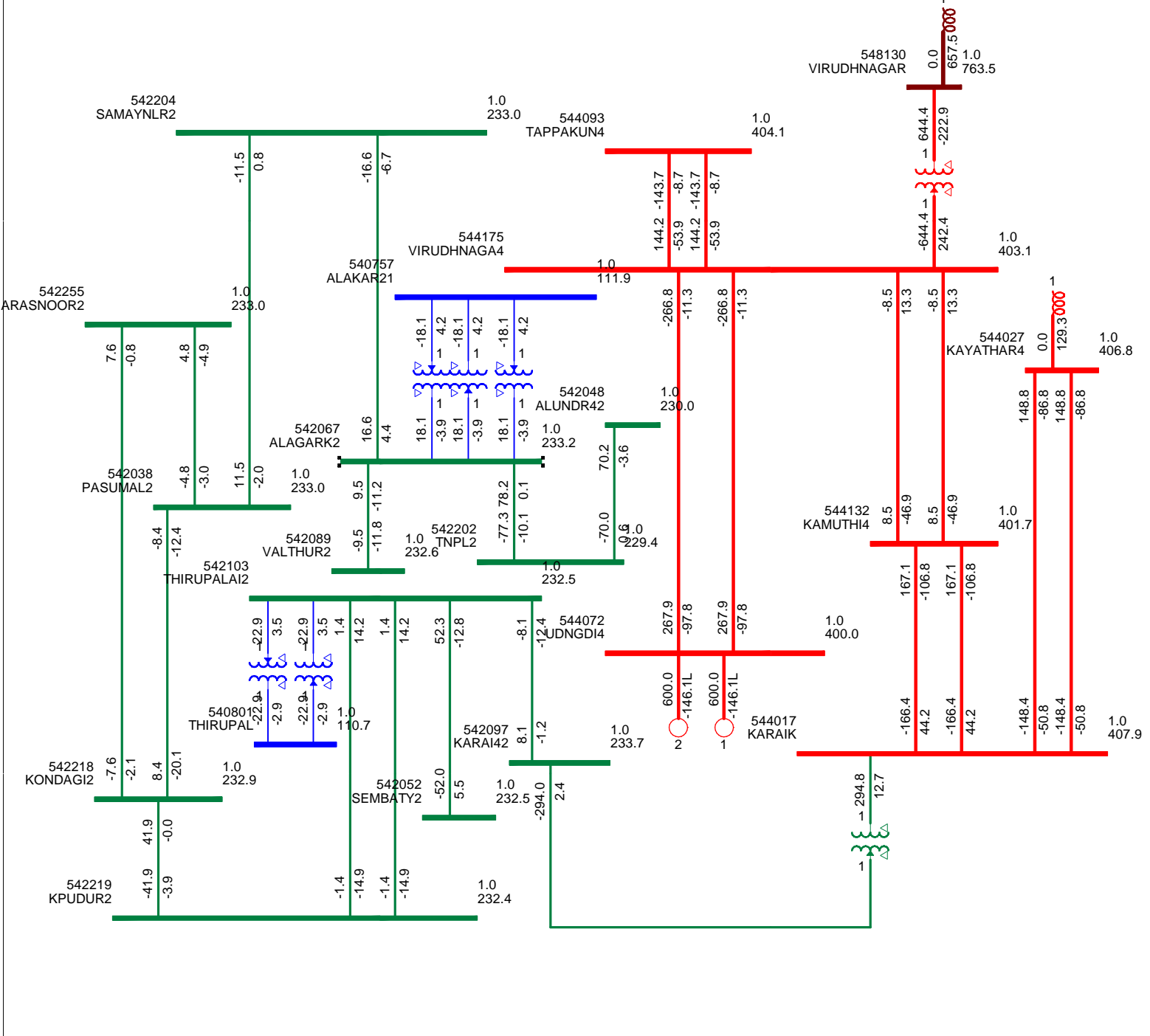
It is requested that the above points may be included in the agenda for the ensuing 2nd meeting of the SRSCT.


(D.Ravichandran)
Chief Engineer/Planning & R.C (i/c)
For Director/Transmission Projects

Encl :

Study results in sav. File - by email.

BASECASE_NIL WIND : WITH OUT THE PROPOSED ALAGARKOIL 400/230kV SUBSTATION

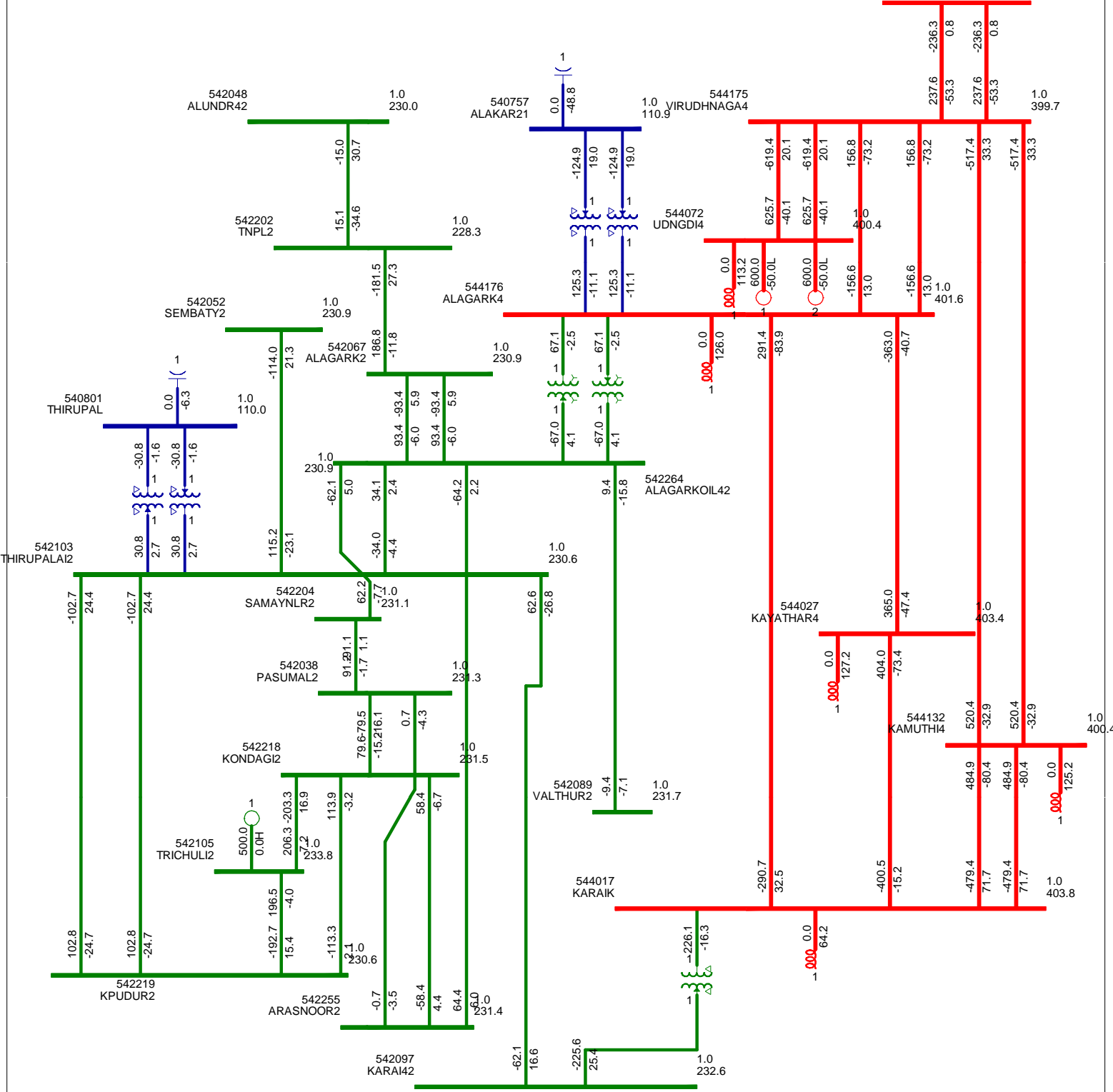


CASE1 : BASE + ALAGARKOIL 400/230-110KV SUBSTATION INSTEAD OF ALREADY APPROVED KONTHAGAI 400KV SS

FULL WIND FULL SOLAR CONDITION

544093
TAPPAKUN4

1.0
400.3

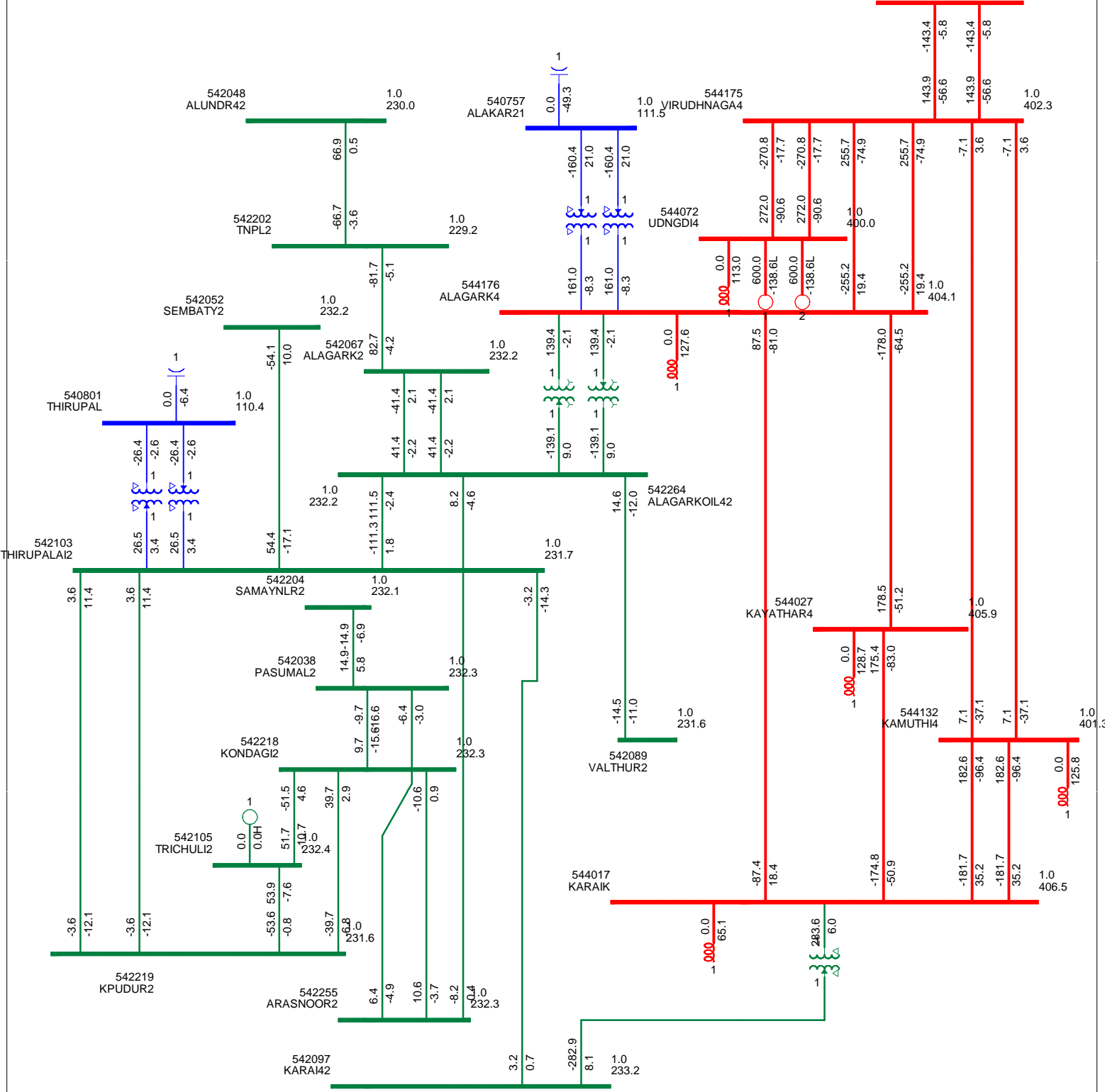


CASE1 : BASE + ALAGARKOIL 400/230-110KV SUBSTATION INSTEAD OF ALREADY APPROVED KONTHAGAI 400KV SS

NIL WIND NIL SOLAR CONDITION

544093
TAPPAKUN4

1.0
403.6



TAMILNADU TRANSMISSION CORPORATION LTD.
(Subsidiary of TNEB Ltd.)

From

Er.T.Senthilvelan, B.E.,
Director/Transmission Projects,
TANTRANSCO,
144, Anna Salai,
Chennai -2.

The Member (Power System),
Central Electricity Authority,
Sewa Bhavan, R.K.Puram,
New Delhi 110 066.

Lr.No.CE/Plg.&R.C/SE/SS/EE-II/AEE1/F. 2nd SRSCT/D. 115 /19 dt. 24.05.19

Dear Sir,

Sub: 2nd Southern Region Standing Committee on Transmission
- Agenda points - reg.

Ref: Joint study meeting held on 01.5.19 & 02.05.19 at SRPC/Bangalore.

The proposals in respect of TANTRANSCO, TamilNadu have been furnished below for including in the forthcoming Southern Region Standing Committee on Transmission (SRSCT) as the Agenda items for deliberations:

1.Vembakkam 230/110 kV SS:

Administrative approval was accorded by TANTRANSCO for establishing a 230/110 kV SS at Vembakkam by LILO of 230 kV MAPS – Echur line and the work is to be commenced soon. Hence approval for making LILO of 230 kV MAPS – Echur line at Vembakkam 230 kV SS is required as MAPS is a central generating station.

2. Bus Reactors:

Approval for erecting 400 kV Bus reactors are requested at the following locations :

1	Korattur	400KV	2x125 MVar
2	Manali	400KV	2x125 MVar
3	Guindy	400KV	2x125 MVar
4	Ottiapakkam	400KV	2x125 MVar
5	Pulianthope	400KV	1x125 MVar
6	Alamathy	400KV	1x125 MVar
7	Vellalaviduthi	400 kV	1x63 MVar

(WORK UNDER PROGRESS)



No - 107 / PSPD - II
24/5/2019

3. Alagarkoil 400/230-110 kV SS (in place of Kondagai) :

Konthagai 400/230-110 kV substation proposal was approved by CEA in the 41st and 42nd meeting of Standing Committee on Power System Planning with the following 400 kV connectivity :

- i) LILO of one circuit of 400 kV Kayathar-Karaikudi DC line by erecting 25 Km of DC line to Konthagai 400 kV SS.
- ii) 400 KV DC Link line from the proposed Virudhunagar 765/400 kV SS to Konthagai 400 kV SS.
- iii) Provision of 2x500 MVA 400/230 kV ICT & 2x200 MVA 400/110kV capacity.

As the identified land at Konthagai is only sufficient to establish a 400 kV GIS SS, as a cost effective measure, it has been decided to establish a 400 kV AIS SS in the premises of the existing Alagarkoil 230 kV SS by retaining the same 400 kV connectivity of Konthagai SS at Alagarkoil . System studies has been conducted for the same and the study results are enclosed herewith.

Hence approval may be accorded for establishing Alagarkoil 400/230-110 kV substation in place of Kondagai 400 kV SS with the following connectivity:

400 kV connectivity:

- i) LILO of one circuit of 400 kV Kayathar-Karaikudi DC line by erecting 25 Km of DC line to Konthagai 400 kV SS.
- ii) 400 KV DC Link line from the proposed Virudhunagar 765/400 kV SS to Konthagai 400 kV SS.
- iii) Provision of 2x500 MVA 400/230 kV ICT & 2x200 MVA 400/110kV capacity.
- iv) 230kV and 110 kV connectivity of the existing Alagarkoil 230 kV SS will be retained. Additional 230 kV connectivity to the proposed new 230 kV SS at Thirupalai near Alagarkoil.

4. Vishwanathapuram 400/230-110kV SS:

Vishwanathapuram 400/230-110 kV SS has been envisaged for the following reasons:

- 1) Hosur area is a fastly developing industrial area. Industrial expansion is expected by way of proposed establishment of SEZ in future. Presently, EHT/HT service applications for around 90 MVA is pending with the distribution circle.

- 2) Due to overloading of auto transformers of the existing Hosur 230 kV SS & the upcoming Uddanapally 230 kV SS and certain 110 kV lines in that area , there is no feasibility to accommodate any additional loads.
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400 KV connectivity:

LILO of 400 kV Thiruvalem – Palavady Quad moose D/C line at the proposed Vishwanathapuram 400/ 230-110 kV SS.

230 KV connectivity:

- i. 230kV S/C line to the existing Hosur 230 kV SS.
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System studies has been conducted for the same and the study results are enclosed herewith.

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400/110 kV ratio introduction at Thiruvalem 400/230 kV SS:

ICT : 2x200 MVA 400/110kV ICTs.

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- i) 110 kV Thiruvalem - M.V.Puram DC line.
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It is requested that the above points may be included in the agenda for the ensuing 2nd meeting of the SRSCT.


(D. Ravichandran)
Chief Engineer/Planning & R.C (i/c)
For Director/Transmission Projects

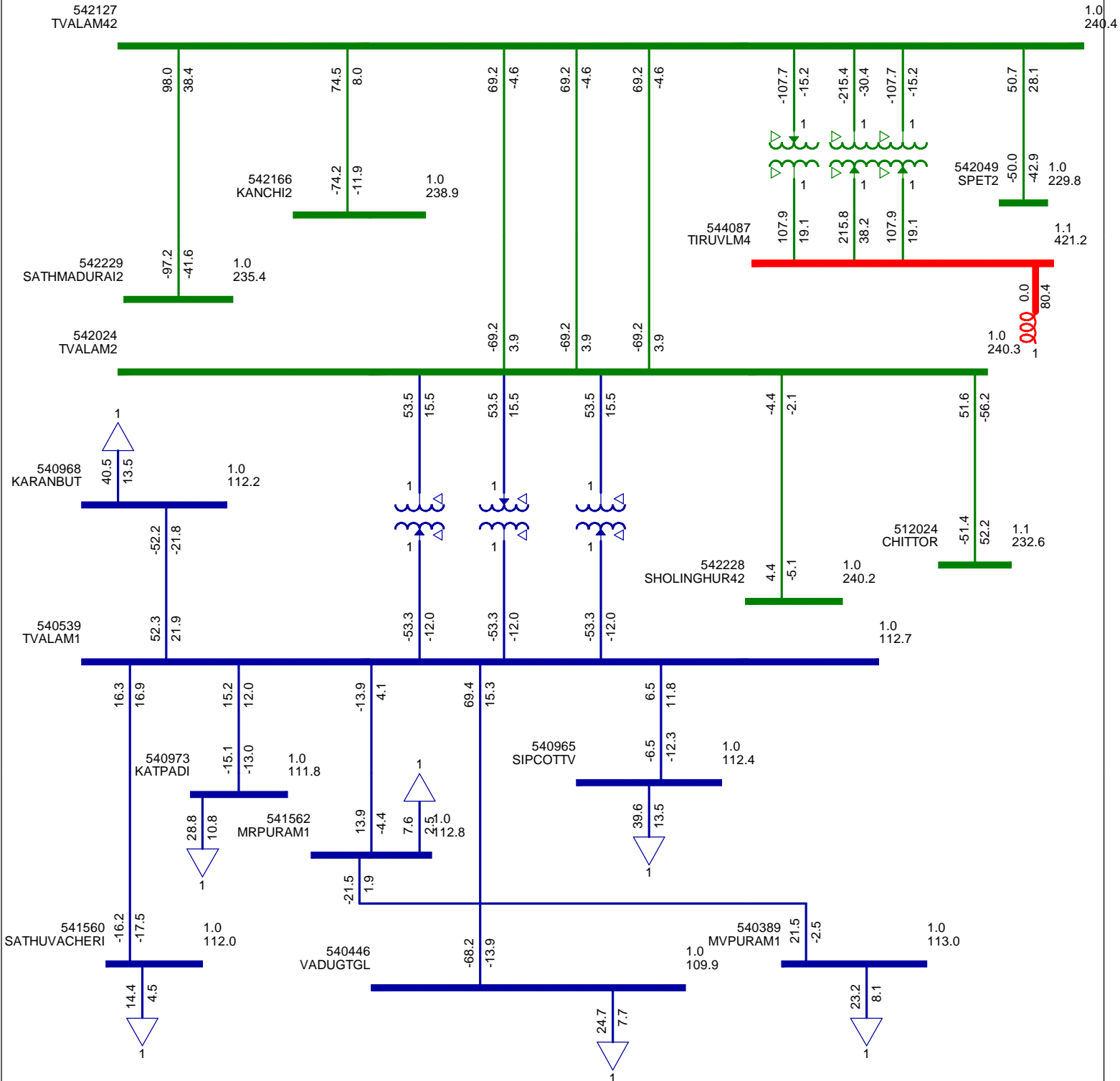
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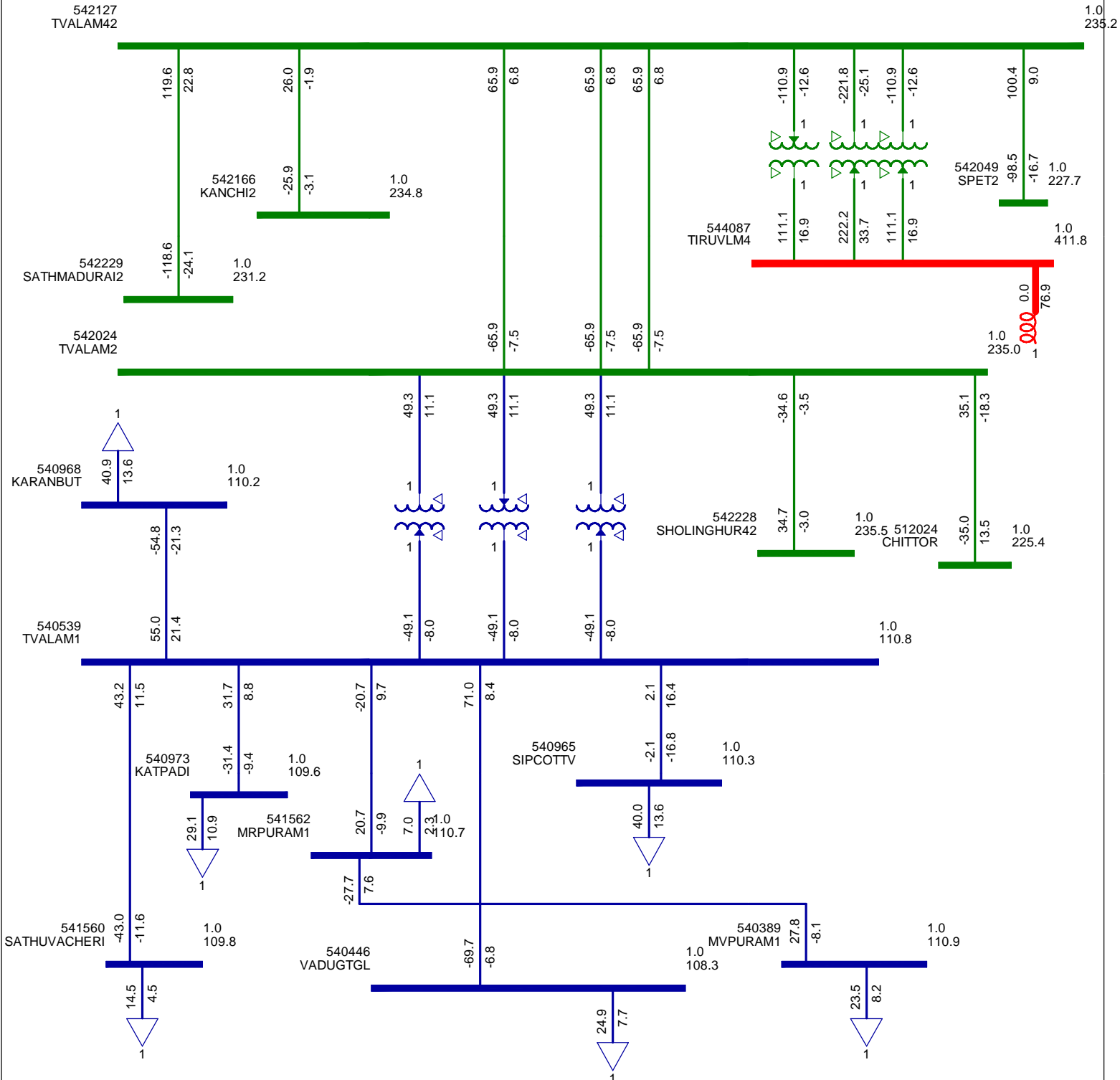
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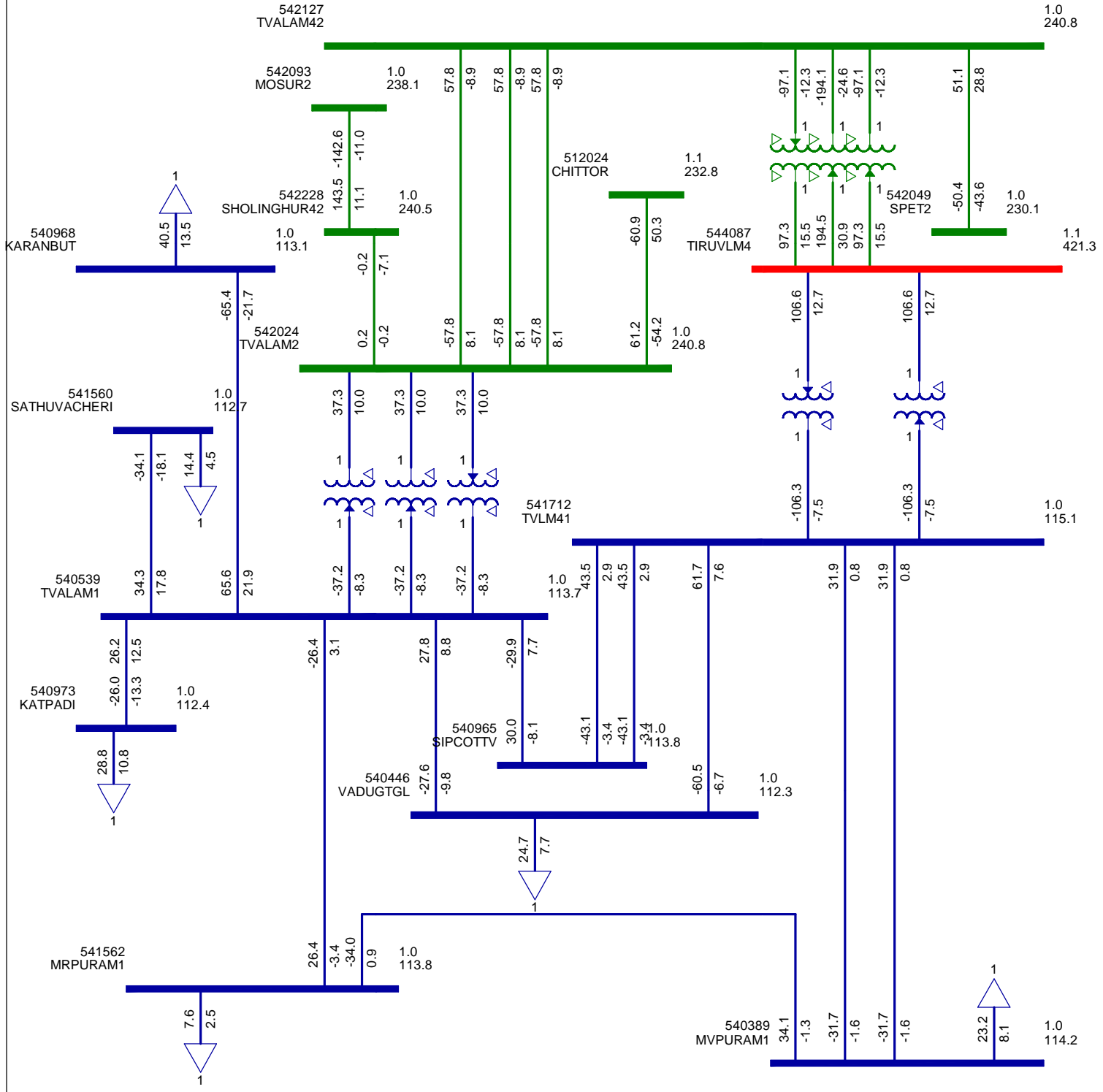
BASECASE(FWFS) : WITH THE EXISTING 400/230KV RATIO AT THIRUVALAM 400KV SS



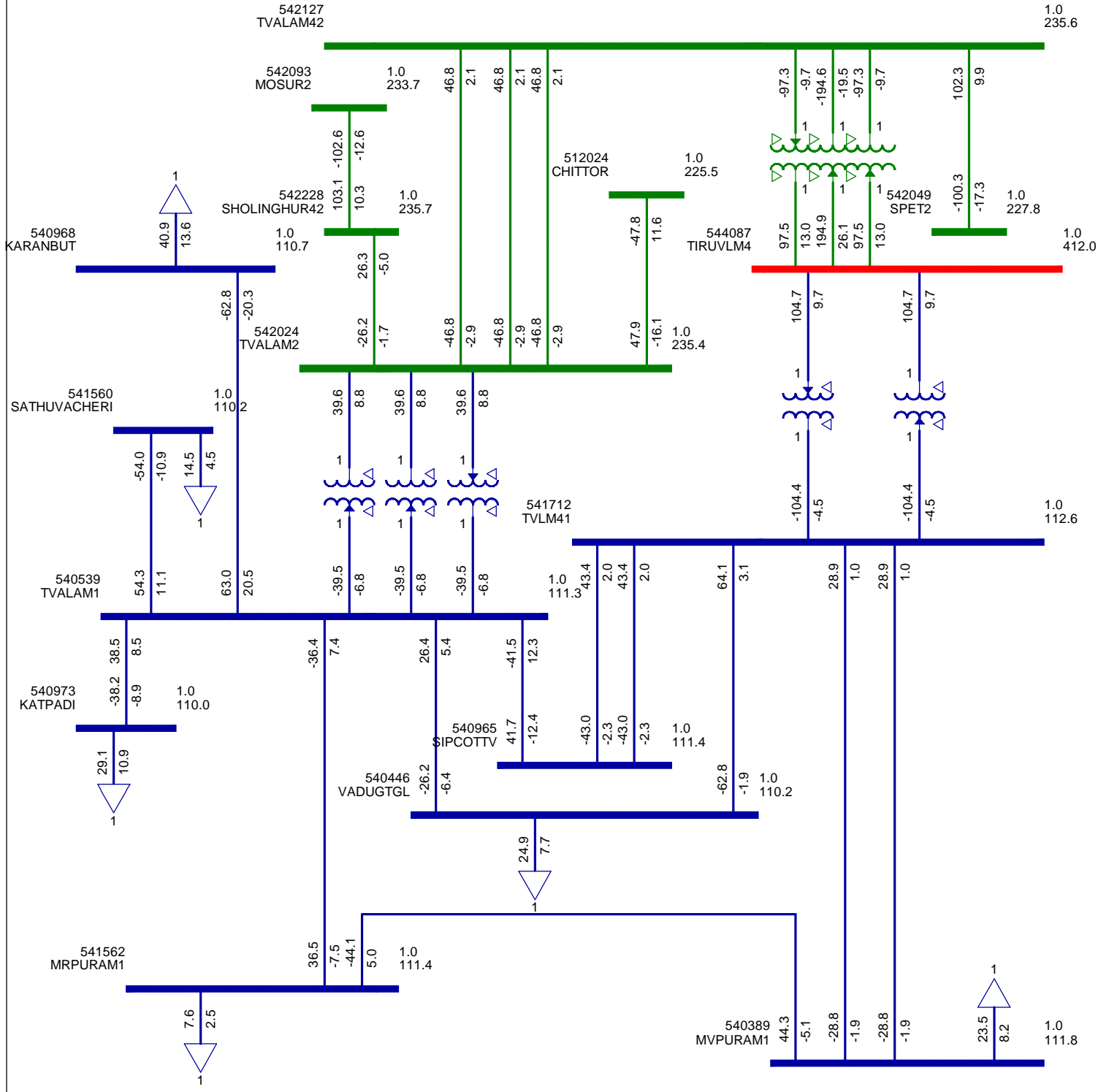
BASECASE(NWNS) : WITH THE EXISTING 400/230KV RATIO AT THIRUVALAM 400KV SS



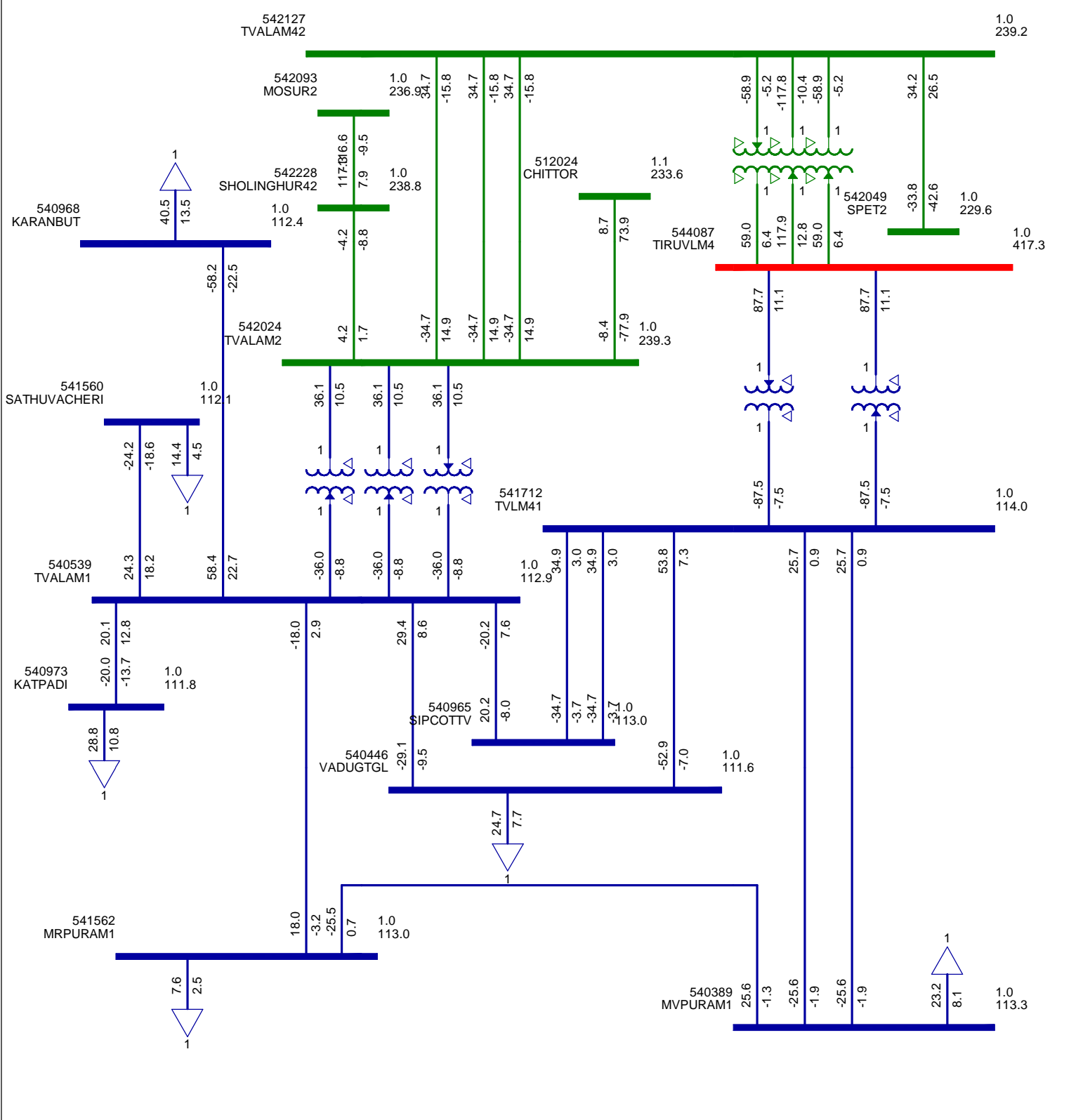
CASE1 (FWFS) : BASECASE + WITH THE INTRODUCTION OF 400/110KV RATIO AT THIRUVALAM 400KV SS



CASE1 (NWNS) : BASECASE + WITH THE INTRODUCTION OF 400/110KV RATIO AT THIRUVALAM 400KV SS



**CASE2 (FWFS) : BASECASE + WITH THE INTRODUCTION OF 400/110KV RATIO AT THIRUVALAM 400KV SS
& WITH THE PROPOSED SPLIT BUS ARRANGEMENT AT THIRUVALAM 400KV SS**



**CASE2 (NWNS) : BASECASE + WITH THE INTRODUCTION OF 400/110KV RATIO AT THIRUVALAM 400KV SS
& WITH THE PROPOSED SPLIT BUS ARRANGEMENT AT THIRUVALAM 400KV SS**

