

पावर ग्रिड कारपोरेशन ऑफ इंडिया लिमिटेड

(भारत सरकार का उद्यम)

POWER GRID CORPORATION OF INDIA LIMITED

(A Government of India Enterprise)



पावरग्रिड

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CIN : L40101DL1989GOI038121

C\CTU-PIg\Angul-Srikakulam

Date: 10th October, 2016

Shri Pradeep Jindal

Chief Engineer (PSPA-II),
Central Electricity Authority,
Sewa Bhawan, R K Puram,
New Delhi - 110 066.

Subject: Temporary Charging of Srikakulam – Vemagiri(PG) 765 kV D/c line at 400 kV by joining it with LILO of Gazuwaka – Vijayawada 400 kV S/c at Vemagiri(PG)

Dear Sir,

Implementation of following transmission elements of Angul – Srikakulam – Vemagiri-II(PG) Inter regional system has been planned under various schemes :

- a) Srikakulam Pooling Station – Angul 765 kV D/c
- b) Establishment of 2 X 1500 MVA, 765/400 kV pooling station in Srikakulam
- c) Srikakulam – Vemagiri-II 765kV D/c line
- d) Establishment of 765/400kV GIS Pooling station at Vemagiri with 2x1500 MVA, 765/400 kV transformers
- e) LILO of Gazuwaka – Vijayawada 400kV S/c line at Vemagiri Pooling Station

Construction of Angul – Srikakulam – Vemagiri-II(PG) 765 kV D/c Inter regional line alongwith 765/400 kV Substations at Srikakulam & Vemagiri and LILO of Gazuwaka – Vijayawada 400 kV S/c at Vemagiri(PG) was expected to be completed during September/October, 2016. However, construction of 765/400kV GIS Pooling station at Vemagiri is expected to take some more time due to delay in supply of GIS equipment. Nevertheless, Angul – Srikakulam – Vemagiri(PG) 765 kV D/c can be gainfully utilized by charging Srikakulam – Vemagiri(PG) 765 kV D/c at 400 kV and joining it with LILO of Gazuwaka – Vijayawada 400 kV S/c at Vemagiri(PG).

With proposed arrangement, the charging, power flow and dynamic stability studies have been carried out. From the studies, it has been observed that it is feasible to charge the long lines with the use of bus reactors at Vemagiri as midpoint reactors and also the ATC can be enhanced by 400 MW.

The detailed study report in this regard is enclosed herewith for concurrence at your end please.

Thanking you

Yours faithfully,

Mukesh Khanna
10/10/16
(Mukesh Khanna)
AGM (CTU-PIg)

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Save Energy for Benefit of Self and Nation

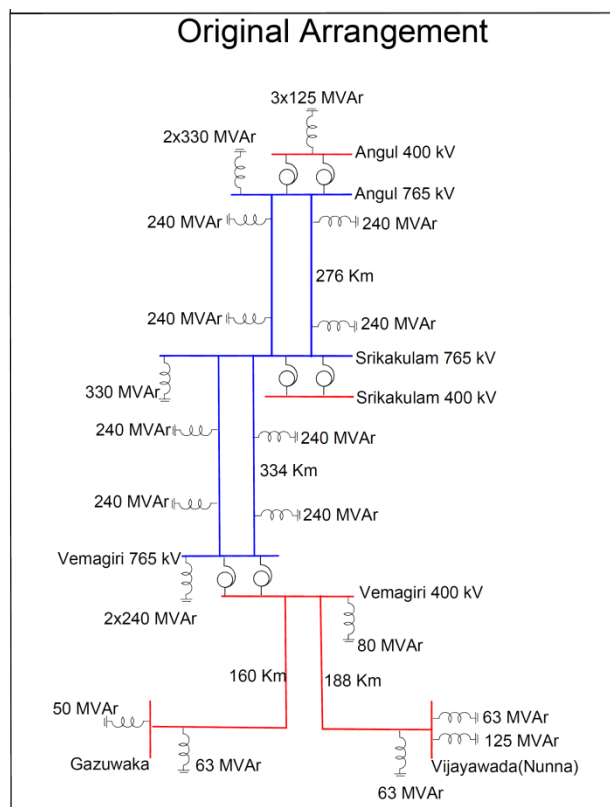
Temporary Charging of Srikakulam – Vemagiri(PG) 765 kV D/c line at 400 kV by joining it with LILO of Gazuwaka – Vijayawada 400 kV S/c at Vemagiri(PG)

1.0 Introduction

Construction of following transmission elements of Angul – Srikakulam – Vemagiri-II(PG) Inter regional system has been planned under various schemes :

- Srikakulam Pooling Station – Angul 765 kV D/c
- Establishment of 2 X 1500 MVA, 765/400 kV pooling station in Srikakulam
- Srikakulam – Vemagiri-II 765kV D/c line
- Establishment of 765/400kV GIS Pooling station at Vemagiri with 2x1500 MVA, 765/400 kV transformers
- LILO of Gazuwaka – Vijayawada 400kV S/c line at Vemagiri Pooling Station

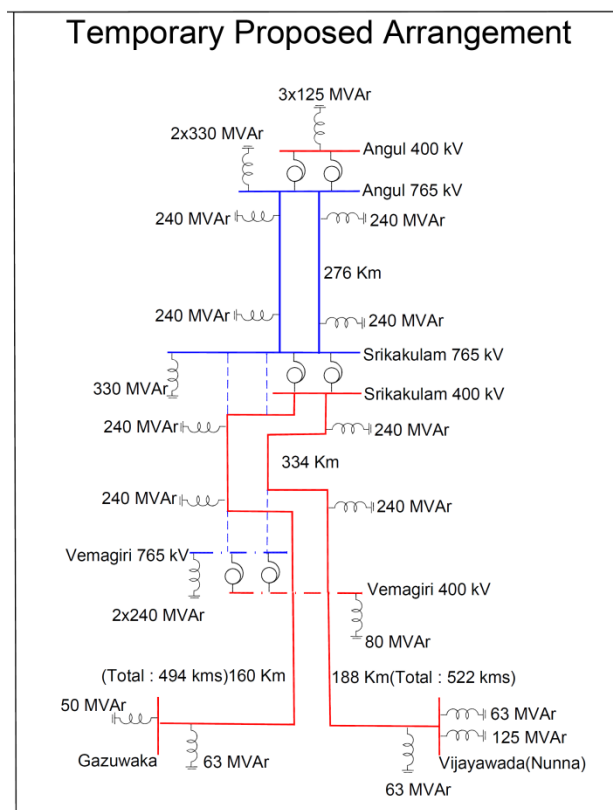
The schematic of original arrangement is given below :



Construction of Angul – Srikakulam – Vemagiri-II(PG) 765 kV D/c Inter regional line alongwith 765/400 kV Substations at Srikakulam & Vemagiri and LILO of Gazuwaka – Vijayawada 400 kV S/c at Vemagiri(PG) was expected to be completed during September/October,2016. However, construction of 765/400kV GIS Pooling station at

Vemagiri is expected to take some more time due to delay in supply of GIS equipment. Nevertheless, Angul – Srikakulam – Vemagiri(PG) 765 kV D/c can be gainfully utilized by charging Srikakulam – Vemagiri(PG) 765 kV D/c at 400 kV and joining it with LILo of Gazuwaka – Vijayawada 400 kV S/c at Vemagiri(PG).

The schematic for temporary proposed arrangements are given below :



With proposed arrangement, the charging, power flow and dynamic stability studies have been carried out. From the studies, it has been observed that it is feasible to charge the long lines with the use of bus reactors at Vemagiri as midpoint reactors and also the ATC can be enhanced by 400 MW. The details of studies are given below :

2.0 Charging Studies

Simulations are carried out for charging the above Angul- Srikaulam – Vemagiri 765 kV D/c line. Based on the availability and distribution of reactors following sequence is proposed :

- i. Angul – Srikakulam 765 kV D/c line from Angul end – 276 Kms
- ii. Charging of Srikakulam –Vemagiri 765 kV line alongwith Vemagiri - Vijayawada 400 kV S/c line from Srikakulam – 522 Kms
- iii. Charging of Srikakulam —Vemagiri 765 kV line alongwith Vemagiri –Gazuwaka 400 kV S/c line from Srikakulam –494 Kms

i. Charging of Angul – Srikakulam 765 kV D/c line from Angul – 276 Kms

Charging study has been carried out considering 240 MVAR line reactors at both ends of Angul – Srikakulam 765 kV D/c line. Charging of Angul-Srikakulam 765 kV D/c line from Angul end at 765 kV will result in total rise of about 20 kV, i.e. 8 kV source rise & 12 kV line rise. Accordingly, the pre charging voltage of about 775 kV or lower is to be maintained at Angul end. To achieve the same, available 2x330 MVAR bus reactors at Angul 765 kV Switchyard and 3x125 MVAR reactors at Angul 400 kV Switchyard can be taken into service.

For charging lines (ii) & (iii), both lines of Angul – Srikakulam along with 2 x1500 MVA transformers at Srikakulam has been considered as pre charging condition.

ii. Charging of Srikakulam –Vemagiri - Vijayawada 400 kV S/c line from Srikakulam – 522 Kms

Charging study has been carried out considering 240 MVAR line reactor rated at 765 kV (i.e. 65 MVAR Charged at 400 kV) at both ends of Srikakulam-Vemagiri line section at 400 kV and 63 MVAR line reactor at Vijayawada end of Vemagiri – Vijayawada 400 kV line section. Studies indicate, total rise of about 32 kV, i.e. 10 kV source rise & 22 kV line rise. Accordingly, the pre charging voltage of about 385 kV or lower is to be maintained at Srikakulam end. To achieve the same, available 330 MVAR bus reactor at Srikakulam 765 kV Switchyard can be taken into service.

Studies has been repeated considering 80 MVAR bus reactor taken into service as additional line reactor. Studies indicated total rise of 12 kV, i.e. 6 kV source rise & 6 kV line rise. Accordingly, the pre charging voltage of about 405 kV or lower is to be maintained at Srikakulam end.

iii. Charging of Srikakulam –Vemagiri - Gazuwaka 400 kV S/c line from Srikakulam – 494 Kms

Charging study has been carried out considering 240 MVAR line reactor rated at 765 kV (i.e 65 MVAR Charged at 400 kV) at both ends of Srikakulam-Vemagiri line section at 400 kV and 63 MVAR line reactor at Gazuwaka end of Vemagiri – Gazuwaka 400 kV line section. Studies indicate, total rise of about 26 kV, i.e. 8 kV source rise & 18 kV line rise. Accordingly, the pre charging voltage of about 390 kV or lower is to be maintained at Srikakulam end. To achieve the same, available 330 MVAR bus reactor at Srikakulam 765 kV Swithyard can be taken into service.

Studies has been repeated considering 240 MVAR bus reactor(charged at 400 kV, i.e. 65 MVAR) is taken into service as additional line reactor. Studies indicated total rise of 8 kV, i.e 4 kV source rise & 4 kV line rise. Accordingly, the pre charging voltage of about 410 kV or lower is to be maintained at Srikakulam end.

Simulation results for charging studies is enclosed at **Exhibit-I**

3.0 Power Flow & TTC Enhancement

It is observed from the load flow that about 545 MW power flow on Srikakulam – Vijayawada 400 kV S/c line (522 kms) would result in angular difference of 30 degrees between Srikakulam and Vijayawada. Accordingly, it is proposed to limit the power flow on Srikakulam – Vijayawada 400 kV S/c line as 545 MW under n-1 contingency. Similarly it is also proposed to limit the flow on Srikakulam – Gazuwaka 400 kV S/c line(494 kms) also to 545 MW.

In base case with 6650 MW SR import, the power flow on Srikakulam – Vijayawada 400kV line is about 430 MW and Srikakulam – Gazuwaka line is about 235 MW and no problem is envisaged regarding loading on transmission lines. Following Simulation results are enclosed at **Exhibit-IIA**.

Case 1	Base Case with 6650 MW import
Case 1A	Case 1 with n-1 contingency of Srikakulam - Gazuwaka 400 kV S/c line
Case 1B	Case 1 with n-1 contingency of Srikakulam – Vijayawada 400 kV S/c line

Case 1C	Case 1 with n-1 contingency of Raichur – Solapur 765 kV S/c line
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From the TLTG results it has been observed that TTC is increased by about 500 MW in case of import is from WR with the limiting constraint is loading on Srikakulam – Vijayawada 400 kV S/c line under the outage of Srikakulam – Gazuwaka 400 kV S/c line. Similarly in case of import is from ER, increase in TTC is 400 MW with the limiting constraint is loading on Srikakulam – Vijayawada 400 kV S/c line under the outage of Srikakulam – Gazuwaka 400 kV S/c line (TLTG results given at **Exhibit-III**). All other line loadings are well within limits. Accordingly, with conservative approach the increase in TTC from present value of 6650 MW would be 400 MW(i.e. total TTC of 7050 MW).

Further, simulation results with import of 7050 MW indicate that Srikakulam – Vijayawada 400 kV line will be loaded to about 470 MW and Srikakulam – Gazuwaka 400 kV line will be loaded about 280 MW and no problem is envisaged regarding loading on transmission lines. Under contingency of Srikakulam – Gazuwaka 400 kV line, Srikakulam – Vijayawada 400 kV line will be loaded to about 540 MW and under contingency of Raichur – Solapur 765kV S/c line, Srikakulam – Vijayawada 400 kV line will be loaded to about 520 MW which is well within the limit of the line. Following Simulation results are enclosed at **Exhibit-IIB**.

Case 2	Case with 7050 MW import
Case 2A	Case 2 with n-1 contingency of Srikakulam - Gazuwaka 400 kV S/c line
Case 2B	Case 1 with n-1 contingency of Srikakulam – Vijayawada 400 kV S/c line
Case 2C	Case 2 with n-1 contingency of Raichur – Solapur 765 kV S/c line

The above arrangement will relieve loading on Raichur – Solapur 765 kV 2xS/c lines and enhance grid reliability by providing additional inter regional path between rest of the grid and southern region.

4.0 Stability Study

Dynamic simulation study has also been carried out to study stability of the system with 7050 MW import to SR. In the study, the rotor angles of the machines at the vicinity of

Angul area(Jindal-660 MW), Gazuwaka area(Simhadri-500 MW) & Vijayawada area(VTPS-IV-500 MW) has been studied with the fault near Srikakulam bus and subsequent outage of Srikakulam – Gazuwaka 400kV S/c line, Srikakulam – Vijayawada 400kV S/c line & Srikakulam – Angul 765 kV S/c line in each case. The plots for rotor angles for machines at Angul(Jindal), Gazuwaka(Simhadri-II), Vijayawada(VTPS), power flow on all inter regional AC lines of Southern Region, Srikakulam – Vijayawada 400kV S/c and Srikakulam – Gazuwaka 400kV S/c lines are given in **Exhibit-IV**. From the study it has been observed that oscillations of machines gets stabilized within 10 to 15 seconds.

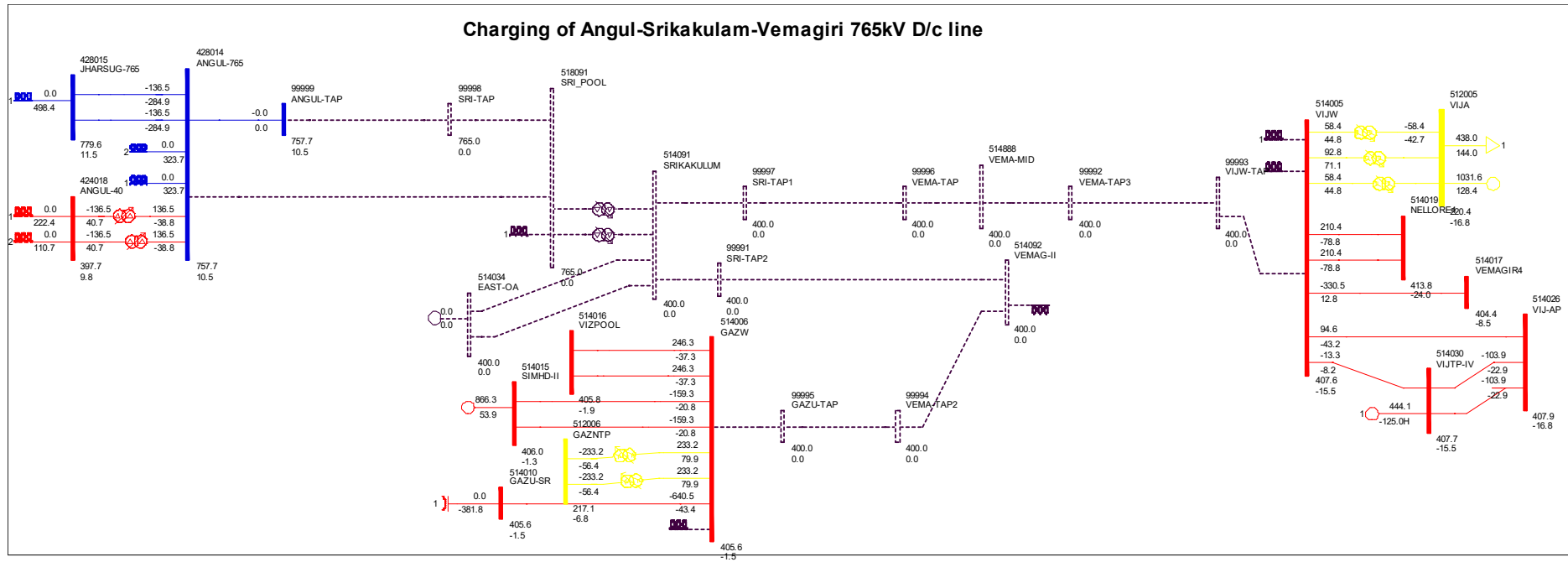
Further, considering high angle difference between Srikakulam and Vijayawada dynamic Simulation Studies are also carried out for charging the line 400 kV S/c Srikakulam – Vijayawada line. From the study it has been observed that oscillations of relative angle between the buses will get stabilized within 6 to 9 seconds.

5.0 Conclusion

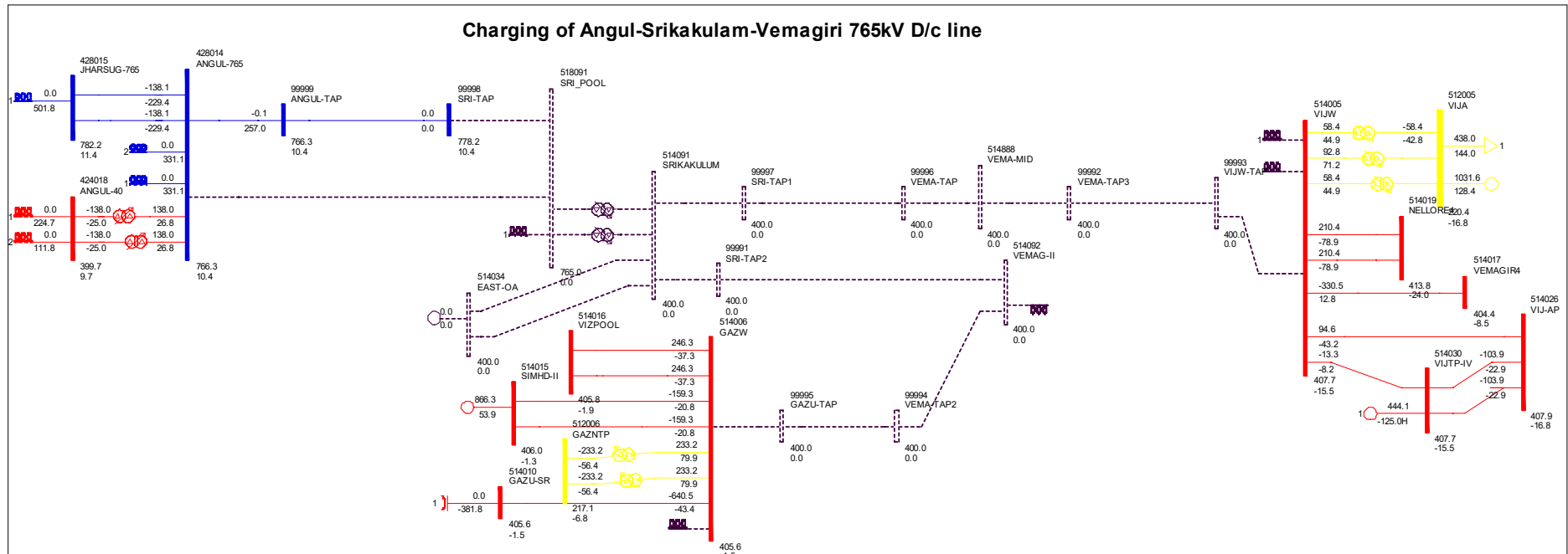
Construction of Angul – Srikakulam – Vemagiri(PG) 765 kV D/c Inter regional line alongwith 765/400 kV Substations at Srikakulam & Vemagiri and LILO of Gazuwaka – Vijayawada 400 kV S/c at Vemagiri(PG) was expected to be completed during October,2016. However, construction of 765/400kV GIS Pooling station at Vemagiri is expected to take some more time due to delay in supply of GIS equipment. However, Angul – Srikakulam – Vemagiri(PG) 765 kV D/c can be gainfully utilized by charging Srikakulam – Vemagiri(PG) 765 kV D/c at 400 kV and joining it with LILO of Gazuwaka – Vijayawada 400 kV S/c at Vemagiri(PG). For charging and utilization of the proposed scheme, charging, power flow and dynamic stability studies have been carried out and based on studies following is summarized.

- a) It is feasible to charge the long lines with the use of bus reactors at Vemagiri as midpoint reactors.
- b) As per load flow studies, no problem is envisaged in enhancing the ATC by 400 MW.
- c) With the enhanced ATC of 400 MW, no problem is envisaged in the dynamic stability studies.

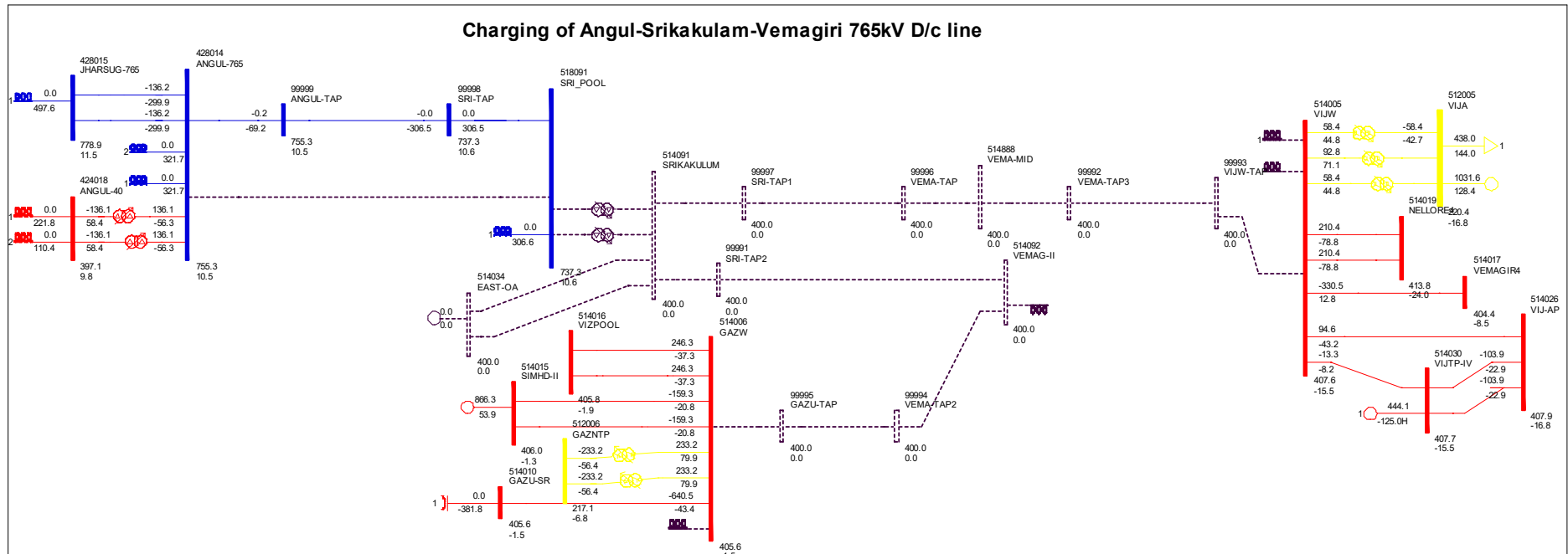
CHARGING OF ANGUL – SRIKAKULAM CIRCUIT - I



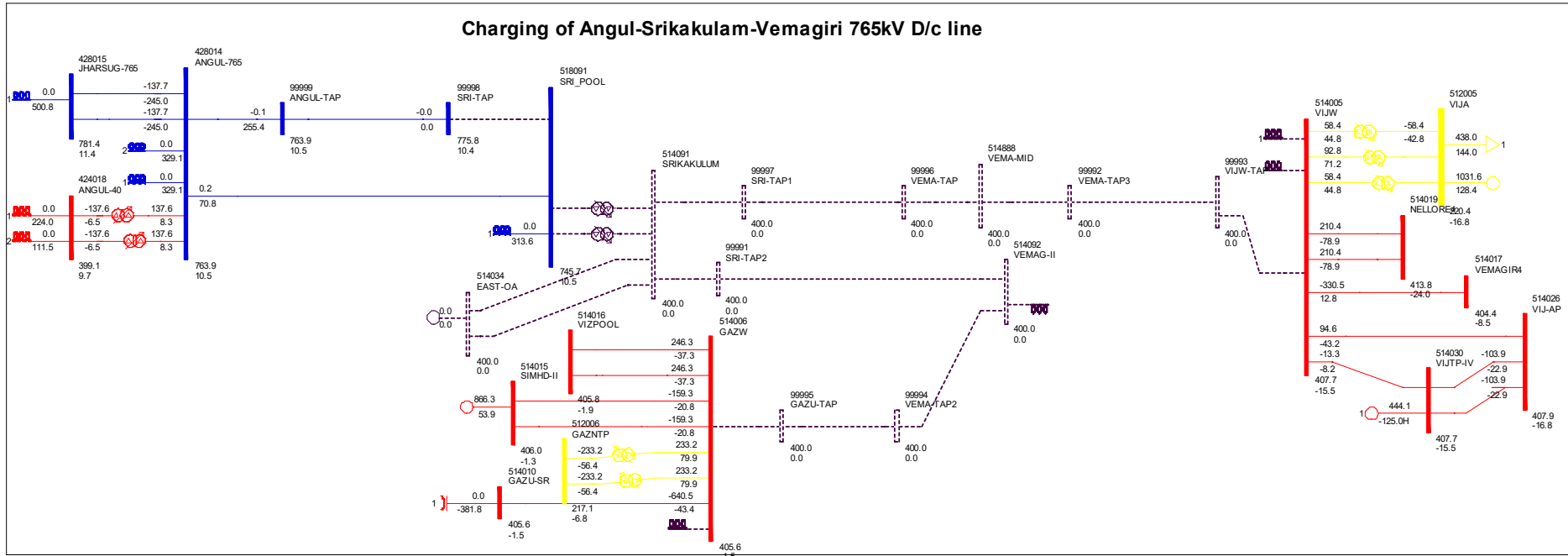
CHARGING OF ANGUL – SRIKAKULAM CIRCUIT - I



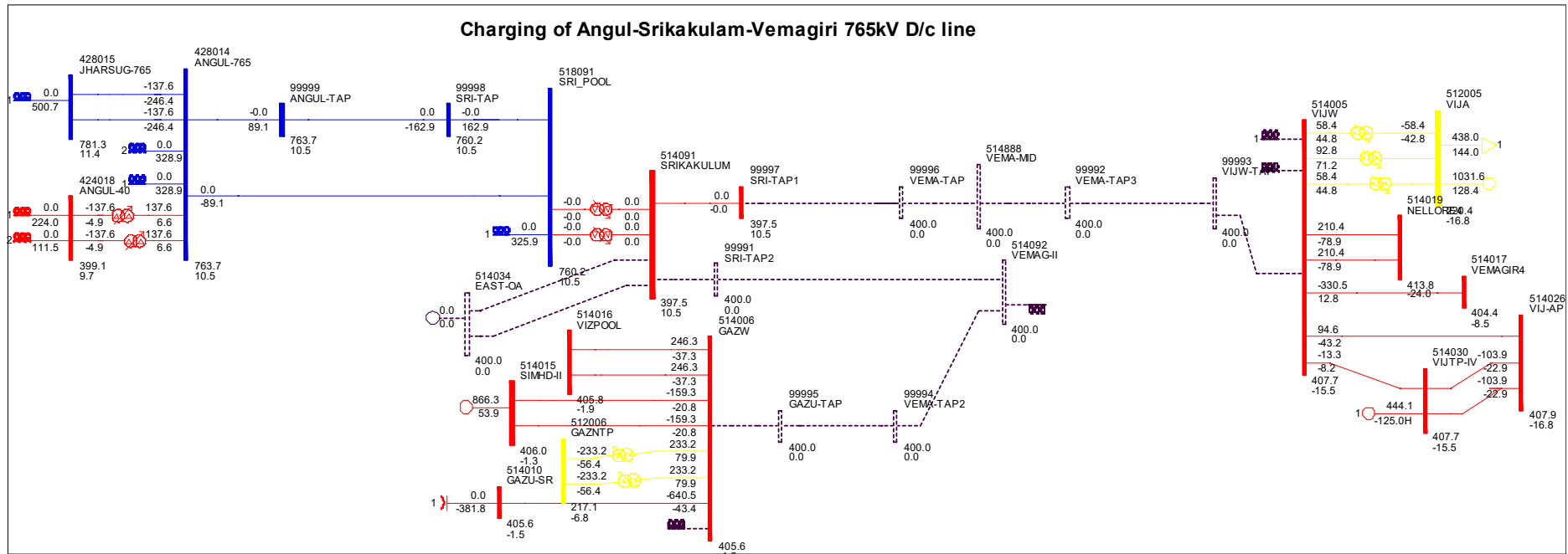
CHARGING OF ANGUL – SRIKAKULAM CIRCUIT - II



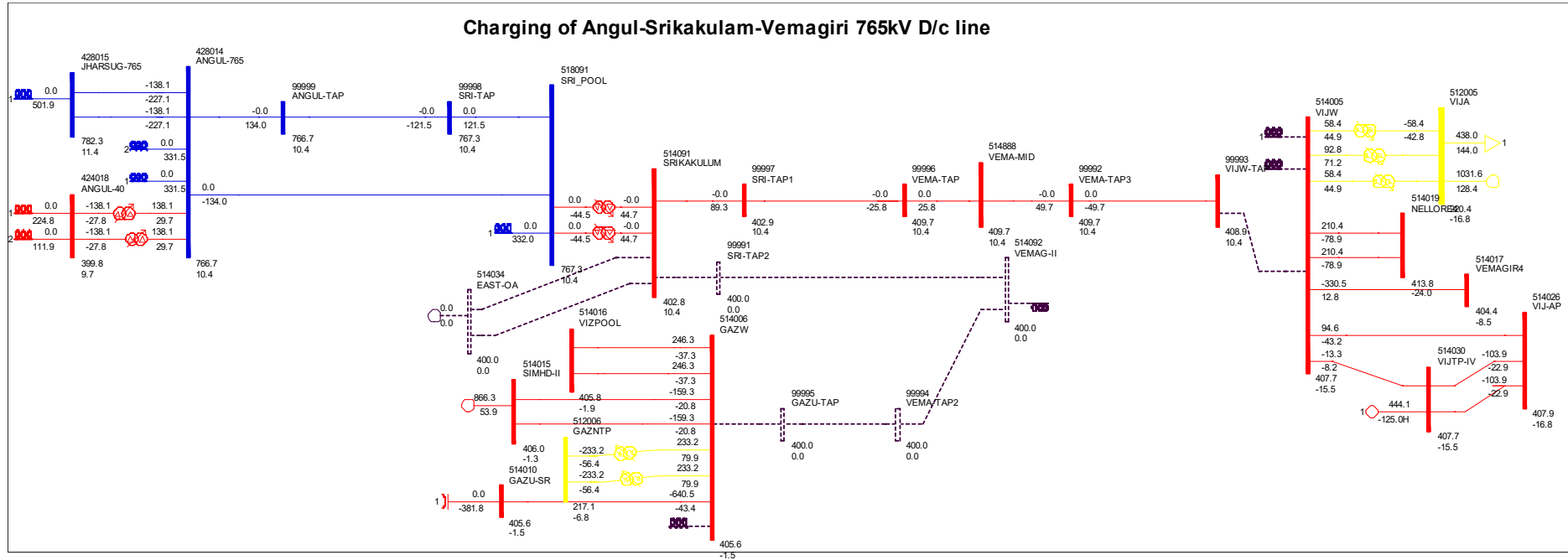
CHARGING OF ANGUL – SRIKAKULAM CIRCUIT - II



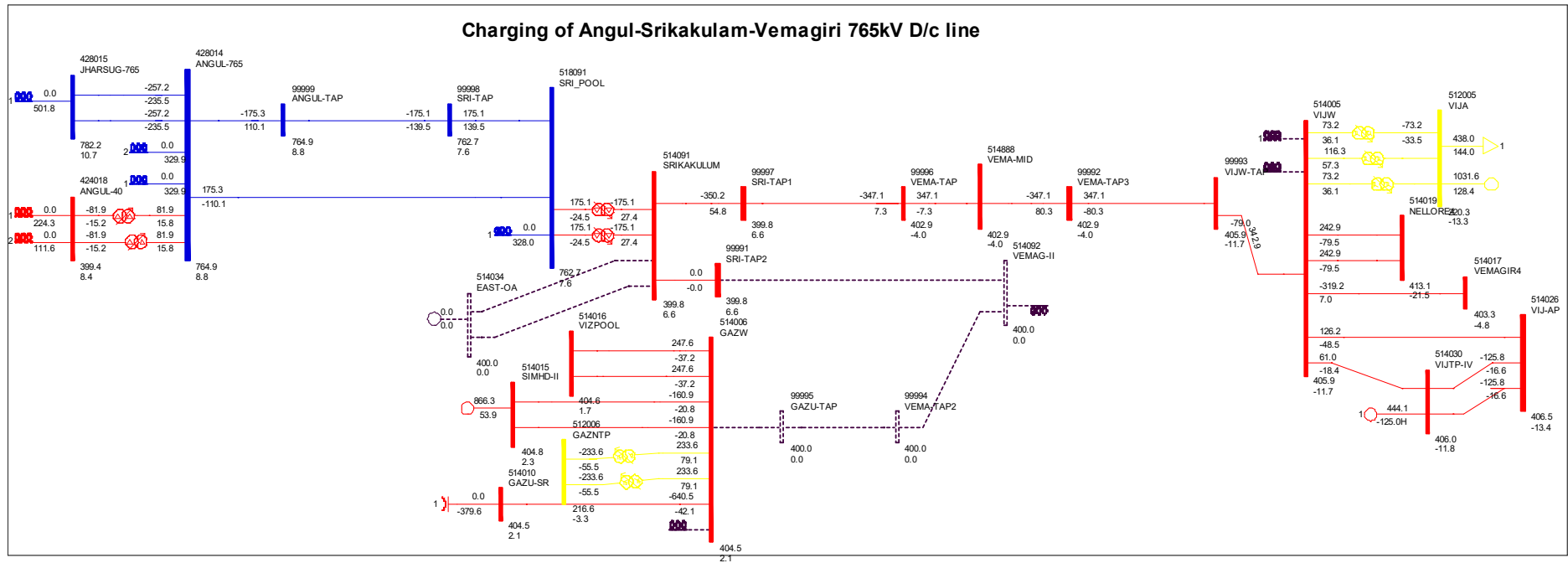
CHARGING OF SRIKAKULAM – VIJAYAWADA



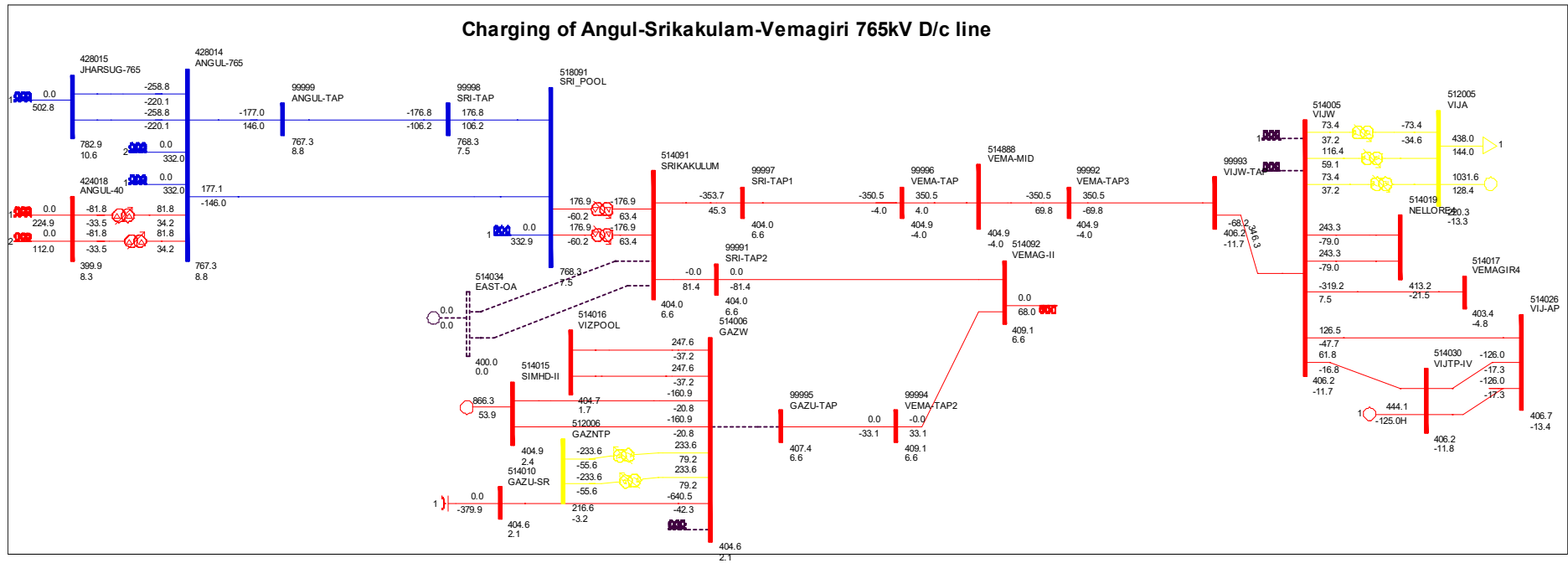
CHARGING OF SRIKAKULAM – VIJAYAWADA



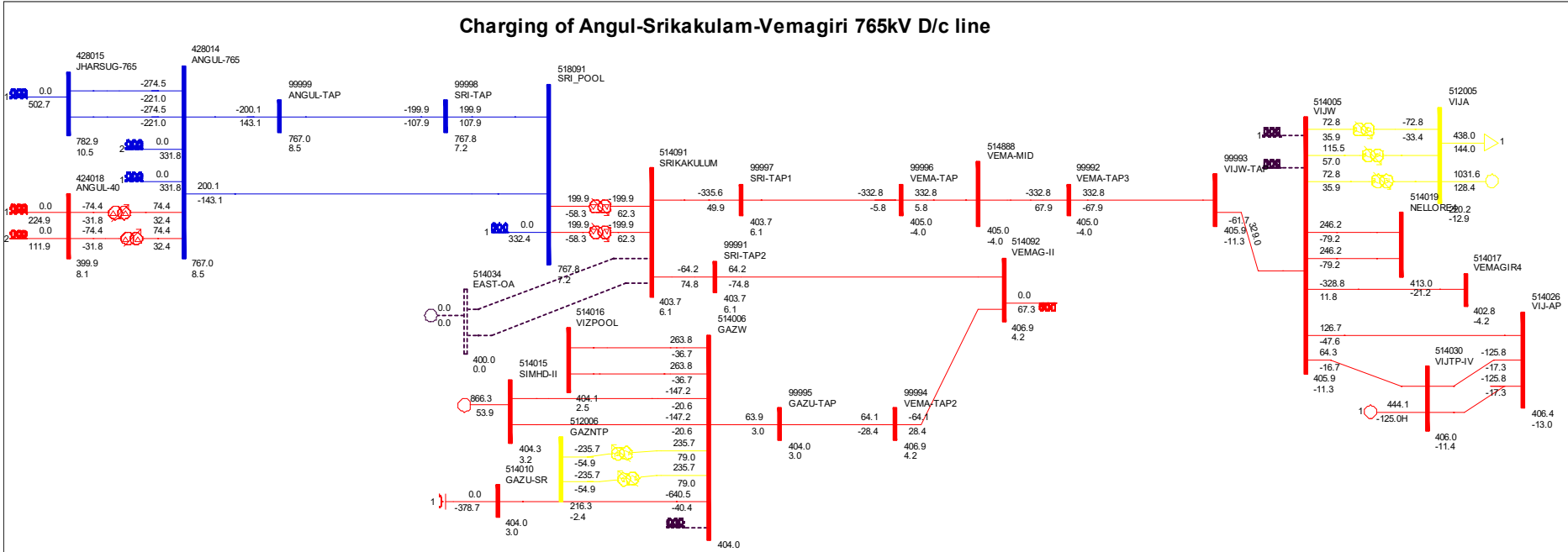
CHARGING OF SRIKAKULAM – VIJAYAWADA



CHARGING OF SRIKAKULAM – GAJUWAKA

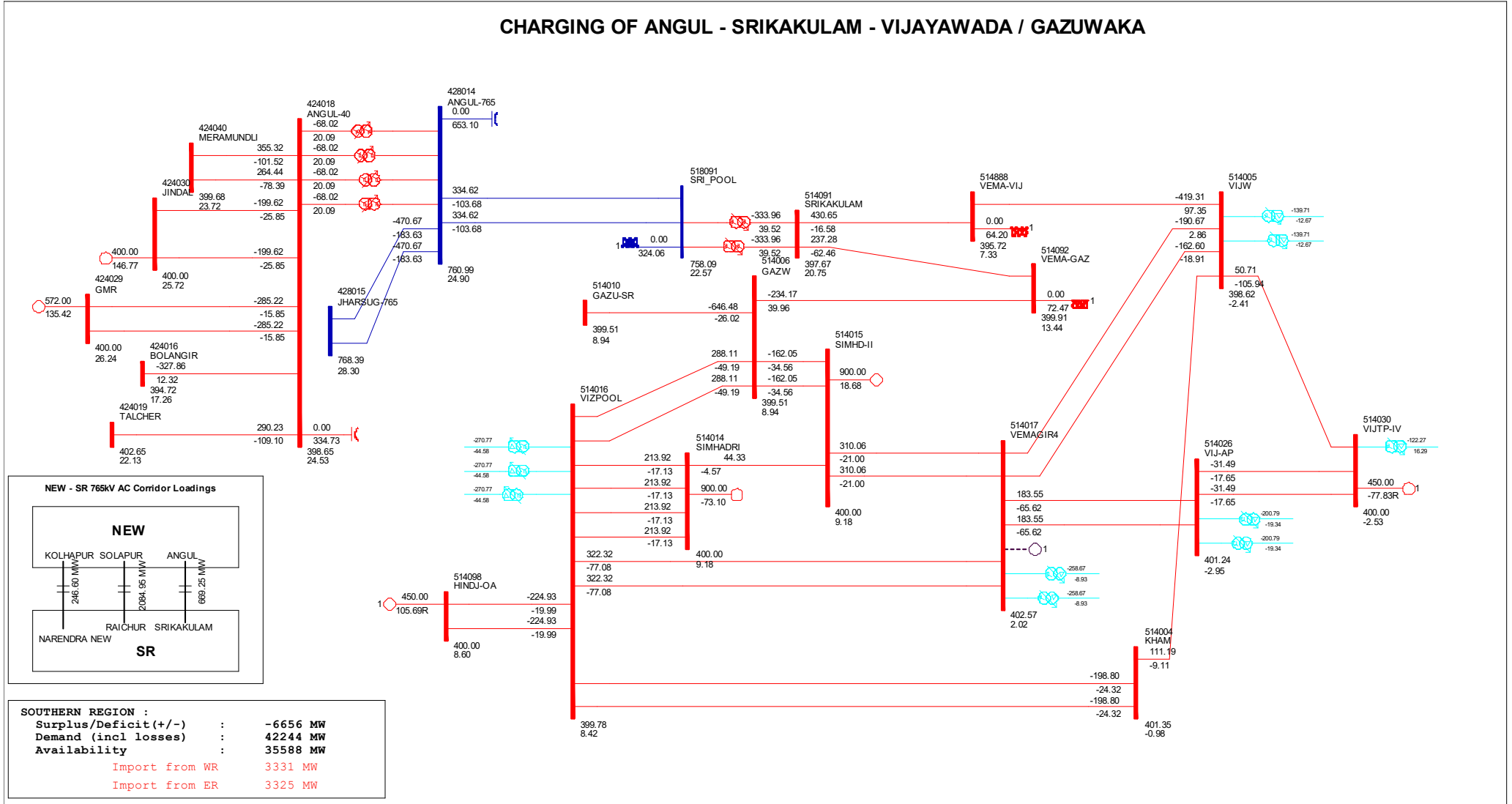


CHARGING OF SRIKAKULAM – GAJUWAKA

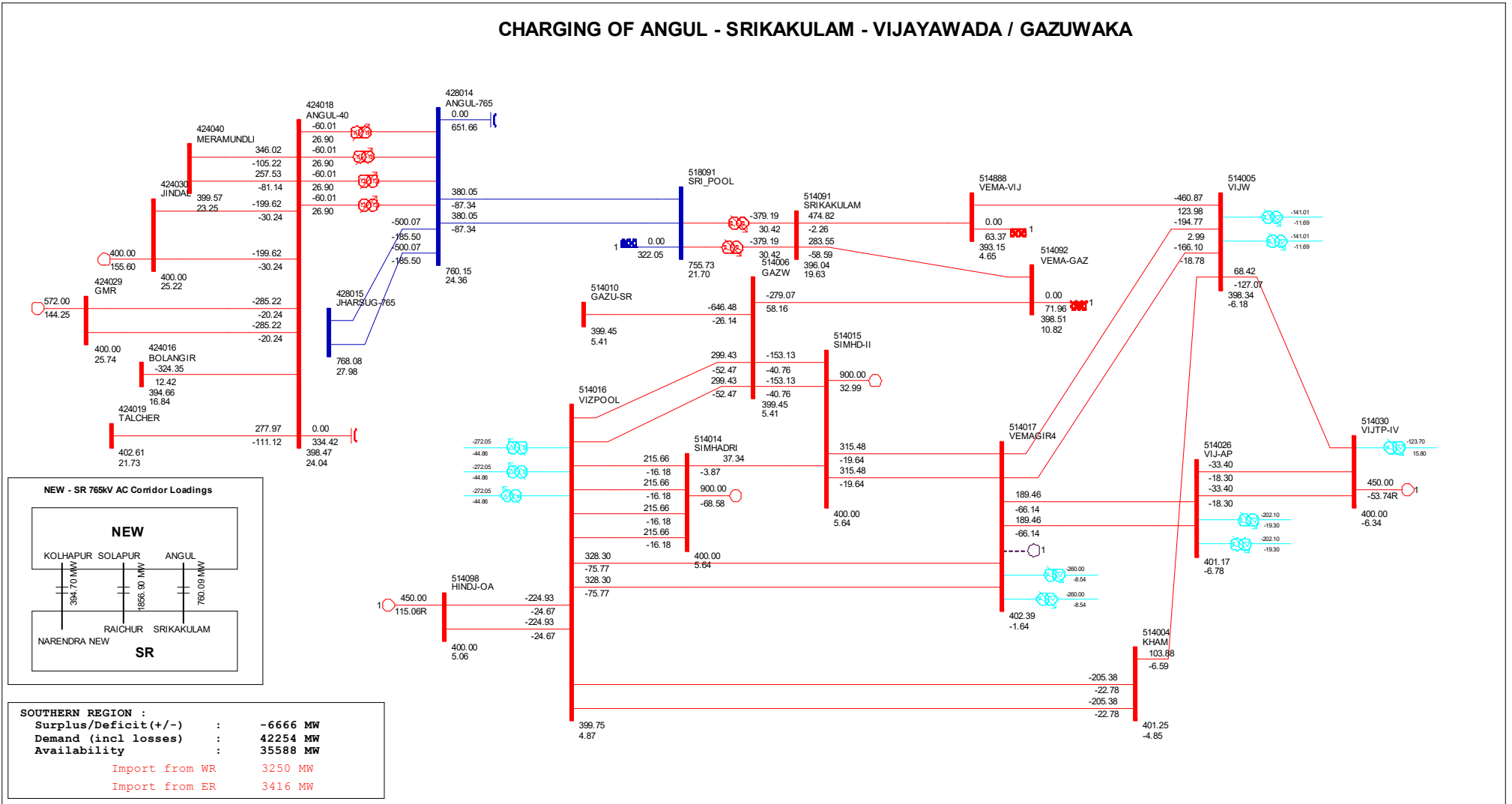


Case 1 : Base Case with import of 6650 MW

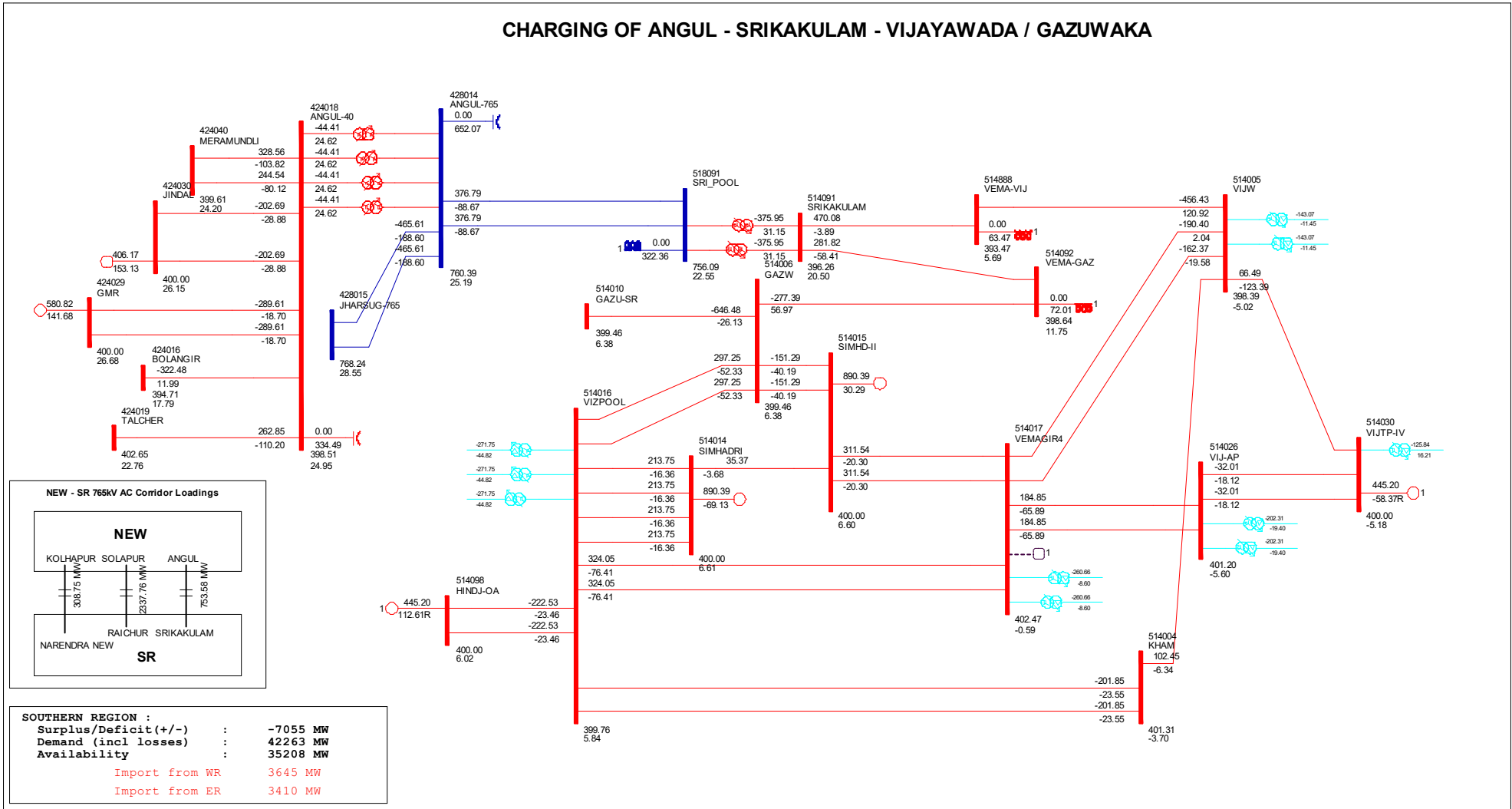
CHARGING OF ANGUL - SRIKAKULAM - VIJAYAWADA / GAZUWAKA



CHARGING OF ANGUL - SRIKAKULAM - VIJAYAWADA / GAZUWAKA

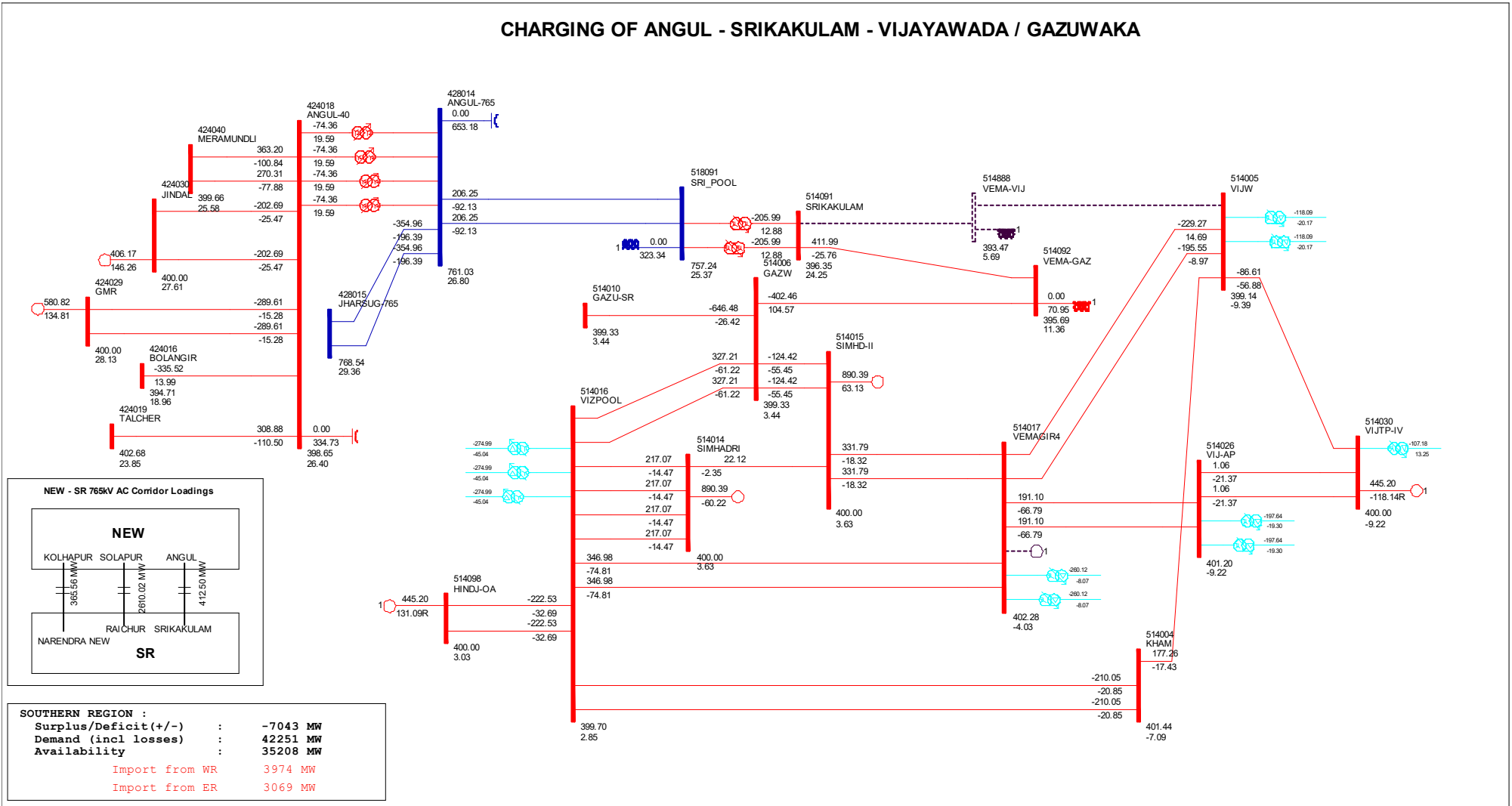


CHARGING OF ANGUL - SRIKAKULAM - VIJAYAWADA / GAZUWAKA



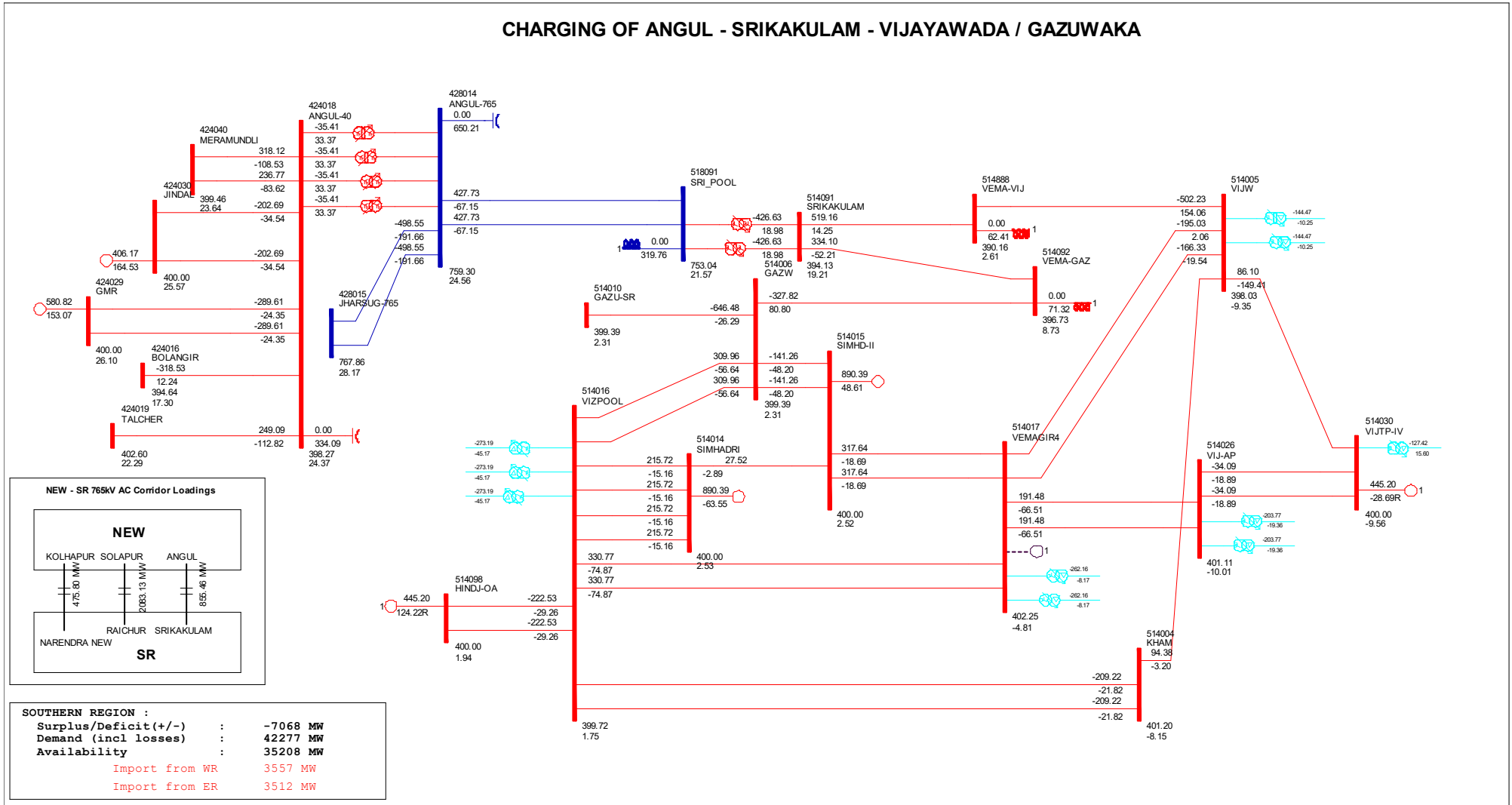
Case 2B : N-1 Contingency of Srikakulam - Vijaywada

CHARGING OF ANGUL - SRIKAKULAM - VIJAYAWADA / GAZUWAKA



Case 2C : : N-1 Contingency of Raichur - Sholapur

CHARGING OF ANGUL - SRIKAKULAM - VIJAYAWADA / GAZUWAKA



TLTG Results with Import from WR

INCR.	PRE- RATING	TRANS <----- LIMITING ELEMENT ----->	DISTR.	SHIFT	BAS/CNT	CAPAB <----- F R O M ----->	<----- T O ----->	CKT	FACTOR	MW	A/B	<----- CONTINGENCY DESCRIPTION ----->
-501.6	514005	VIJW	400.00	514888	VEMA-VIJ	400.00	1	0.10484	-492.4	545.0		-----
												OPEN 514006 [GAZW 400.00] TO 514092 [VEMA-GAZ 400.00] CKT 1
-501.6	514005	VIJW	400.00	514888	VEMA-VIJ	400.00	1	0.10484	-492.4	545.0		-----
												OPEN 514091 [SRIKAKULAM 400.00] TO 514092 [VEMA-GAZ 400.00] CKT 1
-501.6	514091	SRIKAKULAM	400.00	514888	VEMA-VIJ	400.00	2	-0.10484	492.4	545.0		-----
												OPEN 514091 [SRIKAKULAM 400.00] TO 514092 [VEMA-GAZ 400.00] CKT 1
-501.6	514091	SRIKAKULAM	400.00	514888	VEMA-VIJ	400.00	2	-0.10484	492.4	545.0		-----
												OPEN 514006 [GAZW 400.00] TO 514092 [VEMA-GAZ 400.00] CKT 1
-504.4	524011	KOLAR	400.00	544007	HOSUR4	400.00	2	-0.04159	831.0	852.0		-----
												OPEN 524011 [KOLAR 400.00] TO 544007 [HOSUR4 400.00] CKT 1
-504.4	524011	KOLAR	400.00	544007	HOSUR4	400.00	1	-0.04159	831.0	852.0		-----
												OPEN 524011 [KOLAR 400.00] TO 544007 [HOSUR4 400.00] CKT 2
-734.6	514996	FSC-1	400.00	524007	NELMANG4	400.00	1	-0.02037	535.0	550.0		BASE CASE
-734.6	514008	GOOT	400.00	514996	FSC-1	400.00	1	-0.02037	535.0	550.0		BASE CASE
-742.0	378040	SHOLAPUR	765.00	378043	AURANGABD-PG765.00	765.00	2	0.30754	-2271.8	2500.0		-----
												OPEN 378040 [SHOLAPUR 765.00] TO 378043 [AURANGABD-PG765.00] CKT 1
-742.0	378040	SHOLAPUR	765.00	378043	AURANGABD-PG765.00	765.00	1	0.30754	-2271.8	2500.0		-----
												OPEN 378040 [SHOLAPUR 765.00] TO 378043 [AURANGABD-PG765.00] CKT 2
-765.3	514005	VIJW	400.00	514888	VEMA-VIJ	400.00	1	0.09525	-472.1	545.0		-----
												OPEN 378040 [SHOLAPUR 765.00] TO 528003 [RAIC800 765.00] CKT 1
-765.3	514005	VIJW	400.00	514888	VEMA-VIJ	400.00	1	0.09525	-472.1	545.0		-----
												OPEN 378040 [SHOLAPUR 765.00] TO 528003 [RAIC800 765.00] CKT 2
-765.3	514091	SRIKAKULAM	400.00	514888	VEMA-VIJ	400.00	2	-0.09525	472.1	545.0		-----
												OPEN 378040 [SHOLAPUR 765.00] TO 528003 [RAIC800 765.00] CKT 2
-765.3	514091	SRIKAKULAM	400.00	514888	VEMA-VIJ	400.00	2	-0.09525	472.1	545.0		-----
												OPEN 378040 [SHOLAPUR 765.00] TO 528003 [RAIC800 765.00] CKT 1
-828.5*514005	VIJW		400.00	514888	VEMA-VIJ	400.00	1	0.08049	-478.3	545.0		-----
												OPEN 514006 [GAZW 400.00] TO 514010 [GAZU-SR 400.00] CKT 1

TLTG Results with Import from ER

INCR.	PRE- RATING	TRANS <----- LIMITING ELEMENT ----->	DISTR.	SHIFT	BAS/CNT	CAPAB <----- F R O M ----->	<----- T O ----->	CKT	FACTOR	MW	A/B	<----- CONTINGENCY DESCRIPTION ----->
-395.1	514005	VIJW	400.00	514888	VEMA-VIJ	400.00	1	0.13309	-492.4	545.0		
												OPEN 514006 [GAZW 400.00] TO 514092 [VEMA-GAZ 400.00] CKT 1
-395.1	514005	VIJW	400.00	514888	VEMA-VIJ	400.00	1	0.13309	-492.4	545.0		
												OPEN 514091 [SRIKAKULAM 400.00] TO 514092 [VEMA-GAZ 400.00] CKT 1
-395.1	514091	SRIKAKULAM	400.00	514888	VEMA-VIJ	400.00	2	-0.13309	492.4	545.0		
												OPEN 514006 [GAZW 400.00] TO 514092 [VEMA-GAZ 400.00] CKT 1
-395.1	514091	SRIKAKULAM	400.00	514888	VEMA-VIJ	400.00	2	-0.13309	492.4	545.0		
												OPEN 514091 [SRIKAKULAM 400.00] TO 514092 [VEMA-GAZ 400.00] CKT 1
-507.2	524011	KOLAR	400.00	544007	HOSUR4	400.00	1	-0.04136	831.0	852.0		
												OPEN 524011 [KOLAR 400.00] TO 544007 [HOSUR4 400.00] CKT 2
-507.2	524011	KOLAR	400.00	544007	HOSUR4	400.00	2	-0.04136	831.0	852.0		
												OPEN 524011 [KOLAR 400.00] TO 544007 [HOSUR4 400.00] CKT 1
-624.3	514005	VIJW	400.00	514888	VEMA-VIJ	400.00	1	0.11676	-472.1	545.0		
												OPEN 378040 [SHOLAPUR 765.00] TO 528003 [RAIC800 765.00] CKT 2
-624.3	514005	VIJW	400.00	514888	VEMA-VIJ	400.00	1	0.11676	-472.1	545.0		
												OPEN 378040 [SHOLAPUR 765.00] TO 528003 [RAIC800 765.00] CKT 1
-624.3	514091	SRIKAKULAM	400.00	514888	VEMA-VIJ	400.00	2	-0.11676	472.1	545.0		
												OPEN 378040 [SHOLAPUR 765.00] TO 528003 [RAIC800 765.00] CKT 1
-624.3	514091	SRIKAKULAM	400.00	514888	VEMA-VIJ	400.00	2	-0.11676	472.1	545.0		
												OPEN 378040 [SHOLAPUR 765.00] TO 528003 [RAIC800 765.00] CKT 2
-649.5*	514005	VIJW	400.00	514888	VEMA-VIJ	400.00	1	0.10267	-478.3	545.0		
												OPEN 514006 [GAZW 400.00] TO 514010 [GAZU-SR 400.00] CKT 1
-649.5*	514091	SRIKAKULAM	400.00	514888	VEMA-VIJ	400.00	2	-0.10267	478.3	545.0		
												OPEN 514006 [GAZW 400.00] TO 514010 [GAZU-SR 400.00] CKT 1
-678.0	352001	ASOJ2	220.00	354001	ASOJ	400.00	1	0.00333	-497.7	500.0		
												OPEN 354001 [ASOJ 400.00] TO 354029 [KOSAMBA 400.00] CKT 1
-678.0	352001	ASOJ2	220.00	354001	ASOJ	400.00	2	0.00333	-497.7	500.0		
												OPEN 354001 [ASOJ 400.00] TO 354029 [KOSAMBA 400.00] CKT 1
-709.2	514996	FSC-1	400.00	524007	NELMANG4	400.00	1	-0.02110	535.0	550.0		BASE CASE
-709.2	514008	GOOT	400.00	514996	FSC-1	400.00	1	-0.02110	535.0	550.0		BASE CASE

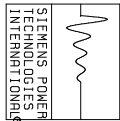
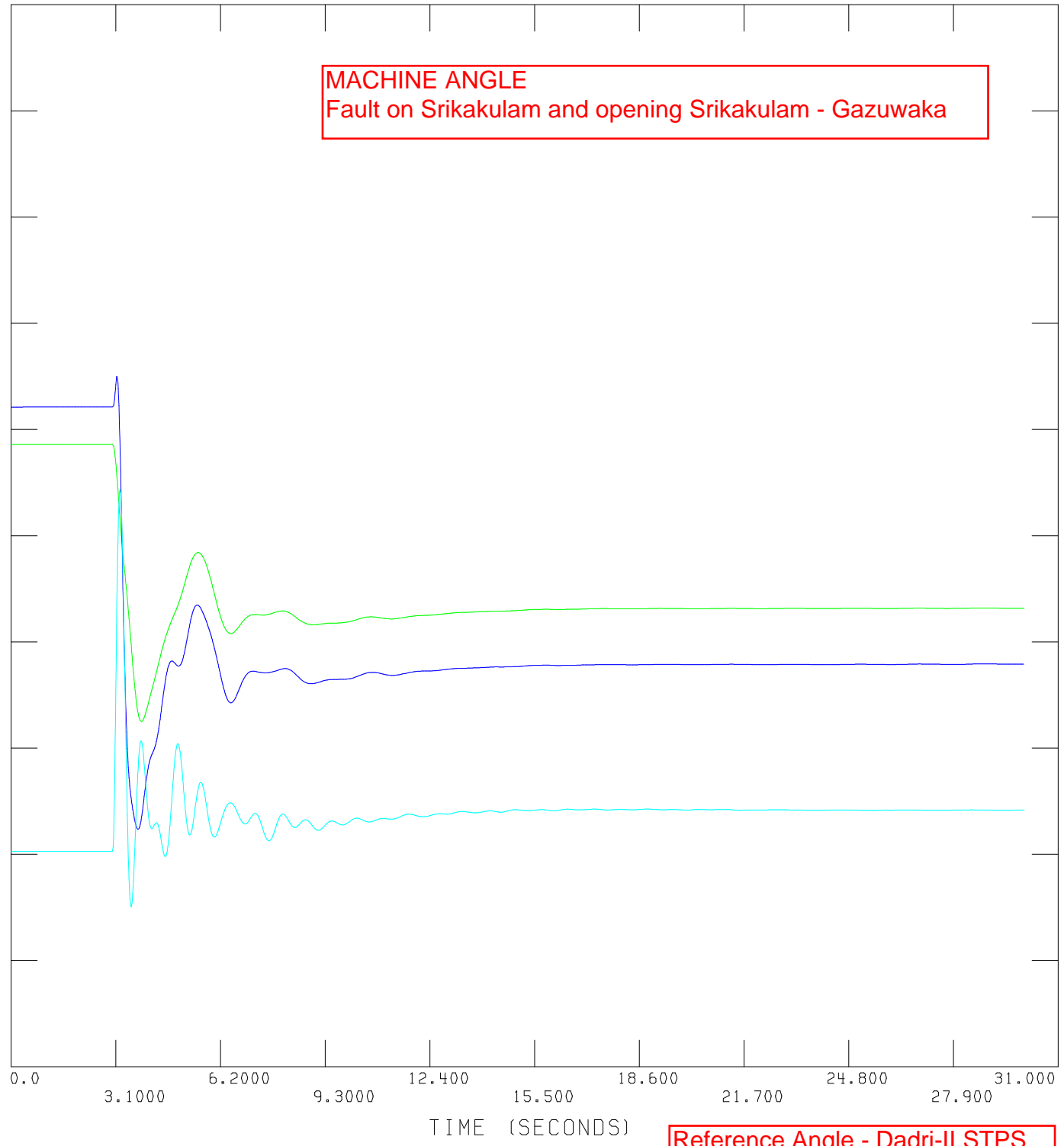


EXHIBIT-IV

FILE: ..\New folder (2)\C1A = Dyn_Fault Srikakulam Opening Srik_Gazw.out

SUN, OCT 09 2016 12:41
MACHINE ANGLE

MACHINE ANGLE
Fault on Srikakulam and opening Srikakulam - Gazuwaka



Reference Angle - Dadri-II STPS



FILE: ..\New folder (2)\C1A = Dyn_Fault Srikakulam Opening Srik_Gazw.out

CHNL# 75: EPOWER SRIKAKUL TO GAZUMA CKT '1 'J

700.00

-300.0

700.00

CHNL# 75: EPOWER SRIKAKUL TO GAZUMA CKT '1 'J

700.00

-300.0

700.00

CHNL# 76: EPOWER SRIKAKUL TO VIJAYA CKT '2 'J

700.00

-300.0

500.00

CHNL# 83: EPOWER SRIKAKUL TO ANGUL CKT '1 'J

500.00

-500.0

406.00

CHNL# 89: EPOWER NARENDRA TO KOLHAR CKT '1 'J

406.00

-594.0

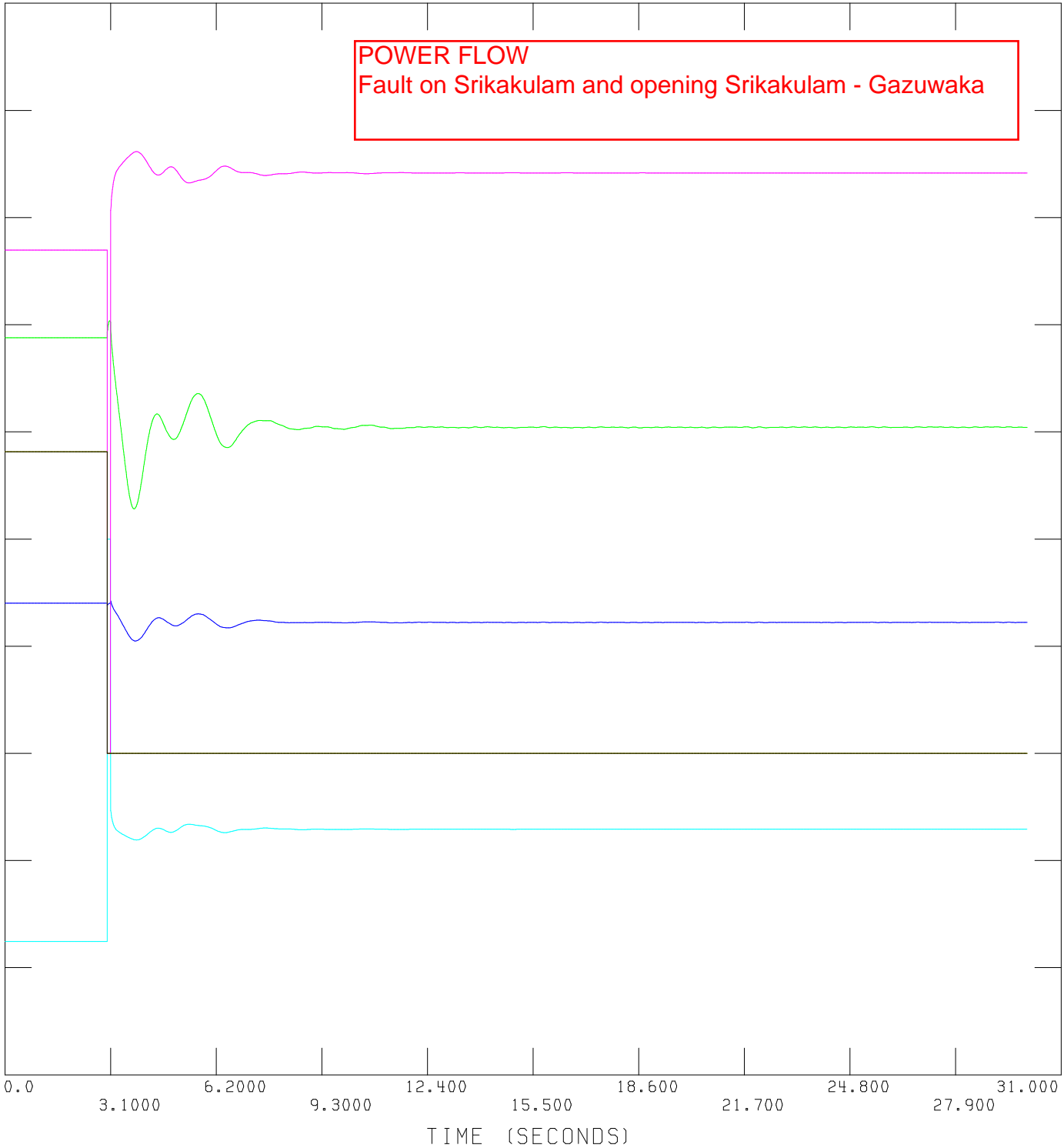
-850.0

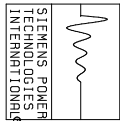
CHNL# 91: EPOWER RAICHUR TO SOLAPUR CKT '1 'J

-850.0

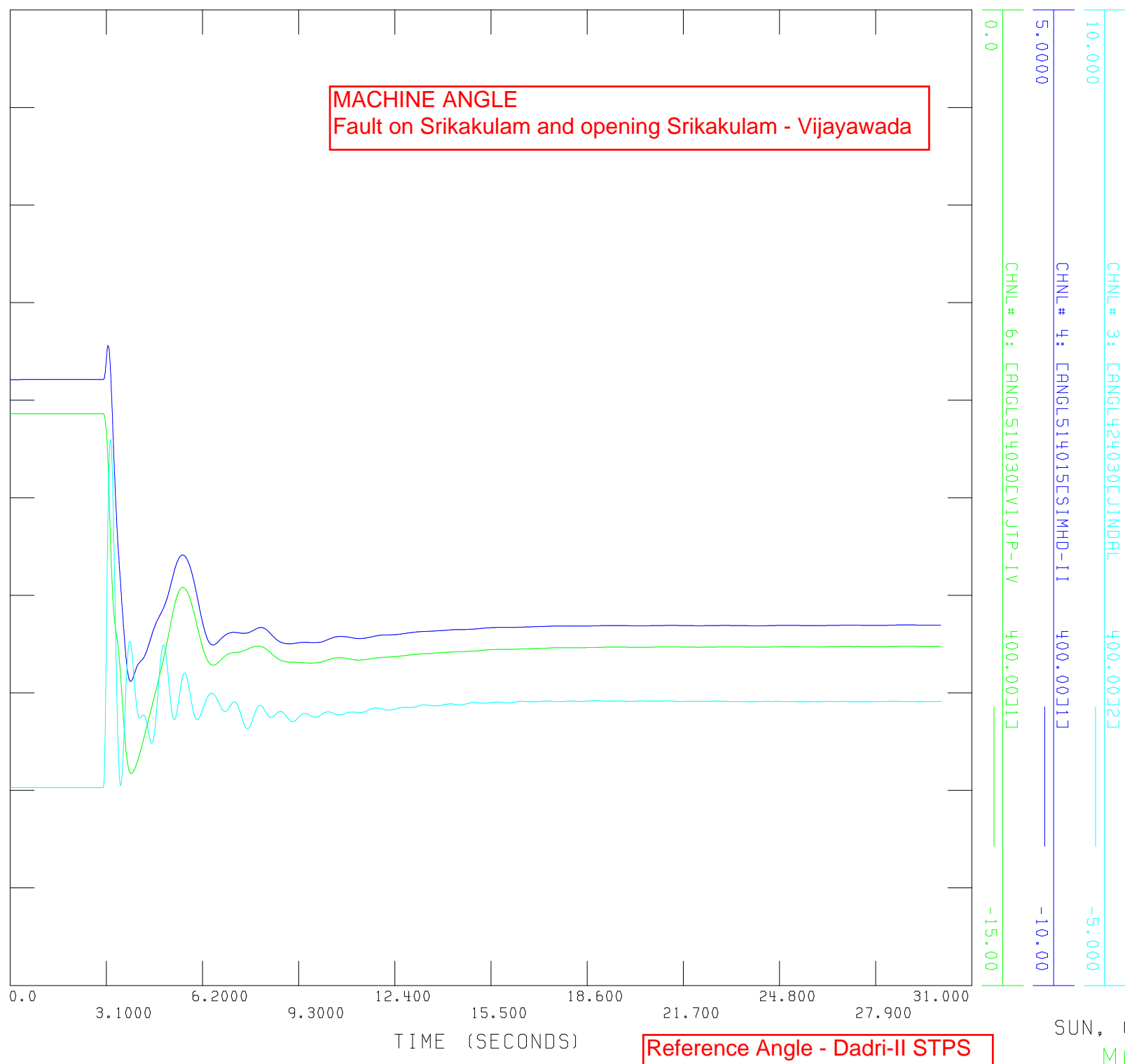
-1850.0

POWER FLOW
 Fault on Srikakulam and opening Srikakulam - Gazuwaka





MACHINE ANGLE
Fault on Srikakulam and opening Srikakulam - Vijayawada



Reference Angle - Dadri-II STPS



FILE: ..\New folder (2)\C1B = Dyn_Fault Srikakulam Opening Srik_VIJW.out

CHNL# 75: EPOWR SRIKAKUL TO GAZUMA CKT '1 'J

700.00
-300.00

700.00
-300.00

700.00
-300.00

500.00
-500.00

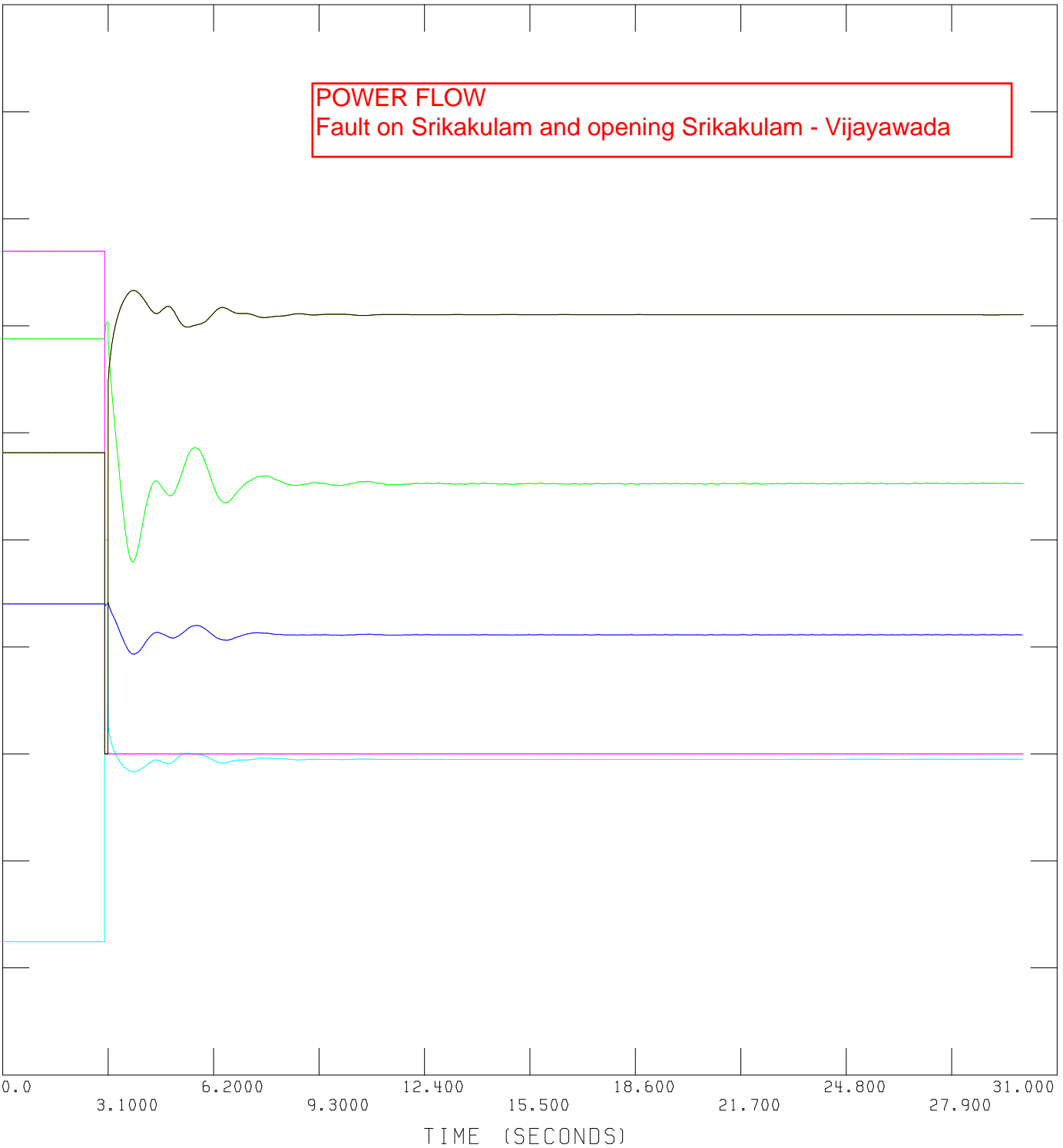
406.00
-594.00

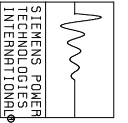
-850.0
-1850.0

SUN, OCT 09 2016 13:03

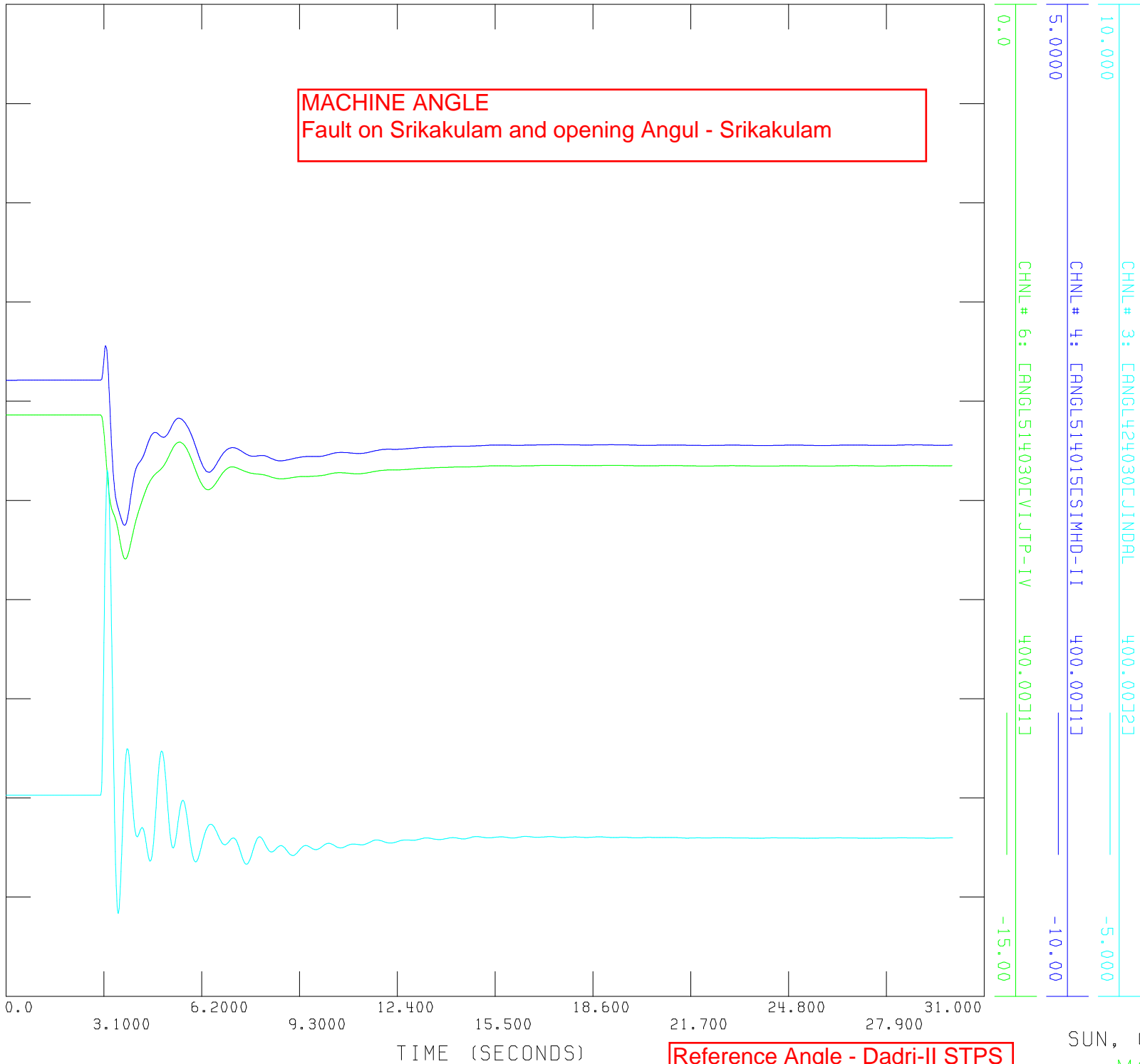
POWER FLOW

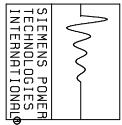
POWER FLOW
 Fault on Srikakulam and opening Srikakulam - Vijayawada





FILE: C1C = Dgn_Fault Srikakulam Opening Angul_Srik.out





FILE: C1C = Dyn_Fault Srikakulam Opening Angul_Srik.out

CHNL# 75: EPOWER SRIKAKUL TO GAZUMA CKT '1 '3

700.00 700.00

700.00 CHNL# 75: EPOWER SRIKAKUL TO GAZUMA CKT '1 '3

700.00 CHNL# 76: EPOWER SRIKAKUL TO VIJAYA CKT '2 '3

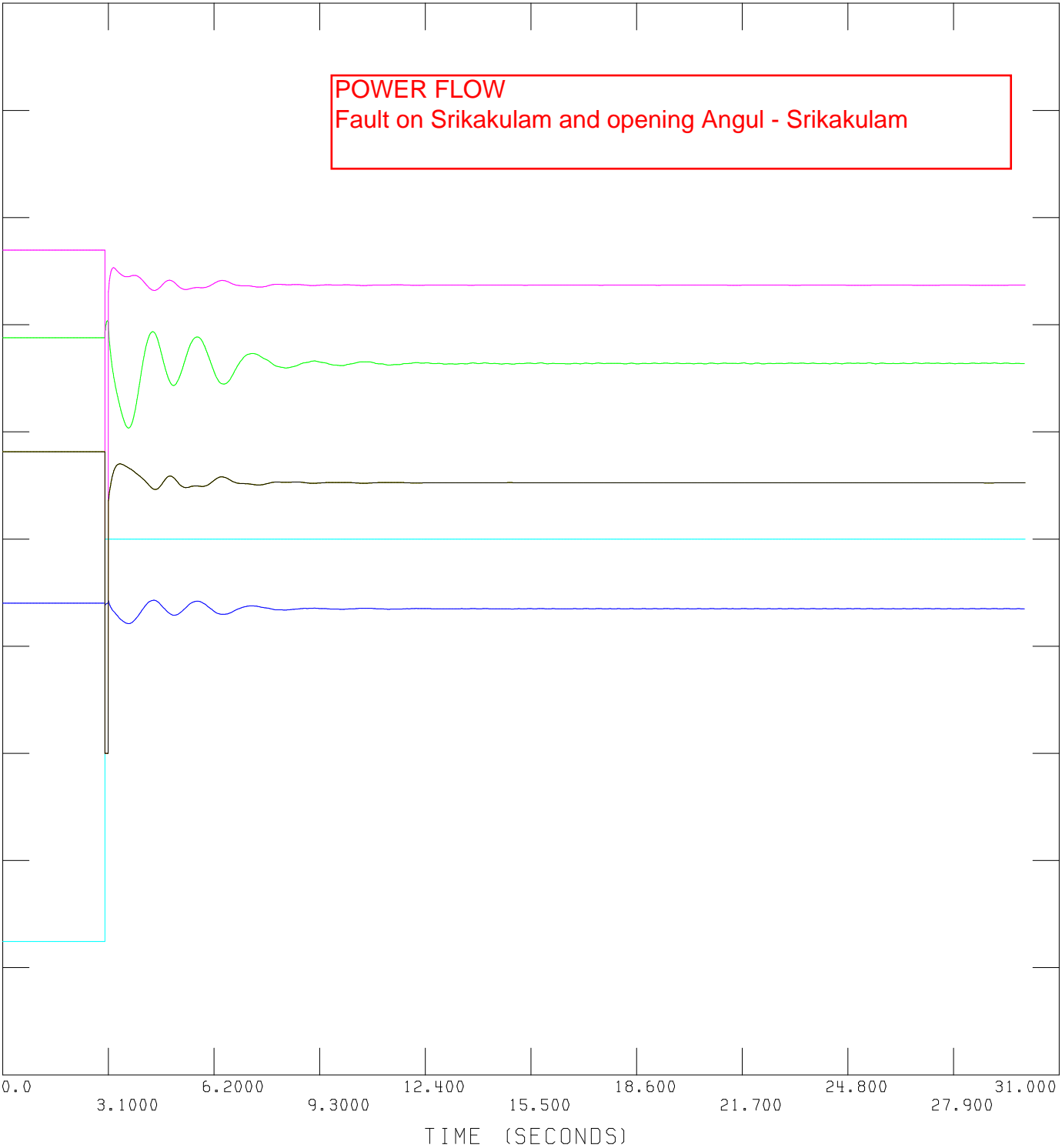
700.00 CHNL# 83: EPOWER SRIKAKUL TO ANGUL CKT '1 '3

500.00 CHNL# 89: EPOWER NARENDRA TO KOLHAP CKT '1 '3

406.00 CHNL# 91: EPOWER RAICHUR TO SOLAPUR CKT '1 '3

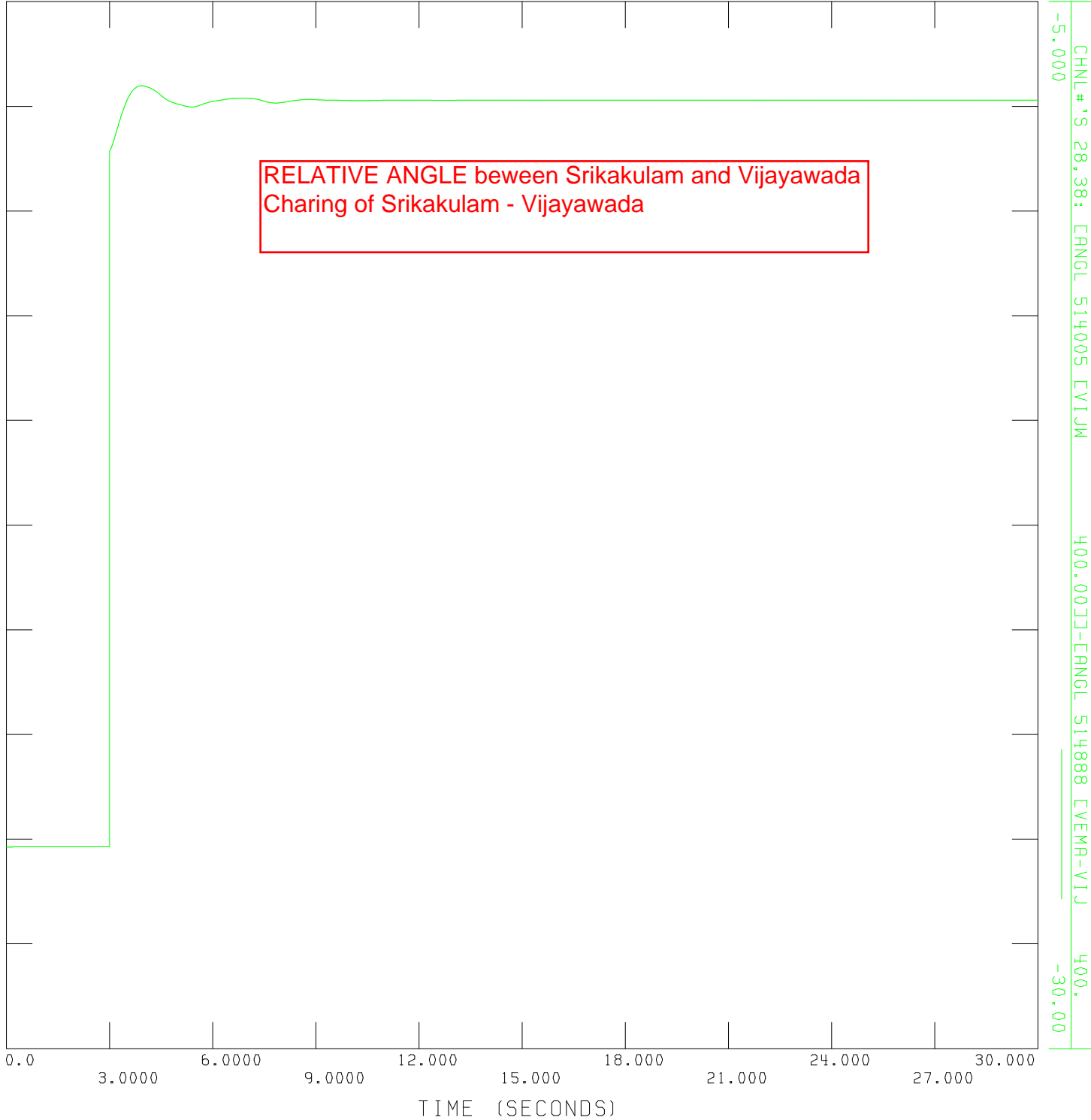
-850.0 -1850.0

POWER FLOW
Fault on Srikakulam and opening Angul - Srikakulam





FILE: C:\Users\...\New folder (2)\CID= dyn_CLOSE SRIKAKULAM_VIJM.out



This is with respect to studies, sent to us by your trailing mail. Regarding temporary arrangement for the Angul – Sirikakulam – Vemagiri 765 kV system. These studies have been seen by us and were also discussed with you (Sh. Mukesh Kumar, AGM and Shri Prakash, Senior Engineer, PGCIL), on 28th September, 2016. After the discussion, following were observed:

1. The flow on Angul – Sirikakulam – Vemagiri/Gazuwaka line should not be more than 545 MW as it violates angular difference criteria of 30° under N-1. The angular difference between Sirikakulam and Vijaywada is very sensitive to the flow on this line, as this line is about 520km long.

2. We may not take dispatch from gas generation projects at Vemagiri. And also we may reduce dispatch from Jindal which is operating under STOA.

3. It was seen that with the proposed system in place, TTC to SR may increase by about 420 MW to 7070 MW (6650+420 MW), however, if above system is not in place and we increase loading limit in Raichur – Sholapur to 2750 MW from the present of 2500 MW then TTC can be increased by about 380 MW. Increasing loading limit to 2750 MW on Raichur – Sholapur along with proposed system also does not give improvement in TTC over and above 420 MW.

4. It was also seen that during charging studies i.e when we charge Angul – Sirikakulam 765 kV line- followed by 765/400 kV transformer at transformer at Sirikakulam- followed by Sirikakulam – Vijaywada section then the angular difference between open points at Vijaywada end, prior to closing, was about 26° . Therefore, we will have to be very careful while closing this connection in real time, if this temporary arrangement is agreed.

5. It was also discussed that as the Sirikakulam – Vijaywada line is more than 520 km long, the line loading on this line may have to be restricted based on Zone-3 setting as given in Planning Criterion.

6. It was deliberated that, out of the pending LTA, MTOA likely to be operationalized after commissioning of Angul – Sirikakulam – Vemagiri, LTA of 135 MW to Kerala would get priority and remaining TTC may have to be either shared among MTOA candidates or will go under

STOA. After discussion, it was brought out that after the grant of MTOA, operationalization of MTOA cannot be done on the basis of part MTOA, as is given under Regulation and procedures of LTA, MTOA connectivity.

7. (a) From stability results, it was observed that scale of MW flows/angle were large and does not reflect oscillations.

(b) It was observed that there were oscillations after about 20 seconds which is alarming.

(c) It was observed that there were consistent oscillations on Raichur – Sholapur line.

In view of above, it was requested that PGCIL may prepare a report, considering above and may send an official proposal for taking up at appropriate level.