PG-154
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November, 2005
Final Report

Estimation of energy losses in CESC's T&D network corresponding to 2004-05 conditions (Volume II)

Prepared for

CESC Limited, Kolkata

Project Report No. 2004 ER26

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Exhibit 4: I.T disribution system (400 volts)

Exhibit 1:

CESC 132 kV Network upto 33kV

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**		Page:	1
Location:	Kolkota, West Bengal	4.0.4C		Date:	26-09-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S.Bhalla		Study Case: LF	Revision:	Base
Filename:	cesc132ks			Config.:	Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	4	4	45	53

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	38	0	0	38	0	3	79

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	5
Precision of Solution:	0.000010

System Frequency:	50.00
Unit System:	Metric
Project Filename:	cesc132ks
Output Filename:	C:\ETAP 404\PowerStation\cesc132kv_R1\Untitled.lf1

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 2
Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final ease with 80% motor load

BUS Input Data

Bus			Initial Voltage		Generator		Motor Load		Static Load		Mvar Limits	
ID	Type	kV	% Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	Max.	Min.
1Howrah WB	Swing	132.000	98.0	0.0								
2 Bot1	Load	132.000	102.0	0.0								
3 BOT3	Load	132.000	102.0	0.0								
4SRS	Load	132.000	102.1	0.0								
5MAJ	Load	132.000	102.3	0.1								
6BBDB	Load	132.000	102.3	0.1								
7BBDA	Load	132.000	102.3	0.1								
8TAR	Load	132.000	102.4	0.1								
9CHAK	Load	132.000	102.5	0.2								
10BBG	Load	132.000	103.8	1.5								
11JAD	Load	132.000	102.1	0.0								
12iiPRSB	Load	132.000	100.0	0.0								
12iPRSB	Load	132.000	100.0	0.0								
12PRSB	Load	132.000	102.3	0.1								
13iPRSA	Load	132.000	100.0	0.0								
14PLN	Load	132.000	102.1	0.0								
15 KRSWB	Swing	132.000	100.0	0.0								
16KRS1	Load	132.000	100.0	0.0								
16KRSi	Load	132.000	100.0	0.0								
17KRS2	Load	132.000	100.0	0.0								
17KRSi	Load	132.000	100.0	0.0								
18KRS3	Load	132.000	102.1	0.0								
18KRSi	Load	132.000	102.1	0.0								
19ECAL	Load	132.000	102.3	0.2								
20BTRDA	Load	132.000	102.3	0.3								
22NCGS	Load	132.000	102.3	0.4								
23TRSA	Load	132.000	99.9	0.0								
24TRSB	Load	132.000	102.3	1.0								
25TITWB	Swing	132.000	100.0	0.0								
26LILWB	Swing	132.000	101.0	0.0								
27BRS1	Load	132.000	99.9	0.0								
28BRS2	Load	132.000	99.9	0.0								
29BRS3	Load	132.000	99.9	0.0								
31Bot3	Load	33.000	94.6	-6.4			32.300	20.018	8.075	5.004		
32SRSA	Load	33.000	97.6	4.2			71.912	36.842	17.978	9.210		
33SRSB	Load	33.000	97.5	-4.4			60.480	29.292	15.120	7.323		
34MAJ	Load	33.000	98.7	-4.5			68.208	44.058	17.052	11.015		
35BBD	Load	33.000	98.9	-3.2			46.280	23.710	11.570	5.927		

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 3
Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

Bus			Initial Voltage		Generator		Motor Load		Static Load		Mvar Limits	
ID	Type	kV	% Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	Max.	Min.
36JAD	Load	33.000	95.0	-7.6			65.318	42.192	16.330	-9.452		
37PLN	Load	33.000	98.2	-3.1			43.411	28.041	10.853	7.010		
38PRSC	Load	33.000	97.0	-4.7			20.808	10.078	5.202	2.519		
40PRSA	Load	33.000	94.8	0.1			30.272	16.339	7.568	-10.915		
41KRSA	Load	33.000	94.9	-6.7			71.136	34.453	17.784	-6.387		
42KRSB	Load	33.000	98.3	-3.2			22.440	13.907	5.610	3.477		
43ECAL	Load	33.000	100.0	-3.8			36.120	21.432	9.030	-9.642		
45TRSA	Load	33.000	95.6	-3.6			15.136	8.981	3.784	2.245		
47TRSC	Load	33.000	100.0	14.2			129.584	59.040	32.396	14.760		
48BRS	Load	33.000	97.2	-4.0			49.698	25.461	12.424	-8.635		
52G2	Gen.	11.000	102.2	9.2	124.000	0.000					80.000	35.000
54G4	Gen.	16.000	105.0	6.6	476.000	0.000					260.000	70.000
56G10	Gen.	11.000	100.0	24.3	215.000	0.000					110.000	60.000
B111	Gen.	33.000	100.0	-4.4	91.000	0.000	143.197	73.362	35.799	-1.659	50.000	20.000
BTRD-B	Load	132.000	100.0	0.0								
Total Nunmber of Buses: 53					906.000	0.000	906.301	487.205	226.575	21.801		

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 4
Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

LINE / CABLE Input Data

Line/Cable	Ohms or Mohs / 1000 m per Conductor (Cable) or per Phase (Line)							
ID	Library	Size	Length(m)	#/Phase	T (°C)	R	X	Y
Lc36			13357.0	1	75	0.087000	0.139000	0.0000400
LnC1i			851.0	1	75	0.056800	0.130000	0.0000565
LnC2i			1075.0	1	75	0.174000	0.105000	0.0000850
LnC3i			707.0	1	75	0.174000	0.105000	0.0000850
LnC4j			2337.0	1	75	0.174000	0.105000	0.0000850
LnC5			2454.0	1	75	0.174000	0.105000	0.0000850
LnC6			2913.0	1	75	0.174000	0.105000	0.0000850
LnC7			6422.0	1	75	0.087000	0.139000	0.0000400
LnC8			6243.0	1	75	0.087000	0.139000	0.0000400
LnC9			5586.0	1	75	0.056800	0.130000	0.0000565
LnC10			7427.0	1	75	0.087000	0.139000	0.0000400
LnC 11			857.0	1	75	0.568000	0.130000	0.0000565
LnC13i			10538.0	1	75	0.056800	0.130000	0.0000565
LnC14i			7709.0	1	75	0.244300	0.138000	0.0000884
LnC15i			7665.0	1	75	0.244300	0.138000	0.0000884
LnC16i			4460.0	1	75	0.174000	0.105000	0.0000850
LnC17i			4437.0	1	75	0.174000	0.105000	0.0000850
LnC18i			4385.0	1	75	0.174000	0.105000	0.0000850
LnC23			6124.0	1	75	0.056800	0.130000	0.0000565
LnC24			6045.0	1	75	0.056800	0.130000	0.0000565
LnC25			5425.0	1	75	0.056800	0.130000	0.0000565
LnC26			5358.0	1	75	0.056800	0.130000	0.0000565
LnC27			10908.0	1	75	0.056800	0.130000	0.0000565
LnC28			10381.0	1	75	0.056800	0.130000	0.0000565
LnC29			1355.0	1	75	0.056800	0.130000	0.0000565
LnC30			1370.0	1	75	0.056800	0.130000	0.0000565
LnC31			6565.0	1	75	0.056800	0.105000	0.0000565
LnC32			9260.0	1	75	0.232100	0.097800	0.0000852
LnC34			9621.0	1	75	0.056800	0.130000	0.0000565
LnC35			1522.0	1	75	0.108300	0.216700	0.0000911
line43			572.0	1	75	0.244300	0.138000	0.0000884
LnC37i			20.0	1	75	0.074900	0.399300	0.0000008
LnT19i			20923.0	1	75	0.087000	0.393800	0.0000031
LnT20i			20913.0	1	75	0.087000	0.393800	0.0000031
LnT21i			18653.0	1	75	0.087000	0.393800	0.0000031
LnT22i			18653.0	1	75	0.087000	0.393800	0.0000031
LnT38i			20.0	1	75	0.074900	0.399300	0.0000008
LnT39i			20.0	1	75	0.074900	0.399300	0.0000008

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 5
Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

Line / Cable resistances are listed at the specified temperatures.

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 6
Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

2-WINDING TRANSFORMER Input Data

Transformer	Rating					Z Variation			% Tap Setting		Adjusted	Phase Shift	
ID	MVA	Prim. kV	Sec. kV	% Z	X/R	+ 5%	- 5%	% Tol.	Prim.	Sec.	% Z	Type	Angle
T1	50.000	132.000	33.000	16.600	33.5	10.00	-10.00	0	-5.000	0	14.9400	Std Pos. Seq.	0.0
T2	55.000	132.000	33.000	11.500	23.4	10.00	-10.00	0	-3.500	0	10.6950	Std Pos. Seq.	0.0
T3i	55.000	132.000	33.000	11.500	23.0	10.00	-10.00	0	-3.000	0	10.8100	Std Pos. Seq.	0.0
T4i	55.000	132.000	33.000	11.500	23.4	10.00	-10.00	0	-4.500	0	10.4650	Std Pos. Seq.	0.0
T5i	85.000	11.000	33.000	11.760	39.3	5.00	-5.00	0	-2.500	0	11.4660	Std Pos. Seq.	0.0
T6i	85.000	11.000	33.000	11.760	39.3	5.00	-5.00	0	-2.500	0	11.4660	Std Pos. Seq.	0.0
T7i	50.000	132.000	33.000	16.600	13.8	10.00	-10.00	0	0	0	16.6000	Std Pos. Seq.	0.0
T9i	50.000	132.000	33.000	16.600	13.8	10.00	-10.00	0	0	0	16.6000	Std Pos. Seq.	0.0
T10i	75.000	132.000	33.000	15.160	33.1	10.00	-10.00	0	-10.500	0	11.9764	Std Pos. Seq.	0.0
T11i	55.000	132.000	33.000	12.040	24.1	10.00	-10.00	0	-10.500	0	9.5116	Std Pos. Seq.	0.0
T12i	69.000	132.000	33.000	14.090	35.3	10.00	-10.00	0	-2.000	0	13.5264	Std Pos. Seq.	0.0
T13i	68.000	132.000	33.000	14.000	23.3	10.00	-10.00	0	-2.000	0	13.4400	Std Pos. Seq.	0.0
T16i	50.000	132.000	33.000	15.360	33.3	10.00	-10.00	0	-2.500	0	14.5920	Std Pos. Seq.	0.0
T17i	50.000	132.000	33.000	16.600	29.6	10.00	-10.00	0	-2.500	0	15.7700	Std Pos. Seq.	0.0
T18i	75.000	132.000	33.000	15.500	33.9	10.00	-10.00	0	-2.500	0	14.7250	Std Pos. Seq.	0.0
T19i	75.000	132.000	33.000	15.160	32.0	10.00	-10.00	0	-2.500	0	14.4020	Std Pos. Seq.	0.0
T20i	50.000	132.000	33.000	16.600	13.8	10.00	-10.00	0	-8.000	0	13.9440	Std Pos. Seq.	0.0
T21i	50.000	132.000	33.000	16.600	29.2	10.00	-10.00	0	-2.000	0	15.9360	Std Pos. Seq.	0.0
T22i	50.000	132.000	33.000	16.600	33.5	10.00	-10.00	0	-2.000	0	15.9360	Std Pos. Seq.	0.0
T23i	75.000	132.000	33.000	15.160	50.7	10.00	-10.00	0	-1.500	0	14.7052	Std Pos. Seq.	0.0
T24i	50.000	132.000	33.000	16.600	13.8	10.00	-10.00	0	-1.500	0	16.1020	Std Pos. Seq.	0.0
T25i	75.000	132.000	33.000	15.160	50.7	10.00	-10.00	0	-2.000	0	14.5536	Std Pos. Seq.	0.0
T26i	50.000	132.000	33.000	15.900	28.4	10.00	-10.00	0	-8.000	0	13.3560	Std Pos. Seq.	0.0
T27i	50.000	132.000	33.000	15.900	34.5	10.00	-10.00	0	-8.000	0	13.3560	Std Pos. Seq.	0.0
T28i	50.000	132.000	33.000	16.600	33.5	10.00	-10.00	0	-1.000	0	16.2680	Std Pos. Seq.	0.0
T29i	50.000	132.000	33.000	15.900	32.8	10.00	-10.00	0	-1.000	0	15.5820	Std Pos. Seq.	0.0
T30i	50.000	132.000	33.000	15.900	32.8	10.00	-10.00	0	-1.000	0	15.5820	Std Pos. Seq.	0.0
T31i	50.000	132.000	33.000	16.600	33.5	10.00	-10.00	0	-2.000	0	15.9360	Std Pos. Seq.	0.0
T32i	50.000	33.000	132.000	16.600	28.3	10.00	-10.00	0	3.000	0	17.5960	Std Pos. Seq.	0.0
T33i	75.000	33.000	132.000	15.500	33.9	10.00	-10.00	0	3.000	0	16.4300	Std Pos. Seq.	0.0
T34i	50.000	33.000	132.000	9.000	34.3	10.00	-5.00	0	3.000	2.500	9.9900	Std Pos. Seq.	0.0
T35i	70.000	11.000	33.000	14.400	36.0	5.00	-5.00	0	-2.000	0	14.1120	Std Pos. Seq.	0.0
T36	315.000	16.000	132.000	13.500	50.0	5.00	-5.00	0	-0.500	0	13.4325	Std Pos. Seq.	0.0
T37i	70.000	11.000	33.000	14.400	36.0	5.00	-5.00	0	-2.000	0	14.1120	Std Pos. Seq.	0.0
T38i	70.000	11.000	33.000	14.400	36.0	5.00	-5.00	0	-2.000	0	14.1120	Std Pos. Seq.	0.0
-T8i	50.000	132.000	33.000	16.600	13.8	10.00	-10.00	0	0	0	16.6000	Std Pos. Seq.	0.0
Ti14	315.000	16.000	132.000	13.500	50.0	5.00	-5.00	0	-0.500	0	13.4325	Std Pos. Seq.	0.0
Ti36	70.000	11.000	33.000	14.400	36.0	5.00	-5.00	0	-2.000	0	14.1120	Std Pos. Seq.	0.0

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 7
Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
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Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

Transformer	Rating					Z Variation			% Tap Setting		Adjusted	Phase Shift	
ID	MVA	Prim. kV	Sec. kV	% Z	X/R	+ 5%	- 5%	% Tol.	Prim.	Sec.	% Z	Type	Angle

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 8
Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004BR26		SN: TATAENRGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

BRANCH CONNECTIONS

CKT/Branch		Connected Bus ID		% Impedance, Pos. Seq., 100 MVAb			
ID	Type	From Bus	To Bus	R	X	Z	Y
T 1	2W XFMR	3 BOT3	31Bot3	0.71	23 89	23.90	
T 2	2W XFMR	4SRS	32SRSA	0.71	16.71	16.72	
T3i	2W XFMR	4SRS	33SRSB	0.75	17.28	17.30	
T4i	2W XFMR	4SRS	33SRSB	0.67	15.59	15.60	
T5i	2W XFMR	52G2	32SRSA	0.32	12.48	12.49	
T6i	2W XFMR	52G2	32SRSA	0.32	12.48	12.49	
T7i	2W XFMR	27BRS1	48BRS	2.39	33.11	33.20	
T9i	2W XFMR	29BRS3	48BRS	2.39	33.11	33.20	
T10i	2W XFMR	5MAJ	34MAJ	0.56	18.71	18.72	
T11i	2W XFMR	5MAJ	34MAJ	0.84	20.26	20.28	
T12i	2W XFMR	6BBDB	35BBD	0.51	18.03	18.04	
T13i	2W XFMR	7BBDA	35BBD	0.78	18.17	18.18	
T16i	2W XFMR	11JAD	36JAD	0.79	26.25	26.27	
T17i	2W XFMR	11JAD	36JAD	0.96	28.37	28.39	
T18i	2W XFMR	14PLN	37PLN	0.52	17.66	17.67	
T19i	2W XFMR	14PLN	37PLN	0.54	17.27	17.28	
T20i	2W XFMR	12PRSB	38PRSC	2.39	33.11	33.20	
T21i	2W XFMR	12iiPRSB	40PRSA	1.00	29.31	29.32	
T22i	2W XFMR	13iPRSA	40PRSA	0.88	29.31	29.32	
T23i	2W XFMR	16KRS1	41KRSA	0.36	18.43	18.43	
T24i	2W XFMR	17KRS2	41KRSA	2.18	30.19	30.27	
T25i	2W XFMR	18KRS3	42KRSB	0.35	17.85	17.85	
T26i	2W XFMR	19ECAL	43ECAL	1.12	31.78	31.80	
T27i	2W XFMR	19ECAL	43ECAL	0.92	31.79	31.80	
T28i	2W XFMR	24TRSB	47TRSC	0.93	31.22	31.23	
T29i	2W XFMR	24TRSB	47TRSC	0.91	29.90	29.92	
T30i	2W XFMR	24TRSB	47TRSC	0.91	29.90	29.92	
T31i	2W XFMR	23TRSA	45TRSA	0.88	29.31	29.32	
T32i	2W XFMR	B111	22NCGS	1.39	39.39	39.42	
T33i	2W XFMR	B111	22NCGS	0.72	24.52	24.54	
T34i	2W XFMR	B111	22NCGS	0.67	22.87	22.88	
T35i	2W XFMR	56G10	47TRSC	0.53	18.95	18.96	
T36	2W XFMR	54G4	10BBG	0.08	4.20	4.20	
T37i	2W XFMR	56G10	47TRSC	0.53	18.95	18.96	
T38i	2W XFMR	56G10	47TRSC	0.53	18.95	18.96	
-T8i	2W XFMR	28BRS2	48BRS	2.39	33.11	33.20	
Ti14	2W XFMR	54G4	10BBG	0.08	4.20	4.20	
Ti36	2W XFMR	56G10	47TRSC	0.53	18.95	18.96	
Lc36	Cable	24TRSB	22NCGS	0.67	1.07	1.26	9.3092947
LnC1i	Cable	1Howrah WB	2 Bot1	0.03	0.06	0.07	0.8377721

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 9
Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

CKT/Branch		Connected Bus ID		% Impedance, Pos. Seq., 100 MVAb			
ID	Type	From Bus	To Bus	R	X	Z	Y
LnC2i	Cable	1Howrah WB	3 BOT3	0.11	0.06	0.13	1.5921180
LnC3i	Cable	1Howrah WB	3 BOT3	0.07	0.04	0.08	1.0470953
LnC4i	Cable	2 Bot1	4SRS	0.23	0.14	0.27	3.4611905
LnC5	Cable	3 BOT3	4SRS	0.25	0.15	0.29	3.6344721
LnC6	Cable	1Howrah WB	4SRS	0.29	0.18	0.34	4.3142695
LnC7	Cable	4SRS	5MAJ	0.32	0.51	0.60	4.4758768
LnC8	Cable	4SRS	5MAJ	0.31	0.50	0.59	4.3511209
LnC9	Cable	5MAJ	11JAD	0.18	0.42	0.45	5.4991713
LnC10	Cable	5MAJ	14PLN	0.37	0.59	0.70	5.1763220
LnC 11	Cable	5MAJ	8TAR	0.28	0.06	0.29	0.8436788
LnC13i	Cable	11JAD	18KRS3	0.34	0.79	0.86	10.3741980
LnC14i	Cable	12iiPRSB	15 KRSWB	1.08	0.61	1.24	11.8740301
LnC15i	Cable	13iPRSA	15 KRSWB	1.07	0.61	1.23	11.8062582
LnC16i	Cable	26LILWB	27BRS1	0.45	0.27	0.52	6.6054382
LnC17i	Cable	26LILWB	28BRS2	0.44	0.27	0.52	6.5713744
LnC18i	Cable	26LILWB	29BRS3	0.44	0.26	0.51	6.4943604
LnC23	Cable	5MAJ	9CHAK	0.20	0.46	0.50	6.0288086
LnC24	Cable	5MAJ	9CHAK	0.20	0.45	0.49	5.9510365
LnC25	Cable	8TAR	9CHAK	0.18	0.40	0.44	5.3406739
LnC26	Cable	8TAR	9CHAK	0.17	0.40	0.44	5.2747154
LnC27	Cable	8TAR	12PRSB	0.36	0.81	0.89	10.7384462
LnC28	Cable	8TAR	6BBDB	0.34	0.77	0.85	10.2196379
LnC29	Cable	6BBDB	12PRSB	0.04	0.10	0.11	1.3339379
LnC30	Cable	7BBDA	12PRSB	0.04	0.10	0.11	1.3487047
LnC31	Cable	12PRSB	19ECAL	0.21	0.40	0.45	6.4629536
LnC32	Cable	BTRD-B	12iPRSB	1.23	0.52	1.34	13.7467003
LnC34	Cable	20BTRDA	19ECAL	0.31	0.72	0.78	9.4714518
LnC35	Cable	22NCGS	20BTRDA	0.09	0.19	0.21	2.4159110
SPST8	Tie Switch	15 KRSWB	17KRSi				
SPST9	Tie Switch	15 KRSWB	16KRSi				
SPST34	Tie Switch	12PRSB	12iPR8B				
line43	Line	25TITWB	23TRSA	0.08	0.05	0.09	0.8810410
LnC37i	Line	18KRSi	18KRS3	0.00	0.00	0.00	0.0002788
LnT19i	Line	10BBG	9CHAK	1.04	4.73	4.84	1.1301433
LnT20i	Line	10BBG	9CHAK	1.04	4.73	4.84	1.1296031
LnT21i	Line	10BBG	9CHAK	0.93	4.22	4.32	1.0075306
LnT22i	Line	10BBG	9CHAK	0.93	4.22	4.32	1.0075306
LnT38i	Line	17KRSi	17KRS2	0.00	0.00	0.00	0.0002788
LnT39i	Line	16KRSi	16KRS1	0.00	0.00	0.00	0.0002788

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Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004BR26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1Howrah WB	132.000	98.000	0.0	29.00	67.28	0	0	0	0	2 Bot1	-3.13	14.20	64	-21.5	
										3 BOT3	13.27	15.20	90	65.7	
										3 BOT3	20.17	23.78	139	64.7	
										4SRS	-1.31	14.10	63	-9.3	
2 Bot1	132.000	97.991	0.0	0	0	0	0	0	0	1Howrah WB	3.13	-15.00	68	-20.4	
										4SRS	-3.13	15.00	68	-20.4	
3 BOT3	132.000	97.975	0.0	0	0	0	0	0	0	1Howrah WB	-13.26	-16.73	95	62.1	
										1Howrah WB	-20.16	-24.78	142	63.1	
										4SRS	-7.37	10.45	57	-57.6	
										31Bot3	40.79	31.06	228	79.6	-10.000
4SRS	132.000	97.975	0.0	0	0	0	0	0	0	2 Bot1	3.14	-18.32	82	-16.9	
										3 BOT3	7.37	-13.94	70	-46.8	
										1Howrah WB	1.32	-18.24	81	-7.2	
										5MAJ	-27.75	-0.11	123	100.0	
										5MAJ	-28.54	0.01	127	100.0	
										32SRSA	-32.12	7.22	146	-97.6	-7.000
										33SRSB	35.89	10.33	166	96.1	-6.000
										33SRSB	40.70	33.05	234	77.6	-9.000
5MAJ	132.000	98.055	0.1	0	0	0	0	0	0	4SRS	27.77	-4.15	125	-98.9	
										4SRS	28.57	-4.15	128	-99.0	
										11JAD	109.16	49.91	535	90.9	
										14PLN	54.39	34.13	286	84.7	
										8TAR	67.80	-17.34	312	96.9	
										9CHAK	-117.14	-61.29	589	88.6	
										9CHAK	-118.67	-62.02	597	88.6	
										34MAJ	43.35	33.98	245	78.7	-2.500
										34MAJ	40.38	30.92	226	79.4	-2.500
6BBDB	132.000	97.799	-0.2	0	0	0	0	0	0	8TAR	-80.39	-27.73	380	94.5	
										12PRSB	51.34	10.50	234	98.0	
										35BBD	29.05	17.23	151	86.0	-4.000
7BBDA	132.000	97.735	-0.3	0	0	0	0	0	0	12PRSB	-28.64	-16.30	147	86.9	
										35BBD	28.64	16.30	147	86.9	-4.000
8TAR	132.000	98.259	0.1	0	0	0	0	0	0	5MAJ	67.95	16.55	311	97.2	
										9CHAK	-115.14	-26.64	526	97.4	
										9CHAK	-116.58	-26.91	532	97.4	
										12PRSB	83.14	18.52	379	97.6	
										6BBDB	80.63	18.48	368	97.5	
9CHAK	132.000	98.567	0.4	0	0	0	0	0	0	5MAJ	117.50	56.28	578	90.2	
										5MAJ	119.03	57.09	585	90.2	
										8TAR	115.39	22.05	521	98.2	

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Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
										8TAR	116.84	22.39	527	98.2	
										10BBG	-110.45	-37.24	517	94.8	
										10BBG	-110.51	-37.26	517	94.8	
										10BBG	-123.90	-41.65	580	94.8	
										10BBG	-123.90	-41.65	580	94.8	
10BBG	132.000	101.617	3.1	0	0	0	0	0	0	9CHAK	111.91	42.71	515	93.4	
										9CHAK	111.97	42.73	515	93.4	
										9CHAK	125.53	48.04	578	93.4	
										9CHAK	125.53	48.04	578	93.4	
										54G4	-237.47	-90.75	1094	93.4	
										54G4	-237.47	-90.75	1094	93.4	
11JAD	132.000	97.630	-0.1	0	0	0	0	0	0	5MAJ	-108.88	-54.54	545	89.4	
										18KRS3	27.90	9.53	132	94.6	
										36JAD	42.02	23.45	215	87.3	-5.000
										36JAD	38.96	21.55	199	87.5	-5.000
12iiPRSB	132.000	99.807	-0.1	0	0	0	0	0	0	15 KRSWB	-19.18	-3.42	85	98.4	
										40PRSA	19.18	3.42	85	98.4	-4.000
12iPRSB	132.000	97.764	-0.2	0	0	0	0	0	0	BTRD-B	0.01	-13.14	58	0.0	
										12PRSB	-0.01	13.14	58	0.0	
12PRSB	132.000	97.764	-0.2	0	0	0	0	0	0	8TAR	-82.86	-28.21	391	94.7	
										6BBDB	-51.32	-11.74	235	97.5	
										7BBDA	28.65	15.02	144	88.6	
										19ECAL	80.07	22.79	372	96.2	
										38PRSC	25.46	15.28	132	85.7	
										12iPRSB	0.01	-13.14	58	0.0	
13iPRSA	132.000	99.808	-0.1	0	0	0	0	0	0	15 KRSWB	-19.17	-3.50	85	98.4	
										40PRSA	19.17	3.50	85	98.4	-4.000
14PLN	132.000	97.628	0.0	0	0	0	0	0	0	5MAJ	-54.22	-38.82	298	81.3	
										37PLN	26.79	19.22	147	81.3	-5.000
										37PLN	27.43	19.60	151	81.4	-5.000
* 15 KRSWB	132.000	100.000	0.0	127.34	21.99	0	0	0	0	12iiPRSB	19.22	-8.41	91	-91.6	
										13iPRSA	19.22	-8.26	91	-91.9	
										17KRSi	34.11	13.53	160	93.0	
										16KRSi	54.79	25.13	263	90.9	
16KRS1	132.000	99.998	0.0	0	0	0	0	0	0	16KRSi	-54.78	-25.13	263	90.9	
										41KRSA	54.78	25.13	263	90.9	-3.000
16KRSi	132.000	100.000	0.0	0	0	0	0	0	0	16KRS1	54.79	25.13	263	90.9	
										15 KRSWB	-54.79	-25.13	263	90.9	
17KRS2	132.000	99.999	0.0	0	0	0	0	0	0	17KRSi	-34.11	-13.53	160	93.0	
										41KRSA	34.11	13.53	160	93.0	-3.000
17KRSi	132.000	100.000	0.0	0	0	0	0	0	0	17KRS2	34.11	13.53	160	93.0	
										15 KRSWB	-34.11	-13.53	160	93.0	

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Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
18KRS3	132.000	97.415	-0.2	0	0	0	0	0	0	11JAD	-27.86	-19.32	152	82.2	
										18KRSi	0.00	0.00	0	0.0	
										42KRSB	27.86	19.32	152	82.2	-4.000
18KRSi	132.000	97.415	-0.2	0	0	0	0	0	0	18KRS3					
19ECAL	132.000	97.484	-0.4	0	0	0	0	0	0	12PRSB	-79.91	-28.66	380	94.1	
										20BTRDA	35.55	12.15	168	94.6	
										43ECAL	22.21	8.19	106	93.8	
										43ECAL	22.15	8.32	106	93.6	
20BTRDA	132.000	97.248	-0.5	0	0	0	0	0	0	19ECAL	-35.50	-21.01	185	86.1	
										22NCGS	35.50	21.01	185	86.1	
22NCGS	132.000	97.170	-0.5	0	0	0	0	0	0	24TRSB	-52.26	-6.50	237	99.2	
										20BTRDA	-35.48	-23.26	190	83.6	
										B111	20.38	9.24	100	91.1	
										B111	32.66	15.04	161	90.8	
										B111	34.70	5.47	158	98.8	2.500
23TRSA	132.000	99.979	0.0	0	0	0	0	0	0	25TITWB	-18.99	-12.72	99	83.1	
										45TRSA	18.99	12.72	99	83.1	-4.000
24TRSB	132.000	97.553	-0.2	0	0	0	0	0	0	22NCGS	52.45	-2.02	235	-99.9	
										47TRSC	-16.99	0.65	76	-99.9	-2.000
										47TRSC	-17.73	0.69	79	-99.9	-2.000
										47TRSC	-17.73	0.69	79	-99.9	-2.000
*25TITWB	132.000	100.000	0.0	19.00	11.84	0	0	0	0	23TRSA	19.00	11.84	97	84.9	
*26LILWB	132.000	101.000	0.0	62.09	1.80	0	0	0	0	27BRS1	20.69	0.55	89	100.0	
										28BRS2	20.70	0.59	89	100.0	
										29BRS3	20.70	0.67	89	99.9	
27BRS1	132.000	100.898	0.0	0	0	0	0	0	0	26LILWB	-20.67	-7.27	95	94.3	
										48BRS	20.67	7.27	95	94.3	
28BRS2	132.000	100.899	0.0	0	0	0	0	0	0	26LILWB	-20.68	-7.27	95	94.3	
										48BRS	20.68	7.27	95	94.3	
29BRS3	132.000	100.900	0.0	0	0	0	0	0	0	26LILWB	-20.68	-7.27	95	94.3	
										48BRS	20.68	7.27	95	94.3	
31Bot3	33.000	101.457	-5.5	0	0	32.30	20.02	8.31	5.15	3 BOT3	-40.61	-25.17	823	85.0	
32SRSA	33.000	104.499	3.1	0	0	71.91	36.84	19.63	10.06	4SRS	32.20	-5.46	546	-98.6	
										52G2	-61.87	-20.72	1092	94.8	
										52G2	-61.87	-20.72	1092	94.8	
33SRSB	33.000	102.322	-3.5	0	0	60.48	29.29	15.83	7.67	4SRS	-35.79	-7.97	626	97.6	
										4SRS	-40.52	-28.98	851	81.3	
34MAJ	33.000	94.182	-4.8	0	0	68.21	44.06	15.13	9.77	5MAJ	-43.17	-28.22	958	83.7	
										5MAJ	-40.16	-25.61	884	84.3	
35BBD	33.000	98.686	-3.3	0	0	46.28	23.71	11.27	5.77	6BBDB	-28.99	-15.17	580	88.6	
										7BBDA	-28.56	-14.31	566	89.4	
36JAD	33.000	96.763	-6.7	0	0	65.32	42.19	15.29	-8.85	11JAD	-41.84	-17.39	819	92.3	

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Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
										11JAD	-38.77	-15.95	758	92.5	
37PLN	33.000	99.261	-2.7	0	0	43.41	28.04	10.69	6.91	14PLN	-26.74	-17.30	561	84.0	
										14PLN	-27.37	-17.64	573	84.0	
38PRSC	33.000	92.334	-5.4	0	0	20.81	10.08	4.43	2.15	12PRSB	-25.24	-12.23	531	90.0	
40PRSA	33.000	102.922	-3.2	0	0	30.27	16.34	8.02	-11.56	12iiPRSB	-19.15	-2.35	327	99.3	
										13iPRSA	-19.14	-2.43	328	99.2	
41KRSA	33.000	98.770	-5.8	0	0	71.14	34.45	17.35	-6.23	16KRS1	-54.66	-18.63	1022	94.7	
										17KRS2	-33.83	-9.59	622	96.2	
42KRSB	33.000	97.963	-3.1	0	0	22.44	13.91	5.38	3.34	18KRS3	-27.82	-17.24	584	85.0	
43ECAL	33.000	94.831	-4.7	0	0	36.12	21.43	8.12	-8.67	19ECAL	-22.14	-6.31	424	96.2	
										19ECAL	-22.10	-6.45	424	96.0	
45TRSA	33.000	100.400	-3.1	0	0	15.14	8.98	3.81	2.26	23TRSA	-18.95	-11.24	383	86.0	
47TRSC	33.000	99.648	2.9	0	0	129.58	59.04	32.17	14.66	24TRSB	17.01	0.28	298	100.0	
										24TRSB	17.76	0.28	311	100.0	
										24TRSB	17.76	0.28	311	100.0	
										56G10	-53.57	-18.64	995	94.4	
										56G10	-53.57	-18.64	995	94.4	
										56G10	-53.57	-18.64	995	94.4	
										56G10	-53.57	-18.64	995	94.4	
48BRS	33.000	98.245	-3.9	0	0	49.70	25.46	11.99	-8.33	27BRS1	-20.56	-5.71	380	96.4	
										29BRS3	-20.57	-5.71	380	96.4	
										28BRS2	-20.56	-5.71	380	96.4	
*52G2	11.000	102.200	7.2	124.00	51.68	0	0	0	0	32SRSA	62.00	25.84	3449	92.3	-5.000
										32SRSA	62.00	25.84	3449	92.3	-5.000
*54G4	16.000	105.000	8.5	476.00	234.61	0	0	0	0	10BBG	238.00	117.30	9118	89.7	-1.000
										10BBG	238.00	117.30	9118	89.7	-1.000
*56G10	11.000	100.000	8.7	215.00	100.13	0	0	0	0	47TRSC	53.75	25.03	3112	90.7	-4.000
										47TRSC	53.75	25.03	3112	90.7	-4.000
										47TRSC	53.75	25.03	3112	90.7	-4.000
										47TRSC	53.75	25.03	3112	90.7	-4.000
B111	33.000	99.295	-5.2	91.00	50.00	143.20	73.36	35.30	-1.64	22NCGS	-20.31	-7.27	380	94.1	6.000
										22NCGS	-32.56	-11.87	610	94.0	6.000
										22NCGS	-34.62	-2.58	611	99.7	6.000
BTRD-B	132.000	97.799	-0.3	0	0	0	0	0	0	12IPRSB					

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

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Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

BUS LOADING Summary Report

Bus			Bus Total Load					
ID	kV	Rated Amp	MW	Mvar	MVA	% PF	Amp	% Loading
1Howrah WB	132.000		33.435	67.278	75.128	44.5	335.31	
2 Botl	132.000		3.129	15.002	15.325	20.4	68.40	
3 BOT3	132.000		40.788	41.507	58.194	70.1	259.79	
4SRS	132.000		88.411	50.603	101.868	86.8	454.77	
5MAJ	132.000		303.615	148.939	338.179	89.8	1508.49	
6BBDB	132.000		80.388	27.731	85.036	94.5	380.31	
7BBDA	132.000		28.641	16.297	32.953	86.9	147.47	
8TAR	132.000		231.719	53.550	237.827	97.4	1058.65	
9CHAK	132.000		468.756	157.807	494.606	94.8	2194.80	
10BBG	132.000		474.938	181.506	508.439	93.4	2188.47	
11JAD	132.000		108.879	54.540	121.776	89.4	545.56	
12iPRSB	132.000		19.183	3.418	19.485	98.4	85.39	
12iPRSB	132.000		0.006	13.141	13.141	0.0	58.79	
12PRSB	132.000		134.187	53.092	144.308	93.0	645.62	
13iPRSA	132.000		19.175	3.504	19.493	98.4	85.42	
14PLN	132.000		54.222	38.818	66.685	81.3	298.76	
15 KRSWB	132.000		127.337	38.662	133.077	95.7	582.06	
16KRS1	132.000		54.785	25.127	60.272	90.9	263.63	
16KRSi	132.000		54.785	25.129	60.273	90.9	263.63	
17KRS2	132.000		34.113	13.533	36.700	93.0	160.52	
17KRSi	132.000		34.114	13.533	36.700	93.0	160.52	
18KRS3	132.000		27.865	19.320	33.907	82.2	152.24	
18KRSi	132.000					0.0		
19ECAL	132.000		79.914	28.657	84.896	94.1	380.91	
20BTRDA	132.000		35.502	21.011	41.254	86.1	185.54	
22NCGS	132.000		87.741	29.756	92.649	94.7	417.04	
23TRSA	132.000		18.994	12.715	22.857	83.1	100.00	
24TRSB	132.000		52.450	2.019	52.489	99.9	235.34	
25TITWB	132.000		18.998	11.837	22.384	84.9	97.90	
26LILWB	132.000		62.086	1.802	62.112	100.0	268.98	
27BRS1	132.000		20.675	7.269	21.915	94.3	95.00	
28BRS2	132.000		20.676	7.271	21.917	94.3	95.01	
29BRS3	132.000		20.678	7.274	21.920	94.3	95.02	
31Bot3	33.000		40.612	25.169	47.779	85.0	823.91	
32SRSA	33.000		123.740	46.899	132.329	93.5	2215.48	
33SRSB	33.000		76.310	36.959	84.789	90.0	1449.77	
34MAJ	33.000		83.333	53.828	99.207	84.0	1842.89	
35BBD	33.000		57.548	29.483	64.661	89.0	1146.33	

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 15
Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

Bus			Bus Total Load					
ID	kV	Rated Amp	MW	Mvar	MVA	% PF	Amp	% Loading
36JAD	33.000		80.608	42.192	90.982	88.6	1645.03	
37PLN	33.000		54.104	34.948	64.410	84.0	1135.27	
38PRSC	33.000		25.243	12.226	28.048	90.0	531.45	
40PRSA	33.000		38.289	16.339	41.629	92.0	707.65	
41KRSA	33.000		88.485	34.453	94.956	93.2	1681.99	
42KRSB	33.000		27.824	17.244	32.734	85.0	584.60	
43ECAL	33.000		44.241	21.432	49.159	90.0	906.94	
45TRSA	33.000		18.950	11.244	22.035	86.0	383.98	
47TRSC	33.000		214.289	74.546	226.885	94.4	3983.48	
48BRS	33.000		61.690	25.461	66.737	92.4	1188.46	
52G2	11.000		124.000	51.683	134.340	92.3	6899.22	
54G4	16.000		476.000	234.606	530.675	89.7	18237.22	
56G10	11.000		215.000	100.130	237.173	90.7	12448.36	
B111	33.000		178.494	73.362	192.982	92 5	3400.29	
BTRD-B	132.000					0.0		

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 16
Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

BRANCH LOADING Summary Report

CKT / Branch		Cable & Reactor			Transformer				
						Loading (input)		Loading (output)	
ID	Type	Ampacity (Amp)	Loading Amp	%	Capability (MVA)	MVA	%	MVA	%
T 1	Transformer				50.000	51.266	102.5	47.779	95.6
T 2	Transformer				55.000	32.921	59.9	32.655	59.4
T3i	Transformer				55.000	37.348	67.9	36.665	66.7
T4i	Transformer				55.000	52.423	95.3	49.822	90.6
T5i	Transformer				85.000	67.170	79.0	65.247	76.8
T6i	Transformer				85.000	67.170	79.0	65.247	76.8
T7i	Transformer				50.000	21.915	43.8	21.339	42.7
T9i	Transformer				50.000	21.920	43.8	21.343	42.7
T10i	Transformer				75.000	55.079	73.4	51.580	68.8
T11i	Transformer				55.000	50.858	92.5	47.628	86.6
T12i	Transformer				69.000	33.777	49.0	32.720	47.4
T13i	Transformer				68.000	32.953	48.5	31.943	47.0
T16i	Transformer				50.000	48.120	96.2	45.308	90.6
T17i	Transformer				50.000	44.525	89.1	41.923	83.8
T18i	Transformer				75.000	32.973	44.0	31.848	42.5
T19i	Transformer				75.000	33.712	44.9	32.562	43.4
T20i	Transformer				50.000	29.697	59.4	28.048	56.1
T21i	Transformer				50.000	19.485	39.0	19.289	38.6
T22i	Transformer				50.000	19.493	39.0	19.297	38.6
T23i	Transformer				75.000	60.272	80.4	57.746	77.0
T24i	Transformer				50.000	36.700	73.4	35.161	70.3
T25i	Transformer				75.000	33.907	45.2	32.734	43.6
T26i	Transformer				50.000	23.667	47.3	23.022	46.0
T27i	Transformer				50.000	23.667	47.3	23.022	46.0
T28i	Transformer				50.000	17.015	34.0	16.997	34.0
T29i	Transformer				50.000	17.764	35.5	17.746	35.5
T30i	Transformer				50.000	17.764	35.5	17.746	35.5
T31i	Transformer				50.000	22.857	45.7	22.035	44.1
T32i	Transformer				50.000	22.381	44.8	21.576	43.2
T33i	Transformer				75.000	35.954	47.9	34.660	46.2
T34i	Transformer				50.000	35.130	70.3	34.713	69.4
T35i	Transformer				70.000	59.293	84.7	56.721	81.0
T36	Transformer				315.000	265.337	84.2	254.220	80.7
T37i	Transformer				70.000	59.293	84.7	56.721	81.0
T38i	Transformer				70.000	59.293	84.7	56.721	81.0
-T8i	Transformer				50.000	21.917	43.8	21.340	42.7
Ti14	Transformer				315.000	265.337	84.2	254.220	80.7

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 17
Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

CKT / Branch		Cable & Reactor			Transformer				
		Ampacity	Loading		Capability	Loading (input)		Loading (output)	
ID	Type	(Amp)	Amp	%	(MVA)	MVA	%	MVA	%
Ti36	Transformer				70.000	59.293	84.7	56.721	81.0

* Indicates a branch with operating load exceeding the branch capability

Project: CESC LossStudy Report(2004-05)
Location: Kolkota, West Bengal
Contract: 2004ER26
Engineer: M.S.Bhalla
Filename: cesc132ks

ETAP PowerStation
4.0.4C

Study Case: LF

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SN: TATAENERGY
Revision: Base
Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

BRANCH LOSSES Summary Report

Bus ID	kV	Rated Amp	Bus Total Load MW	Mvar	MVA	% PF	Amp	% Loading	
36JA CKT / Branch	From To Bus Flow		To From Bus Flow		Losses			% Bus Voltage	Vd % Drop
37PLN ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
L38PRSC	33.000	14.199	25.429	12.602	28.048	90.0	803.1	531.45	98.0	98.0	0.01
LnG2i 40PRSA	33.000	15.204	38.289	16.359	41.629	92.0	1525.8	707.65	98.0	98.0	0.03
LnC3i 41KRSA	33.000	23.777	-20.162	-24.778	94.956	93.2	1001.0	1681.99	98.0	98.0	0.03
LnC6 42KRSB	33.000	14.098	1.318	-18.235	32.734	85.0	4137.6	584.60	98.0	98.0	0.03
LnC4i 43SCAL	33.000	15.002	3.136	-18.321	49.159	90.0	3318.8	906.94	98.0	98.0	0.02
Ln25	33.000	10.451	44.241	21.432	22.013	90.0	3485.6	383.98	98.0	98.0	0.00
T45TRSA	33.000	31.057	19.902	11.244	22.013	86.0	6887.7	383.98	98.0	101.5	3.48
LnC7 47TRSC	33.000	-0.110	27.773	-4.148	226.885	94.4	4258.6	3983.48	98.0	98.1	0.08
LnC8 48BRS	33.000	0.008	28.569	-4.145	66.737	92.4	4137.6	1188.46	98.0	98.1	0.08
T 2 52G2	11.000	7.215	32.195	-5.461	74.9	102.6	1754.4	6899.22	98.0	104.5	6.52
T5i 54G4	11.000	10.335	124.000	51.683	134.340	92.3	2360.3	237.29	98.0	102.3	4.35
T4i 56G10	11.000	33.046	47.000	234.000	530.671	89.7	4061.2	237.29	98.0	102.3	4.35
LnC9 B111	33.000	49.912	198.879	100.130	237.143	90.7	4628.1	12448.38	98.1	97.6	0.43
LnC10 B1RD-B	33.000	34.128	178.494	73.362	192.982	92.5	4690.4	3400.29	98.1	97.6	0.43
LnC 11 LnC23	132.000	-17.335	67.946	16.555	141.9	0.0	780.4		98.1	98.3	0.20
LnC24		-61.292	117.496	56.279	355.7		5012.8		98.1	98.6	0.51
T10i		-62.018	119.031	57.091	360.4		4927.0		98.1	98.6	0.51
T11i		33.979	-43.175	-28.222	173.7		5757.1		98.1	94.2	3.87
LnC28		30.920	-40.159	-25.606	220.7		5313.7		98.1	94.2	3.87
LnC29		-27.731	80.635	18.475	247.1		9255.3		97.8	98.3	0.46
T12i		10.498	-51.324	-11.744	12.7		1246.2		97.8	97.8	0.03
LnC30		17.232	-28.992	-15.168	58.4		2064.4		97.8	98.7	0.89
T13i		-16.297	28.645	15.020	5.0		1277.3		97.7	97.8	0.03
LnC25		16.297	-28.556	-14.315	84.9		1982.6		97.7	98.7	0.95
LnC26		-26.641	115.393	22.048	253.4		4592.5		98.3	98.6	0.31
LnC27		-26.910	116.836	22.388	256.6		4521.3		98.3	98.6	0.31
LnT19i		18.520	-82.863	-28.206	275.3		9685.8		98.3	97.8	0.50
LnT20i		-37.244	111.912	42.706	1456.7		5461.2		98.6	101.6	3.05
LnT21i		-37.262	111.965	42.727	1457.4		5464.9		98.6	101.6	3.05
LnT22i		-41.650	125.531	48.037	1634.0		6386.5		98.6	101.6	3.05
T36		-41.650	125.531	48.037	1634.0		6386.5		98.6	101.6	3.05
Ti14		-90.753	238.000	117.303	531.0		26549.7		101.6	105.0	3.38
LnC13i		-90.753	238.000	117.303	531.0		26549.7		101.6	105.0	3.38
T16i		9.534	-27.865	-19.319	35.6		9785.0		97.6	97.4	0.21
T17i		23.451	-41.837	-17.392	181.8		6059.0		97.6	96.8	0.87
LnC14i		21.555	-38.771	-15.949	189.1		5605.7		97.6	96.8	0.87
T21i		-3.418	19.223	-8.410	40.6		11828.3		99.8	100.0	0.19
LnC32		3.418	-19.146	-2.346	36.7		1072.2		99.8	102.9	3.11
LnC31		-13.141			5.6		13141.2		97.8	97.8	0.03
T20i		22.790	-79.914	-28.657	158.6		5866.4		97.8	97.5	0.28
LnC15i		15.281	-25.243	-12.226	220.9		3055.5		97.8	92.3	5.43
T22i		-3.504	19.215	-8.257	40.3		11760.8		99.8	100.0	0.19
T18i		3.504	-19.143	-2.431	32.0		1073.2		99.8	102.9	3.11
T19i		19.217	-26.737	-17.303	56.5		1913.9		97.6	99.3	1.63
LnT39i		19.601	-27.367	-17.644	61.1		1956.8		97.6	99.3	1.63
T23i		-25.127	54.785	25.129	0.3		1.4		100.0	100.0	0.00
		25.127	-54.657	-18.634	128.2		6493.4		100.0	98.8	1.23

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 19
Location:	Kolkota, West Bengal	4.0.4C	Date: 26-09-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
LnT38i	-34.113	-13.533	34.114	13.533	0.1	0.3	100.0	100.0	0.00
T24i	34.113	13.533	-33.828	-9.588	285.0	3944.7	100.0	98.8	1.23
LnC37i	0.000	0.000			0.0	-0.3	97.4	97.4	0.00
T25i	27.865	19.320	-27.824	-17.244	41.0	2075.9	97.4	98.0	0.55
LnC34	35.553	12.149	-35.502	-21.011	50.9	-8862.7	97.5	97.2	0.24
T26i	22.206	8.185	-22.140	-6.312	66.0	1873.1	97.5	94.8	2.65
T27i	22.155	8.323	-22.100	-6.450	54.3	1873.5	97.5	94.8	2.65
LnC35	35.502	21.011	-35.484	-23.259	17.5	-2247.9	97.2	97.2	0.08
Lc36	-52.257	-6.497	52.450	-2.019	193.2	-8515.9	97.2	97.6	0.38
T32i	20.383	9.243	-20.313	-7.272	69.6	1971.4	97.2	99.3	2.12
T33i	32.657	15.039	-32.564	-11.871	93.5	3167.5	97.2	99.3	2.12
T34i	34.701	5.473	-34.617	-2.583	84.4	2890.8	97.2	99.3	2.12
line43	-18.994	-12.715	18.998	11.837	4.1	-878.5	100.0	100.0	0.02
T31i	18.994	12.715	-18.950	-11.244	43.9	1470.6	100.0	100.4	0.42
T28i	-16.985	0.647	17.013	0.282	27.7	928.9	97.6	99.6	2.09
T29i	-17.732	0.686	17.762	0.284	29.5	969.7	97.6	99.6	2.09
T30i	-17.732	0.686	17.762	0.284	29.5	969.7	97.6	99.6	2.09
LnC16i	20.694	0.549	-20.675	-7.269	19.4	-6719.7	101.0	100.9	0.10
LnC17i	20.695	0.586	-20.676	-7.271	19.3	-6685.1	101.0	100.9	0.10
LnC18i	20.697	0.667	-20.678	-7.274	19.1	-6606.8	101.0	100.9	0.10
T7i	20.675	7.269	-20.562	-5.707	112.9	1562.2	100.9	98.2	2.65
-T8i	20.676	7.271	-20.563	-5.708	112.9	1562.4	100.9	98.2	2.65
T9i	20.678	7.274	-20.565	-5.711	112.9	1562.8	100.9	98.2	2.65
T5i	-61.870	-20.719	62.000	25.842	130.2	5122.3	104.5	102.2	2.30
T6i	-61.870	-20.719	62.000	25.842	130.2	5122.3	104.5	102.2	2.30
T35i	-53.572	-18.636	53.750	25.033	177.7	6396.2	99.6	100.0	0.35
T37i	-53.572	-18.636	53.750	25.033	177.7	6396.2	99.6	100.0	0.35
T38i	-53.572	-18.636	53.750	25.033	177.7	6396.2	99.6	100.0	0.35
Ti36	-53.572	-18.636	53.750	25.033	177.7	6396.2	99.6	100.0	0.35
					14390.8	29680.1			

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 20
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Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	cesc132ks		Config.: Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

Alert Summary Report

	% Alert Settings	
	Critical	Marginal
Loading		
Bus		
Cable		
Reactor		
Generator		
Transformer		
Protective Device		
Bus Voltage		
OverVoltage	105.0	105.0
UnderVoltage	90.0	91.0
Generator Excitation		
OverExcited (Q Max.)		
UnderExcited (Q Min.)		

Critical Report

ID	Device Type	Rating	Unit	Calculated	%Mag.	Condition
54G4	Bus	16.000	kV	16.800	105.0	OverVoltage

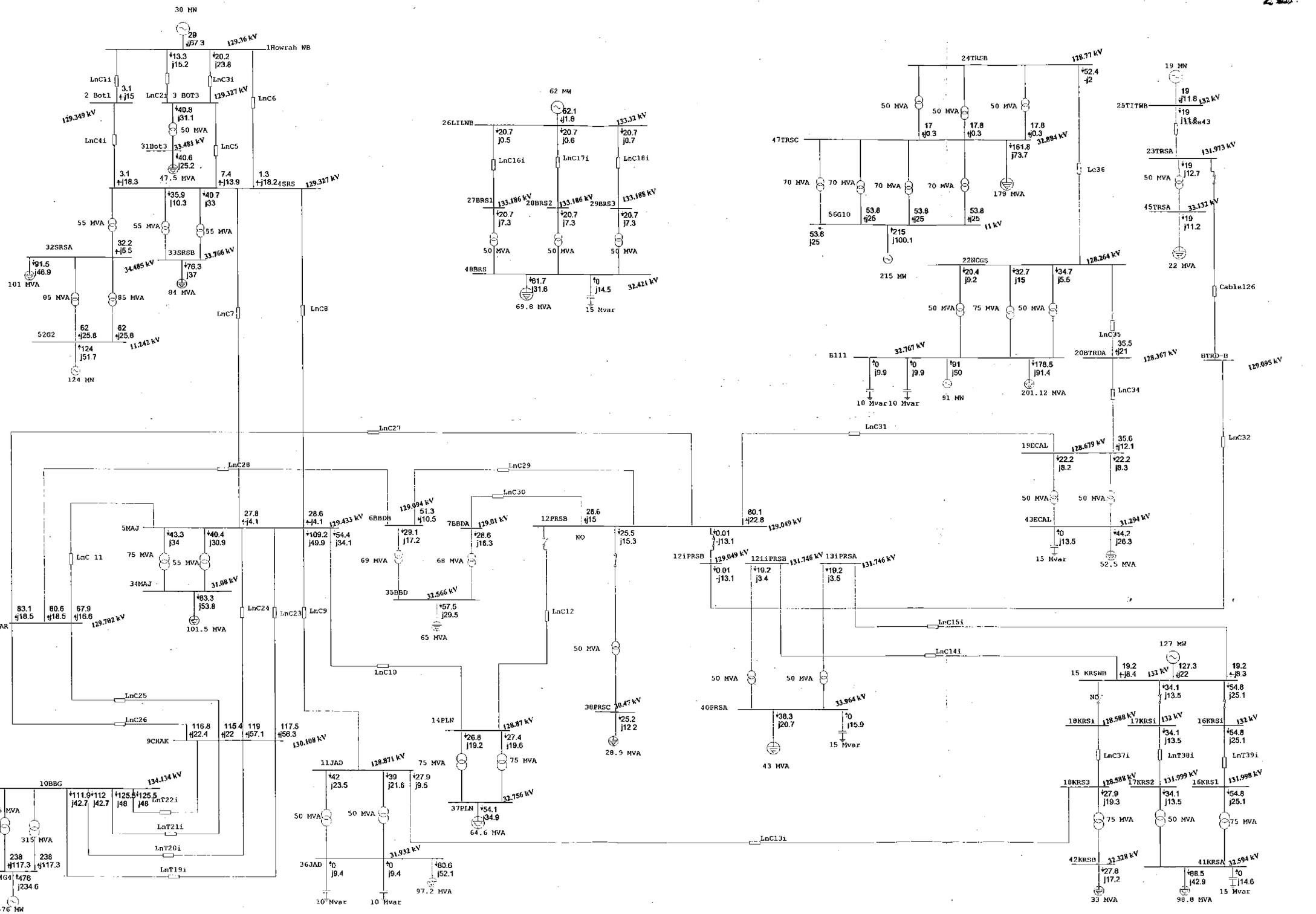
Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation		Page:	21
Location:	Kolkota, West Bengal	4.0.4C		Date:	26-09-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF		Revision:	Base
Filename:	cesc132ks			Config.:	Normal

CESC 132 kV Network upto 33kV. Final case with 80% motor load

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	237.418	102.912	258.763	91.75 Lagging
Generators:	906.000	436.419	1005.633	90.09 Lagging
Total Demand:	1143.418	539.331	1264.232	90.44 Lagging
Total Motor Load:	906.301	487.205	1028.956	88.08 Lagging
Total Static Load:	222.726	22.446		
Apparent Losses:	14.391	29.680		
System Mismatch:	0.000	0.000		

Number of Iterations: 2


30 MW
29
129.36 kV
1Howrah WB
LnC11
2 Bot1
LnC2s
3 BOT3
LnC31
LnC6
129.349 kV
129.327 kV
LnC4i
31Bot3
33.481 kV
LnC5
47.5 MVA
55 MVA
32SRSA
33SRSB
34.485 kV
33.766 kV
84 MVA
101 MVA
85 MVA
52G2
11.242 kV
124 MW
LnC7
LnC8
62 MW
26LILWB
133.32 kV
LnC16i
LnC17i
LnC18i
27BRS1
28BRS2
29BRS3
133.186 kV
133.188 kV
48BRS
69.8 MVA
15 Mvar
32.421 kV
24TRSB
128.77 kV
50 MVA
47TRSC
32.884 kV
178 MVA
70 MVA
56G10
11 kV
215 MW
Lc36
22NCGS
128.264 kV
50 MVA
75 MVA
B111
32.767 kV
10 Mvar
91 MW
201.12 MVA
LnC35
20BTRDA
128.367 kV
LnC34
19 MW
25TITWB
132 kV
23TRSA
131.973 kV
45TRSA
33.132 kV
22 MVA
Cable126
6TRD-B
129.095 kV
LnC32
LnC31
19ECAL
128.679 kV
43ECAL
31.294 kV
15 Mvar
52.5 MVA
LnC27
LnC28
LnC29
LnC30
5MAJ
6BBDB
7BBDA
12PRSB
NO
LnC 11
75 MVA
34MAJ
31.08 kV
101.5 MVA
69 MVA
68 MVA
35BBD
32.566 kV
65 MVA
LnC24
LnC23
LnC9
LnC10
LnC12
8TAR
129.782 kV
LnC25
LnC26
9CHAK
130.108 kV
10BBG
134.134 kV
315 MVA
54G4
476 MW
LnT22i
LnT21i
LnT20i
LnT19i
11JAD
128.871 kV
36JAD
31.932 kV
97.2 MVA
14PLN
128.87 kV
37PLN
32.756 kV
64.6 MVA
38PRSC
30.47 kV
28.9 MVA
121PRSB
12iiPRSB
131.746 kV
131PRSA
40PRSA
33.964 kV
43 MVA
15 Mvar
LnC15i
LnC14i
LnC13i
127 MW
15 KRSWB
132 kV
NO
18KRS1
17KRS1
16KRS1
18KRS3
17KRS2
16KRS2
42KRSB
41KRSA
LnC37i
LnT38i
LnT39i
33 MVA
98.8 MVA

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 1
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33KV-SOUTHERN-REC-CUM-GEN-STN		Config.: Normal

33 kV Area SOUTHERN REC. CUM GEN. Station

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	2	0	64	66

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	29	0	0	51	0	0	80

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	33KV-SOUTHERN-REC-CUM-GEN-STN
Output Filename:	C:\ETAP 404\PowerStation\33KV-SOUTHERN-REC-CUM-GEN-STN\SOUT-R-G.lfl

Project:	CESC Loss Study Report 2004-05	ETAP PowerStation		Page:	10
Location:	Kolkata, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla		Study Case: LF	Revision:	Base
Filename:	33KV-SOUTHERN-REC-CUM-GEN-STN			Config.:	Normal

33 kV Area SOUTHERN REC. CUM GEN. Station

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
6AKRA	6.000	91.807	-3.9	0	0	7.74	3.75	0	0	33AKRA	-7.74	-3.75	991	90.0	
6ALIPORE	6.000	101.388	-2.6	0	0	4.98	2.41	0.00	-3.08	33ALIPORE	-4.98	0.67	476	-99.1	
6BLVDR	6.000	93.331	-1.2	0	0	2.08	1.37	0	0	33BLVDR-1	-1.04	-0.69	128	83.5	
										33BLVDR-2	-1.04	-0.69	128	83.5	
6BRSHA	6.000	103.260	-2.6	0	0	4.73	2.29	0.00	-4.80	33BRSHA	-4.73	2.51	499	-88.4	
6BUDGE	6.000	93.671	-2.8	0	0	9.82	5.57	0.00	-1.32	33BUDG-2	-3.98	1.67	443	-92.2	
										33BUDG-1	-5.84	-5.92	854	70.2	
6BWNIPR	6.000	92.012	-4.2	0	0	9.10	6.83	0	0	33BWNIPR	-9.10	-6.83	1190	80.0	
6CNT-AV	6.000	89.256	-2.8	0	0	5.00	2.42	0	0	33CNT-AV	-5.00	-2.42	599	90.0	
6ELGN-RD	6.000	98.498	-2.1	0	0	4.83	2.99	0	0	33ELGN-RD	-4.83	-2.99	554	85.0	
6FORT-GL	6.000	95.036	-2.0	0	0	4.34	2.69	0	0	33FLUD-2	-2.17	-1.34	258	85.0	
										33FLUD-2	-2.17	-1.34	258	85.0	
6HIDE-RD	6.000	97.139	-3.4	0	0	7.78	4.82	0	0	33HIDE-RD	-7.78	-4.82	906	85.0	
6HWRHW	6.000	90.110	-4.8	0	0	18.49	13.87	0.00	-3.65	33HWRHW-2	-8.26	-1.16	891	99.0	
										33HWRHW-1	-10.22	-9.05	1458	74.9	
6KIDPRE	6.000	94.952	-3.3	0	0	13.53	7.67	0.00	-4.06	33KIDPR-1	-7.82	-6.87	1054	75.1	
										33KIDPR-2	-5.71	3.26	666	-86.8	
6LUDLOW	6.000	94.925	-1.7	0	0	3.17	2.21	0	0	33LUDLO-2	-1.58	-1.10	195	82.0	
										33LUDLO-1	-1.58	-1.10	195	82.0	
6MOUGRM	6.000	94.351	-1.7	0	0	2.27	1.41	0	0	33MOURGM	-2.27	-1.41	272	85.0	
6SHLMR	6.000	97.067	-3.0	0	0	20.09	9.73	0.00	-2.83	33SHLMR-1	-6.15	1.07	618	-98.5	
										33SHLMR-2	-8.03	-9.64	1243	64.0	
										33SHLMR-3	-5.91	1.66	608	-96.3	
6SOUTHHRN	6.000	98.232	-3.4	0	0	22.30	10.80	0.00	-10.13	33SOUT-4	-7.89	-4.00	866	89.2	
										33SOUT-1	-7.90	-4.03	868	89.1	
										33SOUT-3	-6.52	7.36	963	-66.3	
6TRATLA	6.000	92.641	-3.3	0	0	14.11	9.48	0	0	33TRATLA-1	-7.93	-9.91	1318	62.4	
										33TRATLA-2	-6.18	0.43	643	-99.8	
20SOUTRN	20.000	101.110	-0.9	0	0	1.70	0.82	0	0	33SOUTRN	-1.70	-0.82	53	90.0	
33AKRA	33.000	91.647	-0.2	0	0	0	0	0	0	33U/A-TRATLA	-7.78	-4.42	170	87.0	
										6AKRA	7.78	4.42	170	87.0	-4.000
33ALIPORE	33.000	101.153	-0.5	0	0	0	0	0	0	33RAJA-ST	-4.99	0.49	86	-99.5	
										6ALIPORE	4.99	-0.49	86	-99.5	
33AND1	33.000	100.968	0.1	0	0	0	0	0	0	33BOT8	-8.12	-8.23	200	70.3	
										33FLUD-2	8.12	8.23	200	70.3	
33AND2-3	33.000	92.357	-0.2	0	0	0	0	0	0	33BOT-GRDN	-1.53	0.78	32	-89.0	
										33BOT-GRDN	-2.82	1.01	56	-94.1	
										33FLUD-2	0.30	-1.32	25	-22.1	
										33RAJ-1	0.88	-0.94	24	-68.4	

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 11
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33KV-SOUTHERN-REC-CUM-GEN-STN		Config.: Normal

33 kV Area SOUTHERN REC. CUM GEN. Station

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
										33MOU-1	2.28	1.41	50	85.0	
										33RAJ-2	0.88	-0.94	24	-68.4	
33BLVDR-1	33.000	92.329	-0.5	0	0	0	0	0	0	33RAJ-1	-1.04	-0.70	23	82.8	
										6BLVDR	1.04	0.70	23	82.8	-2.000
33BLVDR-2	33.000	92.329	-0.5	0	0	0	0	0	0	33RAJ-2	-1.04	-0.70	23	82.8	
										6BLVDR	1.04	0.70	23	82.8	-2.000
33BOT8	33.000	101.360	0.0	0	0	0	0	0	0	33SOUTRN-R-STN-3	-8.16	-7.88	195	71.9	
										33AND1	8.16	7.88	195	71.9	
33BOT-GRDN	33.000	92.416	-0.2	0	0	0	0	0	0	33SOUTRN-R-STN-2	-11.01	-2.99	215	96.5	
										33AND2-3	1.53	-0.97	34	-84.4	
										33AND2-3	2.82	-1.31	58	-90.7	
										33SOUTRN-R-STN-4	-9.82	-3.13	195	95.3	
										33HWRHW-1	10.54	10.03	275	72.4	
										33SHLMR-3	5.93	-1.63	116	-96.4	
33BRSHA	33.000	101.664	-0.6	0	0	0	0	0	0	33MJRHT-STN	-4.75	2.30	90	-90.0	
										6BRSHA	4.75	-2.30	90	-90.0	
33BUDG-1	33.000	98.824	-0.2	0	0	0	0	0	0	33O/D-TRATLA	-5.87	-6.52	155	66.9	
										6BUDGE	5.87	6.52	155	66.9	
33BUDG-2	33.000	92.546	-0.8	0	0	0	0	0	0	33L/A-MAH	-3.99	1.51	80	-93.5	
										6BUDGE	3.99	-1.51	80	-93.5	
33BWNIPR	33.000	90.467	0.0	0	0	0	0	0	0	33SOUTRN-R-STN-4	-9.17	-7.99	235	75.4	
										6BWNIPR	9.17	7.99	235	75.4	-8.000
33CNT-AV	33.000	91.647	-0.2	0	0	0	0	0	0	33PRS-3	-5.02	-2.72	108	87.9	
										6CNT-AV	5.02	2.72	108	87.9	
33CONS.	33.000	92.331	-0.2	0	0	0	0	0	0	33MOU-1	0.00	0.00	0	0.0	
33ELGN-RD	33.000	101.076	-0.1	0	0	0	0	0	0	33SOUTRN-R-STN-1	-4.84	-3.25	100	83.1	
										6ELGN-RD	4.84	3.25	100	83.1	
33FLUD-2	33.000	92.890	-0.6	0	0	0	0	0	0	33AND1	-7.57	-7.98	207	68.8	
										33AND2-3	-0.29	0.85	16	-32.7	
										33LUDLO-2	1.59	1.01	35	84.5	
										33LUDLO-1	1.59	1.01	35	84.5	
										33RAJ-1	0.16	1.14	21	14.4	
										33RAJ-2	0.16	1.14	21	14.4	
										6FORT-GL	2.17	1.42	48	83.7	-4.000
										6FORT-GL	2.17	1.42	48	83.7	-4.000
33HIDE-RD	33.000	101.416	0.0	0	0	0	0	0	0	33SOUTRN-R-STN-1	-7.81	-5.50	164	81.8	
										6HIDE-RD	7.81	5.50	164	81.8	
33HWRHW-1	33.000	90.683	0.0	0	0	0	0	0	0	33BOT-GRDN	-10.32	-10.80	288	69.1	
										6HWRHW	10.32	10.80	288	69.1	-8.000
33HWRHW-2	33.000	91.726	-0.5	0	0	0	0	0	0	33SOUTRN-R-STN-4	-8.30	-1.81	162	97.7	
										6HWRHW	8.30	1.81	162	97.7	
33KIDPR-1	33.000	100.977	0.1	0	0	0	0	0	0	33SOUTRN-R-STN-1	-7.87	-7.79	191	71.1	

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**		Page:	12
Location:	Kolkata, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla		Study Case: LF	Revision:	Base
Filename:	33KV-SOUTHERN-REC-CUM-GEN-STN			Config.:	Normal

33 kV Area SOUTHERN REC. CUM GEN. Station

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
										6KIDPRE	7.87	7.79	191	71.1	
33KIDPR-2	33.000	92.702	-0.4	0	0	0	0	0	0	33SOUTRN-R-STN-4	-5.73	2.90	121	-89.2	
										6KIDPRE	5.73	-2.90	121	-89.2	
33L/A-MAH	33.000	92.680	-0.6	0	0	0	0	0	0	33BUDG-2	4.00	-2.01	84	-89.3	
										33SOUTRN-R-STN-2	-4.00	2.01	84	-89.3	
33L/A-TRATLA	33.000	92.462	-0.1	0	0	0	0	0	0	33AKRA	7.84	3.71	164	90.4	
										33SOUTRN-R-STN-2	-7.84	-3.71	164	90.4	
33LUDLO-1	33.000	92.467	-0.7	0	0	0	0	0	0	33FLUD-2	-1.59	-1.15	37	81.0	
										6LUDLOW	1.59	1.15	37	81.0	-4.000
33LUDLO-2	33.000	92.467	-0.7	0	0	0	0	0	0	33FLUD-2	-1.59	-1.15	37	81.0	
										6LUDLOW	1.59	1.15	37	81.0	-4.000
33MJRHT-STN	33.000	101.800	-0.4	0	0	0	0	0	0	33SOUTRN-R-STN-1	-4.76	2.96	96	-84.9	
										33BRSHA	4.76	-2.96	96	-84.9	
33MOU-1	33.000	92.331	-0.2	0	0	0	0	0	0	33CONS.	0.00	-0.05	0	0.0	
										33MOURGM	2.28	1.47	51	84.1	
										33AND2-3	-2.28	-1.42	50	84.9	
33MOURGM	33.000	92.324	-0.2	0	0	0	0	0	0	33MOU-1	-2.28	-1.49	51	83.6	
										6MOUGRM	2.28	1.49	51	83.6	-4.000
33MTP2	33.000	92.492	-0.1	0	0	2.50	1.55	0	0	33SOUTRN-R-STN-2	-2.50	-1.55	55	85.0	
33MTP-1	33.000	101.145	-0.4	0	0	2.00	1.24	0	0	33RAJA-ST	-2.00	-1.24	40	85.0	
33O/D-TRATLA	33.000	101.491	0.0	0	0	0	0	0	0	33SOUTRN-R-STN-3	-6.00	-6.41	151	68.3	
										33BUDG-1	6.00	6.41	151	68.3	
33PRS-3	33.000	91.936	-0.2	0	0	0	0	0	0	33SOUTRN-R-STN-2	-5.03	-2.46	106	89.8	
										33CNT-AV	5.03	2.46	106	89.8	
33RAJ-1	33.000	92.411	-0.5	0	0	0	0	0	0	33AND2-3	-0.88	0.74	21	-76.6	
										33BLVDR-1	1.04	0.66	23	84.4	
										33FLUD-2	-0.16	-1.40	26	11.4	
33RAJ-2	33.000	92.411	-0.5	0	0	0	0	0	0	33BLVDR-2	1.04	0.66	23	84.4	
										33FLUD-2	-0.16	-1.40	26	11.4	
										33AND2-3	-0.88	0.74	21	-76.6	
33RAJA-ST	33.000	101.247	-0.4	0	0	0	0	0	0	33SOUTRN-R-STN-1	-6.99	0.02	120	100.0	
										33ALIPORE	4.99	-0.76	87	-98.9	
										33MTP-1	2.00	0.74	36	93.8	
33SHLMR-1	33.000	92.744	-0.2	0	0	0	0	0	0	33SOUTRN-R-STN-4	-6.17	0.76	117	-99.3	
										6SHLMR	6.17	-0.76	117	-99.3	-4.000
33SHLMR-2	33.000	100.901	0.2	0	0	0	0	0	0	33SOUTRN-R-STN-3	-8.10	-10.91	235	59.6	
										6SHLMR	8.10	10.91	235	59.6	-4.000
33SHLMR-3	33.000	92.283	-0.3	0	0	0	0	0	0	33BOT-GRDN	-5.92	1.36	115	-97.5	
										6SHLMR	5.92	-1.36	115	-97.5	-4.000
33SOUT-1	33.000	101.856	0.0	0	0	0	0	0	0	33SOUTRN-R-STN-3	-7.93	-4.65	157	86.3	
										6SOUTHHRN	7.93	4.65	157	86.3	
33SOUT-3	33.000	92.969	-0.1	0	0	0	0	0	0	33SOUTRN-R-STN-4	-6.56	6.60	175	-70.5	

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**		Page:	13
Location:	Kolkata, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF		Revision:	Base
Filename:	33KV-SOUTHERN-REC-CUM-GEN-STN			Config.:	Normal

33 kV Area SOUTHERN REC. CUM GEN. Station

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
										6SOUTHHRN	6.56	-6.60	175	-70.5	
33SOUT-4	33.000	101.838	0.0	0	0	0	0	0	0	33SOUTRN-R-STN-3	-7.92	-4.62	157	86.4	
										6SOUTHHRN	7.92	4.62	157	86.4	
33SOUTRN	33.000	101.997	0.0	0	0	0	0	0	0	33SOUTRN-R-STN-1	-1.70	-0.86	32	89.3	
										20SOUTRN	1.70	0.86	32	89.3	
*33SOUTRN-R-STN-1	33.000	102.000	0.0	80.66	52.74	0	0	0	0	33SOUTRN	1.70	0.84	32	89.7	
										33RAJA-ST	7.05	-1.56	123	-97.6	
										33HIDE-RD	7.86	4.85	158	85.1	
										33MJRHT-STN	4.79	-4.25	109	-74.8	
										33ELGN-RD	4.88	1.86	89	93.5	
										33TRATLA-1	8.08	10.84	231	59.8	
										33KIDPR-1	7.95	7.20	184	74.1	
										33SOUTRN-R-STN-3	38.34	32.95	867	75.8	
*33SOUTRN-R-STN-2	33.000	93.000	0.0	83.05	1.85	0	0	0	0	33L/A-TRATLA	7.88	3.40	161	91.8	
										33PRS-3	5.09	1.44	99	96.2	
										33MTP2	2.51	-0.17	47	-99.8	
										33L/A-MAH	4.05	-3.76	103	-73.2	
										33BOT-GRDN	11.07	2.75	214	97.1	
										33SOUTRN-R-STN-4	52.45	-1.80	987	-99.9	
33SOUTRN-R-STN-3	33.000	101.957	0.0	0	0	0	0	0	0	33O/D-TRATLA	6.03	5.84	144	71.9	
										33SOUT-4	7.93	4.54	156	86.8	
										33SOUT-1	7.94	4.57	157	86.6	
										33SHLMR-2	8.22	10.43	227	61.9	
										33BOT8	8.21	7.55	191	73.6	
										33SOUTRN-R-STN-1	-38.33	-32.94	867	75.8	
33SOUTRN-R-STN-4	33.000	92.980	0.0	0	0	0	0	0	0	33TRATLA-2	6.22	-0.56	117	-99.6	
										33KIDPR-2	5.77	-3.42	126	-86.0	
										33SOUT-3	6.57	-6.67	176	-70.2	
										33SHLMR-1	6.18	-1.03	117	-98.6	
										33BOT-GRDN	9.87	2.86	193	96.1	
										33HWRHW-2	8.40	0.51	158	99.8	
										33BWNIPR	9.43	6.49	215	82.4	
										33SOUTRN-R-STN-2	-52.44	1.82	987	-99.9	
33TRATLA-1	33.000	101.322	0.1	0	0	0	0	0	0	33SOUTRN-R-STN-1	-8.00	-11.34	239	57.7	
										6TRATLA	8.00	11.34	239	57.7	
33TRATLA-2	33.000	92.700	-0.2	0	0	0	0	0	0	33SOUTRN-R-STN-4	-6.20	0.09	117	-100.0	
										6TRATLA	6.20	-0.09	117	-100.0	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study Report 2004-05	ETAP PowerStation		Page:	17
Location:	Kolkata, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF		Revision:	Base
Filename:	33KV-SOUTHERN-REC-CUM-GEN-STN			Config.:	Normal

33 kV Area SOUTHERN REC. CUM GEN. Station

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
T6	-7.740	-3.749	7.776	4.417	35.9	668.1	91.8	91.6	0.16
T2	-4.977	0.673	4.987	-0.487	10.0	186.8	101.4	101.2	0.23
T27	-1.040	-0.685	1.041	0.704	1.3	19.2	93.3	92.3	1.00
T28	-1.040	-0.685	1.041	0.704	1.3	19.2	93.3	92.3	1.00
T4	-4.734	2.505	4.745	-2.301	11.0	204.9	103.3	101.7	1.60
T12	-3.982	1.671	3.990	-1.509	8.7	161.8	93.7	92.5	1.12
T13	-5.841	-5.921	5.873	6.519	32.2	598.3	93.7	98.8	5.15
T22	-9.104	-6.828	9.167	7.993	62.6	1164.7	92.0	90.5	1.55
T11	-5.004	-2.424	5.020	2.719	15.9	295.5	89.3	91.6	2.39
T5	-4.828	-2.992	4.842	3.245	13.6	253.2	98.5	101.1	2.58
T23	-2.168	-1.343	2.173	1.421	5.5	77.6	95.0	92.9	2.15
T24	-2.168	-1.343	2.173	1.421	5.5	77.6	95.0	92.9	2.15
T3	-7.778	-4.820	7.814	5.496	36.3	675.6	97.1	101.4	4.28
T20	-8.265	-1.158	8.300	1.811	35.1	653.1	90.1	91.7	1.62
T21	-10.223	-9.055	10.317	10.803	94.0	1748.8	90.1	90.7	0.57
T9	-7.817	-6.873	7.866	7.788	49.2	915.0	95.0	101.0	6.03
T10	-5.712	3.263	5.731	-2.898	19.6	365.4	95.0	92.7	2.25
T25	-1.583	-1.105	1.586	1.149	3.1	44.5	94.9	92.5	2.46
T26	-1.583	-1.105	1.586	1.149	3.1	44.5	94.9	92.5	2.46
T29	-2.270	-1.407	2.276	1.493	6.1	86.3	94.4	92.3	2.03
T17	-6.149	1.073	6.166	-0.759	16.9	313.8	97.1	92.7	4.32
T18	-8.032	-9.639	8.100	10.907	68.2	1268.0	97.1	100.9	3.83
T19	-5.907	1.664	5.924	-1.361	16.3	303.4	97.1	92.3	4.78
T14	-7.889	-4.004	7.922	4.622	33.2	617.6	98.2	101.8	3.61
T15	-7.895	-4.027	7.928	4.646	33.3	619.8	98.2	101.9	3.62
T16	-6.518	7.362	6.559	-6.601	40.9	760.3	98.2	93.0	5.26
T7	-7.927	-9.914	8.004	11.344	76.9	1429.5	92.6	101.3	8.68
T8	-6.183	0.432	6.201	-0.092	18.3	340.8	92.6	92.7	0.06
T30	-1.701	-0.824	1.703	0.857	2.1	33.1	101.1	102.0	0.89
Cable10	-7.776	-4.417	7.839	3.709	63.1	-707.3	91.6	92.5	0.82
Cable3	-4.987	0.487	4.992	-0.761	5.2	-273.9	101.2	101.2	0.09
Cable47	-8.123	-8.225	8.159	7.883	35.8	-341.7	101.0	101.4	0.39
Line1	8.123	8.225	-7.565	-7.979	557.5	246.0	101.0	92.9	8.08
Cable33	-1.526	0.780	1.528	-0.971	1.9	-190.1	92.4	92.4	0.06
Cable34	-2.818	1.010	2.821	-1.312	3.0	-302.0	92.4	92.4	0.06
Line2	0.299	-1.317	-0.293	0.847	6.0	-469.3	92.4	92.9	0.53
Line5	0.884	-0.942	-0.881	0.739	3.1	-203.1	92.4	92.4	0.05
Line11	2.276	1.411	-2.276	-1.417	0.5	-6.0	92.4	92.3	0.03
Line14	0.884	-0.942	-0.881	0.739	3.1	-203.1	92.4	92.4	0.05
Line6	-1.041	-0.704	1.042	0.661	0.7	-43.6	92.3	92.4	0.08
Line8	-1.041	-0.704	1.042	0.661	0.7	-43.6	92.3	92.4	0.08
Cable31	-8.159	-7.883	8.211	7.553	52.8	-330.1	101.4	102.0	0.60
Cable24	-11.009	-2.993	11.071	2.748	62.0	-245.3	92.4	93.0	0.58
Cable35	-9.817	-3.126	9.870	2.859	53.1	-267.5	92.4	93.0	0.56
Cable37	10.542	10.034	-10.317	-10.803	225.3	-769.1	92.4	90.7	1.73
Cable46	5.935	-1.632	-5.924	1.361	11.2	-271.7	92.4	92.3	0.13
Cable7	-4.745	2.301	4.759	-2.957	14.2	-656.5	101.7	101.8	0.14

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 18
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33KV-SOUTHERN-REC-CUM-GEN-STN		Config.: Normal

33 kV Area SOUTHERN REC. CUM GEN. Station

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Line13	-5.873	-6.519	6.001	6.410	128.3	-109.4	98.8	101.5	2.67
Cable20	-3.990	1.509	4.001	-2.015	10.3	-505.8	92.5	92.7	0.13
Cable40	-9.167	-7.993	9.425	6.492	258.4	-1500.7	90.5	93.0	2.51
Cable18	-5.020	-2.719	5.034	2.465	14.4	-254.3	91.6	91.9	0.29
Cable41	0.000	0.000	0.000	-0.050	0.0	-50.2	92.3	92.3	0.00
Cable8	-4.842	-3.245	4.882	1.858	39.9	-1386.9	101.1	102.0	0.92
Line3	1.591	1.009	-1.586	-1.149	5.5	-140.6	92.9	92.5	0.42
Line4	1.591	1.009	-1.586	-1.149	5.5	-140.6	92.9	92.5	0.42
Line7	0.165	1.136	-0.160	-1.400	4.4	-263.1	92.9	92.4	0.48
Line10	0.165	1.136	-0.160	-1.400	4.4	-263.1	92.9	92.4	0.48
Cable5	-7.814	-5.496	7.857	4.852	43.2	-643.3	101.4	102.0	0.58
Cable36	-8.300	-1.811	8.405	0.509	104.6	-1301.5	91.7	93.0	1.25
Cable14	-7.866	-7.788	7.954	7.203	87.8	-585.2	101.0	102.0	1.02
Cable15	-5.731	2.898	5.770	-3.423	38.6	-524.8	92.7	93.0	0.28
Cable21	-4.001	2.015	4.046	-3.762	45.6	-1747.4	92.7	93.0	0.32
Cable11	-7.839	-3.709	7.880	3.403	40.8	-306.0	92.5	93.0	0.54
Cable6	-4.759	2.957	4.793	-4.248	33.9	-1290.8	101.8	102.0	0.20
Cable42	2.276	1.467	-2.276	-1.493	0.1	-26.0	92.3	92.3	0.01
Cable19	-2.499	-1.549	2.511	-0.167	12.2	-1715.4	92.5	93.0	0.51
Cable4	-1.998	-1.238	1.999	0.739	1.8	-498.8	101.1	101.2	0.10
Cable23	-6.001	-6.410	6.033	5.839	31.8	-571.5	101.5	102.0	0.47
Cable16	-5.034	-2.465	5.086	1.437	51.6	-1027.6	91.9	93.0	1.06
Cable2	-6.992	0.021	7.049	-1.563	57.5	-1541.5	101.2	102.0	0.75
Cable28	-6.166	0.759	6.184	-1.031	18.0	-271.8	92.7	93.0	0.24
Cable29	-8.100	-10.907	8.215	10.433	115.2	-473.9	100.9	102.0	1.06
Cable26	-7.928	-4.646	7.936	4.575	7.3	-71.8	101.9	102.0	0.10
Cable27	-6.559	6.601	6.565	-6.668	6.5	-66.9	93.0	93.0	0.01
Cable25	-7.922	-4.622	7.931	4.537	8.5	-84.6	101.8	102.0	0.12
Cable1	-1.703	-0.857	1.703	0.838	0.0	-19.0	102.0	102.0	0.00
Cable12	8.080	10.841	-8.004	-11.344	76.4	-503.0	102.0	101.3	0.68
Cable43	38.338	32.954	-38.326	-32.937	12.0	16.4	102.0	102.0	0.04
Cable44	52.451	-1.805	-52.439	1.822	12.2	17.7	93.0	93.0	0.02
Cable13	6.221	-0.561	-6.201	0.092	19.5	-469.5	93.0	92.7	0.28
					3151.8	-9453.0			

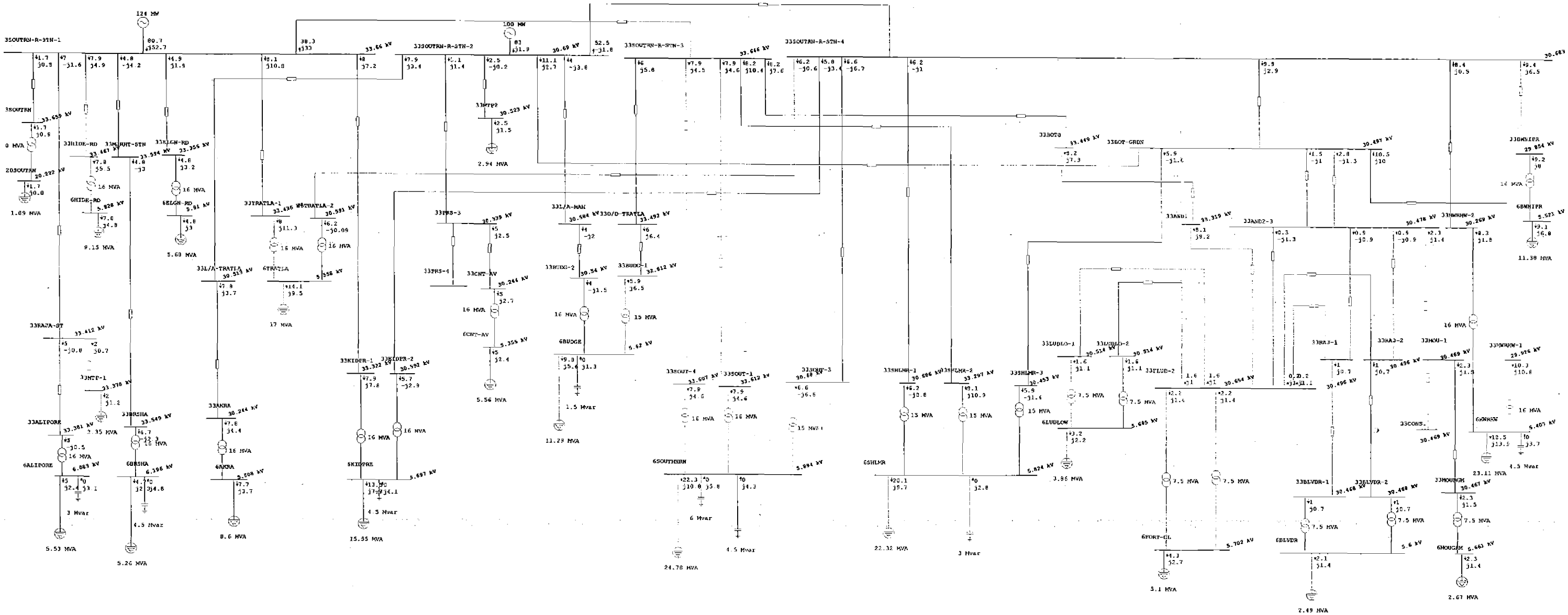
Project:	CESC Loss Study Report 2004-05	ETAP PowerStation	Page: 21
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33KV-SOUTHERN-REC-CUM-GEN-STN		Config.: Normal

33 kV Area SOUTHERN REC. CUM GEN. Station

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	163.701	54.590	172.564	94.86 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	163.701	54.590	172.564	94.86 Lagging
Total Motor Load:	160.550	93.911	185.998	86.32 Lagging
Total Static Load:	0.000	-29.868		
Apparent Losses:	3.152	-9.453		
System Mismatch:	0.000	0.000		

Number of Iterations: 3


124 MW
80.7
j52.7
35OUTRN-R-STN-1
38.3
j130
33.66 kV
100 MW
83
j31.9
30.69 kV
52.5
-j31.8
33SOUTRN-R-STN-2
33SOUTRN-R-STN-3
33.646 kV
33SOUTRN-R-STN-4
30.683
35OUTRN
33.659 kV
0 MVA
33HIDE-RD
33.467 kV
33LIGHT-STN
33.594 kV
33ELGN-RD
33.355 kV
33HTP2
30.523 kV
2.94 MVA
33BOT
33.449 kV
33BOT-GRDN
30.497 kV
33DMNIPR
29.854 kV
203OUTRN
20.222 kV
1.09 MVA
16 MVA
GHIDE-RD
5.828 kV
9.15 MVA
6ELGN-RD
5.91 kV
5.68 MVA
33JTRATLA-1
33.436 kV
33JTRATLA-2
30.591 kV
16 MVA
6TRATLA
5.556 kV
17 MVA
33L/A-TRATLA
30.513 kV
33L/A-MAN
30.584 kV
33O/D-TRATLA
33.492 kV
33PRS-3
30.339 kV
33PRS-4
33CNT-AV
30.244 kV
6CNT-AV
5.355 kV
5.56 MVA
33BUDG-2
30.54 kV
33BUDG-1
32.612 kV
6BUDGR
1.5 Mvar
11.29 MVA
33KIDPR-1
33.322 kV
33KIDPR-2
30.592 kV
16 MVA
6KIDPRE
5.697 kV
4.5 Mvar
15.55 MVA
33RAZA-ST
33.412 kV
33ALIPORE
33.381 kV
2.35 MVA
6ALIPORE
6.089 kV
3 Mvar
5.53 MVA
33HTP1
33.378 kV
33BRSHA
33.549 kV
6BRSHA
6.396 kV
4.5 Mvar
5.26 MVA
33AKRA
30.244 kV
6AKRA
5.508 kV
8.6 MVA
33SOUT-4
33.607 kV
33SOUT-1
33.612 kV
33SOUT-3
30.69 kV
6SOUTHERN
5.894 kV
6 Mvar
4.5 Mvar
24.78 MVA
33SHLMR-1
30.586 kV
33SHLMR-2
33.297 kV
33SHLMR-3
30.453 kV
6SHLMR
22.32 MVA
3 Mvar
33LUDLO-1
30.554 kV
33LUDLO-2
30.554 kV
6LUDLOW
7.5 MVA
5.685 kV
3.86 MVA
33ELUD-2
30.654 kV
6PORT-CL
5.702 kV
3.1 MVA
33AND1
33.319 kV
33AND2-3
33RAJ-1
33RAJ-2
30.496 kV
33HOU-1
30.469 kV
33CONS.
30.469 kV
33DLVDR-1
30.468 kV
33DLVDR-2
30.468 kV
6DLVDR
7.5 MVA
5.6 kV
2.49 MVA
33MOUNGM
30.467 kV
33MOUNGM-1
29.976 kV
6MOUGM
5.663 kV
2.67 MVA
60MRNW
5.407 kV
4.5 Mvar
23.11 MVA
33MRNW-2
30.269 kV
33MRNW
30.476 kV
16 MVA
68WNIPR
5.571 kV
11.38 MVA

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 7
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004er26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33KV-BELUR-SUBSTATION		Config.: Normal

33 kV Area BELUR Substation with revised loads and cable lengths

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
6BALD2-1	6.000	96.157	-7.5	0	0	15.18	7.98	0.00	-2.77	33BALD1	0.10	-5.27	527	-1.9	
										33BALD2	-15.28	0.06	1528	100.0	
6BELD2	6.000	96.341	-3.3	0	0	13.37	6.66	0.00	-2.78	33BELD2	-6.69	-1.94	695	96.0	
										33BELD4	-6.69	-1.94	695	96.0	
6HCEND2-1	6.000	92.422	-9.3	0	0	22.61	11.27	0	0	33HCEND1	-4.20	-8.50	987	44.3	
										33HCEND2	-18.41	-2.76	1938	98.9	
6KAM1	6.000	97.347	-1.0	0	0	1.97	0.95	0	0	33KAM1	-1.97	-0.95	216	90.0	
6LILD2-1	6.000	99.161	-5.8	0	0	8.07	3.91	0.00	-4.42	33LILD1	4.27	-2.12	463	-89.5	
										33LILD2	-12.35	2.64	1225	-97.8	
33BALD1	33.000	100.330	-7.6	0	0	0	0	0	0	33INDAL	0.09	-5.50	95	-1.6	
										6BALD2-1	-0.09	5.50	95	-1.6	
33BALD2	33.000	97.511	-0.3	0	0	0	0	0	0	33BRS-2	-15.38	-1.86	277	99.3	
										6BALD2-1	15.38	1.86	277	99.3	
33BELD2	33.000	98.485	0.0	0	0	0	0	0	0	33BRS-1	-6.71	-2.37	126	94.3	
										6BELD2	6.71	2.37	126	94.3	
33BELD4	33.000	98.482	0.0	0	0	0	0	0	0	33BRS-2	-6.71	-2.37	126	94.3	
										6BELD2	6.71	2.37	126	94.3	
33BRS-1	33.000	98.500	0.0	0	0	0	0	0	0	33BELD2	6.71	2.36	126	94.3	
										33BRS-2	-6.71	-2.36	126	94.3	
33BRS-2	33.000	98.500	0.0	62.27	9.51	0	0	0	0	33BELD4	6.71	2.36	126	94.4	
										33NCG(4)3	1.98	-0.06	35	-100.0	
										33LILD2	12.47	-1.79	223	-99.0	
										33HCEND2	18.88	5.14	347	96.5	
										33BALD2	15.52	1.51	277	99.5	
										33BRS-1	6.71	2.36	126	94.3	
33BRS-3	33.000	100.582	-7.8	0	0	0	0	0.00	-15.18	33HCEND1	4.32	8.68	168	44.6	
										33INDAL	-0.07	4.63	80	-1.5	
										33LILD1	-4.26	1.86	80	-91.6	
33HCEND1	33.000	99.661	-7.6	0	0	0	0	0	0	33BRS-3	-4.24	-9.31	179	41.5	
										6HCEND2-1	4.24	9.31	179	41.5	
33HCEND2	33.000	96.692	-0.4	0	0	0	0	0	0	33BRS-2	-18.58	-5.85	352	95.4	
										6HCEND2-1	18.58	5.85	352	95.4	
33INDAL	33.000	100.494	-7.8	0	0	0	0	0	0	33BALD1	-0.07	4.96	86	-1.5	
										33BRS-3	0.07	-4.96	86	-1.5	
33KAM1	33.000	98.188	-0.1	0	0	0	0	0	0	33NCG(4)3	-1.97	-0.99	39	89.3	
										6KAM1	1.97	0.99	39	89.3	
33LILD1	33.000	100.673	-7.7	0	0	0	0	0	0	33BRS-3	4.26	-2.30	84	-88.0	
										6LILD2-1	-4.26	2.30	84	-88.0	
33LILD2	33.000	98.114	-0.2	0	0	0	0	0	0	33BRS-2	-12.41	1.41	222	-99.4	

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**		Page:	8
Location:	Kolkata, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004er26			SN:	TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF		Revision:	Base
Filename:	33KV-BELUR-SUBSTATION			Config.:	Normal

33 kV Area BELUR Substation with revised loads and cable lengths

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
										6LILD2-1	12.41	-1.41	222	-99.4	
33NCG(4)3	33.000	98.427	0.0	0	0	0	0	0	0	33BRS-2	-1.98	-0.22	35	99.4	
										33KAM1	1.98	0.22	35	99.4	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 11
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004cr26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33KV-BELUR-SUBSTATION		Config.: Normal

33 kV Area BELUR Substation with revised loads and cable lengths

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
BALLY-1	0.098	-5.274	-0.085	5.504	12.3	229.2	96.2	100.3	4.17
BALLY-2	-15.276	0.063	15.379	1.858	103.3	1921.5	96.2	97.5	1.35
BELUR-2	-6.686	-1.941	6.710	2.375	23.3	433.1	96.3	98.5	2.14
BELUR-4	-6.685	-1.938	6.708	2.371	23.3	432.9	96.3	98.5	2.14
HOWRHC-1	-4.199	-8.503	4.242	9.305	43.1	801.7	92.4	99.7	7.24
HWRHC-2	-18.409	-2.764	18.575	5.853	166.1	3088.9	92.4	96.7	4.27
KMRHATI	-1.971	-0.955	1.973	0.993	2.1	38.5	97.3	98.2	0.84
LILOAH-1	4.273	-2.125	-4.263	2.301	9.5	176.3	99.2	100.7	1.51
LILOAH-2	-12.346	2.640	12.412	-1.406	66.4	1234.1	99.2	98.1	1.05
Cable8	0.085	-5.504	-0.074	4.956	11.6	-547.5	100.3	100.5	0.16
Cable13	-15.379	-1.858	15.525	1.507	145.7	-351.5	97.5	98.5	0.99
Cable12	-6.710	-2.375	6.710	2.361	0.9	-13.8	98.5	98.5	0.02
Cable2	-6.708	-2.371	6.709	2.355	1.1	-16.0	98.5	98.5	0.02
Cable3	1.979	-0.062	-1.977	-0.222	1.4	-284.2	98.5	98.4	0.07
Cable5	12.467	-1.785	-12.412	1.406	55.0	-379.6	98.5	98.1	0.39
Cable9	18.884	5.137	-18.575	-5.853	308.7	-715.9	98.5	96.7	1.81
Cable10	4.324	8.678	-4.242	-9.305	81.8	-626.6	100.6	99.7	0.92
Cable11	-0.068	4.634	0.074	-4.956	5.7	-321.6	100.6	100.5	0.09
Cable14	-4.256	1.862	4.263	-2.301	7.6	-438.9	100.6	100.7	0.09
Cable4	-1.973	-0.993	1.977	0.222	4.3	-771.4	98.2	98.4	0.24
					1073.0	3889.2			

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 14
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004er26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33KV-BELUR-SUBSTATION		Config.: Normal

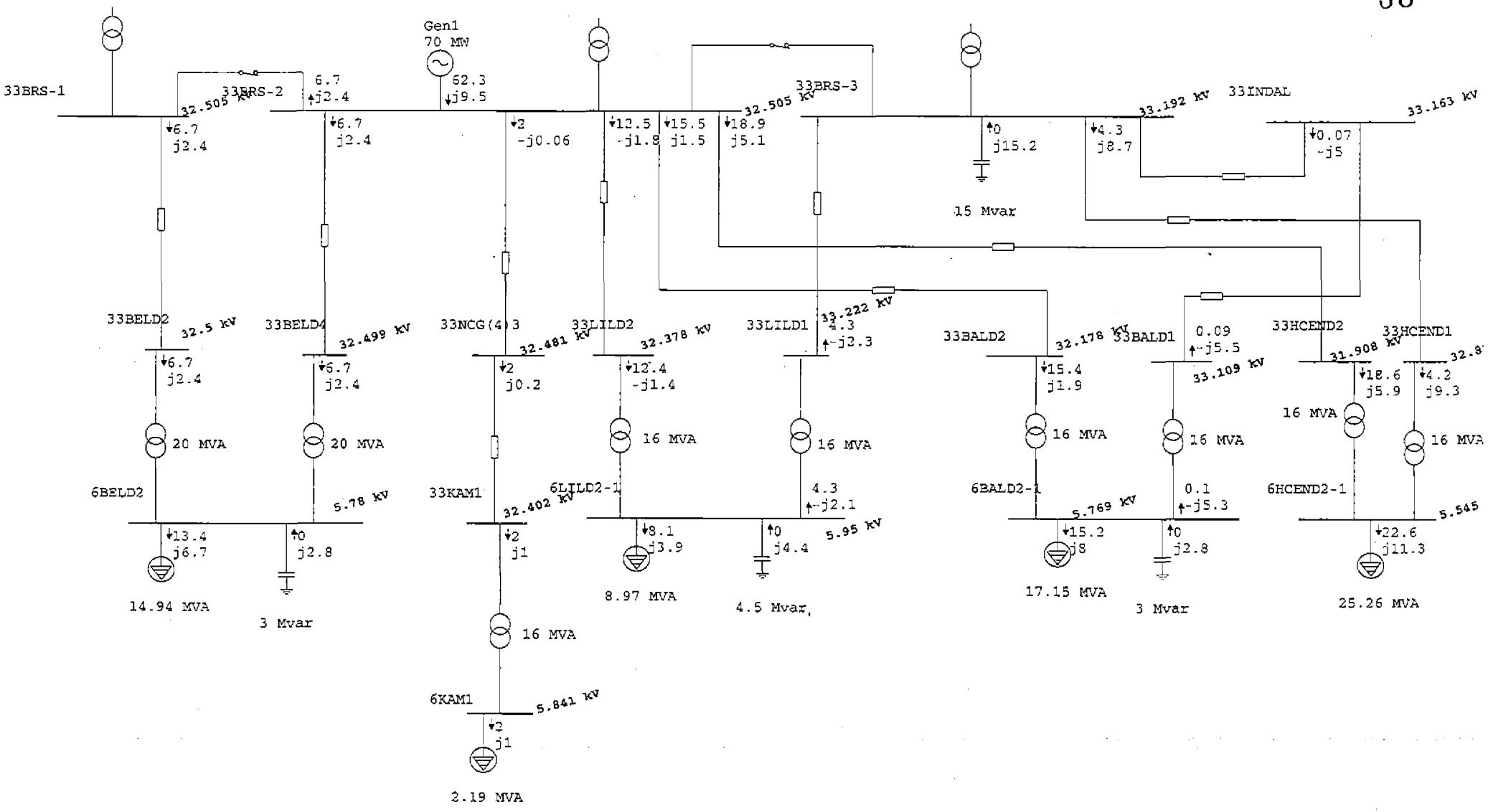
33 kV Area BELUR Substation with revised loads and cable lengths

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	62.274	9.512	62.996	98.85 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	62.274	9.512	62.996	98.85 Lagging
Total Motor Load:	61.201	30.781	68.506	89.34 Lagging
Total Static Load:	0.000	-25.158		
Apparent Losses:	1.073	3.889		
System Mismatch:	0.000	0.000		

Number of Iterations: 4

One-Line Diagram - OLV1



Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 1
Location:	Kolkota, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	NEW-COSSPORE-GEN-STN		Config.: Normal

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	39	40

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	21	0	0	31	0	2	54

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	NEW-COSSPORE-GEN-STN
Output Filename:	C:\ETAP 404\PowerStation\NEW-COSSPORE-GEN-STN\NEWCOSSI.lf1

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**		Page:	9
Location:	Kolkota, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla		Study Case: LF	Revision:	Base
Filename:	NEW-COSSPORE-GEN-STN			Config.:	Normal

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
6AMHRST	6.000	90.355	-4.2	0	0	8.05	3.90	0	0	33AMRT-ST	-8.05	-3.90	952	90.0	
6BARANGR	6.000	91.275	-4.4	0	0	18.04	9.74	0	0	33BARANGR-2	-8.98	-4.67	1067	88.7	
										33BARANGR-1	-9.06	-5.06	1093	87.3	
6CANAL	6.000	88.100	-9.6	0	0	31.28	13.33	0.00	-3.49	33CANAL-3	-10.43	-3.28	1194	95.4	
										33CANAL-2	-10.46	-3.34	1199	95.3	
										33CANAL-1	-10.39	-3.21	1187	95.5	
6DMDM	6.000	89.349	-4.8	0	0	27.20	16.86	0.00	-3.59	33DMDM-2	-9.34	-4.81	1131	88.9	
										33DMDM-1	-9.32	-4.78	1128	89.0	
										33DMDM-3	-8.54	-3.68	1000	91.8	
6GRAT-ST	6.000	90.924	-4.0	0	0	7.84	3.80	0	0	33GRAY-ST	-7.84	-3.80	921	90.0	
6KMRHTI	6.000	92.253	-2.1	0	0	8.10	3.92	0	0	33KMRHT-1	-4.02	-1.80	459	91.3	
										33KMRHTI-2	-4.08	-2.12	479	88.7	
6KUTGHT	6.000	92.290	-3.3	0	0	27.28	14.72	0	0	33KUTGHT-2	-6.82	-3.68	808	88.0	
										33KUTGHT-4	-6.82	-3.68	808	88.0	
										33KUTGHT-1	-6.82	-3.67	807	88.0	
										33KUTGHT-3	-6.82	-3.68	808	88.0	
6SINTHA	6.000	90.648	-5.7	0	0	17.54	9.94	0.00	-3.70	33SINTHA-3	-6.56	-2.64	750	92.8	
										33SINTHA-4	-10.98	-3.61	1226	95.0	
6STRND-NR	6.000	89.383	-5.6	0	0	18.77	9.09	0	0	33STRND-NR1	-6.25	-3.02	747	90.0	
										33STRND-NR2	-6.25	-3.02	747	90.0	
										33STRND-NR3	-6.27	-3.05	750	89.9	
33AIRPT	33.000	89.783	-0.4	0	0	8.10	3.92	0	0	33JESRE-RD	0.15	0.02	2	98.9	
										33RED-SW-HOUSE	-8.25	-3.94	178	90.2	
33AMRT-ST	33.000	90.465	-0.2	0	0	0	0	0	0	33RED-SW-HOUSE	-8.09	-4.64	180	86.7	
										6AMHRST	8.09	4.64	180	86.7	-4.000
33BARANGR-1	33.000	91.375	-0.1	0	0	0	0	0	0	33MAJ11	-9.11	-6.05	209	83.3	
										6BARANGR	9.11	6.05	209	83.3	-5.000
33BARANGR-2	33.000	91.062	-0.1	0	0	0	0	0	0	33BLUE-SW-HOUSE	-9.03	-5.61	204	84.9	
										6BARANGR	9.03	5.61	204	84.9	-5.000
* 33BLUE-SW-HOUSE	33.000	92.000	0.0	181.41	83.01	0	0	0	0	33STRND-NR3	6.37	3.24	135	89.1	
										33BARANGR-2	9.12	4.97	197	87.8	
										33MAJ11	6.33	3.23	135	89.1	
										33CANAL-3	10.71	4.75	222	91.4	
										33GRAY-ST	7.96	3.93	168	89.7	
										33SYMBZ-MTP-2	1.24	-0.18	23	-99.0	
										33SYMB-MPT-1	1.35	-0.12	25	-99.6	
										33SINTHA-4	11.18	4.14	226	93.8	
										33NCGS	10.74	4.93	224	90.9	
										33KUTGHT-3	6.85	4.18	152	85.4	
										33DMDM-2	9.55	4.83	203	89.2	

Project: CESC Loss Study Report 2004-05
Location: Kolkota, West Bengal
Contract: 2004ER26
Engineer: M.S. Bhalla
Filename: NEW-COSSPORE-GEN-STN

ETAP PowerStation
4.0.4C

Study Case: LF

Page: 10
Date: 09-22-2005
SN: TATAENERGY
Revision: Base
Config.: Normal

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
										33DMDM-1	9.53	4.78	202	89.4	
										33JESRE-RD	8.65	2.17	169	97.0	
										33RED-SW-HOUSE	81.83	38.17	1717	90.6	
33BRS-3	33.000	91.796	0.0	0	0	0	0	0	0	33RED-SW-HOUSE	-3.61	-1.45	74	92.8	
										33INDL	3.61	1.45	74	92.8	
33CANAL-1	33.000	90.282	-0.2	0	0	0	0	0	0	33RED-SW-HOUSE	-10.50	-5.23	227	89.5	
										6CANAL	10.50	5.23	227	89.5	-5.000
33CANAL-2	33.000	90.493	-0.2	0	0	0	0	0	0	33RED-SW-HOUSE	-10.57	-5.41	229	89.0	
										6CANAL	10.57	5.41	229	89.0	-5.000
33CANAL-3	33.000	90.391	-0.2	0	0	0	0	0	0	33BLUE-SW-HOUSE	-10.54	-5.32	228	89.3	
										6CANAL	10.54	5.32	228	89.3	-5.000
33DMDM-1	33.000	90.398	-0.1	0	0	0	0	0	0	33BLUE-SW-HOUSE	-9.38	-5.82	213	85.0	
										6DMDM	9.38	5.82	213	85.0	-4.000
33DMDM-2	33.000	90.426	-0.1	0	0	0	0	0	0	33BLUE-SW-HOUSE	-9.40	-5.86	214	84.8	
										6DMDM	9.40	5.86	214	84.8	-4.000
33DMDM-3	33.000	89.419	-0.5	0	0	0	0	0	0	33JESRE-RD	-8.58	-4.50	189	88.6	
										6DMDM	8.58	4.50	189	88.6	-4.000
33GRAY-ST	33.000	90.885	-0.1	0	0	0	0	0	0	33BLUE-SW-HOUSE	-7.88	-4.50	174	86.9	
										6GRAT-ST	7.88	4.50	174	86.9	-4.000
33INDL	33.000	91.653	-0.1	0	0	3.60	1.74	0	0	33BRS-3	-3.60	-1.74	76	90.0	
33JESRE-RD	33.000	89.778	-0.4	0	0	0	0	0	0	33BLUE-SW-HOUSE	-8.46	-4.01	182	90.4	
										33DMDM-3	8.61	4.24	187	89.7	
										33AIRPT	-0.15	-0.24	5	52.9	
33KMRHT-1	33.000	91.154	-0.1	0	0	0	0	0	0	33MAJ11	-4.03	-1.97	86	89.8	
										6KMRHTI	4.03	1.97	86	89.8	-3.000
33KMRHTI-2	33.000	91.415	-0.1	0	0	0	0	0	0	33NCGS	-4.09	-2.31	89	87.1	
										6KMRHTI	4.09	2.31	89	87.1	-3.000
33KUTGHT-1	33.000	91.948	0.0	0	0	0	0	0	0	33RED-SW-HOUSE	-6.85	-4.21	152	85.2	
										6KUTGHT	6.85	4.21	152	85.2	-4.000
33KUTGHT-2	33.000	91.956	0.0	0	0	0	0	0	0	33RED-SW-HOUSE	-6.85	-4.22	153	85.1	
										6KUTGHT	6.85	4.22	153	85.1	-4.000
33KUTGHT-3	33.000	91.956	0.0	0	0	0	0	0	0	33BLUE-SW-HOUSE	-6.85	-4.22	153	85.1	
										6KUTGHT	6.85	4.22	153	85.1	-4.000
33KUTGHT-4	33.000	91.956	0.0	0	0	0	0	0	0	33RED-SW-HOUSE	-6.85	-4.22	153	85.1	
										6KUTGHT	6.85	4.22	153	85.1	-4.000
33MAJ11	33.000	91.405	-0.1	0	0	0	0	0	0	33BARANGR-1	9.11	6.03	209	83.4	
										33KMRHT-1	4.04	1.52	82	93.6	
										33BLUE-SW-HOUSE	-6.30	-3.63	139	86.6	
										33RED-SW-HOUSE	-6.85	-3.92	151	86.8	
33NCGS	33.000	91.979	0.0	0	0	0	0	0	0	33KMRHTI-2	4.11	1.69	84	92.5	
										33SINTHA-3	6.62	3.24	140	89.8	
										33BLUE-SW-HOUSE	-10.73	-4.93	224	90.9	

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**		Page:	11
Location:	Kolkota, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla		Study Case: LF	Revision:	Base
Filename:	NEW-COSSPORE-GEN-STN			Config.:	Normal

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
33RED-SW-HOUSE	33.000	92.000	0.0	0	0	0	0	0	0	33STRND-NR1	6.36	3.17	135	89.5	
										33STRND-NR2	6.36	3.17	135	89.5	
										33MAJ11	6.90	3.56	147	88.9	
										33CANAL-1	10.68	4.62	221	91.8	
										33CANAL-2	10.73	4.50	221	92.2	
										33AMRT-ST	8.21	3.39	168	92.4	
										33BRS-3	3.61	1.17	72	95.1	
										33KUTGHT-2	6.85	4.18	152	85.4	
										33KUTGHT-4	6.85	4.18	152	85.4	
										33KUTGHT-1	6.85	4.18	152	85.4	
										33AIRPT	8.43	2.06	164	97.1	
										33BLUE-SW-HOUSE	-81.83	-38.17	1717	90.6	
33SINTHA-3	33.000	91.670	0.0	0	0	0	0	0	0	33NCGS	-6.60	-3.44	142	88.7	
										6SINTHA	6.60	3.44	142	88.7	-4.000
33SINTHA-4	33.000	90.824	-0.2	0	0	0	0	0	0	33BLUE-SW-HOUSE	-11.05	-4.84	232	91.6	
										6SINTHA	11.05	4.84	232	91.6	-4.000
33STRND-NR1	33.000	91.010	-0.1	0	0	0	0	0	0	33RED-SW-HOUSE	-6.30	-3.82	141	85.5	
										6STRND-NR	6.30	3.82	141	85.5	-4.000
33STRND-NR2	33.000	91.010	-0.1	0	0	0	0	0	0	33RED-SW-HOUSE	-6.30	-3.82	141	85.5	
										6STRND-NR	6.30	3.82	141	85.5	-4.000
33STRND-NR3	33.000	91.056	-0.1	0	0	0	0	0	0	33BLUE-SW-HOUSE	-6.31	-3.86	142	85.3	
										6STRND-NR	6.31	3.86	142	85.3	-4.000
33SYMB-MPT-1	33.000	91.886	0.0	0	0	2.58	1.25	0	0	33BLUE-SW-HOUSE	-1.35	-0.62	28	90.9	
										33SYMBZ-MTP-2	-1.24	-0.63	26	89.0	
33SYMBZ-MTP-2	33.000	91.886	0.0	0	0	0	0	0	0	33BLUE-SW-HOUSE	-1.24	-0.63	26	89.0	
										33SYMB-MPT-1	1.24	0.63	26	89.0	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**		Page:	15
Location:	Kolkota, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla			Revision:	Base
Filename:	NEW-COSSPORE-GEN-STN	Study Case: LF		Config.:	Normal

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
T12	-8.046	-3.897	8.086	4.642	40.1	745.4	90.4	90.5	0.11
T5	-8.984	-4.674	9.035	5.611	50.4	937.4	91.3	91.1	0.21
T6	-9.056	-5.063	9.108	6.047	52.9	983.7	91.3	91.4	0.10
T9	-10.430	-3.279	10.540	5.323	109.9	2044.8	88.1	90.4	2.29
T10	-10.461	-3.344	10.571	5.407	110.9	2063.1	88.1	90.5	2.39
T11	-10.389	-3.210	10.498	5.232	108.7	2022.6	88.1	90.3	2.18
T20	-9.340	-4.810	9.397	5.862	56.6	1052.6	89.3	90.4	1.08
T21	-9.325	-4.778	9.381	5.825	56.3	1047.0	89.3	90.4	1.05
T22	-8.535	-3.677	8.579	4.501	44.3	823.8	89.3	89.4	0.07
T13	-7.839	-3.797	7.877	4.495	37.6	698.7	90.9	90.9	0.04
T7	-4.020	-1.801	4.029	1.974	9.3	173.6	92.3	91.2	1.10
T8	-4.080	-2.122	4.090	2.311	10.2	189.2	92.3	91.4	0.84
T16	-6.821	-3.684	6.850	4.221	28.9	537.2	92.3	92.0	0.33
T17	-6.821	-3.683	6.849	4.220	28.9	537.1	92.3	92.0	0.33
T18	-6.818	-3.674	6.847	4.210	28.8	536.2	92.3	91.9	0.34
T19	-6.821	-3.683	6.849	4.220	28.9	537.1	92.3	92.0	0.33
T14	-6.558	-2.636	6.601	3.444	43.4	807.1	90.6	91.7	1.02
T15	-10.982	-3.606	11.048	4.844	66.6	1237.9	90.6	90.8	0.18
T1	-6.254	-3.021	6.297	3.822	43.1	801.5	89.4	91.0	1.63
T2	-6.254	-3.021	6.297	3.822	43.1	801.5	89.4	91.0	1.63
T3	-6.267	-3.051	6.310	3.858	43.4	807.3	89.4	91.1	1.67
Cable33	0.148	0.022	-0.148	-0.237	0.0	-215.1	89.8	89.8	0.01
Cable34	-8.248	-3.945	8.429	2.058	180.8	-1887.0	89.8	92.0	2.22
Cable16	-8.086	-4.642	8.210	3.391	124.3	-1251.5	90.5	92.0	1.53
Cable7	-9.108	-6.047	9.111	6.027	2.8	-19.3	91.4	91.4	0.03
Cable9	-9.035	-5.611	9.122	4.966	86.7	-645.7	91.1	92.0	0.94
Cable4	6.370	3.239	-6.310	-3.858	60.2	-619.1	92.0	91.1	0.94
Cable10	6.334	3.234	-6.296	-3.632	37.5	-398.5	92.0	91.4	0.60
Cable15	10.709	4.751	-10.540	-5.323	168.5	-572.4	92.0	90.4	1.61
Cable19	7.965	3.926	-7.877	-4.495	88.1	-569.1	92.0	90.9	1.11
Cable20	1.237	-0.176	-1.235	-0.632	1.4	-808.0	92.0	91.9	0.11
Cable21	1.349	-0.121	-1.348	-0.619	1.5	-740.3	92.0	91.9	0.11
Cable22	11.176	4.140	-11.048	-4.844	127.6	-703.8	92.0	90.8	1.18
Cable24	10.736	4.927	-10.734	-4.929	1.7	-2.1	92.0	92.0	0.02
Cable28	6.853	4.178	-6.849	-4.220	3.1	-42.3	92.0	92.0	0.04
Cable29	9.548	4.835	-9.397	-5.862	151.4	-1027.4	92.0	90.4	1.57
Cable30	9.535	4.775	-9.381	-5.825	153.6	-1049.6	92.0	90.4	1.60
Cable31	8.649	2.172	-8.463	-4.007	186.0	-1835.3	92.0	89.8	2.22
Cable18	-3.605	-1.451	3.612	1.171	7.1	-280.1	91.8	92.0	0.20
Cable35	3.605	1.451	-3.600	-1.744	5.0	-292.6	91.8	91.7	0.14
Cable13	-10.498	-5.232	10.677	4.616	179.1	-616.8	90.3	92.0	1.72
Cable14	-10.571	-5.407	10.730	4.499	158.6	-908.0	90.5	92.0	1.51
Cable32	-8.579	-4.501	8.611	4.244	31.4	-256.7	89.4	89.8	0.36
Cable8	-4.029	-1.974	4.039	1.523	9.9	-451.8	91.2	91.4	0.25
Cable12	-4.090	-2.311	4.113	1.687	22.7	-624.3	91.4	92.0	0.56
Cable27	-6.847	-4.210	6.851	4.179	3.6	-30.8	91.9	92.0	0.05
Cable25	-6.850	-4.221	6.853	4.179	3.1	-41.9	92.0	92.0	0.04

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 16
Location:	Kolkota, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	NEW-COSSPORE-OEN-STN		Config.: Normal

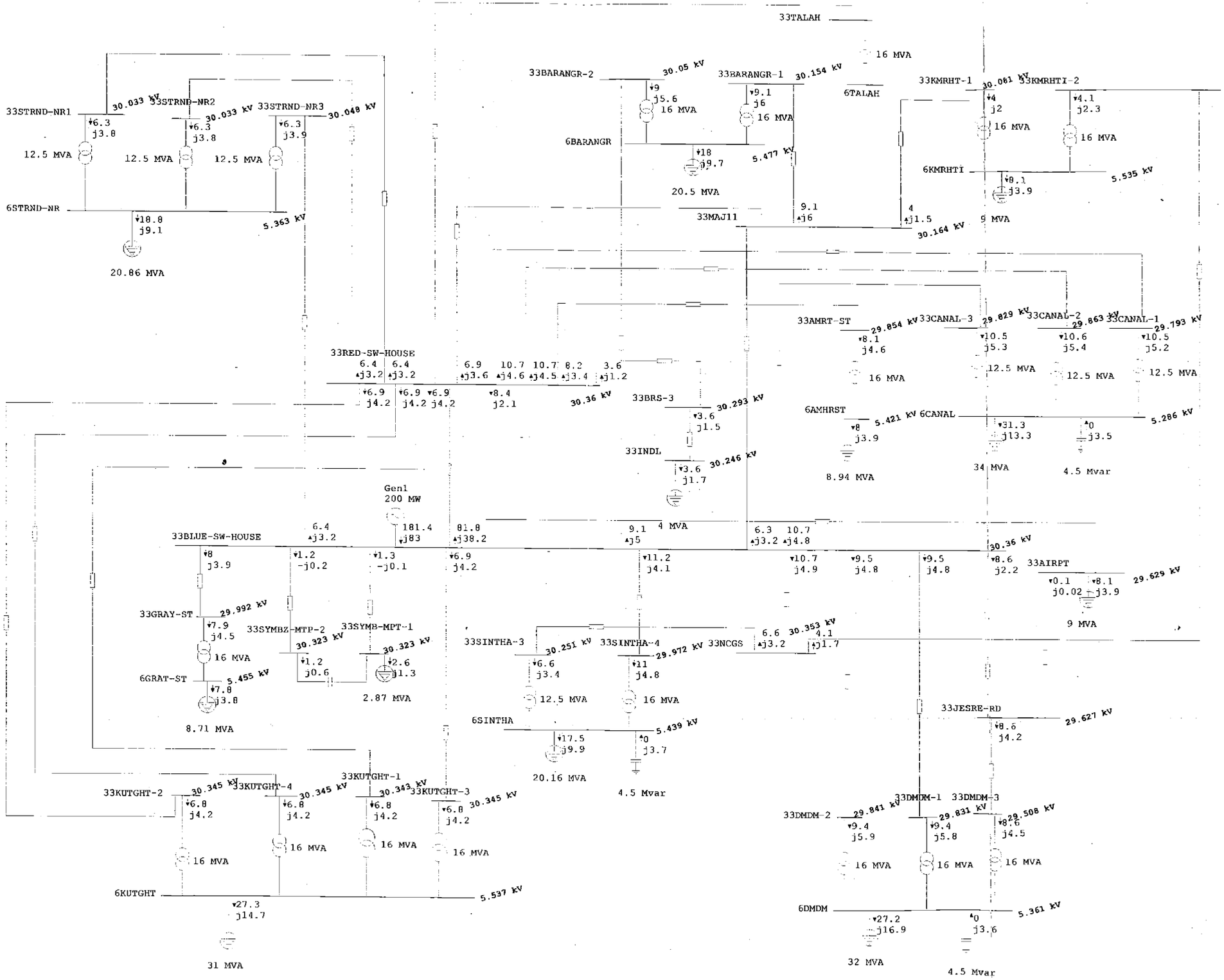
CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable26	-6.849	-4.220	6.853	4.178	3.1	-42.3	92.0	92.0	0.04
Cable11	-6.854	-3.918	6.895	3.557	40.8	-361.2	91.4	92.0	0.60
Cable23	6.621	3.242	-6.601	-3.444	20.1	-201.4	92.0	91.7	0.31
Cable2	6.360	3.170	-6.297	-3.822	62.8	-652.7	92.0	91.0	0.99
Cable3	6.360	3.170	-6.297	-3.822	62.8	-652.7	92.0	91.0	0.99
					3027.9	1585.6			

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 19
Location:	Kolkota, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M S. Bhalla	Study Case: LF	Revision: Base
Filename:	NEW-COSSPORE-GEN-STN		Config.: Normal

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	181.409	83.013	199.500	90.93 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	181.409	83.013	199.500	90 93 Lagging
Total Motor Load:	178.381	92.210	200.805	88.83 Lagging
Total Static Load:	0.000	-10.783		
Apparent Losses:	3.028	1.586		
System Mismatch:	0.000	0.000		

Number of Iterations: 3


33TALAH
16 MVA
33BARANGR-2
30.05 kV
33BARANGR-1
30.154 kV
6TALAH
33KMRHT-1
30.061 kV
33KMRHTI-2
30.167 kV
33STRND-NR1
30.033 kV
33STRND-NR2
30.033 kV
33STRND-NR3
30.048 kV
12.5 MVA
12.5 MVA
12.5 MVA
6STRND-NR
5.363 kV
20.86 MVA
6BARANGR
5.477 kV
20.5 MVA
33MAJ11
30.164 kV
9 MVA
6KMRHTI
5.535 kV
33RED-SW-HOUSE
30.36 kV
33AMRT-ST
29.854 kV
33CANAL-3
29.829 kV
33CANAL-2
29.863 kV
33CANAL-1
29.793 kV
16 MVA
12.5 MVA
12.5 MVA
12.5 MVA
33BRS-3
30.293 kV
33INDL
30.246 kV
6AMHRST
5.421 kV
6CANAL
5.286 kV
8.94 MVA
34 MVA
4.5 Mvar
Gen1
200 MW
33BLUE-SW-HOUSE
33AIRPT
29.629 kV
9 MVA
33GRAY-ST
29.992 kV
33SYMBZ-MTP-2
30.323 kV
33SYMB-MPT-1
30.323 kV
16 MVA
6GRAT-ST
5.455 kV
8.71 MVA
2.87 MVA
33SINTHA-3
30.251 kV
33SINTHA-4
29.972 kV
33NCGS
30.353 kV
12.5 MVA
16 MVA
6SINTHA
5.439 kV
20.16 MVA
4.5 Mvar
33JESRE-RD
29.627 kV
33KUTGHT-2
30.345 kV
33KUTGHT-4
30.345 kV
33KUTGHT-1
30.343 kV
33KUTGHT-3
30.345 kV
16 MVA
16 MVA
16 MVA
16 MVA
6KUTGHT
5.537 kV
31 MVA
33DMDM-2
29.841 kV
33DMDM-1
29.831 kV
33DMDM-3
29.508 kV
16 MVA
16 MVA
16 MVA
6DMDM
5.361 kV
32 MVA
4.5 Mvar

Project:	CESC Loss Study Report 2004-05	ETAP PowerStation	Page: 7
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33-EAST-CALCUTTA-SUBSTATION		Config.: Normal

33 kV Area EAST CALCUTTA Sub Station

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
6JEST-1-2	6.000	93.633	-3.5	0	0	14.31	9.43	0.00	-2.63	33JEST2	-7.15	-3.40	813	90.3	
										33JEST1	-7.16	-3.40	814	90.3	
6KANT-1-2	6.000	93.157	-3.9	0	0	15.75	8.71	0	0	33KANT2	-7.52	-4.19	889	87.4	
										33KANT1	-8.23	-4.52	969	87.6	
6PAGT1	6.000	93.119	-3.4	0	0	7.27	4.31	0	0	33PAGT1	-7.27	-4.31	873	86.0	
6TLPT1	6.000	93.929	-3.5	0	0	7.37	3.57	0	0	33TLPT1	-7.37	-3.57	839	90.0	
*33-EAST-CALCUTTA	33.000	92.000	0.0	45.19	23.07	0	0	0	0	33ENTT2	0.00	-0.81	15	0.0	
										33PAGT1	7.35	4.34	162	86.1	
										33JEST1	7.25	3.07	149	92.1	
										33KANT1	8.30	4.98	184	85.7	
										33KANT2	7.59	4.77	170	84.7	
										33TLPT1	7.44	3.68	157	89.7	
										33JEST2	7.25	3.05	149	92.2	
33ENTT2	33.000	92.025	0.0	0	0	0	0	0	0	33-EAST-CALCUTTA					
33JEST1	33.000	91.068	-0.1	0	0	0	0	0	0	33-EAST-CALCUTTA	-7.19	-3.95	157	87.6	
										6JEST-1-2	7.19	3.95	157	87.6	-6.000
33JEST2	33.000	91.062	-0.1	0	0	0	0	0	0	33-EAST-CALCUTTA	-7.18	-3.94	157	87.7	
										6JEST-1-2	7.18	3.94	157	87.7	-6.000
33KANT1	33.000	91.587	0.0	0	0	0	0	0	0	33-EAST-CALCUTTA	-8.27	-5.29	187	84.2	
										6KANT-1-2	8.27	5.29	187	84.2	-6.000
33KANT2	33.000	91.618	0.0	0	0	0	0	0	0	33-EAST-CALCUTTA	-7.56	-4.90	172	83.9	
										6KANT-1-2	7.56	4.90	172	83.9	-6.000
33PAGT1	33.000	91.306	0.0	0	0	0	0	0	0	33-EAST-CALCUTTA	-7.30	-4.94	168	82.8	
										6PAGT1	7.30	4.94	168	82.8	-6.000
33TLPT1	33.000	91.479	-0.1	0	0	0	0	0	0	33-EAST-CALCUTTA	-7.40	-4.15	162	87.2	
										6TLPT1	7.40	4.15	162	87.2	-6.000

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**		Page:	10
Location:	Kolkata, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla			Revision:	Base
Filename:	33-EAST-CALCUTTA-SUBSTATION	Study Case:	LF	Config.:	Normal

33 kV Area EAST CALCUTTA Sub Station

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
JESR-RD	-7.154	-3.397	7.183	3.942	29.3	544.7	93.6	91.1	2.57
JESS-RD	-7.158	-3.404	7.187	3.950	29.3	545.6	93.6	91.1	2.57
KNKRGCH	-7.525	-4.192	7.563	4.901	38.1	709.0	93.2	91.6	1.54
KNKRGCHI	-8.225	-4.522	8.267	5.295	41.6	773.0	93.2	91.6	1.57
P.DANGA	-7.267	-4.312	7.301	4.939	33.7	627.0	93.1	91.3	1.81
TALPUKUR	-7.371	-3.570	7.402	4.149	31.1	578.9	93.9	91.5	2.45
Cable1	0.000	-0.811			0.1	-810.7	92.0	92.0	0.02
Cable2	7.353	4.342	-7.301	-4.939	52.6	-597.2	92.0	91.3	0.69
Cable4	7.254	3.065	-7.187	-3.950	66.6	-884.9	92.0	91.1	0.93
Cable5	8.302	4.983	-8.267	-5.295	35.2	-312.5	92.0	91.6	0.41
Cable6	7.591	4.768	-7.563	-4.901	28.1	-133.5	92.0	91.6	0.38
Cable7	7.441	3.677	-7.402	-4.149	38.6	-471.8	92.0	91.5	0.52
Cable8	7.250	3.050	-7.183	-3.942	66.9	-891.8	92.0	91.1	0.94
					491.3	-324.2			

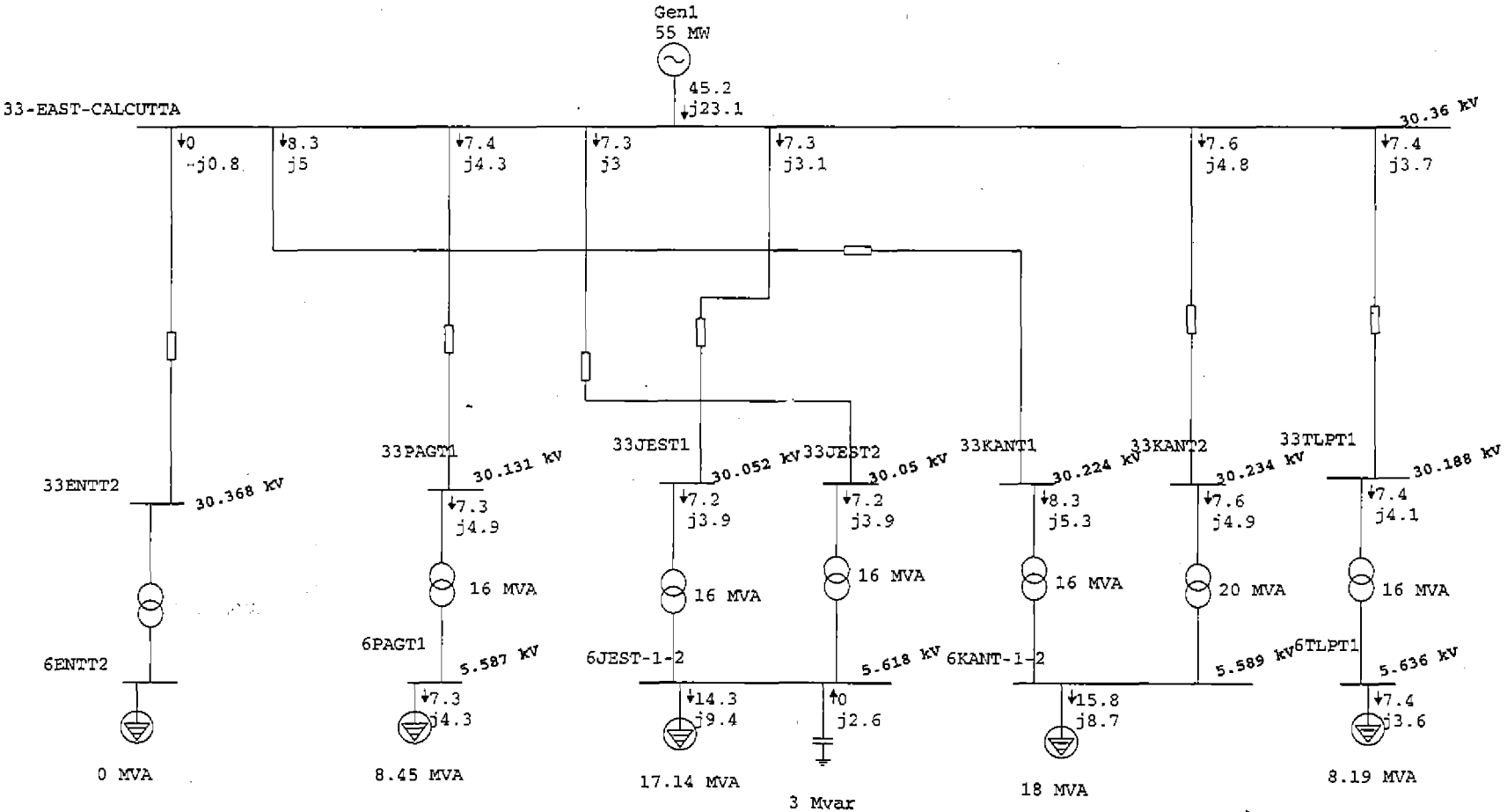
Project:	CESC Loss Study Report 2004-05	ETAP PowerStation		Page:	13
Location:	Kolkata, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF		Revision:	Base
Filename:	33-EAST-CALCUTTA-SUBSTATION			Config.:	Normal

33 kV Area EAST CALCUTTA Sub Station

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	45.191	23.073	50.741	89.06 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	45.191	23.073	50.741	89.06 Lagging
Total Motor Load:	44.700	26.027	51.725	86.42 Lagging
Total Static Load:	0.000	-2.630		
Apparent Losses:	0.491	-0.324		
System Mismatch:	0.000	0.000		

Number of Iterations: 2


Gen1
55 MW
45.2
j23.1
33-EAST-CALCUTTA
30.36 kV
0
-j0.8
8.3
j5
7.4
j4.3
7.3
j3
7.3
j3.1
7.6
j4.8
7.4
j3.7
33ENTT2
30.368 kV
33PAGT1
30.131 kV
33JEST1
30.052 kV
33JEST2
30.05 kV
33KANT1
30.224 kV
33KANT2
30.234 kV
33TLPT1
30.188 kV
7.3
j4.9
7.2
j3.9
7.2
j3.9
8.3
j5.3
7.6
j4.9
7.4
j4.1
16 MVA
16 MVA
16 MVA
16 MVA
20 MVA
16 MVA
6ENTT2
6PAGT1
5.587 kV
6JEST-1-2
5.618 kV
6KANT-1-2
5.589 kV
6TLPT1
5.636 kV
7.3
j4.3
14.3
j9.4
0
j2.6
15.8
j8.7
7.4
j3.6
0 MVA
8.45 MVA
17.14 MVA
3 Mvar
18 MVA
8.19 MVA

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 1
Location:	Kolkota, West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	33KvKASBA		Config.: Normal

33 kv Kasba with modified lenghts and Loads

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	30	31

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	15	0	0	18	0	0	33

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	33KvKASBA
Output Filename:	C:\ETAP 404\PowerStation\33KvKASBA\Untitled.lf1

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 7
Location:	Kolkota, West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	33KvKASBA		Config.: Normal

33 kv Kasba with modified lenghts and Loads

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
*1 KASBA - A 33 kv Rec.St	33.000	92.500	0.0	118.05	6.15	0	0	0	0	10RAS L/a	28.32	6.35	548	97.6	
										18NBGT2	20.57	2.06	391	99.5	
										20BLET	7.22	0.47	136	99.8	
										23SCCT	7.57	1.15	144	98.9	
										26RITT3	10.53	-0.16	199	-100.0	
										28RITT	12.01	-0.58	227	-99.9	
										29RIT	11.64	-1.67	222	-99.0	
										31ENT	9.61	-4.09	197	-92.0	
										32ENT	10.59	2.62	206	97.1	
3CHIT	33.000	90.440	-13.6	0	0	0	0	0	0	K A S B A- B 33 kVRec St	-7.99	-5.44	187	82.7	
										4CHIT	7.99	5.44	187	82.7	-6.000
4CHIT	6.000	92.022	-17.2	0	0	7.95	4.72	0	0	3CHIT	-7.95	-4.72	967	86.0	
5Kasba	33.000	90.980	-13.5	0	0	0	0	0	0	K A S B A- B 33 kVRec St	-2.74	-1.74	62	84.5	
										6Kasba	2.74	1.74	62	84.5	-4.000
6Kasba	11.000	91.666	-16.3	0	0	2.73	1.55	0	0	5Kasba	-2.73	-1.55	179	87.0	
7BLG	33.000	90.775	-13.6	0	0	0	0	0	0	K A S B A- B 33 kVRec St	-4.61	-3.10	107	83.0	
										8BALGT	4.61	3.10	107	83.0	-4.000
8BALGT	6.000	92.032	-15.7	0	0	4.60	2.85	0	0	7BLG	-4.60	-2.85	565	85.0	
9NBLG	33.000	91.322	-13.3	0	0	0	0	0	0	K A S B A- B 33 kVRec St	7.10	-2.82	146	-92.9	
										19NBGT2	-7.10	2.82	146	-92.9	-3.000
10RAS L/a	33.000	91.185	-0.3	0	0	0	0	0	0	1 KASBA - A 33 kv Rec St	-27.96	-9.92	569	94.2	
										12EP	27.96	9.92	569	94.2	
11Rasti	33.000	91.237	-13.3	0	0	0	0	0	0	K A S B A- B 33 kVRec St	8.36	-4.34	180	-88.8	
										14RAS	-8.36	4.34	180	-88.8	-4.000
12EP	33.000	91.057	-0.4	0	0	0	0	0	0	10RAS L/a	-27.93	-10.36	572	93.8	
										13RAST2	19.04	4.87	377	96.9	
										15PGANT	8.89	5.49	200	85.1	
13RAST2	33.000	91.018	-0.4	0	0	0	0	0	0	12EP	-19.04	-5.09	378	96.6	
										14RAS	19.04	5.09	378	96.6	-5.000
14RAS	6.000	92.285	-9.2	0	0	10.47	5.65	0	0	11Rasti	8.40	-3.62	953	-91.8	
										13RAST2	-18.87	-2.03	1979	99.4	
15PGANT	33.000	89.711	-0.7	0	0	0	0	0	0	16Patul	8.79	5.43	201	85.1	
										12EP	-8.79	-5.43	201	85.1	
16Patul	33.000	89.696	-0.7	0	0	0	0	0	0	15PGANT	-8.79	-5.57	202	84.5	
										17PATTI	8.79	5.57	202	84.5	-6.000
17PATTI	6.000	91.113	-4.7	0	0	8.74	4.72	0	0	16Patul	-8.74	-4.72	1049	88.0	
18NBGT2	33.000	91.837	-0.2	0	0	0	0	0	0	1 KASBA - A 33 kv Rec.St	-20.44	-4.86	400	97.3	
										19NBGT2	20.44	4.86	400	97.3	-4.000
19NBGT2	6.000	92.409	-9.8	0	0	13.12	7.08	0.00	-3.42	18NBGT2	-20.25	-1.33	2112	99.8	

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 8
Location:	Kolkota, West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	33KvKASBA		Config.: Normal

33 kv Kasba with modified lenghts and Loads

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
										9NBLG	7.13	-2.33	780	-95.0	
20BLET	33.000	92.253	-0.1	0	0	0	0	0	0	1 KASBA - A 33 kv Rec.St	-7.20	-3.37	150	90.6	
										21BLET1	7.20	3.37	150	90.6	-2.000
21BLET1	6.000	91.330	-3.6	0	0	7.17	2.83	0	0	20BLET	-7.17	-2.83	812	93.0	
22SCT1	6.000	90.769	-3.7	0	0	7.52	3.42	0	0	23SCCT	-7.52	-3.42	875	91.0	
23SCCT	33.000	92.228	-0.1	0	0	0	0	0	0	1 KASBA - A 33 kv Rec.St	-7.55	-4.04	162	88.2	
										22SCT1	7.55	4.04	162	88.2	-2.000
26RITT3	33.000	91.584	-0.2	0	0	0	0	0	0	1 KASBA - A 33 kv Rec.St	-10.43	-6.85	238	83.6	
										33RITT2	10.43	6.85	238	83.6	-4.000
28RITT	33.000	91.514	-0.3	0	0	0	0	0	0	1 KASBA - A 33 kv Rec.St	-11.89	-6.34	257	88.2	
										30RITT	11.89	6.34	257	88.2	-5.000
29RIT	33.000	91.618	-0.3	0	0	0	0	0	0	1 KASBA - A 33 kv Rec.St	-11.54	-5.12	241	91.4	
										30RITT	11.54	5.12	241	91.4	-4.000
30RITT	6.000	91.208	-6.1	0	0	23.28	9.92	0.00	-1.32	28RITT	-11.81	-4.83	1346	92.6	
										29RIT	-11.46	-3.76	1272	95.0	
31ENT	33.000	91.864	-0.3	0	0	0	0	0	0	1 KASBA - A 33 kv Rec.St	-9.54	-2.89	189	95.7	
										33ENT	9.54	2.89	189	95.7	-2.000
32ENT	33.000	91.858	-0.2	0	0	0	0	0	0	1 KASBA - A 33 kv Rec.St	-10.53	-3.08	208	96.0	
										33ENT	10.53	3.08	208	96.0	-2.000
33ENT	6.000	91.201	-5.3	0	0	19.96	7.38	0.00	-3.33	31ENT	-9.49	-1.99	1022	97.9	
										32ENT	-10.47	-2.06	1125	98.1	
33RITT2	6.000	90.055	-5.1	0	0	10.37	5.60	0	0	26RITT3	-10.37	-5.60	1258	88.0	
K A S B A- B 33 kVRec St	33.000	90.984	-13.5	0	0	0	0	0	0	3CHIT	8.04	0.34	154	99.9	
										5Kasba	2.74	1.61	61	86.3	
										7BLG	4.62	-0.51	89	-99.4	
										9NBLG	-7.07	-2.01	141	96.2	
										11Rasti	-8.33	0.58	160	-99.8	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 11
Location:	Kolkota, West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	33KvKASBA		Config.: Normal

33 kv Kasba with modified lenghts and Loads

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
C6	28.320	6.355	-27.961	-9.918	358.5	-3563.0	92.5	91.2	1.31
C10	20.571	2.063	-20.437	-4.857	134.5	-2793.6	92.5	91.8	0.66
C11	7.216	0.471	-7.199	-3.366	17.2	-2894.8	92.5	92.3	0.25
C12	7.570	1.150	-7.550	-4.043	19.8	-2892.1	92.5	92.2	0.27
C14	10.526	-0.164	-10.434	-6.846	92.7	-7009.8	92.5	91.6	0.92
C15	12.008	-0.576	-11.893	-6.344	114.7	-6919.2	92.5	91.5	0.99
C16	11.640	-1.675	-11.538	-5.124	102.0	-6799.2	92.5	91.6	0.88
C17	9.608	-4.093	-9.538	-2.887	69.4	-6979.8	92.5	91.9	0.64
C18	10.591	2.623	-10.526	-3.084	65.5	-460.9	92.5	91.9	0.64
C1	-7.994	-5.443	8.037	0.335	42.8	-5108.4	90.4	91.0	0.54
T1	7.994	5.443	-7.955	-4.720	38.9	723.2	90.4	92.0	1.58
C2	-2.744	-1.735	2.744	1.609	0.1	-125.6	91.0	91.0	0.00
T4	2.744	1.735	-2.732	-1.548	12.1	186.8	91.0	91.7	0.69
C3	-4.612	-3.102	4.622	-0.509	9.5	-3611.3	90.8	91.0	0.21
T6	4.612	3.102	-4.598	-2.850	13.6	252.6	90.8	92.0	1.26
C4	7.101	-2.820	-7.073	-2.013	27.5	-4832.9	91.3	91.0	0.34
T16	-7.101	2.820	7.127	-2.334	26.1	486.4	91.3	92.4	1.09
C7	27.961	9.918	-27.930	-10.357	31.2	-439.6	91.2	91.1	0.13
C5	8.361	-4.338	-8.329	0.577	32.2	-3760.7	91.2	91.0	0.25
T9	-8.361	4.338	8.400	-3.620	38.6	718.0	91.2	92.3	1.05
C8	19.043	4.869	-19.036	-5.092	6.7	-223.0	91.1	91.0	0.04
Line3	8.887	5.488	-8.789	-5.435	98.1	53.3	91.1	89.7	1.35
T10	19.036	5.092	-18.872	-2.032	164.5	3060.0	91.0	92.3	1.27
C9	8.789	5.435	-8.788	-5.569	1.2	-134.5	89.7	89.7	0.01
T12	8.788	5.569	-8.742	-4.718	45.7	850.8	89.7	91.1	1.42
T15	20.437	4.857	-20.248	-1.332	189.5	3524.4	91.8	92.4	0.57
T18	7.199	3.366	-7.170	-2.834	28.6	531.8	92.3	91.3	0.92
T20	-7.517	-3.425	7.550	4.043	33.2	617.9	90.8	92.2	1.46
T25	10.434	6.846	-10.366	-5.595	67.2	1250.7	91.6	90.1	1.53
T27	11.893	6.344	-11.812	-4.833	81.2	1510.6	91.5	91.2	0.31
T28	11.538	5.124	-11.464	-3.760	73.4	1364.3	91.6	91.2	0.41
T30	9.538	2.887	-9.490	-1.987	48.4	899.5	91.9	91.2	0.66
T32	10.526	3.084	-10.471	-2.062	54.9	1021.7	91.9	91.2	0.66
					2139.5	-41496.3			

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 14
Location:	Kolkota, West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	33KvKASBA		Config.: Normal

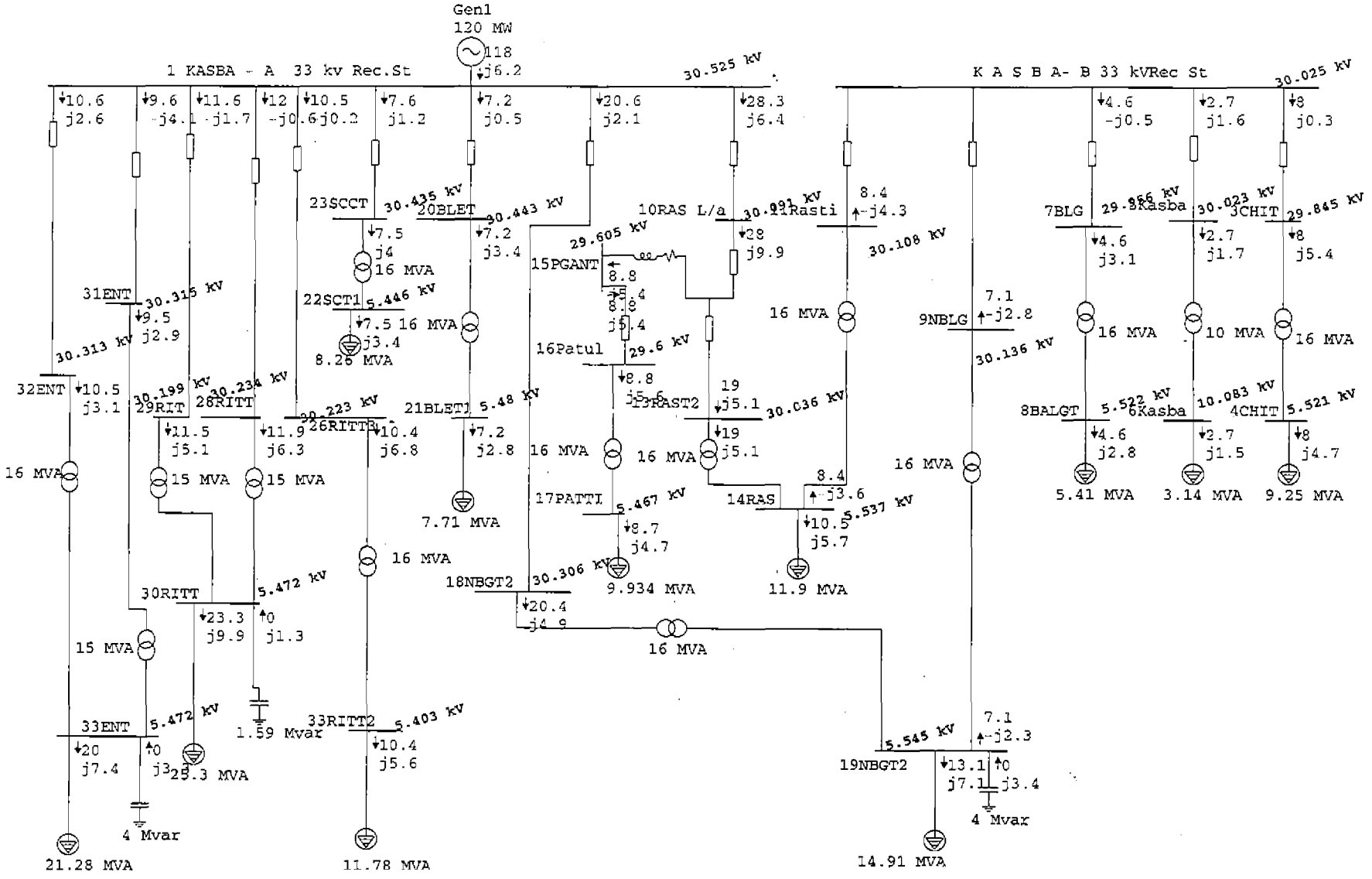
33 kv Kasba with modified lenghts and Loads

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	118.049	6.155	118.210	99.86 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	118.049	6.155	118.210	99.86 Lagging
Total Motor Load:	115.910	55.716	128.606	90.13 Lagging
Total Static Load:	0.000	-8.065		
Apparent Losses:	2.140	-41.496		
System Mismatch:	0.000	0.000		

Number of Iterations: 4

One-Line Diagram - 33KvKasba



Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 1
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33KV-TITAGARH-RS		Config.: Normal

33 kV Area TITAGARH/MULAJORE GEN./REC.Station

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	2	0	49	51

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	27	0	0	52	0	0	79

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	60.00
Unit System:	English
Project Filename:	33KV-TITAGARH-RS
Output Filename:	C:\ETAP 404\PowerStation\33KV-TITAGARH-RS\Untitled.lfl

Project:	CESC Loss Study Report 2004-05	ETAP PowerStation		Page:	10
Location:	Kolkata, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla		Study Case: LF	Revision:	Base
Filename:	33KV-TITAGARH-RS			Config.:	Normal

33 kV Area TITAGARH/MULAJORE GEN./REC.Station

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
6AGAARP	6.000	97.608	-6.6	0	0	18.24	10.34	0	0	33AGARP_2	-9.13	-5.20	1035	86.9	
										33AGARP_1	-9.12	-5.13	1031	87.1	
6BARACKP	6.000	94.530	-3.6	0	0	12.94	6.99	0.00	-5.36	33BARACK_3	-4.41	-1.37	469	95.5	
										33BARACKP_2	-4.42	-1.36	470	95.6	
										33BARACKP_1	-4.12	1.10	433	-96.6	
6BHATP-NORTH	6.000	98.499	-4.1	0	0	9.14	4.42	0	0	33BHTP-NR-16	-4.57	-2.21	495	90.0	
										33BHTP-NR-13	-4.57	-2.21	495	90.0	
6BHTPRA	6.000	98.693	-4.0	0	0	15.60	7.55	0	0	33BHTPRA-7	-7.80	-3.78	844	90.0	
										33BHTPRA-8	-7.80	-3.78	844	90.0	
6BIRATI	6.000	95.884	-1.1	0	0	1.97	0.84	0	0	33BIRATI	-1.97	-0.84	214	92.0	
6GARULIA	6.000	100.183	-4.1	0	0	18.70	11.59	0	0	33GRULIA-5	-8.78	-5.43	991	85.0	
										33GURLIA-15	-4.87	-2.89	543	86.0	
										33GURLIA-4	-5.06	-3.27	578	84.0	
6GURHTI	6.000	100.349	-5.8	0	0	27.28	14.72	0.00	-4.03	33GURHTI-10	-7.42	-3.27	777	91.5	
										33GURHTI-16	-7.00	-2.05	699	96.0	
										33GURHTI-11	-12.85	-5.39	1336	92.2	
6ISHPRE	6.000	100.305	-2.4	0	0	6.58	3.19	0	0	33ISHPOR-13	-2.46	-1.24	264	89.3	
										33ISHPOR-14	-4.12	-1.95	437	90.4	
6RISHRA	6.000	102.519	-4.7	0	0	19.12	10.32	0.00	-4.73	33RISHRA_1	-6.15	-1.80	601	96.0	
										33RISHRA_1	-6.15	-1.80	601	96.0	
										33RISHRA_1	-6.83	-2.00	667	96.0	
6SERAMP	6.000	99.612	-2.7	0	0	10.85	8.14	0	0	33SERAMP-1	-5.42	-4.07	655	80.0	
										33SERAMP-2	-5.42	-4.07	654	80.0	
6SINTHIA	6.000	96.583	-7.2	0	0	18.71	9.06	0	0	33SINTH-2	-9.36	-4.53	1035	90.0	
										33SINTH-1	-9.35	-4.53	1035	90.0	
6SUKCH	6.000	102.928	-3.6	0	0	12.82	6.21	0.00	-3.18	33SUKCH-1	-5.28	-2.99	567	87.0	
										33SUKCH-2	-7.53	-0.04	704	100.0	
33AGARP_1	33.000	95.349	-0.1	0	0	0	0	0	0	33TITAGRH-RS	-9.20	-6.66	208	81.0	
										6AGAARP	9.20	6.66	208	81.0	-10.000
33AGARP_2	33.000	95.436	-0.1	0	0	0	0	0	0	33TITAGRH-RS	-9.21	-6.74	209	80.7	
										6AGAARP	9.21	6.74	209	80.7	-10.000
33BARACK_3	33.000	96.973	0.0	0	0	0	0	0	0	33TITAGRH-RS	-4.43	-1.68	85	93.5	
										6BARACKP	4.43	1.68	85	93.5	
33BARACKP_1	33.000	93.481	0.0	0	0	0	0	0	0	33TITAGRH-RS(1)	-4.13	0.83	78	-98.0	
										6BARACKP	4.13	-0.83	78	-98.0	
33BARACKP_2	33.000	96.965	0.0	0	0	0	0	0	0	33TITAGRH-RS	-4.43	-1.68	85	93.5	
										6BARACKP	4.43	1.68	85	93.5	
33BHTP-NR-13	33.000	93.828	-0.7	0	0	0	0	0	0	33MULAJORE	-4.59	-2.56	97	87.3	
										6BHATP-NORTH	4.59	2.56	97	87.3	-8.000

Project:	CESC Loss Study Report 2004-05	ETAP PowerStation		Page:	11
Location:	Kolkata, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla		Study Case: LF	Revision:	Base
Filename:	33KV-TITAGARH-RS			Config.:	Normal

33 kV Area TITAGARH/MULAJORE GEN./REC.Station

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
33BHTP-NR-16	33.000	93.831	-0.7	0	0	0	0	0	0	33MULAJORE	-4.59	-2.57	97	87.3	
										6BHATP-NORTH	4.59	2.57	97	87.3	-8.000
33BHTPRA-7	33.000	93.930	-0.7	0	0	0	0	0	0	33MULAJORE	-7.83	-4.36	166	87.4	
										6BHTPRA	7.83	4.36	166	87.4	-8.000
33BHTPRA-8	33.000	93.931	-0.7	0	0	0	0	0	0	33MULAJORE	-7.83	-4.36	166	87.3	
										6BHTPRA	7.83	4.36	166	87.3	-8.000
33BIRATI	33.000	96.646	-0.2	0	0	0	0	0	0	33TITAGRH-RS	-1.97	-0.88	39	91.4	
										6BIRATI	1.97	0.88	39	91.4	
33BORD-ISHPR	33.000	93.848	-0.7	0	0	0	0	0	0	33ISHPOR-14	4.13	2.10	86	89.1	
										33MULAJORE	-5.12	-2.45	105	90.2	
										33ISHPRE-REF	0.99	0.35	19	94.2	
33CHORDRD	33.000	94.362	-0.6	0	0	0	0	0	0	33MULAJORE	0.00	0.00	0	0.0	
										33MULAJORE	0.00	0.00	0	0.0	
33GRULIA-5	33.000	94.379	-0.6	0	0	0	0	0	0	33TITAGRH-RS	-10.75	-4.11	213	93.4	
										33MULAJORE	1.93	-2.12	53	-67.3	
										6GARULIA	8.82	6.24	200	81.7	-10.000
33GURDH-YRD	33.000	94.502	-0.7	0	0	0	0	0	0	33MULAJORE	2.35	2.97	70	62.1	
										33MULAJORE	2.30	2.90	68	62.1	
										33PTUL-YRD	-2.32	-2.94	69	62.1	
										33PTUL-YRD	-2.32	-2.94	69	62.1	
33GURHTI-10	33.000	95.071	-0.6	0	0	0	0	0	0	33R(OH)	-11.88	-6.89	252	86.5	
										33MULAJORE	4.41	2.75	95	84.8	
										6GURHTI	7.47	4.13	157	87.5	-10.000
33GURHTI-11	33.000	94.852	-0.6	0	0	0	0	0	0	33R(OH)	-16.35	-9.25	346	87.0	
										33MULAJORE	3.42	2.40	77	81.9	
										6GURHTI	12.93	6.85	269	88.4	-10.000
33GURHTI-16	33.000	93.559	-0.8	0	0	0	0	0	0	33MULAJORE	-7.04	-2.75	141	93.2	
										6GURHTI	7.04	2.75	141	93.2	-10.000
33GURLIA-4	33.000	94.573	-0.5	0	0	0	0	0	0	33TITAGRH-RS	-10.33	-3.71	203	94.1	
										33MULAJORE	5.24	-0.04	96	100.0	
										6GARULIA	5.08	3.75	116	80.4	-10.000
33GURLIA-15	33.000	94.089	-0.7	0	0	0	0	0	0	33MULAJORE	-4.89	-3.31	109	82.8	
										6GARULIA	4.89	3.31	109	82.8	-10.000
33ISHPOR-13	33.000	93.996	-0.7	0	0	0	0	0	0	33MULAJORE	-2.46	-1.34	52	87.9	
										6ISHPRE	2.46	1.34	52	87.9	-8.000
33ISHPOR-14	33.000	93.837	-0.7	0	0	0	0	0	0	33BORD-ISHPR	-4.13	-2.10	86	89.1	
										6ISHPRE	4.13	2.10	86	89.1	-8.000
33ISHPRE-REF	33.000	93.832	-0.7	0	0	0.99	0.48	0	0	33BORD-ISHPR	-0.99	-0.48	20	90.0	
33MULAJORE	33.000	94.361	-0.6	0	0	0	0	0	0	33PLTAW	-5.87	-2.30	116	93.1	
										33GRULIA-5	-1.93	1.83	49	-72.6	
										33TITAGRH-RS	-9.56	-3.34	187	94.4	
										33TITAGRH-RS	-9.55	-3.34	187	94.4	

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 12
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33KV-TITAGARH-RS		Config.: Normal

33 kV Area TITAGARH/MULAJORE GEN./REC.Station

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
										33CHORDRD	0.00	-0.15	2	0.0	
										33CHORDRD	0.00	-0.15	2	0.0	
										33GURLIA-4	-5.23	-0.23	97	99.9	
										33ISHPOR-13	2.47	0.92	48	93.7	
										33BORD-ISHPR	5.14	1.95	101	93.5	
										33BHTPRA-7	7.86	4.12	164	88.6	
										33BHTPRA-8	7.86	4.12	164	88.6	
										33BHTP-NR-16	4.61	2.00	93	91.7	
										33BHTP-NR-13	4.61	2.00	93	91.7	
										33GURLIA-15	4.90	3.06	107	84.8	
										33GURHTI-10	-4.38	-3.47	103	78.4	
										33GURHTI-16	7.10	2.17	137	95.6	
										33GURHTI-11	-3.40	-3.01	84	74.9	
										33GURDH-YRD	-2.35	-3.12	72	60.1	
										33GURDH-YRD	-2.29	-3.05	70	60.1	
33PLTAW	33.000	95.454	-0.4	0	0	2.96	1.43	0	0	33TITAGRH-RS	-8.89	-2.72	170	95.6	
										33MULAJORE	5.93	1.28	111	97.7	
33PTUL-YRD	33.000	96.703	0.0	0	0	0	0	0	0	33TITAGRH-RS	-2.34	-3.02	69	61.3	
										33TITAGRH-RS	-2.34	-3.02	69	61.3	
										33GURDH-YRD	2.34	3.02	69	61.3	
										33GURDH-YRD	2.34	3.02	69	61.3	
33R(L/A)2	33.000	95.039	-0.4	0	0	0	0	0	0	33RISHRA_1	0.55	18.29	336	3.0	
										33S(L/A)2	3.90	0.18	71	99.9	
										33R(OH)	-4.45	-18.48	349	23.4	
33R(OH)	33.000	95.389	-0.6	0	0	0	0	0	0	33R(L/A)2	4.52	18.40	347	23.9	
										33S(L/A)2	7.05	7.75	192	67.3	
										33GURHTI-10	11.92	6.78	251	86.9	
										33GURHTI-11	16.44	9.15	345	87.4	
										33T(OH)-1	-20.12	-21.21	536	68.8	
										33T(OH)-2	-19.81	-20.87	527	68.9	
33RISHRA_1	33.000	95.009	-0.4	0	0	0	0	0	0	33R(L/A)2	-0.55	-18.29	336	3.0	
										33TITAGRH-RS(1)	11.12	20.59	430	47.5	
										33TITAGRH-RS	-29.78	-9.50	575	95.3	
										6RISHRA	6.17	2.32	121	93.6	-10.000
										6RISHRA	6.17	2.32	121	93.6	-10.000
										6RISHRA	6.86	2.57	134	93.6	-10.000
33S(L/A)2	33.000	94.784	-0.5	0	0	0	0	0	0	33R(L/A)2	-3.89	-0.61	72	98.8	
										33SERAMP-1	5.44	4.42	129	77.6	
										33SERAMP-2	5.44	4.41	129	77.7	
										33R(OH)	-7.00	-8.22	199	64.8	
33SERAMP-1	33.000	94.780	-0.5	0	0	0	0	0	0	33S(L/A)2	-5.44	-4.42	129	77.6	
										6SERAMP	5.44	4.42	129	77.6	-8.000

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 13
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33KV-TITAGARH-RS		Config.: Normal

33 kV Area TITAGARH/MULAJORE GEN./REC.Station

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
33SERAMP-2	33.000	94.779	-0.5	0	0	0	0	0	0	33S(J/A)2	-5.44	-4.42	129	77.6	
										6SERAMP	5.44	4.42	129	77.6	-8.000
33SINTH-1	33.000	93.830	-0.3	0	0	0	0	0	0	33TITAGRH-RS	-9.44	-6.07	209	84.1	
										6SINTHIA	9.44	6.07	209	84.1	-10.000
33SINTH-2	33.000	93.835	-0.3	0	0	0	0	0	0	33TITAGRH-RS	-9.44	-6.07	209	84.1	
										6SINTHIA	9.44	6.07	209	84.1	-10.000
33SUKCH-1	33.000	96.620	0.0	0	0	0	0	0	0	33TITAGRH-RS	-5.31	-3.45	114	83.8	
										6SUKCH	5.31	3.45	114	83.8	-10.000
33SUKCH-2	33.000	93.116	-0.2	0	0	0	0	0	0	33TITAGRH-RS(I)	-7.55	-0.48	142	99.8	
										6SUKCH	7.55	0.48	142	99.8	-10.000
33T(OH)-1	33.000	96.730	-0.1	0	0	0	0	0	0	33TITAGRH-RS	-20.21	-21.69	536	68.2	
										33R(OH)	20.21	21.69	536	68.2	
33T(OH)-2	33.000	96.709	-0.1	0	0	0	0	0	0	33TITAGRH-RS	-19.90	-21.33	527	68.2	
										33R(OH)	19.90	21.33	527	68.2	
* 33TITAGRH-RS	33.000	97.000	0.0	179.70	93.99	0	0	0	0	33T(OH)-2	19.92	21.33	526	68.3	
										33SINTH-1	9.73	4.62	194	90.3	
										33SINTH-2	9.73	4.62	194	90.3	
										33BIRATI	1.98	-1.49	44	-79.9	
										33AGARP_2	9.36	5.56	196	86.0	
										33AGARP_1	9.35	5.91	199	84.5	
										33SUKCH-1	5.33	2.89	109	87.9	
										33BARACK_3	4.43	1.66	85	93.6	
										33BARACKP_2	4.43	1.63	85	93.9	
										33RISHRA_1	30.33	9.31	572	95.6	
										33PLTAW	9.02	1.74	165	98.2	
										33GRULIA-5	11.02	2.91	205	96.7	
										33MULAJORE	9.80	1.88	179	98.2	
										33GURLIA-4	10.56	2.51	195	97.3	
										33MULAJORE	9.78	1.88	179	98.2	
										33PTUL-YRD	2.35	2.67	64	66.0	
										33PTUL-YRD	2.35	2.67	64	66.0	
										33T(OH)-1	20.23	21.69	534	68.2	
* 33TITAGRH-RS(I)	33.000	93.500	0.0	0.93	-21.34	0	0	0	0	33SUKCH-2	7.58	0.26	142	99.9	
										33BARACKP_1	4.13	-0.87	79	-97.9	
										33RISHRA_1	-10.79	-20.73	437	46.2	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**		Page:	17
Location:	Kolkata, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla		Study Case: LF	Revision:	Base
Filename:	33KV-TITAGARH-RS			Config.:	Normal

33 kV Area TITAGARH/MULAJORE GEN./REC.Station

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
T12	-9.128	-5.205	9.211	6.743	82.7	1538.7	97.6	95.4	2.17
T13	-9.116	-5.135	9.198	6.660	82.0	1525.4	97.6	95.3	2.26
T16	-4.409	-1.366	4.427	1.682	17.0	316.6	94.5	97.0	2.44
T17	-4.416	-1.360	4.433	1.677	17.1	317.2	94.5	97.0	2.44
T18	-4.119	1.100	4.134	-0.830	14.5	270.1	94.5	93.5	1.05
T26	-4.568	-2.213	4.587	2.566	19.0	352.6	98.5	93.8	4.67
T27	-4.567	-2.211	4.586	2.564	18.9	352.3	98.5	93.8	4.67
T24	-7.798	-3.776	7.830	4.363	31.6	586.8	98.7	93.9	4.76
T25	-7.799	-3.778	7.830	4.365	31.6	587.0	98.7	93.9	4.76
T11	-1.969	-0.839	1.971	0.877	2.0	37.9	95.9	96.6	0.76
T19	-8.777	-5.428	8.820	6.236	43.4	807.9	100.2	94.4	5.80
T20	-4.865	-2.888	4.888	3.311	22.8	423.4	100.2	94.1	6.09
T21	-5.058	-3.273	5.084	3.753	25.8	480.2	100.2	94.6	5.61
T28	-7.425	-3.266	7.471	4.133	46.6	867.4	100.2	95.1	5.28
T29	-7.004	-2.046	7.042	2.748	37.7	701.9	100.3	93.6	6.79
T30	-12.851	-5.385	12.930	6.853	78.9	1468.0	100.3	94.9	5.50
T22	-2.459	-1.239	2.464	1.339	5.4	100.1	100.3	94.0	6.31
T23	-4.120	-1.947	4.128	2.105	8.4	157.2	100.3	93.8	6.47
T1	-6.146	-1.797	6.174	2.315	27.9	518.1	102.5	95.0	7.51
T2	-6.146	-1.797	6.174	2.315	27.9	518.1	102.5	95.0	7.51
T3	-6.829	-1.997	6.860	2.573	30.9	575.6	102.5	95.0	7.51
T4	-5.424	-4.069	5.443	4.422	19.0	352.8	99.6	94.8	4.83
T7	-5.424	-4.067	5.443	4.420	19.0	352.7	99.6	94.8	4.83
T9	-9.357	-4.533	9.439	6.071	82.7	1538.5	96.6	93.8	2.75
T10	-9.354	-4.529	9.437	6.067	82.7	1537.4	96.6	93.8	2.75
T14	-5.285	-2.991	5.310	3.453	24.8	462.1	102.9	96.6	6.31
T15	-7.531	-0.038	7.555	0.482	23.9	444.0	102.9	93.1	9.81
Cable15	-9.198	-6.660	9.351	5.910	153.1	-750.5	95.3	97.0	1.65
Cable14	-9.211	-6.743	9.356	5.561	145.0	-1182.1	95.4	97.0	1.56
Cable18	-4.427	-1.682	4.427	1.664	0.9	-17.8	97.0	97.0	0.03
Cable20	-4.134	0.830	4.135	-0.867	1.1	-37.2	93.5	93.5	0.02
Cable19	-4.433	-1.677	4.435	1.631	1.4	-45.5	97.0	97.0	0.03
Cable40	-4.586	-2.564	4.610	2.000	23.5	-564.1	93.8	94.4	0.53
Cable39	-4.587	-2.566	4.610	2.004	23.4	-561.4	93.8	94.4	0.53
Cable37	-7.830	-4.363	7.863	4.118	32.8	-244.7	93.9	94.4	0.43
Cable38	-7.830	-4.365	7.863	4.121	32.8	-244.0	93.9	94.4	0.43
Cable13	-1.971	-0.877	1.979	-1.491	8.4	-2367.6	96.6	97.0	0.35
Cable34	4.129	2.099	-4.128	-2.105	0.3	-5.9	93.8	93.8	0.01
Cable35	-5.119	-2.452	5.144	1.949	25.0	-503.1	93.8	94.4	0.51
Cable36	0.990	0.353	-0.990	-0.479	0.1	-126.1	93.8	93.8	0.02
Cable30	0.000	-0.002	0.000	-0.153	0.0	-155.1	94.4	94.4	0.00
Cable31	0.000	0.002	0.000	-0.153	0.0	-151.7	94.4	94.4	0.00
Cable25	-10.751	-4.112	11.015	2.907	264.0	-1205.2	94.4	97.0	2.62
Cable26	1.931	-2.124	-1.928	1.825	3.5	-298.7	94.4	94.4	0.02
Cable46	2.350	2.970	-2.346	-3.116	4.3	-145.9	94.5	94.4	0.14
Cable47	2.298	2.900	-2.294	-3.050	4.2	-149.4	94.5	94.4	0.14
Line5	-2.324	-2.935	2.342	3.018	18.1	83.0	94.5	96.7	2.20

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 18
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33KV-TITAGARH-RS		Config.: Normal

33 kV Area TITAGARH/MULAJORE GEN./REC.Station

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	
Line6	-2.324	-2.935	2.342	3.018	18.1	83.0	94.5	96.7	2.20
Cable7	-11.880	-6.887	11.917	6.781	36.8	-105.6	95.1	95.4	0.32
Cable43	4.409	2.754	-4.376	-3.470	32.1	-716.3	95.1	94.4	0.71
Cable8	-16.351	-9.248	16.436	9.149	85.2	-99.1	94.9	95.4	0.54
Cable45	3.421	2.395	-3.403	-3.013	18.0	-617.6	94.9	94.4	0.49
Cable44	-7.042	-2.748	7.095	2.170	53.4	-577.4	93.6	94.4	0.80
Cable28	-10.327	-3.712	10.561	2.508	234.7	-1203.5	94.6	97.0	2.43
Cable32	5.243	-0.042	-5.231	-0.229	11.6	-271.0	94.6	94.4	0.21
Cable41	-4.888	-3.311	4.901	3.063	13.4	-247.9	94.1	94.4	0.27
Cable33	-2.464	-1.339	2.474	0.922	9.2	-416.7	94.0	94.4	0.37
Cable24	-5.872	-2.303	5.932	1.282	60.2	-1021.7	94.4	95.5	1.09
Cable27	-9.562	-3.344	9.800	1.881	237.4	-1463.1	94.4	97.0	2.64
Cable29	-9.547	-3.341	9.784	1.875	237.1	-1466.1	94.4	97.0	2.64
Cable23	-8.893	-2.716	9.022	1.739	128.4	-976.5	95.5	97.0	1.55
Cable48	-2.342	-3.018	2.351	2.673	8.5	-345.4	96.7	97.0	0.30
Cable49	-2.342	-3.018	2.351	2.673	8.5	-345.4	96.7	97.0	0.30
Cable1	0.552	18.292	-0.549	-18.291	3.6	1.0	95.0	95.0	0.03
Cable2	3.901	0.184	-3.891	-0.609	9.8	-424.5	95.0	94.8	0.26
Cable5	-4.453	-18.477	4.524	18.396	71.3	-80.9	95.0	95.4	0.35
Cable6	7.051	7.748	-6.996	-8.222	55.3	-473.7	95.4	94.8	0.61
Line1	-20.116	-21.208	20.206	21.686	90.0	478.0	95.4	96.7	1.34
Line2	-19.812	-20.866	19.899	21.329	87.2	463.1	95.4	96.7	1.32
Cable21	11.116	20.590	-10.789	-20.733	327.5	-142.9	95.0	93.5	1.51
Cable22	-29.777	-9.502	30.331	9.307	554.0	-195.6	95.0	97.0	1.99
Cable3	5.443	4.418	-5.443	-4.422	0.2	-3.4	94.8	94.8	0.00
Cable4	5.443	4.412	-5.443	-4.420	0.3	-7.4	94.8	94.8	0.00
Cable11	-9.437	-6.067	9.730	4.616	293.0	-1450.4	93.8	97.0	3.17
Cable12	-9.439	-6.071	9.732	4.624	292.6	-1447.4	93.8	97.0	3.17
Cable16	-5.310	-3.453	5.329	2.890	19.5	-562.4	96.6	97.0	0.38
Cable17	-7.555	-0.482	7.585	0.256	29.9	-226.3	93.1	93.5	0.38
Cable50	-20.206	-21.686	20.228	21.691	21.7	4.6	96.7	97.0	0.27
Cable9	-19.899	-21.329	19.922	21.331	23.0	1.9	96.7	97.0	0.29
					4737.8	-5339.6			

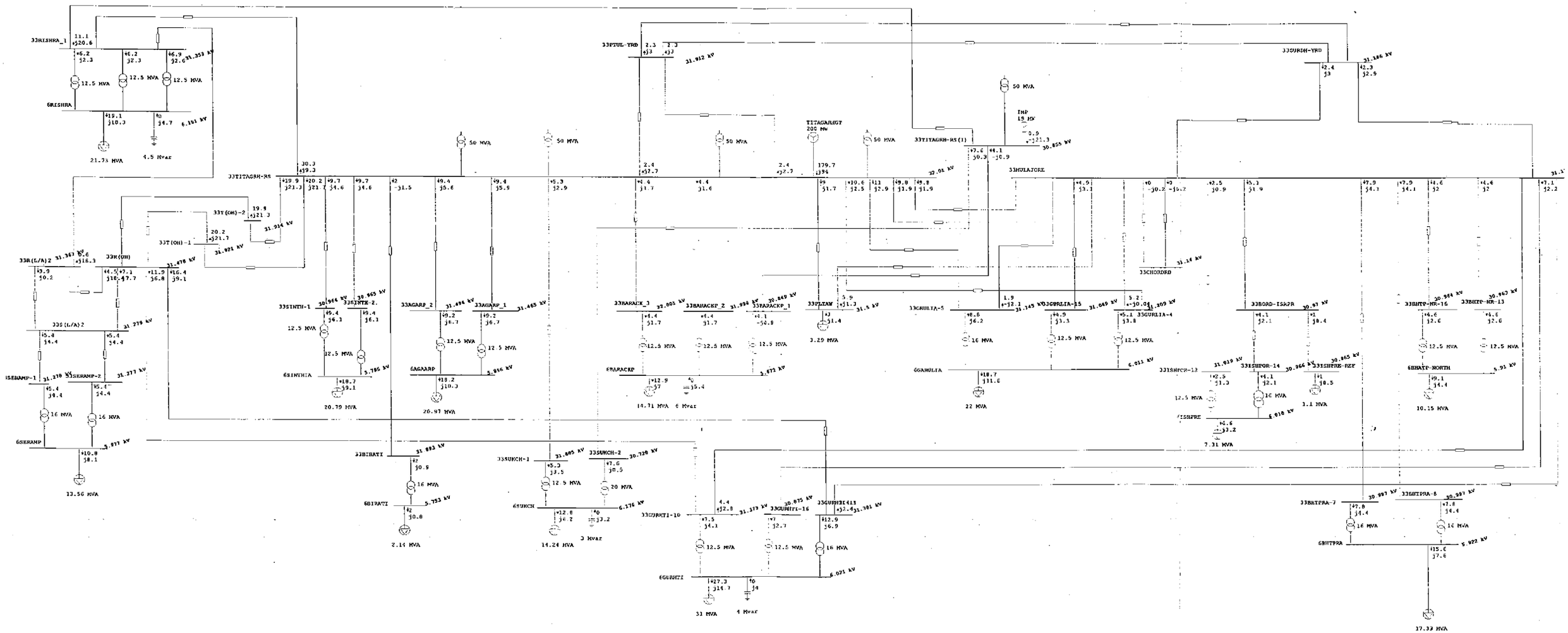
Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 21
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33KV-TITAGARH-RS		Config.: Normal

33 kV Area TITAGARH/MULAJORE GEN./REC.Station

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	180.635	72.646	194.695	92.78 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	180.635	72.646	194.695	92.78 Lagging
Total Motor Load:	175.897	95.283	200.046	87.93 Lagging
Total Static Load:	0.000	-17.297		
Apparent Losses:	4.738	-5.340		
System Mismatch:	0.000	0.000		

Number of Iterations: 4


33RISHRA_1
11.1 j20.6
6.2 j2.3
6.2 j2.3
6.9 j2.6
31.353 kV
12.5 MVA
12.5 MVA
12.5 MVA
6RISHRA
15.1 j10.3
0
j4.7
6.151 kV
21.73 MVA
4.5 Mvar
33TITAGRH-RS
30.3 j39.3
19.9 j21.3
20.2 j21.7
9.7 j4.6
49.7 j4.6
2 -j1.5
49.4 j5.6
49.4 j5.9
5.3 j2.9
50 MVA
50 MVA
33T(OH)-2
31.934 kV
33T(OH)-1
31.921 kV
33R(L/A)2
31.367 kV
33R(OH)
31.478 kV
33S(L/A)2
31.279 kV
33SRAMP-1
31.230 kV
33SRAMP-2
31.277 kV
16 MVA
16 MVA
6SRAMP
10.8 j8.1
5.977 kV
13.56 MVA
33SINTH-1
30.964 kV
33SINTH-2
30.965 kV
12.5 MVA
12.5 MVA
6SINTHIA
18.7 j9.1
5.795 kV
20.79 MVA
33AGARP_2
31.494 kV
33AGARP_1
31.465 kV
12.5 MVA
12.5 MVA
6AGAARP
18.2 j10.3
5.956 kV
20.97 MVA
33PTUL-YRD
2.3 j3
2.3 j3
31.912 kV
50 MVA
50 MVA
2.4 j2.7
4.4 j1.7
4.4 j1.6
2.4 j2.3
TITAGARGT
200 MW
179.7 j96
50 MVA
33TITAGRH-RS(1)
7.6 j0.3
48.1 -j0.9
50 MVA
INP
15 MW
0.9
-j21.3
30.855 kV
33HULAJORE
32.01 kV
33BARACK_3
32.801 kV
33BARACKP_2
31.998 kV
33BARACKP_1
30.849 kV
4.4 j1.7
4.4 j1.7
4.1 -j0.8
12.5 MVA
12.5 MVA
12.5 MVA
6BARACKP
12.9 j7
35.4
14.71 MVA 6 Mvar
33PLAW
5.9 j1.3
j3 j1.4
31.5 kV
3.29 MVA
33BIRATI
31.893 kV
j2 j0.5
16 MVA
6BIRATI
5.753 kV
j2 j0.8
2.14 MVA
33SUKCH-1
33.885 kV
33SUKCH-2
30.720 kV
5.3 j3.5
7.6 j0.5
12.5 MVA
20 MVA
6SUKCH
6.376 kV
12.8 j6.2
0
j3.2
14.24 MVA
3 Mvar
33GURHTI-10
4.4 j2.8
31.373 kV
33GURHTI-16
30.875 kV
33GURHTI413
32.431 kV
7.5 j4.1
j7 j2.7
12.9 j6.9
12.5 MVA
12.5 MVA
16 MVA
6GURHTI
27.3 j14.7
0
j4
6.021 kV
31 MVA
4 Mvar
33CRULTA-5
1.9 j2.1
31.145 kV
33JGURLIA-15
31.049 kV
33GURLIA-4
31.309 kV
8.8 j6.2
4.9 j3.3
5.1 j3.8
16 MVA
12.5 MVA
12.5 MVA
6GARULIA
18.7 j11.6
6.011 kV
22 MVA
33CHORDRD
31.14 kV
33GURDH-YRD
31.386 kV
2.4 j3
2.3 j2.9
33HULAJORE
0 -j0.2
0 -j0.2
2.5 j0.9
5.1 j1.9
47.9 j4.3
47.9 j4.1
4.6 j2
4.6 j2
47.1 j2.2
33BORD-ISKPR
30.97 kV
4.1 j2.1
2 j0.4
33BHTP-NR-16
30.984 kV
33BHTP-NR-13
30.962 kV
4.6 j2.6
4.6 j2.6
12.5 MVA
12.5 MVA
6BHATP-NORTH
5.91 kV
9.1 j4.4
10.15 MVA
33SHPRE-12
31.919 kV
33SUPOR-14
30.966 kV
33SHPRE-RZF
30.865 kV
2.5 j1.3
4.1 j2.1
1 j0.5
12.5 MVA
16 MVA
6SHPRE
6.038 kV
7.31 MVA
1.1 MVA
33BHTPRA-7
30.987 kV
33BHTPRA-8
30.987 kV
7.8 j4.4
7.8 j4.4
16 MVA
16 MVA
6BHTPRA
15.6 j7.6
5.922 kV
17.33 MVA

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 7
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33KV-PRINSEP-STREET-SUBSTATION		Config.: Normal

33 kV Area PRINSEP STREET Substation

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
6AMHT1	6.000	108.774	-4.6	0	0	6.59	2.39	0.00	-5.32	33AMHT1	-6.59	2.93	638	-91.4	
6PRN-ST-DIST-STN	6.000	86.365	-7.8	0	0	26.00	14.96	0	0	33PSTT3	-8.82	-5.81	1176	83.5	
										33PSTT1	-8.59	-4.58	1084	88.2	
										33PSTT2	-8.59	-4.58	1084	88.2	
6PSTT4	6.000	103.944	-6.2	0	0	8.67	3.43	0.00	-4.32	33PSTT4	-8.67	0.90	806	-99.5	
6RSAT1-2	6.000	100.498	-4.3	0	0	20.02	9.12	0.00	-4.04	33RSAT1	-10.16	-2.79	1008	96.4	
										33RSAT2	-9.86	-2.29	969	97.4	
33AMHT1	33.000	103.829	-0.2	0	0	0	0	0	0	33PRS	-6.62	2.35	118	-94.2	
										6AMHT1	6.62	-2.35	118	-94.2	-2.000
33MTPR	33.000	102.912	-0.2	0	0	2.79	1.10	0	0	33R(LA)	-2.79	-1.10	51	93.0	
*33PRNSP-ST-REC-STN	33.000	95.000	0.0	26.29	6.73	0	0	0.00	-13.54	33PSTT3	8.93	7.77	218	75.5	
										33PSTT2	8.68	6.26	197	81.1	
										33PSTT1	8.68	6.24	196	81.2	
*33PRS	33.000	104.000	0.0	38.43	3.25	0	0	0	0	33RSAT1	10.27	2.88	179	96.3	
										33R(LA)	12.81	3.22	222	97.0	
										33PSTT4	8.72	0.02	146	100.0	
										33AMHT1	6.64	-2.87	121	-91.8	
33PSTT1	33.000	94.981	0.0	0	0	0	0	0	0	33PRNSP-ST-REC-STN	-8.68	-6.26	197	81.1	
										6PRN-ST-DIST-STN	8.68	6.26	197	81.1	
33PSTT2	33.000	94.987	0.0	0	0	0	0	0	0	33PRNSP-ST-REC-STN	-8.68	-6.27	197	81.1	
										6PRN-ST-DIST-STN	8.68	6.27	197	81.1	
33PSTT3	33.000	94.971	0.0	0	0	0	0	0	0	33PRNSP-ST-REC-STN	-8.93	-7.79	218	75.3	
										6PRN-ST-DIST-STN	8.93	7.79	218	75.3	-2.000
33PSTT4	33.000	103.992	0.0	0	0	0	0	0	0	33PRS	-8.72	-0.04	146	100.0	
										6PSTT4	8.72	0.04	146	100.0	
33R(LA)	33.000	102.916	-0.2	0	0	0	0	0	0	33RSAT2	9.90	3.05	176	95.6	
										33PRS	-12.69	-4.13	226	95.1	
										33MTPR	2.79	1.08	50	93.2	
33RSAT1	33.000	103.302	-0.1	0	0	0	0	0	0	33PRS	-10.20	-3.62	183	94.2	
										6RSAT1-2	10.20	3.62	183	94.2	
33RSAT2	33.000	102.902	-0.2	0	0	0	0	0	0	33R(LA)	-9.90	-3.07	176	95.5	
										6RSAT1-2	9.90	3.07	176	95.5	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 10
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33KV-PRINSEP-STREET-SUBSTATION		Config.: Normal

33 kV Area PRINSEP STREET Substation

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
AHMRS	-6.589	2.933	6.621	-2.349	31.4	583.7	108.8	103.8	4.95
PRNS-3	-8.824	-5.807	8.930	7.793	106.8	1986.0	86.4	95.0	8.61
PRNSEP-1	-8.588	-4.577	8.678	6.263	90.6	1685.6	86.4	95.0	8.62
PRNSEP-2	-8.590	-4.581	8.680	6.268	90.7	1686.8	86.4	95.0	8.62
PRNSEP-4	-8.668	0.896	8.718	0.037	50.2	933.1	103.9	104.0	0.05
RABNDS-1	-10.159	-2.787	10.204	3.624	45.0	836.6	100.5	103.3	2.80
RABNDS-2	-9.861	-2.294	9.903	3.067	41.5	772.8	100.5	102.9	2.40
Cable9	-6.621	2.349	6.639	-2.866	17.9	-517.4	103.8	104.0	0.17
Cable4	-2.790	-1.103	2.790	1.081	0.1	-21.9	102.9	102.9	0.00
Cable5	8.933	7.769	-8.930	-7.793	2.4	-24.0	95.0	95.0	0.03
Cable6	8.681	6.256	-8.680	-6.268	0.9	-12.0	95.0	95.0	0.01
Cable7	8.680	6.244	-8.678	-6.263	1.4	-18.3	95.0	95.0	0.02
Cable1	10.265	2.879	-10.204	-3.624	61.3	-744.9	104.0	103.3	0.70
Cable3	12.813	3.219	-12.694	-4.128	118.9	-908.2	104.0	102.9	1.08
Cable8	8.718	0.019	-8.718	-0.037	0.6	-18.4	104.0	104.0	0.01
Cable2	9.904	3.047	-9.903	-3.067	1.1	-20.4	102.9	102.9	0.01
					660.8	6199.2			

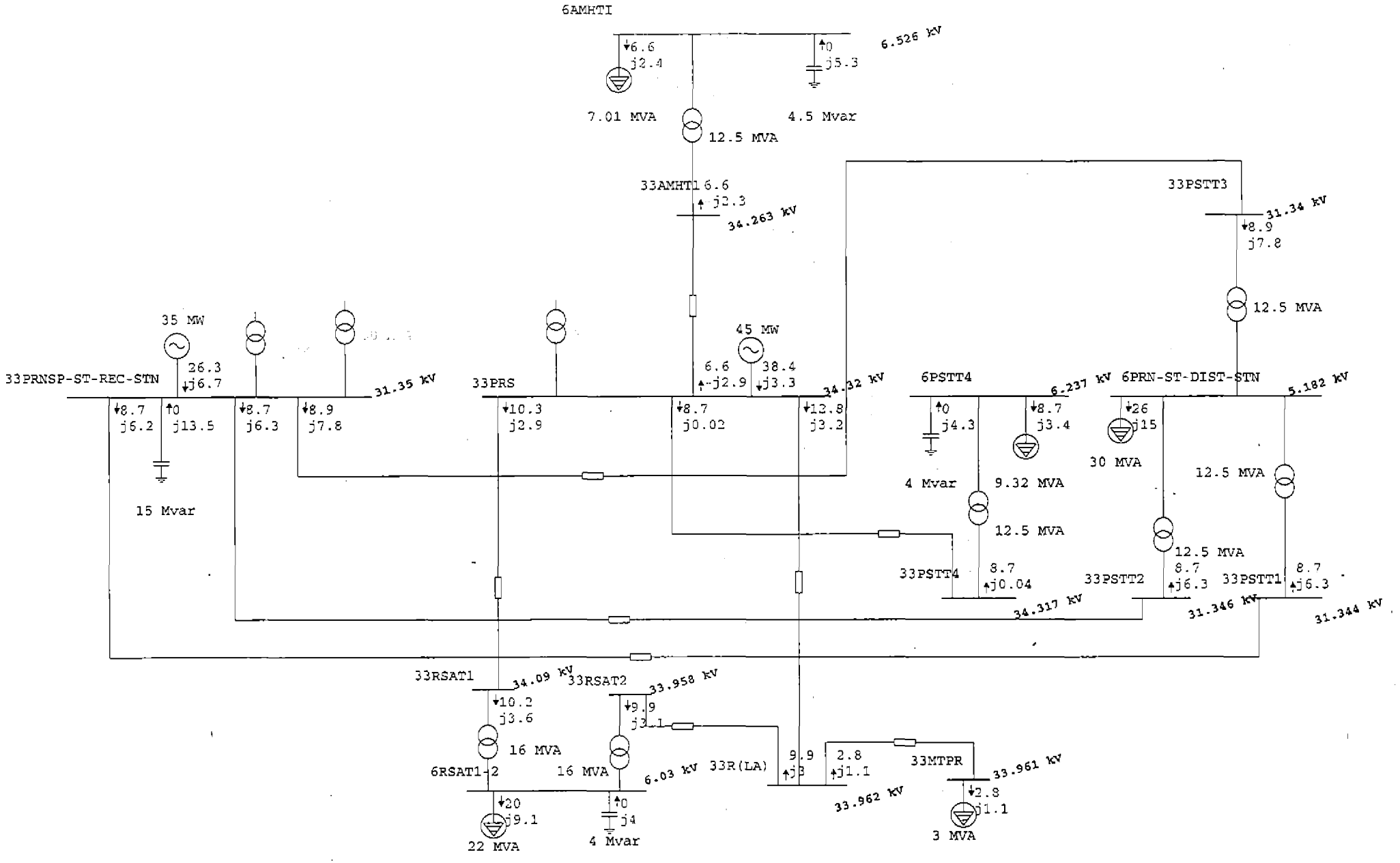
Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 13
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla	Study Case: LF	Revision: Base
Filename:	33KV-PRINSEP-STREET-SUBSTATION		Config.: Normal

33 kV Area PRINSEP STREET Substation

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	64.729	9.982	65.494	98.83 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	64.729	9.982	65.494	98.83 Lagging
Total Motor Load:	64.068	31.006	71.177	90.01 Lagging
Total Static Load:	0.000	-27.223		
Apparent Losses:	0.661	6.199		
System Mismatch:	0.000	0.000		

Number of Iterations: 3


6AMHTI
6.6
j2.4
0
j5.3
6.526 kV
7.01 MVA
4.5 Mvar
12.5 MVA
33AMHTI
6.6
j2.3
34.263 kV
33PSTT3
31.34 kV
8.9
j7.8
12.5 MVA
35 MW
26.3
j6.7
33PRNSP-ST-REC-STN
31.35 kV
8.7
j6.2
0
j13.5
15 Mvar
8.7
j6.3
8.9
j7.8
45 MW
6.6
j2.9
38.4
j3.3
33PRS
34.32 kV
10.3
j2.9
8.7
j0.02
12.8
j3.2
6PSTT4
6.237 kV
0
j4.3
8.7
j3.4
4 Mvar
9.32 MVA
12.5 MVA
33PSTT4
8.7
j0.04
34.317 kV
6PRN-ST-DIST-STN
5.182 kV
26
j15
30 MVA
12.5 MVA
12.5 MVA
33PSTT2
8.7
j6.3
33PSTT1
8.7
j6.3
31.346 kV
31.344 kV
33RSAT1
34.09 kV
33RSAT2
33.958 kV
10.2
j3.6
9.9
j3.1
16 MVA
6RSAT1-2
16 MVA
6.03 kV
33R(LA)
9.9
j3
2.8
j1.1
33MTPR
33.961 kV
33.962 kV
20
j9.1
22 MVA
0
j4
4 Mvar
2.8
j1.1
3 MVA

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 1
Location:	Kolkota ,West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	JADAVPORE33		Config.: Normal

Jadavpore 33 KV with modified loads and lengths

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	16	17

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	9	0	0	10	0	0	19

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	JADAVPORE33
Output Filename:	C:\e data\ETAP 404\PowerStation\JADAVPORE33\MS.lfl

Project:	CESC Loss Study Report 2004-05	ETAP PowerStation	Page: 7
Location:	Kolkota ,West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	JADAVPORE33		Config.: Normal

Jadavpore 33 KV with modified loads and lengths

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
6BLG_T2	6.000	91.259	-3.8	0	0	8.34	3.55	0	0	33BLG_T2	-8.34	-3.55	956	92.0	
6DHAT2	6.000	90.622	-4.0	0	0	10.00	7.50	0	0	DHAT2	-10.00	-7.50	1327	80.0	
6JADT	6.000	90.899	-3.7	0	0	16.30	13.15	0	0	33JADT	-8.77	-7.07	1192	77.8	
										33JADT	-7.53	-6.08	1024	77.8	
6JADT3	6.000	90.107	-3.5	0	0	7.23	4.48	0	0	33JADT3	-7.23	-4.48	907	85.0	
6PAST	6.000	91.926	-4.5	0	0	22.62	13.00	0	0	33PASTI	-11.30	-6.43	1360	86.9	
										33PAS T2	-11.32	-6.56	1370	86.5	
6TLNTI	6.000	89.962	-3.1	0	0	6.75	5.95	0	0	TLNTI	-6.75	-5.95	962	75.0	
6TOLTI	6.000	91.944	-4.2	0	0	9.77	5.27	0	0	33TOL T1	-9.77	-5.27	1161	88.0	
33BLG_T2	33.000	94.435	-0.1	0	0	0	0	0	0	JADAVPORE 33	-8.38	-4.23	173	89.3	
										6BLG_T2	8.38	4.23	173	89.3	
33J(ODY)1	33.000	94.881	0.0	0	0	0	0	0	0	JADAVPORE 33	-7.30	-5.11	164	81.9	
										33JADT3	7.30	5.11	164	81.9	
33JADT	33.000	94.845	0.0	0	0	0	0	0	0	JADAVPORE 33	-8.24	-7.59	206	73.5	
										JADAVPORE 33	-8.16	-7.52	204	73.5	
										6JADT	8.82	8.13	221	73.5	-2.000
										6JADT	7.58	6.98	190	73.5	-2.000
33JADT3	33.000	94.258	0.0	0	0	0	0	0	0	33J(ODY)1	-7.26	-5.14	165	81.6	
										6JADT3	7.26	5.14	165	81.6	
33PASTI	33.000	95.155	0.0	0	0	0	0	0	0	JADAVPORE 33	-11.36	-7.71	252	82.7	
										6PAST	11.36	7.71	252	82.7	-2.000
33PAS T2	33.000	95.246	0.0	0	0	0	0	0	0	JADAVPORE 33	-11.39	-7.86	254	82.3	
										6PAST	11.39	7.86	254	82.3	-2.000
33TOL TI	33.000	94.560	0.0	0	0	0	0	0	0	JADAVPORE 33	-9.82	-6.27	215	84.3	
										6TOLTI	9.82	6.27	215	84.3	-2.000
DHAT2	33.000	94.620	0.0	0	0	0	0	0	0	JADAVPORE 33	-10.06	-8.73	246	75.5	
										6DHAT2	10.06	8.73	246	75.5	-2.000
*JADAVPORE 33	33.000	95.500	0.0	82.04	61.64	0	0	0	0	TLNTI	6.81	6.67	174	71.4	
										DHAT2	10.16	8.74	245	75.8	
										33JADT	8.30	7.59	205	73.8	
										33J(ODY)1	7.35	5.08	163	82.2	
										33PASTI	11.40	7.72	252	82.8	
										33TOL TI	9.91	6.27	214	84.5	
										33JADT	8.22	7.51	204	73.8	
										33BLG_T2	8.46	4.19	173	89.6	
										33PAS T2	11.42	7.87	254	82.3	
TLNTI	33.000	95.190	0.0	0	0	0	0	0	0	JADAVPORE 33	-6.79	-6.68	175	71.3	
										6TLNTI	6.79	6.68	175	71.3	

Project:	CESC Loss Study Report 2004-05	ETAP PowerStation		Page:	11
Location:	Kolkota ,West Bengal	4.0.4C		Date:	09-21-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF		Revision:	Base
Filename:	JADAVPORE33			Config.:	Normal

Jadavpore 33 KV with modified loads and lengths

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
BALLYGUN_T2	-8.344	-3.555	8.378	4.230	33.8	675.8	91.3	94.4	3.18
DHAKURIA_T2	-10.000	-7.500	10.061	8.726	61.3	1225.7	90.6	94.6	4.00
JADAV_T1	-8.766	-7.072	8.819	8.126	52.7	1054.3	90.9	94.8	3.95
JADAV_T2	-7.534	-6.078	7.579	6.984	45.3	906.0	90.9	94.8	3.95
JAD_T3	-7.225	-4.478	7.258	5.136	32.9	658.8	90.1	94.3	4.15
PAS T1	-11.297	-6.432	11.361	7.711	64.0	1279.6	91.9	95.2	3.23
PAS T2	-11.324	-6.564	11.389	7.861	64.9	1297.1	91.9	95.2	3.32
TOLLY NTH _T1	-6.750	-5.953	6.786	6.681	36.4	727.8	90.0	95.2	5.23
TOLLYGUNGE	-9.768	-5.272	9.818	6.269	49.9	997.1	91.9	94.6	2.62
LNC9	-8.378	-4.230	8.464	4.193	85.8	-37.0	94.4	95.5	1.07
LNC4	-7.305	-5.111	7.351	5.084	46.5	-26.8	94.9	95.5	0.62
LNC5	7.305	5.111	-7.258	-5.136	46.8	-25.7	94.9	94.3	0.62
LNC3	-8.238	-7.591	8.300	7.585	62.0	-5.5	94.8	95.5	0.65
LNC8	-8.160	-7.519	8.221	7.513	61.4	-6.4	94.8	95.5	0.65
LNC6	-11.361	-7.711	11.401	7.719	39.9	7.5	95.2	95.5	0.35
LNC10	-11.389	-7.861	11.418	7.867	29.5	5.8	95.2	95.5	0.25
LNC7	-9.818	-6.269	9.911	6.268	92.7	-1.7	94.6	95.5	0.94
LNC2	-10.061	-8.726	10.160	8.742	99.1	16.0	94.6	95.5	0.88
LNC1	6.811	6.670	-6.786	-6.681	25.0	-10.6	95.5	95.2	0.31
					1029.7	8737.8			

Project:	CESC Loss Study Report 2004-05	ETAP PowerStation	Page: 14
Location:	Kolkota ,West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	JADAVPORE33		Config.: Normal

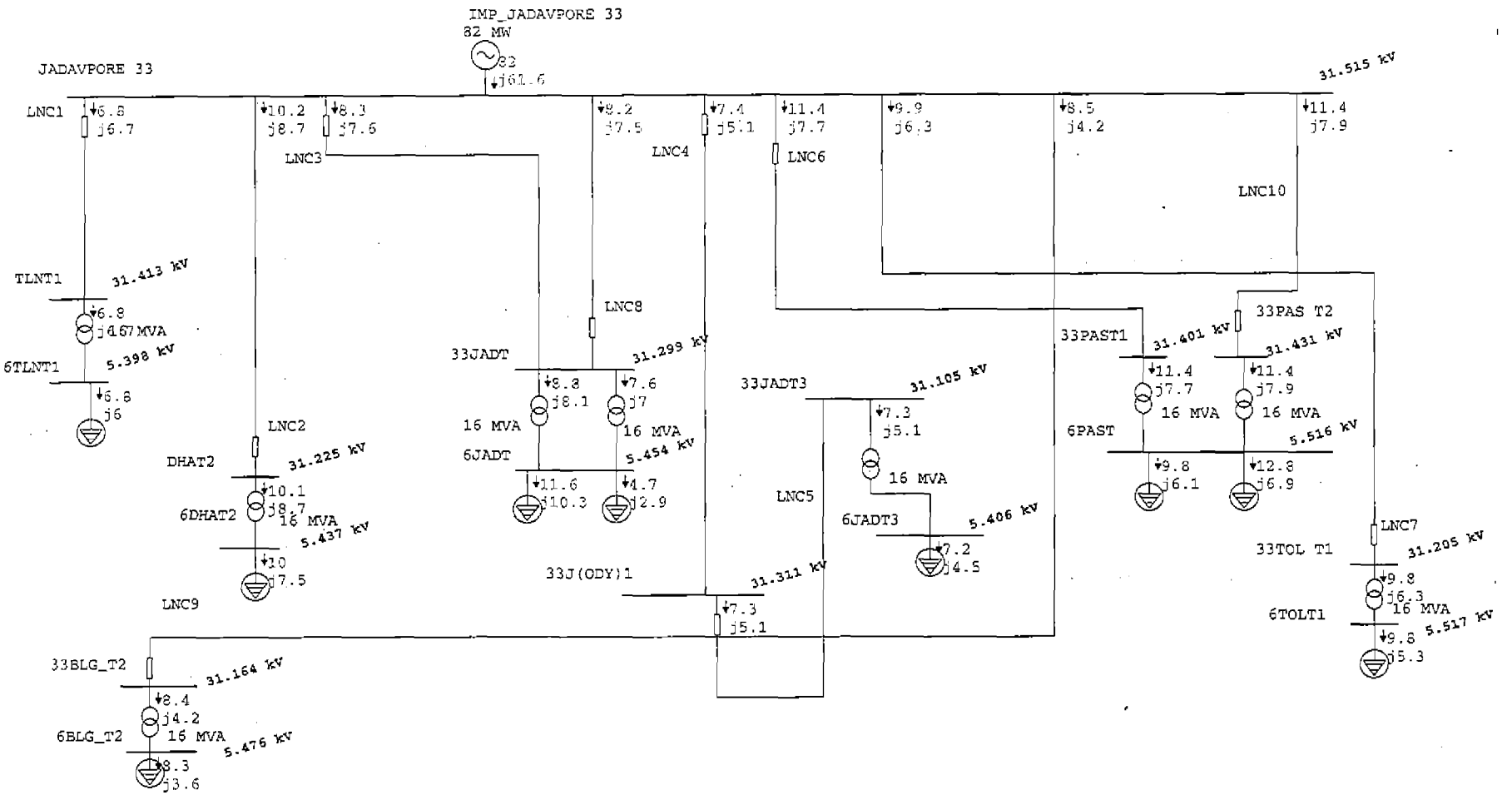
Jadavpore 33 KV with modified loads and lengths

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	82.039	61.640	102.615	79.95 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	82.039	61.640	102.615	79.95 Lagging
Total Motor Load:	81.009	52.902	96.753	83.73 Lagging
Total Static Load:	0.000	0.000		
Apparent Losses:	1.030	8.738		
System Mismatch:	0.000	0.000		

Number of Iterations: 2

One-Line Diagram - OLV1



Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 1
Location:	Kolkota ,West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	PARKLANE33		Config.: Normal

PARK LANE _ 33 KV with modified lengths and load

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	11	12

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	6	0	0	8	0	0	14

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	PARKLANE33
Output Filename:	C:\e data\ETAP 404\PowerStation\PARKLANE33\Untitled.lf1

Project:	CESC Loss Study Report 2004-05	ETAP PowerStation	Page: 7
Location:	Kolkota ,West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER36		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	. PARKLANE33		Config.: Normal

PARK LANE _ 33 KV with modified lengths and load

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
6ASQT	6.000	95.681	-2.7	0	0	15.60	11.70	0	0	33ASQT1	-7.80	-5.84	980	80.0	
										33ASQT2	-7.80	-5.86	980	80.0	
6MART1	6.000	93.395	-4.1	0	0	9.60	7.20	0	0	33MART1	-9.60	-7.20	1236	80.0	
6PCIRT1	6.000	93.792	-4.5	0	0	10.00	7.50	0.00	-1.23	33PCIRT1	-10.00	-6.27	1210	84.7	
6PLNT	6.000	93.864	-4.1	0	0	18.40	13.80	0	0	33PLNT2	-9.20	-6.90	1178	80.0	
										33PLNT1	-9.20	-6.90	1179	80.0	
33ASQT1	33.000	99.667	0.0	0	0	0	0	0	0	PARK LINE 33	-7.83	-6.47	178	77.1	
										6ASQT	7.83	6.47	178	77.1	
33ASQT2	33.000	99.674	0.0	0	0	0	0	0	0	PARK LINE 33	-7.83	-6.48	178	77.0	
										6ASQT	7.83	6.48	178	77.0	
33MART1	33.000	99.699	0.0	0	0	0	0	0	0	PARK LINE 33	-9.66	-8.41	224	75.4	
										6MART1	9.66	8.41	224	75.4	
33PCIRT1	33.000	99.482	0.0	0	0	0	0	0	0	PARK LINE 33	-10.06	-7.45	220	80.3	
										6PCIRT1	10.06	7.45	220	80.3	
33PLNT1	33.000	99.973	0.0	0	0	0	0	0	0	PARK LINE 33	-9.25	-8.03	214	75.5	
										6PLNT	9.25	8.03	214	75.5	
33PLNT2	33.000	99.970	0.0	0	0	0	0	0	0	PARK LINE 33	-9.25	-8.02	214	75.6	
										6PLNT	9.25	8.02	214	75.6	
*PARK LINE 33	33.000	100.000	0.0	54.02	44.76	0	0	0	0	PRINSEP STREET33	0.00	-0.05	0	0.0	
										33PLNT2	9.26	8.02	214	75.6	
										33ASQT1	7.85	6.47	178	77.2	
										33PLNT1	9.26	8.03	214	75.5	
										33PCIRT1	10.11	7.45	219	80.5	
										33ASQT2	7.85	6.49	178	77.1	
										33MART1	9.69	8.41	224	75.5	
										PRINSEP STREET33	0.00	-0.05	0	0.0	
PRINSEP STREET33	33.000	100.001	0.0	0	0	0	0	0	0	PARK LINE 33	0.00	0.00	0	0.0	
										PARK LINE 33	0.00	0.00	0	0.0	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study Report 2004-05	ETAP PowerStation	Page: 10
Location:	Kolkota ,West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	PARKLANE33		Config.: Normal

PARK LANE _ 33 KV with modified lengths and load

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
AUCKLAND T1	-7.799	-5.845	7.826	6.467	27.0	622.0	95.7	99.7	3.99
AUCKLANDT2	-7.801	-5.855	7.828	6.478	27.1	622.9	95.7	99.7	3.99
MARQUIS T1	-9.600	-7.200	9.664	8.409	63.6	1209.0	93.4	99.7	6.30
PARKCIR T1	-10.000	-6.268	10.056	7.455	56.5	1186.2	93.8	99.5	5.69
PARKLANT1	-9.200	-6.898	9.253	8.023	53.5	1124.3	93.9	100.0	6.11
PARKLANT2	-9.200	-6.902	9.254	8.027	53.6	1124.8	93.9	100.0	6.11
LNC5	-7.826	-6.467	7.851	6.474	25.2	7.2	99.7	100.0	0.33
LNC8	-7.828	-6.478	7.853	6.485	24.7	7.1	99.7	100.0	0.33
LNC9	-9.664	-8.409	9.695	8.408	30.9	-0.9	99.7	100.0	0.30
LNC7	-10.056	-7.455	10.109	7.451	52.1	-3.1	99.5	100.0	0.52
LNC6	-9.254	-8.027	9.256	8.027	2.2	0.6	100.0	100.0	0.03
LNC3	-9.253	-8.023	9.256	8.023	2.5	0.7	100.0	100.0	0.03
LNC1	0.000	-0.053	0.000	0.002	0.0	-51.6	100.0	100.0	0.00
LNC_2	0.000	-0.053	0.000	-0.002	0.0	-55.0	100.0	100.0	0.00
					419.0	5794.2			

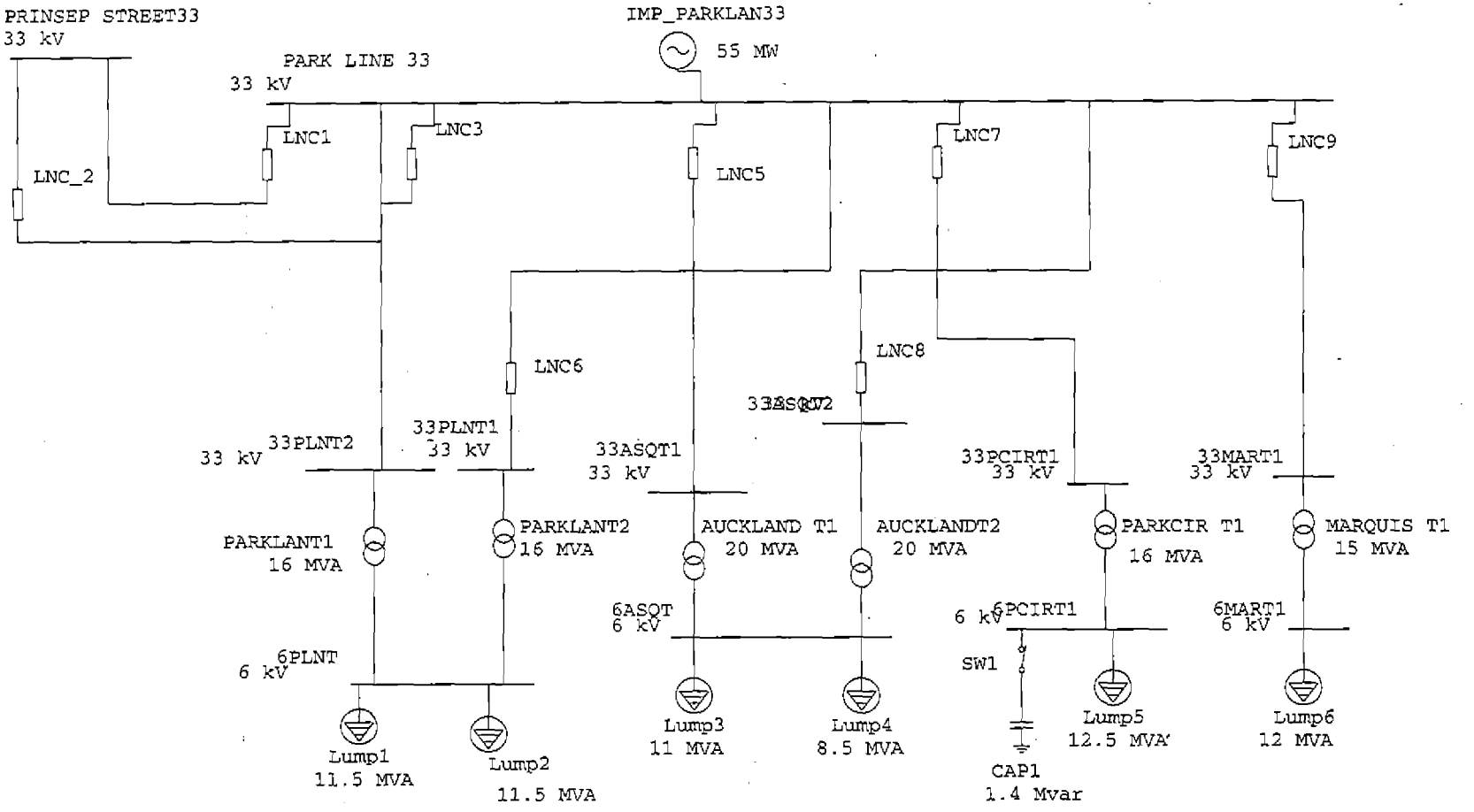
PARK LANE _ 33 KV with modified lengths and load

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	54.019	44.763	70.155	77.00 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	54.019	44.763	70.155	77.00 Lagging
Total Motor Load:	53.600	40.200	67.000	80.00 Lagging
Total Static Load:	0.000	-1.232		
Apparent Losses:	0.419	5.794		
System Mismatch:	0.000	0.000		

Number of Iterations: 2

One-Line Diagram - OLV1



Project:	CESC Loss Study Report	**ETAP PowerStation**	Page: 1
Location:	Kolkota , West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	MAJERHAT33KV		Config.: Normal

Majerhat _33 KV with modified load and lengths

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	17	18

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	9	0	0	10	0	0	19

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	5
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	MAJERHAT33KV
Output Filename:	C:\ETAP 404\PowerStation\MAJERHAT33KV\CESC_MAJ.lf1

Project:	CESC Loss Study Report	ETAP PowerStation		Page:	7
Location:	Kolkota , West Bengal	4.0.4C		Date:	09-21-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF		Revision:	Base
Filename:	MAJERHAT33KV			Config.:	Normal

Majerhat _33 KV with modified load and lengths

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
6ALIT2	6.000	95.046	-3.2	0	0	12.02	6.16	0	0	33 ALIT2	-12.02	-6.16	1367	89.0	
6BAR	6.000	98.874	-2.1	0	0	8.55	4.14	0	0	33BART1	-8.55	-4.14	924	90.0	
6BEHT1	6.000	99.268	-2.4	0	0	9.50	3.12	0	0	33BEHT1	-9.50	-3.12	969	95.0	
6MAHT1	6.000	97.909	-2.7	0	0	9.79	3.87	0	0	33ALIT2	-9.79	-3.87	1034	93.0	
6MAJT	6.000	97.705	-3.2	0	0	19.24	7.62	1.08	0.52	33MAJT1	-10.16	-4.07	1078	92.8	
										33MAJT2	-10.16	-4.07	1078	92.8	
6 MAJT3	6.000	101.435	-3.4	0	0	13.16	3.30	0.14	0.03	33MAJT3	-13.29	-3.33	1300	97.0	
6THAT1	6.000	92.880	-2.0	0	0	13.73	7.15	0	0	33THAT1	-6.86	-3.57	801	88.7	
										33THAT2	-6.87	-3.58	802	88.7	
33 ALIT2	33.000	94.389	-0.1	0	0	0	0	0	0	MAJERHAT 33	-12.07	-7.04	259	86.4	
										6ALIT2	12.07	7.04	259	86.4	-4.000
33ALIT2	33.000	93.965	-0.2	0	0	0	0	0	0	MAJERHAT 33	-9.82	-4.38	200	91.3	
										6MAHT1	9.82	4.38	200	91.3	-6.000
33BART1	33.000	94.916	-0.1	0	0	0	0	0	0	MAJERHAT 33	-8.57	-4.54	178	88.4	
										6BAR	8.57	4.54	178	88.4	-6.000
33BART2	33.000	95.501	0.0	0	0	0	0	0	0	MAJERHAT 33					
33BEHT1	33.000	94.894	-0.1	0	0	0	0	0	0	MAJERHAT 33	-9.52	-3.57	187	93.7	
										6BEHT1	9.52	3.57	187	93.7	-6.000
33MAJT1	33.000	95.484	0.0	0	0	0	0	0	0	MAJERHAT 33	-10.20	-4.77	206	90.6	
										6MAJT	10.20	4.77	206	90.6	-5.000
33MAJT2	33.000	95.484	0.0	0	0	0	0	0	0	MAJERHAT 33	-10.20	-4.77	206	90.6	
										6MAJT	10.20	4.77	206	90.6	-5.000
33MAJT3	33.000	95.192	-0.1	0	0	0	0	0	0	MAJERHAT 33	-13.34	-4.18	256	95.4	
										6 MAJT3	13.34	4.18	256	95.4	-8.000
33THAT1	33.000	94.784	-0.1	0	0	0	0	0	0	MAJERHAT 33	-6.88	-3.87	145	87.1	
										6THAT1	6.88	3.87	145	87.1	
33THAT2	33.000	94.789	-0.1	0	0	0	0	0	0	MAJERHAT 33	-6.88	-3.88	145	87.1	
										6THAT1	6.88	3.88	145	87.1	
* MAJERHAT 33	33.000	95.500	0.0	88.00	40.86	0	0	0	0	33BART1	8.62	4.53	178	88.5	
										33BEHT1	9.58	3.55	187	93.8	
										33ALIT2	9.96	4.36	199	91.6	
										33 ALIT2	12.20	7.07	258	86.5	
										33THAT1	6.93	3.83	144	87.5	
										33MAJT1	10.20	4.77	206	90.6	
										33MAJT2	10.20	4.77	206	90.6	
										33BART2	0.00	-0.05	0	0.0	
										33THAT2	6.93	3.84	145	87.5	
										33MAJT3	13.38	4.20	256	95.4	

Project:	CESC Loss Study Report	**ETAP PowerStation**	Page: 11
Location:	Kolkota , West Bengal	4 0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename.	MAJERHAT33KV		Config.: Normal

Majerhat _33 KV with modified load and lengths

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
ALIPORE T2	-12.024	-6.160	12.071	7.043	47.5	882.7	95.0	94.4	0.66
BART1	-8.550	-4.141	8.572	4.544	21.7	403.3	98.9	94.9	3.96
BEHALAT1	-9.500	-3.122	9.524	3.566	23.8	443.3	99.3	94.9	4.37
MAHESH_T1	-9.793	-3.870	9.820	4.376	27.2	505.3	97.9	94.0	3.94
MAJ T1	-10.162	-4.072	10.200	4.774	37.7	702.0	97.7	95.5	2.22
MAJT2	-10.162	-4.071	10.199	4.773	37.7	701.9	97.7	95.5	2 22
MAJT3	-13.293	-3.331	13.339	4.182	45.7	850.5	101.4	95.2	6 24
THAT1	-6.862	-3.569	6 878	3.872	16.3	303.0	92.9	94.8	1.90
THAT2	-6.866	-3.578	6.882	3.882	16.3	303.5	92.9	94.8	1.91
LNC5	-12.071	-7.043	12.204	7.072	132.3	29.1	94.4	95.5	1.11
LNC4	-9.820	-4.376	9.964	4.356	143.8	-19.7	94.0	95.5	1.54
LNC2	-8.572	-4.544	8.620	4.526	48.3	-17.9	94.9	95.5	0.58
LNC9			0.000	-0.053	0 0	-53.5	95.5	95.5	0.00
LNC3	-9.524	-3.566	9.578	3.551	54.1	-14.5	94.9	95.5	0.61
LNC7	-10 200	-4.774	10.201	4.774	1.5	-0.1	95.5	95.5	0.02
LNC8	-10.199	-4.773	10.201	4.773	1.6	0.3	95.5	95.5	0.02
LNC_1	-13.339	-4.182	13.377	4.198	38.3	15.8	95.2	95.5	0.31
LNC6	-6.878	-3.872	6.926	3.827	48.0	-45.1	94 8	95.5	0.72
LNC10	-6.882	-3.882	6.930	3.837	47.7	-44.7	94.8	95 5	0.71
					789.5	4945.5			

Project:	CESC Loss Study Report	ETAP PowerStation	Page: 14
Location:	Kolkota , West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	MAJERHAT33KV		Config.: Normal

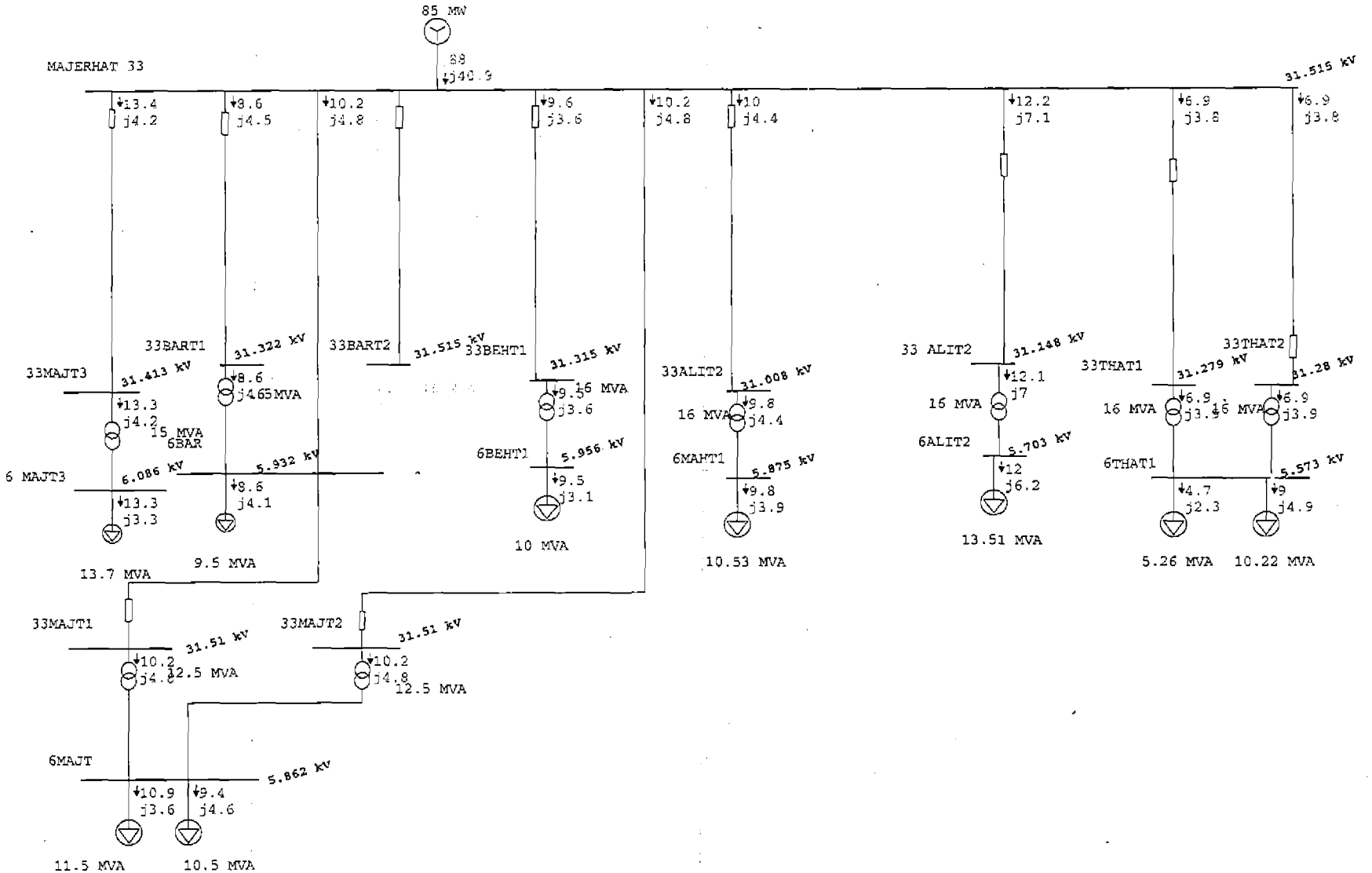
Majerhat _33 KV with modified load and lengths

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	88.000	40.861	97.024	90.70 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	88.000	40.861	97.024	90.70 Lagging
Total Motor Load:	85.992	35.357	92.977	92.49 Lagging
Total Static Load:	1.219	0.559		
Apparent Losses:	0.789	4.945		
System Mismatch:	0.000	0.000		

Number of Iterations: 2

One-Line Diagram - OLV1



Project:	CESC Loss Study Report 2004-05	ETAP PowerStation	Page: 1
Location:	Kolkota , West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	BBDBAG_33		Config.: Normal

BBDBAG 33 KV with modified lengths and loads

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	19	20

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	9	0	0	16	0	0	25

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	BBDBAG_33
Output Filename:	C:\e data\ETAP 404\PowerStation\BBDBAG_33\Untitled.lf1

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 7
Location:	Kolkota , West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	BBDBAG_33		Config.: Normal

BBDBAG 33 KV with modified lengths and loads

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
6BBDT2	6.000	94.074	-2.0	0	0	10.00	7.50	0	0	33BBDT1	-4.88	-3.66	624	80.0	
										33BBDT2	-5.12	-3.84	654	80.0	
6CENT	6.000	94.091	-4.1	0	0	15.07	3.73	0	0	CENT1	-8.12	-1.95	854	97.2	
										CENT2	-6.95	-1.78	733	96.9	
6ELGT2	6.000	94.197	-1.8	0	0	4.20	2.27	0	0	33ELGT2	-4.20	-2.27	487	88.0	
6HSTT	6.000	93.697	-1.9	0	0	8.63	7.61	0	0	33HSTT1	-4.31	-3.80	590	75.0	
										33HSTT2	-4.31	-3.80	590	75.0	
6JACT1	6.000	93.538	-2.7	0	0	6.72	4.16	0	0	33JACT1	-6.72	-4.16	812	85.0	
6STST1	6.000	92.616	-3.2	0	0	8.08	5.00	0	0	33STST1	-8.08	-5.00	987	85.0	
33BBDT1	33.000	96.996	0.0	0	0	0	0	0	0	BBD BAG 33	-4.90	-3.95	113	77.8	
										6BBDT2	4.90	3.95	113	77.8	
33BBDT2	33.000	96.995	0.0	0	0	0	0	0	0	BBD BAG 33	-5.13	-4.14	118	77.8	
										6BBDT2	5.13	4.14	118	77.8	
33ELGT2	33.000	96.009	-0.1	0	0	0	0	0	0	33HAS(L/A)	-4.21	-2.44	88	86.5	
										6ELGT2	4.21	2.44	88	86.5	
33HAS(L/A)	33.000	96.299	-0.1	0	0	0	0	0	0	PRINSEP STREET	-4.22	-2.39	88	87.0	
										33ELGT2	4.22	2.39	88	87.0	
33HSTT1	33.000	96.920	0.0	0	0	0	0	0	0	BBD BAG 33	-4.33	-4.08	107	72.7	
										6HSTT	4.33	4.08	107	72.7	
33HSTT2	33.000	96.918	0.0	0	0	0	0	0	0	BBD BAG 33	-4.33	-4.08	107	72.8	
										6HSTT	4.33	4.08	107	72.8	
33JACT1	33.000	96.808	0.0	0	0	0	0	0	0	BBD BAG 33	-6.74	-4.63	147	82.4	
										6JACT1	6.74	4.63	147	82.4	
33MBOW1	33.000	96.786	0.0	0	0	2.74	1.48	0	0	PRINSEP STREET	-2.74	-1.48	56	88.0	
33STST1	33.000	96.606	0.0	0	0	0	0	0	0	BBD BAG 33	-8.12	-5.68	179	81.9	
										6STST1	8.12	5.68	179	81.9	
*BBD BAG 33	33.000	97.000	0.0	58.09	36.32	0	0	0	0	33JACT1	6.75	4.62	147	82.6	
										33STST1	8.15	5.67	179	82.1	
										33BBDT2	5.13	4.14	118	77.8	
										33HSTT2	4.33	4.07	107	72.9	
										PRINSEP STREET	6.79	2.72	131	92.8	
										PRINSEP STREET	6.83	2.74	132	92.8	
										33HSTT1	4.33	4.07	107	72.9	
										33BBDT1	4.90	3.95	113	77.8	
										PRINSEP STREET	3.88	1.54	75	92.9	
										PRINSEP STREET	7.00	2.80	135	92.8	
CENT1	33.000	96.485	-0.1	0	0	0	0	0	0	PRINSEP STREET	-8.17	-2.57	155	95.4	
										6CENT	8.17	2.57	155	95.4	
CENT2	33.000	96.622	-0.1	0	0	0	0	0	0	PRINSEP STREET	-6.99	-2.32	133	94.9	

Project:	CESC Loss Study Report 2004-05	**ETAP PowerStation**	Page: 8
Location:	Kolkota , West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	BBDBAG_33		Config.: Normal

BBDBAG 33 KV with modified lengths and loads

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
										6CENT	6.99	2.32	133	94.9	
MOW2	33.000	96.794	0.0	0	0	2.28	1.23	0	0	PRINSEP STREET	-2.28	-1.23	46	88.0	
PRINSEP STREET	33.000	96.828	0.0	0	0	0	0	0	0	BBD BAG 33	-6.78	-2.74	132	92.7	
										BBD BAG 33	-6.82	-2.75	132	92.7	
										BBD BAG 33	-3.88	-1.58	75	92.6	
										33MBOW1	2.74	1.47	56	88.2	
										MOW2	2.28	1.22	46	88.2	
										33HAS(L/A)	4.24	2.34	87	87.5	
										BBD BAG 33	-6.99	-2.82	136	92.7	
										CENT2	7.00	2.30	133	95.0	
										CENT1	8.20	2.55	155	95.5	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study Report 2004-05	ETAP PowerStation		Page:	11
Location:	Kolkota , West Bengal	4.0.4C		Date:	09-21-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF		Revision:	Base
Filename:	BBDBAG_33			Config.:	Normal

BBDBAG 33 KV with modified lengths and loads

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
BBDBAG T1	-4.884	-3.664	4.899	3.953	15.2	289.2	94.1	97.0	2.92
BBDT2	-5.116	-3.836	5.132	4.139	15.9	302.8	94.1	97.0	2.92
CENT_T1	-8.125	-1.951	8.173	2.574	47.9	622.7	94.1	96.5	2.39
CENT_T2	-6.947	-1.780	6.989	2.322	41.7	542.1	94.1	96.6	2.53
ELGIN T1	-4.198	-2.266	4.207	2.437	9.0	171.7	94.2	96.0	1.81
HARE T1	-4.312	-3.804	4.327	4.081	14.6	277.4	93.7	96.9	3.22
HARE T2	-4.313	-3.802	4.327	4.080	14.6	277.3	93.7	96.9	3.22
JACSON T1	-6.715	-4.162	6.740	4.629	24.6	467.5	93.5	96.8	3.27
STRAND SOUTH _T1	-8.075	-5.004	8.117	5.684	42.4	679.1	92.6	96.6	3.99
LNC10	-4.899	-3.953	4.899	3.953	0.2	-0.3	97.0	97.0	0.00
LNC3	-5.132	-4.139	5.132	4.139	0.3	-0.4	97.0	97.0	0.01
LNC16	-4.207	-2.437	4.218	2.391	11.8	-46.2	96.0	96.3	0.29
LNC15	-4.218	-2.391	4.240	2.342	21.3	-49.4	96.3	96.8	0.53
LNC9	-4.327	-4.081	4.331	4.072	4.0	-9.8	96.9	97.0	0.08
LNC4	-4.327	-4.080	4.331	4.070	4.0	-10.0	96.9	97.0	0.08
LNC1	-6.740	-4.629	6.753	4.617	12.9	-12.3	96.8	97.0	0.19
LNC13	-2.737	-1.477	2.738	1.465	1.1	-11.9	96.8	96.8	0.04
LNC2	-8.117	-5.684	8.150	5.671	32.3	-12.9	96.6	97.0	0.39
LNC5	6.790	2.721	-6.780	-2.736	10.7	-14.7	97.0	96.8	0.17
LNC7	6.827	2.736	-6.816	-2.751	10.8	-14.6	97.0	96.8	0.17
LNC12	3.883	1.543	-3.877	-1.578	6.1	-35.3	97.0	96.8	0.17
LNC_8	6.996	2.804	-6.985	-2.818	11.0	-13.8	97.0	96.8	0.17
LNC_12	-8.173	-2.574	8.198	2.554	25.9	-20.1	96.5	96.8	0.34
LNC_11	-6.989	-2.322	7.002	2.304	13.2	-17.6	96.6	96.8	0.21
LNC14	-2.279	-1.230	2.280	1.218	0.7	-12.0	96.8	96.8	0.03
					392.4	3348.5			

Project:	CESC Loss Study Report 2004-05	ETAP PowerStation	Page: 14
Location:	Kolkota , West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	BBDBAG_33		Config.: Normal

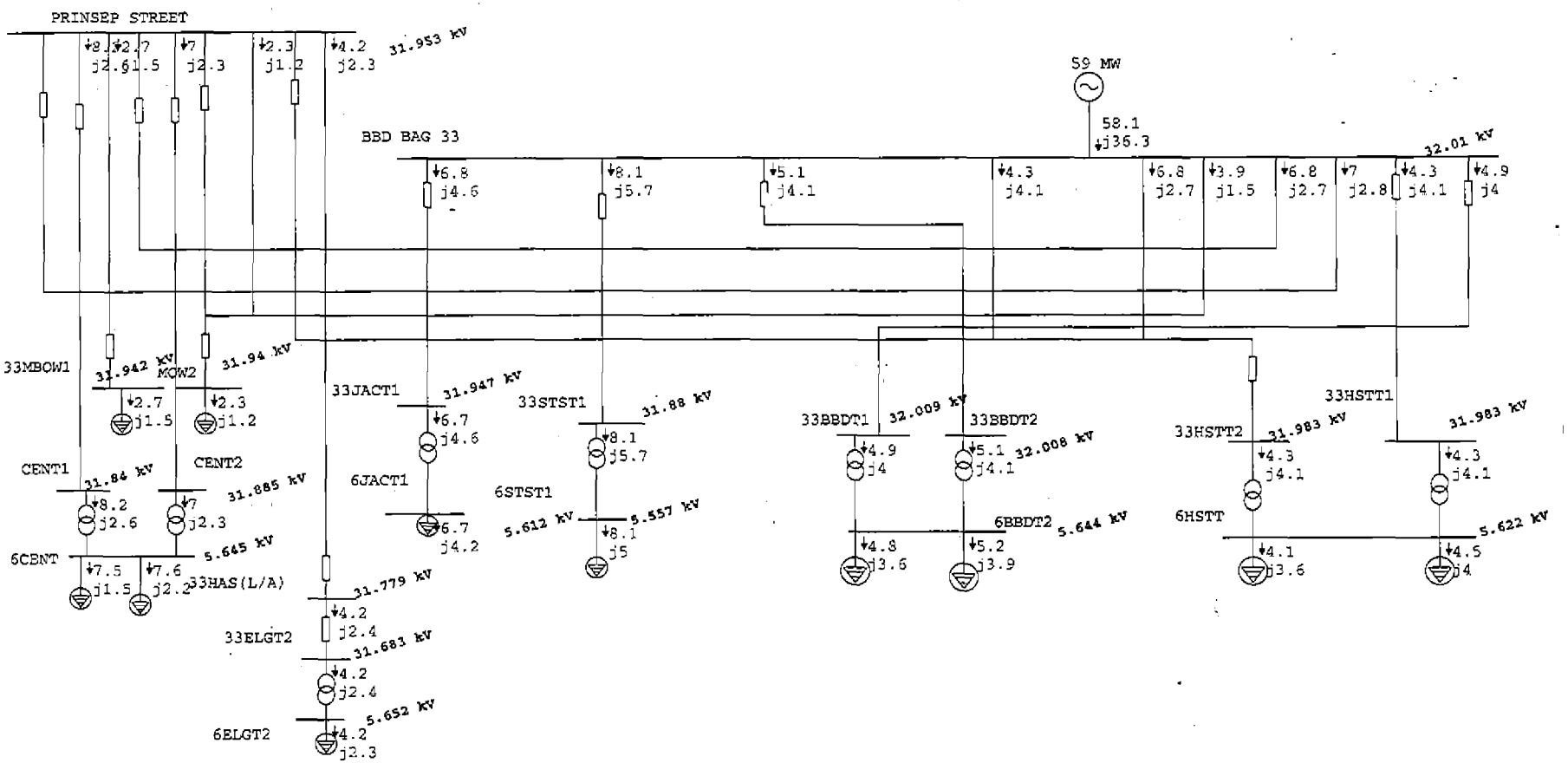
BBDBAG 33 KV with modified lengths and loads

SUMMARY OF TOTAL GENERATION , LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	58.093	36.325	68.514	84.79 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	58.093	36.325	68.514	84.79 Lagging
Total Motor Load:	57.700	32.976	66.459	86.82 Lagging
Total Static Load:	0.000	0.000		
Apparent Losses:	0.392	3.348		
System Mismatch:	0.000	0.000		

Number of Iterations: 2

One-Line Diagram - OLV1



Project:	CESC Loss Study Report	ETAP PowerStation	Page: 1
Location:	Kolkota , West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	33KVBotanicalGarden		Config.: Normal

Botanical Garden _33 KV with modified lengths and loads

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	12	13

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	5	0	0	11	0	0	16

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	English
Project Filename:	33KVBotanicalGarden
Output Filename:	C:\c data\ETAP 404\PowerStation\33KVBotanicalGarden\Untitled.lf1

Project:	CESC Loss Study Report	ETAP PowerStation	Page: 7
Location:	Kolkota , West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	33KVBotanicalGarden		Config.: Normal

Botanical Garden _33 KV with modified lengths and loads

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
Belur 6	6.000	97.640	-1.4	0	0	6.80	5.10	0	0	Blur T3	-6.80	-5.10	837	80.0	
Belur A	33.000	99.642	-0.1	0	0	0	0	0	0	Botanical Grd	-7.45	-5.93	167	78.2	
										Botanical Grd	-7.45	-5.93	167	78.2	
										Bus8	8.08	6.51	182	77.9	
										Bhr T3	6.82	5.35	152	78.6	
Blur T3	33.000	99.624	-0.1	0	0	0	0	0	0	Belur A	-6.81	-5.36	152	78.6	
										Belur 6	6.81	5.36	152	78.6	
* Botanical Grd	33.000	102.000	0.0	40.01	28.72	0	0	0	0	Belur A	7.62	4.33	150	86.9	
										Foreshore	9.32	8.31	214	74.6	
										Foreshore	3.48	2.76	76	78.4	
										Belur A	7.62	4.33	150	86.9	
										Foreshore	3.51	2.79	76	78.3	
										GKW1	3.55	2.52	74	81.6	
										L/AK	4.91	3.67	105	80.1	
Bus4	6.000	96.623	-2.6	0	0	7.50	6.61	0	0	Foreshore	-7.50	-6.61	995	75.0	
Bus5	6.000	96.673	-2.7	0	0	8.63	7.61	0	0	Foreshore	-8.63	-7.61	1144	75.0	
Bus8	33.000	99.089	-0.1	0	0	0	0	0	0	Belur A	-8.04	-6.81	186	76.3	
										Bus10	8.04	6.81	186	76.3	-1.000
Bus10	6.000	94.990	-3.5	0	0	8.00	6.00	0	0	Bus8	-8.00	-6.00	1012	80.0	
Foreshore	33.000	101.453	0.0	0	0	0	0	0	0	Botanical Grd	-9.26	-8.57	217	73.4	
										Botanical Grd	-3.46	-3.55	85	69.8	
										Botanical Grd	-3.49	-3.57	86	69.9	
										Bus5	8.67	8.40	208	71.8	
										Bus4	7.55	7.30	181	71.9	
GKW1	33.000	101.815	0.0	0	0	0	0	0	0	Botanical Grd	-3.54	-2.96	79	76.7	
										L/AK	3.54	2.96	79	76.7	
Kont A	33.000	101.724	0.0	0	0	0	0	0	0	L/AK	-8.44	-7.19	190	76.1	
										Konti 6	8.44	7.19	190	76.1	
Konti 6	6.000	96.328	-3.6	0	0	8.40	6.30	0	0	Kont A	-8.40	-6.30	1048	80.0	
L/AK	33.000	101.758	0.0	0	0	0	0	0	0	Botanical Grd	-4.90	-4.09	109	76.8	
										Kont A	8.44	7.18	190	76.2	
										GKW1	-3.54	-3.09	80	75.3	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study Report	**ETAP PowerStation**	Page: 10
Location:	Kolkota , West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	33KVBotanicalGarden		Config.: Normal

Botanical Garden _33 KV with modified lengths and loads

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
T1	-6.800	-5.100	6.814	5.365	14.2	264.9	97.6	99.6	1.98
Cable1	-7.447	-5.930	7.617	4.329	170.1	-1600.4	99.6	102.0	2.36
Cable6	-7.449	-5.931	7.620	4.332	170.2	-1599.7	99.6	102.0	2.36
Cable16	8.081	6.509	-8.037	-6.814	43.2	-304.8	99.6	99.1	0.55
Cable17	6.815	5.352	-6.814	-5.365	1.2	-12.7	99.6	99.6	0.02
Cable3	9.315	8.314	-9.261	-8.574	54.0	-259.5	102.0	101.5	0.55
Cable4	3.483	2.762	-3.463	-3.550	20.2	-788.4	102.0	101.5	0.55
Cable8	3.512	2.791	-3.492	-3.572	20.4	-781.7	102.0	101.5	0.55
Cable9	3.551	2.517	-3.545	-2.962	6.5	-444.5	102.0	101.8	0.18
Cable11	4.912	3.675	-4.900	-4.087	11.9	-412.6	102.0	101.8	0.24
T10	-7.500	-6.614	7.549	7.298	48.7	683.8	96.6	101.5	4.83
T6	-8.625	-7.607	8.668	8.398	42.5	791.3	96.7	101.5	4.78
T9	8.037	6.814	-8.000	-6.000	37.3	813.7	99.1	95.0	4.10
Cable13	3.545	2.962	-3.543	-3.094	2.1	-132.1	101.8	101.8	0.06
Cable12	-8.441	-7.190	8.443	7.181	2.1	-9.1	101.7	101.8	0.03
T12	8.441	7.190	-8.400	-6.300	40.8	890.2	101.7	96.3	5.40
					685.6	-2901.8			

Project:	CESC Loss Study Report	ETAP PowerStation	Page: 13
Location:	Kolkota , West Bengal	4.0.4C	Date: 09-21-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Manish Shrivastava	Study Case: LF	Revision: Base
Filename:	33KVBotanicalGarden		Config.: Normal

Botanical Garden _33 KV with modified lengths and loads

SUMMARY OF TOTAL GENERATION , LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	40.011	28.719	49.251	81.24 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	40.011	28.719	49.251	81.24 Lagging
Total Motor Load:	39.325	31.621	50.461	77.93 Lagging
Total Static Load:	0.000	0.000		
Apparent Losses:	0.686	-2.902		
System Mismatch.	0.000	0.000		

Number of Iterations: 3

One-Line Diagram - OLV1

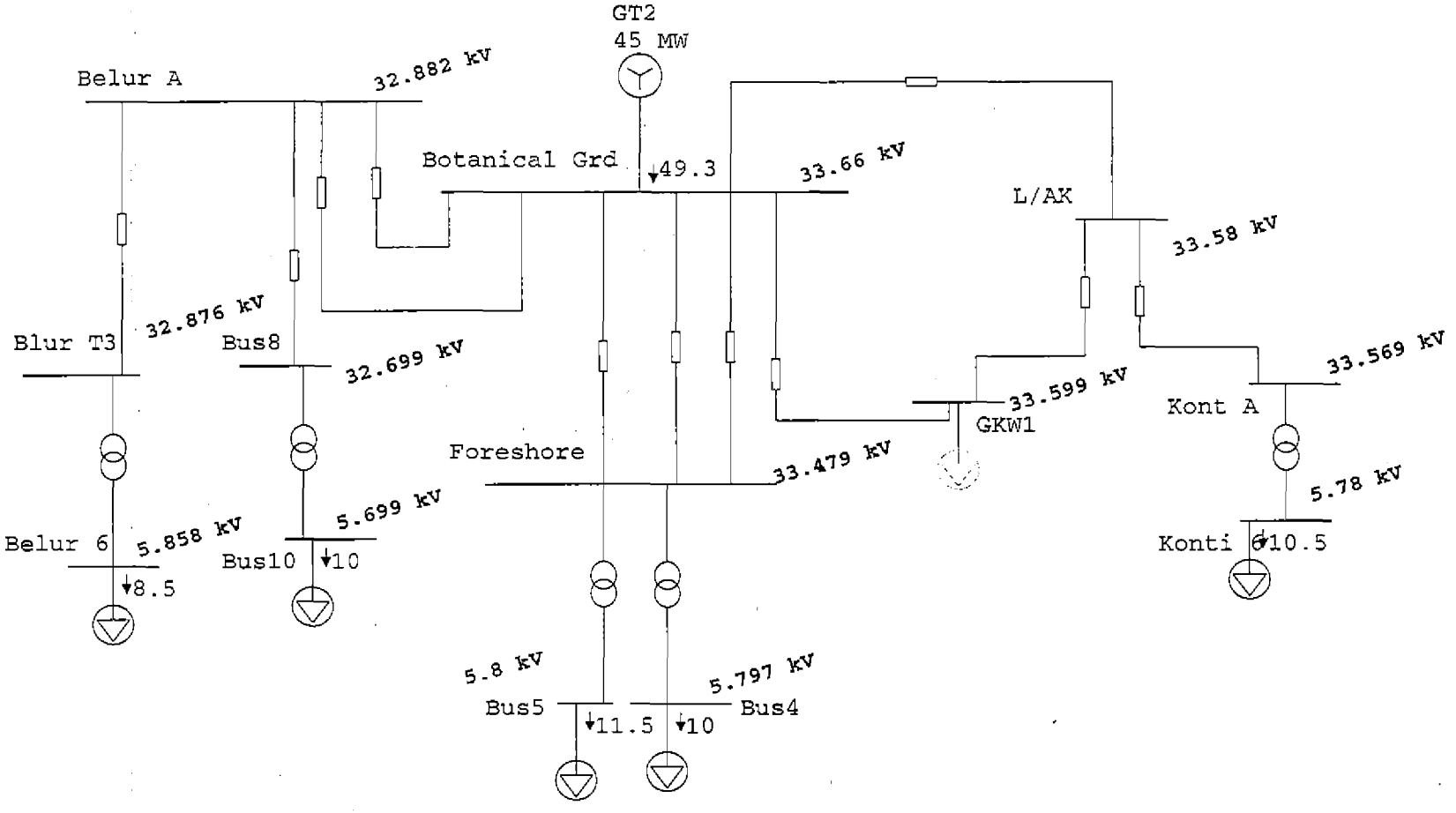


Exhibit 3:

11/6 KV system

Project:	CESC Loss Study (2002-05)	**ETAP PowerStation**	Page: 1
Location:	Kolkota, West Bengal	4.0.4C	Date: 08-05-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	11KV-AKRACOLOT		Config.: Normal

Revised Study with modified l lengths &80% Motor load.

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	6	7

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	2	0	0	4	0	0	6

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename.	11KV-AKRACOLOT
Output Filename:	C:\ETAP 404\PowerStation\11KV-AKRACOLOT\Akra-Col.lf1

Project:	CESC Loss Study (2002-05)	ETAP PowerStation	Page: 7
Location:	Kolkota, West Bengal	4.0.4C	Date: 07-28-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	11KV-AKRACOLOT		Config.: Normal

Revised Study with modified load and lengths

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
Bus9	11.000	99.993	0.0	0	0	0	0	0	0	N2	0.41	0.20	23	89.9	
										N1 _AKRA D/S	-0.41	-0.20	23	89.9	
Bus12	0.400	97.538	-1.8	0	0	0.16	0.08	0.04	0.02	N4_AKRA COLONY O/T	-0.20	-0.10	323	90.0	
LV AKRA SAK COL P/T	0.400	99.738	-1.6	0	0	0.16	0.08	0.04	0.02	N3_AKRA SAK COL P/T	-0.20	-0.10	329	90.0	
*N1 _AKRA D/S	11.000	100.000	0.0	0.41	0.20	0	0	0	0	Bus9	0.41	0.20	23	89.9	
N2	11.000	99.989	0.0	0	0	0	0	0	0	Bus9	-0.41	-0.20	23	89.8	
										N4_AKRA COLONY O/T	0.20	0.10	11	89.7	
										N3_AKRA SAK COL P/T	0.21	0.10	12	89.9	
N3_AKRA SAK COL P/T	11.000	99.915	0.0	0	0	0	0	0	0	N2	-0.21	-0.11	12	88.7	
										LV AKRA SAK COL P/T	0.21	0.11	12	88.7	-2.000
N4_AKRA COLONY O/T	11.000	99.924	0.0	0	0	0	0	0	0	N2	-0.20	-0.10	11	88.6	
										Bus12	0.20	0.10	11	88.6	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study (2002-05)	**ETAP PowerStation**		Page:	10
Location:	Kolkota, West Bengal	4.0.4C		Date:	07-28-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF		Revision:	Base
Filename:	11KV-AKRACOLOT			Config.:	Normal

Revised Study with modified load and lengths

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable4	0.406	0.197	-0.406	-0.199	0.0	-1.3	100.0	100.0	0.00
Cable6	-0.406	-0.197	0.406	0.197	0.0	-0.3	100.0	100.0	0.01
T4	-0.197	-0.095	0.199	0.104	1.7	8.6	97.5	99.9	2.39
T2	-0.205	-0.099	0.207	0.107	1.6	8.1	99.7	99.9	0.18
Cable8	0.199	0.098	-0.199	-0.104	0.2	-6.0	100.0	99.9	0.07
Cable10	0.207	0.101	-0.207	-0.107	0.2	-6.6	100.0	99.9	0.07
					3.7	2.4			

Project:	CESC Loss Study (2002-05)	ETAP PowerStation		Page:	13
Location:	Kolkota, West Bengal	4.0.4C		Date:	08-24-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF		Revision:	Base
Filename:	11KV-AKRACOLOT			Config.:	Normal

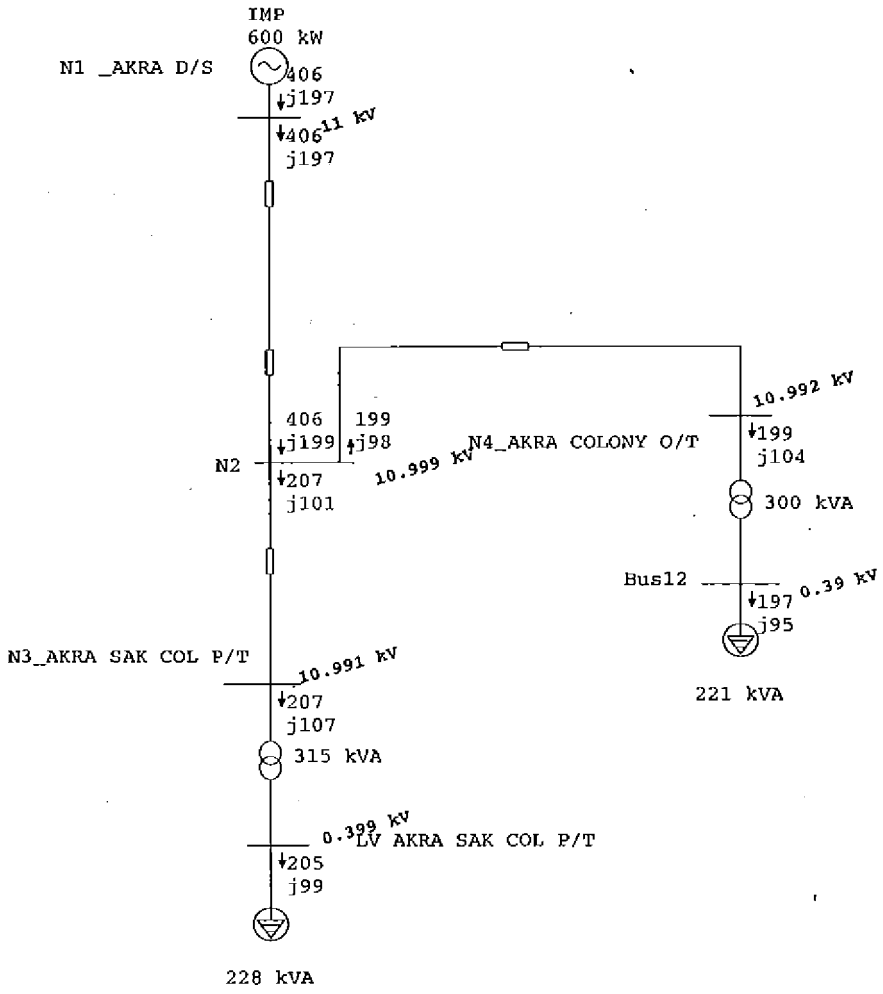
Revised Study with modified l lengths &80% Motor load.

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	0.338	0.296	0.449	75.23 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	0.338	0.296	0.449	75.23 Lagging
Total Motor Load:	0.269	0.238	0.359	75.00 Lagging
Total Static Load:	0.065	0.057		
Apparent Losses:	0.004	0.001		
System Mismatch:	0.000	0.000		

Number of Iterations: 1

One-Line Diagram - OLV1



Project:	CESC Loss Study (2004-05)	**ETAP PowerStation**	Page: 1
Location:	Kolkata, West Bengal.	4.0.4C	Date: 08-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla, TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	11kvRasbehari-Bharatbiscutis		Config.: Normal

Revised Study with modified loads and lengths.

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	11	12

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	1	0	0	10	0	0	11

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	11kvRasbehari-Bharatbiscutis
Output Filename:	C:\ETAP 404\PowerStation\11kvRasbehari-Bharatbiscutis\U1489.lf1

Project:	CESC Loss Study (2004-05)	**ETAP PowerStation**	Page: 2
Location:	Kolkata, West Bengal.	4.0.4C	Date: 08-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla, TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	11kvRasbehari-Bharatbiscutis		Config.: Normal

Revised Study with modified loads and lengths.

BUS Input Data

Bus			Initial Voltage		Generator		Motor Load		Static Load		Mvar Limits	
ID	Type	kV	% Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	Max.	Min.
1 Rashbehari	Swing	11.000	100.0	0.0								
2 B.Biscuts	Load	11.000	100.0	0.0			0.033	0.016	0.022	0.011		
3 Sigma	Load	11.000	100.0	0.0			0.014	0.007	0.009	0.004		
4 Kasba	Load	11.000	100.0	0.0								
5 Duroplast	Load	11.000	100.0	0.0			0.076	0.057	0.051	0.038		
6 AGRO	Load	11.000	100.0	0.0								
7 Asianleather	Load	11.000	100.0	0.0			0.138	0.086	0.092	0.057		
8 DaysMed	Load	11.000	100.0	0.0			0.478	0.245	0.319	0.163		
9 CDMA Ectp	Load	11.000	100.0	0.0			0.086	0.034	0.057	0.023		
10 CDMA pump	Load	11.000	100.0	0.0			0.005	0.003	0.003	0.002		
11 kasba Ind.	Load	11.000	100.0	0.0								
Kasba	Load	0.400	100.0	0.0			0.067	0.050	0.044	0.033		
Total Number of Buses: 12					0.000	0.000	0.897	0.498	0.598	0.332		

Project:	CESC Loss Study (2004-05)	**ETAP PowerStation**		Page:	3
Location:	Kolkata, West Bengal.	4.0.4C		Date:	08-08-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla, TERI, New Delhi.		Study Case: LF	Revision:	Base
Filename:	11kvRasbehari-Bharatbiscuits			Config.:	Normal

Revised Study with modified loads and lengths.

LINE / CABLE Input Data

Line/Cable	Ohms or Mohs / 1000 m per Conductor (Cable) or per Phase (Line)							
ID	Library	Size	Length(m)	#/Phase	T (°C)	R	X	Y
Cable1			500.0	1	75	0.248400	0.081400	0.0002000
Cable3			162.0	1	75	0.248400	0.081400	0.0002000
Cable4			206.0	1	75	0.248400	0.081400	0.0002000
Cable6			174.0	1	75	0.248400	0.081400	0.0002000
Cable7			1193.0	1	75	0.248400	0.081400	0.0002000
Cable8			350.0	1	75	0.248400	0.081400	0.0002000
Cable9			245.0	1	75	0.248400	0.081400	0.0002000
Cable10			108.0	1	75	0.747600	0.081400	0.0001000
Cable13			120.0	1	75	0.747600	0.081400	0.0001000
Cable14			120.0	1	75	0.747600	0.081400	0.0001000

Line / Cable resistances are listed at the specified temperatures.

Project:	CESC Loss Study (2004-05)	**ETAP PowerStation**	Page: 4
Location:	Kolkata, West Bengal.	4.0.4C	Date: 08-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla, TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	11kvRasbehari-Bharatbiscutis		Config.: Normal

Revised Study with modified loads and lengths.

2-WINDING TRANSFORMER Input Data

Transformer	Rating					Z Variation			% Tap Setting		Adjusted	Phase Shift	
ID	MVA	Prim. kV	Sec. kV	% Z	X/R	+ 5%	- 5%	% Tol.	Prim.	Sec.	% Z	Type	Angle
T1	0.315	11.000	0.400	5.200	5.1	5.00	-5.00	0	-1.000	0.400	5.1688	Std Pos. Seq.	0.0

Project:	CESC Loss Study (2004-05)	ETAP PowerStation	Page: 5
Location:	Kolkata, West Bengal.	4.0.4C	Date: 08-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla, TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	11kvRasbehari-Bharatbiscuits		Config.: Normal

Revised Study with modified loads and lengths.

BRANCH CONNECTIONS

CKT/Branch		Connected Bus ID		% Impedance, Pos. Seq., 100 MVAb			
ID	Type	From Bus	To Bus	R	X	Z	Y
T1	2W XFMR	11 kasba Ind.	Kasba	313.82	1600.50	1630.98	
Cable1	Cable	1 Rashbehari	2 B.Biscuts	10.26	3.36	10.80	0.0121000
Cable3	Cable	2 B.Biscuts	3 Sigma	3.33	1.09	3.50	0.0039204
Cable4	Cable	7 Asianleather	8 DaysMed	4.23	1.39	4.45	0.0049852
Cable6	Cable	8 DaysMed	9 CDMA Ectp	3.57	1.17	3.76	0.0042108
Cable7	Cable	9 CDMA Ectp	10 CDMA pump	24.49	8.03	25.77	0.0288706
Cable8	Cable	2 B.Biscuts	6 AGRO	7.19	2.35	7.56	0.0084700
Cable9	Cable	6 AGRO	7 Asianleather	5.03	1.65	5.29	0.0059290
Cable10	Cable	3 Sigma	4 Kasba	6.67	0.73	6.71	0.0013068
Cable13	Cable	4 Kasba	11 kasba Ind.	7.41	0.81	7.46	0.0014520
Cable14	Cable	11 kasba Ind.	5 Duroplast	7.41	0.81	7.46	0.0014520

Project:	CESC Loss Study (2004-05)	**ETAP PowerStation**		Page:	6
Location:	Kolkata, West Bengal.	4.0.4C		Date:	08-08-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla, TERI, New Delhi.		Study Case: LF	Revision:	Base
Filename:	11kvRasbchari-Bharatbiscuits			Config.:	Normal

Revised Study with modified loads and lengths.

EQUIPMENT CABLE Input Data

Equipment Cable	Equipment		ohms / 1000 m per Conductor								O/L Heater
ID	ID	Type	Library	Size	L(m)	#/ph	T (°C)	R	X	Y	R (ohm)

Project:	CESC Loss Study (2004-05)	**ETAP PowerStation**	Page: 7
Location:	Kolkata, West Bengal.	4.0.4C	Date: 08-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla, TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	11kvRasbehari-Bharatbiscutis		Config.: Normal

Revised Study with modified loads and lengths.

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1 Rashbehari	11.000	100.000	0.0	1.50	0.76	0	0	0	0	2 B.Biscuts	1.50	0.76	88	89.2	
2 B.Biscuts	11.000	99.821	0.0	0	0	0.03	0.02	0.02	0.01	1 Rashbehari	-1.49	-0.77	88	88.9	
										3 Sigma	0.26	0.18	16	81.7	
										6 AGRO	1.18	0.56	68	90.3	
3 Sigma	11.000	99.810	0.0	0	0	0.01	0.01	0.01	0.00	2 B.Biscuts	-0.26	-0.19	16	81.1	
										4 Kasba	0.24	0.18	15	80.3	
4 Kasba	11.000	99.793	0.0	0	0	0	0	0	0	3 Sigma	-0.24	-0.18	15	80.0	
										11 kasba Ind.	0.24	0.18	15	80.0	
5 Duroplast	11.000	99.763	0.0	0	0	0.08	0.06	0.05	0.04	11 kasba Ind.	-0.13	-0.10	8	80.0	
6 AGRO	11.000	99.723	0.0	0	0	0	0	0	0	2 B.Biscuts	-1.18	-0.57	68	90.1	
										7 Asianleather	1.18	0.57	68	90.1	
7 Asianleather	11.000	99.654	0.0	0	0	0.14	0.09	0.09	0.06	8 DaysMed	0.95	0.43	54	91.0	
										6 AGRO	-1.18	-0.57	68	89.9	
8 DaysMed	11.000	99.608	0.0	0	0	0.48	0.25	0.32	0.16	7 Asianleather	-0.95	-0.44	54	90.8	
										9 CDMA Ectp	0.15	0.03	8	98.2	
9 CDMA Ectp	11.000	99.602	0.0	0	0	0.09	0.03	0.06	0.02	8 DaysMed	-0.15	-0.03	8	97.7	
										10 CDMA pump	0.01	-0.02	1	-32.1	
10 CDMA pump	11.000	99.601	0.0	0	0	0.00	0.00	0.00	0.00	9 CDMA Ectp	-0.01	-0.01	0	84.0	
11 kasba Ind.	11.000	99.773	0.0	0	0	0	0	0	0	4 Kasba	-0.24	-0.18	15	79.8	
										5 Duroplast	0.13	0.09	8	80.4	
										Kasba	0.11	0.09	7	79.1	-1.000
Kasba	0.400	99.463	-0.8	0	0	0.07	0.05	0.04	0.03	11 kasba Ind.	-0.11	-0.08	200	80.0	0.400

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study (2004-05)	ETAP PowerStation	Page: 8
Location:	Kolkata, West Bengal.	4.0.4C	Date: 08-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla, TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	11kvRasbehari-Bharatbiscutis		Config.: Normal

Revised Study with modified loads and lengths.

BUS LOADING Summary Report

Bus			Bus Total Load					
ID	kV	Rated Amp	MW	Mvar	MVA	% PF	Amp	% Loading
1 Rashbehari	11.000		1.497	0.760	1.678	89.2	88.09	
2 B.Biscuts	11.000		1.494	0.771	1.681	88.9	88.38	
3 Sigma	11.000		0.261	0.188	0.322	81.1	16.91	
4 Kasba	11.000		0.238	0.179	0.298	80.0	15.66	
5 Duroplast	11.000		0.127	0.095	0.159	80.0	8.35	
6 AGRO	11.000		1.177	0.568	1.307	90.1	68.77	
7 Asianleather	11.000		1.176	0.574	1.308	89.9	68.91	
8 DaysMed	11.000		0.946	0.436	1.041	90.8	54.87	
9 CDMA Ectp	11.000		0.151	0.056	0.161	93.7	8.48	
10 CDMA pump	11.000		0.008	0.005	0.009	84.0	0.50	
11 kasba Ind.	11.000		0.238	0.180	0.299	79.8	15.71	
Kasba	0.400		0.111	0.083	0.138	80.0	200.85	

Project:	CESC Loss Study (2004-05)	ETAP PowerStation		Page:	9
Location:	Kolkata, West Bengal.	4.0.4C		Date:	08-08-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla, TERI, New Delhi.		Study Case: LF	Revision:	Base
Filename:	11kvRasbehari-Bharatbiscutis			Config.:	Normal

Revised Study with modified loads and lengths.

BRANCH LOADING Summary Report

CKT / Branch		Cable & Reactor			Transformer				
						Loading (input)		Loading (output)	
ID	Type	Ampacity (Amp)	Loading Amp	%	Capability (MVA)	MVA	%	MVA	%
T1	Transformer				0.315	0.141	44.7	0.138	43.9

* Indicates a branch with operating load exceeding the branch capability

Project:	CESC Loss Study (2004-05)	ETAP PowerStation	Page: 10
Location:	Kolkata, West Bengal.	4.0.4C	Date: 08-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla, TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	11kvRasbehari-Bharatbiscutis		Config.: Normal

Revised Study with modified loads and lengths.

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	1.497	0.760	-1.494	-0.771	2.9	-11.1	100.0	99.8	0.18
Cable3	0.261	0.184	-0.261	-0.188	0.0	-3.9	99.8	99.8	0.01
Cable8	1.178	0.560	-1.177	-0.568	1.2	-8.0	99.8	99.7	0.10
Cable10	0.238	0.177	-0.238	-0.179	0.1	-1.3	99.8	99.8	0.02
Cable13	0.238	0.179	-0.238	-0.180	0.1	-1.4	99.8	99.8	0.02
Cable14	-0.127	-0.095	0.127	0.094	0.0	-1.4	99.8	99.8	0.01
Cable9	1.177	0.568	-1.176	-0.574	0.9	-5.6	99.7	99.7	0.07
Cable4	0.946	0.431	-0.946	-0.436	0.5	-4.8	99.7	99.6	0.05
Cable6	0.151	0.029	-0.151	-0.033	0.0	-4.2	99.6	99.6	0.01
Cable7	0.008	-0.024	-0.008	-0.005	0.0	-28.6	99.6	99.6	0.00
T1	0.111	0.086	-0.111	-0.083	0.6	3.1	99.8	99.5	0.31
					6.3	-67.3			

Project:	CESC Loss Study (2004-05)	**ETAP PowerStation**		Page:	11
Location:	Kolkata, West Bengal.	4.0.4C		Date:	08-08-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla, TERI, New Delhi.		Study Case: LF	Revision:	Base
Filename:	11kvRasbehari-Bharatbiscutis			Config.:	Normal

Revised Study with modified loads and lengths.

EQUIPMENT CABLE LOSSES Summary Report

Equipment Cable	Connected	Losses		% Voltage		Vd % Drop	Vst % for
ID	Load Type	kW	kvar	Bus	Load	in Vmag	Motor

Project:	CESC Loss Study (2004-05)	ETAP PowerStation		Page:	12
Location:	Kolkata, West Bengal.	4.0.4C		Date:	08-08-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla, TERI, New Delhi.	Study Case: LF		Revision:	Base
Filename:	11kvRasbehari-Bharatbiscutis			Config.:	Normal

Revised Study with modified loads and lengths.

Alert Summary Report

	% Alert Settings	
	Critical	Marginal
Loading		
Bus		
Cable		
Reactor		
Generator		
Transformer		
Protective Device		
Bus Voltage		
OverVoltage	105.0	102.0
UnderVoltage	95.0	98.0
Generator Excitation		
OverExcited (Q Max.)		
UnderExcited (Q Min.)		

Report

ID	Device Type	Rating	Unit	Calculated	%Mag.	Condition

Project:	CESC Loss Study (2004-05)	ETAP PowerStation	Page: 13
Location:	Kolkata, West Bengal.	4.0.4C	Date: 08-24-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla, TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	11kvRasbehari-Bharatbiscuits		Config.: Normal

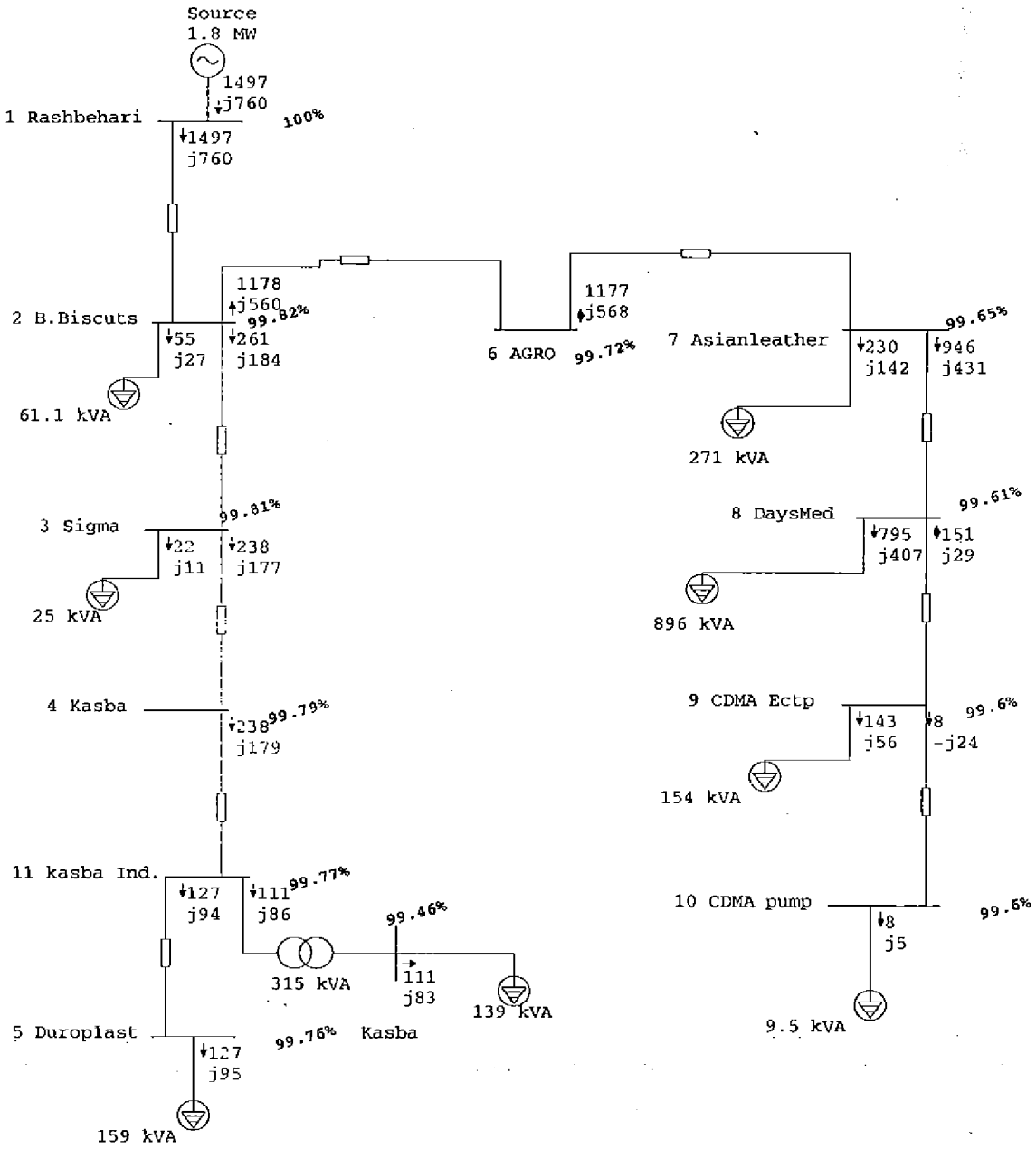
Revised Study with modified loads and lengths.

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	1.235	1.120	1.667	74.09 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	1.235	1.120	1.667	74.09 Lagging
Total Motor Load:	0.740	0.714	1.028	71.93 Lagging
Total Static Load:	0.490	0.473		
Apparent Losses:	0.006	-0.067		
System Mismatch:	0.000	0.000		

Number of Iterations: 2

One-Line Diagram - OLV1



Project:	CESCLossStudy (2004-05)	**ETAP PowerStation**	Page: 1
Location:	KOLKOTA, West Bengal	4.0.4C	Date: 08-05-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	11Jadavpur-RajpurOT		Config.: Normal

Modified with increased length & 80% motor load.

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	42	43

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	14	0	0	29	0	0	43

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	11Jadavpur-RajpurOT
Output Filename:	C:\ETAP 404\PowerStation\11Jadavpur-RajpurOT\Jadavpur.lf1

Project:	CESCLossStudy (2004-05)	ETAP PowerStation		Page:	9
Location:	KOLKOTA, West Bengal	4.0.4C		Date:	08-05-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF		Revision:	Base
Filename:	11Jadavpur-RajpurOT			Config.:	Normal

Modified with increased length & 80% motor load.

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1Jad	11.000	95.000	0.0	3.16	1.67	0	0	0	0	2Rajp	3.16	1.67	197	88.4	
2Rajp	11.000	94.428	0.0	0	0	0	0	0	0	1Jad	-3.14	-1.69	198	88.1	
										3Rajpw	2.88	1.51	180	88.6	
										Bus25	0.27	0.18	17	82.6	
3Rajpw	11.000	94.424	0.0	0	0	0	0	0	0	2Rajp	-2.88	-1.51	180	88.6	
										5Gbagan	2.72	1.43	170	88.5	
										N3N16	0.16	0.08	9	89.7	
4Cpark	11.000	94.387	0.0	0	0	0	0	0	0	N3N16	-0.16	-0.08	9	88.8	
										Bus17	0.16	0.08	9	88.8	
5Gbagan	11.000	93.887	0.0	0	0	0	0	0	0	3Rajpw	-2.70	-1.45	171	88.1	
										Bus8	2.70	1.45	171	88.1	
6Gbaganp/t	11.000	93.467	0.0	0	0	0	0	0	0	7	0.63	0.26	38	92.6	
										6Gbagant/h	-0.83	-0.36	50	91.6	
										Bus21	0.20	0.11	12	88.5	
6Gbagant/h	11.000	93.787	0.0	0	0	0	0	0	0	6Gbaganp/t	0.83	0.36	50	91.9	
										13 GB t/h	0.44	0.26	28	86.4	
										Bus8	-1.27	-0.62	79	90.1	
7	11.000	93.466	0.0	0	0	0	0	0	0	8N	0.63	0.26	38	92.6	
										6Gbaganp/t	-0.63	-0.26	38	92.6	
8N	11.000	93.402	0.0	0	0	0	0	0	0	10Rpally	0.37	0.19	23	89.1	
										9Gbagan o/t	0.26	0.07	15	96.4	
										7	-0.63	-0.26	38	92.5	
9Gbagan o/t	11.000	93.402	0.0	0	0	0	0	0	0	8N	-0.26	-0.07	15	96.4	
										19BJ (s)	0.06	-0.03	3	-87.6	
										Bus20	0.20	0.11	12	88.4	
10Rpally	11.000	93.349	0.1	0	0	0	0	0	0	11GB(S)	0.20	0.10	12	89.0	
										8N	-0.37	-0.19	23	88.9	
										Bus26	0.16	0.09	10	88.7	
11GB(S)	11.000	93.305	0.1	0	0	0	0	0	0	10Rpally	-0.20	-0.11	12	88.4	
										Bus22	0.20	0.11	12	88.4	
12 GBO/T	11.000	93.712	0.0	0	0	0	0	0	0	Bus9	-1.43	-0.84	92	86.1	
										Bus10	1.15	0.69	75	85.7	
										Bus30	0.27	0.15	17	87.9	
13 GB t/h	11.000	93.786	0.0	0	0	0	0	0	0	6Gbagant/h	-0.44	-0.26	28	86.3	
										15RGO/T	0.24	0.13	15	88.8	
										Bus29	0.20	0.13	13	83.2	
14N	11.000	93.618	0.0	0	0	0	0	0	0	Bus10	-1.15	-0.70	75	85.5	
										Bus12	0.93	0.55	60	86.1	
										Bus28	0.22	0.15	14	83.0	
15RGO/T	11.000	93.714	0.0	0	0	0	0	0	0	13 GB t/h	-0.24	-0.13	15	88.1	

Project: CESCLossStudy (2004-05)
Location: KOLKOTA, West Bengal
Contract: 2004ER26
Engineer: M.S.Bhalla
Filename: 11Jadavpur-RajpurOT

ETAP PowerStation
4.0.4C

Study Case: LF

Page: 10
Date: 08-05-2005
SN: TATAENERGY
Revision: Base
Config.: Normal

Modified with increased length & 80% motor load.

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
										Bus24	0.24	0.13	15	88.1	
16GM	11.000	93.584	0.0	0	0	0	0	0	0	Bus12	-0.93	-0.55	60	86.0	
										Bus13	0.71	0.41	46	86 9	
										Bus27	0.22	0.15	14	83.0	
17VS	11.000	93.511	0.0	0	0	0	0	0	0	Bus15	-0.71	-0.41	46	86.5	
										Bus16	0.47	0.28	30	85.7	
										Bus23	0.24	0.13	15	88.1	
18 bjatim	11.000	93.407	0.0	0	0	0	0	0	0	Bus14	-0.47	-0.30	31	84.3	
										19BJ (s)	0.21	0.16	15	79.7	
										Bus19	0 26	0.14	16	88.0	
19BJ (s)	11.000	93.371	0.0	0	0	0	0	0	0	18 bjatim	-0.21	-0.17	15	77 4	
										9Gbagan o/t	-0.06	0.03	3	-92.4	
										Bus18	0.27	0.15	17	87.8	
Bus8	11.000	93.790	0.0	0	0	0	0	0	0	5Gbagan	-2.70	-1.45	171	88.1	
										Bus9	1.43	0.84	92	86.3	
										6Gbaganu/h	1.27	0.62	79	90.1	
Bus9	11.000	93.735	0.0	0	0	0	0	0	0	Bus8	-1.43	-0 84	92	86.2	
										12 GBO/T	1.43	0 84	92	86.2	
Bus10	11.000	93.648	0.0	0	0	0	0	0	0	12 GBO/T	-1.15	-0.70	75	85.6	
										14N	1.15	0.70	75	85.6	
Bus12	11.000	93.610	0.0	0	0	0	0	0	0	14N	-0.93	-0.55	60	86.1	
										16GM	0.93	0.55	60	86.1	
Bus13	11.000	93.577	0.0	0	0	0	0	0	0	16GM	-0.71	-0.41	46	86.8	
										Bus15	0 71	0.41	46	86.8	
Bus14	11.000	93.425	0.0	0	0	0	0	0	0	Bus16	-0.47	-0.30	31	84.4	
										18 bjatim	0.47	0.30	31	84.4	
Bus15	11.000	93.542	0.0	0	0	0	0	0	0	17VS	0.71	0.41	46	86.6	
										Bus13	-0.71	-0.41	46	86.6	
Bus16	11.000	93.496	0.0	0	0	0	0	0	0	17VS	-0.47	-0.29	30	85.4	
										Bus14	0.47	0.29	30	85.4	
Bus17	0.400	92.479	-1.5	0	0	0.13	0.06	0.03	0.01	4Cpark	-0.16	-0.08	272	90 0	
Bus18	0.400	89.958	-2.7	0	0	0.22	0.11	0.05	0.02	19BJ (s)	-0.27	-0.13	481	90 0	
Bus19	0.400	90.237	-2.5	0	0	0.21	0.10	0.04	0 02	18 bjatim	-0.25	-0.12	448	90.0	
Bus20	0.400	90.935	-1.9	0	0	0.16	0.08	0.03	0.02	9Gbagan o/t	-0.20	-0.10	350	90.0	
Bus21	0.400	91.002	-1.9	0	0	0.16	0.08	0.03	0.02	6Gbaganp/t	-0.20	-0.10	350	90.0	
Bus22	0.400	90.837	-1.9	0	0	0.16	0.08	0.03	0.02	11GB(S)	-0 20	-0.10	351	90.0	
Bus23	0.400	90 492	-2.4	0	0	0.20	0.10	0.04	0.02	17VS	-0.24	-0.12	427	90.0	
Bus24	0 400	90.700	-2.4	0	0	0.20	0.10	0.04	0.02	15RGO/T	-0.24	-0.12	426	90.0	
Bus25	0 400	90.523	-2.5	0	0	0.22	0.13	0.04	0.03	2Rajp	-0.26	-0.16	490	85 0	
Bus26	0 400	91.338	-1.6	0	0	0.14	0.07	0.03	0.01	10Rpally	-0.16	-0.08	287	90 0	
Bus27	0.400	90.360	-2.1	0	0	0.18	0.11	0.04	0.02	16GM	-0.22	-0.13	406	85.0	

Project:	CESCLossStudy (2004-05)	**ETAP PowerStation**	Page: 11
Location:	KOLKOTA, West Bengal	4.0.4C	Date: 08-05-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	11Jadavpur-RajpurOT		Config.: Normal

Modified with increased length & 80% motor load.

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
Bus28	0.400	90.396	-2.1	0	0	0.18	0.11	0.04	0.02	14N	-0.22	-0.13	406	85.0	
Bus29	0.400	90.892	-1.9	0	0	0.18	0.11	0.02	0.01	13 GB t/h	-0.20	-0.12	365	85.0	
Bus30	0.400	90.320	-2.7	0	0	0.22	0.11	0.05	0.02	12 GBO/T	-0.27	-0.13	478	90.0	
N3N16	11.000	94.424	0.0	0	0	0	0	0	0	4Cpark	0.16	0.08	9	89.6	
										3Rajpw	-0.16	-0.08	9	89.6	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESCLossStudy (2004-05)	ETAP PowerStation		Page:	15
Location:	KOLKOTA, West Bengal	4.0.4C		Date:	08-05-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF		Revision:	Base
Filename:	11Jadavpur-RajpurOT			Config.:	Normal

Modified with increased length & 80% motor load.

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	3.161	1.673	-3.143	-1.689	18.5	-16.2	95.0	94.4	0.57
Cable3	2.878	1.508	-2.878	-1.508	0.1	-0.1	94.4	94.4	0.00
T13	0.265	0.181	-0.261	-0.162	3.7	18.7	94.4	90.5	3.91
Cable5	2.719	1.430	-2.704	-1.450	15.0	-20.3	94.4	93.9	0.54
Cable7	0.159	0.078	-0.159	-0.078	0.0	-0.3	94.4	94.4	0.00
Cable6	-0.158	-0.082	0.159	0.078	0.1	-3.5	94.4	94.4	0.04
T8	0.158	0.082	-0.157	-0.076	1.1	5.8	94.4	92.5	1.91
Cable8	2.704	1.450	-2.701	-1.451	3.0	-0.4	93.9	93.8	0.10
Cable34	0.628	0.257	-0.628	-0.257	0.0	0.0	93.5	93.5	0.00
Cable35	-0.829	-0.363	0.832	0.357	3.2	-5.5	93.5	93.8	0.32
T15	0.201	0.106	-0.199	-0.096	1.9	9.6	93.5	91.0	2.47
Cable36	0.442	0.258	-0.442	-0.258	0.0	-0.3	93.8	93.8	0.00
Cable39	-1.274	-0.615	1.274	0.615	0.0	-0.2	93.8	93.8	0.00
Cable33	0.628	0.257	-0.628	-0.258	0.5	-1.5	93.5	93.4	0.06
Cable30	0.366	0.186	-0.366	-0.188	0.2	-2.1	93.4	93.3	0.05
Cable31	0.262	0.072	-0.262	-0.072	0.0	0.0	93.4	93.4	0.00
Cable32	0.061	-0.034	-0.061	0.025	0.0	-8.5	93.4	93.4	0.03
T18	0.201	0.106	-0.199	-0.096	1.9	9.6	93.4	90.9	2.47
Cable29	0.201	0.103	-0.201	-0.106	0.1	-3.3	93.3	93.3	0.04
T19	0.165	0.086	-0.164	-0.079	1.3	6.4	93.3	91.3	2.01
T20	0.201	0.106	-0.199	-0.096	1.9	9.6	93.3	90.8	2.47
Cable11	-1.425	-0.840	1.426	0.838	0.4	-1.7	93.7	93.7	0.02
Cable13	1.152	0.692	-1.151	-0.696	0.9	-4.2	93.7	93.6	0.06
T24	0.273	0.148	-0.270	-0.131	3.5	17.8	93.7	90.3	3.39
Cable38	0.244	0.127	-0.244	-0.131	0.2	-4.4	93.8	93.7	0.07
T14	0.198	0.132	-0.196	-0.121	2.0	10.4	93.8	90.9	2.89
Cable15	-1.151	-0.697	1.151	0.696	0.4	-0.9	93.6	93.6	0.03
Cable18	0.932	0.550	-0.932	-0.551	0.1	-0.9	93.6	93.6	0.01
T23	0.219	0.147	-0.216	-0.134	2.5	12.8	93.6	90.4	3.22
T11	0.244	0.131	-0.241	-0.117	2.8	14.2	93.7	90.7	3.01
Cable20	-0.932	-0.553	0.932	0.551	0.3	-2.2	93.6	93.6	0.03
Cable22	0.713	0.406	-0.713	-0.407	0.1	-1.0	93.6	93.6	0.01
T17	0.219	0.147	-0.216	-0.134	2.5	12.8	93.6	90.4	3.22
Cable16	-0.712	-0.413	0.713	0.411	0.3	-1.7	93.5	93.5	0.03
Cable24	0.469	0.282	-0.468	-0.285	0.1	-3.5	93.5	93.5	0.01
T21	0.244	0.131	-0.241	-0.117	2.8	14.2	93.5	90.5	3.02
Cable26	-0.468	-0.299	0.468	0.298	0.1	-1.5	93.4	93.4	0.02
Cable28	0.213	0.161	-0.213	-0.174	0.1	-12.8	93.4	93.4	0.04
T4	0.255	0.138	-0.252	-0.122	3.1	15.6	93.4	90.2	3.17
T3	0.274	0.149	-0.270	-0.131	3.5	18.0	93.4	90.0	3.41
Cable9	1.427	0.836	-1.426	-0.838	0.9	-2.8	93.8	93.7	0.05
Cable23	0.713	0.407	-0.713	-0.411	0.3	-3.9	93.6	93.5	0.04
Cable25	-0.468	-0.298	0.468	0.285	0.4	-12.1	93.4	93.5	0.07
					79.8	59.7			

Project:	CESCLossStudy (2004-05)	ETAP PowerStation		Page:	18
Location:	KOLKOTA, West Bengal	4.0.4C		Date:	08-24-2005
Contract:	2004ER26			SN:	TATABNERGY
Engineer:	M.S.Bhalla		Study Case: LF	Revision:	Base
Filename:	I:\Jadavpur-RajpurOT			Config.:	Normal

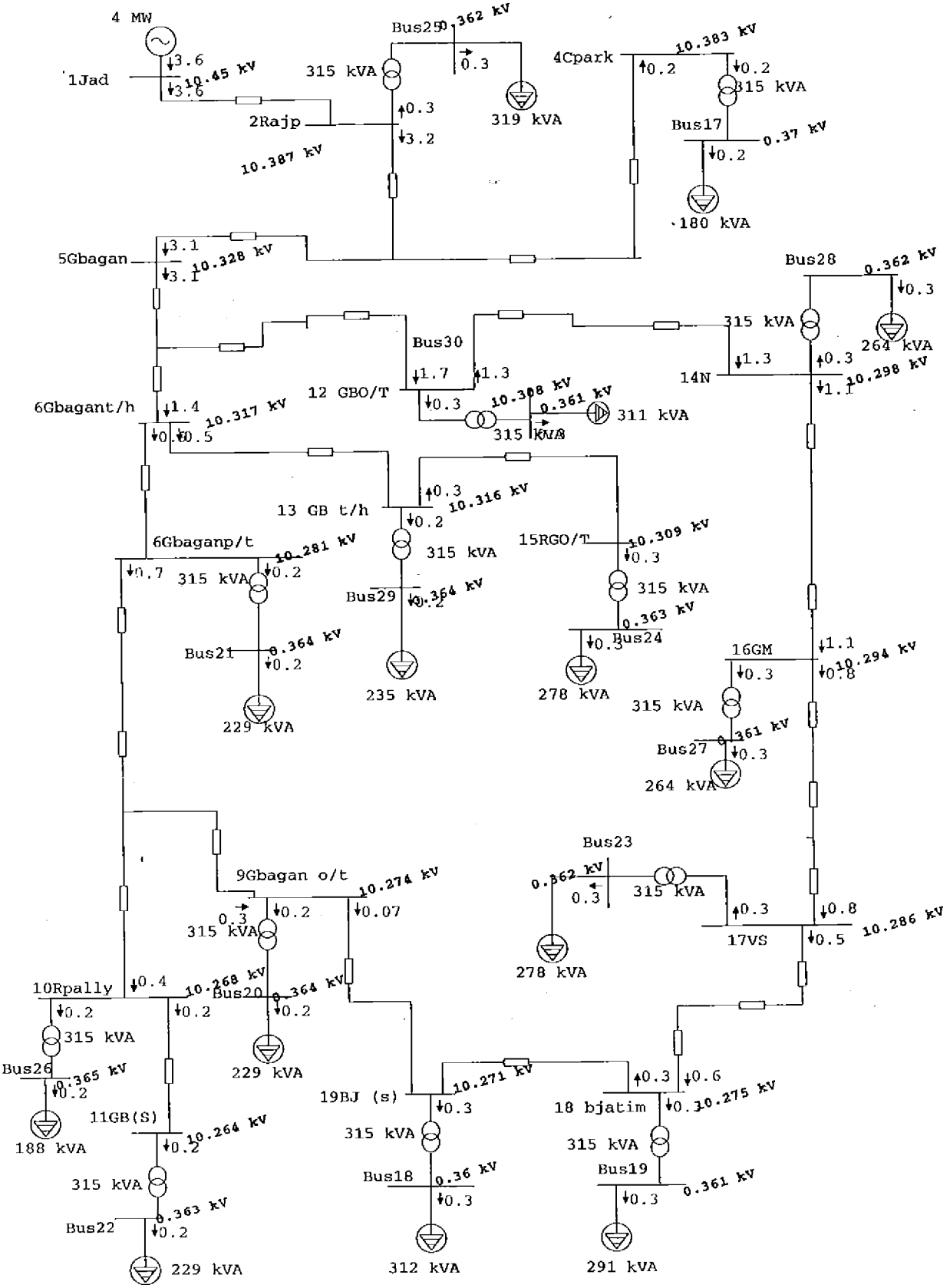
Modified with increased length & 80% motor load.

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	2.962	1.999	3.573	82.90 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	2.962	1.999	3.573	82.90 Lagging
Total Motor Load:	2.407	1.619	2.901	82.97 Lagging
Total Static Load:	0.475	0.319		
Apparent Losses:	0.080	0.061		
System Mismatch:	0.000	0.000		

Number of Iterations: 3

One-Line Diagram - OLV1



Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 1
Location:	Kolkota, West Bengal	4.0.4C	Date: 05-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla,TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kvAlipore-Bhabnani		Config.: Normal

6 KV Alipore D/S - Bhabhani Developers/ RMI Hospital With modifiedlengths &80% motor load

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	14	15

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	1	0	0	13	0	0	14

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6kvAlipore-Bhabnani
Output Filename:	C:\ETAP 404\PowerStation\6kvAlipore-Bhabnani\6Alipore.lf1

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 7
Location:	Kolkata,West Bengal	4.0.4C	Date: 07-25-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kVAlipore-Bhabhani-RMI		Config.: Normal

6kV Alipore - Bhabhani Developers-RMI (Modified with revised loads & cable lengths)

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1Alipore	6.000	101.000	0.0	4.09	2.49	0	0	0	0	2 Bhabhani	1.13	0.67	124	86.2	
										9 RMI	2.96	1.82	331	85.2	
2 Bhabhani	6.000	100.649	0.0	0	0	0.15	0.08	0.04	0.02	1Alipore	-1.13	-0.67	125	86.0	
										3 Piya Majumder	0.94	0.56	105	85.8	
3 Piya Majumder	6.000	100.331	0.0	0	0	0.07	0.04	0.02	0.01	2 Bhabhani	-0.94	-0.57	105	85.6	
										8 Shawalace	0.08	0.04	8	90.7	
										4 P&T	0.77	0.48	87	85.2	
4 P&T	6.000	100.180	0.0	0	0	0.10	0.05	0.02	0.01	3 Piya Majumder	-0.77	-0.48	87	85.0	
										5 Ganga HS	0.65	0.42	74	84.1	
5 Ganga HS	6.000	99.934	0.0	0	0	0.10	0.07	0.03	0.02	4 P&T	-0.65	-0.42	74	83.7	
										6 Jhansi	0.52	0.34	59	83.7	
6 Jhansi	6.000	99.860	0.0	0	0	0.26	0.20	0.07	0.05	5 Ganga HS	-0.52	-0.34	59	83.5	
										7 Majeriat	0.19	0.09	20	89.4	
7 Majeriat	6.000	99.829	0.0	0	0	0	0	0	0	6 Jhansi	-0.19	-0.10	20	88.9	
										Bus3	0.19	0.10	20	88.9	-2.000
8 Shawalace	6.000	100.312	0.0	0	0	0.07	0.03	0.02	0.01	3 Piya Majumder	-0.08	-0.04	8	89.0	
9 RMI	6.000	98.725	0.0	0	0	0	0	0	0	1Alipore	-2.90	-1.80	332	85.0	
										10 Mlt.Hosp.	2.90	1.80	332	85.0	
10 Mlt.Hosp.	6.000	98.716	0.0	0	0	1.25	0.77	0.30	0.19	9 RMI	-2.90	-1.80	332	85.0	
										Bus2	1.34	0.83	154	85.0	
11 Kothari	6.000	98.305	0.0	0	0	0.64	0.38	0.15	0.09	Bus2	-1.34	-0.83	154	84.9	
										Bus4	0.55	0.37	64	83.2	
12 Garrison	6.000	98.180	0.0	0	0	0.44	0.30	0.11	0.07	Bus4	-0.55	-0.37	64	83.0	
Bus2	6.000	98.437	0.0	0	0	0	0	0	0	10 Mlt.Hosp.	-1.34	-0.83	154	84.9	
										11 Kothari	1.34	0.83	154	84.9	
Bus3	0.400	99.890	-1.4	0	0	0.15	0.07	0.04	0.02	7 Majeriat	-0.19	-0.09	300	90.0	
Bus4	6.000	98.251	0.0	0	0	0	0	0	0	11 Kothari	-0.55	-0.37	64	83.1	
										12 Garrison	0.55	0.37	64	83.1	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**		Page:	10
Location:	Kolkata,West Bengal	4.0.4C		Date:	07-25-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF		Revision:	Base
Filename:	6kVAlipore-Bhabhani-RMI			Config.:	Normal

6kV Alipore - Bhabhani Developers-RMI (Modified with revised loads & cable lengths)

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	
Cable1	1.129	0.666	-1.125	-0.663	3.9	-2.5	101.0	100.6	0.35
Cable2	2.963	1.824	-2.896	-1.795	67.1	28.9	101.0	98.7	2.28
Cable8	0.943	0.565	-0.940	-0.568	3.0	-3.4	100.6	100.3	0.32
Cable9	0.083	0.039	-0.083	-0.042	0.0	-3.9	100.3	100.3	0.02
Cable10	0.774	0.476	-0.773	-0.478	1.2	-2.3	100.3	100.2	0.15
Cable11	0.649	0.418	-0.647	-0.423	1.6	-4.7	100.2	99.9	0.25
Cable12	0.517	0.339	-0.516	-0.340	0.4	-1.9	99.9	99.9	0.07
Cable13	0.189	0.095	-0.188	-0.097	0.1	-2.6	99.9	99.8	0.03
T1	0.188	0.097	-0.187	-0.091	1.4	6.5	99.8	99.9	0.06
Cable4	2.896	1.795	-2.896	-1.795	0.3	0.1	98.7	98.7	0.01
Cable5	1.343	0.833	-1.339	-0.834	3.9	-0.5	98.7	98.4	0.28
Cable6	-1.337	-0.834	1.339	0.834	1.9	-0.2	98.3	98.4	0.13
Cable14	0.548	0.365	-0.548	-0.366	0.3	-1.1	98.3	98.3	0.05
Cable15	-0.547	-0.368	0.548	0.366	0.4	-1.2	98.2	98.3	0.07
					85.5	11.3			

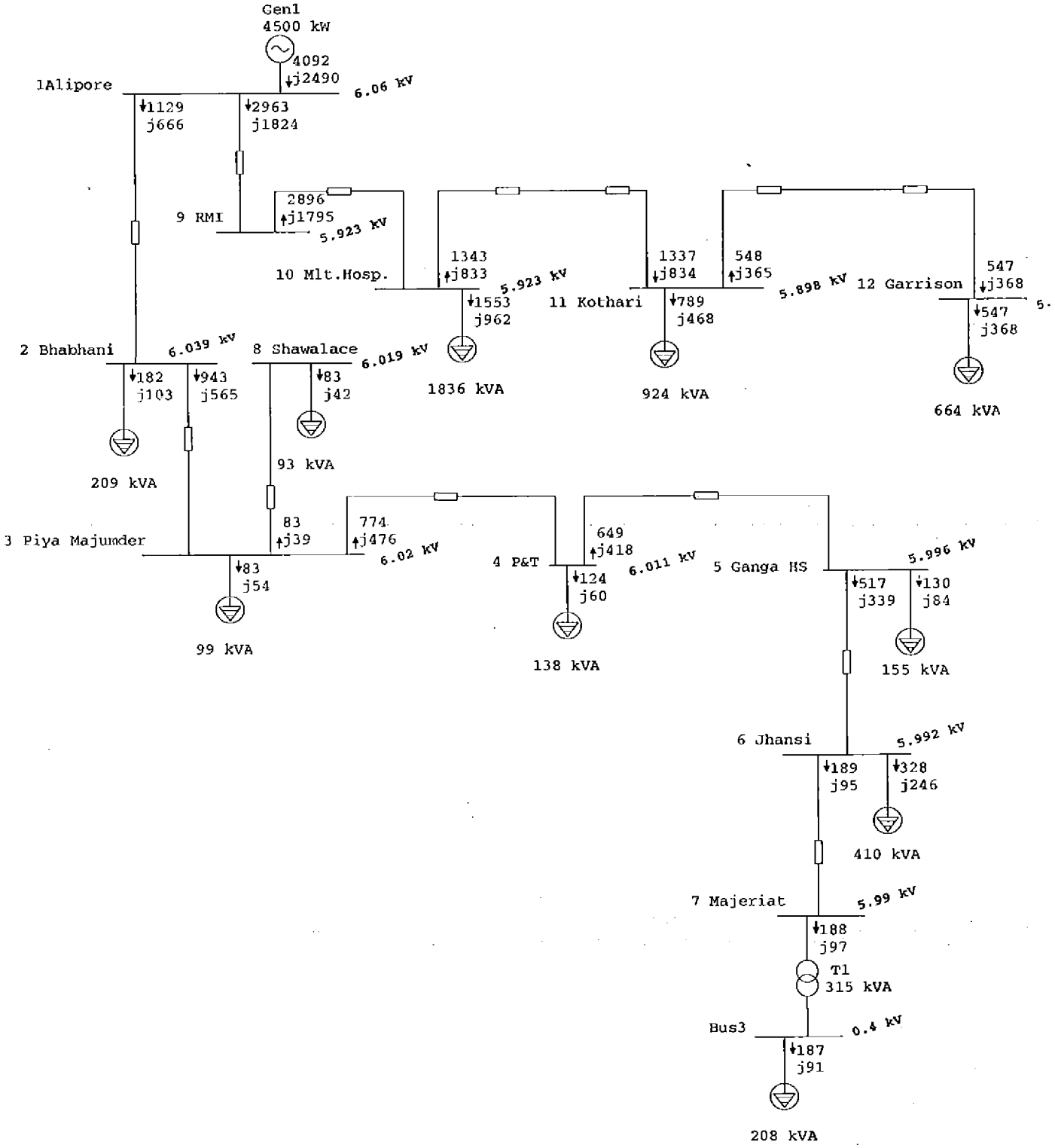
Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 13
Location:	Kolkola, West Bengal	4.0.4C	Date: 22-09-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla,TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kvAlipore-Bhabnani		Config.: Normal

6 KV Alipore D/S - Bhabhani Developers/ RMI Hospital With modifiedlengths &80% motor load

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	3.859	2.839	4.791	80.55 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	3.859	2.839	4.791	80.55 Lagging
Total Motor Load:	3.029	2.276	3.789	79.94 Lagging
Total Static Load:	0.717	0.539		
Apparent Losses:	0.113	0.024		
System Mismatch:	0.000	0.000		

Number of Iterations: 3


Gen1
4500 kW
4092
j2490
1Alipore
6.06 kV
1129
j666
2963
j1824
9 RMI
2896
j1795
5.923 kV
10 Mlt.Hosp.
1343
j833
5.923 kV
1553
j962
1836 kVA
11 Kothari
1337
j834
789
j468
924 kVA
548
j365
5.898 kV
12 Garrison
547
j368
547
j368
664 kVA
2 Bhabhani
6.039 kV
182
j103
943
j565
209 kVA
8 Shawalace
6.019 kV
83
j42
93 kVA
3 Piya Majumder
83
j39
774
j476
6.02 kV
83
j54
99 kVA
4 P&T
649
j418
6.011 kV
124
j60
138 kVA
5 Ganga HS
5.996 kV
517
j339
130
j84
155 kVA
6 Jhansi
5.992 kV
189
j95
328
j246
410 kVA
7 Majeriat
5.99 kV
188
j97
T1
315 kVA
Bus3
0.4 kV
187
j91
208 kVA

Project:	CESC Loss Study(2004-05)	ETAP PowerStation	Page: 1
Location:	Kolkata, West Bengal.	4.0.4C	Date: 08-23-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla,TERI,New Delhi.	Study Case: LF	Revision: Base
Filename:	6kvAmherst-Rajabazar		Config.: normal

Modified with increased length and 80% Motor Load

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	17	18

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	2	0	0	15	0	0	17

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	60.00
Unit System:	Metric
Project Filename:	6kvAmherst-Rajabazar
Output Filename:	C:\ETAP 404\PowerStation\6kvAmherst-Rajabazar\Untitled.lf1

Project:	CESC Loss Study(2004-05)	ETAP PowerStation	Page: 7
Location:	Kolkata, West Bengal.	4.0.4C	Date: 08-23-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla,TERI,New Delhi.	Study Case: LF	Revision: Base
Filename:	6kvAmherst-Rajabazar		Config.: normal

Modified with increased length and 80% Motor Load

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1Amherst st	6.000	90.000	0.0	2.56	1.93	0	0	0	0	Bus11	1.59	1.31	219	77.2	
										9Three Way	0.97	0.63	123	84.0	
2AMHERST ST1	6.000	89.692	0.1	0	0	0	0	0	0	3AMHERST ST2	1.36	1.13	189	76.9	
										Bus13	-1.58	-1.31	219	77.1	
										Bus8	0.22	0.18	30	78.1	-5.000
3AMHERST ST2	6.000	89.677	0.1	0	0	0	0	0	0	2AMHERST ST1	-1.36	-1.13	189	76.9	
										Bus17	1.14	0.95	159	76.7	
										Amherst	0.22	0.18	30	77.9	-2.000
4Science College	6.000	87.960	0.5	0	0	0.55	0.48	0.11	0.09	Bus17	-1.11	-0.95	159	76.1	
										5Node	0.10	0.07	13	83.2	
										7Node	0.35	0.20	50	76.1	
5Node	6.000	87.861	0.5	0	0	0	0	0	0	4Science College	-0.10	-0.07	13	82.2	
										Bus23	0.10	0.07	13	82.2	
6HOSPITAL	6.000	87.847	0.5	0	0	0.09	0.06	0.02	0.01	Bus23	-0.10	-0.07	13	82.0	
7Node	6.000	87.931	0.5	0	0	0	0	0	0	8Bose Inst.	0.35	0.30	50	76.1	
										4Science College	-0.35	-0.30	50	76.1	
8Bose Inst.	6.000	87.844	0.5	0	0	0.29	0.25	0.06	0.05	7Node	-0.35	-0.30	50	76.0	
9Three Way	6.000	89.482	0.0	0	0	0	0	0	0	1Amherst st	-0.96	-0.63	123	83.8	
										12Rajabazar	0.53	0.34	67	84.0	
										Bus19	0.43	0.29	55	83.4	
11Oriental Gas	6.000	89.283	0.0	0	0	0.36	0.24	0.07	0.05	Bus19	-0.43	-0.29	56	83.0	
12Rajabazar	6.000	89.477	0.0	0	0	0.44	0.29	0.09	0.06	9Three Way	-0.53	-0.34	67	84.0	
Amherst	0.400	87.915	-1.9	0	0	0.18	0.14	0.04	0.03	3AMHERST ST2	-0.22	-0.16	445	80.0	
Bus8	0.400	91.085	-1.7	0	0	0.18	0.14	0.04	0.03	2AMHERST ST1	-0.22	-0.16	434	80.0	
Bus11	6.000	89.966	0.0	0	0	0	0	0	0	1Amherst st	-1.59	-1.31	219	77.2	
										Bus13	1.59	1.31	219	77.2	
Bus13	6.000	89.889	0.0	0	0	0	0	0	0	Bus11	-1.59	-1.31	219	77.2	
										2AMHERST ST1	1.59	1.31	219	77.2	
Bus17	6.000	87.978	0.5	0	0	0	0	0	0	4Science College	1.11	0.95	159	76.1	
										3AMHERST ST2	-1.11	-0.95	159	76.1	
Bus19	6.000	89.292	0.0	0	0	0	0	0	0	11Oriental Gas	0.43	0.29	56	83.0	
										9Three Way	-0.43	-0.29	56	83.0	
Bus23	6.000	87.848	0.5	0	0	0	0	0	0	6HOSPITAL	0.10	0.07	13	82.1	
										5Node	-0.10	-0.07	13	82.1	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study(2004-05)	ETAP PowerStation		Page:	10
Location:	Kolkata, West Bengal.	4.0.4C		Date:	08-23-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S. Bhalla,TERI,New Delhi.	Study Case: LF		Revision:	Base
Filename:	6kvAmherst-Rajabazar			Config.:	normal

Modified with increased length and 80% Motor Load

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	1.587	1.308	-1.587	-1.308	0.7	0.2	90.0	90.0	0.03
Cable10	0.969	0.626	-0.963	-0.628	5.7	-2.3	90.0	89.5	0.52
Cable3	1.358	1.129	-1.358	-1.129	0.3	0.0	89.7	89.7	0.01
Cable16	-1.581	-1.306	1.585	1.307	4.5	1.2	89.7	89.9	0.20
T3	0.222	0.177	-0.219	-0.165	2.7	12.8	89.7	91.1	1.39
Cable18	1.138	0.952	-1.110	-0.946	28.3	5.8	89.7	88.0	1.70
T1	0.220	0.177	-0.217	-0.163	3.0	14.2	89.7	87.9	1.76
Cable4	-1.110	-0.946	1.110	0.946	0.3	0.0	88.0	88.0	0.02
Cable5	0.104	0.069	-0.104	-0.072	0.1	-2.8	88.0	87.9	0.10
Cable8	0.351	0.299	-0.351	-0.299	0.2	-0.1	88.0	87.9	0.03
Cable22	0.104	0.072	-0.104	-0.072	0.0	-0.4	87.9	87.8	0.01
Cable6	-0.104	-0.073	0.104	0.072	0.0	-0.2	87.8	87.8	0.00
Cable7	0.351	0.299	-0.350	-0.300	0.5	-0.2	87.9	87.8	0.09
Cable11	0.531	0.343	-0.531	-0.343	0.0	-0.1	89.5	89.5	0.00
Cable20	0.433	0.286	-0.432	-0.290	0.9	-4.1	89.5	89.3	0.19
Cable13	-0.432	-0.290	0.432	0.290	0.0	-0.2	89.3	89.3	0.01
Cable14	1.587	1.308	-1.585	-1.307	1.5	0.4	90.0	89.9	0.08
					48.9	24.5			

Project:	CESC Loss Study(2004-05)	ETAP PowerStation	Page: 13
Location:	Kolkata, West Bengal.	4.0.4C	Date: 08-23-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S. Bhalla,TERI,New Delhi.	Study Case: LF	Revision: Base
Filename:	6kvAmherst-Rajabazar		Config.: normal

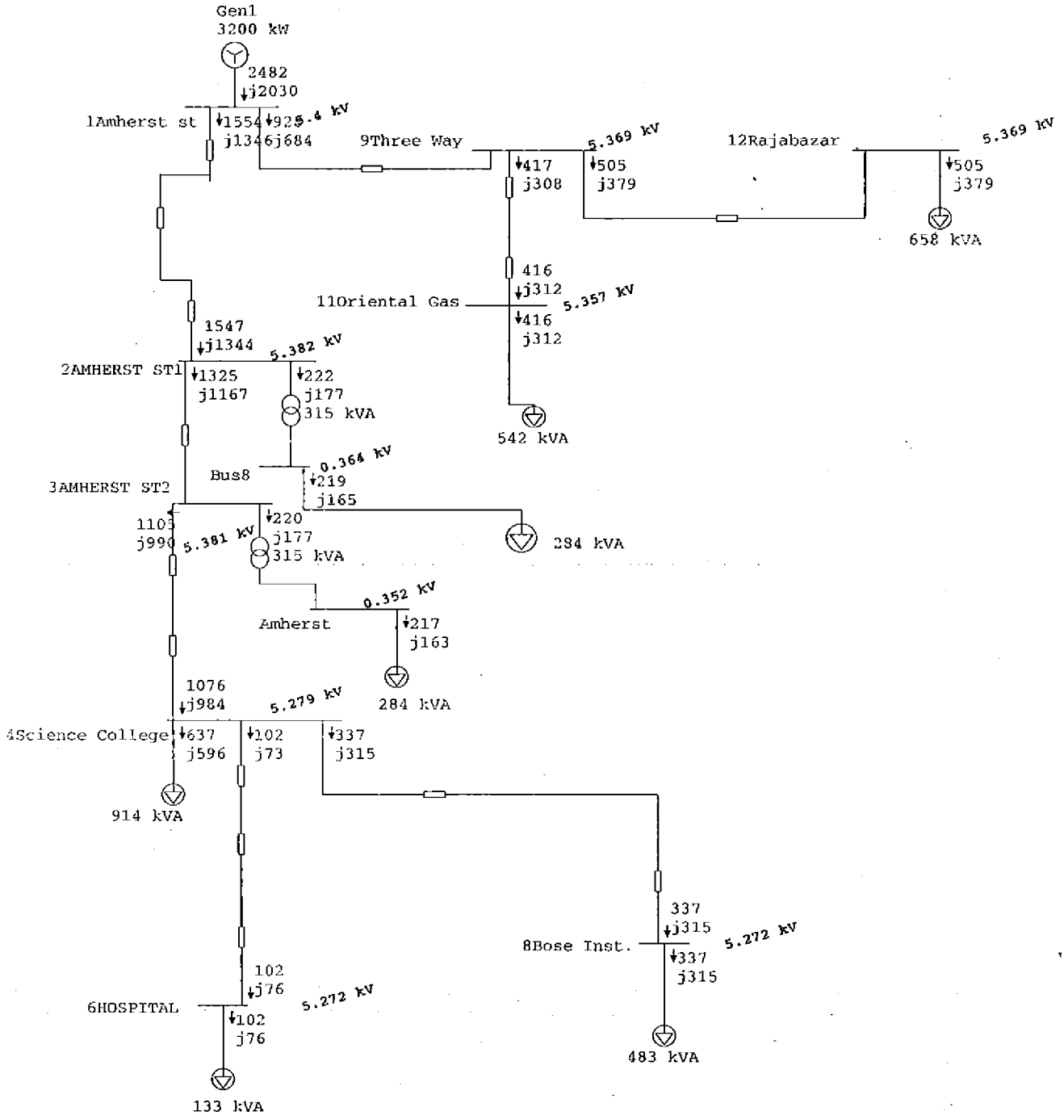
Modified with increased length and 80% Motor Load

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	2.482	2.030	3.207	77.40 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	2.482	2.030	3.207	77.40 Lagging
Total Motor Load:	2.032	1.676	2.635	77.15 Lagging
Total Static Load:	0.400	0.330		
Apparent Losses:	0.049	0.024		
System Mismatch:	0.000	0.000		

Number of Iterations: 3

One-Line Diagram - OLV1



Project:	CESC Loss Study Report(2004-05	**ETAP PowerStation**	Page: 1
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth,TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	6KV-BHATPARA		Config.: Normal

6kV Bhatpura Feeder (Modified with revised motor loads (80%) & cable lengths)

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	4	5

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	0	0	0	4	0	0	4

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6KV-BHATPARA
Output Filename:	C:\ETAP 404\PowerStation\6KV-BHATPARA\6-bhtpr.lf1

Project:	CESC Loss Study Report(2004-05	**ETAP PowerStation**	Page: 6
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth,TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	6KV-BHATPARA		Config.: Normal

6kV Bhatpura Feeder (Modified with revised motor loads (80%) & cable lengths)

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
*BHTPR-N1	6.000	100.000	0.0	1.90	0.96	0	0	0	0	NODE-1	1.90	0.96	204	89.3	
N.I.CABLE-N2	6.000	98.055	-0.2	0	0	1.24	0.60	0.30	0.14	NODE-2	-1.87	-0.95	205	89.2	
										N.P.TUBES-N3	0.33	0.20	37	85.3	
N.P.TUBES-N3	6.000	97.990	-0.2	0	0	0.26	0.16	0.06	0.04	N.I.CABLE-N2	-0.33	-0.20	37	85.0	
NODE-1	6.000	98.339	0.0	0	0	0	0	0	0	BHTPR-N1	-1.87	-0.95	205	89.1	
										NODE-2	1.87	0.95	205	89.1	
NODE-2	6.000	98.214	0.0	0	0	0	0	0	0	NODE-1	-1.87	-0.95	205	89.1	
										N.I.CABLE-N2	1.87	0.95	205	89.1	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study Report(2004-05	ETAP PowerStation	Page: 9
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth,TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	6KV-BHATPARA		Config.: Normal

6kV Bhatpnra Feeder (Modified with revised motor loads (80%) & cable lengths)

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	1.902	0.958	-1.871	-0.952	30.9	5.3	100.0	98.3	1.66
Cable3	-1.868	-0.947	1.869	0.952	0.9	5.2	98.1	98.2	0.16
Cable4	0.328	0.201	-0.328	-0.203	0.2	-2.4	98.1	98.0	0.06
Cable2	1.871	0.952	-1.869	-0.952	2.4	0.3	98.3	98.2	0.13
					34.5	8.5			

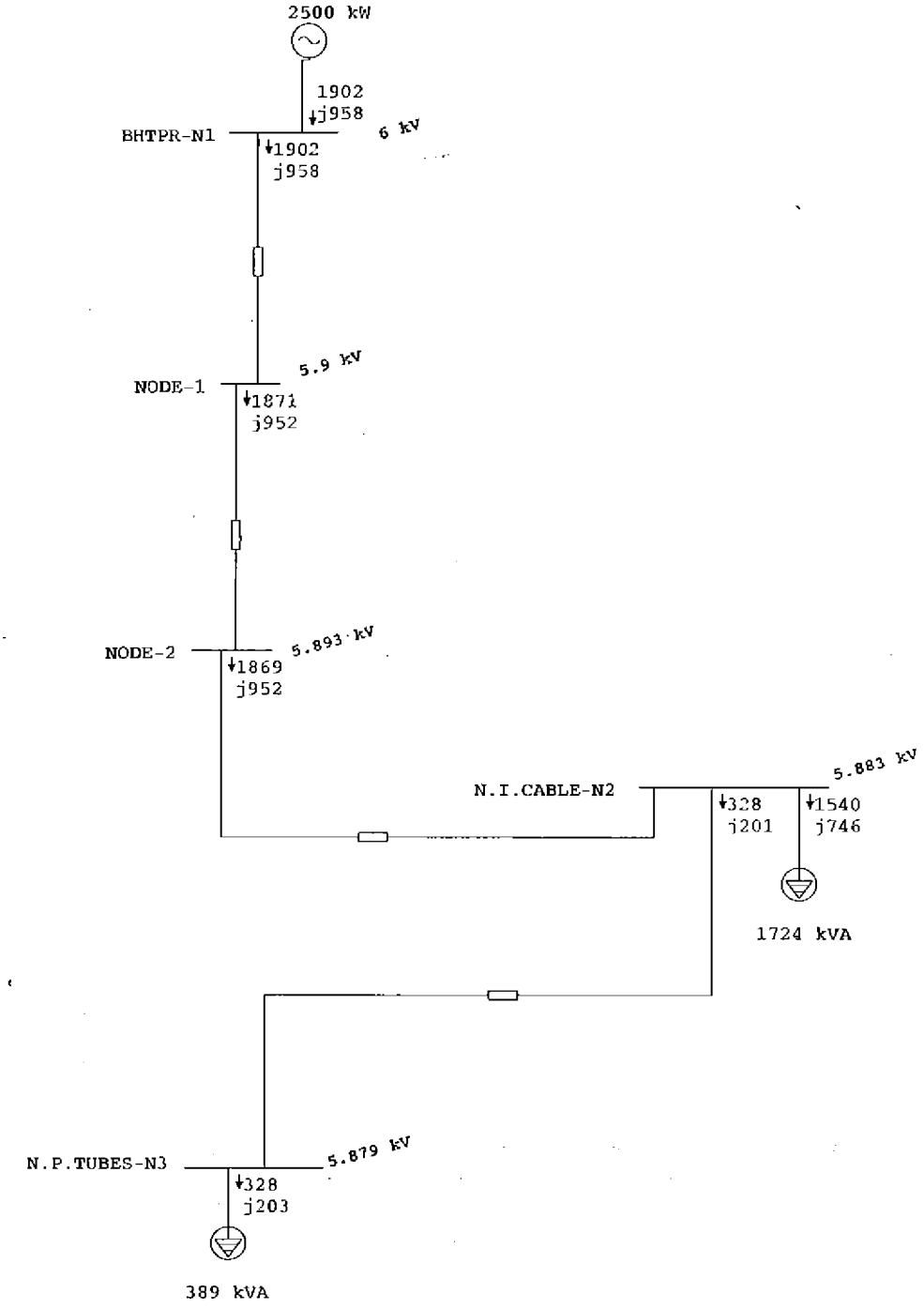
Project:	CESC Loss Study Report(2004-05	**ETAP PowerStation**		Page:	12
Location:	Kolkata, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	Navin Seth,TERI, New Delhi.		Study Case: LF	Revision:	Base
Filename:	6KV-BHATPARA			Config.:	Normal

6kV Bhatpura Feeder (Modified with revised motor loads (80%) & cable lengths)

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	1.902	0.958	2.130	89.32 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	1.902	0.958	2.130	89.32 Lagging
Total Motor Load:	1.506	0.765	1.689	89.15 Lagging
Total Static Load:	0.362	0.184		
Apparent Losses:	0.035	0.009		
System Mismatch:	0.000	0.000		

Number of Iterations 2


2500 kW
1902
j958
BHTPR-N1
6 kV
1902
j958
NODE-1
5.9 kV
1871
j952
NODE-2
5.893 kV
1869
j952
N.I.CABLE-N2
5.883 kV
328
j201
1540
j746
1724 kVA
N.P.TUBES-N3
5.879 kV
328
j203
389 kVA

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 1
Location:	Kolkata,West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth,TERI,New Delhi	Study Case: LF	Revision: Base
Filename:	6kVBallyganj-BallyganjParkWFdr		Config.: Normal

6 kV BallygungeD/S - Ballygunge Park (W) Feeder (Modified with revised motor loads-60% & cable lengths-20%)

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	39	40

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	13	0	0	27	0	0	40

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6kVBallyganj-BallyganjParkWFdr
Output Filename:	C:\ETAP 404\PowerStation\6kVBallyganj-BallyganjParkWFdr\6BG-BGP.lf1

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 8
Location:	Kolkata,West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth,TERI,New Delhi	Study Case: LF	Revision: Base
Filename:	6kVBallyganj-BallyganjParkWFdr		Config.: Normal

6 kV BallygungeD/S - Ballygunge Park (W) Feeder (Modified with revised motor loads-60% & cable lengths-20%)

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
*1 Ballygunge	6.000	101.500	0.0	3.50	2.45	0	0	0	0	2 BallyGungePark(W)T/H-2	3.50	2.45	404	81.9	
2 BallyGungePark(W)T/H-2	6.000	100.921	0.0	0	0	0	0	0	0	1 Ballygunge	-3.48	-2.43	404	81.9	
										3 Accurate Inv	3.42	2.40	398	81.9	
										Bus1	0.06	0.04	6	84.6	
3 Accurate Inv	6.000	100.389	0.1	0	0	0.04	0.04	0.03	0.02	2 BallyGungePark(W)T/H-2	-3.40	-2.39	398	81.8	
										4 B.Park (C)T/H	3.33	2.33	389	81.9	
4 B.Park (C)T/H	6.000	100.088	0.1	0	0	0	0	0	0	3 Accurate Inv	-3.32	-2.33	389	81.9	
										5 Chitralekha	3.15	2.22	370	81.8	
										Bus2	0.17	0.11	18	83.9	-1.000
5 Chitralekha	6.000	99.780	0.1	0	0	0.08	0.10	0.05	0.07	4 B.Park (C)T/H	-3.14	-2.21	370	81.7	
										Bus3	0.38	0.25	44	83.7	
										10 Mayfair T/H	2.63	1.79	306	82.6	
6 B.Park(N)O/T	6.000	99.770	0.1	0	0	0	0	0	0	Bus3	-0.38	-0.25	44	83.7	
										Bus6	0.24	0.16	27	83.5	
										Bus7	0.15	0.09	16	84.0	-1.000
7 B Park(N)T/H	6.000	99.751	0.1	0	0	0	0	0	0	Bus6	-0.24	-0.16	27	83.4	
										Bus8	0.24	0.16	27	83.4	-2.000
8 Bright St.	6.000	98.908	0.2	0	0	0	0	0	0	9 West Builders	-0.18	-0.11	20	83.8	
										Bus9	0.18	0.11	20	83.8	-2.000
9 West Builders	6.000	98.972	0.2	0	0	0.05	0.05	0.04	0.03	8 Bright St.	0.18	0.11	20	83.9	
										Bus10	-0.27	-0.19	31	80.9	
10 Mayfair T/H	6.000	99.111	0.2	0	0	0	0	0	0	Bus10	0.81	0.61	98	80.1	
										5 Chitralekha	-2.61	-1.79	306	82.5	
										Bus11	0.57	0.37	66	83.8	
										18 Mayfare(W)T/H	0.15	0.09	16	84.7	
										19 Chamru T/H	0.44	0.29	51	83.5	
										Bus13	0.32	0.21	37	83.3	-3.000
										Bus13	0.32	0.21	37	83.3	-3.000
11 Ballygunge P/Stn	6.000	98.664	0.3	0	0	0	0	0	0	Bus12	-0.57	-0.38	66	83.5	
										Bus16	0.57	0.38	66	83.5	
14 Tiljala P/T	6.000	98.224	0.4	0	0	0	0	0	0	Bus15	-0.57	-0.38	66	83.3	
										Bus22	0.35	0.24	41	83.2	
										Bus17	0.21	0.14	24	83.5	-3.000
18 Mayfare(W)T/H	6.000	99.080	0.2	0	0	0	0	0	0	10 Mayfair T/H	-0.15	-0.09	16	84.2	
										Bus18	0.15	0.09	16	84.2	-1.000
19 Chamru T/H	6.000	98.725	0.3	0	0	0	0	0	0	10 Mayfair T/H	-0.44	-0.29	51	83.3	
										20Chamru P/T	0.13	0.09	15	84.3	
										Bus19	0.31	0.21	36	82.9	-3.000
20Chamru P/T	6.000	98.668	0.3	0	0	0	0	0	0	19 Chamru T/H	-0.13	-0.09	15	84.1	
										Bus20	0.13	0.09	15	84.1	-2.000

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 9
Location:	Kolkata,West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth,TERI,New Delhi	Study Case: LF	Revision: Base
Filename:	6kVBallyganj-BallyganjParkWFdr		Config.: Normal

6 kV BallygungeD/S - Ballygunge Park (W) Feeder (Modified with revised motor loads-60% & cable lengths-20%)

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
21 Tiljala(S)T/H	6.000	98.137	0.4	0	0	0	0	0	0	Bus22	-0.35	-0.24	41	83.1	
										Bus23	0.35	0.24	41	83.1	-4.000
24 Bright St (E)	6.000	98.841	0.3	0	0	0	0	0	0	24 K.N.Prop	-0.37	-0.27	44	81.3	
										25 Pushpa Bagrodia	0.08	0.07	10	75.1	
										Bus24	0.29	0.20	34	83.0	-3.000
24 K.N.Prop	6.000	98.924	0.2	0	0	0.07	0.06	0.05	0.04	Bus10	-0.54	-0.42	66	79.4	
										24 Teage Tools	0.05	0.04	6	75.5	
										24 Bright St (E)	0.37	0.27	44	81.3	
24 Teage Tools	6.000	98.901	0.3	0	0	0.03	0.03	0.02	0.02	24 K.N.Prop	-0.05	-0.05	6	75.0	
25 Pushpa Bagrodia	6.000	98.832	0.3	0	0	0.05	0.04	0.03	0.03	24 Bright St (E)	-0.08	-0.07	10	75.0	
Bus1	0.400	100.190	-0.4	0	0	0.04	0.02	0.02	0.01	2 BallyGungePark(W)T/H-2	-0.06	-0.04	99	85.0	
Bus2	0.400	99.015	-1.1	0	0	0.10	0.06	0.07	0.04	4 B.Park (C)T/H	-0.16	-0.10	282	85.0	
Bus3	6.000	99.776	0.1	0	0	0	0	0	0	5 Chitralekha	-0.38	-0.25	44	83.7	
										6 B.Park(N)O/T	0.38	0.25	44	83.7	
Bus6	6.000	99.760	0.1	0	0	0	0	0	0	6 B.Park(N)O/T	-0.24	-0.16	27	83.5	
										7 B.Park(N)T/H	0.24	0.16	27	83.5	
Bus7	0.400	98.931	-1.0	0	0	0.09	0.05	0.06	0.04	6 B.Park(N)O/T	-0.15	-0.09	250	85.0	
Bus8	0.400	98.812	-1.6	0	0	0.14	0.09	0.09	0.06	7 B.Park(N)T/H	-0.23	-0.14	400	85.0	
Bus9	0.400	98.701	-1.1	0	0	0.11	0.07	0.07	0.04	8 Bright St.	-0.17	-0.11	301	85.0	
Bus10	6.000	99.058	0.2	0	0	0	0	0	0	9 West Builders	0.27	0.19	31	81.3	
										10 Mayfair T/H	-0.81	-0.61	98	80.1	
										24 K.N.Prop	0.54	0.42	66	79.5	
Bus11	6.000	99.094	0.2	0	0	0	0	0	0	10 Mayfair T/H	-0.57	-0.37	66	83.8	
										Bus12	0.57	0.37	66	83.8	
Bus12	6.000	98.672	0.3	0	0	0	0	0	0	Bus11	-0.57	-0.37	66	83.5	
										11 Ballygunge P/Stn	0.57	0.37	66	83.5	
Bus13	0.400	99.025	-1.6	0	0	0.38	0.24	0.25	0.15	10 Mayfair T/H	-0.31	-0.19	538	85.0	
										10 Mayfair T/H	-0.31	-0.19	538	85.0	
Bus15	6.000	98.503	0.3	0	0	0	0	0	0	Bus16	-0.57	-0.38	66	83.4	
										14 Tiljala P/T	0.57	0.38	66	83.4	
Bus16	6.000	98.525	0.3	0	0	0	0	0	0	11 Ballygunge P/Stn	-0.57	-0.38	66	83.4	
										Bus15	0.57	0.38	66	83.4	
Bus17	0.400	98.590	-1.2	0	0	0.13	0.08	0.08	0.05	14 Tiljala P/T	-0.21	-0.13	360	85.0	
Bus18	0.400	98.628	-0.7	0	0	0.09	0.05	0.06	0.04	18 Mayfare(W)T/H	-0.15	-0.09	250	85.0	
Bus19	0.400	97.853	-2.0	0	0	0.19	0.11	0.12	0.07	19 Chamru T/H	-0.30	-0.19	526	85.0	
Bus20	0.400	98.986	-0.7	0	0	0.08	0.05	0.05	0.03	20Chamru P/T	-0.13	-0.08	229	85.0	
Bus22	6.000	98.222	0.4	0	0	0	0	0	0	14 Tiljala P/T	-0.35	-0.24	41	83.1	
										21 Tiljala(S)T/H	0.35	0.24	41	83.1	
Bus23	0.400	98.698	-1.6	0	0	0.21	0.13	0.14	0.09	21 Tiljala(S)T/H	-0.35	-0.22	602	85.0	
Bus24	0.400	98.152	-1.9	0	0	0.18	0.11	0.11	0.07	24 Bright St (E)	-0.29	-0.18	502	85.0	

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation		Page:	14
Location:	Kolkata,West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	Navin Seth,TERI,New Delhi	Study Case: LF		Revision:	Base
Filename:	6kVBallyganj-BallyganjParkWFdr			Config.:	Normal

6 kV BallygungeD/S - Ballygunge Park (W) Feeder (Modified with revised motor loads-60% & cable lengths-20%)

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	3.497	2.447	-3.476	-2.435	20.5	12.1	101.5	100.9	0.58
Cable2	3.417	2.398	-3.397	-2.390	20.2	7.6	100.9	100.4	0.53
T1	0.059	0.037	-0.059	-0.036	0.2	0.7	100.9	100.2	0.73
Cable3	3.329	2.330	-3.318	-2.326	11.2	4.2	100.4	100.1	0.30
Cable4	3.152	2.218	-3.141	-2.214	10.9	4.0	100.1	99.8	0.31
T2	0.166	0.108	-0.164	-0.102	1.2	5.7	100.1	99.0	1.07
Cable5	0.383	0.250	-0.382	-0.250	0.0	-0.1	99.8	99.8	0.00
Cable14	2.629	1.792	-2.610	-1.786	19.6	6.2	99.8	99.1	0.67
Cable6	-0.382	-0.250	0.382	0.250	0.0	-0.1	99.8	99.8	0.01
Cable9	0.236	0.155	-0.236	-0.156	0.0	-0.5	99.8	99.8	0.01
T3	0.147	0.095	-0.146	-0.090	1.0	4.5	99.8	98.9	0.84
Cable10	-0.236	-0.156	0.236	0.156	0.0	-0.4	99.8	99.8	0.01
T4	0.236	0.156	-0.233	-0.145	2.4	11.5	99.8	98.8	0.94
Cable11	-0.176	-0.115	0.177	0.114	0.2	-0.5	98.9	99.0	0.06
T5	0.176	0.115	-0.175	-0.108	1.4	6.5	98.9	98.7	0.21
Cable12	-0.266	-0.193	0.266	0.191	0.3	-2.5	99.0	99.1	0.09
Cable13	0.811	0.606	-0.810	-0.606	0.5	-0.4	99.1	99.1	0.05
Cable15	0.572	0.373	-0.572	-0.373	0.1	-0.2	99.1	99.1	0.02
Cable21	0.146	0.092	-0.146	-0.094	0.1	-1.8	99.1	99.1	0.03
Cable22	0.445	0.293	-0.442	-0.294	2.3	-1.1	99.1	98.7	0.39
T6	0.318	0.211	-0.314	-0.195	3.5	16.4	99.1	99.0	0.09
T13	0.318	0.211	-0.314	-0.195	3.5	16.4	99.1	99.0	0.09
Cable17	-0.569	-0.375	0.569	0.375	0.0	-0.1	98.7	98.7	0.01
Cable18	0.569	0.375	-0.568	-0.375	1.1	-0.2	98.7	98.5	0.14
Cable20	-0.566	-0.376	0.568	0.376	2.1	-0.4	98.2	98.5	0.28
Cable24	0.355	0.237	-0.355	-0.237	0.0	-0.1	98.2	98.2	0.00
T7	0.211	0.139	-0.209	-0.130	2.0	9.3	98.2	98.6	0.37
T8	0.146	0.094	-0.145	-0.090	0.8	3.5	99.1	98.6	0.45
Cable23	0.135	0.086	-0.135	-0.087	0.1	-0.6	98.7	98.7	0.06
T9	0.308	0.208	-0.303	-0.188	4.2	19.8	98.7	97.9	0.87
T10	0.135	0.087	-0.134	-0.083	0.8	3.8	98.7	99.0	0.32
Cable25	-0.354	-0.237	0.355	0.237	0.4	-0.3	98.1	98.2	0.09
T11	0.354	0.237	-0.350	-0.217	4.3	20.4	98.1	98.7	0.56
Cable28	-0.373	-0.268	0.374	0.267	0.4	-0.3	98.8	98.9	0.08
Cable29	0.079	0.069	-0.079	-0.069	0.0	-0.2	98.8	98.8	0.01
T12	0.294	0.198	-0.291	-0.180	3.8	18.1	98.8	98.2	0.69
Cable26	-0.543	-0.416	0.544	0.416	1.1	-0.2	98.9	99.1	0.13
Cable27	0.051	0.045	-0.051	-0.045	0.0	-0.7	98.9	98.9	0.02
Cable16	0.572	0.373	-0.569	-0.375	2.8	-2.1	99.1	98.7	0.42
Cable19	-0.568	-0.376	0.568	0.375	0.2	-0.3	98.5	98.5	0.02
					123.3	157.5			

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 17
Location:	Kolkata,West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth,TERI,New Delhi	Study Case: LF	Revision: Base
Filename:	6kVBallyganj-BallyganjParkWFdr		Config.: Normal

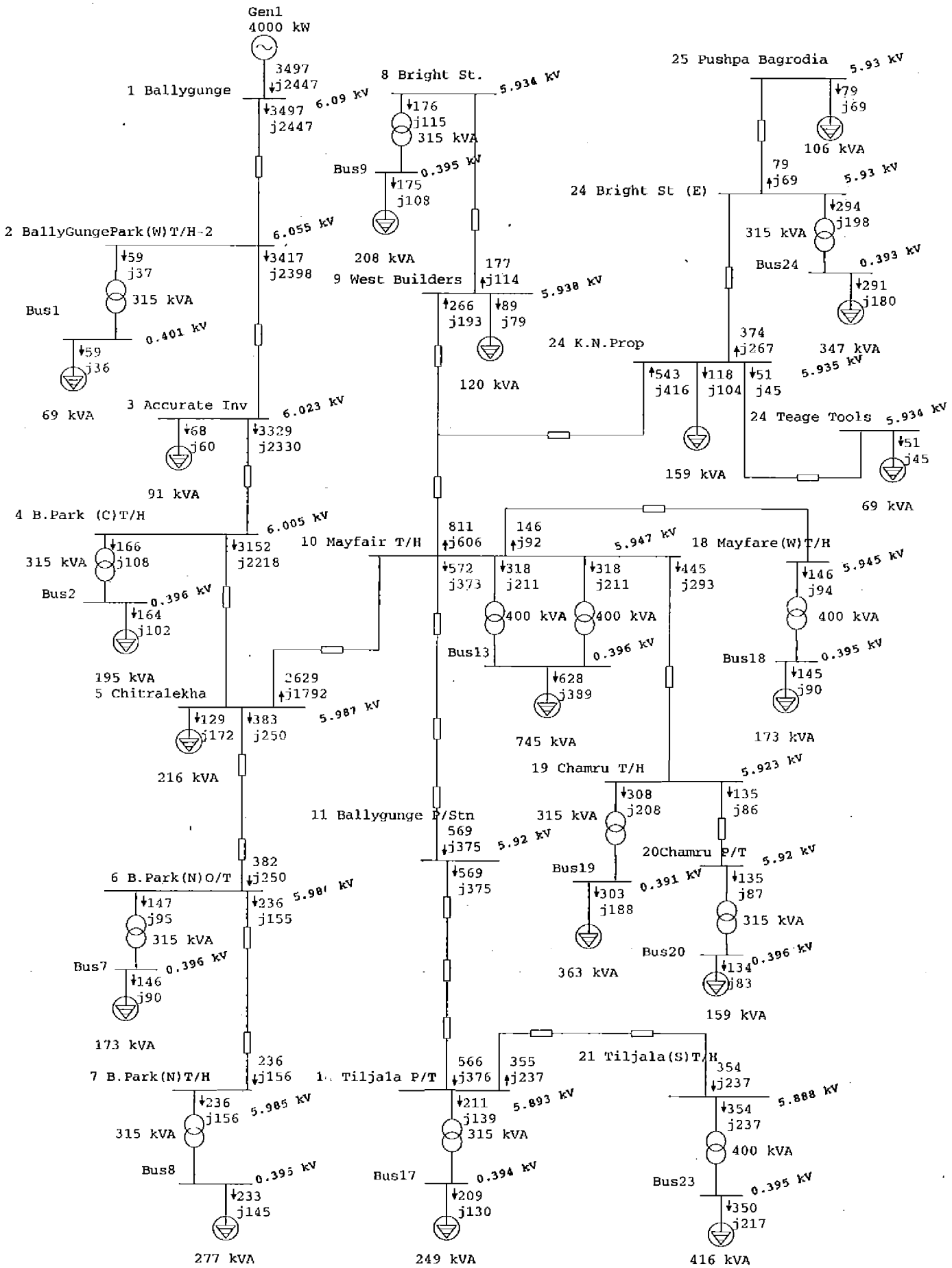
6 kV BallygungeD/S - Ballygunge Park (W) Feeder (Modified with revised motor loads-60% & cable lengths-20%)

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	3.497	2.447	4.268	81.93 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	3.497	2.447	4.268	81.93 Lagging
Total Motor Load:	2.044	1.386	2.470	82.76 Lagging
Total Static Load:	1.330	0.903		
Apparent Losses:	0.123	0.157		
System Mismatch:	0.000	0.000		

Number of Iterations: 3

One-Line Diagram - OLV1



Project:	CESC lossStudy Report(2004-05)	**ETAP PowerStation**		Page:	1
Location:	Kolkata, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	Navin Seth,TERI, New Delhi		Study Case: LF	Revision:	Base
Filename:	6kVBelur-Chandrapara			Config.:	Normal

6kVBelur D/S - Chandalpara Switch House Feeder (Modified with revised motor loads-80% & increased Cable lengths)

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	13	14

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	2	0	0	11	0	0	13

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6kVBelur-Chandrapara
Output Filename:	C:\ETAP 404\PowerStation\6kVBelur-Chandrapara\Bel-Chp.lf1

Project:	CESC lossStudy Report(2004-05)	**ETAP PowerStation**	Page: 7
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth,TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kVBelur-Chandrapara		Config.: Normal

6kVBelur D/S - Chandalpara Switch House Feeder (Modified with revised motor loads-80% & increased Cable lengths)

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
*1Belur	6.000	100.000	0.0	1.10	1.00	0	0	0	0	Bus1	1.10	1.00	143	74.2	
2 C.Para	6.000	98.658	0.2	0	0	0	0	0	0	Bus2	-1.09	-1.00	144	73.5	
										3CLMissrRd.(E)	0.14	0.12	17	74.6	
										Bus4	0.95	0.88	126	73.3	
3CLMissrRd.(E)	6.000	98.620	0.2	0	0	0	0	0	0	2 C.Para	-0.14	-0.12	17	74.1	
										4Bngl.Iron	0.00	0.00	0	0.0	
										Bus3	0.14	0.12	17	73.9	-2.000
4Bngl.Iron	6.000	98.620	0.2	0	0	0	0	0	0	3CLMissrRd.(E)					
5Shym Steel	6.000	98.449	0.2	0	0	0.54	0.51	0.13	0.12	Bus5	-0.95	-0.88	126	73.2	
										Bus6	0.27	0.25	36	73.8	
6CL MsrRd.	6.000	98.386	0.2	0	0	0	0	0	0	Bus6	-0.27	-0.25	36	73.6	
										7CalTubes	0.00	0.00	0	0.0	
										Bus7	0.27	0.25	36	73.6	-4.000
7CalTubes	6.000	98.386	0.2	0	0	0	0	0	0	6CL MsrRd					
Bus1	6.000	98.722	0.2	0	0	0	0	0	0	1Belur	-1.09	-1.00	144	73.5	
										Bus2	1.09	1.00	144	73.5	
Bus2	6.000	98.679	0.2	0	0	0	0	0	0	Bus1	-1.09	-1.00	144	73.5	
										2 C.Para	1.09	1.00	144	73.5	
Bus3	0.400	98.395	-0.7	0	0	0.11	0.10	0.03	0.02	3CLMissrRd.(E)	-0.13	-0.12	262	75.0	
Bus4	6.000	98.481	0.2	0	0	0	0	0	0	2 C.Para	-0.95	-0.88	126	73.3	
										Bus5	0.95	0.88	126	73.3	
Bus5	6.000	98.456	0.2	0	0	0	0	0	0	Bus4	-0.95	-0.88	126	73.2	
										5Shym Steel	0.95	0.88	126	73.2	
Bus6	6.000	98.398	0.2	0	0	0	0	0	0	5Shym Steel	-0.27	-0.25	36	73.7	
										6CL MsrRd.	0.27	0.25	36	73.7	
Bus7	0.400	99.538	-1.0	0	0	0.22	0.19	0.05	0.05	6CL MsrRd.	-0.27	-0.24	521	75.0	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC lossStudy Report(2004-05)	**ETAP PowerStation**	Page: 10
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth,TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kVBelur-Chandrapara		Config.: Normal

6kVBelur D/S - Chandalpara Switch House Feeder (Modified with revised motor loads-80% & increased Cable lengths)

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	1.104	0.998	-1.087	-1.002	17.1	-4.0	100.0	98.7	1.28
Cable3	-1.086	-1.002	1.086	1.002	0.3	-0.1	98.7	98.7	0.02
Cable4	0.135	0.121	-0.135	-0.123	0.1	-2.1	98.7	98.6	0.04
Cable6	0.951	0.881	-0.948	-0.881	2.4	0.1	98.7	98.5	0.18
Cable5	0.000	-0.001			0.0	-0.5	98.6	98.6	0.00
T1	0.135	0.123	-0.134	-0.118	1.0	4.9	98.6	98.4	0.23
Cable8	-0.948	-0.881	0.948	0.881	0.1	0.0	98.4	98.5	0.01
Cable9	0.272	0.249	-0.272	-0.250	0.2	-0.7	98.4	98.4	0.05
Cable10	-0.272	-0.250	0.272	0.250	0.0	-0.3	98.4	98.4	0.01
Cable11	0.000	0.000			0.0	-0.5	98.4	98.4	0.00
T2	0.272	0.251	-0.270	-0.238	2.7	12.9	98.4	99.5	1.15
Cable2	1.087	1.002	-1.086	-1.002	0.6	-0.1	98.7	98.7	0.04
Cable7	0.948	0.881	-0.948	-0.881	0.3	-0.1	98.5	98.5	0.02
					24.9	9.5			

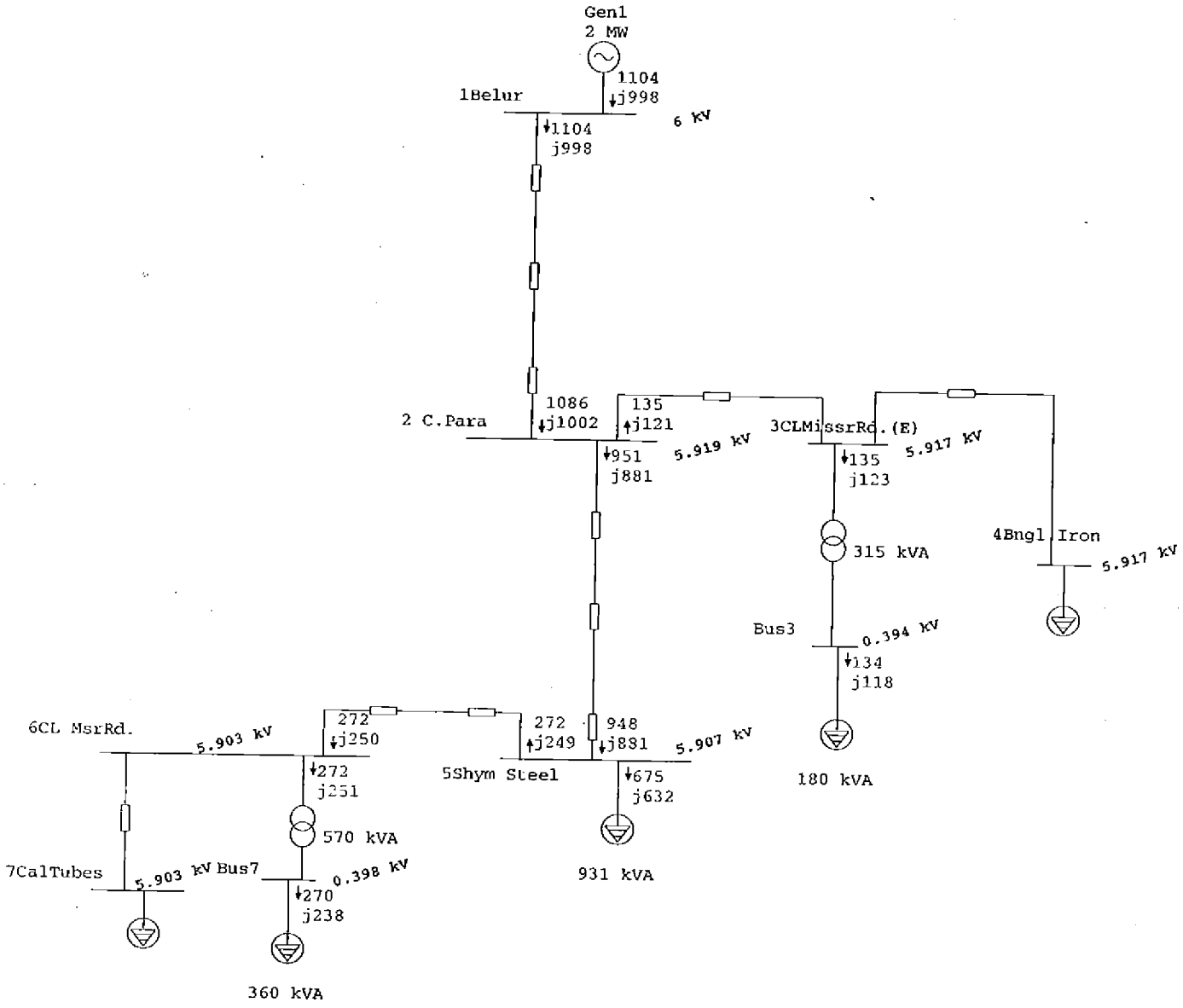
Project:	CESC lossStudy Report(2004-05)	**ETAP PowerStation**	Page: 13
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth,TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kVBelur-Chandrapara		Config.: Normal

6kVBelur D/S - Chandalpara Switch House Feeder (Modified with revised motor loads-80% & increased Cable lengths)

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	1.104	0.998	1.488	74.19 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	1.104	0.998	1.488	74.19 Lagging
Total Motor Load:	0.868	0.795	1.177	73.74 Lagging
Total Static Load:	0.211	0.194		
Apparent Losses:	0.025	0.009		
System Mismatch:	0.000	0.000		

Number of Iterations: 3


Gen1
2 MW
1104
j998
1Belur
6 kV
1104
j998
2 C.Para
1086
j1002
135
j121
3CLMissrRd.(E)
951
j881
5.919 kV
135
j123
5.917 kV
315 kVA
4Bngl.Iron
5.917 kV
Bus3
0.394 kV
134
j118
180 kVA
6CL MsrRd.
5.903 kV
272
j250
272
j251
570 kVA
7CalTubes
5.903 kV
Bus7
0.398 kV
270
j238
360 kVA
272
j249
948
j881
5.907 kV
5Shym Steel
675
j632
931 kVA

Project:	CESC Loss Study (2004-05)	ETAP PowerStation	Page: 1
Location:	KOLKOTA,West Bengal	4.0.4C	Date: 08-05-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvBelur-JNMukerjee		Config.: Normal

Revised study with modified loads and lengths & 80%motor load

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	33	34

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	7	0	0	26	0	0	33

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6kvBelur-JNMukerjee
Output Filename:	C:\ETAP 404\PowerStation\6kvBelur-JNMukerjee\U1478.lf1

Project:	CESC Loss Study (2004-05)	**ETAP PowerStation**	Page: 7
Location:	KOLKOTA,West Bengal	4.0.4C	Date: 07-26-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvBelur-JNMukerjee		Config.: Normal

Revised study with modified loads and lengths

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
*1Belur	6.000	102.000	0.0	3.40	1.91	0	0	0	0	Bus3	3.40	1.91	367	87.1	
2JNMukerjee1	6.000	98.396	0.3	0	0	0	0	0	0	Bus6	-3.27	-1.87	368	86.8	
										Bus7	0.74	0.38	81	88.8	
										5JNMukerjee3	0.12	0.08	13	84.2	
										Bus20	2.06	1.18	232	86.7	
										Bus10	0.35	0.23	41	83.3	
3LRMills	6.000	97.992	0.4	0	0	0.31	0.12	0.07	0.03	4JNMukerjee2	0.35	0.23	41	83.4	
										Bus7	-0.73	-0.38	81	88.7	
4JNMukerjee2	6.000	97.810	0.5	0	0	0	0	0	0	3LRMills	-0.35	-0.23	41	83.3	
										Bus13	0.35	0.23	41	83.3	
5JNMukerjee3	6.000	98.395	0.3	0	0	0	0	0	0	2JNMukerjee1	-0.12	-0.08	13	84.2	
										Bus12	0.12	0.08	13	84.2	
6Salkia	6.000	96.594	0.5	0	0	0.06	0.07	0.01	0.02	Bus21	-2.02	-1.17	232	86.5	
										Bus23	1.95	1.09	222	87.3	
7SALKIA E	6.000	96.263	0.6	0	0	0	0	0	0	Bus25	-0.34	-0.24	41	81.2	
										Bus27	0.04	0.04	6	70.2	
										Bus14	0.29	0.20	35	82.9	-4.000
8SM Krishna	6.000	96.255	0.6	0	0	0.04	0.04	0.01	0.01	Bus27	-0.04	-0.05	6	70.0	
9Hanuman	6.000	96.349	0.6	0	0	0.23	0.12	0.05	0.03	Bus24	-1.60	-0.84	180	88.5	
										Bus28	1.32	0.70	148	88.4	
10 R Kumar	6.000	96.117	0.6	0	0	0.02	0.03	0.00	0.01	Bus29	-1.31	-0.70	148	88.4	
										11Om Deve.	1.29	0.66	145	89.0	
11Om Deve.	6.000	95.998	0.6	0	0	0.48	0.16	0.11	0.04	10 R Kumar	-1.29	-0.66	145	88.9	
										12 JNMukerjee 4	0.32	0.22	39	82.7	
										15 SNTemple	0.35	0.22	41	84.0	
										14Bandhaghat	0.02	0.02	2	66.6	
12 JNMukerjee 4	6.000	95.934	0.6	0	0	0	0	0	0	11Om Deve.	-0.32	-0.22	39	82.7	
										Bus15	0.32	0.22	39	82.7	-4.000
14Bandhaghat	6.000	95.996	0.6	0	0	0.02	0.02	0.00	0.00	11Om Deve.	-0.02	-0.02	2	66.0	
15 SNTemple	6.000	95.973	0.6	0	0	0	0	0	0	11Om Deve.	-0.35	-0.23	41	84.0	
										16BAZALPARA	0.14	0.09	17	84.6	
										Bus16	0.20	0.13	24	83.5	-2.000
16BAZALPARA	6.000	95.920	0.6	0	0	0	0	0	0	15 SNTemple	-0.14	-0.09	17	83.9	
										Bus17	0.14	0.09	17	83.9	
Bus3	6.000	99.053	0.3	0	0	0	0	0	0	1Belur	-3.29	-1.88	368	86.8	
										Bus5	3.29	1.88	368	86.8	
Bus5	6.000	98.692	0.3	0	0	0	0	0	0	Bus3	-3.28	-1.88	368	86.8	
										Bus6	3.28	1.88	368	86.8	
Bus6	6.000	98.466	0.3	0	0	0	0	0	0	2JNMukerjee1	3.27	1.87	368	86.8	

Project:	CESC Loss Study (2004-05)	**ETAP PowerStation**	Page: 8
Location:	KOLKOTA,West Bengal	4.0.4C	Date: 07-26-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvBelur-JNMukerjee		Config.: Normal

Revised study with modified loads and lengths

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
										Bus5	-3.27	-1.87	368	86.8	
Bus7	6.000	98.313	0.4	0	0	0	0	0	0	2JNMukerjee1	-0.74	-0.38	81	88.8	
										3LRMills	0.74	0.38	81	88.8	
Bus10	0.400	95.636	-1.4	0	0	0.28	0.17	0.06	0.04	2JNMukerjee1	-0.35	-0.21	615	85.0	
Bus12	0.400	96.888	-0.6	0	0	0.09	0.06	0.02	0.01	5JNMukerjee3	-0.12	-0.07	204	85.0	
Bus13	0.400	95.038	-1.3	0	0	0.28	0.17	0.06	0.04	4JNMukerjee2	-0.35	-0.21	618	85.0	
Bus14	0.400	96.468	-1.6	0	0	0.24	0.15	0.05	0.03	7SALKIA E	-0.29	-0.18	510	85.0	
Bus15	0.400	95.710	-1.9	0	0	0.26	0.16	0.06	0.04	12 JNMukerjee 4	-0.32	-0.20	564	85.0	
Bus16	0.400	95.319	-1.0	0	0	0.16	0.10	0.04	0.02	15 SNTemple	-0.20	-0.13	359	85.0	
Bus17	0.400	94.004	-0.6	0	0	0.12	0.07	0.03	0.02	16BAZALPARA	-0.14	-0.09	259	85.0	
Bus20	6.000	96.637	0.5	0	0	0	0	0	0	2JNMukerjee1	-2.02	-1.17	232	86.5	
										Bus21	2.02	1.17	232	86.5	
Bus21	6.000	96.622	0.5	0	0	0	0	0	0	Bus20	-2.02	-1.17	232	86.5	
										6Salkia	2.02	1.17	232	86.5	
Bus23	6.000	96.415	0.6	0	0	0	0	0	0	6Salkia	-1.94	-1.08	222	87.3	
										Bus24	1.94	1.08	222	87.3	
Bus24	6.000	96.398	0.6	0	0	0	0	0	0	Bus23	-1.94	-1.08	222	87.3	
										9Hanuman	1.60	0.84	180	88.5	
										Bus25	0.34	0.24	41	81.3	
Bus25	6.000	96.303	0.6	0	0	0	0	0	0	Bus24	-0.34	-0.24	41	81.2	
										7SALKIA E	0.34	0.24	41	81.2	
Bus27	6.000	96.259	0.6	0	0	0	0	0	0	7SALKIA E	-0.04	-0.04	6	70.1	
										8SM Krishna	0.04	0.04	6	70.1	
Bus28	6.000	96.205	0.6	0	0	0	0	0	0	9Hanuman	-1.32	-0.70	148	88.4	
										Bus29	1.32	0.70	148	88.4	
Bus29	6.000	96.195	0.6	0	0	0	0	0	0	Bus28	-1.32	-0.70	148	88.4	
										10 R Kumar	1.32	0.70	148	88.4	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study (2004-05)	ETAP PowerStation		Page:	11
Location:	KOLKOTA,West Bengal	4.0.4C		Date:	08-05-2005
Contract:	2004BR26			SN:	TATAENERGY
Engineer:	M.S.Bhalla			Revision:	Base
Filename:	6kvBelur-JNMukerjee	Study Case: LF		Config.:	Normal

Revised study with modified loads and lengths & 80%motor load

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	3.411	1.917	-3.292	-1.879	119.2	38.4	102.0	98.7	3.25
Cable5	-3.266	-1.870	3.269	1.872	2.6	1.2	98.0	98.1	0.08
Cable7	0.737	0.382	-0.737	-0.382	0.8	-0.1	98.0	97.9	0.09
Cable10	0.117	0.075	-0.117	-0.075	0.0	-0.2	98.0	98.0	0.00
Cable11	2.062	1.181	-2.017	-1.169	45.1	12.3	98.0	96.1	1.94
T8	0.349	0.232	-0.346	-0.215	3.0	17.3	98.0	95.3	2.77
Cable2	0.349	0.231	-0.348	-0.231	1.0	-0.7	97.6	97.4	0.20
Cable8	-0.733	-0.383	0.737	0.382	3.2	-0.3	97.6	97.9	0.35
T1	0.348	0.231	-0.345	-0.214	3.0	17.4	97.4	94.6	2.78
T4	0.117	0.075	-0.117	-0.072	0.6	3.0	98.0	96.5	1.51
Cable15	-2.016	-1.169	2.017	1.169	0.6	0.2	96.0	96.1	0.03
Cable16	1.943	1.084	-1.939	-1.082	4.4	1.2	96.0	95.8	0.20
Cable21	-0.337	-0.243	0.338	0.243	0.2	-0.2	95.7	95.7	0.04
Cable23	0.044	0.045	-0.044	-0.045	0.0	-0.1	95.7	95.7	0.00
T3	0.293	0.198	-0.289	-0.179	4.0	18.8	95.7	95.8	0.16
Cable25	-0.044	-0.045	0.044	0.045	0.0	-0.1	95.7	95.7	0.00
Cable18	-1.599	-0.840	1.600	0.840	1.0	0.2	95.8	95.8	0.05
Cable26	1.316	0.695	-1.313	-0.694	2.6	0.4	95.8	95.6	0.17
Cable28	-1.312	-0.694	1.313	0.694	1.3	-0.2	95.5	95.6	0.10
Cable29	1.286	0.661	-1.284	-0.660	1.9	0.3	95.5	95.3	0.13
Cable30	0.323	0.220	-0.322	-0.220	0.3	-0.3	95.3	95.3	0.07
Cable31	0.348	0.224	-0.348	-0.225	0.1	-0.5	95.3	95.3	0.03
Cable32	0.019	0.021	-0.019	-0.021	0.0	-0.4	95.3	95.3	0.00
T5	0.322	0.220	-0.318	-0.197	4.9	23.0	95.3	95.0	0.27
Cable33	0.144	0.091	-0.144	-0.094	0.1	-3.0	95.3	95.3	0.06
T6	0.203	0.134	-0.201	-0.125	1.9	9.2	95.3	94.6	0.68
T7	0.144	0.094	-0.143	-0.089	1.0	4.9	95.3	93.3	1.93
Cable4	3.292	1.879	-3.277	-1.875	14.8	3.8	98.7	98.3	0.40
Cable6	3.277	1.875	-3.269	-1.872	8.7	3.2	98.3	98.1	0.25
Cable13	2.017	1.169	-2.017	-1.169	0.4	0.1	96.1	96.1	0.02
Cable17	1.939	1.082	-1.938	-1.082	0.4	0.1	95.8	95.8	0.02
Cable19	0.338	0.242	-0.338	-0.243	0.5	-0.3	95.8	95.7	0.10
Cable27	1.313	0.694	-1.313	-0.694	0.2	0.0	95.6	95.6	0.01
					228.0	148.5			

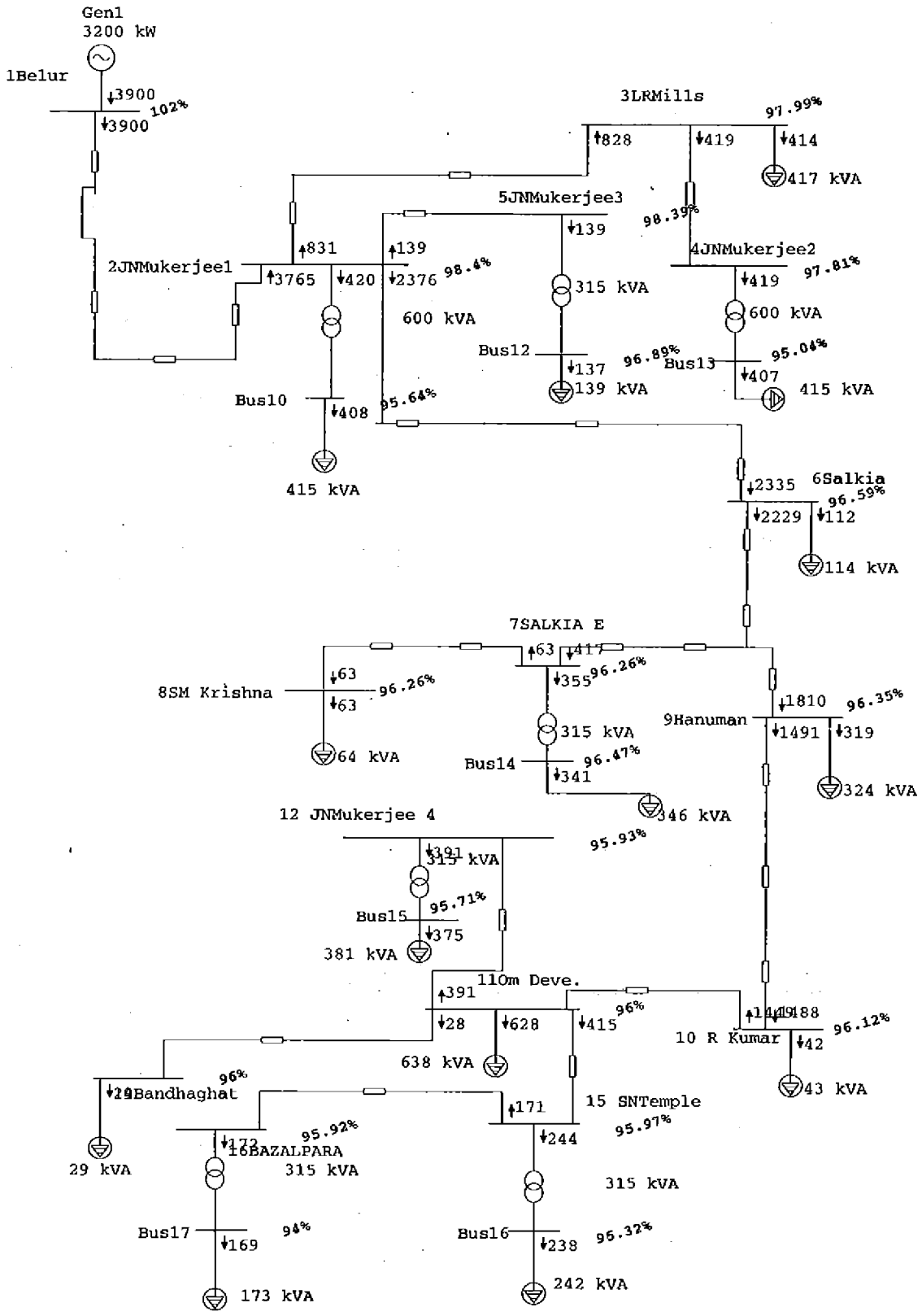
Project:	CESC Loss Study (2004-05)	ETAP PowerStation	Page: 14
Location:	KOLKOTA,West Bengal	4.0.4C	Date: 08-24-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvBelur-JNMukerjee		Config.: Normal

Revised study with modified loads and lengths & 80%motor load

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	3.214	2.245	3.920	81.98 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	3.214	2.245	3.920	81.98 Lagging
Total Motor Load:	2.431	1.708	2.971	81.83 Lagging
Total Static Load:	0.554	0.388		
Apparent Losses:	0.229	0.149		
System Mismatch:	0.000	0.000		

Number of Iterations: 3


Gen1
3200 kW
1Belur
3900
3900
102%
3LRMills
828
419
414
97.99%
417 kVA
5JNMukerjee3
139
98.39%
2JNMukerjee1
831
139
3765
420
2376
98.4%
315 kVA
4JNMukerjee2
419
97.81%
600 kVA
600 kVA
Bus12
137
96.89%
139 kVA
Bus13
407
95.04%
415 kVA
Bus10
408
95.64%
415 kVA
2335
6Salkia
96.59%
2229
112
114 kVA
7SALKIA E
63
417
355
96.26%
8SM Krishna
63
63
96.26%
64 kVA
315 kVA
Bus14
341
96.47%
346 kVA
9Hanuman
1810
96.35%
1491
319
324 kVA
12 JNMukerjee 4
391
315 kVA
95.93%
Bus15
375
95.71%
381 kVA
11Om Deve.
391
28
628
415
96%
638 kVA
10 R Kumar
1419188
42
96.12%
43 kVA
29Bandhaghat
96%
29 kVA
172
16BAZALPARA
95.92%
315 kVA
171
15 SNTemple
244
95.97%
315 kVA
Bus17
169
94%
173 kVA
Bus16
238
95.32%
242 kVA

Project:	CESC Loss Study (2004-05)	**ETAP PowerStation**	Page: 1
Location:	Kolkota ,West Bengal	4.0.4C	Date: 05-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvBELUR-ShriAmbicaJuteMILL		Config.: Normal

6 KV Belur - Shri Ambica Jute Mill feeder(Modified with revised lengths and 80%motor load

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	6	7

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	0	0	0	6	0	0	6

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	English
Project Filename:	6kvBELUR-ShriAmbicaJuteMILL
Output Filename:	C:\ETAP 404\PowerStation\6kvBELUR-ShriAmbicaJuteMILL\Untitled.lf1

Project:	CESC Loss Study (2004-05)	ETAP PowerStation	Page: 6
Location:	Kolkota ,West Bengal	4.0.4C	Date: 28-07-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvBELUR-ShriAmbicaJuteMILL		Config.: Normal

6 KV Belur - Shri Ambica Jute Mill feeder(Modified with revised lengths)

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Aug.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1Belur D/S	6.000	100.000	0.0	2.06	0.51	0	0	0	0	Bus2	2.06	0.51	204	97.0	
2Shri Bajrang Iron	6.000	98.374	-0.1	0	0	0	0	0	0	Bus8	2.03	0.51	204	97.0	
										Bus6	-2.03	-0.51	204	97.0	
3 Shri Ambica Jute MILL	6.000	96.022	-0.2	0	0	1.23	0.31	0.75	0.19	Bus8	-1.98	-0.50	204	97.0	
Bus2	6.000	98.583	-0.1	0	0	0	0	0	0	1Belur D/S	-2.03	-0.51	204	97.0	
										Bus5	2.03	0.51	204	97.0	
Bus5	6.000	98.535	-0.1	0	0	0	0	0	0	Bus2	-2.03	-0.51	204	97.0	
										Bus6	2.03	0.51	204	97.0	
Bus6	6.000	98.440	-0.1	0	0	0	0	0	0	Bus5	-2.03	-0.51	204	97.0	
										2Shri Bajrang Iron	2.03	0.51	204	97.0	
Bus8	6.000	96.035	-0.2	0	0	0	0	0	0	2Shri Bajrang Iron	-1.98	-0.50	204	97.0	
										3 Shri Ambica Jute MILL	1.98	0.50	204	97.0	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

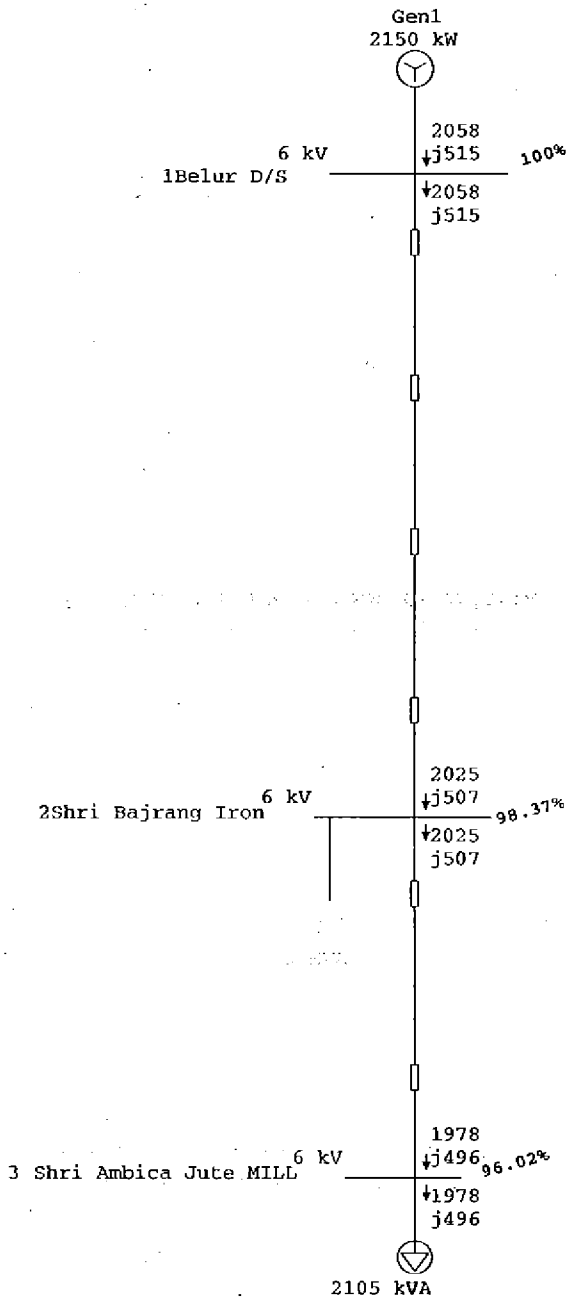
Project:	CESC Loss Study (2004-05)	ETAP PowerStation	Page: 12
Location:	Kolkota ,West Bengal	4.0.4C	Date: 24-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvBELUR-ShriAmbicaJuteMILL		Config.: Normal

6 KV Belur - Shri Ambica Jute Mill feeder(Modified with revised lengths and 80%motor load

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	1.993	0.833	2.160	92.27 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	1.993	0.833	2.160	92.27 Lagging
Total Motor Load:	1.549	0.660	1.684	92.00 Lagging
Total Static Load:	0.354	0.151		
Apparent Losses:	0.090	0.022		
System Mismatch:	0.000	0.000		

Number of Iterations: 3


Gen1
2150 kW
2058
j515
6 kV
100%
1Belur D/S
2058
j515
2025
j507
6 kV
2Shri Bajrang Iron
98.37%
2025
j507
1978
j496
6 kV
3 Shri Ambica Jute MILL
96.02%
1978
j496
2105 kVA

Project:	CESCLoss Study (2004-050	**ETAP PowerStation**		Page:	1
Location:	KOLKOTA, West Bengal	4.0.4C		Date:	08-05-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S.Bhalla		Study Case: LF	Revision:	Base
Filename:	6kvChingrihata-Chowbhaga			Config.:	Normal

Revised with increased length & 80% motor load

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	23	24

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	5	0	0	18	0	0	23

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6kvChingrihata-Chowbhaga
Output Filename:	C:\ETAP 404\PowerStation\6kvChingrihata-Chowbhaga\Chingri.lf1

Project:	CESCLoss Study (2004-050	**ETAP PowerStation**	Page: 7
Location:	KOLKOTA, West Bengal	4.0.4C	Date: 07-26-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:		Study Case: LF	Revision: Base
Filename:	6kvChingrihata-Chowbhaga		Config.: Normal

Revised with increased length

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1Chingrihata	6.000	100.000	0.0	5.69	3.55	0	0	0	0	2Eastern	2.29	1.46	261	84.5	
										11Chowbagha	3.39	2.09	383	85.1	
2Eastern	6.000	99.560	0.0	0	0	0	0	0	0	1Chingrihata	-2.28	-1.45	261	84.4	
										3Mathes O/T	2.28	1.45	261	84.4	
3Mathes O/T	6.000	99.223	0.0	0	0	0	0	0	0	2Eastern	-2.28	-1.45	261	84.3	
										4Chungchi	2.06	1.31	236	84.4	
										Bus21	0.22	0.14	25	83.4	
4Chungchi	6.000	99.084	0.0	0	0	0.10	0.06	0.02	0.02	3Mathes O/T	-2.06	-1.31	236	84.4	
										Bus2	1.93	1.23	222	84.4	
5Changsheng	6.000	98.942	0.1	0	0	0.09	0.06	0.02	0.01	Bus4	-0.45	-0.28	51	84.4	
										6Liansheng	0.33	0.21	38	84.2	
6Liansheng	6.000	98.930	0.1	0	0	0.10	0.06	0.03	0.02	5Changsheng	-0.33	-0.21	38	84.1	
										7Talim	0.21	0.14	23	83.6	
7Talim	6.000	98.927	0.1	0	0	0	0	0	0	6Liansheng	-0.21	-0.14	23	83.5	
										8Mathes	0.21	0.14	23	83.5	
8Mathes	6.000	98.914	0.1	0	0	0	0	0	0	7Talim	-0.21	-0.14	23	83.5	
										9	0.21	0.14	23	83.5	
9	0.400	96.253	-1.5	0	0	0.17	0.10	0.04	0.02	8Mathes	-0.20	-0.13	359	85.0	
10Mathe	6.000	98.373	0.2	0	0	0	0	0	0	Bus7	-1.27	-0.81	147	84.2	
										11Tan	0.96	0.61	110	84.5	
										Bus10	0.31	0.20	36	83.5	
11Chowbagha	6.000	98.261	0.0	0	0	1.42	0.88	0.34	0.21	1Chingrihata	-3.34	-2.07	384	85.0	
										Bus23	1.57	0.97	180	85.0	
11Tan	6.000	98.177	0.3	0	0	0.29	0.18	0.07	0.04	10Mathe	-0.95	-0.61	110	84.4	
										12Wansan	0.59	0.38	68	84.1	
12Topsia	6.000	98.176	0.0	0	0	1.26	0.78	0.30	0.19	Bus23	-1.56	-0.97	180	85.0	
12Wansan	6.000	97.899	0.4	0	0	0.17	0.10	0.04	0.03	11Tan	-0.59	-0.38	68	83.9	
										13Mathes	0.38	0.25	44	83.3	
13Mathes	6.000	97.846	0.4	0	0	0	0	0	0	12Wansan	-0.38	-0.25	44	83.3	
										14	0.38	0.25	44	83.3	-4.000
14	0.400	99.032	-1.4	0	0	0.30	0.19	0.07	0.05	13Mathes	-0.38	-0.23	644	85.0	
15Tangra	6.000	99.016	0.0	0	0	0	0	0	0	Bus2	-0.21	-0.14	23	83.5	
										Bus17	0.21	0.14	23	83.5	
Bus2	6.000	99.025	0.0	0	0	0	0	0	0	4Chungchi	-1.93	-1.23	222	84.4	
										Bus4	1.72	1.09	198	84.5	
										15Tangra	0.21	0.14	23	83.5	
Bus4	6.000	99.022	0.0	0	0	0	0	0	0	Bus2	-1.72	-1.09	198	84.5	
										5Changsheng	0.45	0.28	51	84.6	
										Bus7	1.28	0.81	146	84.4	

Project: CESCLoss Study (2004-050
Location: KOLKOTA, West Bengal
Contract: 2004ER26
Engineer:
Filename: 6kvChingrihata-Chowbhaga

ETAP PowerStation
4.0.4C

Study Case: LF

Page: 8
Date: 07-26-2005
SN: TATAENERGY
Revision: Base
Config.: Normal

Revised with increased length

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
Bus7	6.000	98.380	0.2	0	0	0	0	0	0	Bus4	-1.27	-0.81	147	84.2	
										10Mathe	1.27	0.81	147	84.2	
Bus10	0.400	95.934	-1.4	0	0	0.25	0.16	0.06	0.04	10Mathe	-0.31	-0.19	544	85.0	
Bus17	0.400	96.356	-1.5	0	0	0.17	0.10	0.04	0.02	15Tangra	-0.20	-0.13	358	85.0	
Bus21	0.400	96.420	-1.6	0	0	0.17	0.11	0.04	0.03	3Mathes O/T	-0.21	-0.13	377	85.0	
Bus23	6.000	98.189	0.0	0	0	0	0	0	0	11Chowbagha	-1.56	-0.97	180	85.0	
										12Topsia	1.56	0.97	180	85.0	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESCLoss Study (2004-050	ETAP PowerStation		Page:	11
Location:	KOLKOTA, West Bengal	4.0.4C		Date:	07-26-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:		Study Case: LF		Revision:	Base
Filename:	6kvChingrihata-Chowbhaga			Config.:	Normal

Revised with increased length

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	2.295	1.455	-2.285	-1.452	10.2	3.3	100.0	99.6	0.44
Cable4	3.395	2.095	-3.336	-2.066	59.4	28.3	100.0	98.3	1.74
Cable8	2.285	1.452	-2.276	-1.450	8.4	2.2	99.6	99.2	0.34
Cable10	2.060	1.307	-2.056	-1.306	3.1	0.7	99.2	99.1	0.14
T7	0.217	0.143	-0.215	-0.133	2.2	10.2	99.2	96.4	2.80
Cable11	1.931	1.228	-1.930	-1.228	1.2	0.2	99.1	99.0	0.06
Cable13	-0.447	-0.284	0.447	0.282	0.4	-1.9	98.9	99.0	0.08
Cable14	0.333	0.214	-0.333	-0.214	0.0	-0.4	98.9	98.9	0.01
Cable16	0.206	0.135	-0.206	-0.135	0.0	-0.2	98.9	98.9	0.00
Cable17	0.206	0.135	-0.205	-0.135	0.0	-0.1	98.9	98.9	0.01
T18	0.205	0.135	-0.204	-0.126	2.0	9.2	98.9	96.3	2.66
Cable22	-1.266	-0.810	1.266	0.810	0.1	0.0	98.4	98.4	0.01
Cable24	0.956	0.606	-0.954	-0.606	2.5	0.0	98.4	98.2	0.20
T16	0.310	0.204	-0.308	-0.191	2.3	13.5	98.4	95.9	2.44
Cable5	1.565	0.969	-1.564	-0.969	1.5	0.1	98.3	98.2	0.07
Cable25	0.591	0.381	-0.589	-0.381	2.2	-0.4	98.2	97.9	0.28
Cable7	-1.564	-0.969	1.564	0.969	0.2	0.0	98.2	98.2	0.01
Cable26	0.379	0.252	-0.379	-0.252	0.3	-0.2	97.9	97.8	0.05
T15	0.379	0.252	-0.376	-0.233	3.3	18.8	97.8	99.0	1.19
Cable27	-0.206	-0.135	0.206	0.135	0.0	-0.1	99.0	99.0	0.01
T13	0.206	0.135	-0.204	-0.126	2.0	9.2	99.0	96.4	2.66
Cable12	1.724	1.093	-1.724	-1.093	0.1	0.0	99.0	99.0	0.00
Cable21	1.277	0.810	-1.266	-0.810	10.8	0.6	99.0	98.4	0.64
					112.1	93.1			

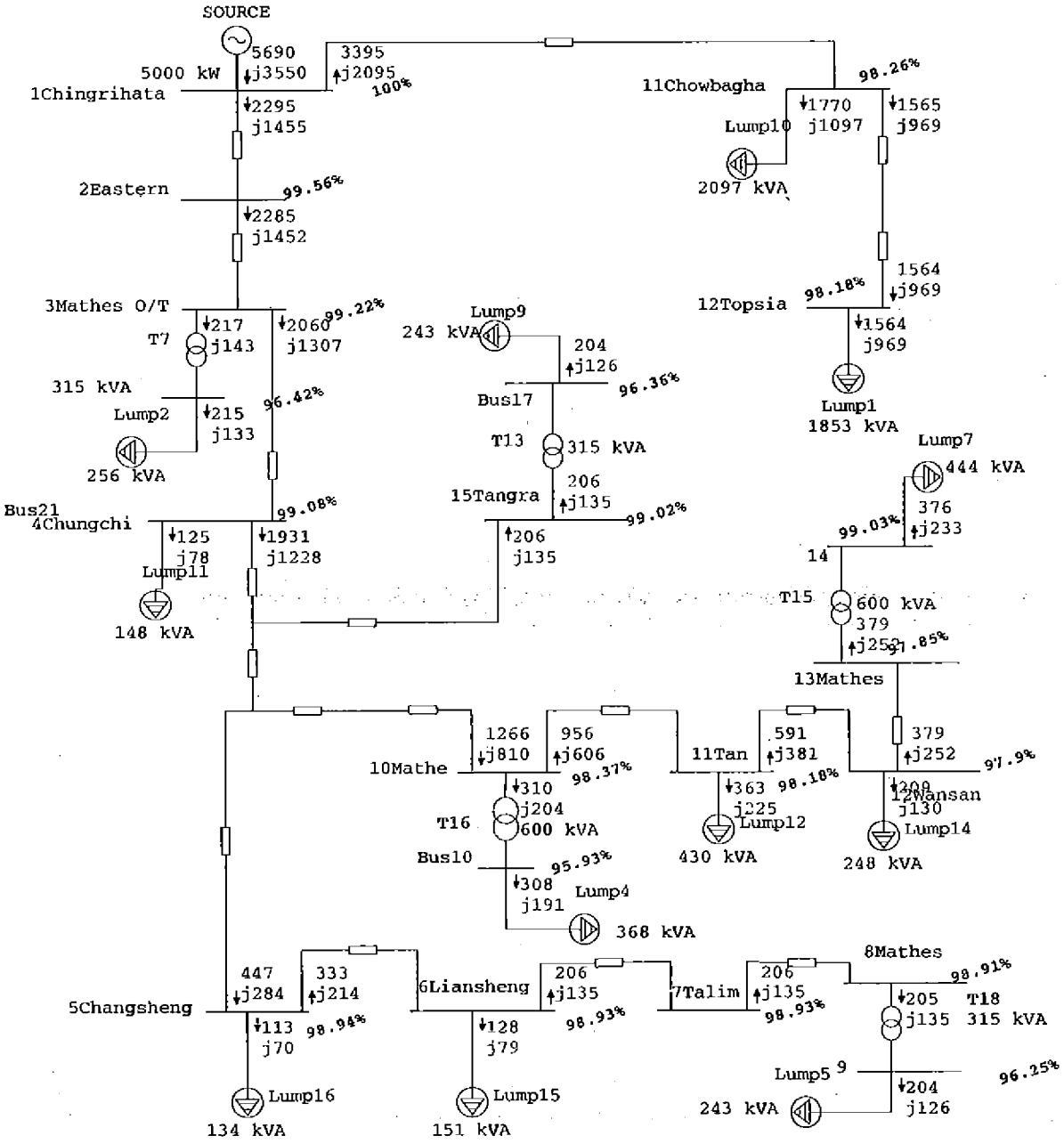
Project:	CESCLoss Study (2004-050	ETAP PowerStation	Page: 14
Location:	KOLKOTA, West Bengal	4.0.4C	Date: 08-24-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvChingrihata-Chowbhaga		Config.: Normal

Revised with increased length & 80% motor load

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	5.042	4.420	6.705	75.20 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	5.042	4.420	6.705	75.20 Lagging
Total Motor Load:	3.971	3.489	5.286	75.12 Lagging
Total Static Load:	0.949	0.834		
Apparent Losses:	0.122	0.097		
System Mismatch:	0.000	0.000		

Number of Iterations: 3


SOURCE
5690
j3550
3395
j2095
100%
5000 kW
1Chingrihata
2295
j1455
2Eastern
99.56%
2285
j1452
3Mathes O/T
217
j143
T7
2060
j1307
99.22%
315 kVA
Lump2
215
j133
96.42%
256 kVA
Bus21
4Chungchi
125
j78
1931
j1228
99.08%
Lump11
148 kVA
Lump9
243 kVA
204
j126
Bus17
96.36%
T13
315 kVA
206
j135
15Tangra
99.02%
206
j135
11Chowbagha
98.26%
1770
j1097
1565
j969
Lump10
2097 kVA
1564
j969
12Topsia
98.18%
1564
j969
Lump1
1853 kVA
Lump7
444 kVA
376
j233
99.03%
14
T15
600 kVA
379
j252
97.85%
13Mathes
1266
j810
956
j606
10Mathe
98.37%
310
j204
T16
600 kVA
Bus10
95.93%
308
j191
Lump4
368 kVA
591
j381
11Tan
379
j252
97.9%
363
j225
98.10%
Lump12
430 kVA
209
j130
12Wansan
Lump14
248 kVA
447
j284
333
j214
5Changsheng
113
j70
98.94%
Lump16
134 kVA
6Liansheng
206
j135
128
j79
98.93%
Lump15
151 kVA
7Talim
206
j135
98.93%
8Mathes
98.91%
205
j135
T18
315 kVA
Lump5
9
204
j126
96.25%
243 kVA

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation		Page:	1
Location:	Kolkota , West Bengal	4.0.4C		Date:	24-08-2005
Contract:	2004BR26			SN:	TATAENERGY
Engineer:	M.S.Bhalla,TERI, New Delhi	Study Case: LF		Revision:	Base
Filename:	6kvEntally-SaxbyFARMER			Config.:	Normal

6 kV Entally D/S - Saxby Farmer(Revised)

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	22	23

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	4	0	0	18	0	0	22

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6kvEntally-SaxbyFARMER
Output Filename:	C:\ETAP 404\PowerStation\6kvEntally-SaxbyFARMER\Untitled.lf1

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation		Page:	7
Location:	Kolkota , West Bengal	4.0.4C		Date:	24-08-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S.Bhalla,TERI, New Delhi	Study Case: LF		Revision:	Base
Filename:	6kvEntally-SaxbyFARMER			Config.:	Normal

6 kV Entally D/S - Saxby Farmer(Revised)

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1Entally	6.000	100.000	0.0	1.44	1.55	0	0	0	0	Bus7	1.44	1.55	204	68.0	
2Node	6.000	99.573	0.1	0	0	0	0	0	0	6Saxby Farmer	1.03	1.19	152	65.5	
										3Node	0.40	0.36	51	74.5	
										Bus7	-1.43	-1.55	204	67.8	
3Node	6.000	99.232	0.3	0	0	0	0	0	0	4State Lab	0.19	0.16	23	75.2	
										2Node	-0.40	-0.36	51	74 2	
										5Convent Ln	0.21	0 20	28	73.3	
4State Lab	6.000	99.143	0.3	0	0	0.11	0.10	0.07	0.06	3Node	-0.19	-0.16	24	75 0	
5Convent Ln	6.000	99.220	0 3	0	0	0	0	0	0	3Node	-0.21	-0.20	28	73.3	
										Bus6	0.21	0.20	28	73 3	-2.000
6Saxby Farmer	6.000	99.102	0.4	0	0	0.15	0.18	0.10	0.12	2Node	-1.02	-1.19	152	65.1	
										10Smith St	0.29	0.40	47	58.9	
										7Sur Iron	0 49	0.49	67	70.5	
7Sur Iron	6.000	98.843	0.5	0	0	0.07	0.09	0.04	0.06	6Saxby Farmer	-0.48	-0.49	67	70.3	
										8Canal St.	0.37	0.34	49	73.7	
8Canal St.	6.000	98.571	0.6	0	0	0	0	0	0	9Dwarka Indst	0.12	0.11	16	74.1	
										7Sur Iron	-0.37	-0.34	49	73.5	
										Bus4	0.25	0.23	33	73.2	-5.000
9Dwarka Indst	6.000	98.559	0.6	0	0	0	0	0	0	8Canal St.	-0.12	-0.11	16	74.0	
										Bus13	0.12	0.11	16	74.0	-1.500
10Smith St	6.000	99.020	0.4	0	0	0.07	0.12	0.05	0.08	Bus9	0.17	0.19	25	66.2	
										6Saxby Farmer	-0.29	-0.40	47	58.8	
11Convent RdE	6.000	98.999	0.4	0	0	0	0	0	0	Bus10	0 17	0.19	25	66 2	
										Bus9	-0.17	-0.19	25	66.2	
12Sur Ind2	6.000	98.978	0.4	0	0	0.01	0.04	0 01	0.03	Bus11	0.15	0.13	19	75.2	
										Bus10	-0.17	-0.19	25	66.0	
13 Convent Rd C	6.000	98.924	0.4	0	0	0	0	0	0	Bus12	0.03	0.02	3	78.5	
										Bus11	-0.15	-0.13	19	74.9	
										Bus2	0.12	0.11	15	74.1	-4.000
14Arim Metal	6.000	98.916	0.4	0	0	0.02	0.01	0.01	0.01	Bus12	-0.03	-0.02	3	77.0	
Bus2	0 400	101.173	-0.3	0	0	0.07	0.06	0.05	0.04	13 Convent Rd C	-0.12	-0.11	228	75.0	
Bus4	0.400	99.894	-1.0	0	0	0.15	0.13	0.10	0.09	8Canal St.	-0.25	-0.22	474	75.0	
Bus6	0.400	97.792	-1.2	0	0	0.13	0.11	0.08	0.07	5Convent Ln	-0.21	-0 18	411	75.0	
Bus7	6.000	99.918	0.0	0	0	0	0	0	0	1Entally	-1.44	-1.55	204	68.0	
										2Node	1.44	1.55	204	68.0	
Bus9	6.000	99.009	0.4	0	0	0	0	0	0	10Smith St	-0.17	-0.19	25	66 2	
										11Convent RdE	0.17	0.19	25	66 2	
Bus10	6.000	98.993	0.4	0	0	0	0	0	0	11Convent RdE	-0.17	-0.19	25	66.1	
										12Sur Ind2	0.17	0.19	25	66.1	

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 8
Location:	Kolkota , West Bengal	4.0.4C	Date: 24-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla,TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kvEntally-SaxbyFARMER		Config.: Normal

6 kV Entally D/S - Saxby Farmer(Revised)

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
Bus11	6.000	98.933	0.4	0	0	0	0	0	0	12Sur Ind2	-0.15	-0.13	19	75.0	
										13 Convent Rd C	0.15	0.13	19	75.0	
Bus12	6.000	98 917	0.4	0	0	0	0	0	0	13 Convent Rd C	-0.03	-0.02	3	77.7	
										14Arim Metal	0.03	0.02	3	77.7	
Bus13	0.400	98.040	-0.3	0	0	0 07	0.07	0.05	0 04	9Dwarka Indst	-0.12	-0.11	240	75.0	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 11
Location:	Kolkota , West Bengal	4.0.4C	Date: 24-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla,TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kvEntally-SaxbyFARMER		Config.: Normal

6 kV Entally D/S - Saxby Farmer(Revised)

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable3	1.443	1.554	-1.441	-1.554	2.1	0.3	100.0	99.9	0.08
Cable4	1.034	1.194	-1.024	-1.193	9.3	0.8	99.6	99.1	0.47
Cable8	0.400	0.359	-0.398	-0.359	2.2	-0.8	99.6	99.2	0.34
Cable19	-1.433	-1.552	1.441	1.554	7.8	1.9	99.6	99.9	0.35
Cable5	0.186	0.163	-0.185	-0.164	0.3	-0.6	99.2	99.1	0.09
Cable11	0.212	0.196	-0.212	-0.196	0.0	-0.1	99.2	99.2	0.01
T5	0.212	0.196	-0.209	-0.185	2.5	11.9	99.2	97.8	1.43
Cable6	0.290	0.398	-0.289	-0.398	0.5	-0.5	99.1	99.0	0.08
Cable12	0.487	0.490	-0.484	-0.490	2.3	-0.4	99.1	98.8	0.26
Cable13	0.375	0.344	-0.373	-0.345	1.7	-0.7	98.8	98.6	0.27
Cable7	0.123	0.112	-0.123	-0.112	0.0	-0.1	98.6	98.6	0.01
T3	0.250	0.233	-0.247	-0.217	3.3	15.3	98.6	99.9	1.32
T7	0.123	0.112	-0.123	-0.108	0.9	4.1	98.6	98.0	0.52
Cable1	0.171	0.194	-0.171	-0.194	0.0	-0.1	99.0	99.0	0.01
Cable14	0.171	0.194	-0.171	-0.194	0.0	-0.1	99.0	99.0	0.01
Cable20	-0.171	-0.194	0.171	0.194	0.0	-0.1	99.0	99.0	0.01
Cable15	0.149	0.130	-0.148	-0.131	0.1	-0.7	99.0	98.9	0.05
Cable21	-0.171	-0.195	0.171	0.194	0.0	-0.8	99.0	99.0	0.01
Cable17	0.027	0.022	-0.027	-0.022	0.0	-0.6	98.9	98.9	0.01
Cable22	-0.148	-0.131	0.148	0.131	0.0	-0.4	98.9	98.9	0.01
T1	0.121	0.110	-0.120	-0.106	0.8	3.6	98.9	101.2	2.25
Cable23	-0.027	-0.023	0.027	0.022	0.0	-0.5	98.9	98.9	0.00
					34.0	31.4			

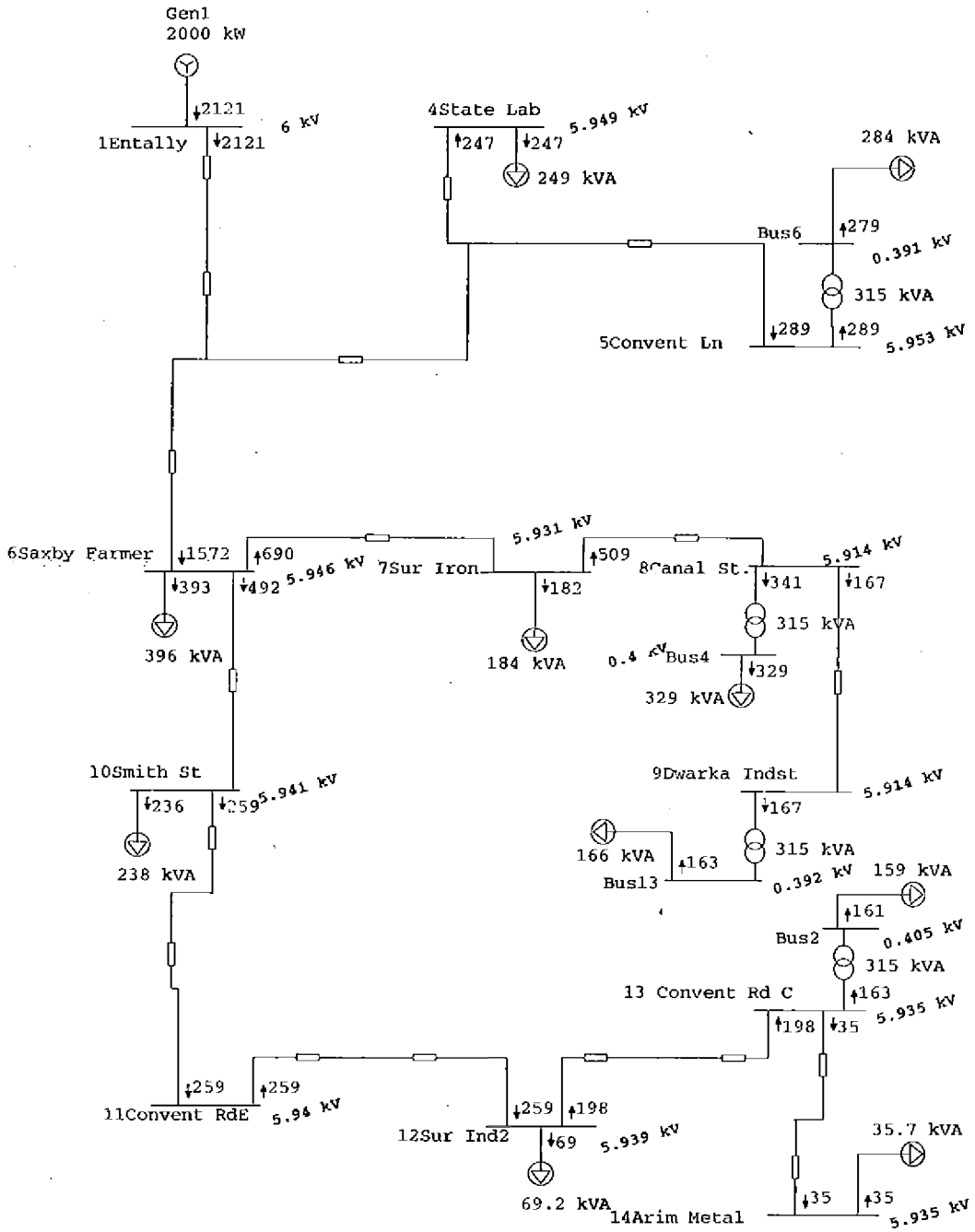
Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation		Page:	14
Location:	Kolkota , West Bengal	4.0.4C		Date:	24-08-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S.Bhalla,TERI, New Delhi	Study Case: LF		Revision:	Base
Filename:	6kvEntally-SaxbyFARMER			Config.:	Normal

6 kV Entally D/S - Saxby Farmer(Revised)

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	1.443	1.554	2.121	68.05 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	1.443	1.554	2.121	68.05 Lagging
Total Motor Load:	0.852	0.920	1.254	67.92 Lagging
Total Static Load:	0.558	0.602		
Apparent Losses:	0.034	0.031		
System Mismatch:	0.000	0.000		

Number of Iterations: 2


Gen1
2000 kW
2121
1Entally
2121
6 kV
4State Lab
247
247
5.949 kV
249 kVA
284 kVA
Bus6
279
0.391 kV
315 kVA
5Convent Ln
289
289
5.953 kV
6Saxby Farmer
1572
690
5.946 kV
393
492
396 kVA
7Sur Iron
5.931 kV
509
182
184 kVA
8Canal St.
5.914 kV
341
167
315 kVA
0.4 kV Bus4
329
329 kVA
10Smith St
236
259
5.941 kV
238 kVA
9Dwarka Indst
5.914 kV
167
166 kVA
163
Bus13
315 kVA
0.392 kV
159 kVA
161
Bus2
0.405 kV
315 kVA
13 Convent Rd C
163
198
35
5.935 kV
259
259
11Convent RdE
5.94 kV
259
198
12Sur Ind2
69
5.939 kV
69.2 kVA
35.7 kVA
35
35
14Arim Metal
5.935 kV

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 1
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth, TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	6kVDumdum-RMI		Config.: Normal

6kV Dumdum D/S - RMI Feeder (Modified with revised loads & cable lengths)

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	27	28

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	3	0	0	24	0	0	27

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6kVDumdum-RMI
Output Filename:	C:\ETAP 404\PowerStation\6kVDumdum-RMI\Dum-RMI.lf1

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 7
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth, TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	6kVDumdum-RMI		Config.: Normal

6kV Dumdum D/S - RMI Feeder (Modified with revised loads & cable lengths)

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
Bus1	6.000	99.876	0.0	0	0	0	0	0	0	N2RMI	-1.73	-0.80	183	90.8	
										N3 Ordin	1.73	0.80	183	90.8	
Bus2	6.000	98.953	0.1	0	0	0	0	0	0	N3 Ordin	-0.31	-0.33	44	67.9	
										N8 Const. Mach	0.00	0.00	0	0.0	
										Bus3	0.31	0.33	44	67.9	
Bus3	6.000	98.716	0.2	0	0	0	0	0	0	Bus2	-0.31	-0.33	44	67.6	
										Bus4	0.31	0.33	44	67.6	
Bus4	6.000	98.602	0.3	0	0	0	0	0	0	Bus3	-0.31	-0.33	44	67.5	
										N5 EMRd.	0.31	0.33	44	67.5	
Bus5	0.400	97.877	-0.8	0	0	0.09	0.08	0.06	0.05	N5 EMRd.	-0.15	-0.14	301	75.0	
Bus6	0.400	99.067	-0.1	0	0	0.05	0.04	0.03	0.03	N6 Mall Rd.	-0.08	-0.07	150	75.0	
Bus9	6.000	99.604	0.2	0	0	0	0	0	0	N9 DumdumT/H	-0.09	-0.15	17	50.4	
										Bus10	0.09	0.15	17	50.4	
Bus10	6.000	99.549	0.2	0	0	0	0	0	0	Bus9	-0.09	-0.15	17	50.2	
										Bus12	0.09	0.15	17	50.2	
Bus12	6.000	99.548	0.2	0	0	0	0	0	0	Bus10	-0.09	-0.15	17	50.1	
										N10 APV Engg.	0.09	0.15	17	50.1	
Bus14	6.000	99.698	0.1	0	0	0	0	0	0	N9 DumdumT/H	-0.26	-0.13	28	90.4	
										N15 Palan	0.26	0.13	28	90.4	
Bus26	6.000	99.235	0.2	0	0	0	0	0	0	N12 Dum Exch	-0.13	-0.11	16	75.2	
										Bus27	0.13	0.11	16	75.2	
Bus27	6.000	99.233	0.2	0	0	0	0	0	0	Bus26	-0.13	-0.11	16	75.2	
										Bus28	0.13	0.11	16	75.2	
Bus28	6.000	99.227	0.2	0	0	0	0	0	0	Bus27	-0.13	-0.11	16	75.0	
										N13 Wesman	0.13	0.11	16	75.0	
Jessore Rd.	0.400	99.158	-1.0	0	0	0.09	0.08	0.06	0.05	N11 Jessore Rd.	-0.15	-0.14	300	75.0	
* N1Dumdum	6.000	100.000	0.0	2.72	1.58	0	0	0	0	N2RMI	2.72	1.58	302	86.4	
N2RMI	6.000	99.977	0.0	0	0	0	0	0	0	N1Dumdum	-2.72	-1.58	302	86.4	
										Bus1	1.73	0.80	183	90.8	
										N9 DumdumT/H	0.99	0.79	121	78.4	
N3 Ordin	6.000	99.099	0.0	0	0	0.85	0.28	0.55	0.18	Bus1	-1.71	-0.79	183	90.7	
										Bus2	0.31	0.33	44	68.1	
N5 EMRd.	6.000	98.442	0.3	0	0	0	0	0	0	Bus4	-0.30	-0.34	44	67.3	
										N6 Mall Rd.	0.15	0.19	23	61.3	
										Bus5	0.15	0.14	20	73.7	-2.000
N6 Mall Rd.	6.000	98.339	0.4	0	0	0	0	0	0	N5 EMRd.	-0.15	-0.19	24	61.0	
										N7 Dum Bearing	0.07	0.12	14	50.1	
										Bus6	0.08	0.07	10	74.4	-2.000
N7 Dum Bearing	6.000	98.326	0.4	0	0	0.04	0.08	0.03	0.05	N6 Mall Rd	-0.07	-0.12	14	50.0	

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 8
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth, TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	6kVDumdum-RMI		Config.: Normal

6kV Dumdum D/S - RMI Feeder (Modified with revised loads & cable lengths)

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
N8 Const. Mach.	6.000	98.953	0.1	0	0	0	0	0	0	Bus2	0.00	0.00	0	0.0	
N9 DumdumT/H	6.000	99.704	0.1	0	0	0	0	0	0	N2RMI	-0.99	-0.79	121	78.3	
										Bus9	0.09	0.15	17	50.7	
										N11 Jessore Rd.	0.16	0.14	20	74.0	
										Bus14	0.26	0.13	28	90.4	
										N12 Dum Exch	0.48	0.37	58	79.5	
N10 APV Engg.	6.000	99.540	0.2	0	0	0.05	0.09	0.04	0.06	Bus12	-0.09	-0.16	17	50.0	
N11 Jessore Rd.	6.000	99.691	0.1	0	0	0	0	0	0	N9 DumdumT/H	-0.16	-0.14	20	73.8	
										Jessore Rd.	0.16	0.14	20	73.8	-2.000
N12 Dum Exch	6.000	99.452	0.1	0	0	0.21	0.16	0.14	0.10	N9 DumdumT/H	-0.48	-0.37	58	79.3	
										Bus26	0.13	0.10	15	77.3	
N13 Wesman	6.000	99.226	0.2	0	0	0.08	0.07	0.05	0.04	Bus28	-0.13	-0.11	16	75.0	
N15 Palan	6.000	99.368	0.1	0	0	0.16	0.08	0.10	0.05	Bus14	-0.26	-0.13	28	90.0	
										N16Nireka	0.00	0.00	0	0.0	
N16Nireka	6.000	99.368	0.1	0	0	0	0	0	0	N15 Palan					

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**		Page:	11
Location:	Kolkata, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	Navin Seth, TERI, New Delhi.			Revision:	Base
Filename:	6kVDumdum-RMI	Study Case: LF		Config.:	Normal

6kV Dumdum D/S - RMI Feeder (Modified with revised loads & cable lengths)

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		% Vd Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable2	-1.725	-0.796	1.727	0.796	1.6	0.1	99.9	100.0	0.10
Cable3	1.725	0.796	-1.711	-0.793	14.0	3.0	99.9	99.1	0.78
Cable4	-0.308	-0.333	0.309	0.332	0.8	-0.9	99.0	99.1	0.15
Cable5	0.000	0.000	0.000	0.000	0.0	-0.2	99.0	99.0	0.00
Cable6	0.308	0.333	-0.307	-0.334	1.4	-0.8	99.0	98.7	0.24
Cable7	0.307	0.334	-0.306	-0.335	0.6	-0.7	98.7	98.6	0.11
Cable8	0.306	0.335	-0.305	-0.335	1.0	-0.6	98.6	98.4	0.16
T1	-0.153	-0.135	0.155	0.142	1.4	6.5	97.9	98.4	0.57
T2	-0.077	-0.068	0.078	0.070	0.3	1.6	99.1	98.3	0.73
Cable15	-0.090	-0.154	0.090	0.153	0.3	-0.9	99.6	99.7	0.10
Cable16	0.090	0.154	-0.090	-0.155	0.2	-0.7	99.6	99.5	0.05
Cable17	0.090	0.155	-0.090	-0.155	0.0	0.0	99.5	99.5	0.00
Cable19	0.090	0.155	-0.090	-0.155	0.0	-0.6	99.5	99.5	0.01
Cable21	-0.264	-0.125	0.264	0.125	0.0	0.0	99.7	99.7	0.01
Cable22	0.264	0.125	-0.263	-0.127	1.0	-1.9	99.7	99.4	0.33
Cable33	-0.127	-0.111	0.127	0.104	0.4	-6.8	99.2	99.5	0.22
Cable34	0.127	0.111	-0.127	-0.111	0.0	-0.1	99.2	99.2	0.00
Cable35	0.127	0.111	-0.127	-0.112	0.0	-0.5	99.2	99.2	0.01
Cable36	0.127	0.112	-0.127	-0.112	0.0	-0.1	99.2	99.2	0.00
T3	-0.155	-0.137	0.156	0.143	1.4	6.5	99.2	99.7	0.53
Cable1	2.721	1.583	-2.721	-1.582	0.3	0.7	100.0	100.0	0.02
Cable11	0.994	0.786	-0.990	-0.786	4.0	0.1	100.0	99.7	0.27
Cable9	0.150	0.193	-0.150	-0.194	0.4	-0.9	98.4	98.3	0.10
Cable10	0.072	0.125	-0.072	-0.125	0.0	-0.3	98.3	98.3	0.01
Cable20	0.156	0.142	-0.156	-0.143	0.0	-1.2	99.7	99.7	0.01
Cable24	0.479	0.365	-0.478	-0.367	1.5	-1.7	99.7	99.5	0.25
Cable23	0.000	0.000			0.0	-0.3	99.4	99.4	0.00
					30.7	-0.6			

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 14
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth, TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	6kVDumdum-RMI		Config.: Normal

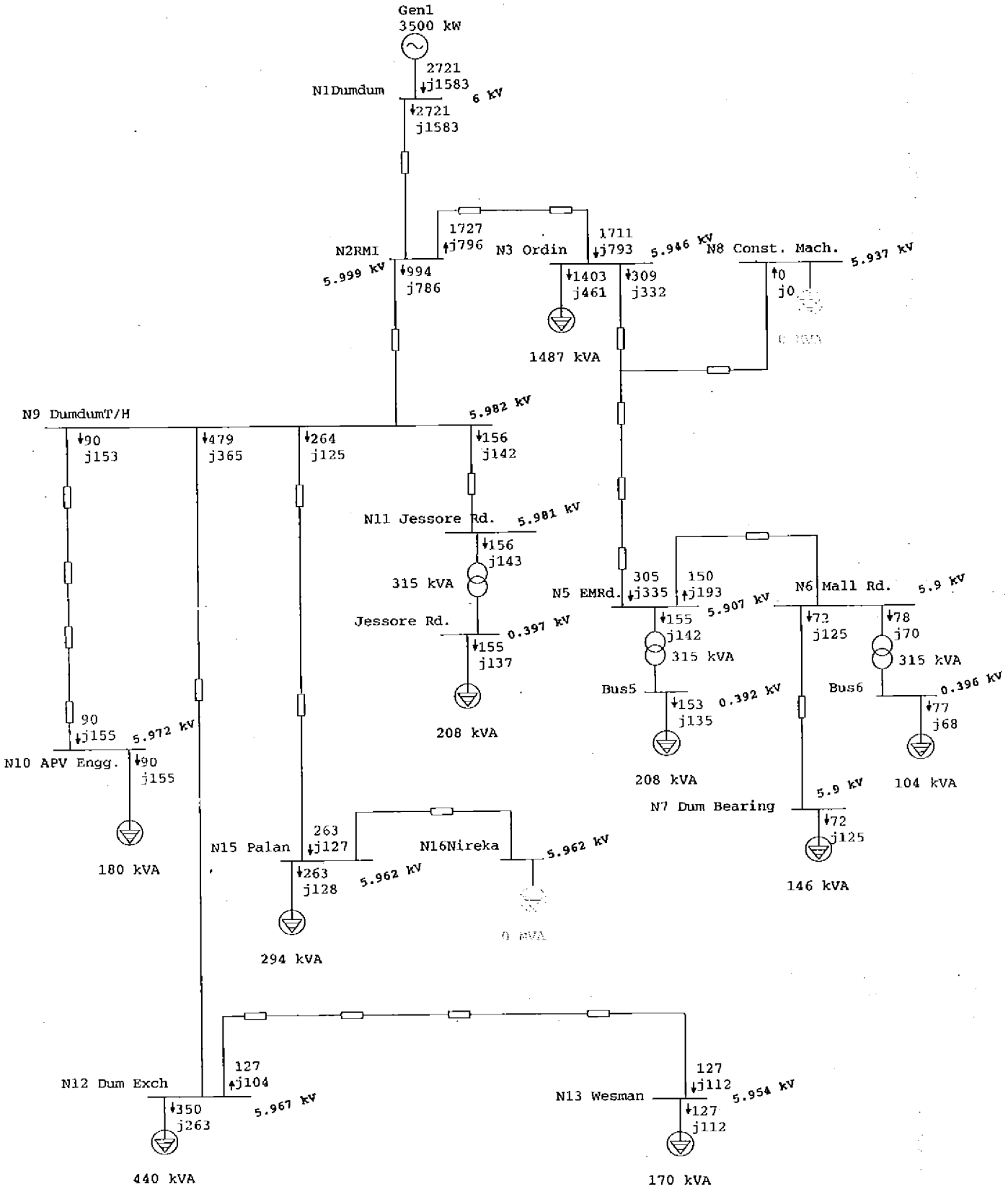
6kV Dumdum D/S - RMI Feeder (Modified with revised loads & cable lengths)

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	2.721	1.583	3.148	86.44 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	2.721	1.583	3.148	86.44 Lagging
Total Motor Load:	1.626	0.957	1.887	86.18 Lagging
Total Static Load:	1.065	0.626		
Apparent Losses:	0.031	-0.001		
System Mismatch:	0.000	0.000		

Number of Iterations: 2

One-Line Diagram - OLV1



Project:	CESC Loss Study Report	ETAP PowerStation	Page: 1
Location:	KOLKOTA, West Bengal	4.0.4C	Date: 08-06-2005
Contract:	2004 ER 26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvParkLn--ParkStW		Config.: Normal

Revised with increased length & 60% Motor load

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	17	18

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	5	0	0	12	0	0	17

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6kvParkLn--ParkStW
Output Filename:	C:\ETAP 404\PowerStation\6kvParkLn--ParkStW\Untitled.lf1

Project: CESC Loss Study Report
Location: KOLKOTA, West Bengal
Contract: 2004 ER 26
Engineer: M.S.Bhalla
Filename: 6kvParkLn;-ParkStW

ETAP PowerStation
4.0.4C

Study Case: LF

Page: 7
Date: 08-06-2005
SN: TATAENERGY
Revision: Base
Config.: Normal

Revised with increased length & 60% Motor load

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1ParkLn	6.000	100.000	0.0	3.25	1.76	0	0	0	0	2ParkSt	3.25	1.76	355	87.9	
2ParkSt	6.000	98.436	0.0	0	0	0	0	0	0	1ParkLn	-3.20	-1.74	356	87.8	
										4ParkSt3	2.83	1.53	314	88.0	
										5Park	0.37	0.22	41	86.4	
4ParkSt3	6.000	98.388	0.0	0	0	0	0	0	0	2ParkSt	-2.83	-1.53	314	88.0	
										6 SVFood	2.71	1.46	300	88.0	
										6Park	0.12	0.07	13	87.2	
5Park	0.400	95.810	-1.9	0	0	0.30	0.16	0.07	0.04	2ParkSt	-0.37	-0.20	626	88.0	
6Park	0.400	96.976	-1.0	0	0	0.10	0.05	0.02	0.01	4ParkSt3	-0.12	-0.07	204	88.0	
6 SVFood	6.000	98.118	-0.1	0	0	0.08	0.04	0.02	0.01	4ParkSt3	-2.70	-1.46	300	88.0	
										7Midleton	2.60	1.40	289	88.0	
7Midleton	6.000	97.968	-0.1	0	0	0	0	0	0	6 SVFood	-2.60	-1.40	290	88.0	
										9APSARA	2.42	1.30	270	88.1	
										8Mton	0.18	0.10	19	86.8	
8Mton	0.400	95.903	-1.5	0	0	0.14	0.08	0.03	0.02	7Midleton	-0.17	-0.09	297	88.0	
9APSARA	6.000	97.788	-0.1	0	0	0.12	0.07	0.03	0.02	7Midleton	-2.42	-1.30	270	88.1	
										10Mdlton2	2.27	1.22	253	88.1	
10MD3	0.400	96.536	-0.8	0	0	0.07	0.04	0.02	0.01	10Mdlton2	-0.09	-0.05	153	88.0	
10Mdlton2	6.000	97.593	-0.1	0	0	0	0	0	0	12Camac	2.17	1.17	243	88.1	
										9APSARA	-2.26	-1.22	253	88.1	
										10MD3	0.09	0.05	10	87.4	
12Camac	6.000	97.170	-0.1	0	0	0	0	0	0	14Abloom	2.07	1.11	232	88.1	
										10Mdlton2	-2.16	-1.16	243	88.1	
										13Camac	0.10	0.05	10	87.3	
13Camac	0.400	96.038	-0.9	0	0	0.08	0.04	0.02	0.01	12Camac	-0.10	-0.05	164	88.0	
14Abloom	6.000	96.978	-0.1	0	0	0.32	0.17	0.08	0.04	12Camac	-2.06	-1.11	232	88.1	
										15Cont	1.67	0.89	187	88.1	
15Cont	6.000	96.831	-0.1	0	0	0.12	0.06	0.03	0.01	14Abloom	-1.66	-0.89	187	88.1	
										16 Camac	1.52	0.82	171	88.1	
16 Camac	6.000	96.730	-0.1	0	0	0.14	0.08	0.03	0.02	15Cont	-1.52	-0.82	171	88.1	
										18CMC	0.83	0.45	93	88.1	
										17Somnath	0.52	0.28	58	88.1	
17Somnath	6.000	96.653	-0.1	0	0	0.42	0.23	0.10	0.05	16 Camac	-0.52	-0.28	58	88.0	
18CMC	6.000	96.652	-0.1	0	0	0.67	0.36	0.16	0.08	16 Camac	-0.83	-0.45	93	88.0	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study Report	ETAP PowerStation	Page: 10
Location:	KOLKOTA, West Bengal	4.0.4C	Date: 08-06-2005
Contract:	2004 ER 26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvParkLn--ParkStW		Config.: Normal

Revised with increased length & 60% Motor load

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	3.249	1.765	-3.199	-1.742	49.6	22.5	100.0	98.4	1.56
Cable6	2.830	1.527	-2.829	-1.526	1.3	0.6	98.4	98.4	0.05
T1	0.369	0.215	-0.366	-0.198	3.1	17.8	98.4	95.8	2.63
Cable8	2.707	1.458	-2.700	-1.455	7.2	2.9	98.4	98.1	0.27
T3	0.121	0.068	-0.121	-0.065	0.6	3.0	98.4	97.0	1.41
Cable9	2.603	1.403	-2.599	-1.401	3.9	1.5	98.1	98.0	0.15
Cable10	2.424	1.301	-2.420	-1.299	4.3	1.5	98.0	97.8	0.18
T5	0.175	0.100	-0.174	-0.094	1.3	6.3	98.0	95.9	2.06
Cable19	2.269	1.218	-2.264	-1.217	4.4	1.4	97.8	97.6	0.19
T9	-0.090	-0.049	0.091	0.050	0.4	1.7	96.5	97.6	1.06
Cable17	2.174	1.166	-2.164	-1.164	9.2	2.7	97.6	97.2	0.42
Cable11	2.068	1.110	-2.064	-1.109	4.0	1.1	97.2	97.0	0.19
T12	0.097	0.054	-0.096	-0.052	0.4	1.9	97.2	96.0	1.13
Cable13	1.666	0.894	-1.663	-0.893	2.5	0.2	97.0	96.8	0.15
Cable14	1.521	0.817	-1.519	-0.817	1.5	0.0	96.8	96.7	0.10
Cable15	0.830	0.447	-0.829	-0.448	0.7	-0.9	96.7	96.7	0.08
Cable16	0.517	0.277	-0.517	-0.279	0.4	-1.9	96.7	96.7	0.08
					94.8	62.3			

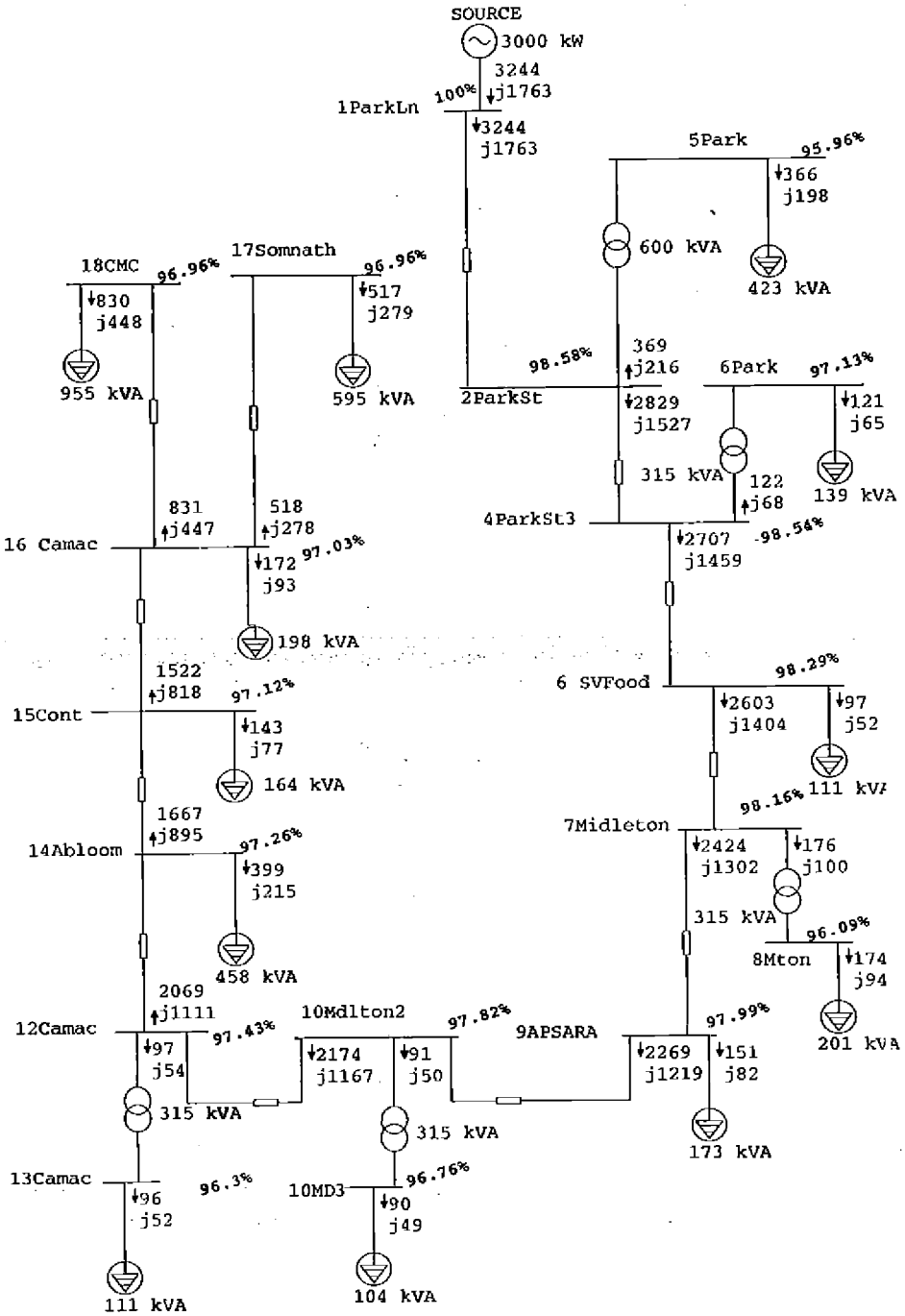
Project:	CESC Loss Study Report	ETAP PowerStation	Page: 13
Location:	KOLKOTA, West Bengal	4.0.4C	Date: 08-24-2005
Contract:	2004 ER 26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvParkLn--ParkStW		Config.: Normal

Revised with increased length & 60% Motor load

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	3.020	2.129	3.695	81.73 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	3.020	2.129	3.695	81.73 Lagging
Total Motor Load:	2.372	1.675	2.904	81.68 Lagging
Total Static Load:	0.553	0.391		
Apparent Losses:	0.095	0.062		
System Mismatch:	0.000	0.000		

Number of Iterations: 3


SOURCE
3000 kW
3244
j1763
100%
1ParkLn
3244
j1763
5Park
95.96%
366
j198
600 kVA
423 kVA
18CMC
96.96%
830
j448
17Somnath
96.96%
517
j279
955 kVA
595 kVA
98.58%
369
j216
2ParkSt
2829
j1527
6Park
97.13%
121
j65
315 kVA
122
j68
139 kVA
4ParkSt3
2707
j1459
98.54%
831
j447
518
j278
16 Camac
172
j93
97.03%
198 kVA
6 SVFood
98.29%
2603
j1404
97
j52
111 kVA
1522
j818
97.12%
15Cont
143
j77
164 kVA
98.16%
7Midleton
2424
j1302
176
j100
315 kVA
96.09%
8Mton
174
j94
201 kVA
1667
j895
97.26%
14Abloom
399
j215
458 kVA
2069
j1111
12Camac
97.43%
97
j54
10Mdlton2
97.82%
2174
j1167
91
j50
9APSARA
97.99%
2269
j1219
151
j82
315 kVA
315 kVA
173 kVA
13Camac
96
j52
96.3%
10MD3
96.76%
90
j49
111 kVA
104 kVA

Project:	CESC Loss Study Report(2004-05	**ETAP PowerStation**	Page: 1
Location:	KOLKOTA, West Bengal	4.0.4C	Date: 08-06-2005
Contract:	2004ER26, TERI, New Delhi		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvHideRoad--3wayLC1		Config.: Normal

Revised for increased lengths and 80 % motor load

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	40	41

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	5	0	0	36	0	0	41

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6kvHideRoad--3wayLC1
Output Filename:	C:\ETAP 404\PowerStation\6kvHideRoad--3wayLC1\HideRE.lf1

Project:	CESC Loss Study Report(2004-05	**ETAP PowerStation**	Page: 3
Location:	KOLKOTA, West Bengal	4.0.4C	Date: 07-21-2005
Contract:	2004ER26, TERI, New Delhi		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvHideRoad--3wayLC1		Config.: Normal

Revised for increased lengths, metric system

Bus			Initial Voltage		Generator		Motor Load		Static Load		Mvar Limits	
ID	Type	kV	% Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	Max.	Min.
N2	Load	6.000	100.0	0.0								
N5	Load	6.000	100.0	0.0								
SRS	Load	0.400	100.0	0.0			0.193	0.120	0.048	0.030		
Total Number of Buses: 41					0.000	0.000	2.763	1.539	0.691	0.385		

Project:	CESC Loss Study Report(2004-05	ETAP PowerStation	Page: 4
Location:	KOLKOTA, West Bengal	4.0.4C	Date: 07-21-2005
Contract:	2004ER26, TERI, New Delhi		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvHideRoad--3wayLC1		Config.: Normal

Revised for increased lengths, metric system

LINE / CABLE Input Data

Line/Cable	Ohms or Mohs / 1000 m per Conductor (Cable) or per Phase (Line)							
ID	Library	Size	Length(m)	#/Phase	T (°C)	R	X	Y
Cable1			17.0	1	75	0.032800	0.012200	0.0003000
Cable3			1650.0	1	75	0.144800	0.081000	0.0002000
Cable5			72.0	1	75	0.124800	0.075400	0.0002000
Cable6			25.0	1	75	0.166800	0.077900	0.0002000
Cable8			110.0	1	75	0.240900	0.086400	0.0001000
Cable10			17.0	1	75	0.124800	0.075400	0.0002000
Cable12			45.0	1	75	0.240900	0.086400	0.0001000
Cable14			84.0	1	75	0.166200	0.077900	0.0002000
Cable16			345.0	1	75	0.240900	0.086400	0.0001000
Cable17			35.0	1	75	0.248400	0.081400	0.0002000
Cable19			150.0	1	75	0.166200	0.077900	0.0002000
Cable21			338.0	1	75	0.240900	0.086400	0.0001000
Cable23			24.0	1	75	0.248400	0.081000	0.0002000
Cable24			15.0	1	75	0.166200	0.077900	0.0002000
Cable25			170.0	1	75	0.897800	0.106000	0.0001000
Cable26			60.0	1	75	0.747600	0.094200	0.0001000
Cable28			260.0	1	75	0.897800	0.106000	0.0001000
Cable30			116.0	1	75	0.747600	0.094200	0.0001000
Cable31			25.0	1	75	0.747600	0.094200	0.0001000
Cable33			110.0	1	75	0.240900	0.086400	0.0001000
Cable35			40.0	1	75	0.144800	0.081000	0.0002000
Cable37			33.0	1	75	0.166200	0.077900	0.0002000
Cable39			65.0	1	75	0.144800	0.081000	0.0002000
Cable41			37.0	1	75	0.166200	0.077900	0.0002000
Cable43			300.0	1	75	0.240900	0.086400	0.0001000
Cable44			223.0	1	75	0.747600	0.094200	0.0001000
Cable45			184.0	1	75	0.240900	0.086400	0.0001000
Cable47			176.0	1	75	0.747600	0.094200	0.0001000
Cable48			490.0	1	75	0.747600	0.094200	0.0001000
Cable50			1400.0	1	75	0.144800	0.081000	0.0002000
Cable52			50.0	1	75	0.124800	0.075400	0.0002000
Cable54			450.0	1	75	0.166800	0.077900	0.0002000
Cable56			33.0	1	75	0.747600	0.094200	0.0001000
Cable58			1900.0	1	75	0.144800	0.081000	0.0002000
Cable60			225.0	1	75	0.166800	0.077900	0.0002000
Cable62			72.0	1	75	0.124800	0.075400	0.0002000

Line / Cable resistances are listed at the specified temperatures.

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Location:	KOLKOTA, West Bengal	4.0.4C	Date: 07-21-2005
Contract:	2004ER26, TERI, New Delhi		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvHideRoad--3wayLC1		Config.: Normal

Revised for increased lengths, metric system

2-WINDING TRANSFORMER Input Data

Transformer	Rating					Z Variation			% Tap Setting		Adjusted	Phase Shift	
ID	MVA	Prim. kV	Sec. kV	% Z	X/R	+ 5%	- 5%	% Tol.	Prim.	Sec.	% Z	Type	Angle
T2	0.400	6.000	0.400	4.800	4.7	5.00	-5.00	0	-1.000	0	4.7520	Std Pos. Seq.	0.0
T4	0.400	6.000	0.400	4.800	4.7	5.00	-5.00	0	-1.000	0	4.7520	Std Pos. Seq.	0.0
T5	0.315	6.000	0.400	4.800	4.7	0	0	0	-1.000	0	4.8000	Std Pos. Seq.	0.0
T7	0.200	6.000	0.400	4.800	4.7	0	0	0	0	0	4.8000	Std Pos. Seq.	0.0
T9	0.850	6.000	0.400	4.800	4.7	0	0	0	-1.000	0	4.8000	Std Pos. Seq.	0.0

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Contract:	2004ER26, TERI, New Delhi		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvHideRoad--3wayLC1		Config.: Normal

Revised for increased lengths, metric system

BRANCH CONNECTIONS

CKT/Branch		Connected Bus ID		% Impedance, Pos. Seq., 100 MVAb			
ID	Type	From Bus	To Bus	R	X	Z	Y
T2	2W XFMR	6Hide I	Hide	239.84	1127.25	1152.48	
T4	2W XFMR	6Hide I	Hide	239.84	1127.25	1152.48	
T5	2W XFMR	11Hide	Hide 2	310.77	1460.64	1493.33	
T7	2W XFMR	12B Bridge	Ba Lawri	499.46	2347.45	2400.00	
T9	2W XFMR	5SRS	SRS	115.17	541.30	553.41	
Cable1	Cable	1Hide	2LC	0.15	0.06	0.17	0.0001836
Cable3	Cable	2LC	Bus7	66.37	37.13	76.04	0.0118800
Cable5	Cable	Bus8	6Hide I	2.50	1.51	2.92	0.0005184
Cable6	Cable	Bus7	Bus8	1.16	0.54	1.28	0.0001800
Cable8	Cable	6Hide I	N5	7.36	2.64	7.82	0.0003960
Cable10	Cable	N5	13Bi.Lawrie	0 59	0.36	0.69	0.0001224
Cable12	Cable	13Bi Lawrie	14	3.01	1.08	3.20	0.0001620
Cable14	Cable	14	Bus5	3.88	1.82	4.28	0.0006048
Cable16	Cable	Bus5	Bus22	23.09	8.28	24.53	0.0012420
Cable17	Cable	Bus22	Bus4	2.41	0.79	2.54	0.0002520
Cable19	Cable	Bus4	15SLids	6.92	3.25	7.65	0.0010800
Cable21	Cable	15SLids	Bus13	22.62	8.11	24 03	0.0012168
Cable23	Cable	Bus13	Bus14	1.66	0.54	1.74	0.0001728
Cable24	Cable	Bus14	16Minerals	0.69	0.32	0.76	0.0001080
Cable25	Cable	Bus5	N2	42.40	5.01	42.69	0.0006120
Cable26	Cable	N2	17IndRods	12.46	1.57	12.56	0.0002160
Cable28	Cable	Bus6	17IndRods	64.84	7.66	65.29	0.0009360
Cable30	Cable	18Sonarpur	Bus6	24.09	3.04	24.28	0.0004176
Cable31	Cable	Bus15	19WRpr	5.19	0.65	5.23	0.0000900
Cable33	Cable	18Sonarpur	Bus15	7.36	2.64	7.82	0.0003960
Cable35	Cable	6Hide I	Bus26	1.61	0.90	1.84	0.0002880
Cable37	Cable	Bus26	7Ba Lawrie	1.52	0.71	1.68	0.0002376
Cable39	Cable	7Ba Lawrie	Bus12	2.61	1.46	3.00	0.0004680
Cable41	Cable	Bus12	8Glaxo	1.71	0.80	1.89	0.0002664
Cable43	Cable	9M.Box	8Glaxo	20.07	7.20	21.33	0.0010800
Cable44	Cable	Bus27	9M.Box	46.31	5.84	46.68	0.0008028
Cable45	Cable	12B Bridge	Bus27	12.31	4.42	13.08	0.0006624
Cable47	Cable	10Lipton	9M Box	36 55	4.61	36.84	0.0006336
Cable48	Cable	11Hide	10Lipton	101.76	12.82	102.56	0.0017640
Cable50	Cable	Bus9	2LC	56.31	31.50	64.52	0.0100800
Cable52	Cable	Bus10	Bus9	1.73	1.05	2.03	0.0003600
Cable54	Cable	3Indian oil	Bus10	20.85	9.74	23.01	0.0032400
Cable56	Cable	4ware housing	3Indian oil	6.85	0.86	6 91	0.0001188
Cable58	Cable	Bus2	3Indian oil	76.42	42.75	87.57	0.0136800
Cable60	Cable	Bus11	Bus2	10.43	4.87	11.51	0.0016200

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Contract:	2004ER26, TERI, New Delhi		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvHideRoad--3wayLC1		Config.: Normal

Revised for increased lengths, metric system

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1Hide	6.000	100.000	0.0	3.52	1.91	0	0	0	0	2LC	3.52	1.91	385	87.9	
2LC	6.000	99.993	0.0	0	0	0	0	0	0	1Hide	-3.52	-1.91	385	87.9	
										Bus7	2.81	1.56	309	87.4	
										Bus9	0.71	0.35	76	89.7	
3Indian oil	6.000	99.283	0.0	0	0	0.35	0.16	0.09	0.04	Bus10	-0.70	-0.36	76	89.0	
										4ware housing	0.02	0.02	2	71.2	
										Bus2	0.24	0.14	27	86.8	
4ware housing	6.000	99.282	0.0	0	0	0.02	0.02	0.00	0.00	3Indian oil	-0.02	-0.02	2	71.0	
5SRS	6.000	98.992	0.0	0	0	0	0	0	0	Bus11	-0.24	-0.15	27	84.4	
										SRS	0.24	0.15	27	84.4	-2.000
6Hide I	6.000	97.412	0.0	0	0	0.02	0.02	0.00	0.00	Bus8	-2.74	-1.53	309	87.2	
										N5	1.49	0.69	161	90.8	
										Bus26	1.00	0.69	120	82.6	
										Hlde	0.11	0.07	13	84.4	-2.000
										Hide	0.11	0.07	13	84.4	-2.000
7Ba Lawrie	6.000	97.368	0.0	0	0	0.41	0.23	0.10	0.05	Bus26	-1.00	-0.69	120	82.5	
										Bus12	0.50	0.40	63	78.0	
8Glaxo	6.000	97.337	0.0	0	0	0.08	0.07	0.02	0.02	Bus12	-0.50	-0.40	63	77.9	
										9M.Box	0.40	0.31	50	79.1	
9M.Box	6.000	97.231	0.0	0	0	0	0	0	0	8Glaxo	-0.40	-0.31	50	79.0	
										Bus27	0.06	0.04	6	85.2	
										10Lipton	0.34	0.28	43	78.0	
10Lipton	6.000	97.088	0.1	0	0	0.16	0.15	0.04	0.03	9M.Box	-0.34	-0.28	43	77.8	
										11Hlde	0.15	0.09	17	84.4	
11Hlde	6.000	96.921	0.1	0	0	0	0	0	0	10Lipton	-0.15	-0.10	17	83.9	
										Hide 2	0.15	0.10	17	83.9	-2.000
12B Bridge	6.000	97.192	0.0	0	0	0	0	0	0	Bus27	-0.06	-0.04	6	84.3	
										Ba Lawri	0.06	0.04	6	84.3	
13Bi.Lawrie	6.000	97.269	0.0	0	0	0	0	0	0	N5	-1.49	-0.69	161	90 8	
										14	1.49	0.69	161	90.8	
14	6.000	97.215	0.0	0	0	0	0	0	0	13Bi.Lawrie	-1.49	-0.69	161	90.8	
										Bus5	1.49	0.69	161	90.8	
15SLids	6.000	97.083	0.0	0	0	0.11	0.09	0.03	0.02	Bus4	-0.14	-0.11	17	78.4	
										Bus13	0.00	0.00	0	0.0	
16Minerals	6.000	97.083	0.0	0	0	0	0	0	0	Bus14					
17IndRods	6.000	96.345	0.1	0	0	0.99	0.45	0.23	0.10	N2	-1.33	-0.58	144	91.8	
										Bus6	0.12	0.02	11	98.3	
18Sonarpur	6.000	96.234	0.2	0	0	0	0	0	0	Bus6	-0.12	-0.02	12	98.1	
										Bus15	0.12	0.02	12	98.1	

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Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvHideRoad--3wayLC1		Config.: Normal

Revised for increased lengths, metric system

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
19WRpr	6.000	96.218	0.2	0	0	0.10	0.02	0.02	0.00	Bus15	-0.12	-0.02	12	98.0	
Ba Lawri	0.400	96.009	-0.7	0	0	0.05	0.03	0.01	0.01	12B Bridge	-0.06	-0.04	102	85.0	
Bus2	6.000	99.033	0.0	0	0	0	0	0	0	3Indian oil	-0.24	-0.15	27	84.7	
										Bus11	0.24	0.15	27	84.7	
Bus4	6.000	97.096	0.0	0	0	0	0	0	0	Bus22	-0.14	-0.11	17	78.7	
										15SLids	0.14	0.11	17	78.7	
Bus5	6.000	97.143	0.0	0	0	0	0	0	0	14	-1.49	-0.69	162	90.8	
										Bus22	0.14	0.11	17	79.1	
										N2	1.34	0.58	144	91.9	
Bus6	6.000	96.264	0.2	0	0	0	0	0	0	17IndRods	-0.12	-0.02	12	98.1	
										18Sonarpur	0.12	0.02	12	98.1	
Bus7	6.000	97.547	0.0	0	0	0	0	0	0	2LC	-2.74	-1.54	309	87.2	
										Bus8	2.74	1.54	309	87.2	
Bus8	6.000	97.506	0.0	0	0	0	0	0	0	6Hide I	2.74	1.53	309	87.2	
										Bus7	-2.74	-1.53	309	87.2	
Bus9	6.000	99.482	0.0	0	0	0	0	0	0	2LC	-0.71	-0.36	76	89.2	
										Bus10	0.71	0.36	76	89.2	
Bus10	6.000	99.466	0.0	0	0	0	0	0	0	Bus9	-0.71	-0.36	76	89.2	
										3Indian oil	0.71	0.36	76	89.2	
Bus11	6.000	99.000	0.0	0	0	0	0	0	0	Bus2	-0.24	-0.15	27	84.5	
										5SRS	0.24	0.15	27	84.5	
Bus12	6.000	97.349	0.0	0	0	0	0	0	0	7Ba Lawrie	-0.50	-0.40	63	77.9	
										8Glaxo	0.50	0.40	63	77.9	
Bus13	6.000	97.083	0.0	0	0	0	0	0	0	15SLids	0.00	0.00	0	0.0	
										Bus14	0.00	0.00	0	0.0	
Bus14	6.000	97.083	0.0	0	0	0	0	0	0	Bus13	0.00	0.00	0	0.0	
										16Minerals	0.00	0.00	0	0.0	
Bus15	6.000	96.224	0.2	0	0	0	0	0	0	19WRpr	0.12	0.02	12	98.0	
										18Sonarpur	-0.12	-0.02	12	98.0	
Bus22	6.000	97.101	0.0	0	0	0	0	0	0	Bus5	-0.14	-0.11	17	78.7	
										Bus4	0.14	0.11	17	78.7	
Bus26	6.000	97.389	0.0	0	0	0	0	0	0	6Hide I	-1.00	-0.69	120	82.5	
										7Ba Lawrie	1.00	0.69	120	82.5	
Bus27	6.000	97.201	0.0	0	0	0	0	0	0	9M.Box	-0.06	-0.04	6	84.7	
										12B Bridge	0.06	0.04	6	84.7	
Hide	0.400	98.308	-0.7	0	0	0.18	0.11	0.04	0.03	6Hide 1	-0.11	-0.07	192	85.0	
										6Hide 1	-0.11	-0.07	192	85.0	
Hide 2	0.400	97.011	-1.0	0	0	0.12	0.07	0.03	0.02	11Hide	-0.15	-0.09	255	85.0	
N2	6.000	96.527	0.1	0	0	0	0	0	0	Bus5	-1.34	-0.58	144	91.8	
										17IndRods	1.34	0.58	144	91.8	
N5	6.000	97.281	0.0	0	0	0	0	0	0	6Hide 1	-1.49	-0.69	161	90.8	

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Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvHideRoad--3wayLC1		Config.: Normal

Revised for increased lengths, metric system

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
										13Bi.Lawrie	1.49	0.69	161	90.8	
SRS	0.400	99.895	-0.7	0	0	0.19	0.12	0.05	0.03	5SRS	-0.24	-0.15	410	85.0	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

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Contract:	2004ER26, TERI, New Delhi			SN:	TATAENERGY
Engineer:	M.S.Bhalla		Study Case: LF	Revision:	Base
Filename:	6kvHideRoad--3wayLC1			Config.:	Normal

Revised for increased lengths, metric system

BUS LOADING Summary Report

Bus			Bus Total Load					
ID	kV	Rated Amp	MW	Mvar	MVA	% PF	Amp	% Loading
1Hide	6.000		3.519	1.911	4.005	87.9	385.34	
2LC	6.000		3.519	1.911	4.004	87.9	385.35	
3Indian oil	6.000		0.704	0.360	0.791	89.0	76.68	
4ware housing	6.000		0.021	0.021	0.030	71.0	2.90	
5SRS	6.000		0.242	0.154	0.287	84.4	27.90	
6Hide 1	6.000		2.737	1.534	3.137	87.2	309.92	
7Ba Lawrie	6.000		1.003	0.686	1.215	82.5	120.11	
8Glaxo	6.000		0.498	0.401	0.640	77.9	63.24	
9M.Box	6.000		0.402	0.312	0.509	79.0	50.33	
10Lipton	6.000		0.343	0.277	0.441	77.8	43.68	
11Hide	6.000		0.147	0.095	0.175	83.9	17.40	
12B Bridge	6.000		0.058	0.037	0.069	84.3	6.81	
13Bi.Lawrie	6.000		1.487	0.685	1.637	90.8	161.99	
14	6.000		1.486	0.685	1.637	90.8	162.00	
15SLids	6.000		0.140	0.113	0.180	78.0	17.83	
16Minerals	6.000					0.0		
17IndRods	6.000		1.332	0.576	1.451	91.8	144.96	
18Sonarpur	6.000		0.118	0.023	0.120	98.1	12.01	
19WRpr	6.000		0.118	0.024	0.120	98.0	12.02	
Ba Lawri	0.400		0.058	0.036	0.068	85.0	102.11	
Bus2	6.000		0.242	0.152	0.286	84.7	27.79	
Bus4	6.000		0.140	0.110	0.178	78.7	17.68	
Bus5	6.000		1.485	0.685	1.636	90.8	162.02	
Bus6	6.000		0.118	0.023	0.120	98.1	12.00	
Bus7	6.000		2.741	1.535	3.141	87.2	309.88	
Bus8	6.000		2.740	1.535	3.140	87.2	309.89	
Bus9	6.000		0.706	0.357	0.791	89.2	76.52	
Bus10	6.000		0.706	0.358	0.791	89.2	76.53	
Bus11	6.000		0.242	0.154	0.287	84.5	27.88	
Bus12	6.000		0.499	0.401	0.640	77.9	63.22	
Bus13	6.000		0.000	0.000	0.000	0.0	0.03	
Bus14	6.000		0.000	0.000	0.000	0.0	0.01	
Bus15	6.000		0.118	0.024	0.120	98.0	12.02	
Bus22	6.000		0.140	0.110	0.178	78.7	17.67	
Bus26	6.000		1.003	0.686	1.216	82.5	120.10	
Bus27	6.000		0.058	0.036	0.068	84.7	6.77	
Hide	0.400		0.223	0.138	0.262	85.0	385.01	
Hide 2	0.400		0.146	0.091	0.172	85.0	255.84	

Project:	CESC Loss Study Report(2004-05	ETAP PowerStation	Page: 15
Location:	KOLKOTA, West Bengal	4.0.4C	Date: 08-06-2005
Contract:	2004BR26, TERI, New Delhi		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvHideRoad--3wayLCI		Config.: Normal

Revised for increased lengths and 80 % motor load

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	3.525	1.909	-3.525	-1.909	0.3	-0.1	100.0	100.0	0.01
Cable3	2.816	1.562	-2.740	-1.533	75.9	29.7	100.0	97.3	2.70
Cable50	0.710	0.347	-0.706	-0.356	3.9	-8.8	100.0	99.4	0.56
Cable54	-0.704	-0.359	0.706	0.356	1.5	-2.8	99.2	99.4	0.20
Cable56	0.021	0.021	-0.021	-0.021	0.0	-0.1	99.2	99.2	0.00
Cable58	0.243	0.137	-0.242	-0.152	0.7	-14.4	99.2	98.9	0.27
Cable62	-0.242	-0.154	0.242	0.153	0.0	-0.5	98.9	98.9	0.01
T9	0.242	0.154	-0.241	-0.149	1.0	4.5	98.9	99.8	0.90
Cable5	-2.736	-1.531	2.738	1.532	2.9	1.2	97.1	97.3	0.10
Cable8	1.489	0.684	-1.487	-0.684	2.3	0.4	97.1	97.0	0.14
Cable35	1.003	0.685	-1.002	-0.685	0.3	-0.1	97.1	97.1	0.03
T2	0.112	0.071	-0.111	-0.069	0.4	2.1	97.1	98.0	0.89
T4	0.112	0.071	-0.111	-0.069	0.4	2.1	97.1	98.0	0.89
Cable37	-1.002	-0.685	1.002	0.685	0.3	-0.1	97.1	97.1	0.02
Cable39	0.498	0.399	-0.498	-0.400	0.1	-0.4	97.1	97.1	0.02
Cable41	-0.498	-0.400	0.498	0.400	0.1	-0.2	97.1	97.1	0.01
Cable43	0.402	0.310	-0.401	-0.311	0.6	-0.9	97.1	96.9	0.12
Cable44	0.058	0.035	-0.058	-0.036	0.0	-0.8	96.9	96.9	0.03
Cable47	0.344	0.276	-0.343	-0.276	0.8	-0.6	96.9	96.8	0.16
Cable48	0.147	0.093	-0.147	-0.095	0.4	-1.8	96.8	96.6	0.18
T5	0.147	0.095	-0.146	-0.090	1.0	4.7	96.6	96.7	0.08
Cable45	-0.058	-0.037	0.058	0.036	0.0	-0.7	96.9	96.9	0.01
T7	0.058	0.037	-0.058	-0.036	0.3	1.2	96.9	95.7	1.19
Cable10	-1.487	-0.684	1.487	0.684	0.2	0.0	97.0	97.0	0.01
Cable12	1.487	0.684	-1.486	-0.684	1.0	0.2	97.0	96.9	0.06
Cable14	1.486	0.684	-1.484	-0.684	1.2	-0.1	96.9	96.9	0.08
Cable19	-0.140	-0.111	0.140	0.110	0.0	-1.1	96.8	96.8	0.02
Cable21	0.000	-0.002	0.000	0.000	0.0	-1.3	96.8	96.8	0.00
Cable24			0.000	0.000	0.0	-0.1	96.8	96.8	0.00
Cable26	-1.330	-0.575	1.334	0.575	3.1	0.2	96.0	96.2	0.20
Cable28	0.118	0.022	-0.118	-0.023	0.1	-0.9	96.0	95.9	0.09
Cable30	-0.118	-0.023	0.118	0.023	0.0	-0.4	95.8	95.9	0.03
Cable33	0.118	0.023	-0.118	-0.024	0.0	-0.4	95.8	95.8	0.01
Cable31	-0.118	-0.024	0.118	0.024	0.0	-0.1	95.8	95.8	0.01
Cable60	0.242	0.152	-0.242	-0.153	0.1	-1.7	98.9	98.9	0.04
Cable17	-0.140	-0.110	0.140	0.110	0.0	-0.3	96.8	96.8	0.00
Cable16	0.140	0.108	-0.140	-0.110	0.1	-1.3	96.9	96.8	0.05
Cable25	1.344	0.575	-1.334	-0.575	10.6	0.6	96.9	96.2	0.68
Cable6	2.740	1.533	-2.738	-1.532	1.4	0.4	97.3	97.3	0.05
Cable52	0.706	0.356	-0.706	-0.356	0.1	-0.3	99.4	99.4	0.02
Cable23	0.000	0.000	0.000	0.000	0.0	-0.2	96.8	96.8	0.00
					111.0	6.6			

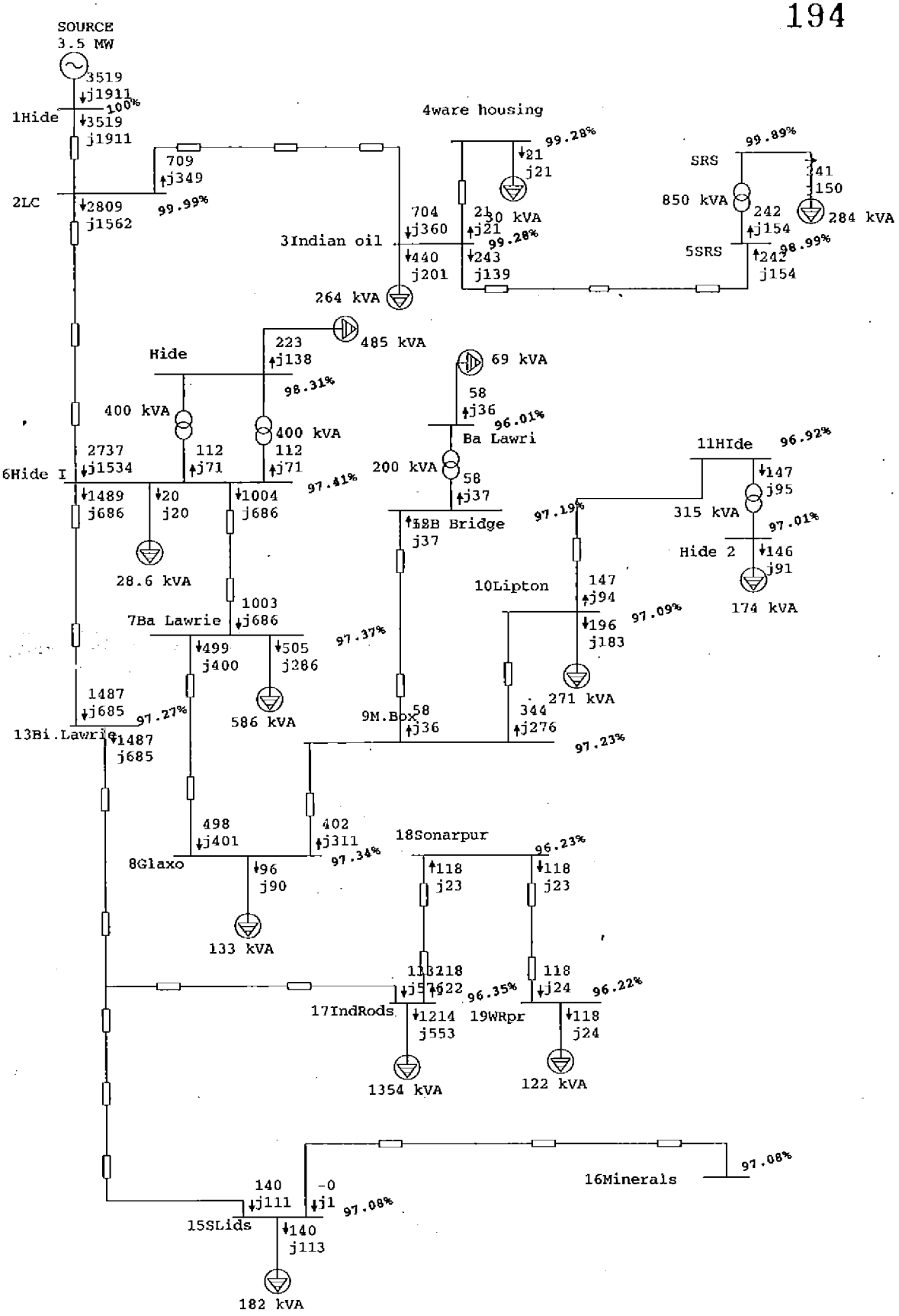
Project:	CESC Loss Study Report(2004-05	ETAP PowerStation	Page: 18
Location:	KOLKOTA, West Bengal	4.0.4C	Date: 08-24-2005
Contract:	2004ER26, TERI, New Delhi		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvHideRoad--3wayLC1		Config.: Normal

Revised for increased lengths and 80 % motor load

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	3.296	2.291	4.014	82.12 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	3.296	2.291	4.014	82.12 Lagging
Total Motor Load:	2.577	1.848	3.171	81.27 Lagging
Total Static Load:	0.608	0.436		
Apparent Losses:	0.111	0.007		
System Mismatch:	0.000	0.000		

Number of Iterations: 3


SOURCE
3.5 MW
3519
j1911
100%
1Hide
3519
j1911
709
j349
2LC
2809
j1562
99.99%
4ware housing
99.28%
21
j21
704
j360
21
j21
30 kVA
99.28%
3Indian oil
440
j201
243
j139
264 kVA
99.89%
SRS
241
150
850 kVA
242
j154
284 kVA
5SRS
242
j154
98.99%
485 kVA
223
j138
Hide
98.31%
400 kVA
400 kVA
112
j71
112
j71
2737
j1534
6Hide I
1489
j686
20
j20
1004
j686
97.41%
28.6 kVA
69 kVA
58
j36
96.01%
Ba Lawri
200 kVA
58
j37
18B Bridge
j37
11HIde
96.92%
147
j95
315 kVA
97.19%
97.01%
Hide 2
146
j91
174 kVA
10Lipton
147
j94
196
j183
97.09%
271 kVA
1003
j686
7Ba Lawrie
499
j400
505
j286
97.37%
586 kVA
1487
j685
97.27%
13Bi.Lawrie
1487
j685
9M.Box
58
j36
344
j276
97.23%
498
j401
402
j311
97.34%
8Glaxo
96
j90
133 kVA
18Sonarpur
96.23%
118
j23
118
j23
118
j24
118
j24
96.35%
96.22%
17IndRods
1214
j553
19WRpr
118
j24
1354 kVA
122 kVA
16Minerals
97.08%
140
j111
-0
j1
97.08%
15SLids
140
j113
182 kVA

Project:	CESC Loss Study (2004-05)	ETAP PowerStation	Page: 1
Location:	KOLKOTA , West Bengal	4.0.4C	Date: 08-06-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvJACKSON-CANNING		Config.: Normal

Revised Study with incresed length and 100 % Motor load

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	23	24

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Brauches:	7	0	0	18	0	0	25

Method of Solution: Newton-Raphson Method

Maximum No. of Iteration: 99

Precision of Solution: 0.000100

System Frequency: 50.00

Unit System: Metric

Project Filename: 6kvJACKSON-CANNING

Output Filename: C:\ETAP 404\PowerStation\6kvJACKSON-CANNING\Untitled.lf1

Project: CESC Loss Study (2004-05)
Location: KOLKOTA , West Bengal
Contract: 2004ER26
Engineer: M.S.Bhalla
Filename: 6kvJACKSON-CANNING

ETAP PowerStation
4.0.4C

Study Case: LF

Page: 7
Date: 07-22-2005
SN: TATAENERGY
Revision: Base
Config.: Normal

Revised Study with 10percent incresed length

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1Jackson	6.000	100.000	0.0	2.23	2.02	0	0	0	0	Bus8	1.42	1.07	171	79.9	
										Bus11	0.81	0.95	120	64.6	
2Sarvamangla	6.000	99.602	0.1	0	0	0.18	0.08	0	0	Bus10	-1.42	-1.07	171	79.8	
										3Jardin Handerson	1.24	0.98	152	78.4	
3Jardin Handerson	6.000	99.309	0.2	0	0	0.15	0.13	0	0	2Sarvamangla	-1.23	-0.98	152	78.2	
										4Clive Row	0.78	0.61	95	78.8	
										5Clive (E)	0.31	0.25	38	78.2	
4Clive Row	6.000	98.946	0.3	0	0	0	0	0	0	3Jardin Handerson	-0.78	-0.61	95	78.7	
										6Chartered Bank	0.11	0.08	13	78.1	
										16 Clive	0.20	0.14	23	80.4	
										16 Clive	0.24	0.19	29	78.1	
										16 Clive	0.24	0.19	29	78.1	
5Clive (E)	6.000	99.262	0.2	0	0	0	0	0	0	3Jardin Handerson	-0.31	-0.25	38	78.1	
										Bus19	0.31	0.25	38	78.1	
6Chartered Bank	6.000	98.930	0.3	0	0	0.11	0.08	0	0	4Clive Row	-0.11	-0.08	13	78.0	
7Canning	6.000	99.798	0.1	0	0	0	0	0	0	Bus12	-0.80	-0.95	120	64.5	
										Bus7	0.80	0.51	90	84.3	
										13Can	0.01	0.45	42	2.2	
8Strand(S)	6.000	99.637	0.1	0	0	0	0	0	0	Bus7	-0.79	-0.51	91	84.2	
										Bus6	0.64	0.39	71	85.5	
										14Strnd	0.16	0.12	19	78.8	
9Govt.Off	6.000	99.580	0.1	0	0	0.11	0.05	0	0	Bus6	-0.64	-0.39	71	85.5	
										Bus4	0.52	0.34	60	84.2	
11Model	6.000	99.454	0.1	0	0	0.25	0.12	0	0	Bus15	-0.25	-0.12	27	90.0	
12Strnd	0.400	96.314	-1.5	0	0	0.27	0.20	0	0	Bus3	-0.27	-0.20	499	80.0	
13Can	0.400	93.120	0.8	0	0	0.00	0.42	0	0	7Canning	0.00	-0.42	644	0.8	
14Strnd	0.400	97.329	-1.1	0	0	0.16	0.12	0	0	8Strand(S)	-0.16	-0.12	287	80.0	
16 Clive	0.400	96.761	-0.9	0	0	0.67	0.50	0	0	4Clive Row	-0.19	-0.14	354	81.6	
										4Clive Row	-0.24	-0.18	443	79.3	
										4Clive Row	-0.24	-0.18	443	79.3	
Bus3	6.000	99.477	0.1	0	0	0	0	0	0	Bus15	0.25	0.12	27	90.1	
										Bus4	-0.52	-0.34	60	84.2	
										12Strnd	0.27	0.21	33	78.3	
Bus4	6.000	99.515	0.1	0	0	0	0	0	0	9Govt.Off	-0.52	-0.34	60	84.2	
										Bus3	0.52	0.34	60	84.2	
Bus6	6.000	99.591	0.1	0	0	0	0	0	0	8Strand(S)	-0.64	-0.39	71	85.5	
										9Govt.Off	0.64	0.39	71	85.5	
Bus7	6.000	99.695	0.1	0	0	0	0	0	0	7Canning	-0.79	-0.51	90	84.2	
										8Strand(S)	0.79	0.51	90	84.2	

Project:	CESC Loss Study (2004-05)	**ETAP PowerStation**	Page: 8
Location:	KOLKOTA , West Bengal	4.0.4C	Date: 07-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvJACKSON-CANNING		Config.: Normal

Revised Study with 10percent incresed length

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
Bus8	6.000	99.662	0.1	0	0	0	0	0	0	1Jackson	-1.42	-1.07	171	79.8	
										Bus10	1.42	1.07	171	79.8	
Bus10	6.000	99.617	0.1	0	0	0	0	0	0	Bus8	-1.42	-1.07	171	79.8	
										2Sarvamangla	1.42	1.07	171	79.8	
Bus11	6.000	99.842	0.1	0	0	0	0	0	0	1Jackson	-0.81	-0.95	120	64.5	
										Bus12	0.81	0.95	120	64.5	
Bus12	6.000	99.816	0.1	0	0	0	0	0	0	Bus11	-0.80	-0.95	120	64.5	
										7Canning	0.80	0.95	120	64.5	
Bus15	6.000	99.471	0.1	0	0	0	0	0	0	Bus3	-0.25	-0.12	27	90.1	
										11Model	0.25	0.12	27	90.1	
Bus19	0.400	95.610	-1.6	0	0	0.30	0.23	0	0	5Clive (E)	-0.30	-0.23	575	80.0	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study (2004-05)	ETAP PowerStation	Page: 11
Location:	KOLKOTA , West Bengal	4.0.4C	Date: 07-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvJACKSON-CANNING		Config.: Normal

Revised Study with 10percent incresed length

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	1.422	1.069	-1.416	-1.068	5.9	1.1	100.0	99.7	0.34
Cable5	0.807	0.953	-0.805	-0.953	2.2	0.0	100.0	99.8	0.16
Cable4	-1.415	-1.068	1.415	1.068	0.2	0.0	99.6	99.6	0.02
Cable23	1.240	0.983	-1.234	-0.983	5.4	0.3	99.6	99.3	0.29
Cable24	0.780	0.608	-0.776	-0.608	4.2	-0.2	99.3	98.9	0.36
Cable25	0.309	0.246	-0.309	-0.247	0.2	-1.2	99.3	99.3	0.05
Cable27	0.105	0.084	-0.105	-0.084	0.0	-0.2	98.9	98.9	0.02
T1	0.195	0.144	-0.194	-0.137	1.5	7.1	98.9	96.8	2.18
T3	0.237	0.190	-0.236	-0.181	1.5	8.9	98.9	96.8	2.18
T5	0.237	0.190	-0.236	-0.181	1.5	8.9	98.9	96.8	2.18
T9	0.309	0.247	-0.305	-0.229	4.0	18.6	99.3	95.6	3.65
Cable8	-0.805	-0.954	0.805	0.953	0.2	-0.1	99.8	99.8	0.02
Cable10	0.795	0.508	-0.794	-0.508	0.9	-0.2	99.8	99.7	0.10
T8	0.010	0.446	-0.003	-0.416	6.3	29.7	99.8	93.1	6.68
Cable11	-0.794	-0.509	0.794	0.508	0.5	-0.4	99.6	99.7	0.06
Cable13	0.637	0.386	-0.637	-0.386	0.3	-0.2	99.6	99.6	0.05
T7	0.156	0.122	-0.155	-0.116	1.3	5.9	99.6	97.3	2.31
Cable15	-0.637	-0.387	0.637	0.386	0.1	-0.1	99.6	99.6	0.01
Cable17	0.525	0.336	-0.524	-0.336	0.4	-0.4	99.6	99.5	0.07
Cable22	-0.255	-0.123	0.255	0.123	0.0	-0.6	99.5	99.5	0.02
T6	-0.266	-0.200	0.269	0.214	3.0	14.0	96.3	99.5	3.16
Cable18	0.255	0.123	-0.255	-0.123	0.0	-0.1	99.5	99.5	0.01
Cable20	-0.524	-0.336	0.524	0.336	0.2	-0.5	99.5	99.5	0.04
Cable3	1.416	1.068	-1.415	-1.068	0.7	0.0	99.7	99.6	0.04
Cable6	0.805	0.953	-0.805	-0.953	0.4	-0.1	99.8	99.8	0.03
					41.1	90.2			

Project:	CESC Loss Study (2004-05)	ETAP PowerStation	Page: 14
Location:	KOLKOTA , West Bengal	4.0.4C	Date: 08-06-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvJACKSON-CANNING		Config.: Normal

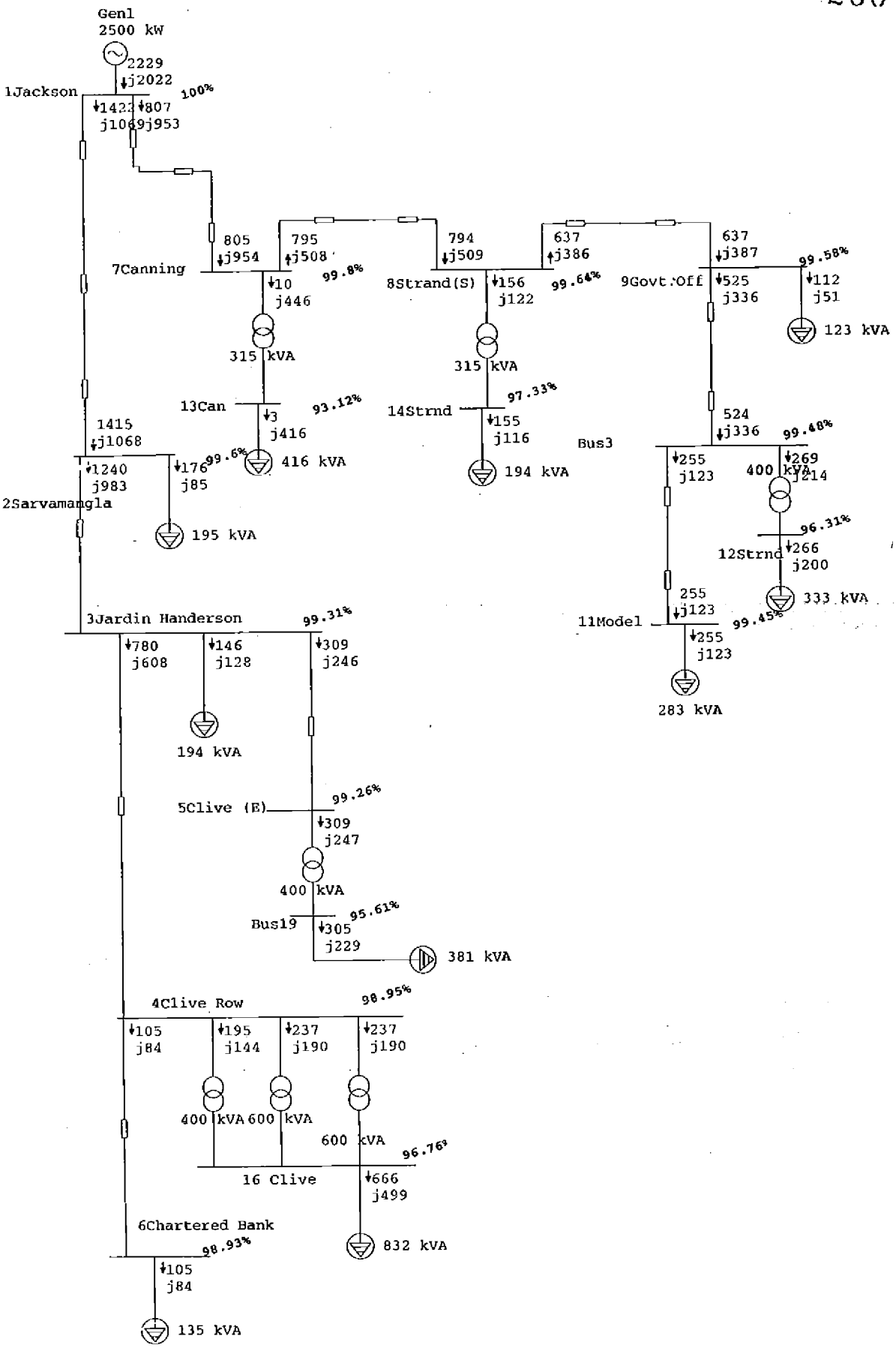
Revised Study with incresed length and 100 % Motor load

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	2.232	2.022	3.012	74.10 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	2.232	2.022	3.012	74.10 Lagging
Total Motor Load:	2.188	1.932	2.919	74.96 Lagging
Total Static Load:	0.000	0.000		
Apparent Losses:	0.043	0.090		
System Mismatch:	0.000	0.000		

Number of Iterations: 2

One-Line Diagram - OLV1



Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 1
Location:	Kolkota, West Bengal	4.0.4C	Date: 06-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla ,TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kvKidderpore-TajHotel		Config.: Normal

6 KV Kidderpur D/S - India Hotel (Taj) Feeder with increased lengths and 60 % motor load

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	7	8

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	1	0	0	6	0	0	7

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	English
Project Filename:	6kvKidderpore-TajHotel
Output Filename:	C:\ETAP 404\PowerStation\6kvKidderpore-TajHotel\Untitled.lf1

6 KV Kidderpur D/S - India Hotel (Taj) Feeder

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1Kidderpore	6.000	101.500	0.0	3.17	1.51	0	0	0	0	2 TajHotel	3.17	1.51	332	90.2	
2 TajHotel	6.000	99.786	-0.1	0	0	1.10	0.53	0.73	0.35	1Kidderpore	-3.12	-1.49	333	90.2	
										3Rani Sati	0.57	0.39	66	82.7	
										6 PFRC	0.72	0.22	73	95.7	
3Rani Sati	6.000	99.370	-0.1	0	0	0.08	0.06	0.05	0.04	2 TajHotel	-0.56	-0.39	66	82.0	
										4 Bajoria Prop.	0.43	0.29	50	82.6	
4 Bajoria Prop.	6.000	99.324	-0.1	0	0	0.18	0.11	0.12	0.07	3Rani Sati	-0.43	-0.30	50	82.5	
										5 Judg.Court Rd.	0.14	0.11	17	79.3	
5 Judg.Court Rd.	6.000	99.313	-0.1	0	0	0	0	0	0	4 Bajoria Prop.	-0.14	-0.11	17	79.0	
										Bus2	0.14	0.11	17	79.0	-2.000
6 PFRC	6.000	99.618	-0.1	0	0	0.22	0.07	0.14	0.05	2 TajHotel	-0.72	-0.22	73	95.5	
										7 P&T	0.36	0.11	36	96.0	
7 P&T	6.000	99.617	-0.1	0	0	0.22	0.06	0.14	0.04	6 PFRC	-0.36	-0.11	36	96.0	
Bus2	0.400	99.365	-1.0	0	0	0.08	0.06	0.05	0.04	5 Judg.Court Rd.	-0.14	-0.10	251	80.0	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 10
Location:	Kolkota, West Bengal	4.0.4C	Date: 06-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla ,TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kvKidderpore-TajHotel		Config.: Normal

6 KV Kidderpur D/S - India Hotel (Taj) Feeder with increased lengths and 60 % motor load

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	3.169	1.509	-3.108	-1.482	61.2	26.3	101.5	99.4	2.06
Cable20	0.566	0.382	-0.563	-0.393	3.0	-10.9	99.4	98.9	0.50
Cable25	0.723	0.220	-0.721	-0.224	1.4	-4.0	99.4	99.2	0.20
Cable21	0.429	0.292	-0.429	-0.294	0.3	-1.7	98.9	98.9	0.06
Cable23	0.139	0.107	-0.139	-0.108	0.0	-1.3	98.9	98.9	0.01
T1	0.139	0.108	-0.138	-0.103	0.9	4.4	98.9	98.9	0.04
Cable27	0.361	0.105	-0.361	-0.105	0.0	-0.1	99.2	99.2	0.00
					66.7	12.8			

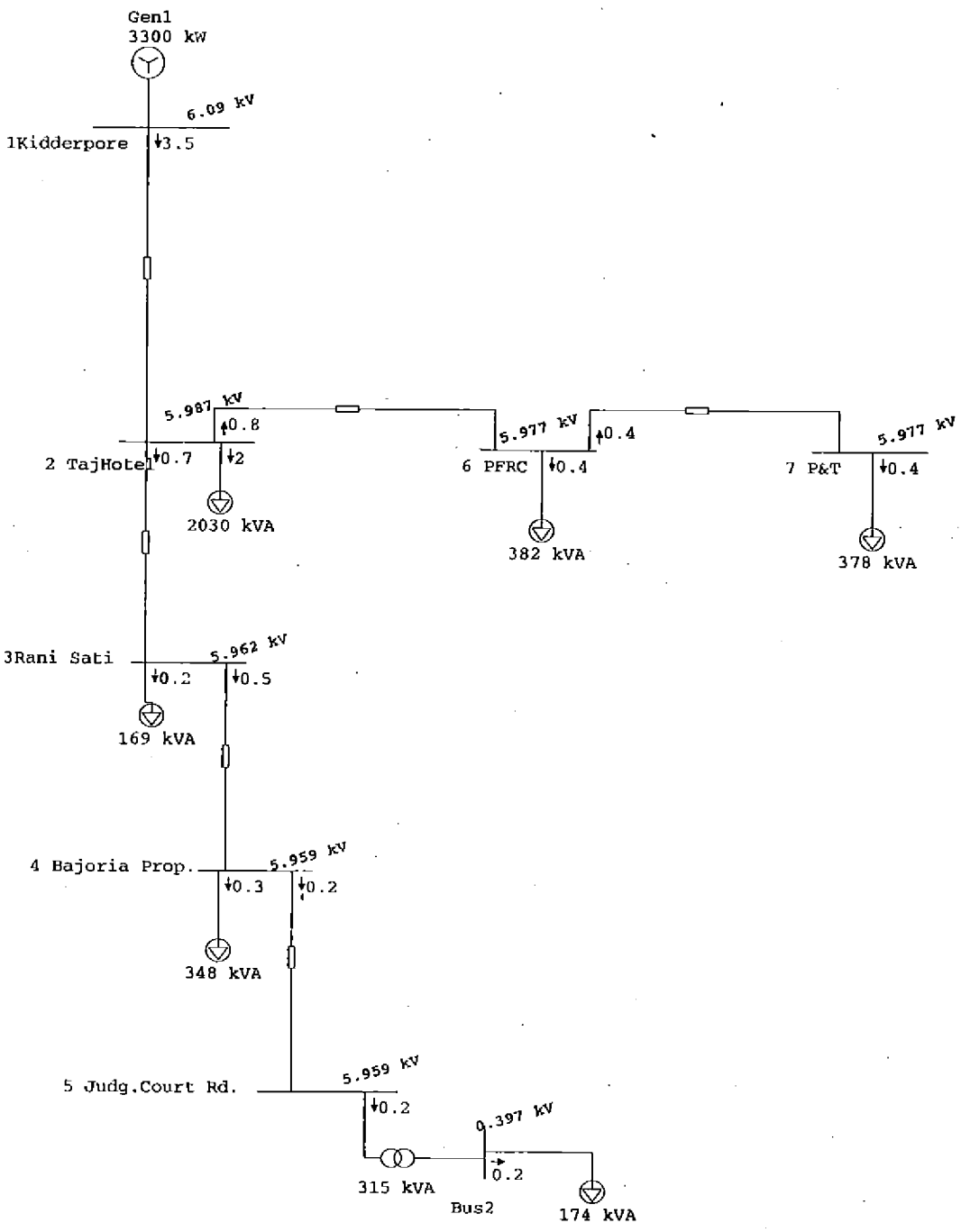
Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 13
Location:	Kolkota, West Bengal	4.0.4C	Date: 24-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla ,TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kvKidderpore-TajHotel		Config.: Normal

6 KV Kidderpur D/S - India Hotel (Taj) Feeder with increased lengths and 60 % motor load

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	2.967	1.886	3.516	84.39 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	2.967	1.886	3.516	84.39 Lagging
Total Motor Load:	1.750	1.131	2.084	84.00 Lagging
Total Static Load:	1.150	0.743		
Apparent Losses:	0.067	0.013		
System Mismatch:	0.000	0.000		

Number of Iterations: 2


Gen1
3300 kW
6.09 kV
1Kidderpore
3.5
5.987 kV
0.8
2 TajHotel
0.7
2
2030 kVA
5.977 kV
0.4
6 PFRC
0.4
382 kVA
5.977 kV
7 P&T
0.4
378 kVA
3Rani Sati
5.962 kV
0.2
0.5
169 kVA
4 Bajoria Prop.
5.959 kV
0.3
0.2
348 kVA
5 Judg.Court Rd.
5.959 kV
0.2
0.397 kV
315 kVA
0.2
Bus2
174 kVA

Project:	CESC Loss Study (2004-05)	**ETAP PowerStation**	Page: 1
Location:	KOLKOTA, West Bengal	4.0.4C	Date: 08-06-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6KVKuttighat-SpecialEngg		Config.: Normal

Revised Study with modified loads and lenghts

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	25	26

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	5	0	0	20	0	0	25

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000010

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6KVKuttighat-SpecialEngg
Output Filename:	C:\ETAP 404\PowerStation\6KVKuttighat-SpecialEngg\U1485.lf1

Project:
Location:
Contract:
Engineer:
Filename: 6KVKuttlghat-SpecialEngg

ETAP PowerStation
4.0.4C

Study Case: LF

Page: 8
Date: 07-27-2005
SN: TATABNERGY
Revision: Base
Config.: Normal

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
										4ECEqp.	0.86	0.49	97	86.8	
Bus15	6.000	97.730	0.2	0	0	0	0	0	0	4ECEqp.	-0.74	-0.44	84	85.6	
										6B Barrel	0.47	0.27	53	86.4	
										13KPSinghi O/T	0.26	0.17	30	84.2	
Bus20	6.000	97.578	0.3	0	0	0	0	0	0	7Cold Storage	0.00	0.00	0	0.0	
										16GEngnr	0.00	0.00	0	0.0	
Bus23	0.400	96.362	-0.9	0	0	0.11	0.07	0.03	0.02	11KPSinghiP/T	-0.14	-0.09	245	85.0	
Bus27	0.400	95.976	-0.8	0	0	0.10	0.06	0.02	0.01	13KPSinghi O/T	-0.13	-0.08	227	85.0	
Bus28	0.400	95.118	-1.2	0	0	0.15	0.09	0.03	0.02	9Sugar2	-0.18	-0.11	328	85.0	
Bus29	0.400	95.414	-1.0	0	0	0.13	0.08	0.03	0.02	8Sugar 1	-0.16	-0.10	289	85.0	
Bus31	0.400	95.872	-0.8	0	0	0.11	0.07	0.03	0.02	14KPSinghi O/T2	-0.13	-0.08	236	85.0	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:
Location:
Contract:
Engineer:
Filename: 6KVKuttighat-SpecialEngg

ETAP PowerStation
4.0.4C

Study Case: LF

Page: 7
Date: 07-27-2005
SN: TATAENERGY
Revision: Base
Config.: Normal

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1Kuttighat	6.000	100.000	0.0	1.30	0.65	0	0	0	0	Bus7	1.30	0.65	140	89.3	
2SVCs	6.000	98.442	0.1	0	0	0.10	0.01	0.02	0.00	Bus7	-1.28	-0.65	140	89.1	
										3SVC4W	1.15	0.63	128	87.6	
3SVC4W	6.000	98.436	0.1	0	0	0	0	0	0	2SVCs	-1.15	-0.63	128	87.6	
										10Ambica	0.00	0.00	0	0.0	
										Bus2	0.28	0.14	30	89.3	
										Bus11	0.87	0.49	97	87.0	
4ECEqp.	6.000	97.872	0.2	0	0	0.10	0.04	0.02	0.01	Bus11	-0.86	-0.49	97	86.8	
										Bus15	0.74	0.44	84	85.7	
6B Barrel	6.000	97.676	0.3	0	0	0.10	0.04	0.02	0.01	Bus15	-0.47	-0.27	53	86.4	
										15E.India	0.00	0.00	0	0.0	
										7Cold Storage	0.35	0.23	41	83.9	
7Cold Storage	6.000	97.579	0.3	0	0	0	0	0	0	Bus20	0.00	0.00	0	0.0	
										6B Barrel	-0.35	-0.23	41	83.8	
										8Sugar 1	0.35	0.23	41	83.8	
8Sugar 1	6.000	97.556	0.3	0	0	0	0	0	0	7Cold Storage	-0.35	-0.23	41	83.7	
										9Sugar2	0.19	0.12	21	83.6	
										Bus29	0.16	0.11	19	83.8	
9Sugar2	6.000	97.554	0.3	0	0	0	0	0	0	8Sugar 1	-0.19	-0.12	21	83.6	
										Bus28	0.19	0.12	21	83.6	
10Ambica	6.000	98.436	0.1	0	0	0	0	0	0	3SVC4W					
11KPSinghiP/T	6.000	98.171	0.1	0	0	0	0	0	0	12CMDA	0.14	0.06	14	93.1	
										Bus10	-0.28	-0.15	31	88.8	
										Bus23	0.14	0.09	16	84.0	
12CMDA	6.000	98.167	0.1	0	0	0.11	0.05	0.03	0.01	11KPSinghiP/T	-0.14	-0.06	14	93.0	
13KPSinghi O/T	6.000	97.657	0.3	0	0	0	0	0	0	Bus15	-0.26	-0.17	30	84.1	
										14KPSinghi O/T2	0.13	0.09	15	84.1	
										Bus27	0.13	0.08	15	84.0	
14KPSinghi O/T2	6.000	97.620	0.3	0	0	0	0	0	0	13KPSinghi O/T	-0.13	-0.09	15	84.0	
										Bus31	0.13	0.09	15	84.0	
15E.India	6.000	97.676	0.3	0	0	0	0	0	0	6B Barrel	0.00	0.00	0	0.0	
16GEngnr	6.000	97.578	0.3	0	0	0	0	0	0	Bus20	0.00	0.00	0	0.0	
Bus2	6.000	98.271	0.1	0	0	0	0	0	0	3SVC4W	-0.28	-0.14	31	89.1	
										Bus10	0.28	0.14	31	89.1	
Bus7	6.000	98.476	0.1	0	0	0	0	0	0	1Kuttighat	-1.28	-0.65	140	89.1	
										2SVCs	1.28	0.65	140	89.1	
Bus10	6.000	98.239	0.1	0	0	0	0	0	0	Bus2	-0.28	-0.14	31	89.0	
										11KPSinghiP/T	0.28	0.14	31	89.0	
Bus11	6.000	97.959	0.2	0	0	0	0	0	0	3SVC4W	-0.86	-0.49	97	86.8	

Project:	CESC Loss Study (2004-05)	ETAP PowerStation	Page: 11
Location:	KOLKOTA, West Bengal	4.0.4C	Date: 08-06-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6KVKuttighat-SpecialEngg		Config.: Normal

Revised Study with modified loads and lenghts

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	In Vmag
Cable1	1.303	0.654	-1.280	-0.652	23.3	2.6	100.0	98.3	1.68
Cable3	-1.279	-0.652	1.280	0.652	0.5	-0.1	98.3	98.3	0.04
Cable4	1.152	0.634	-1.152	-0.634	0.1	0.0	98.3	98.3	0.01
Cable6	0.001	-0.001	-0.001	0.000	0.0	-0.9	98.3	98.3	0.00
Cable8	0.283	0.142	-0.282	-0.144	0.6	-1.4	98.3	98.1	0.18
Cable14	0.868	0.492	-0.852	-0.492	5.5	-0.3	98.3	97.8	0.52
Cable18	-0.861	-0.493	0.862	0.492	0.9	-0.6	97.7	97.8	0.10
Cable20	0.737	0.444	-0.735	-0.444	1.4	-0.2	97.7	97.5	0.16
Cable22	-0.471	-0.275	0.471	0.274	0.4	-0.2	97.4	97.5	0.06
Cable27	0.001	0.000	-0.001	-0.001	0.0	-0.1	97.4	97.4	0.00
Cable30	0.351	0.227	-0.351	-0.228	0.5	-0.8	97.4	97.3	0.11
Cable28	0.001	0.000	-0.001	0.000	0.0	-0.5	97.3	97.3	0.00
Cable32	0.350	0.228	-0.350	-0.229	0.1	-0.5	97.3	97.3	0.02
Cable34	0.186	0.122	-0.186	-0.122	0.0	-0.1	97.3	97.3	0.00
T5	0.164	0.107	-0.163	-0.101	1.3	6.0	97.3	95.2	2.15
T6	0.186	0.122	-0.184	-0.114	1.7	7.8	97.3	94.9	2.44
Cable15	0.142	0.056	-0.142	-0.056	0.0	-0.3	98.0	98.0	0.00
Cable16	-0.282	-0.146	0.282	0.144	0.2	-2.2	98.0	98.1	0.07
T1	0.140	0.090	-0.139	-0.086	0.9	4.3	98.0	96.2	1.81
Cable23	-0.264	-0.170	0.264	0.170	0.3	-0.4	97.4	97.5	0.08
Cable25	0.135	0.086	-0.135	-0.087	0.1	-0.4	97.4	97.4	0.04
T4	0.130	0.083	-0.129	-0.080	0.8	3.7	97.4	95.7	1.68
T3	0.135	0.087	-0.134	-0.083	0.9	4.0	97.4	95.6	1.75
Cable29	-0.001	-0.001	0.001	0.000	0.0	-0.2	97.3	97.3	0.00
Cable10	0.282	0.144	-0.282	-0.144	0.1	-0.5	98.1	98.1	0.04
					39.5	18.8			

Project:	CESC Loss Study 2004-05	ETAP PowerStation		Page:	14
Location:	KOLKOTA, West Bengal	4.0.4C		Date:	08-24-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF		Revision:	Base
Filename:	6KVKuttighat-SpecialEngg			Config.:	Normal

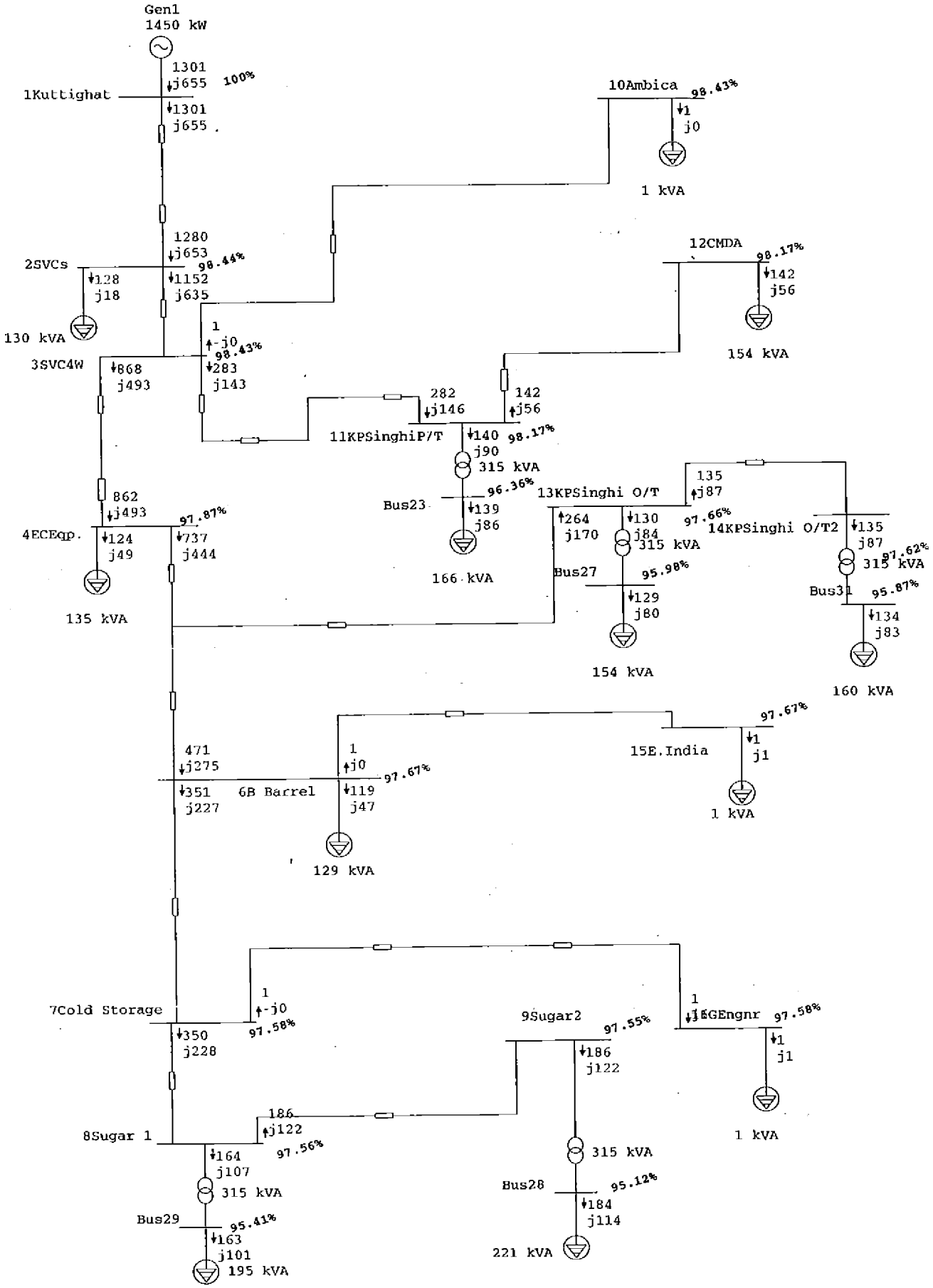
Revised Study with modified loads and lenghts and 80% motor load

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	1.220	0.814	1.467	83.16 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	1.220	0.814	1.467	83.16 Lagging
Total Motor Load:	0.956	0.645	1.153	82.90 Lagging
Total Static Load:	0.222	0.149		
Apparent Losses:	0.042	0.020		
System Mismatch:	0.000	0.000		

Number of Iterations: 3

One-Line Diagram -- OLV1



Project:	CESC Loss Study(2004-05)	**ETAP PowerStation**	Page: 1
Location:	Kolkota, West Bengal	4.0.4C	Date: 08-05-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.BHALLA	Study Case: LF	Revision: Base
Filename:	6kvMajerhat-Biecco		Config.: Normal

Revised study with modified lengths &80 % motor load

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	33	34

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches.	6	0	0	27	0	0	33

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6kvMajerhat-Biecco
Output Filename:	C:\ETAP 404\PowerStation\6kvMajerhat-Biecco\U1494.lf1

Project:	CESC Loss Study(2004-05)	ETAP PowerStation		Page:	7
Location:	Kolkola, West Bengal	4.0.4C		Date:	07-25-2005
Contract:	2004BR26			SN:	TATAENERGY
Engineer:	M.S.BHALLA	Study Case: LF		Revision:	Base
Filename:	6kvMajerhat-Biecco			Config.:	Normal

Revised study with modified loads and lengths

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1Majerhat	6.000	100.000	0.0	4.18	2.68	0	0	0	0	2Biecco	4.18	2.68	477	84.2	
2Biecco	6.000	99.359	-0.1	0	0	0	0	0	0	1Majerhat	-4.16	-2.65	477	84.3	
										11Tatala	1.33	0.98	160	80.4	
										Bus12	0.94	0.46	101	89.7	
										3UCarb	0.92	0.58	105	84.6	
										Bus4	0.08	0.06	9	81.6	
										Bus7	0.89	0.57	101	84.2	
3UCarb	6.000	98.419	-0.1	0	0	0.73	0.47	0.18	0.11	2Biecco	-0.91	-0.59	105	84.0	
4Gorgacha	6.000	99.342	-0.1	0	0	0.07	0.05	0.02	0.01	Bus4	-0.08	-0.06	10	80.0	
5Indian Jute	6.000	99.295	-0.1	0	0	0.37	0.23	0.09	0.06	Bus7	-0.89	-0.57	102	84.2	
										Bus5	0.42	0.28	49	83.3	
6SWRO	6.000	99.224	-0.1	0	0	0	0	0	0	Bus5	-0.42	-0.28	49	83.1	
										16 Durgapur	0.30	0.22	36	80.4	
										SWRO	0.12	0.06	13	89.2	
7Chatala	6.000	98.289	0.1	0	0	0	0	0	0	Bus13	-0.93	-0.48	102	88.8	
										Bus8	0.68	0.35	74	88.9	
										19 Chatl1	0.25	0.13	27	88.4	
8Chatla2	6.000	98.101	0.1	0	0	0	0	0	0	Bus8	-0.68	-0.35	74	88.8	
										Bus9	0.31	0.15	33	89.2	
										20Chatla2	0.37	0.20	41	88.5	
9ChatlaE1	6.000	98.064	0.1	0	0	0	0	0	0	Bus9	-0.31	-0.16	33	89.1	
										Bus10	0.18	0.09	19	89.1	
										21Chatla E	0.13	0.07	14	89.2	
10ChatlaE2	6.000	98.040	0.1	0	0	0	0	0	0	Bus11	-0.18	-0.09	19	88.9	
										22ChatlaE2	0.18	0.09	19	88.9	
11Tatala	6.000	98.739	-0.1	0	0	0	0	0	0	2Biecco	-1.32	-0.98	160	80.2	
										12Boiler	1.26	0.95	153	79.7	
										23TART	0.06	0.03	6	89.6	
12Boiler	6.000	98.446	0.0	0	0	0.03	0.02	0.01	0.00	11Tatala	-1.25	-0.95	153	79.6	
										Bus14	1.21	0.93	149	79.3	
13Electronics	6.000	97.481	0.1	0	0	0.23	0.14	0.06	0.03	Bus14	-1.20	-0.94	150	78.8	
										Bus15	0.91	0.76	117	76.9	
14CMDA	6.000	97.397	0.1	0	0	0.09	0.23	0.02	0.05	Bus15	-0.91	-0.76	117	76.9	
										15A Resins	0.80	0.48	92	85.8	
15A Resins	6.000	96.241	0.2	0	0	0.64	0.40	0.15	0.09	14CMDA	-0.79	-0.49	92	85.0	
16 Durgapur	6.000	99.173	-0.1	0	0	0	0	0	0	6SWRO	-0.30	-0.22	36	80.0	
										17BDPoddarHosp.	0.30	0.22	36	80.0	
17BDPoddarHosp.	6.000	99.163	-0.1	0	0	0.24	0.18	0.06	0.04	16 Durgapur	-0.30	-0.22	36	80.0	
19 Chatl1	0.400	95.556	-1.9	0	0	0.20	0.10	0.05	0.02	7Chatala	-0.25	-0.12	412	90.0	

Project:	CESC Loss Study(2004-05)	ETAP PowerStation	Page: 8
Location:	Kolkota, West Bengal	4.0.4C	Date: 07-25-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.BHALLA	Study Case: LF	Revision: Base
Filename:	6kvMajerhat-Biecco		Config.: Normal

Revised study with modified loads and lengths

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
20Chatla2	0.400	95.658	-1.8	0	0	0.30	0.15	0.07	0.03	8Chatla2	-0.37	-0.18	617	90.0	
21Chatla E	0.400	96.663	-0.9	0	0	0.10	0.05	0.02	0.01	9ChatlaB1	-0.13	-0.06	213	90.0	
22ChatlaE2	0.400	96.123	-1.3	0	0	0.17	0.08	0	0	10ChatlaE2	-0.17	-0.08	291	90.0	
23TART	0.400	98.082	-0.5	0	0	0.05	0.02	0.01	0.01	11Tatala	-0.06	-0.03	100	90.0	
Bus4	6.000	99.346	-0.1	0	0	0	0	0	0	2Biecco	-0.08	-0.06	10	80.3	
										4Gorgacha	0.08	0.06	10	80.3	
Bus5	6.000	99.262	-0.1	0	0	0	0	0	0	5Indian Jute	-0.42	-0.28	49	83.2	
										6SWRO	0.42	0.28	49	83.2	
Bus7	6.000	99.331	-0.1	0	0	0	0	0	0	2Biecco	-0.89	-0.57	101	84.2	
										5Indian Jute	0.89	0.57	101	84.2	
Bus8	6.000	98.121	0.1	0	0	0	0	0	0	7Chatala	-0.68	-0.35	74	88.8	
										8Chatla2	0.68	0.35	74	88.8	
Bus9	6.000	98.086	0.1	0	0	0	0	0	0	8Chatla2	-0.31	-0.15	33	89.2	
										9ChatlaB1	0.31	0.15	33	89.2	
Bus10	6.000	98.051	0.1	0	0	0	0	0	0	9ChatlaB1	-0.18	-0.09	19	89.0	
										Bus11	0.18	0.09	19	89.0	
Bus11	6.000	98.044	0.1	0	0	0	0	0	0	Bus10	-0.18	-0.09	19	88.9	
										10ChatlaE2	0.18	0.09	19	88.9	
Bus12	6.000	99.230	-0.2	0	0	0	0	0	0	2Biecco	-0.94	-0.46	101	89.7	
										Bus13	0.94	0.46	101	89.7	
Bus13	6.000	98.306	0.1	0	0	0	0	0	0	Bus12	-0.93	-0.48	102	88.8	
										7Chatala	0.93	0.48	102	88.8	
Bus14	6.000	97.520	0.1	0	0	0	0	0	0	12Boiler	-1.20	-0.94	150	78.9	
										13Electronics	1.20	0.94	150	78.9	
Bus15	6.000	97.419	0.1	0	0	0	0	0	0	13Electronics	-0.91	-0.76	117	76.9	
										14CMDA	0.91	0.76	117	76.9	
SWRO	0.400	97.893	-1.1	0	0	0.10	0.05	0.02	0.01	6SWRO	-0.12	-0.06	203	90.0	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study(2004-05)	ETAP PowerStation	Page: 11
Location:	Kolkota, West Bengal	4.0.4C	Date: 07-25-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.BHALLA	Study Case: LF	Revision: Base
Filename:	6kvMajerhat-Biecco		Config.: Normal

Revised study with modified loads and lengths

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	4.178	2.675	-4.157	-2.651	20.6	23.7	100.0	99.4	0.64
Cable3	1.329	0.983	-1.320	-0.983	9.6	-0.8	99.4	98.7	0.62
Cable4	0.938	0.461	-0.937	-0.463	0.9	-1.9	99.4	99.2	0.13
Cable7	0.919	0.580	-0.910	-0.588	9.4	-7.5	99.4	98.4	0.94
Cable8	0.084	0.059	-0.084	-0.062	0.0	-3.0	99.4	99.3	0.01
Cable11	0.887	0.568	-0.886	-0.568	0.3	-0.2	99.4	99.3	0.03
Cable9	-0.084	-0.063	0.084	0.062	0.0	-0.6	99.3	99.3	0.00
Cable12	-0.886	-0.569	0.886	0.568	0.3	-0.4	99.3	99.3	0.04
Cable13	0.424	0.282	-0.424	-0.283	0.2	-0.9	99.3	99.3	0.03
Cable14	-0.424	-0.284	0.424	0.283	0.2	-1.0	99.2	99.3	0.04
Cable16	0.299	0.221	-0.299	-0.224	0.1	-2.8	99.2	99.2	0.05
T1	0.125	0.063	-0.124	-0.060	0.6	3.0	99.2	97.9	1.33
Cable6	-0.926	-0.481	0.927	0.480	0.1	-0.2	98.3	98.3	0.02
Cable20	0.678	0.349	-0.677	-0.350	1.2	-0.6	98.3	98.1	0.17
T5	0.248	0.131	-0.246	-0.119	2.6	12.2	98.3	95.6	2.73
Cable21	-0.677	-0.350	0.677	0.350	0.1	-0.2	98.1	98.1	0.02
Cable22	0.306	0.155	-0.305	-0.155	0.1	-0.2	98.1	98.1	0.02
T4	0.371	0.196	-0.368	-0.178	3.0	17.3	98.1	95.7	2.44
Cable23	-0.305	-0.155	0.305	0.155	0.1	-0.6	98.1	98.1	0.02
Cable34	0.176	0.090	-0.176	-0.090	0.0	-0.3	98.1	98.1	0.01
T3	0.129	0.066	-0.129	-0.062	0.7	3.3	98.1	96.7	1.40
Cable38	-0.176	-0.091	0.176	0.090	0.0	-0.3	98.0	98.0	0.00
T8	0.176	0.091	-0.175	-0.085	1.3	6.1	98.0	96.1	1.92
Cable24	1.258	0.953	-1.254	-0.953	4.3	-0.5	98.7	98.4	0.29
T6	0.062	0.031	-0.062	-0.030	0.2	0.7	98.7	98.1	0.66
Cable25	1.214	0.934	-1.201	-0.936	13.4	-2.0	98.4	97.5	0.93
Cable27	-1.200	-0.936	1.201	0.936	0.5	-0.1	97.5	97.5	0.04
Cable29	0.912	0.758	-0.912	-0.758	0.7	-0.4	97.5	97.4	0.06
Cable30	-0.912	-0.759	0.912	0.758	0.2	-0.2	97.4	97.4	0.02
Cable32	0.800	0.478	-0.790	-0.489	10.1	-11.3	97.4	96.2	1.16
Cable18	0.299	0.224	-0.299	-0.224	0.0	-0.4	99.2	99.2	0.01
Cable36	0.176	0.090	-0.176	-0.090	0.0	-0.3	98.1	98.0	0.01
Cable5	0.937	0.463	-0.927	-0.480	11.0	-17.1	99.2	98.3	0.92
					91.9	12.5			

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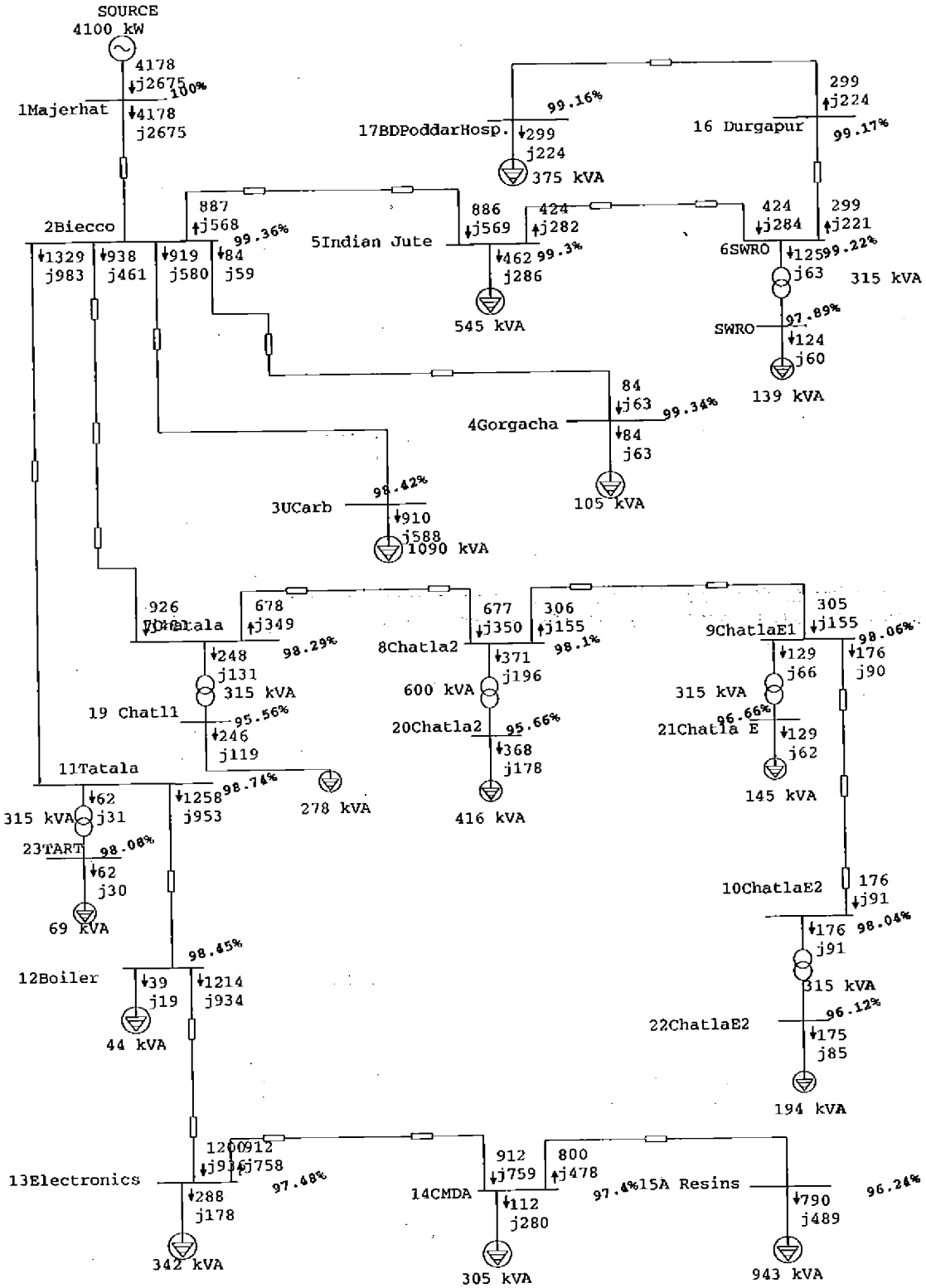
Project:	CESC Loss Study(2004-05)	ETAP PowerStation	Page: 14
Location:	Kolkota, West Bengal	4.0.4C	Date: 08-24-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.BHALLA	Study Case: LF	Revision: Base
Filename:	6kvMajerhat-Biecco		Config.: Normal

Revised study with modified lengths &80 % motor load

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	3.951	3.011	4.967	79.53 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	3.951	3.011	4.967	79.53 Lagging
Total Motor Load:	3.145	2.445	3.984	78.94 Lagging
Total Static Load:	0.705	0.555		
Apparent Losses:	0.101	0.010		
System Mismatch:	0.000	0.000		

Number of Iterations: 3


SOURCE
4100 kW
4178
j2675
100%
1Majerhat
4178
j2675
17BDPoddarHosp.
99.16%
299
j224
375 kVA
16 Durgapur
299
j224
99.17%
2Biecco
887
j568
99.36%
1329
j983
938
j461
919
j580
84
j59
5Indian Jute
886
j569
424
j282
462
j286
99.3%
545 kVA
6SWRO
424
j284
299
j221
1259
99.22%
j63
315 kVA
SWRO
97.89%
124
j60
139 kVA
84
j63
99.34%
4Gorgacha
84
j63
105 kVA
98.42%
3UCarb
910
j588
1090 kVA
926
678
j349
248
j131
315 kVA
98.29%
19 Chatl1
95.56%
246
j119
278 kVA
677
j350
306
j155
98.1%
8Chatla2
371
j196
600 kVA
20Chatla2
95.66%
368
j178
416 kVA
305
j155
98.06%
9ChatlaE1
129
j66
176
j90
315 kVA
21Chatla E
96.66%
129
j62
145 kVA
11Tatala
62
315 kVA
j31
1258
98.74%
j953
23TART
98.08%
62
j30
69 kVA
10ChatlaE2
176
j91
176
98.04%
j91
315 kVA
22ChatlaE2
96.12%
175
j85
194 kVA
12Boiler
98.45%
39
j19
1214
j934
44 kVA
13Electronics
1200912
j936j758
97.48%
288
j178
342 kVA
912
j759
800
j478
14CMDA
112
j280
305 kVA
97.4%15A Resins
790
j489
96.24%
943 kVA

Project:	CESC LossStudy Report (2004-05	**ETAP PowerStation**	Page: 1
Location:	Kolkota, New Delhi -03	4.0.4C	Date: 23-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla, TERI, New Delhi 03	Study Case: LF	Revision: Base
Filename:	6KVPrinsep-UBI		Config.: Normal

6 kV Princep Street D/S - United Bank of India F2 Feeder With increased length AND 60% Motor load

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	22	23

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	6	0	0	17	0	0	23

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6KVPrinsep-UBI
Output Filename:	C:\ETAP 404\PowerStation\6KVPrinsep-UBI\Untitled.lf1

Project:	CESC LossStudy Report (2004-05	ETAP PowerStation		Page:	7
Location:	Kolkota, New Delhi -03	4.0.4C		Date:	06-08-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S.Bhalla, TERI, New Delhi 03		Study Case: LF	Revision:	Base
Filename:	6KVPrinsep-UBI			Config.:	Normal

6 kV Princep Street D/S - United Bank of India F2 Feeder With increased length AND 60% Motor load

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1Prinsep St D/S	6.000	101.650	0.0	3.04	2.31	0	0	0	0	Bus1	3.04	2.31	361	79.7	
2 UBI	6.000	98.260	0.6	0	0	0	0	0	0	3India ship	2.92	2.27	361	78.9	
										Bus14	-2.92	-2.27	361	78.9	
3India ship	6.000	98.084	0.6	0	0	0.19	0.16	0.12	0.10	2 UBI	-2.91	-2.27	361	78.9	
										Bus17	1.82	1.40	225	79.4	
										4Cooke&Kelvey	0.77	0.61	96	78.1	
4Cooke&Kelvey	6.000	97.975	0.7	0	0	0.09	0.08	0.06	0.05	Bus15	0.61	0.48	76	78.8	
										3India ship	-0.77	-0.61	96	78.1	
5 Rajbhavan	6.000	97.605	0.8	0	0	0	0	0	0	6Govt.Place E	0.23	0.18	28	78.5	
										Bus15	-0.61	-0.48	76	78.6	
										Bus6	0.16	0.09	17	86.4	-2.000
										Bus6	0.22	0.21	29	73.4	-3.000
6Govt.Place E	6.000	97.453	0.9	0	0	0	0	0	0	5 Rajbhavan	-0.23	-0.18	28	78.3	
										Bus8	0.23	0.18	28	78.3	-4.000
7Larkin Ln	6.000	97.871	0.7	0	0	0	0	0	0	Bus17	-1.82	-1.40	225	79.3	
										Bus18	1.59	1.22	196	79.4	
										Bus9	0.23	0.18	28	78.3	-3.000
8Node	6.000	97.544	0.8	0	0	0	0	0	0	9Saraf	1.00	0.76	124	79.8	
										Bus18	-1.58	-1.22	196	79.3	
										11Council HS St1	0.58	0.46	72	78.5	
9Saraf	6.000	97.527	0.8	0	0	0.25	0.20	0.16	0.13	10Eastern States	0.59	0.43	71	81.1	
										8Node	-1.00	-0.76	124	79.8	
10Eastern States	6.000	97.363	0.8	0	0	0.36	0.26	0.23	0.16	9Saraf	-0.59	-0.43	71	81.0	
11Council HS St1	6.000	97.456	0.8	0	0	0	0	0	0	8Node	-0.58	-0.46	72	78.4	
										12Council House St 2	0.35	0.28	44	78.5	
										Bus10	0.23	0.18	28	78.4	-4.000
12Council House St 2	6.000	97.423	0.8	0	0	0	0	0	0	13 Council Hs Properties	0.20	0.16	25	78.1	
										11Council HS St1	-0.35	-0.28	44	78.4	
										Bus11	0.15	0.12	18	78.9	-3.000
13 Council Hs Properties	6.000	97.381	0.9	0	0	0.12	0.10	0.08	0.06	12Council House St 2	-0.20	-0.16	25	78.0	
Bus1	6.000	98.949	0.5	0	0	0	0	0	0	1Prinsep St D/S	-2.94	-2.28	361	79.0	
										Bus14	2.94	2.28	361	79.0	
Bus6	0.400	97.780	-0.4	0	0	0.23	0.17	0.15	0.11	5 Rajbhavan	-0.16	-0.09	263	87.4	
										5 Rajbhavan	-0.22	-0.20	434	74.8	
Bus8	0.400	98.291	-0.7	0	0	0.14	0.10	0.09	0.07	6Govt.Place E	-0.23	-0.17	417	80.0	
Bus9	0.400	97.635	-0.9	0	0	0.14	0.10	0.09	0.07	7Larkin Ln	-0.23	-0.17	417	80.0	
Bus10	0.400	98.339	-0.7	0	0	0.14	0.10	0.09	0.07	11Council HS St1	-0.22	-0.17	411	80.0	
Bus11	0.400	98.318	-0.2	0	0	0.09	0.07	0.06	0.04	12Council House St 2	-0.15	-0.11	272	80.0	
Bus14	6.000	98.478	0.6	0	0	0	0	0	0	Bus1	-2.92	-2.27	361	78.9	

Project:	CESC LossStudy Report (2004-05	**ETAP PowerStation**	Page: 8
Location:	Kolkota, New Delhi -03	4.0.4C	Date: 06-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla, TERI, New Delhi 03		Revision: Base
Filename:	6KVPrinsep-UBI	Study Case: LF	Config.: Normal

6 kV Princep Street D/S - United Bank of India F2 Feeder With increased length AND 60% Motor load

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
Bus15	6.000	97.944	0.7	0	0	0	0	0	0	2 UBI	2.92	2.27	361	78.9	
										4Cooke&Kelvey	-0.61	-0.48	76	78.8	
Bus17	6.000	97.916	0.7	0	0	0	0	0	0	5 Rajbhavan	0.61	0.48	76	78.8	
										3India ship	-1.82	-1.40	225	79.3	
Bus18	6.000	97.603	0.8	0	0	0	0	0	0	7Larkin Ln	1.82	1.40	225	79.3	
										8Node	1.58	1.22	196	79.3	
										7Larkin Ln	-1.58	-1.22	196	79.3	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC LossStudy Report (2004-05	**ETAP PowerStation**		Page:	11
Location:	Kolkota, New Delhi -03	4.0.4C		Date:	06-08-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	M.S.Bhalla, TERI, New Delhi 03		Study Case: LF	Revision:	Base
Filename:	6KVPrinsep-UBI			Config.:	Normal

6 kV Princep Street D/S - United Bank of India F2 Feeder With increased length AND 60% Motor load

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	3.042	2.305	-2.940	-2.279	102.2	25.9	101.7	98.9	2.70
Cable3	2.916	2.270	-2.910	-2.268	6.1	2.2	98.3	98.1	0.18
Cable21	-2.916	-2.270	2.924	2.274	7.1	3.3	98.3	98.5	0.22
Cable16	1.824	1.399	-1.820	-1.398	4.3	0.6	98.1	97.9	0.17
Cable23	0.768	0.614	-0.767	-0.614	1.3	0.0	98.1	98.0	0.11
Cable5	0.613	0.479	-0.613	-0.479	0.3	0.0	98.0	97.9	0.03
Cable6	0.230	0.182	-0.230	-0.182	0.5	-0.7	97.6	97.5	0.15
Cable25	-0.610	-0.479	0.613	0.479	3.1	-0.3	97.6	97.9	0.34
T6	0.157	0.092	-0.156	-0.087	1.0	4.9	97.6	97.8	0.18
T8	0.222	0.206	-0.220	-0.195	2.2	10.3	97.6	97.8	0.18
T5	0.230	0.182	-0.227	-0.170	2.5	12.0	97.5	98.3	0.84
Cable17	-1.819	-1.398	1.820	1.398	1.1	0.2	97.9	97.9	0.04
Cable29	1.590	1.216	-1.584	-1.215	6.0	0.8	97.9	97.6	0.27
T4	0.229	0.182	-0.226	-0.170	2.6	12.1	97.9	97.6	0.24
Cable14	1.004	0.758	-1.004	-0.758	0.2	0.0	97.5	97.5	0.02
Cable27	-1.583	-1.215	1.584	1.215	1.2	0.1	97.5	97.6	0.06
Cable31	0.579	0.457	-0.578	-0.458	0.8	-0.1	97.5	97.5	0.09
Cable7	0.589	0.425	-0.588	-0.425	1.4	-0.2	97.5	97.4	0.16
Cable32	0.351	0.278	-0.351	-0.278	0.2	-0.1	97.5	97.4	0.03
T3	0.227	0.180	-0.224	-0.168	2.5	11.6	97.5	98.3	0.88
Cable10	0.202	0.161	-0.202	-0.162	0.1	-0.3	97.4	97.4	0.04
T1	0.149	0.116	-0.148	-0.111	1.1	5.1	97.4	98.3	0.90
Cable20	2.940	2.279	-2.924	-2.274	16.4	5.9	98.9	98.5	0.47
					164.3	93.2			

Project:	CESC LossStudy Report (2004-05	ETAP PowerStation	Page: 10
Location:	Kolkota, New Delhi -03	4.0.4C	Date: 06-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla, TERI, New Delhi 03	Study Case: LF	Revision: Base
Filename:	6KVPrinsep-UBI		Config.: Normal

6 kV Princep Street D/S - United Bank of India F2 Feeder With increased length AND 60% Motor load

BRANCH LOADING Summary Report

CKT / Branch		Cable & Reactor			Transformer				
						Loading (input)		Loading (output)	
ID	Type	Ampacity (Amp)	Loading Amp	%	Capability (MVA)	MVA	%	MVA	%
T1	Transformer				315.000	0.189	0.1	0.185	0.1
T3	Transformer				0.315	0.289	91.8	0.280	89.0
T4	Transformer				0.315	0.292	92.7	0.283	89.7
T5	Transformer				0.315	0.293	93.1	0.284	90.2
T6	Transformer				0.315	0.182	57.8	0.179	56.8
T8	Transformer				0.400	0.303	75.7	0.294	73.6

* Indicates a branch with operating load exceeding the branch capability

Project:	CESC LossStudy Report (2004-05	**ETAP PowerStation**	Page: 14
Location:	Kolkota, New Delhi -03	4.0.4C	Date: 24-08-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla, TERI, New Delhi 03	Study Case: LF	Revision: Base
Filename:	6KVPrinsep-UBI		Config.: Normal

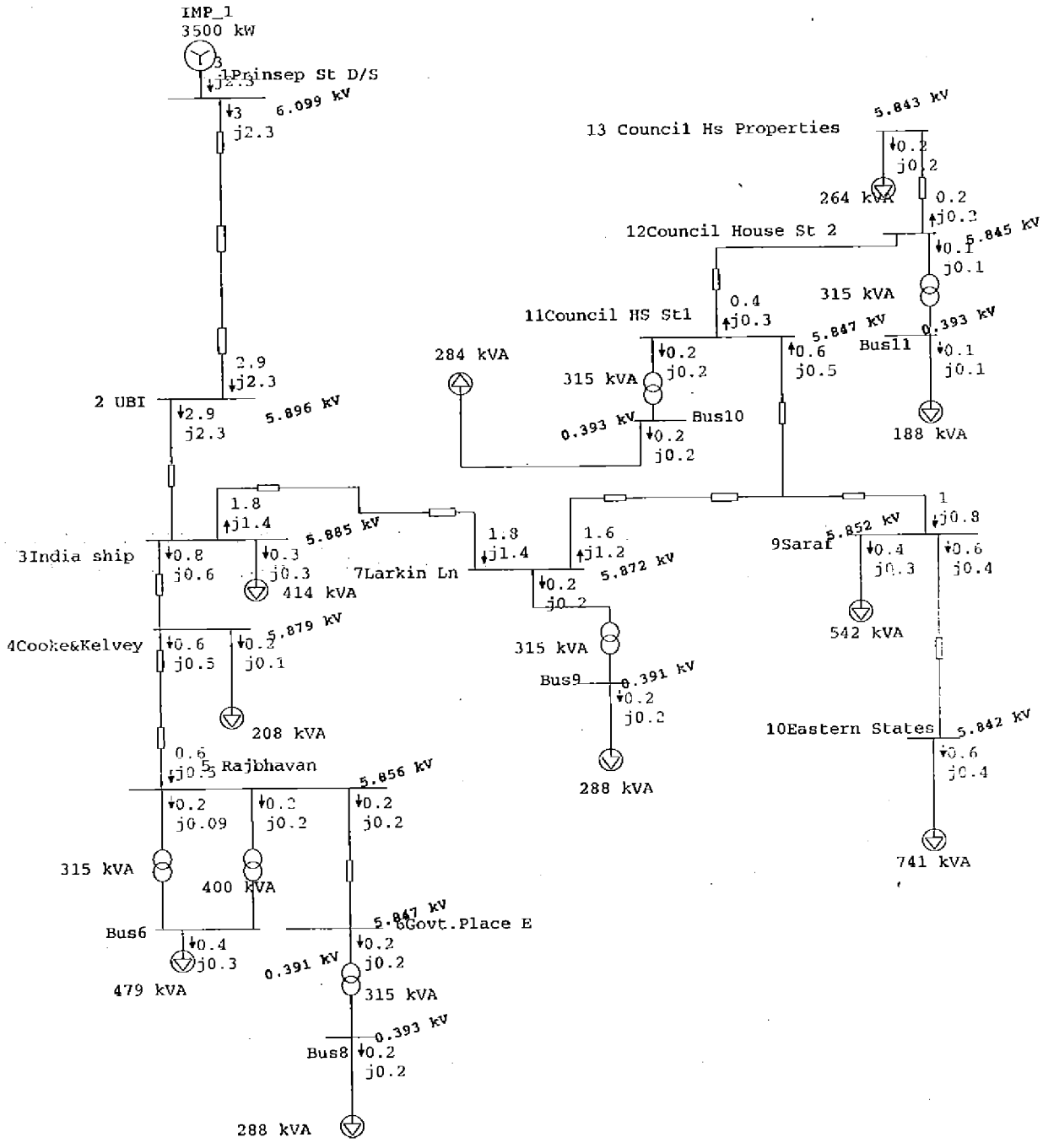
6 kV Princep Street D/S - United Bank of India F2 Feeder With increased length AND 60% Motor load

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	2.820	2.568	3.814	73.94 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	2.820	2.568	3.814	73.94 Lagging
Total Motor Load.	1.621	1.511	2.216	73.16 Lagging
Total Static Load:	1.034	0.964		
Apparent Losses:	0.164	0.093		
System Mismatch.	0.000	0.000		

Number of Iterations: 3

One-Line Diagram - OLV1



Project:	CESCLoss Study Report(2004-05)	**ETAP PowerStation**	Page: 1
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth, TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	6kVRabdrnSadan-CTCChowrngeFdr		Config.: Normal

6 kV Rabindra Sadan D/S - CTC Chowringhee Feeder (Modified with revised loads (80%) & cable lengths)

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	12	13

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	3	0	0	9	0	0	12

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6kVRabdrnSadan-CTCChowrngeFdr
Output Filename:	C:\ETAP 404\PowerStation\6kVRabdrnSadan-CTCChowrngeFdr\6kVRS-Ch.lfl

Project:	CESCLoss Study Report(2004-05)	**ETAP PowerStation**	Page: 7
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth, TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	6kVRabdrnSadan-CTCChowrngeFdr		Config.: Normal

6 kV Rabindra Sadan D/S - CTC Chowringhee Feeder (Modified with revised loads (80%) & cable lengths)

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1Rabindra Sadan	6.000	100.000	0.0	1.71	1.30	0	0	0	0	2 Chowringhee	1.71	1.30	206	79.5	
2 Chowringhee	6.000	99.865	0.0	0	0	0.31	0.27	0.08	0.07	1Rabindra Sadan	-1.71	-1.30	206	79.5	
										Bus6	0.91	0.70	110	79.5	
										3 Nehru Museum 2	0.41	0.27	47	83.8	
3 Nehru Museum 2	6.000	99.758	0.0	0	0	0	0	0	0	4 Nehru Museum 1	0.21	0.14	24	83.6	
										2 Chowringhee	-0.41	-0.27	47	83.6	
										Bus3	0.20	0.13	22	83.7	-2.000
4 Nehru Museum 1	6.000	99.757	0.0	0	0	0	0	0	0	3 Nehru Museum 2	-0.21	-0.14	24	83.5	
										Bus4	0.21	0.14	24	83.5	-2.000
5 Calcutta Club	6.000	99.777	0.0	0	0	0.29	0.14	0.07	0.04	9Gokhale Rd	0.00	0.00	0	0.0	
										6 Rabindra Sadan	0.25	0.22	31	75.1	
										7 Calcutta Inf.Centre	0.30	0.31	41	70.2	
										Bus6	-0.91	-0.70	110	79.4	
6 Rabindra Sadan	6.000	99.697	0.0	0	0	0.20	0.17	0.05	0.04	5 Calcutta Club	-0.25	-0.22	31	75.0	
7 Calcutta Inf.Centre	6.000	99.756	0.0	0	0	0	0	0	0	5 Calcutta Club	-0.30	-0.31	41	70.2	
										8 National Film Theatre	0.30	0.31	41	70.2	
8 National Film Theatre	6.000	99.623	0.1	0	0	0.24	0.25	0.06	0.06	7 Calcutta Inf.Centre	-0.30	-0.31	41	70.0	
9Gokhale Rd	6.000	99.777	0.0	0	0	0	0	0	0	5 Calcutta Club					
										Bus5					-2.000
Bus3	0.400	99.337	-1.4	0	0	0.16	0.10	0.04	0.02	3 Nehru Museum 2	-0.19	-0.12	331	85.0	
Bus4	0.400	99.115	-1.5	0	0	0.17	0.10	0.04	0.03	4 Nehru Museum 1	-0.21	-0.13	361	85.0	
Bus5	0.400	101.814	0.0	0	0	0	0	0	0	9Gokhale Rd					
Bus6	6.000	99.852	0.0	0	0	0	0	0	0	2 Chowringhee	-0.91	-0.70	110	79.5	
										5 Calcutta Club	0.91	0.70	110	79.5	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESCLoss Study Report(2004-05)	**ETAP PowerStation**		Page:	10
Location:	Kolkata, West Bengal	4.0.4C		Date:	09-22-2005
Contract:	2004ER26			SN:	TATAENERGY
Engineer:	Navin Seth, TERI, New Delhi.		Study Case: LF	Revision:	Base
Filename:	6kVRabdmSadan-CTCChowringeFdr			Config.:	Normal

6 kV Rabindra Sadan D/S - CTC Chowringhee Feeder (Modified with revised loads (80%) & cable lengths)

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	1.709	1.302	-1.707	-1.302	2.5	0.4	100.0	99.9	0.14
Cable2	0.915	0.698	-0.915	-0.698	0.1	-0.1	99.9	99.9	0.01
Cable8	0.409	0.266	-0.409	-0.268	0.5	-2.1	99.9	99.8	0.11
Cable4	0.213	0.140	-0.213	-0.140	0.0	-0.1	99.8	99.8	0.00
T2	0.196	0.128	-0.194	-0.120	1.7	7.9	99.8	99.3	0.42
T3	0.213	0.140	-0.211	-0.131	2.0	9.3	99.8	99.1	0.64
Cable3	0.000	-0.001			0.0	-0.8	99.8	99.8	0.00
Cable5	0.246	0.216	-0.246	-0.217	0.3	-0.5	99.8	99.7	0.08
Cable6	0.303	0.307	-0.303	-0.307	0.1	-0.7	99.8	99.8	0.02
Cable9	-0.914	-0.699	0.915	0.698	0.7	-0.7	99.8	99.9	0.07
Cable7	0.303	0.307	-0.302	-0.308	0.7	-0.6	99.8	99.6	0.13
T1							99.8	101.8	2.04
					8.7	12.1			

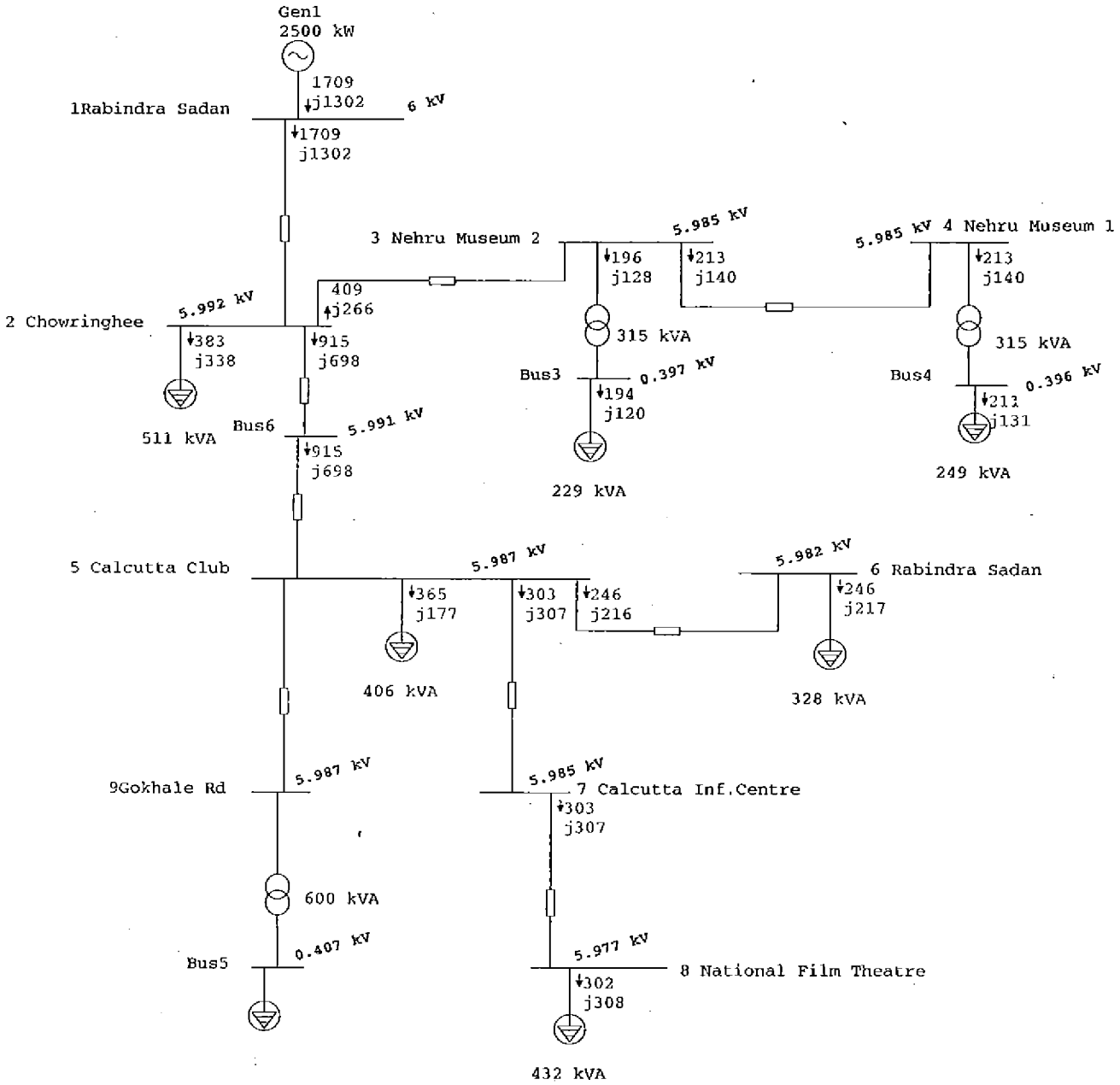
Project:	CESCLoss Study Report(2004-05)	**ETAP PowerStation**	Page: 13
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth, TERI, New Delhi.	Study Case: LF	Revision: Base
Filename:	6kVRabdrnSadan-CTCChowrngeFdr		Config.: Normal

6 kV Rabindra Sadan D/S - CTC Chowringhee Feeder (Modified with revised loads (80%) & cable lengths)

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	1.709	1.302	2.149	79.54 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	1.709	1.302	2.149	79.54 Lagging
Total Motor Load:	1.363	1.034	1.710	79.67 Lagging
Total Static Load:	0.338	0.257		
Apparent Losses:	0.009	0.012		
System Mismatch:	0.000	0.000		

Number of iterations: 3


Gen1
2500 kW
1709
j1302
1Rabindra Sadan
6 kV
1709
j1302
3 Nehru Museum 2
5.985 kV
196
j128
213
j140
5.985 kV 4 Nehru Museum 1
213
j140
409
j266
2 Chowringhee
5.992 kV
383
j338
915
j698
315 kVA
315 kVA
Bus3
0.397 kV
194
j120
Bus4
0.396 kV
213
j131
511 kVA
Bus6
5.991 kV
915
j698
229 kVA
249 kVA
5 Calcutta Club
5.987 kV
365
j177
303
j307
246
j216
5.982 kV
6 Rabindra Sadan
246
j217
406 kVA
328 kVA
9Gokhale Rd
5.987 kV
5.985 kV
7 Calcutta Inf.Centre
303
j307
600 kVA
Bus5
0.407 kV
5.977 kV
8 National Film Theatre
302
j308
432 kVA

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 1
Location:	Kolkata,West Bengal.	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth, TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kVRichie-LakeRoadFeeder		Config.: Normal

6 kV Ritchie - Lake Road (N) Feeder (Modified with revised loads (M.load 60%) & cable lengths)

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	37	38

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	15	0	0	24	0	0	39

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6kVRichie-LakeRoadFeeder
Output Filename:	C:\ETAP 404\PowerStation\6kVRichie-LakeRoadFeeder\6kVRitch.lf1

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 9
Location:	Kolkata,West Bengal.	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth, TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kVRichie-LakeRoadFeeder		Config.: Normal

6 kV Ritchie - Lake Road (N) Feeder (Modified with revised loads (M.load 60%) & cable lengths)

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
DoverRd(E)	6.000	99.134	0.1	0	0	0	0	0	0	YuleRMI	-0.17	-0.11	19	83.8	
										Bus14	0.17	0.11	19	83.8	-1.000
DoverRd(HS)	6.000	99.179	0.1	0	0	0.02	0.01	0.01	0.00	Bus4	-0.34	-0.20	38	85.6	
										YuleRMI	0.30	0.19	34	84.4	
Dover Rd.(S)	6.000	99.204	0.1	0	0	0	0	0	0	Bus4	-0.20	-0.13	23	83.6	
										Bus13	0.20	0.13	23	83.6	-1.000
Lake Rd.(N)	6.000	97.452	0.1	0	0	0	0	0	0	RB.Avn(E)P/T	-0.93	-0.61	110	83.8	
										Bus19	0.33	0.21	38	84.5	
										Bus18	0.30	0.20	36	83.5	-2.000
										Bus18	0.30	0.20	36	83.5	-2.000
Panditia	6.000	98.891	0.1	0	0	0	0	0	0	Bus6	-2.08	-1.34	241	84.1	
										Bus10	1.91	1.22	220	84.2	
										Bus8	0.18	0.11	20	83.8	-2.000
Panditia(N)	6.000	99.093	0.0	0	0	0	0	0	0	Bus3	-2.24	-1.44	258	84.2	
										Bus6	2.09	1.34	240	84.2	
										Bus5	0.15	0.10	17	83.9	-1.000
Panditia Rd.	6.000	98.413	0.1	0	0	0	0	0	0	Bus10	-1.90	-1.22	220	84.1	
										AswDuttaRd.	0.16	0.10	18	84.2	
										RashbehariAvn(W)	1.21	0.77	140	84.3	
										Bus11	0.26	0.17	30	83.5	-2.000
										Bus11	0.26	0.17	30	83.5	-2.000
PurnaDas.Rd.T/H	6.000	97.361	0.1	0	0	0	0	0	0	Bus19	-0.33	-0.21	38	84.1	
										Bus22	0.12	0.08	14	84.5	
										Bus20	0.20	0.13	23	83.9	-2.000
PurnaDasRd.P/T	6.000	97.348	0.1	0	0	0	0	0	0	Bus21	-0.12	-0.08	14	84.1	
										Bus23	0.12	0.08	14	84.1	-2.000
RashbehariAvn(E)	6.000	97.829	0.1	0	0	0	0	0	0	RashbehariAvn(W)	-1.10	-0.71	128	84.1	
										RB.Avn(E)P/T	1.05	0.68	123	84.1	
										Bus12	0.04	0.03	5	84.7	-2.000
RashbehariAvn(W)	6.000	98.082	0.1	0	0	0	0	0	0	RashbehariAvn(E)	1.10	0.71	128	84.2	
										Panditia Rd.	-1.21	-0.77	140	84.2	
										Bus7	0.11	0.07	12	84.3	-2.000
RB.Avn(E)P/T	6.000	97.696	0.1	0	0	0	0	0	0	RashbehariAvn(E)	-1.05	-0.68	123	84.0	
										Lake Rd.(N)	0.94	0.61	109	84.0	
										Bus17	0.12	0.07	13	84.2	-1.000
* Ritchie D/S	6.000	100.000	0.0	2.80	1.78	0	0	0	0	Bus1	2.80	1.78	319	84.4	
YuleRMI	6.000	99.136	0.1	0	0	0	0	0	0	DoverRd(HS)	-0.30	-0.19	35	84.2	
										DoverRd(E)	0.17	0.11	19	83.8	
										Deodar(ST)	0.13	0.08	15	84.7	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 8
Location:	Kolkata,West Bengal.	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth, TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kVRichie-LakeRoadFeeder		Config.: Normal

6 kV Ritchie - Lake Road (N) Feeder (Modified with revised loads (M.load 60%) & cable lengths)

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
AswDuttaRd.	6.000	98.384	0.1	0	0	0	0	0	0	Panditia Rd.	-0.16	-0.10	18	83.9	
										Bus9	0.16	0.10	18	83.9	-2.000
Bus1	6.000	99.489	0.0	0	0	0	0	0	0	Ritchie D/S	-2.79	-1.78	319	84.4	
										Bus2	2.79	1.78	319	84.4	
Bus2	6.000	99.399	0.0	0	0	0	0	0	0	Bus1	-2.79	-1.77	319	84.3	
										Bus3	2.25	1.44	258	84.2	
										Bus4	0.54	0.33	61	85.0	
Bus3	6.000	99.194	0.0	0	0	0	0	0	0	Bus2	-2.24	-1.44	258	84.2	
										Panditia(N)	2.24	1.44	258	84.2	
Bus4	6.000	99.234	0.1	0	0	0	0	0	0	Bus2	-0.54	-0.33	61	84.9	
										DoverRd(HS)	0.34	0.20	38	85.6	
										Dover Rd.(S)	0.20	0.13	23	83.7	
Bus5	0.400	98.168	-1.1	0	0	0.09	0.06	0.06	0.04	Panditia(N)	-0.15	-0.09	260	85.0	
Bus6	6.000	99.010	0.0	0	0	0	0	0	0	Panditia(N)	-2.09	-1.34	241	84.2	
										Panditia	2.09	1.34	241	84.2	
Bus7	0.400	98.753	-0.7	0	0	0.06	0.04	0.04	0.03	RashbehariAvn(W)	-0.11	-0.07	180	85.0	
Bus8	0.400	98.683	-1.3	0	0	0.11	0.07	0.07	0.04	Panditia	-0.17	-0.11	301	85.0	
Bus9	0.400	98.359	-1.1	0	0	0.10	0.06	0.06	0.04	AswDuttaRd.	-0.16	-0.10	275	85.0	
Bus10	6.000	98.447	0.1	0	0	0	0	0	0	Panditia Rd.	1.90	1.22	220	84.1	
										Panditia	-1.90	-1.22	220	84.1	
Bus11	0.400	97.781	-1.5	0	0	0.32	0.20	0.20	0.13	Panditia Rd.	-0.26	-0.16	452	85.0	
										Panditia Rd.	-0.26	-0.16	452	85.0	
Bus12	0.400	99.274	-0.2	0	0	0.03	0.02	0.02	0.01	RashbehariAvn(E)	-0.04	-0.03	75	85.0	
Bus13	0.400	97.671	-1.4	0	0	0.12	0.07	0.08	0.05	Dover Rd.(S)	-0.20	-0.12	342	85.0	
Bus14	0.400	97.982	-1.2	0	0	0.10	0.06	0.07	0.04	DoverRd(E)	-0.17	-0.10	291	85.0	
Bus15	0.400	98.402	-0.9	0	0	0.08	0.05	0.05	0.03	Deodar(ST)	-0.13	-0.08	230	85.0	
Bus17	0.400	97.196	-0.8	0	0	0.07	0.04	0.04	0.03	RB.Avn(E)P/T	-0.12	-0.07	201	85.0	
Bus18	0.400	96.693	-1.5	0	0	0.37	0.23	0.23	0.14	Lake Rd.(N)	-0.30	-0.19	529	85.0	
										Lake Rd.(N)	-0.30	-0.19	529	85.0	
Bus19	6.000	97.385	0.1	0	0	0	0	0	0	Lake Rd.(N)	-0.33	-0.21	38	84.2	
										PurnaDas Rd.T/H	0.33	0.21	38	84.2	
Bus20	0.400	97.303	-1.1	0	0	0.12	0.08	0.08	0.05	PurnaDas Rd.T/H	-0.20	-0.12	351	85.0	
Bus21	6.000	97.350	0.1	0	0	0	0	0	0	Bus22	-0.12	-0.08	14	84.2	
										PurnaDasRd.P/T	0.12	0.08	14	84.2	
Bus22	6.000	97.358	0.1	0	0	0	0	0	0	PurnaDas.Rd.T/H	-0.12	-0.08	14	84.4	
										Bus21	0.12	0.08	14	84.4	
Bus23	0.400	97.775	-0.8	0	0	0.07	0.05	0.05	0.03	PurnaDasRd.P/T	-0.12	-0.08	211	85.0	
Deodar(ST)	6.000	99.099	0.1	0	0	0	0	0	0	YuleRMI	-0.13	-0.09	15	84.1	
										Bus15	0.13	0.09	15	84.1	-1.000

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 13
Location:	Kolkata,West Bengal.	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth, TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kVRichie-LakeRoadFeeder		Config.: Normal

6 kV Ritchie - Lake Road (N) Feeder (Modified with revised loads (M.load 60%) & cable lengths)

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		% Vd Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable12	-0.161	-0.104	0.161	0.103	0.1	-1.5	98.4	98.4	0.03
T5	0.161	0.104	-0.159	-0.099	1.2	5.4	98.4	98.4	0.02
Cable1	-2.789	-1.775	2.804	1.781	14.8	5.9	99.5	100.0	0.51
Cable2	2.789	1.775	-2.786	-1.774	2.8	0.9	99.5	99.4	0.09
Cable3	2.248	1.440	-2.243	-1.439	4.8	1.5	99.4	99.2	0.21
Cable5	0.538	0.334	-0.537	-0.334	1.1	-0.3	99.4	99.2	0.16
Cable4	2.243	1.439	-2.241	-1.438	2.5	0.6	99.2	99.1	0.10
Cable6	0.338	0.204	-0.338	-0.204	0.2	-0.2	99.2	99.2	0.05
Cable7	0.199	0.130	-0.199	-0.130	0.1	-0.2	99.2	99.2	0.03
T1	-0.151	-0.093	0.152	0.098	1.0	4.9	98.2	99.1	0.92
Cable8	-2.087	-1.339	2.089	1.340	1.8	0.5	99.0	99.1	0.08
Cable9	2.087	1.339	-2.084	-1.339	2.7	0.6	99.0	98.9	0.12
T2	-0.105	-0.065	0.106	0.068	0.5	2.3	98.8	98.1	0.67
T3	-0.175	-0.108	0.176	0.115	1.4	6.5	98.7	98.9	0.21
Cable10	1.899	1.222	-1.899	-1.222	0.7	0.1	98.4	98.4	0.03
Cable13	-1.899	-1.222	1.908	1.224	8.9	2.0	98.4	98.9	0.44
T6	-0.261	-0.161	0.263	0.173	2.5	11.5	97.8	98.4	0.63
T7	-0.261	-0.161	0.263	0.173	2.5	11.5	97.8	98.4	0.63
T8	-0.044	-0.027	0.044	0.028	0.1	0.4	99.3	97.8	1.45
T9	-0.197	-0.122	0.199	0.130	1.8	8.4	97.7	99.2	1.53
T10	-0.168	-0.104	0.169	0.110	1.3	6.1	98.0	99.1	1.15
T11	-0.133	-0.083	0.134	0.086	0.8	3.8	98.4	99.1	0.70
T12	-0.116	-0.072	0.116	0.075	0.6	2.9	97.2	97.7	0.50
T13	-0.301	-0.187	0.304	0.201	3.0	14.0	96.7	97.5	0.76
T14	-0.301	-0.187	0.304	0.201	3.0	14.0	96.7	97.5	0.76
Cable20	-0.326	-0.209	0.326	0.206	0.2	-2.4	97.4	97.5	0.07
Cable21	0.326	0.209	-0.325	-0.209	0.1	-0.8	97.4	97.4	0.02
T15	-0.201	-0.125	0.203	0.132	1.5	7.0	97.3	97.4	0.06
Cable23	-0.123	-0.079	0.123	0.078	0.0	-0.8	97.3	97.4	0.01
Cable24	0.123	0.079	-0.123	-0.079	0.0	-0.2	97.3	97.3	0.00
Cable22	-0.123	-0.078	0.123	0.078	0.0	-0.2	97.4	97.4	0.00
T16	-0.122	-0.076	0.123	0.079	0.7	3.2	97.8	97.3	0.43
Cable18	-0.134	-0.086	0.134	0.084	0.1	-2.3	99.1	99.1	0.04
Cable17	-0.169	-0.110	0.169	0.110	0.0	-0.1	99.1	99.1	0.00
Cable16	0.304	0.193	-0.304	-0.194	0.2	-1.1	99.2	99.1	0.04
Cable19	-0.934	-0.608	0.937	0.606	2.6	-1.7	97.5	97.7	0.24
Cable14	1.212	0.773	-1.207	-0.774	4.4	-1.0	98.4	98.1	0.33
Cable11	-1.099	-0.707	1.102	0.706	3.1	-1.1	97.8	98.1	0.25
Cable15	1.055	0.680	-1.053	-0.681	1.6	-0.7	97.8	97.7	0.13
					74.4	99.5			

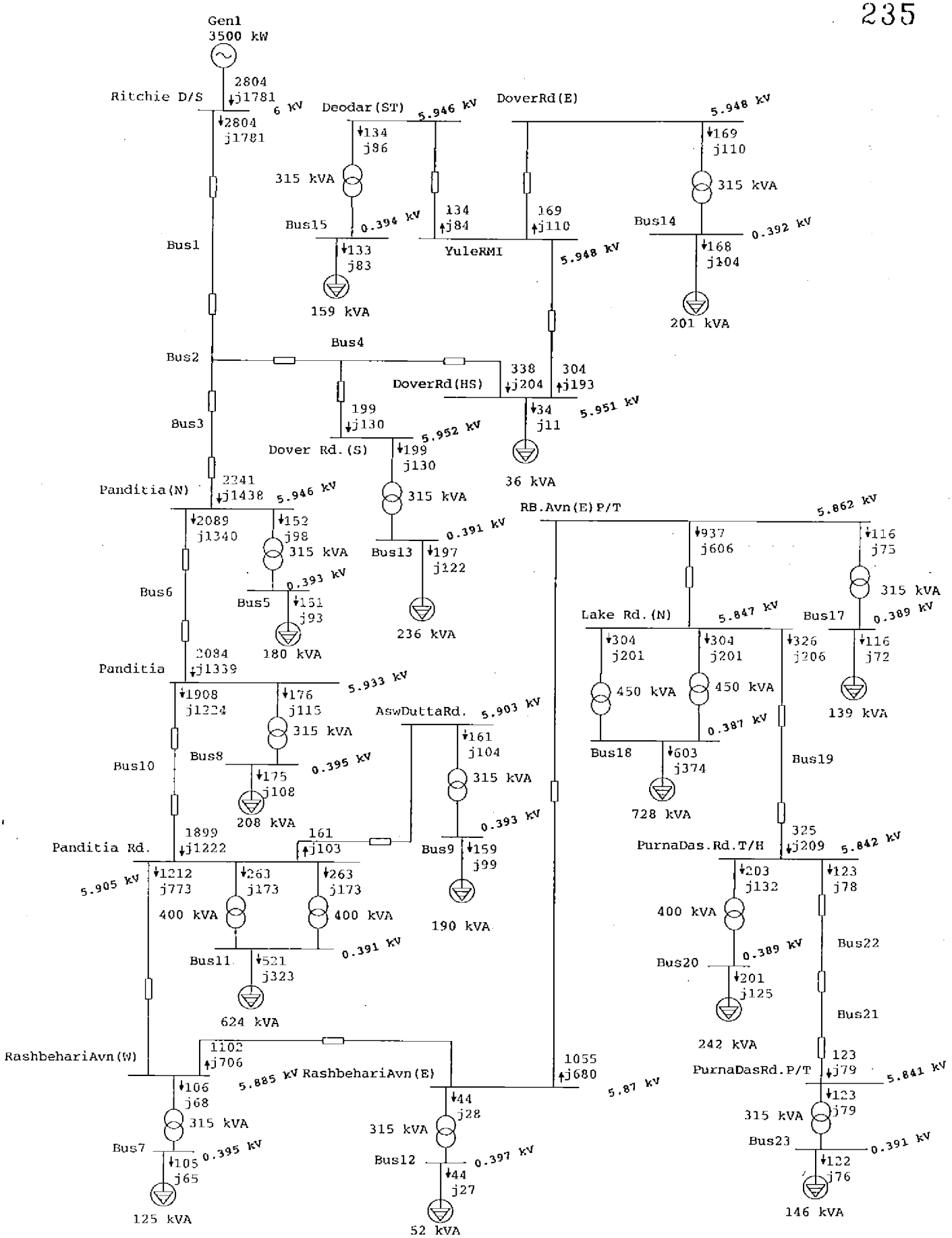
Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 16
Location:	Kolkata,West Bengal.	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth, TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kVRichie-LakeRoadFeeder		Config.: Normal

6 kV Ritchie - Lake Road (N) Feeder (Modified with revised loads (M.load 60%) & cable lengths)

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	2.804	1.781	3.322	84.41 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	2.804	1.781	3.322	84.41 Lagging
Total Motor Load:	1.668	1.028	1.959	85.14 Lagging
Total Static Load:	1.061	0.654		
Apparent Losses:	0.074	0.100		
System Mismatch:	0.000	0.000		

Number of Iterations: 3


Gen1
3500 kW
2804
j1781
Ritchie D/S
6 kV
2804
j1781
Bus1
Deodar(ST)
5.946 kV
134
j86
315 kVA
Bus15
0.394 kV
133
j83
159 kVA
134
j84
YuleRMI
169
j110
5.948 kV
DoverRd(E)
5.948 kV
169
j110
315 kVA
Bus14
0.392 kV
168
j104
201 kVA
Bus4
Bus2
338
j204
304
j193
DoverRd(HS)
199
j130
34
j11
5.951 kV
Bus3
Dover Rd.(S)
5.952 kV
199
j130
36 kVA
315 kVA
Bus13
0.391 kV
197
j122
236 kVA
2241
j1438
Panditia(N)
5.946 kV
2089
j1340
152
j98
315 kVA
0.393 kV
Bus5
151
j93
180 kVA
Bus6
2084
j1339
Panditia
5.933 kV
1908
j1224
176
j115
315 kVA
Bus8
0.395 kV
175
j108
208 kVA
Bus10
1899
j1222
Panditia Rd.
5.905 kV
1212
j773
263
j173
263
j173
400 kVA
400 kVA
0.391 kV
Bus11
521
j323
624 kVA
161
j103
AswDuttaRd.
5.903 kV
161
j104
315 kVA
0.393 kV
Bus9
159
j99
190 kVA
RB.Avn(E)P/T
5.862 kV
937
j606
116
j75
315 kVA
Lake Rd.(N)
5.847 kV
304
j201
304
j201
326
j206
450 kVA
450 kVA
0.387 kV
Bus18
603
j374
728 kVA
Bus17
0.389 kV
116
j72
139 kVA
Bus19
325
j209
PurnaDas.Rd.T/H
5.842 kV
203
j132
123
j78
400 kVA
0.389 kV
Bus20
201
j125
242 kVA
Bus22
Bus21
123
j79
PurnaDasRd.P/T
5.841 kV
123
j79
315 kVA
Bus23
0.391 kV
122
j76
146 kVA
1102
j706
RashbehariAvn(W)
5.885 kV
RashbehariAvn(E)
1055
j680
5.87 kV
106
j68
315 kVA
Bus7
0.395 kV
105
j65
125 kVA
44
j28
315 kVA
Bus12
0.397 kV
44
j27
52 kVA

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 1
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth,TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kVHareSt-ShippingCorporation		Config.: Normal

6 kV Hare Street D/S - Shipping Corporation of India Feeder (Modified with revised loads(M.load 80%) & cable lengths)

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	15	16

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	3	0	0	13	0	0	16

Method of Solution:	Newton-Raphson Method
Maximum No. of iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6kVHareSt-ShippingCorporation
Output Filename:	C:\ETAP 404\PowerStation\6kVHareSt-ShippingCorporation\6kVHareS.lf1

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 7
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth,TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kVHareSt-ShippingCorporation		Config.: Normal

6 kV Hare Street D/S - Shipping Corporation of India Feeder (Modified with revised loads(M.load 80%) & cable lengths)

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
* 1 Hare St.	6.000	100.000	0.0	2.01	1.56	0	0	0	0	Bus1	2.01	1.56	244	79.0	
2 ShippCorp.	6.000	99.748	0.0	0	0	0.39	0.45	0.10	0.11	Bus1	-2.00	-1.56	244	78.9	
										3 Bichar Bhavan	1.52	0.99	175	83.7	
3 Bichar Bhavan	6.000	99.581	0.0	0	0	0	0	0	0	2 ShippCorp.	-1.52	-0.99	175	83.7	
										Bus2	1.52	0.99	175	83.7	
4 Shaw Walace	6.000	99.296	0.1	0	0	0.18	0.11	0.04	0.03	Bus2	-1.51	-0.99	175	83.6	
										Bus3	1.29	0.85	149	83.4	
5 CPWD	6.000	99.153	0.1	0	0	0	0	0	0	Bus3	-1.29	-0.85	150	83.3	
										6 McLeod	1.29	0.85	150	83.3	
6 McLeod	6.000	98.858	0.1	0	0	0.25	0.22	0.06	0.05	5 CPWD	-1.28	-0.85	150	83.2	
										Bus4	0.97	0.58	109	85.9	
7 P&T Dept	6.000	98.580	0.2	0	0	0.17	0.07	0.04	0.02	Bus4	-0.97	-0.58	109	85.8	
										Bus5	0.75	0.49	88	83.6	
8 Hare ST D/T	6.000	98.414	0.2	0	0	0	0	0	0	Bus5	-0.75	-0.49	88	83.6	
										9 Garstin Place	0.62	0.41	72	83.4	
										Bus6	0.14	0.09	15	84.4	-2.000
9 Garstin Place	6.000	98.344	0.2	0	0	0	0	0	0	8 Hare ST D/T	-0.62	-0.41	72	83.4	
										Bus7	0.31	0.20	36	83.4	-4.000
										Bus7	0.31	0.20	36	83.4	-4.000
Bus1	6.000	99.800	0.0	0	0	0	0	0	0	1 Hare St.	-2.01	-1.56	244	79.0	
										2 ShippCorp.	2.01	1.56	244	79.0	
Bus2	6.000	99.380	0.1	0	0	0	0	0	0	3 Bichar Bhavan	-1.51	-0.99	175	83.6	
										4 Shaw Walace	1.51	0.99	175	83.6	
Bus3	6.000	99.225	0.1	0	0	0	0	0	0	4 Shaw Walace	-1.29	-0.85	149	83.3	
										5 CPWD	1.29	0.85	149	83.3	
Bus4	6.000	98.638	0.2	0	0	0	0	0	0	6 McLeod	-0.97	-0.58	109	85.8	
										7 P&T Dept	0.97	0.58	109	85.8	
Bus5	6.000	98.455	0.2	0	0	0	0	0	0	7 P&T Dept	-0.75	-0.49	88	83.6	
										8 Hare ST D/T	0.75	0.49	88	83.6	
Bus6	0.400	99.401	-0.4	0	0	0.11	0.07	0.03	0.02	8 Hare ST D/T	-0.13	-0.08	230	85.0	
Bus7	0.400	99.393	-1.5	0	0	0.49	0.30	0.12	0.07	9 Garstin Place	-0.31	-0.19	521	85.0	
										9 Garstin Place	-0.31	-0.19	521	85.0	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC LossStudy Report(2004-05)	**ETAP PowerStation**	Page: 10
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth,TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kVHareSt-ShippingCorporation		Config.: Normal

6 kV Hare Street D/S - Shipping Corporation of India Feeder (Modified with revised loads(M.load 80%) & cable lengths)

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	2.010	1.559	-2.005	-1.558	4.7	1.1	100.0	99.8	0.20
Cable2	-2.004	-1.558	2.005	1.558	1.1	0.3	99.7	99.8	0.05
Cable3	1.520	0.992	-1.517	-0.992	2.8	0.0	99.7	99.6	0.17
Cable4	1.517	0.992	-1.514	-0.992	3.3	0.0	99.6	99.4	0.20
Cable5	-1.513	-0.992	1.514	0.992	1.3	0.0	99.3	99.4	0.08
Cable6	1.290	0.854	-1.289	-0.854	1.0	-0.2	99.3	99.2	0.07
Cable7	-1.288	-0.855	1.289	0.854	1.0	-0.2	99.2	99.2	0.07
Cable8	1.288	0.855	-1.283	-0.854	4.9	0.4	99.2	98.9	0.29
Cable9	0.969	0.578	-0.967	-0.578	2.6	0.0	98.9	98.6	0.22
Cable10	-0.966	-0.578	0.967	0.578	0.6	-0.3	98.6	98.6	0.06
Cable11	0.754	0.494	-0.753	-0.494	1.2	-0.1	98.6	98.5	0.12
Cable12	-0.753	-0.495	0.753	0.494	0.4	-0.3	98.4	98.5	0.04
Cable13	0.618	0.409	-0.617	-0.409	0.6	-0.1	98.4	98.3	0.07
T1	0.135	0.086	-0.135	-0.084	0.4	2.4	98.4	99.4	0.99
T2	0.309	0.205	-0.305	-0.189	3.3	15.3	98.3	99.4	1.05
T3	0.309	0.205	-0.305	-0.189	3.3	15.3	98.3	99.4	1.05
					32.5	33.6			

Project:	CESC LossStudy Report(2004-05)	ETAP PowerStation	Page: 13
Location:	Kolkata, West Bengal	4.0.4C	Date: 09-22-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	Navin Seth,TERI, New Delhi	Study Case: LF	Revision: Base
Filename:	6kVHareSt-ShippingCorporation		Config.: Normal

6 kV Hare Street D/S - Shipping Corporation of India Feeder (Modified with revised loads(M.load 80%) & cable lengths)

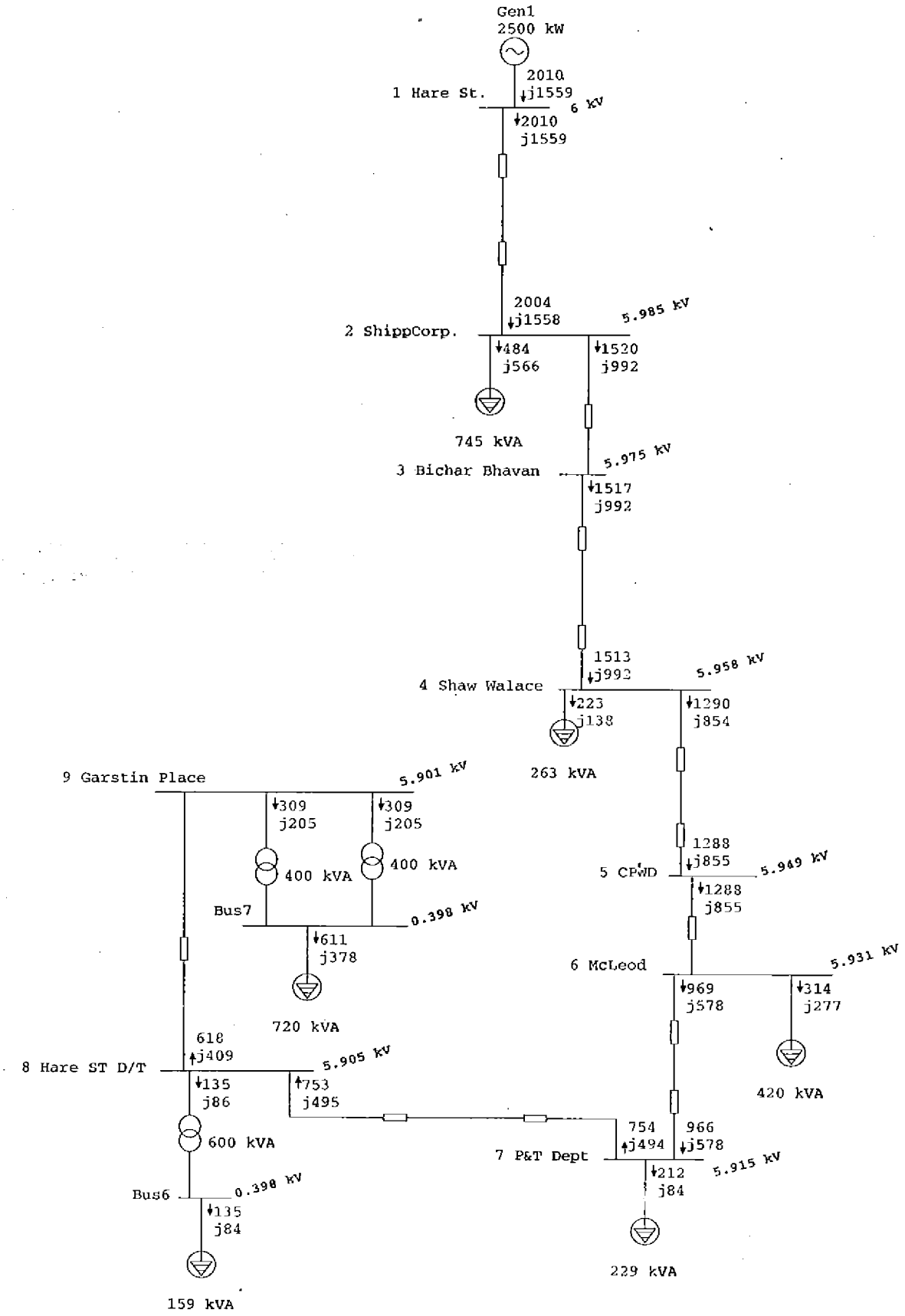
SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	2.010	1.559	2.544	79.01 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	2.010	1.559	2.544	79.01 Lagging
Total Motor Load:	1.586	1.224	2.004	79.18 Lagging
Total Static Load:	0.391	0.302		
Apparent Losses:	0.033	0.034		
System Mismatch:	0.000	0.000		

Number of Iterations: 2

One-Line Diagram - OLV1

240



Project:	CESC Loss Study Report	ETAP PowerStation	Page: 1
Location:	Kolkota, West Bengal	4.0.4C	Date: 08-05-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvAgarpara-PopularIron&Steel		Config.: Normal

Revised with increased length

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

	Swing	Generator	Load	Total
Number of Buses:	1	0	7	8

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	0	0	0	7	0	0	7

Method of Solution:	Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.000100

System Frequency:	50.00
Unit System:	Metric
Project Filename:	6kvAgarpara-PopularIron&Steel
Output Filename:	C:\ETAP 404\PowerStation\6kvAgarpara-PopularIron&Steel\6kvAGARP.lf1

Project:	CESC Loss Study Report	ETAP PowerStation	Page: 6
Location:	Kolkota, West Bengal	4.0.4C	Date: 08-05-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvAgarpara-PopularIron&Steel		Config.: Normal

6kV Agarpara - Popular Iron &Steel

LOAD FLOW REPORT

Bus		Voltage		Generation		Motor Load		Static Load		Load Flow					XFMR
ID	kV	%Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	% Tap
3 WAY L/C	6.000	97.996	0.0	0	0	0	0	0	0	Agarpara	-0.20	-0.12	22	86.6	
										Bus8	0.20	0.12	22	86.6	
4 Til Ltd.	6.000	97.855	0.0	0	0	0	0	0	0	Bus8	-0.20	-0.12	22	86.0	
										Bus10	0.20	0.12	22	86.0	
5 PI&S	6.000	97.555	0.1	0	0	0	0	0	0	Bus10	-0.20	-0.12	22	85.5	
										7 IMI	0.06	0.03	6	85.6	
										6 OCM	0.14	0.09	16	85.5	
6 OCM	6.000	97.359	0.1	0	0	0.14	0.09	0	0	5 PI&S	-0.14	-0.09	16	85.0	
7 IMI	6.000	97.515	0.1	0	0	0.06	0.03	0	0	5 PI&S	-0.06	-0.03	6	85.0	
* Agarpara	6.000	98.000	0.0	0.20	0.12	0	0	0	0	3 WAY L/C	0.20	0.12	22	86.6	
Bus8	6.000	97.994	0.0	0	0	0	0	0	0	3 WAY L/C	-0.20	-0.12	22	86.6	
										4 Til Ltd.	0.20	0.12	22	86.6	
Bus10	6.000	97.751	0.0	0	0	0	0	0	0	4 Til Ltd.	-0.20	-0.12	22	85.8	
										5 PI&S	0.20	0.12	22	85.8	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Project:	CESC Loss Study Report	ETAP PowerStation	Page: 9
Location:	Kolkota, West Bengal	4.0.4C	Date: 08-05-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvAgarpara-PopularIron&Steel		Config.: Normal

6kV Agarpara - Popular Iron &Steel

BRANCH LOSSES Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop
ID	MW	Mvar	MW	Mvar	kW	Kvar	From	To	in Vmag
Cable1	-0.200	-0.115	0.200	0.115	0.0	-0.1	98.0	98.0	0.00
Cable2	0.200	0.115	-0.200	-0.115	0.0	-0.1	98.0	98.0	0.00
Cable3	-0.199	-0.118	0.200	0.115	0.3	-2.8	97.9	98.0	0.14
Cable4	0.199	0.118	-0.199	-0.119	0.3	-0.8	97.9	97.8	0.10
Cable5	-0.198	-0.120	0.199	0.119	0.5	-1.2	97.6	97.8	0.20
Cable7	0.055	0.033	-0.055	-0.034	0.0	-0.9	97.6	97.5	0.04
Cable8	0.143	0.087	-0.143	-0.088	0.4	-1.7	97.6	97.4	0.20
					1.5	-7.4			

Project:	CESC Loss Study Report	ETAP PowerStation	Page: 12
Location:	Kolkota, West Bengal	4.0.4C	Date: 08-24-2005
Contract:	2004ER26		SN: TATAENERGY
Engineer:	M.S.Bhalla	Study Case: LF	Revision: Base
Filename:	6kvAgarpara-PopularIron&Steel		Config.: Normal

Revised with increased length

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Swing Bus(es):	0.163	0.157	0.226	71.95 Lagging
Generators:	0.000	0.000	0.000	100.00 Lagging
Total Demand:	0.163	0.157	0.226	71.95 Lagging
Total Motor Load:	0.130	0.133	0.186	70.00 Lagging
Total Static Load:	0.031	0.032		
Apparent Losses:	0.001	-0.007		
System Mismatch:	0.000	0.000		

Number of Iterations: 3

One-Line Diagram - 6kV Agarpara

245

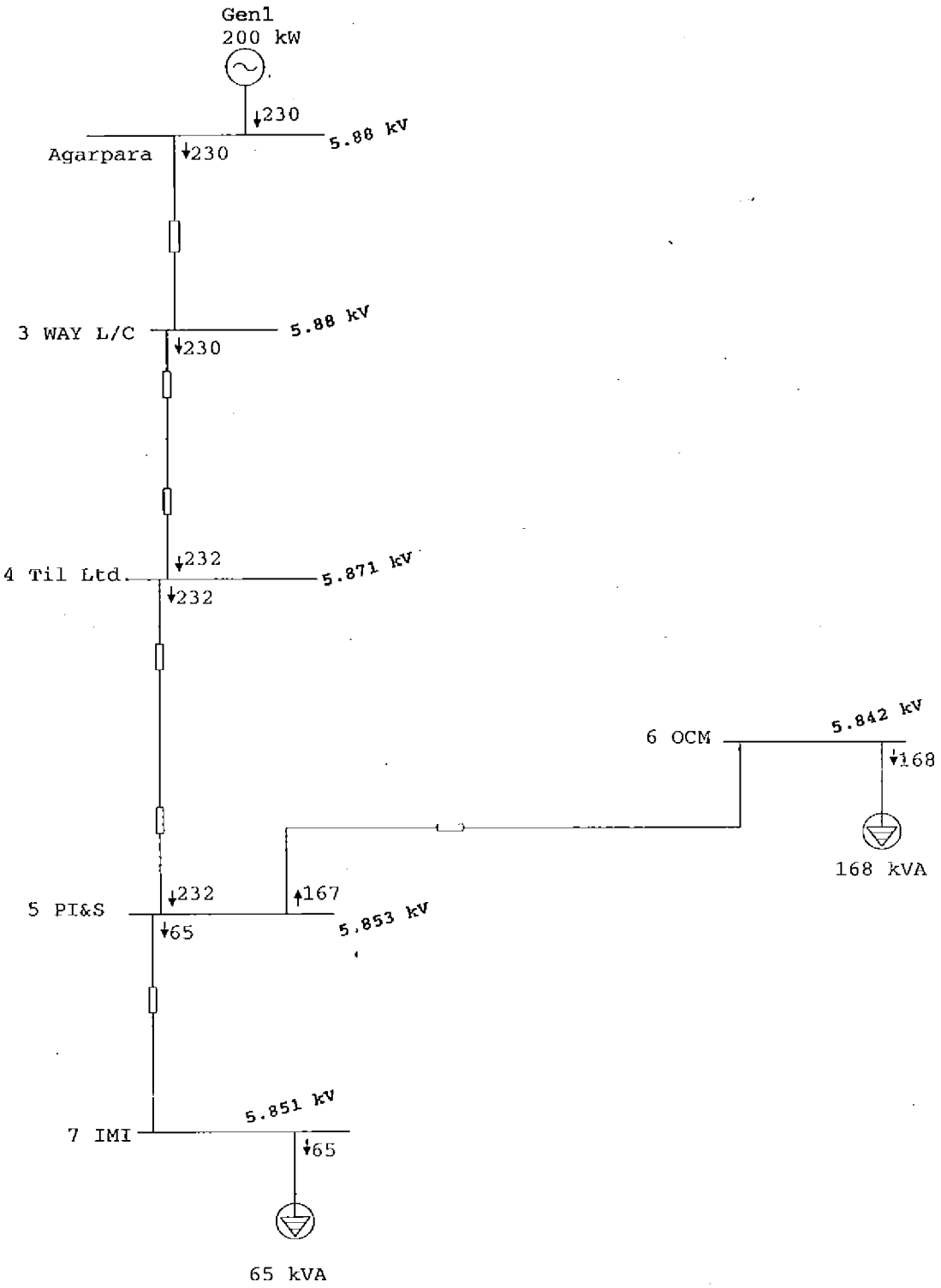
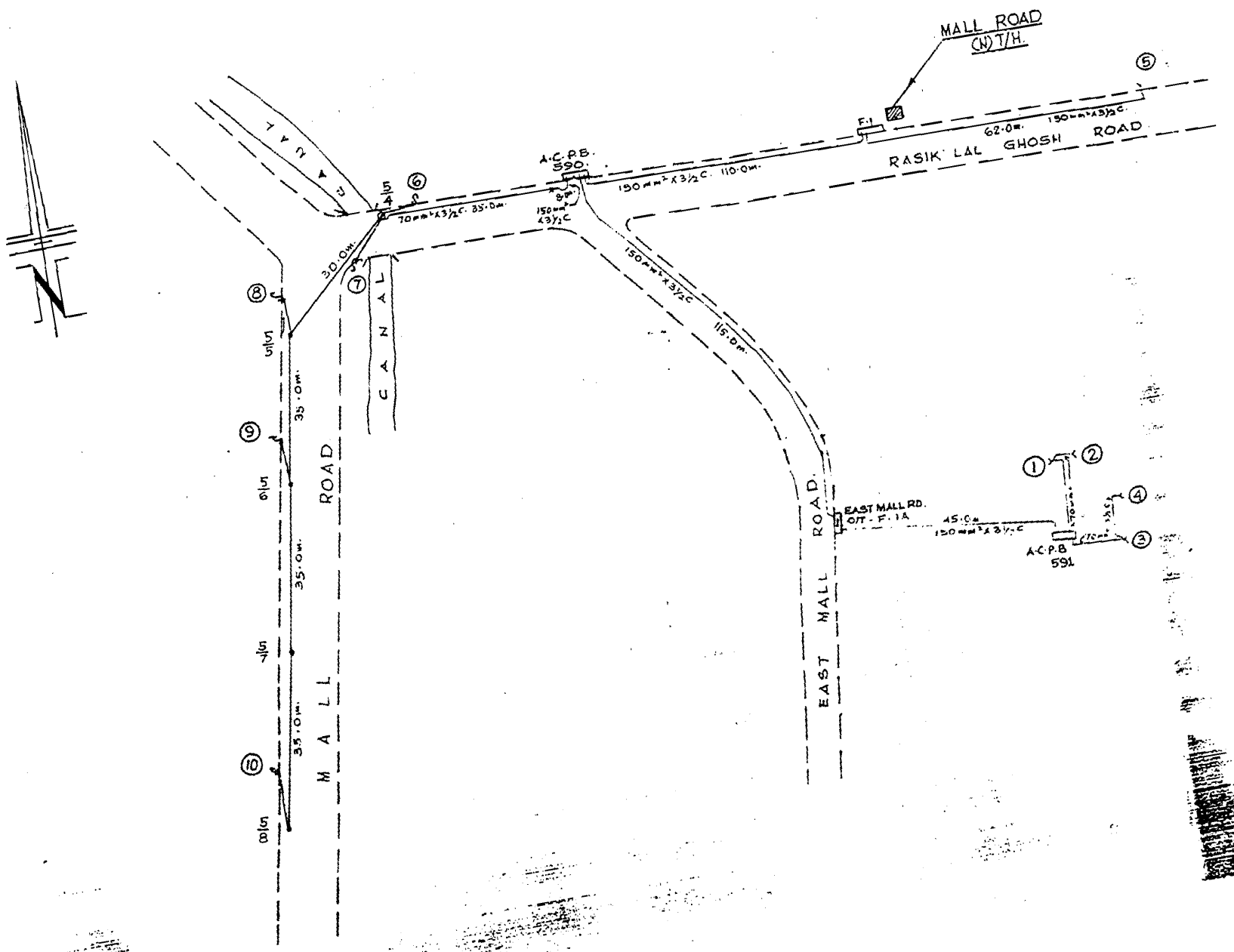


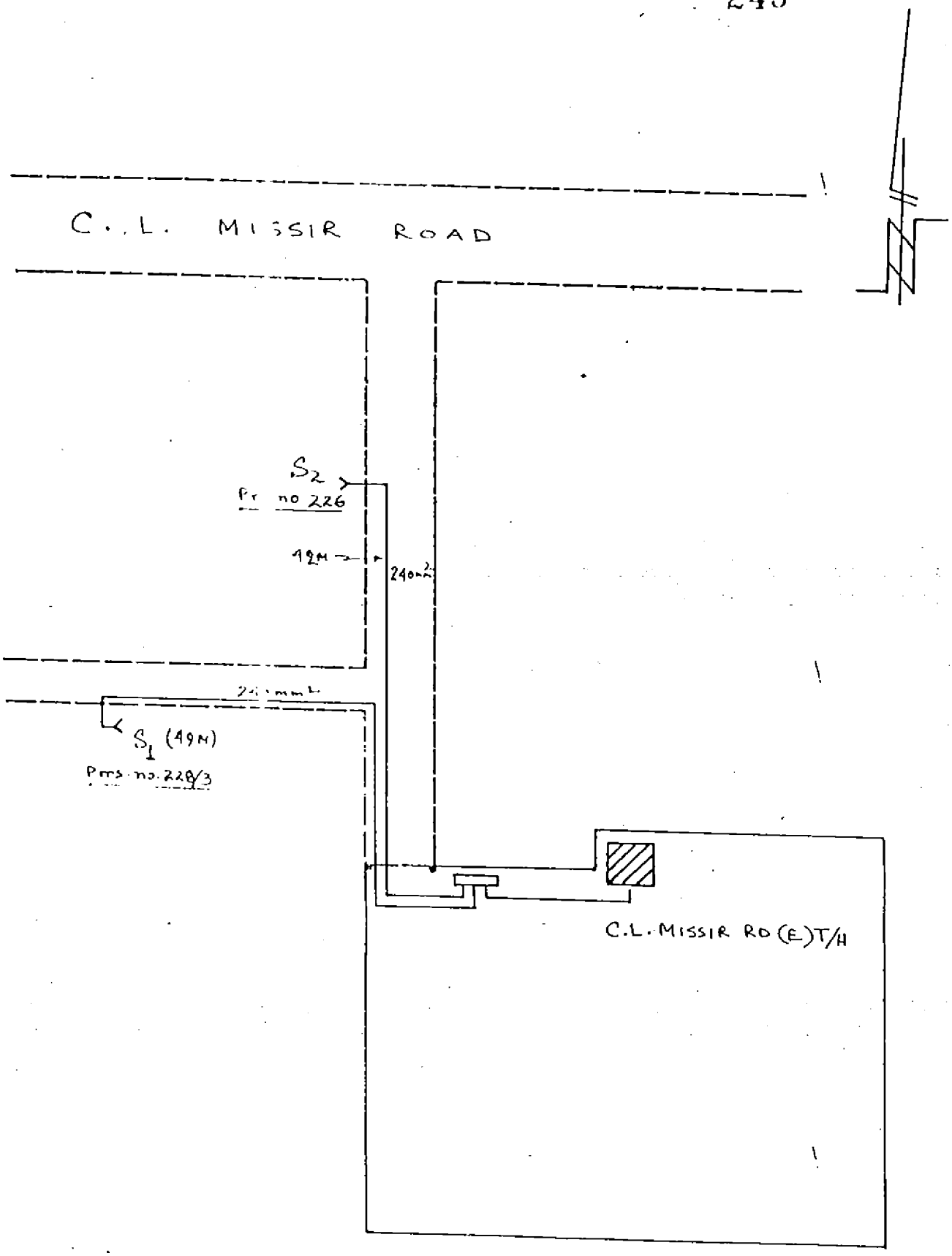
Exhibit 4:

LT Distribution system

Calculation of LT Distribution Loss													
Mall Road (N) T/H													
	Service load details												
	From Section	To Section	Impedence(Z=ohm/KM/Phase)	Length (Meters)	Phase Currents (A)				Phase Losses(W)			Neutral Loss (W)	Total Power Loss (W)
					IR	IY	IB	IN	LR	LY	LB	LN	LTOT
	SVC1		0.607	26.45	10	9	8	1.7333	1.6068	1.3015	1.0284	0.0968	4.033
	SVC2		0.607	12.65	12	9	7	4.3602	1.1066	0.6225	0.3766	0.2922	2.398
	SVC3		0.607	5.75	12	8	8	4.0014	0.5030	0.2236	0.2236	0.1119	1.062
	SVC4		0.607	59.8	10	7	8	3.6066	3.6326	1.7801	1.3078	0.9451	7.666
	SVC5		0.285	71.3	1	2	1	0.9999	0.0203	0.0814	0.0203	0.0407	0.163
	SVC6		4.029	6.9	0	4	0	4.0000	0.0000	0.4448	0.0000	0.8895	1.334
	SVC7		2.551	11.5	15	10.5	9	5.4100	6.6010	3.2345	2.3764	1.7173	13.929
	SVC8		1.636	8.05	5	8	4	1.7321	0.3292	0.4740	0.2107	0.0790	1.093
	SVC9		4.029	16.1	1	1	1	0.0002	0.0649	0.0649	0.0649	0.0000	0.195
	SVC10		4.029	13.6	1	1.5	1	0.4999	0.0556	0.1251	0.0556	0.0276	0.264
				0	67	58	45		0.0000	0.0000	0.0000	0.0000	0.000
	Sectionwise load details			0					0.0000	0.0000	0.0000	0.0000	0.000
				0					0.0000	0.0000	0.0000	0.0000	0.000
	TRF	F1	0.113	28.75	67	58	45	19.1648	14.6218	10.9574	6.5960	2.3927	34.568
	A.C.P.B591	SVC3	0.607	5.75	22	15	14	7.5523	1.6907	0.7859	0.6846	0.3985	3.560
	SVC3	SVC4	0.607	59.8	10	7	8	3.6066	3.6326	1.7801	1.3078	0.9451	7.866
	A.C.P.B591	SVC1	0.607	26.45	22	16	15	6.0854	7.7770	5.2061	3.6154	1.1901	17.789
	SVC1	SVC2	0.607	12.65	12	9	7	4.3602	1.1066	0.6225	0.3766	0.2922	2.398
				0					0.0000	0.0000	0.0000	0.0000	0.000
	F-1A East Mall Rd. O/T	ACPB591	0.285	51.75	44	33	29	13.4588	28.5950	16.0847	12.4217	5.3509	82.452
				0					0.0000	0.0000	0.0000	0.0000	0.000
	ACPB590	F-1A East Mall Rd. O/T	0.285	132.25	44	33	29	13.4588	73.0762	41.1054	31.7444	13.6746	159.600
				0					0.0000	0.0000	0.0000	0.0000	0.000
	F 1	SVC5	0.285	71.3	1	2	1	0.9999	0.0203	0.0814	0.0203	0.0407	0.163
	ACPB590	F 1	0.285	128.5	66	56	44	19.0863	157.2727	113.2248	69.8990	26.3050	366.701
				0					0.0000	0.0000	0.0000	0.0000	0.000
	ACPB590	L.P.5/4	0.285	49.45	22	23	15	7.5515	6.8310	7.4662	3.1756	1.6097	19.082
				0					0.0000	0.0000	0.0000	0.0000	0.000
	L.P.5/4	L.P.5/5	0.955	34.5	7	8.5	6	2.1794	1.6148	2.3809	1.1864	0.3131	5.495
	L.P.5/5	L.P.5/6	0.955	40.25	2	2.5	2	0.4996	0.1538	0.2403	0.1538	0.0192	0.567
	L.P.5/6	L.P.5/7	0.955	40.25	1	1	1	0.0002	0.0384	0.0384	0.0384	0.0000	0.115
	L.P.5/7	L.P.5/8	0.955	40.25	1	1	1	0.0002	0.0384	0.0384	0.0384	0.0000	0.115
									296.4697	200.0126	131.2583	56.7317	712.409
												Total loss (W)	712.409
												Phase loss (kW)	0.628
			-									Neutral loss (kW)	0.057
												Total loss(KW)	0.712
												Av. current	56.667
												Av.load (kW)	31.407
												% loss	2.268


MALL ROAD
(N) T/H.
RASIK LAL GHOSH ROAD
A.C.P.B. 590
F-1
62.0m.
150mm² x 3½C.
110.0m.
70mm² x 3½C. 25.0m.
150mm² x 3½C
8m.
30.0m.
150mm² x 3½C
115.0m.
CANAL
MALL ROAD
35.0m.
35.0m.
35.0m.
EAST MALL ROAD.
EAST MALL RD. O/T - F. 1A
45.0m
150mm² x 3½C
A.C.P.B 591
5/4
5/5
6/5
7/5
8/5

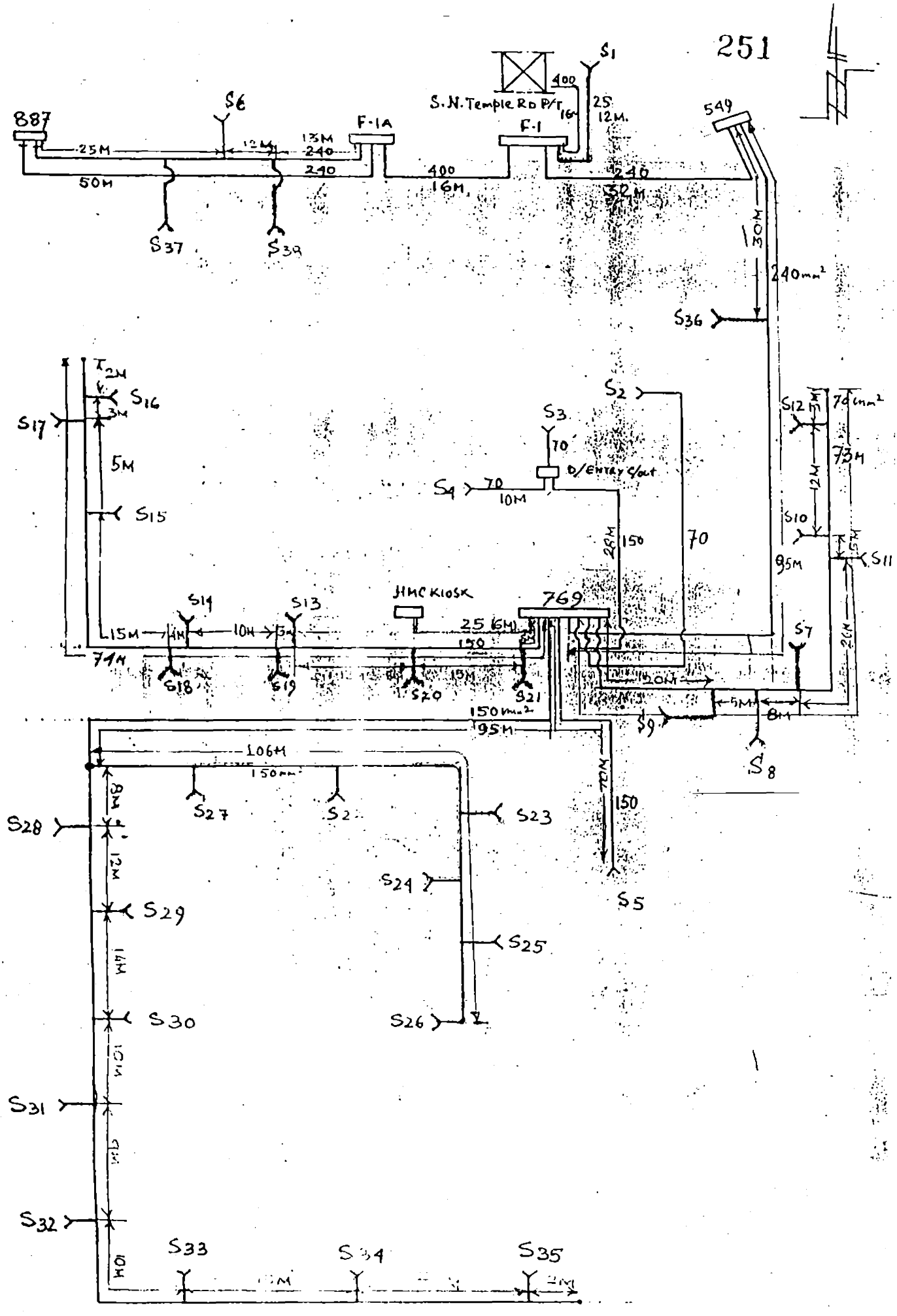
Calculation of LT Distribution Loss															
CL Missir Road (E) T/H															
Service load details															
	From Section	To Section	pedence(Z=ohm/KM/Phas	Length (meters)	Phase Currents (A)			Phase Losses(W)				Neutral Loss (W)	Power Loss (W)		
					IR	IY	IB	IN	LR	LY	LB	LN	LTOT		
	S1		0.1768	56.35	94	85	96	10.155	88.041	71.989	73.71	2.055	240.795		
	S2		0.1768	48.3	330	339	345	13.023	930.060	981.483	1016.53	2.897	2930.973		
	S 2.1		0.2854	9	330	339	340	9.482	279.721	295.136	296.93	0.462	872.299		
Section wise load details															
	T/H	FPB (U1)	0.1133	13.8	440	435	450	13.215	302.691	295.851	316.61	0.546	915.693		
									1600.513	1644.509	1708.78	5.960	4959.760		
												Total loss(W)	4959.760		
												Total loss(kW)	4.960		
												Total phase loss(kW)	4.954		
												Neutral loss(kW)	0.006		
												Av. Current (A)	441.667		
												Load (kW)	244.789		
												% losses	2.026		


C. L. MISSIR ROAD
S2
Pr no 226
19M
240m²
S1 (49M)
Pms no. 228/3
C.L. MISSIR RD (E) T/H

Calculation of LT Distribution Loss														
SN Temple Road P/T														
Service load details														
	From Section	To Section	Impedence(Z=ohm/KM/ Phase)	Length(Meters)	Length (Meters)	Phase Currents (A)			Phase Losses(W)				Neutral Loss(W)	Power Losses (W)
						IR	IY	IB	IN	LR	LY	LB	LN	LTOT
	S38		0.607	22	25.3	16	10	20	8.719	3.935	1.537	6.148	2.337	13.956
	S37		1.640	15	17.25	7	5	5	2.001	1.386	0.707	0.707	0.227	3.027
	S36		0.607	22	25.3	10	5	10	5.001	1.537	0.384	1.537	0.769	4.227
	S35		1.640	8	9.2	0	0	5	5.000	0.000	0.000	0.377	0.754	1.132
	S34		1.640	9	10.35	5	0	0	5.000	0.424	0.000	0.000	0.849	1.273
	S33		1.640	4	4.6	0	3	0	3.000	0.000	0.068	0.000	0.136	0.204
	S32		1.640	10	11.5	5	0	0	5.000	0.472	0.000	0.000	0.943	1.415
	S31		0.607	14	16.1	15	5	10	8.661	2.201	0.245	0.978	1.468	4.891
	S 30		1.640	8	9.2	10	10	15	4.999	1.509	1.509	3.395	0.754	7.167
	S29		1.640	13	14.95	10	15	10	4.999	2.452	5.517	2.452	1.226	11.646
	S28		1.640	13	14.95	5	5	5		0.613	0.613	0.613	0.000	1.839
	S27		1.640	8	9.2	20	20	15	5.002	6.036	6.036	3.395	0.755	16.221
	S26		1.640	13	14.95	10	3	15	10.441	2.452	0.221	5.517	5.346	13.535
	S25		1.640	4	4.6	0	0	5	5.000	0.000	0.000	0.189	0.377	0.566
	S24		1.640	6	6.9	12	0	0	12.000	1.630	0.000	0.000	3.259	4.889
	S23		1.640	7	8.05	2	2	5	3.000	0.053	0.053	0.330	0.238	0.673
	S22		1.640	5	5.75	5	14	10	7.808	0.236	1.848	0.943	1.150	4.177
	S21		1.640	7	8.05	10	20	15	8.658	1.320	5.281	2.971	1.979	11.551
	S20		1.640	24	27.6	5	10	2	7.000	1.132	4.527	0.181	4.436	10.276
	S19		1.640	12	13.8	5	10	5	5.000	0.566	2.263	0.566	1.131	4.526
	S18		1.640	25	28.75	20	10	5	13.230	18.861	4.715	1.179	16.507	41.262
	S17		1.640	13	14.95	0	0	3	3.000	0.000	0.000	0.221	0.441	0.662
	S16		1.640	4	4.6	5	0	12		0.189	0.000	1.086	0.000	1.275
	S15		1.640	12	13.8	15	3	6	10.817	5.093	0.204	0.815	5.297	11.408
	S14		1.640	6	6.9	0	2	0	2.000	0.000	0.045	0.000	0.091	0.136
	S13		1.640	10	11.5	20	10	8	11.137	7.544	1.886	1.207	4.679	15.317
	S12		1.640	7	8.05	15	25	20	8.657	2.971	8.252	5.281	1.979	18.482
	S11		1.640	21	24.15	5	8	2	5.196	0.990	2.535	0.158	2.139	5.823
	S10		1.640	7	8.05	12	5	5	7.001	1.901	0.330	0.330	1.294	3.856
	S9		1.640	11	12.65	5	1	10	7.811	0.519	0.021	2.075	2.531	5.146
	S8		0.607	11	12.65	10	11	10	0.999	0.768	0.930	0.768	0.015	2.482
	S7		1.640	19	21.85	3	5	3	2.000	0.323	0.896	0.323	0.287	1.828
	S6		1.640	10	11.5	5	5	5		0.472	0.472	0.472	0.000	1.415
	S5		0.285	70	80.5	25	15	20	8.663	14.360	5.170	9.190	3.449	32.168
	S4		0.607	10	11.5	10	15	15	4.997	0.699	1.572	1.572	0.349	4.191
	S3		0.285	28	32.2	10	15	5	8.661	0.919	2.068	0.230	1.379	4.595
	S2		0.607	39	44.85	10	10	5	5.001	2.725	2.725	0.681	1.363	7.493
	S1		1.640	12	13.8	10	5	5	5.001	2.263	0.566	0.566	1.132	4.527
	HMC Kiosk		1.640	6	6.9	5	5	5		0.283	0.283	0.283	0.000	0.849
Section wise load details					0					0.000	0.000	0.000	0.000	0.000
	S35	S34	0.285	20	23	0	0	5		0.000	0.000	0.164	0.000	0.164
	S34	S33	0.285	15	17.25	5	0	5		0.123	0.000	0.123	0.000	0.246
	S33	S32	0.285	10	11.5	5	3	5	2.000	0.082	0.030	0.082	0.026	0.220
	S32	S31	0.285	9	10.35	10	3	5	6.246	0.295	0.027	0.074	0.230	0.626
	S31	S30	0.285	10	11.5	25	8	15	14.801	2.051	0.210	0.739	1.438	4.438
	S30	S29	0.285	14	16.1	35	18	30	15.136	5.629	1.489	4.136	2.106	13.359
	S29	S28	0.285	12	13.8	45	33	40	10.446	7.976	4.289	6.302	0.860	19.427
	S26	S25	0.285	18	20.7	10	3	15	10.441	0.591	0.053	1.329	1.288	3.261
	S25	S24	0.285	18	20.7	10	3	20	14.799	0.591	0.053	2.363	2.588	5.595
	S24	S23	0.285	18	20.7	22	3	20	18.085	2.860	0.053	2.363	3.865	9.141
	S23	S22	0.285	18	20.7	24	5	25	19.521	3.403	0.148	3.693	4.503	11.746
	S22	S27	0.285	18	20.7	29	19	35	14.001	4.969	2.133	7.237	2.316	16.655
	769	ACPB	0.285	95	109.25	74	52	75		170.750	84.315	175.396	0.000	430.460
	769	S5	0.285	70	80.5	25	15	20	8.663	14.360	5.170	9.190	3.449	32.168

	S16	S17	0.285	3	3.45	5	0	12		0.025	0.000	0.142	0.000	0.166
	S17	S15	0.285	5	5.75	5	0	15		0.041	0.000	0.369	0.000	0.410
	S15	S18	0.285	15	17.25	20	3	21	17.523	1.969	0.044	2.171	3.024	7.208
	S18	S14	0.285	4	4.6	40	13	26	23.391	2.101	0.222	0.888	1.437	4.647
	S14	S19	0.285	10	11.5	40	15	26	21.706	5.252	0.739	2.219	3.093	11.302
	S19	S13	0.285	3	3.45	45	25	31	17.781	1.994	0.615	0.946	0.623	4.178
	S13	S20	0.285	12	13.8	65	35	39	28.220	16.641	4.825	5.991	6.273	33.730
	S20	S21	0.285	15	17.25	70	45	41	27.229	24.125	9.970	8.276	7.300	49.671
	S21	769	0.285	5	5.75	80	65	56	21.010	10.503	6.934	5.147	1.449	24.032
	769	HMC kiosk	1.640	6	6.9	5	5	5		0.283	0.283	0.283	0.000	0.849
	S4	D/ENTRY	0.607	10	11.5	10	15	15	4.997	0.699	1.572	1.572	0.349	4.191
	S3	D/ENTRY	0.607	10	11.5	10	15	5	8.661	0.699	1.572	0.175	1.048	3.493
	D/ENTRY	769	0.285	28	32.2	20	30	20	9.998	3.676	8.271	3.676	1.837	17.461
	S2	769	0.607	28	32.2	10	10	5	5.001	1.956	1.956	0.489	0.978	5.380
	S12	S10	0.607	12	13.8	15	25	20	8.657	1.886	5.240	3.353	1.257	11.736
	S10	S11	0.607	5	5.75	27	30	25	4.359	2.546	3.144	2.183	0.133	8.006
	S11	S7	0.607	20	23	32	38	27	9.540	14.308	20.176	10.186	2.543	47.213
	S7	S8	0.607	8	9.2	35	43	30	11.358	6.846	10.334	5.030	1.442	23.652
	S8	S9	0.607	5	5.75	45	54	40	12.288	7.074	10.186	5.589	1.055	23.903
	S9	769	0.607	20	23	55	55	50	5.005	42.266	42.266	34.931	0.700	120.164
	S37	S6	0.177	25	28.75	7	5	5	2.001	0.249	0.127	0.127	0.041	0.544
	S6	S38	0.177	12	13.8	12	10	10	2.002	0.351	0.244	0.244	0.020	0.859
	S38	F1A	0.177	13	14.95	28	20	30	9.167	2.072	1.057	2.379	0.444	5.953
	F1A	F1	0.113	16	18.4	28	20	30	9.167	1.634	0.834	1.876	0.350	4.695
	F1	S1	1.640	12	13.8	10	5	5	5.001	2.263	0.566	0.566	1.132	4.527
	F1	549	0.177	32	36.8	300	280	280	20.048	585.634	510.153	510.153	5.231	1611.170
	549	S36	0.177	30	34.5	300	280	280	20.048	549.032	478.268	478.268	4.904	1510.472
	S36	769	0.177	95	109.25	290	275	270	18.073	1624.627	1460.908	1408.267	12.620	4506.422
	F1	U6	0.113	16	18.4	340	310	305	32.839	240.985	200.335	193.924	4.496	639.741
										3454.248	**2942.285**	**2959.346**	157.510	**9513.389**

Total Power Loss(W)	9514.238
Total Phase Loss (kW)	8.135
Total Neutal Loss (kW)	0.136
Total Power Loss(kW)	8.271
Av. Current (A)	318.33
Av.Load (kW)	193.873
% losses	4.266


887
S6
S1
400
S.N. Temple Rd P/T
16
25
12M.
549
F-1A
F-1
25M
12M
13M
240
240
50M
400
16M
240
32M
S37
S39
30M
240mm²
S36
T2M
S16
3M
S17
5M
S15
S2
S3
70
D/entry C/out
S4
70
10M
S12
3M
70mm²
73M
12M
S10
5M
S11
95M
28M
150
70
15M
4M
S14
10M
3M
S13
HMC KIOSK
769
25.6M
150
71M
S18
S19
S20
S21
15M
S7
20M
5M
8M
S9
S8
150mm²
95M
106M
150mm²
8M
S28
S27
S22
S23
70M
150
12M
S29
S24
S5
14M
S25
S30
S26
10M
S31
10M
S32
10M
S33
S34
S35
2M
2M

Calculation of LT Distribution Loss

JN Mukherjee Rd. O/T

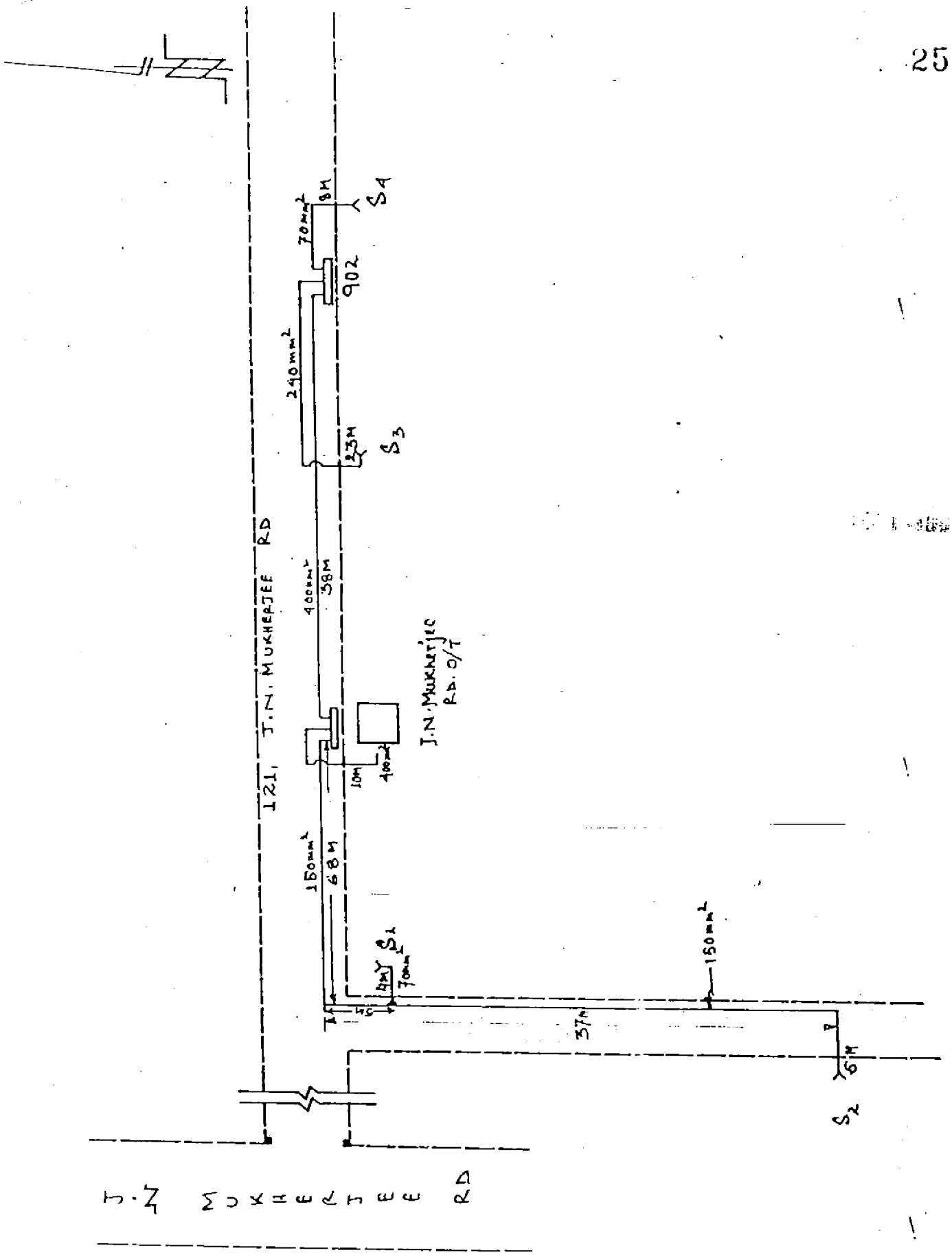
Service load details

From Section	To Section	Impedence(Z= ohm/KM/Phase)	Length (meters)	Phase current (A)				Phase Loss(W)			Neutral loss(W)	Power Loss (KW)
				IR	IY	IB	IN	LR	LY	LB	LN	LTOT
S4		0.607	9.2	194	185	173	18.274	210.346	191.282	167.2718	3.733	572.63
S3		0.177	26.45	36	45	57	18.241	6.061	9.471	15.19538	3.113	33.84
S2		0.285	5.75	11	9	10	1.733	0.199	0.133	0.164113	0.010	0.51
S1		0.607	4.6	0	1	0	1.000	0.000	0.003	0	0.006	0.01

Section wise load details

S4	902	0.607	9.2	194	185	173	18.274	210.346	191.282	167.2718	3.733	572.63
902	S3	0.177	26.45	36	45	57	18.241	6.061	9.471	15.19538	3.113	33.84
902	U1	0.113	43.7	230	230	230		261.910	261.910	261.9099	0.000	785.73
U2	S2(VIA S1)	0.285	120.75	11	10	10	1.002	4.170	3.446	3.446371	0.069	11.13
O/T	U6	0.113	11.5	245	242	242		78.207	76.303	76.30332	0.000	230.61
								777.2998	743.3008	706.758	13.775	2241.13

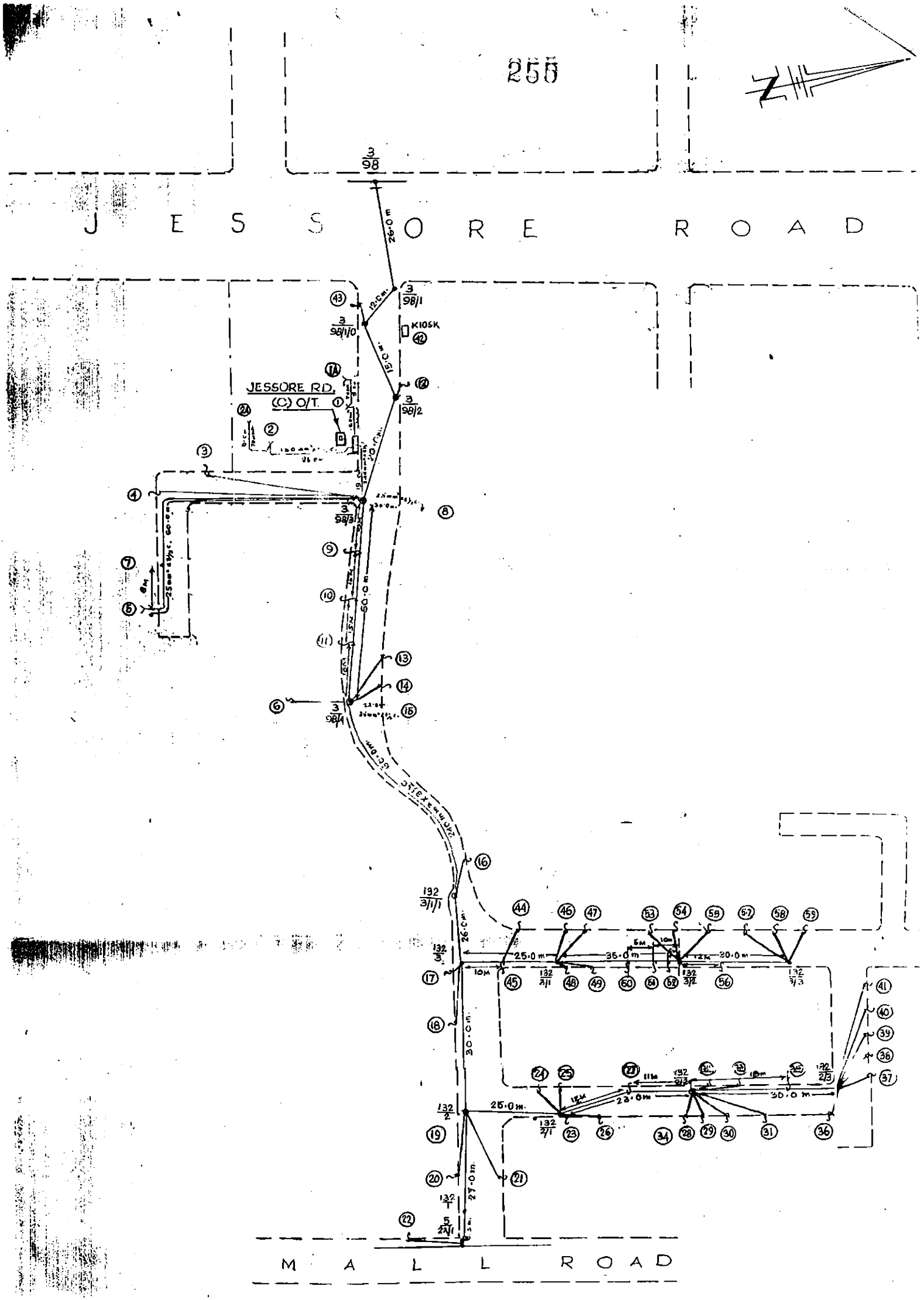
Total loss(W)	2241.13
Total loss(kW)	2.24
Phase loss (kW	2.23
Neutral loss(kW	0.01
Av. Current (A)	243
Av.load (kW)	131.313
% loss	1.707


121, J.N. MUKHERJEE RD
J.N. MUKHERJEE RD
J.N. Mukherjee Rd. 0/7
902
S4
S3
S2
S1
8M
23M
38M
68M
37M
6M
10M
70mm²
240mm²
400mm²
150mm²
150mm²
40mm²

Calculation of LT Distribution Loss
Jessore Rd.

Service load details

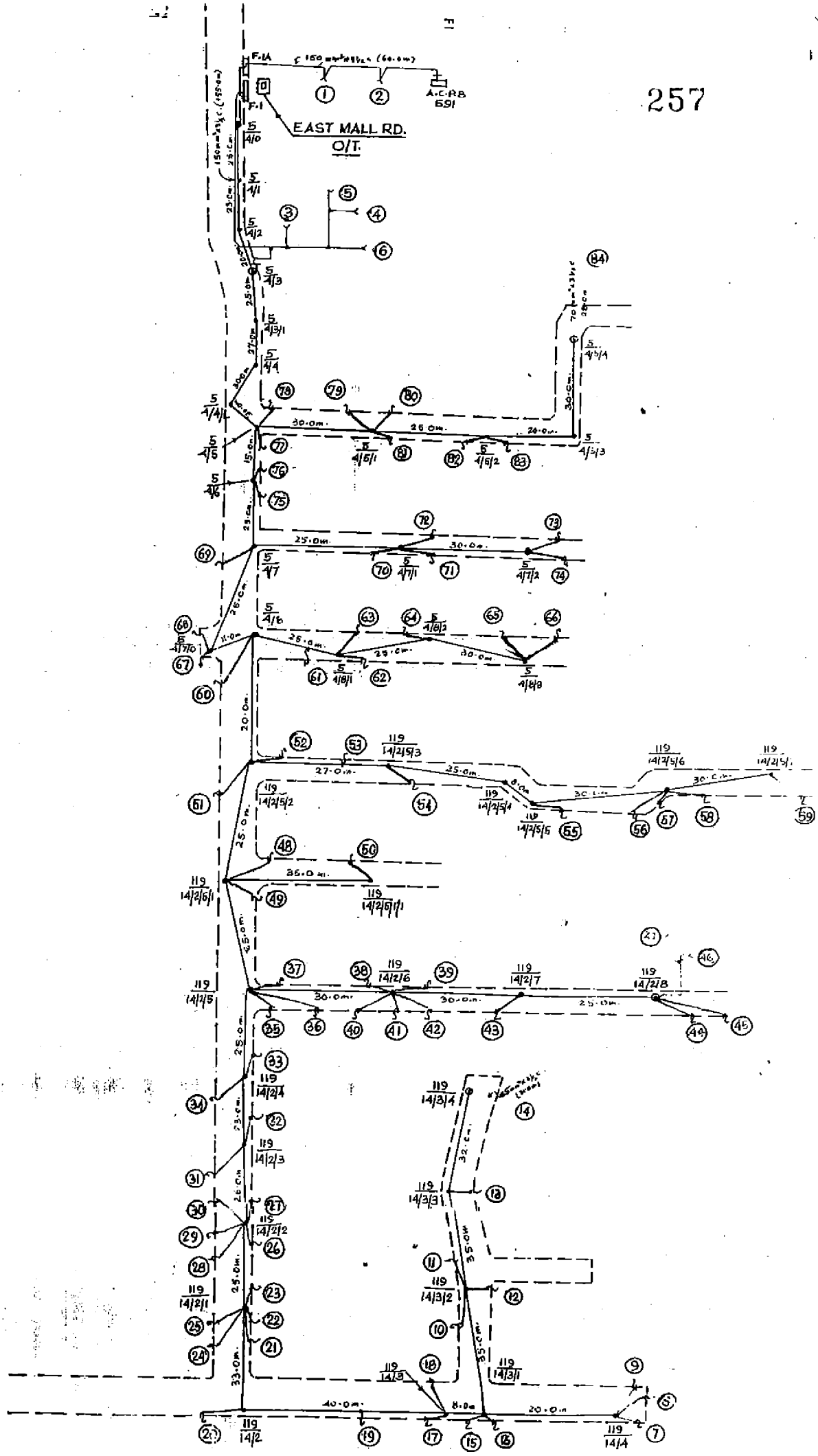
From Section	To Section	Impedence(Z=ohm/KM/Phase	Length (meters)	Phase Currents (A)				Phase Losses(W)			Neutral loss (W)	Power Loss (W)
				IR	IY	IB	IN	LR	LY	LB	LN	LTOT
SVC1		0.285	18.4	7	8	8	1.732	0.257	0.336	0.189	0.032	0.814
SVC-1A		0.607	9.2	8	12	9	3.604	0.358	0.805	0.453	0.145	1.760
SVC2		0.285	29.9	12	18	16	5.289	1.229	2.765	2.185	0.477	6.656
SVC-2A		0.607	9.2	18	32	29	12.782	1.811	5.723	4.700	1.621	14.055
SVC 8		1.640	71.3	1	2	1	1.000	0.117	0.468	0.117	0.234	0.935
SVC 3		1.640	13.8	5	0	0	5.000	0.566	0.000	0.000	1.132	1.698
SVC 4		2.551	32.2	10	8	10	1.000	8.215	5.257	8.215	0.164	21.851
SVC7		1.640	6.9	1	1	1		0.011	0.011	0.011	0.000	0.034
SVC 5		1.640	4.6	3	2	3	1.000	0.068	0.030	0.068	0.015	0.181
SVC 9		4.029	11.5	0	6	0	6.000	0.000	1.668	0.000	3.336	5.004
SVC 10		4.029	10.35	5	0	0	5.000	1.042	0.000	0.000	2.085	3.127
SVC 11		4.029	13.8	0	0	8	8.000	0.000	0.000	3.558	7.118	10.675
SVC 12		4.029	13.8	0	2	0	2.000	0.000	0.222	0.000	0.445	0.667
SVC 42		1.640	18.4	1	2	2		0.030	0.121	0.121	0.000	0.272
SVC 43		4.029	23	1	0	0	1.000	0.093	0.000	0.000	0.185	0.278
SVC6		4.029	34.5	6	0	0	8.000	8.695	0.000	0.000	17.791	26.686
SVC 13		4.029	28.75	0	0	4	4.000	0.000	0.000	1.853	3.706	5.560
SVC 14		4.029	25.3	0	3	0	3.000	0.000	0.917	0.000	1.835	2.752
SVC 15		1.640	25.3	2	2	3	3.000	0.168	0.168	0.373	0.747	1.452
SVC 16		2.551	12.65	3	2	4		0.290	0.129	0.516	0.000	0.936
SVC 17		4.029	12.65	0	0	4	4.000	0.000	0.000	0.815	1.631	2.446
SVC 18		4.029	16.1	0	3	0	3.000	0.000	0.584	0.000	1.168	1.751
SVC 44		4.029	10.35	0	3	0	3.000	0.000	0.375	0.000	0.751	1.126
SVC 45		4.029	12.65	3	0	0	3.000	0.459	0.000	0.000	0.917	1.376
SVC 46		4.029	11.5	3	0	0	3.000	0.417	0.000	0.000	0.834	1.251
SVC 47		2.551	21.85	3	0	0	3.000	0.502	0.000	0.000	1.003	1.505
SVC 48		4.029	13.8	0	6	0	6.000	0.000	2.001	0.000	4.003	6.004
SVC49		4.029	17.25	0	0	8	8.000	0.000	0.000	4.448	8.695	13.343
SVC 50		2.551	9.2	4	5	6	1.000	0.376	0.587	0.845	0.047	1.854
SVC 51		4.029	18.1	0	3	0	3.000	0.000	0.584	0.000	1.168	1.751
SVC 52		4.029	6.9	1	0	0	1.000	0.026	0.000	0.000	0.056	0.083
SVC 53		4.029	23	0	0	3	3.000	0.000	0.000	0.834	1.668	2.502
SVC 54		4.029	16.1	0	3.5	0	3.500	0.000	0.795	0.000	1.589	2.384
SVC 55		4.029	11.5	2.5	0	0	2.500	0.290	0.000	0.000	0.579	0.869
SVC 56		4.029	12.65	0	3.5	0	3.500	0.000	0.624	0.000	1.249	1.873
SVC 57		4.029	18.4	0	3.5	0	3.500	0.000	0.908	0.000	1.816	2.724
SVC 58		4.029	13.8	0	0	3	3.000	0.000	0.000	0.500	1.001	1.501
SVC 59		4.029	34.5	3	0	0	3.000	1.251	0.000	0.000	2.502	3.753
SVC 19		1.640	23	6.5	5	5.5		1.594	0.943	1.141	0.000	3.678
SVC 20		2.551	23	3	4	6		0.528	0.939	2.112	0.000	3.579
SVC 21		4.029	32.2	0	3	0	3.000	0.000	1.168	0.000	2.335	3.503
SVC 23		4.029	9.2	2	0	0	2.000	0.148	0.000	0.000	0.297	0.445
SVC 24		4.029	19.55	0	4	0	4.000	0.000	1.260	0.000	2.520	3.781
SVC 25		4.029	25.3	0	3	0	3.000	0.000	0.917	0.000	1.835	2.752
SVC 26		4.029	23	0	0	5.5	5.500	0.000	0.000	2.603	5.606	8.409
SVC 27		4.029	13.8	4.5	0	0	4.500	1.126	0.000	0.000	2.252	3.377
SVC 28		4.029	20.7	0	0	6	6.000	0.000	0.000	3.002	6.004	9.007
SVC 29		4.029	16.1	0	0	2	2.000	0.000	0.000	0.259	0.519	0.778
SVC 30		4.029	12.65	2	0	0	2.000	0.204	0.000	0.000	0.408	0.612
SVC31		4.029	21.85	4.5	0	0	4.500	1.783	0.000	0.000	3.565	5.348
SVC32		4.029	13.8	0	0	4	4.000	0.000	0.000	0.890	1.779	2.669
SVC 33		4.029	16.1	0	0	2	2.000	0.000	0.000	0.259	0.519	0.778
SVC34		1.640	25.3	3	3	5		0.373	0.373	1.037	0.000	1.784
SVC35		4.029	6.9	0	0	1	1.000	0.000	0.000	0.026	0.056	0.083
SVC36		4.029	10.35	0	2	0	2.000	0.000	0.167	0.000	0.334	0.500
SVC37		4.029	12.65	0	0	2	2.000	0.000	0.000	0.204	0.408	0.612
SVC38		4.029	14.95	3	0	0	3.000	0.542	0.000	0.000	1.084	1.626
SVC39		2.551	13.8	8	7.5	9		2.253	1.980	2.852	0.000	7.085
SVC40		4.029	28.75	0	0	1	1.000	0.000	0.000	0.116	0.232	0.347
SVC41		4.029	31.05	6	0	0	6.000	4.503	0.000	0.000	9.007	13.510
SVC 22		4.029	11.5	3	0	0	3.000	0.417	0.000	0.000	0.834	1.251
								0.000	0.000	0.000	0.000	
Sectionwise load details								0.000	0.000	0.000	0.000	
Trf	FPB	0.113	8.05	165	170	180	13.208	24.830	26.358	29.550	0.318	81.056
FPB	3/98/3	0.177	21.85	120	100	120	20.010	55.635	38.636	55.635	3.094	153.000
3/98/3	3/98/4	2.551	57.5	78	69	84	13.079	892.459	698.389	1035.042	50.185	2676.075
3/98/4	132/3/1/1	0.177	69	68	64	77	11.531	56.416	49.974	72.338	3.244	181.973
132/3/1/1	132/3	2.551	29.9	65	62	73	9.846	322.277	293.215	406.489	14.781	1036.771
132/3	132/2	2.551	34.5	45.5	31.5	49	16.042	182.210	87.332	211.321	45.300	526.164
132/2	5/23/1	2.551	40.25	3	0	0		0.924	0.000	0.000	0.000	0.924
3/98/3	3/98/2	2.551	23	2	4	2	2.000	0.235	0.939	0.235	0.469	1.878
3/98/2	3/98/1/0	2.551	17.25	2	2	2		0.176	0.176	0.176	0.000	0.528
3/98/1/0	3/98/1	2.551	13.6	0	0	0		0.000	0.000	0.000	0.000	0.000
3/98/1	3/-98	2.551	29.9	0	0	0		0.000	0.000	0.000	0.000	0.000
3/98/3	radial	1.640	69	4	3	4	1.000	1.811	1.019	1.811	0.226	4.866
132/2	132/2/1	2.551	28.75	33	19.5	37.5	16.227	79.872	27.889	103.141	38.627	249.529
132/2/1	132/2/2	2.551	26.45	31	12.5	32	19.022	64.846	10.543	69.097	48.833	193.319
132/2/2	132/2/3	2.551	34.5	17	9.5	12	6.616	26.436	7.943	12.674	7.705	53.759
132/3	132/3/1	2.551	28.75	16.5	24.5	20	6.943	19.968	44.025	29.338	7.072	100.403
132/3/1	132/3/2	2.551	40.25	5.5	10.5	6	4.769	3.106	11.321	3.697	4.671	22.794
132/3/2	132/3/3	2.551	34.5	3	3.5	3	0.600	0.792	1.078	0.792	0.044	2.706
								1770.935	1331.661	2075.839	338.313	5285.745
											Total loss(W)	5285.74488
											Total loss(kV	5.28574488
											Total phase	5.17643557
											Total neutral	0.33631259
											Av. current (A	171.666667
											Av. load(kW)	95.1445333
											% loss	5.55548984


255
JESSORE ROAD
MALL ROAD
JESSORE RD.
(C) O/T.
KIOSK
3/98
3/98/1
3/98/10
3/98/2
3/98/3
3/98/4
132/3/1/1
132/3/1/2
132/3/1/3
132/3/2
132/2
132/2/1
132/2/2
132/2/3
132/1
5/2/1
26.0 m.
15.0 m.
50.0 m.
30.0 m.
27.0 m.
25.0 m.
35.0 m.
22.0 m.
12m
10m
5m
18m

Currents (A)			Phase Losses(W)			Neutral Loss(W)	Power Loss (W)
IY	IB	IN	LR	LY	LB	LN	LTOT
7	5	2.645	0.015	0.046	0.024	0.013	0.098
8	7	1.731	0.034	0.060	0.046	0.006	0.146
1	1		0.011	0.011	0.011	0.000	0.034
3	4	1.732	0.075	0.170	0.302	0.113	0.660
4	9	5.000	1.388	1.388	7.028	4.337	14.141
7	6	3.604	0.030	0.161	0.118	0.085	0.394
2	0	2.000	0.000	0.148	0.000	0.297	0.445
0	0	2.500	0.724	0.000	0.000	1.448	2.172
0	2	2.000	0.000	0.000	0.148	0.297	0.445
0	0	3.500	0.795	0.000	0.000	1.589	2.384
0	3.5	3.500	0.000	0.000	0.795	1.589	2.384
0	0	5.500	1.682	0.000	0.000	3.364	5.045
3	0	3.000	0.000	0.417	0.000	0.834	1.251
2.5	0	2.500	0.000	0.319	0.000	0.637	0.956
0	1	1.000	0.000	0.000	0.037	0.074	0.111
0	0	4.000	0.313	0.000	0.000	0.626	0.939
2	0	2.000	0.000	0.352	0.000	0.704	1.056
0	0	1.000	0.037	0.000	0.000	0.074	0.111
0	1	1.000	0.000	0.000	0.093	0.185	0.278
5	0	5.000	0.000	3.127	0.000	6.255	9.382
0	0	3.500	0.397	0.000	0.000	0.795	1.192
0	2.5	2.500	0.000	0.000	0.232	0.463	0.695
0	3	3.000	0.000	0.000	0.584	1.168	1.751
2	0	2.000	0.000	0.445	0.000	0.890	1.334
0	3.5	3.500	0.000	0.000	0.568	1.135	1.703
0	0	2.500	0.232	0.000	0.000	0.463	0.695
3	0	3.000	0.000	0.625	0.000	1.251	1.876
0	2.5	2.500	0.000	0.000	0.521	1.042	1.564
0	0	2.500	0.492	0.000	0.000	0.985	1.477
0	3	3.000	0.000	0.000	0.667	1.334	2.001
4	0	4.000	0.000	1.038	0.000	2.076	3.113
2	0	2.000	0.000	0.167	0.000	0.334	0.500
0	1.5	1.500	0.000	0.000	0.240	0.480	0.719
0	0	1.500	0.073	0.000	0.000	0.146	0.219
0	0	1.000	0.046	0.000	0.000	0.093	0.139
0	1	1.000	0.000	0.000	0.046	0.093	0.139
0	0	1.000	0.097	0.000	0.000	0.195	0.292
1.5	0	1.500	0.000	0.083	0.000	0.167	0.250
0	0	5.500	1.682	0.000	0.000	3.364	5.045
0	2	2.000	0.000	0.000	0.185	0.371	0.556
3	0	3.000	0.000	0.542	0.000	1.084	1.626
0	1.5	1.500	0.000	0.000	0.229	0.459	0.688
0	0	1.500	0.104	0.000	0.000	0.208	0.313
0	2.5	2.500	0.000	0.000	0.376	0.753	1.129
0	0	5.000	2.548	0.000	0.000	5.096	7.645
1.5	0	1.500	0.000	0.167	0.000	0.334	0.500
0	0	4.500	0.938	0.000	0.000	1.876	2.815
0	2	2.000	0.000	0.000	0.167	0.334	0.500
0	2	2.000	0.000	0.000	0.185	0.371	0.556
3	0	3.000	0.000	0.667	0.000	1.334	2.001
0	3	3.000	0.000	0.000	0.500	1.001	1.501
0	0	3.500	1.249	0.000	0.000	2.497	3.746
0	0	3.500	0.681	0.000	0.000	1.362	2.043
5.5	0	5.500	0.000	3.364	0.000	6.727	10.091
0	2	2.000	0.000	0.000	0.060	0.121	0.181
0	2	2.000	0.000	0.000	0.083	0.166	0.249
0	0	4.000	0.890	0.000	0.000	1.779	2.669
0	0	8.500	3.347	0.000	0.000	6.695	10.042
1	0	1.000	0.000	0.069	0.000	0.139	0.208
2	0	2.000	0.000	0.204	0.000	0.408	0.612
1	0	1.000	0.000	0.046	0.000	0.093	0.139
8	0	8.000	0.000	2.669	0.000	5.337	8.006
0	0	3.500	1.135	0.000	0.000	2.270	3.405
0	0	2.500	0.319	0.000	0.000	0.637	0.956
0	2.5	2.500	0.000	0.000	0.347	0.695	1.042
12.5	0	12.500	0.000	5.791	0.000	11.583	17.374
0	1	1.000	0.000	0.000	0.065	0.130	0.195
0	0	6.000	3.168	0.000	0.000	6.337	9.505

	From Section	To Section	Impedence(Z=oh m/KM/Phase)	Length(meters)	Phase Currents (A)				Phase Losses(W)			Neutral Loss(W)	Power Loss (W)
					IR	IY	IB	IN	LR	LY	LB	LN	LTOT
	SVC24		4.029	12.65	8.5	0	0	8.500	3.682	0.000	0.000	7.364	11.046
	SVC25		4.029	23	0	0	3.5	3.500	0.000	0.000	1.135	2.270	3.405
	SVC19		4.029	8.05	0	0	2	2.000	0.000	0.000	0.130	0.259	0.389
	SVC 20		4.029	17.25	0	0	0		0.000	0.000	0.000	0.000	0.000
	SVC17		4.029	10.35	7	0	0	7.000	2.043	0.000	0.000	4.086	6.130
	SVC18		4.029	26.45	0	10.5	0	10.500	0.000	11.748	0.000	23.496	35.245
	SVC15		4.029	12.65	0	7	0	7.000	0.000	2.497	0.000	4.994	7.492
	SVC16		4.029	8.05	3.5	0	0	3.500	0.397	0.000	0.000	0.795	1.192
	SVC10		4.029	10.35	0	0	3	3.000	0.000	0.000	0.375	0.751	1.126
	SVC11		4.029	11.5	5	0	0	5.000	1.158	0.000	0.000	2.317	3.475
	SVC 12		4.029	16.1	8	0	0	8.000	4.151	0.000	0.000	8.302	12.454
	SVC13		4.029	14.95	0	1	0	1.000	0.000	0.060	0.000	0.120	0.181
	SVC14		1.640	35.65	0	0	2.5	2.600	0.000	0.000	0.365	0.731	1.096
	SVC 7		4.029	11.5	0	7	0	7.000	0.000	2.270	0.000	4.540	6.811
	SVC8		4.029	9.2	0	0	3.5	3.500	0.000	0.000	0.454	0.908	1.362
	SVC9		4.029	23	6.5	0	0	6.500	3.915	0.000	0.000	7.830	11.745
	Sectionwise load details												
	TRF	FPB-1	0.113	8.05	135	120	63	65.806	16.622	13.133	3.620	7.899	41.274
	PB F1A	FPB-1A	0.113	6.9	10	15	12	4.357	0.078	0.176	0.113	0.030	0.396
	FPB1	RADIAL	0.285	178.25	10	15	20	8.658	5.087	11.447	20.350	7.627	44.511
	FPB1	LP5/4/0	0.177	20.7	115	90	63	45.056	48.406	29.648	14.527	14.861	107.442
	LP5/4/0	LP5/4/1	0.582	28.75	115	90	63	45.056	221.378	135.589	66.438	67.964	491.369
	LP5/4/1	LP5/4/2	0.582	26.45	115	90	63	45.056	203.668	124.742	61.123	62.527	452.059
	LP5/4/2	LP5/4/3	0.582	23	115	90	63	45.056	177.102	108.471	53.151	54.371	393.095
	LP5/4/3	LP5/4/3/1	0.582	28.75	115	90	63	45.056	221.378	135.589	66.438	67.964	491.369
	LP5/4/3/1	LP5/4/4	0.582	31.05	115	90	63	45.056	239.088	146.436	71.754	73.401	530.678
	LP5/4/4	LP5/4/4/1	0.955	34.5	115	90	63	45.056	435.820	266.930	130.796	133.799	967.344
	LP5/4/4/1	LP5/4/5	0.955	34.5	115	90	63	45.056	435.820	266.930	130.796	133.799	967.344
	LP5/4/5	LP5/4/5/1	1.636	34.5	9.5	5.5	4.5	4.583	5.093	1.707	1.143	2.371	10.314
	LP5/4/5/1	LP5/4/5/2	1.636	28.75	4	2.5	1	2.598	0.752	0.294	0.047	0.635	1.728
	LP5/4/5/2	LP5/4/5/3	1.636	23	4	0	0		0.602	0.000	0.000	0.000	0.602
	LP5/4/5/3	LP5/4/5/4	1.636	34.5	4	0	0		0.903	0.000	0.000	0.000	0.903
	LP5/4/5	LP5/4/6	0.955	17.25	102	84.5	56.5	39.763	171.428	117.651	52.599	52.103	393.761
	LP5/4/6	LP5/4/7	0.955	26.75	99.5	82.5	56.5	37.520	271.880	166.913	87.665	77.320	623.778
	LP5/4/7	LP5/4/7/1	0.955	28.75	4.5	5	3.5	1.323	0.556	0.687	0.336	0.096	1.675
	LP5/4/7/1	LP5/4/7/2	0.955	34.5	3.5	0	2.5	3.123	0.404	0.000	0.206	0.643	1.252
	LP5/4/7/2	LP5/4/7/0	0.955	28.75	95	75.5	53	36.414	247.844	156.540	77.140	72.827	554.351
	LP5/4/7/0	LP5/4/8	0.955	12.65	95	73.5	50	38.994	109.051	65.277	30.208	36.745	241.281
	LP5/4/8	LP5/4/8/1	1.636	28.75	5	7	5.5	1.802	1.176	2.304	1.423	0.305	5.208
	LP5/4/8/1	LP5/4/8/2	1.636	28.75	2.5	4	3	1.322	0.294	0.752	0.423	0.164	1.634
	LP5/4/8/2	LP5/4/8/3	1.636	34.5	0	4	3	3.605	0.000	0.903	0.508	1.467	2.878
	LP5/4/8	LP 119/14/2/5/2	0.955	23	90	66.5	41	42.456	177.953	97.155	36.931	79.199	391.237
	LP 119/14/2/5/2	LP 119/14/2/5/3	1.636	31.05	7.5	1.5	3	5.409	2.857	0.114	0.457	2.972	6.400
	LP 119/14/2/5/3	LP 119/14/2/5/4	1.636	28.75	6.5	1.5	3	4.444	1.987	0.106	0.423	1.658	4.374
	LP 119/14/2/5/4	LP 119/14/2/5/5	1.636	9.2	6.5	1.5	3	4.444	0.636	0.034	0.135	0.595	1.400
	LP 119/14/2/5/5	LP 119/14/2/5/6	1.636	34.5	6.5	1.5	2	4.770	2.384	0.127	0.226	2.568	5.305
	LP 119/14/2/5/6	LP 119/14/2/5/7	1.636	34.5	0	0	2		0.000	0.000	0.226	0.000	0.226
	LP 119/14/2/5/2	LP 119/14/2/5/1	0.955	28.75	81	63	136.5	66.356	160.177	108.996	511.677	241.833	1042.684
	LP 119/14/2/5/1	LP 119/14/2/5/1/1	1.636	40.25	1.5	0	0		0.146	0.000	0.000	0.000	0.148
	LP 119/14/2/5/1	LP 119/14/2/5	0.955	28.75	79.5	60	35	38.644	173.566	98.863	33.641	82.019	388.089
	LP 119/14/2/5	LP 119/14/2/6	0.955	34.5	11.5	8.5	14.5	5.196	4.358	2.381	6.929	1.780	15.448
	LP 119/14/2/6	LP 119/14/2/7	0.955	34.5	7	5.5	7.5	1.803	1.615	0.997	1.654	0.214	4.680
	LP 119/14/2/7	LP 119/14/2/8	0.955	28.75	3.5	5.5	7.5	3.463	0.336	0.831	1.545	0.859	3.371
	LP 119/14/2/5	LP 119/14/2/4	0.955	28.75	63	50	18	40.118	108.996	68.655	8.898	88.396	274.944
	LP 119/14/2/4	LP 119/14/2/3	0.955	26.45	50.5	50	18	32.257	64.432	63.162	8.186	52.578	188.358
	LP 119/14/2/3	LP 119/14/2/2	0.955	29.9	50.5	47	18	30.903	72.836	63.090	9.254	54.552	199.731
	LP 119/14/2/2	LP 119/14/2/1	0.955	28.75	44.5	38	15.5	26.362	54.381	39.655	6.596	36.170	138.804
	LP 119/14/2/1	LP 119/14/2	0.955	37.95	30	25.5	11	17.200	32.625	23.571	4.386	21.448	82.031
	LP 119/14/2	LP 119/14/3	1.636	46	30	25.5	9	19.153	67.719	48.927	6.095	55.206	177.947
	LP 119/14/3	LP 119/14/3/1	1.636	9.2	23	15	9	12.168	7.961	3.386	1.219	4.456	17.022
	LP 119/14/3/1	LP 119/14/4	1.636	23	6.5	7	3.5	3.279	1.590	1.843	0.461	0.809	4.703
	LP 119/14/3/1	LP 119/14/3/2	1.636	40.25	13	1	5.5	10.501	11.127	0.066	1.992	14.519	27.703
	LP 119/14/3/2	LP 119/14/3/3	1.636	40.25	0	1	2.5		0.000	0.066	0.411	0.000	0.477
	LP 119/14/3/3	LP 119/14/3/4	1.636	36.8	0	0	2.5		0.000	0.000	0.376	0.000	0.376
									3819.964	2432.793	1528.839	1780.706	9562.302

Total Loss (W)	9562.302
Phase loss (kW	7.762
Neutral loss (k	1.781
Total loss (KW	9.562
Av. current	106.000
Av. load(KW)	58.749
% loss	16.276


EAST MALL RD.
O/T.
F-1
A.C.R.B. 691
30.0m.
25.0m.
20.0m.
35.0m.
40.0m.
8.0m.

WEST SUBURBAN DISTRICT - AKRA COLONY O/T - U5

CALCULATION OF LT DISTRIBUTION LOSS

S.No	FROM	TO	CABLE SIZE		RESISTANCE (Ohm/KM)		CURRENT READING (A)				PHASE LOSS (KW)	NEUTRAL LOSS (KW)	POWER LOSS (KW)
					PHASE	NEUTRAL	IR	IB	IY	IN			
1	AKRA	U5	400 mm2 (Al.)	28.75	0.11	0.11	108.0	110.0	108.0	2.0	0.10797	0.00001	0.10798
	Colony O/T			0									
2	U5	47/14	240 mm2 (Al.)	211.6	0.17	0.34	48.0	49.1	47.4	1.5	0.25189	0.00016	0.25206
3	47/14	47/13	240 mm2 (Al.)	34.5	0.17	0.34	47.1	48.2	47.4	1.0	0.04005	0.00001	0.04006
4	47/13	47/12	240 mm2 (Al.)	32.2	0.17	0.34	46.3	47.4	45.5	1.7	0.03557	0.00003	0.03560
5	47/12	47/11	240 mm2 (Al.)	32.2	0.17	0.34	45.3	46.6	44.7	1.7	0.03426	0.00003	0.03429
6	47/11	47/10	240 mm2 (Al.)	34.5	0.17	0.34	44.4	45.4	44.0	1.2	0.03521	0.00002	0.03523
7	47/10	47/9	240 mm2 (Al.)	36.8	0.17	0.34	43.5	45.4	44.0	1.7	0.03706	0.00004	0.03710
8	47/9	47/8	240 mm2 (Al.)	32.2	0.17	0.34	42.8	44.6	43.2	1.6	0.03132	0.00003	0.03134
9	47/8	47/7	240 mm2 (Al.)	34.5	0.17	0.34	42.0	43.7	42.2	1.6	0.03218	0.00003	0.03221
10	47/7	47/6	240 mm2 (Al.)	35.65	0.17	0.34	41.3	42.7	40.5	2.0	0.03136	0.00005	0.03141
11	47/6	47/5	240 mm2 (Al.)	33.35	0.17	0.34	40.1	41.7	39.4	2.0	0.02794	0.00005	0.02799
12	47/5	47/4	240 mm2 (Al.)	34.5	0.17	0.34	40.1	40.6	38.5	1.9	0.02796	0.00004	0.02800
13	47/4	47/3	240 mm2 (Al.)	32.2	0.17	0.34	39.1	39.7	38.5	1.0	0.02526	0.00001	0.02527
14	47/3	47/2	240 mm2 (Al.)	34.5	0.17	0.34	38.1	38.9	37.4	1.3	0.02574	0.00002	0.02576
15	47/2	47/1	240 mm2 (Al.)	33.35	0.17	0.34	37.0	38.9	36.3	2.3	0.02395	0.00006	0.02401
16	47/1	22/4/1	240 mm2 (Al.)	35.65	0.17	0.34	33.7	35.7	33.2	2.3	0.02141	0.00006	0.02148
17	22/4/1	22/4	240 mm2 (Al.)	31.05	0.17	0.34	32.7	33.8	31.3	2.2	0.01695	0.00005	0.01700
18	22/4	22/3	240 mm2 (Al.)	33.35	0.17	0.34	20.5	17.3	20.2	3.1	0.00643	0.00011	0.00654
19	22/3	22/2	240 mm2 (Al.)	34.5	0.17	0.34	18.4	16.2	19.1	2.6	0.00570	0.00008	0.00578
20	22/2	22/1	240 mm2 (Al.)	34.5	0.17	0.34	2.1	1.0	0.0	1.8	0.00003	0.00004	0.00007
21	22/1	22/6	240 mm2 (Al.)	34.5	0.17	0.34	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
22	22/2	23/1	240 mm2 (Al.)	37.95	0.17	0.34	16.3	14.4	18.3	3.4	0.00524	0.00015	0.00539
23	23/1	MAIN TAP 77a		0			15.1	13.3	17.6	3.7	0.00000	0.00000	0.00000
24	MAIN TAP 77a	23/2	240 mm2 (Al.)	32.2	0.17	0.34	13.9	13.3	17.6	4.0	0.00374	0.00018	0.00392
25	23/2	23/3	240 mm2 (Al.)	33.35	0.17	0.34	11.0	9.6	12.1	2.2	0.00205	0.00005	0.00210
26	23/3	23/4	240 mm2 (Al.)	34.5	0.17	0.34	10.1	8.9	12.1	2.8	0.00193	0.00009	0.00203
27	23/4	23/6	240 mm2 (Al.)	34.5	0.17	0.34	8.5	8.1	8.4	0.4	0.00123	0.00000	0.00123
28	23/6	91/92	240 mm2 (Al.)	33.35	0.17	0.34	7.6	7.1	8.4	1.1	0.00102	0.00001	0.00103
29	91/92	93/94	240 mm2 (Al.)	32.2	0.17	0.34	6.7	7.1	7.4	0.6	0.00083	0.00000	0.00083
30	93/94	95	240 mm2 (Al.)	34.5	0.17	0.34	2.1	3.2	2.8	1.0	0.00013	0.00001	0.00014
31	95	96/97	240 mm2 (Al.)	34.5	0.17	0.34	2.1	2.0	2.8	0.8	0.00010	0.00001	0.00010
32	96/97	98/99/100	240 mm2 (Al.)	34.5	0.17	0.34	1.1	2.0	1.7	0.8	0.00005	0.00001	0.00006

33	98/99/100	101/101a	240 mm2 (Al.)	35.65	0.17	0.34	0.0	0.9	0.8	0.9	0.00001	0.00001	0.00002
34	23/7	102	70 mm2 (Al.)	34.5	0.61	1.21	2.7	1.9	2.6	0.8	0.00037	0.00002	0.00039
35	102	103	70 mm2 (Al.)	5.75	0.61	1.21	1.7	1.9	2.6	0.8	0.00005	0.00000	0.00005
36	103	104	70 mm2 (Al.)	5.75	0.61	1.21	1.7	0.9	2.6	1.5	0.00004	0.00002	0.00005
37	104	105	70 mm2 (Al.)	4.6	0.61	1.21	1.7	0.9	1.9	0.9	0.00002	0.00000	0.00003
38	105	106	70 mm2 (Al.)	5.75	0.61	1.21	0.8	0.9	1.9	1.1	0.00002	0.00001	0.00003
39	106	107	70 mm2 (Al.)	6.9	0.61	1.21	0.8	0.9	0.9	0.1	0.00001	0.00000	0.00001
40	107	108	70 mm2 (Al.)	6.9	0.61	1.21	0.8	0.0	0.9	0.9	0.00001	0.00001	0.00001
41	108	109	70 mm2 (Al.)	5.75	0.61	1.21	0.8	0.0	0.0	0.8	0.00000	0.00000	0.00001
42	23/4	82	25 mm2 (Al.)	28.75	1.64	3.28	0.7	0.8	2.1	1.4	0.00026	0.00017	0.00043
43	82	83	25 mm2 (Al.)	5.75	1.64	3.28	0.7	0.8	1.2	0.5	0.00002	0.00000	0.00003
44	83	84	25 mm2 (Al.)	8.05	1.64	3.28	0.0	0.8	1.2	1.1	0.00003	0.00003	0.00006
45	84	85	25 mm2 (Al.)	11.5	1.64	3.28	0.0	0.8	0.0	0.8	0.00001	0.00002	0.00004
46	23/4	86	25 mm2 (Al.)	34.5	1.64	3.28	0.9	0.0	1.6	1.4	0.00019	0.00022	0.00041
47	86	87	25 mm2 (Al.)	5.75	1.64	3.28	0.0	0.0	1.6	1.6	0.00002	0.00005	0.00007
48	87	88	25 mm2 (Al.)	11.5	1.64	3.28	0.0	0.0	0.7	0.7	0.00001	0.00002	0.00003
49	22/4	110d	240 mm2 (Al.)	5.75	0.17	0.34	9.5	14.6	9.2	5.3	0.00038	0.00005	0.00044
50	110d	110c	240 mm2 (Al.)	5.75	0.17	0.34	9.5	13.6	9.2	4.3	0.00035	0.00004	0.00039
51	110c	110b	240 mm2 (Al.)	6.9	0.17	0.34	9.5	13.6	8.4	4.7	0.00041	0.00005	0.00046
52	110b	110a	240 mm2 (Al.)	9.2	0.17	0.34	8.6	13.6	8.4	5.1	0.00052	0.00008	0.00060
53	110a	22//4/0	240 mm2 (Al.)	5.75	0.17	0.34	8.6	12.6	8.4	4.1	0.00030	0.00003	0.00033
54	22//4/0	22/4/0/1	240 mm2 (Al.)	34.5	0.17	0.34	7.6	12.6	8.4	4.7	0.00169	0.00026	0.00195
55	22/4/0/1	22/4/0/2	240 mm2 (Al.)	34.5	0.17	0.34	7.6	11.8	7.4	4.3	0.00149	0.00022	0.00170
56	22/4/0/2	22/4/0/3	240 mm2 (Al.)	35.65	0.17	0.34	6.5	11.8	7.4	4.9	0.00144	0.00029	0.00173
57	22/4/0/3	22/4/0/4	240 mm2 (Al.)	32.2	0.17	0.34	6.5	11.8	7.4	4.9	0.00130	0.00027	0.00157
58	22/4/0/4	22/4/0/5	240 mm2 (Al.)	34.5	0.17	0.34	6.5	10.9	7.4	4.0	0.00127	0.00019	0.00146
59	22/4/0/5	22/4/0/6	240 mm2 (Al.)	33.35	0.17	0.34	5.9	10.3	6.3	4.2	0.00103	0.00020	0.00123
60	22/4/0/6	22/4/0/7	240 mm2 (Al.)	34.5	0.17	0.34	5.1	9.4	5.5	4.1	0.00085	0.00020	0.00105
61	22/4/0/7	22/4/0/8	240 mm2 (Al.)	35.65	0.17	0.34	4.4	8.4	5.5	3.6	0.00073	0.00016	0.00089
62	22/4/0/8	Main Tap	240 mm2 (Al.)	5.75	0.17	0.34	4.4	8.4	5.5	3.6	0.00012	0.00003	0.00014
63	Main Tap	22/4/0/9	240 mm2 (Al.)	28.75	0.17	0.34	4.4	7.6	5.5	2.8	0.00053	0.00008	0.00061
64	22/4/0/9	22/4/0/10	240 mm2 (Al.)	34.5	0.17	0.34	2.0	3.0	2.9	1.0	0.00013	0.00001	0.00014
65	22/4/0/10	22/4/0/11	240 mm2 (Al.)	35.65	0.17	0.34	1.3	3.0	1.9	1.5	0.00009	0.00003	0.00011
66	22/4/0/11	22/4/0/12	240 mm2 (Al.)	33.35	0.17	0.34	1.3	1.9	1.0	0.8	0.00004	0.00001	0.00004
67	22/4/0/12	22/4/0/13	240 mm2 (Al.)	37.95	0.17	0.34	1.3	1.9	1.0	0.8	0.00004	0.00001	0.00005
68	22/4/0/13	22/4/0/14	240 mm2 (Al.)	34.5	0.17	0.34	0.7	0.9	0.0	0.8	0.00001	0.00001	0.00002
69	22/4/0/14	22/4/0/15	240 mm2 (Al.)	37.95	0.17	0.34	0.7	0.9	0.0	0.8	0.00001	0.00001	0.00002
70	22/4/0/9	22/4/0/9/1	240 mm2 (Al.)	34.5	0.17	0.34	2.4	4.6	1.7	2.6	0.00018	0.00008	0.00026
71	22/4/0/9/1	22/4/0/9/3	240 mm2 (Al.)	36.8	0.17	0.34	2.4	3.5	1.7	1.6	0.00013	0.00003	0.00016
72	22/4/0/9/3	22/4/0/9/9	240 mm2 (Al.)	36.8	0.17	0.34	2.4	3.5	0.6	2.5	0.00012	0.00008	0.00020

73	22/4/0/9/9	22/4/0/9/10	240 mm2 (Al.)	34.5	0.17	0.34	2.4	2.3	0.6	1.8	0.00007	0.00004	0.00010
74	22/4/0/9/10	22/4/0/9/11	240 mm2 (Al.)	37.95	0.17	0.34	1.6	1.7	0.6	1.1	0.00004	0.00001	0.00005
75	22/4/0/9/11	22/4/0/9/12	240 mm2 (Al.)	35.65	0.17	0.34	1.0	1.7	0.6	1.0	0.00003	0.00001	0.00004
76	22/4/0/9/12	22/4/0/9/13	240 mm2 (Al.)	36.8	0.17	0.34	0.0	0.9	0.6	0.8	0.00001	0.00001	0.00002
											0.74094	0.00451	0.74545
1	47/14	22	10 Sq. mm.	26.45	4.02	8.03	0.9	0.0	0.0	0.9	0.00009	0.00017	0.00026
2	47/14	23	10 Sq. mm.	24.15	4.02	8.03	0.0	0.9	0.0	0.9	0.00008	0.00016	0.00024
3	47/13	24	10 Sq. mm.	23	4.02	8.03	0.0	0.0	1.0	1.0	0.00009	0.00018	0.00028
4	47/13	25	10 Sq. mm.	24.15	4.02	8.03	0.8	0.0	0.0	0.8	0.00006	0.00012	0.00019
5	47/13	26	25 Sq. mm.	23	1.64	3.28	0.0	0.8	0.0	0.8	0.00002	0.00005	0.00007
6	47/13	27	10 Sq. mm.	28.75	4.02	8.03	0.0	0.0	0.9	0.9	0.00009	0.00019	0.00028
7	47/12	28	10 Sq. mm.	24.15	4.02	8.03	1.0	0.0	0.0	1.0	0.00010	0.00019	0.00029
8	47/12	29	10 Sq. mm.	21.85	4.02	8.03	0.0	0.8	0.0	0.8	0.00006	0.00011	0.00017
9	47/12	30	10 Sq. mm.	26.45	4.02	8.03	0.0	0.0	0.8	0.8	0.00007	0.00014	0.00020
10	47/11	31	10 Sq. mm.	24.15	4.02	8.03	0.9	0.0	0.0	0.9	0.00008	0.00016	0.00024
11	47/11	32	10 Sq. mm.	27.6	4.02	8.03	0.0	1.2	0.0	1.2	0.00016	0.00032	0.00048
12	47/11	33	10 Sq. mm.	25.3	4.02	8.03	0.0	0.0	0.7	0.7	0.00005	0.00010	0.00015
13	47/10	34	10 Sq. mm.	26.45	4.02	8.03	0.9	0.0	0.0	0.9	0.00009	0.00017	0.00026
14	47/9	35	10 Sq. mm.	25.3	4.02	8.03	0.0	0.0	0.8	0.8	0.00007	0.00013	0.00020
15	47/9	36	10 Sq. mm.	19.55	4.02	8.03	0.0	0.8	0.0	0.8	0.00005	0.00010	0.00015
16	47/9	37	16 Sq. mm.	14.95	2.53	5.05	0.7	0.0	0.0	0.7	0.00002	0.00004	0.00006
17	47/8	38	25 Sq. mm.	17.25	1.64	3.28	0.0	0.0	1.0	1.0	0.00003	0.00006	0.00008
18	47/8	39	10 Sq. mm.	20.7	4.02	8.03	0.0	0.9	0.0	0.9	0.00007	0.00013	0.00020
19	47/8	40	10 Sq. mm.	17.25	4.02	8.03	0.8	0.0	0.0	0.8	0.00006	0.00006	0.00013
20	47/7	41	10 Sq. mm.	20.7	4.02	8.03	0.0	0.0	0.8	0.8	0.00005	0.00011	0.00016
21	47/7	42	10 Sq. mm.	25.3	4.02	8.03	0.0	1.0	0.0	1.0	0.00010	0.00020	0.00030
22	47/7	43	10 Sq. mm.	16.1	4.02	8.03	1.0	0.0	0.0	1.0	0.00006	0.00013	0.00019
23	47/7	44	10 Sq. mm.	21.85	4.02	8.03	0.0	0.0	0.9	0.9	0.00007	0.00014	0.00021
24	47/6	45	10 Sq. mm.	26.45	4.02	8.03	0.0	1.0	0.0	1.0	0.00011	0.00021	0.00032
25	47/6	46	10 Sq. mm.	16.1	4.02	8.03	0.0	0.0	1.1	1.1	0.00008	0.00016	0.00023
26	47/6	47	10 Sq. mm.	21.85	4.02	8.03	0.9	0.0	0.0	0.9	0.00007	0.00014	0.00021
27	47/5	48	10 Sq. mm.	13.8	4.02	8.03	0.0	1.1	0.0	1.1	0.00007	0.00013	0.00020
28	47/5	49	10 Sq. mm.	11.5	4.02	8.03	0.0	0.0	0.9	0.9	0.00004	0.00007	0.00011
29	47/4	50	10 Sq. mm.	16.1	4.02	8.03	1.0	0.0	0.0	1.0	0.00006	0.00013	0.00019

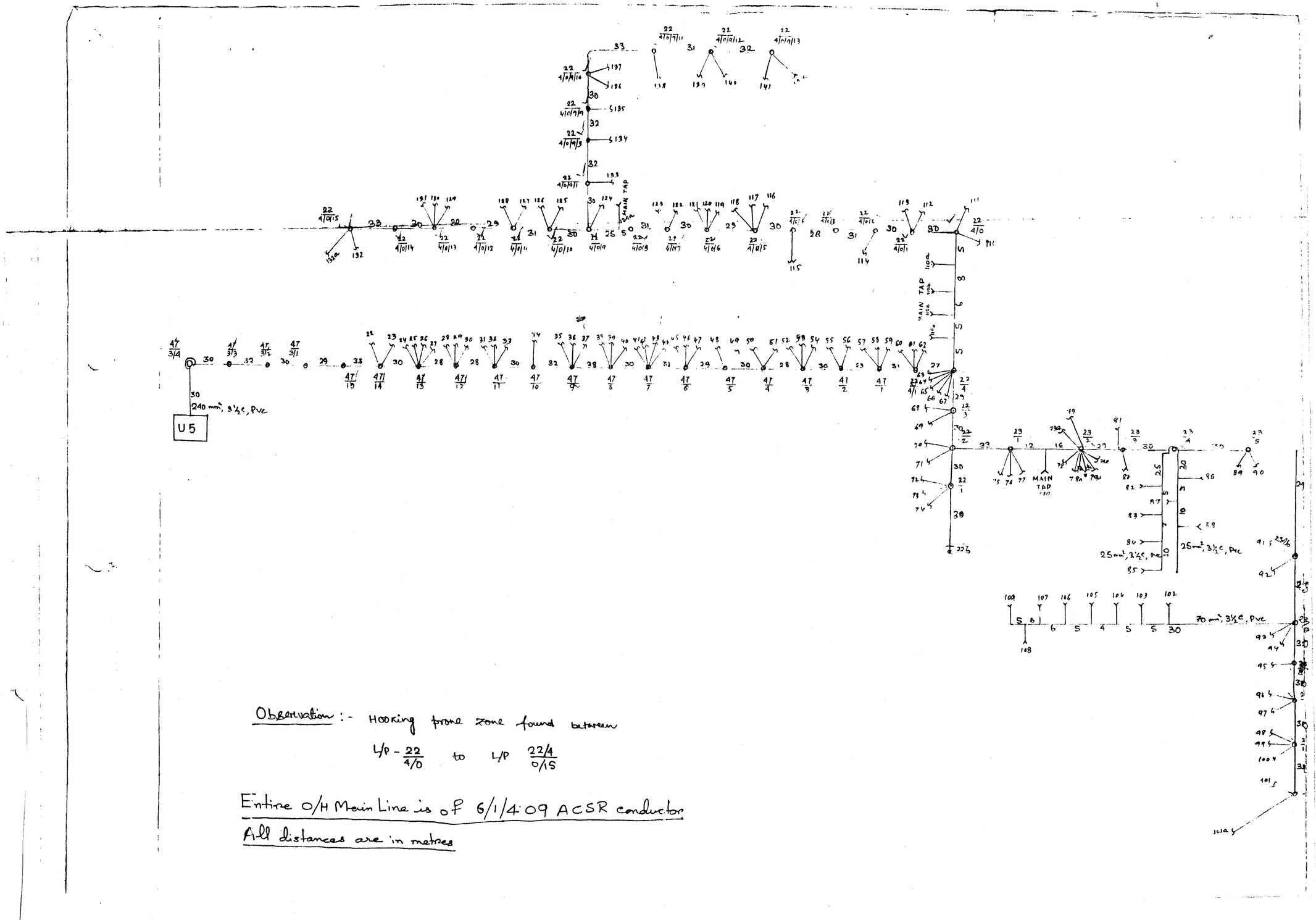
30	47/4	51	10 Sq. mm.	12.65	4.02	8.03	0.0	0.9	0.0	0.9	0.00004	0.00008	0.00012
31	47/3	52	10 Sq. mm.	17.25	4.02	8.03	0.0	0.0	1.1	1.1	0.00008	0.00017	0.00025
32	47/3	53	10 Sq. mm.	16.1	4.02	8.03	1.0	0.0	0.0	1.0	0.00006	0.00013	0.00019
33	47/3	54	10 Sq. mm.	14.95	4.02	8.03	0.0	0.8	0.0	0.8	0.00004	0.00008	0.00012
34	47/2	55	10 Sq. mm.	18.4	4.02	8.03	0.0	0.0	1.1	1.1	0.00009	0.00018	0.00027
35	47/2	56	10 Sq. mm.	20.7	4.02	8.03	1.1	0.0	0.0	1.1	0.00010	0.00020	0.00030
36	47/1	57	16 Sq. mm.	21.85	2.53	5.05	0.9	0.9	0.9	0.0	0.00013	0.00000	0.00013
37	47/1	58	16 Sq. mm.	16.1	2.53	5.05	1.1	1.1	1.0	0.1	0.00014	0.00000	0.00014
38	47/1	59	16 Sq. mm.	17.25	2.53	5.05	1.3	1.2	1.2	0.1	0.00020	0.00000	0.00020
39	22/4/1	60	10 Sq. mm.	13.8	4.02	8.03	0.0	0.0	0.9	0.9	0.00004	0.00009	0.00013
40	22/4/1	61	10 Sq. mm.	13.8	4.02	8.03	0.0	0.9	0.0	0.9	0.00004	0.00009	0.00013
41	22/4/1	62	16 Sq. mm.	16.1	2.53	5.05	1.0	1.0	1.0	0.0	0.00012	0.00000	0.00012
42	22/4	63	10 Sq. mm.	17.25	4.02	8.03	0.7	0.0	0.0	0.7	0.00003	0.00007	0.00010
43	22/4	64	10 Sq. mm.	19.55	4.02	8.03	1.1	0.0	0.0	1.1	0.00010	0.00019	0.00029
44	22/4	65	10 Sq. mm.	13.8	4.02	8.03	0.0	0.9	0.0	0.9	0.00004	0.00009	0.00013
45	22/4	66	16 Sq. mm.	11.5	2.53	5.05	0.9	1.0	1.0	0.1	0.00008	0.00000	0.00008
46	22/4	67	10 Sq. mm.	12.65	4.02	8.03	0.0	0.0	0.9	0.9	0.00004	0.00008	0.00012
47	22/3	68	10 Sq. mm.	16.1	4.02	8.03	0.9	0.0	0.0	0.9	0.00005	0.00010	0.00016
48	22/3	69	16 Sq. mm.	13.8	2.53	5.05	1.2	1.1	1.1	0.1	0.00013	0.00000	0.00014
49	22/2	70	10 Sq. mm.	25.3	4.02	8.03	0.0	0.8	0.0	0.8	0.00007	0.00013	0.00020
50	22/2	71	10 Sq. mm.	16.1	4.02	8.03	0.0	0.0	0.8	0.8	0.00004	0.00008	0.00012
51	22/1	72	10 Sq. mm.	17.25	4.02	8.03	1.0	0.0	0.0	1.0	0.00007	0.00014	0.00021
52	22/1	73	10 Sq. mm.	14.95	4.02	8.03	0.0	1.0	0.0	1.0	0.00006	0.00012	0.00018
53	22/1	74	10 Sq. mm.	20.7	4.02	8.03	1.1	0.0	0.0	1.1	0.00010	0.00020	0.00030
54	23/1	75	10 Sq. mm.	24.15	4.02	8.03	0.0	0.0	0.7	0.7	0.00005	0.00010	0.00014
55	23/1	76	10 Sq. mm.	23	4.02	8.03	1.2	0.0	0.0	1.2	0.00013	0.00027	0.00040
56	23/1	77	10 Sq. mm.	16.1	4.02	8.03	0.0	1.1	0.0	1.1	0.00008	0.00016	0.00023
57		77a	10 Sq. mm.	24.15	4.02	8.03	1.2	0.0	0.0	1.2	0.00014	0.00028	
58	23/2	78	10 Sq. mm.	16.1	4.02	8.03	0.0	0.0	1.2	1.2	0.00009	0.00019	0.00028
59	23/2	78a	10 Sq. mm.	24.15	4.02	8.03	0.0	0.9	0.0	0.9	0.00008	0.00016	0.00024
60	23/2	78b	16 Sq. mm.	24.15	2.53	5.05	1.2	1.2	1.2	0.0	0.00026	0.00000	0.00026
61	23/2	78c	10 Sq. mm.	16.1	4.02	8.03	0.9	0.0	0.0	0.9	0.00005	0.00010	0.00016
62	23/2	78d	10 Sq. mm.	21.85	4.02	8.03	0.0	0.0	1.3	1.3	0.00015	0.00030	0.00044
68	23/2	78e	10 Sq. mm.	16.1	4.02	8.03	0.0	0.0	1.0	0.0	0.00006	0.00000	0.00006
64	23/2	79	10 Sq. mm.	18.4	4.02	8.03	0.8	0.8	0.8	0.0	0.00014	0.00000	0.00014
65	23/2	79a	10 Sq. mm.	14.95	4.02	8.03	0.0	0.8	0.0	0.8	0.00004	0.00008	0.00012

66	23/3	80	10 Sq. mm.	12.65	4.02	8.03	0.9	0.0	0.0	0.9	0.00004	0.00008	0.00012
67	23/3	81	10 Sq. mm.	16.1	4.02	8.03	0.0	0.7	0.0	0.7	0.00003	0.00006	0.00010
68	23/4	82	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	0.9	0.9	0.00001	0.00002	0.00004
69		83	25 Sq. mm.	10.35	1.64	3.28	0.7	0.0	0.0	0.7	0.00001	0.00002	0.00002
70		84	25 Sq. mm.	12.65	1.64	3.28	0.0	0.0	1.2	1.2	0.00003	0.00006	0.00009
71		85	25 Sq. mm.	10.35	1.64	3.28	0.0	0.8	0.0	0.8	0.00001	0.00002	0.00003
72	23/4	86	25 Sq. mm.	9.2	1.64	3.28	0.9	0.0	0.0	0.9	0.00001	0.00002	0.00004
73		87	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	0.9	0.9	0.00002	0.00003	0.00005
74		88	25 Sq. mm.	10.35	1.64	3.28	0.0	0.0	0.7	0.7	0.00001	0.00002	0.00002
75	23/5	89	10 Sq. mm.	17.25	4.02	8.03	0.9	0.0	0.0	0.9	0.00006	0.00011	0.00017
76	23/5	90	10 Sq. mm.	13.8	4.02	8.03	0.0	1.0	0.0	1.0	0.00006	0.00011	0.00017
77		91	10 Sq. mm.	13.8	4.02	8.03	0.0	0.0	1.0	1.0	0.00006	0.00011	0.00017
78		92	10 Sq. mm.	18.4	4.02	8.03	0.9	0.0	0.0	0.9	0.00006	0.00012	0.00018
79		93	16 Sq. mm.	14.95	2.53	5.05	0.9	1.1	1.1	0.2	0.00012	0.00000	0.00013
80		94	16 Sq. mm.	11.5	2.53	5.05	1.0	0.9	0.9	0.1	0.00008	0.00000	0.00008
81		95	8 Sq. mm.	9.2	2.02	4.03	0.0	1.2	0.0	1.2	0.00003	0.00005	0.00008
83		96	9 Sq. mm.	13.8	3.02	6.03	0.0	0.0	1.1	1.1	0.00005	0.00010	0.00015
83		97	10 Sq. mm.	8.05	4.02	8.03	1.0	0.0	0.0	1.0	0.00003	0.00006	0.00010
84		98	10 Sq. mm.	12.65	4.02	8.03	0.0	1.1	0.0	1.1	0.00006	0.00012	0.00018
85		99	10 Sq. mm.	9.2	4.02	8.03	0.0	0.0	0.9	0.9	0.00003	0.00006	0.00009
86		100	10 Sq. mm.	11.5	4.02	8.03	1.1	0.0	0.0	1.1	0.00006	0.00011	0.00017
87		101	10 Sq. mm.	10.35	4.02	8.03	0.0	0.9	0.0	0.9	0.00003	0.00007	0.00010
88		101a	10 Sq. mm.	11.5	4.02	8.03	0.0	0.0	0.8	0.8	0.00003	0.00006	0.00009
89		102	25 Sq. mm.	12.65	1.64	3.28	1.0	0.0	0.0	1.0	0.00002	0.00004	0.00006
90		103	25 Sq. mm.	13.8	1.64	3.28	0.0	1.0	0.0	1.0	0.00002	0.00005	0.00007
91		104	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	0.7	0.7	0.00001	0.00001	0.00002
92		105	25 Sq. mm.	10.35	1.64	3.28	0.9	0.0	0.0	0.9	0.00001	0.00003	0.00004
93		106	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00003	0.00005
94		107	25 Sq. mm.	13.8	1.64	3.28	0.0	0.9	0.0	0.9	0.00002	0.00004	0.00005
95		108	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	0.9	0.9	0.00002	0.00003	0.00005
96		109	25 Sq. mm.	12.65	1.64	3.28	0.8	0.0	0.0	0.8	0.00001	0.00003	0.00004
97		110d	10 Sq. mm.	23	4.02	8.03	0.0	1.0	0.0	1.0	0.00009	0.00018	0.00028
98		110c	10 Sq. mm.	24.15	4.02	8.03	0.0	0.0	0.8	0.8	0.00006	0.00012	0.00019
99		110b	10 Sq. mm.	23	4.02	8.03	0.9	0.0	0.0	0.9	0.00007	0.00015	0.00022
100		110a	10 Sq. mm.	24.15	4.02	8.03	0.0	1.0	0.0	1.0	0.00010	0.00019	0.00029
101	22/4/0	110	10 Sq. mm.	26.45	4.02	8.03	0.0	0.0	0.8	0.8	0.00007	0.00014	0.00020

102	22/4/0	111	10 Sq. mm.	28.75	4.02	8.03	1.0	0.0	0.0	1.0	0.00012	0.00023	0.00035
103	22/4/0/1	112	10 Sq. mm.	24.15	4.02	8.03	0.0	0.8	0.0	0.8	0.00006	0.00012	0.00019
104	22/4/0/1	113	10 Sq. mm.	21.85	4.02	8.03	0.0	0.0	1.0	1.0	0.00009	0.00018	0.00026
105	22/4/0/2	114	10 Sq. mm.	26.45	4.02	8.03	1.1	0.0	0.0	1.1	0.00013	0.00026	0.00039
106	22/4/0/4	115	10 Sq. mm.	24.15	4.02	8.03	0.0	0.9	0.0	0.9	0.00008	0.00016	0.00024
107	22/4/0/5	116	10 Sq. mm.	27.6	4.02	8.03	0.0	0.6	0.0	0.6	0.00004	0.00008	0.00012
108	22/4/0/5	117	10 Sq. mm.	25.3	4.02	8.03	0.6	0.0	0.0	0.6	0.00004	0.00007	0.00011
109	22/4/0/5	118	10 Sq. mm.	26.45	4.02	8.03	0.0	0.0	1.1	1.1	0.00013	0.00026	0.00039
110	22/4/0/6	119	10 Sq. mm.	25.3	4.02	8.03	0.0	0.9	0.0	0.9	0.00008	0.00016	0.00025
111	22/4/0/6	120	10 Sq. mm.	19.55	4.02	8.03	0.8	0.0	0.0	0.8	0.00005	0.00010	0.00015
112	22/4/0/6	121	10 Sq. mm.	20.7	4.02	8.03	0.0	0.0	0.8	0.8	0.00005	0.00011	0.00016
113	22/4/0/7	122	10 Sq. mm.	18.4	4.02	8.03	0.0	1.0	0.0	1.0	0.00007	0.00015	0.00022
114	22/4/0/7	123	10 Sq. mm.	20.7	4.02	8.03	0.7	0.0	0.0	0.7	0.00004	0.00008	0.00012
115	22/4/0/8	124a	10 Sq. mm.	20.7	4.02	8.03	0.0	0.8	0.0	0.8	0.00005	0.00011	0.00016
116	22/4/0/9	124	10 Sq. mm.	17.25	4.02	8.03	0.0	0.0	0.9	0.9	0.00006	0.00011	0.00017
117	22/4/0/10	125	10 Sq. mm.	25.3	4.02	8.03	0.0	0.0	1.0	1.0	0.00010	0.00020	0.00030
118	22/4/0/10	126	10 Sq. mm.	16.1	4.02	8.03	0.7	0.0	0.0	0.7	0.00003	0.00006	0.00010
119	22/4/0/11	127	10 Sq. mm.	21.85	4.02	8.03	0.0	1.1	0.0	1.1	0.00011	0.00021	0.00032
120	22/4/0/11	128	10 Sq. mm.	26.45	4.02	8.03	0.0	0.0	0.9	0.9	0.00009	0.00017	0.00026
121	22/4/0/13	129	10 Sq. mm.	16.1	4.02	8.03	0.6	0.0	0.0	0.6	0.00002	0.00005	0.00007
122	22/4/0/13	130	10 Sq. mm.	18.4	4.02	8.03	0.0	1.0	0.0	1.0	0.00007	0.00015	0.00022
123	22/4/0/13	131	10 Sq. mm.	13.8	4.02	8.03	0.0	0.0	1.0	1.0	0.00006	0.00011	0.00017
124	22/4/0/15	132	10 Sq. mm.	11.5	4.02	8.03	0.0	0.9	0.0	0.9	0.00004	0.00007	0.00011
125	22/4/0/15	132a	10 Sq. mm.	16.1	4.02	8.03	0.7	0.0	0.0	0.7	0.00003	0.00006	0.00010
126	22/4/0/9/1	133	10 Sq. mm.	24.15	4.02	8.03	0.0	1.1	0.0	1.1	0.00012	0.00023	0.00035
127	22/4/0/9/3	134	10 Sq. mm.	26.45	4.02	8.03	0.0	0.0	1.1	1.1	0.00013	0.00026	0.00039
128	22/4/0/9/9	135	10 Sq. mm.	17.25	4.02	8.03	0.0	1.2	0.0	1.2	0.00010	0.00020	0.00030
129	22/4/0/9/10	136	10 Sq. mm.	16.1	4.02	8.03	0.8	0.0	0.0	0.8	0.00004	0.00008	0.00012
130	22/4/0/9/10	137	10 Sq. mm.	11.5	4.02	8.03	0.0	0.6	0.0	0.6	0.00002	0.00003	0.00005
131	22/4/0/9/11	138	10 Sq. mm.	9.2	4.02	8.03	0.6	0.0	0.0	0.6	0.00001	0.00003	0.00004
132	22/4/0/9/12	139	10 Sq. mm.	13.8	4.02	8.03	0.0	0.8	0.0	0.8	0.00004	0.00007	0.00011
133	22/4/0/9/12	140	10 Sq. mm.	8.05	4.02	8.03	1.0	0.0	0.0	1.0	0.00003	0.00006	0.00010
134	22/4/0/9/13	141	10 Sq. mm.	12.65	4.02	8.03	0.0	0.9	0.0	0.9	0.00004	0.00008	0.00012
135	22/4/0/9/13	142	10 Sq. mm.	9.2	4.02	8.03	0.0	0.0	0.6	0.6	0.00001	0.00003	0.00004
							48.0	49.1	48.2		0.00883	0.01471	0.02312

TRANSFORMER DETAILS : CAPACITY-315 KVA,6/0.42 KV			
VOLTAGE		400.00	V
COMPUTED		60.2309 **	KW
PEAK LOAD			
LT NETWORK LOSS			
PEAK LOSS	0.7685695		KW

TOTAL POWER LOSS	0.74977	0.01922	0.76857



Observation :- Hooking prone zone found between

L/P - 22/4/0 to L/P 22/4/0/15

Entire O/H Main Line is of 6/1/4.09 ACSR conductor

All distances are in metres

WEST SUBURBAN DISTRICT - AKRA COLONY O/T - U6

CALCULATION OF LT DISTRIBUTION LOSS

S.No	FROM	TO	CABLE SIZE	LENGTH	RESISTANCE		CURRENT READING (A)				PHASE	NEUTRAL	POWER
				(M)	(Ohm/KM)		IR	IB	IY	IN	LOSS	LOSS	LOSS
					PHASE	NEUTRAL					(KW)	(KW)	(KW)
1	AKRA	U6	400 mm2 (Al.)	28.75	0.11	0.21	100.0	86.0	88.0	13.1	0.0766	0.0011	0.078
	Colony O/T												
2	U6	47/3/4	240 mm2 (Al.)	34.5	0.17	0.34	76.6	67.1	80.3	11.8	0.0992	0.0016	0.10086
3	47/3/4	47/15/5	240 mm2 (Al.)	34.5	0.17	0.34	76.6	67.1	80.3	11.8	0.0992	0.0016	0.10086
4	47/15/5	13/16	240 mm2 (Al.)	34.5	0.17	0.34	76.6	67.1	80.3	11.8	0.0992	0.0016	0.10086
5	13/16	13/17	70 mm2 (Al.)	28.75	0.61	1.21	73.1	62.7	75.0	11.5	0.2602	0.0046	0.26483
6	13/17	13/18	70 mm2 (Al.)	32.2	0.61	1.21	73.1	62.7	75.0	11.5	0.2915	0.0052	0.29661
7	13/18	13/19	70 mm2 (Al.)	34.5	0.61	1.21	72.2	61.8	75.0	12.1	0.3072	0.0061	0.31328
8	13/19	13/20	70 mm2 (Al.)	32.2	0.61	1.21	65.6	55.8	66.6	10.3	0.2319	0.0042	0.23604
9	13/20	13/21	70 mm2 (Al.)	34.5	0.61	1.21	57.0	50.0	58.7	8.0	0.1927	0.0027	0.19538
10	13/21	13/22	70 mm2 (Al.)	36.8	0.61	1.21	42.9	37.8	46.0	7.2	0.1204	0.0023	0.12269
11	13/22	13/23	70 mm2 (Al.)	34.5	0.61	1.21	37.2	32.1	40.6	7.4	0.0851	0.0023	0.08745
12	13/23	13/24	70 mm2 (Al.)	34.5	0.61	1.21	37.2	31.1	39.7	7.7	0.0823	0.0025	0.08477
13	13/24	13/29	70 mm2 (Al.)	368	0.61	1.21	31.3	26.0	33.5	6.7	0.6210	0.0199	0.64098
14	13/29	13/30	70 mm2 (Al.)	36.8	0.61	1.21	29.2	25.2	31.3	5.4	0.0552	0.0013	0.05645
15	13/30	13/31	70 mm2 (Al.)	32.2	0.61	1.21	22.5	19.1	23.0	3.7	0.0274	0.0005	0.02792
16	13/31	13/32	70 mm2 (Al.)	32.2	0.61	1.21	21.7	19.1	23.0	3.4	0.0267	0.0005	0.02716
17	13/32	13/33	70 mm2 (Al.)	34.5	0.61	1.21	20.9	19.1	22.1	2.6	0.0270	0.0003	0.02732
18	13/33	13/34	70 mm2 (Al.)	33.35	0.61	1.21	20.9	18.2	21.3	2.9	0.0248	0.0003	0.02510
20	13/30	13/30/1	70 mm2 (Al.)	34.5	0.61	1.21	6.7	6.1	8.3	2.0	0.0032	0.0002	0.00333
21	13/30/1	13/30/2	70 mm2 (Al.)	32.2	0.61	1.21	5.5	5.1	7.1	1.8	0.0021	0.0001	0.00222
22	13/30/2	13/30/3	70 mm2 (Al.)	34.5	0.61	1.21	5.5	5.1	5.8	0.6	0.0019	0.0000	0.00190
23	13/30/3	13/30/4	70 mm2 (Al.)	33.35	0.61	1.21	4.2	4.0	5.0	0.9	0.0012	0.0000	0.00122
24	13/30/4	270	70 mm2 (Al.)	115	0.61	1.21	3.1	4.0	5.0	1.6	0.0035	0.0004	0.00391
25	270	271	70 mm2 (Al.)	23	0.61	1.21	3.1	2.8	5.0	2.1	0.0006	0.0001	0.00071
26	271	272	70 mm2 (Al.)	9.2	0.61	1.21	3.1	2.8	4.1	1.2	0.0002	0.0000	0.00021
27	272	273	70 mm2 (Al.)	17.25	0.61	1.21	3.1	2.8	3.1	0.3	0.0003	0.0000	0.00029
28	273	274	70 mm2 (Al.)	11.5	0.61	1.21	2.1	2.8	3.1	0.9	0.0002	0.0000	0.00016
29	274	275	70 mm2 (Al.)	23	0.61	1.21	2.1	1.7	3.1	1.2	0.0002	0.0000	0.00028
30	275	276	70 mm2 (Al.)	9.2	0.61	1.21	2.1	1.7	2.0	0.4	0.0001	0.0000	0.00006
31	276	277	70 mm2 (Al.)	13.8	0.61	1.21	0.9	1.7	2.0	1.0	0.0001	0.0000	0.00008
32	277	278	70 mm2 (Al.)	28.75	0.61	1.21	0.9	0.9	2.0	1.1	0.0001	0.0000	0.00014
33	278	279	70 mm2 (Al.)	23	0.61	1.21	0.9	0.9	1.0	0.1	0.0000	0.0000	0.00004

34	279	280	70 mm2 (Al.)	11.5	0.61	1.21	0.0	0.9	1.0	1.0	0.0000	0.0000	0.00003
35	280	281	70 mm2 (Al.)	17.25	0.61	1.21	0.0	0.9	0.0	0.9	0.0000	0.0000	0.00003
36	13/30/3	266	25 mm2 (Al.)	17.25	1.64	3.28	1.3	1.1	0.8	0.4	0.0001	0.0000	0.00011
37	266	267	25 mm2 (Al.)	5.75	1.64	3.28	0.0	1.1	0.8	1.0	0.0000	0.0000	0.00004
38	267	268	25 mm2 (Al.)	9.2	1.64	3.28	0.0	0.0	0.8	0.8	0.0000	0.0000	0.00003
39	13/34	291	150 mm2 (Al.)	80.5	0.28	0.56	19.0	16.3	19.6	3.0	0.0229	0.0004	0.02329
40	291	292	150 mm2 (Al.)	11.5	0.28	0.56	18.0	16.3	19.6	2.9	0.0031	0.0001	0.00320
41	292	293	150 mm2 (Al.)	51.75	0.28	0.56	18.0	16.3	18.6	2.1	0.0136	0.0001	0.01373
42	293	294	150 mm2 (Al.)	23	0.28	0.56	18.0	15.1	18.6	3.2	0.0058	0.0001	0.00594
43	294	295	150 mm2 (Al.)	69	0.28	0.56	16.9	15.1	18.6	3.0	0.0167	0.0004	0.01702
44	295	296	150 mm2 (Al.)	11.5	0.28	0.56	16.9	15.1	17.8	2.4	0.0027	0.0000	0.00272
45	296	297	150 mm2 (Al.)	9.2	0.28	0.56	16.9	14.4	17.8	3.1	0.0021	0.0000	0.00214
46	297	298	150 mm2 (Al.)	11.5	0.28	0.56	15.8	14.4	17.8	3.0	0.0025	0.0001	0.00256
47	298	299	150 mm2 (Al.)	11.5	0.28	0.56	15.8	14.4	17.1	2.3	0.0024	0.0000	0.00246
48	299	a	150 mm2 (Al.)	6.9	0.28	0.56	15.8	13.5	17.1	3.2	0.0014	0.0000	0.00144
49	a	300	150 mm2 (Al.)	9.2	0.28	0.56	14.8	13.5	16.1	2.3	0.0017	0.0000	0.00173
50	300	301	150 mm2 (Al.)	10.35	0.28	0.56	13.6	13.5	16.1	2.6	0.0018	0.0000	0.00186
51	301	302	150 mm2 (Al.)	11.5	0.28	0.56	13.6	13.5	15.5	2.0	0.0020	0.0000	0.00199
52	302	AC-PB 3	150 mm2 (Al.)	17.25	0.28	0.56	13.6	12.7	15.5	2.5	0.0028	0.0001	0.00290
53	a	303	150 mm2 (Al.)	18.4	0.28	0.56	1.0	0.0	1.0	1.0	0.0000	0.0000	0.00002
54	303	304	150 mm2 (Al.)	17.25	0.28	0.56	0.0	0.0	1.0	1.0	0.0000	0.0000	0.00001
55	AC-PB 4	B	70 mm2 (Al.)	17.25	0.61	1.21	3.9	3.7	3.7	0.2	0.0004	0.0000	0.00045
56	AC-PB 1	305	150 mm2 (Al.)	115	0.28	0.56	7.8	8.1	7.8	0.3	0.0061	0.0000	0.00606
57	305	306	150 mm2 (Al.)	11.5	0.28	0.56	7.8	7.0	7.8	0.8	0.0006	0.0000	0.00056
58	306	307	150 mm2 (Al.)	11.5	0.28	0.56	7.8	5.9	7.8	1.9	0.0005	0.0000	0.00053
59	307	308	150 mm2 (Al.)	9.2	0.28	0.56	7.8	5.9	6.7	1.7	0.0004	0.0000	0.00038
60	308	309	150 mm2 (Al.)	11.5	0.28	0.56	7.8	5.9	5.9	1.9	0.0004	0.0000	0.00044
61	309	310	150 mm2 (Al.)	8.05	0.28	0.56	7.0	5.9	5.9	1.1	0.0003	0.0000	0.00027
62	310	311	150 mm2 (Al.)	47.15	0.28	0.56	7.0	5.0	5.9	1.7	0.0014	0.0001	0.00152
63	311	312	150 mm2 (Al.)	17.25	0.28	0.56	7.0	5.0	4.9	2.1	0.0005	0.0000	0.00052
64	312	313	150 mm2 (Al.)	17.25	0.28	0.56	6.3	5.0	4.9	1.4	0.0004	0.0000	0.00045
65	313	314	150 mm2 (Al.)	9.2	0.28	0.56	6.3	5.0	4.0	2.0	0.0002	0.0000	0.00023
66	314	b	150 mm2 (Al.)	11.5	0.28	0.56	6.3	4.2	4.0	2.2	0.0002	0.0000	0.00027
67	b	315	150 mm2 (Al.)	37.95	0.28	0.56	3.8	2.3	1.3	2.2	0.0002	0.0001	0.00033
68	315	316	150 mm2 (Al.)	11.5	0.28	0.56	3.0	2.3	1.3	1.5	0.0001	0.0000	0.00007
69	316	317	150 mm2 (Al.)	12.65	0.28	0.56	3.0	1.2	1.3	1.8	0.0000	0.0000	0.00006
70	317	318	150 mm2 (Al.)	9.2	0.28	0.56	2.1	1.2	1.3	0.9	0.0000	0.0000	0.00002
71	318	319	150 mm2 (Al.)	8.05	0.28	0.56	2.1	1.2	0.7	1.2	0.0000	0.0000	0.00002
72	319	320	150 mm2 (Al.)	9.2	0.28	0.56	1.1	1.2	0.7	0.5	0.0000	0.0000	0.00001
73	320	321	150 mm2 (Al.)	10.35	0.28	0.56	1.1	0.0	0.7	1.0	0.0000	0.0000	0.00001
74	321	322	150 mm2 (Al.)	11.5	0.28	0.56	0.0	0.0	0.7	0.7	0.0000	0.0000	0.00000

75	b	323	150 mm2 (Al.)	11.5	0.28	0.56	2.5	1.9	2.7	0.7	0.0001	0.0000	0.00006
76	323	324	150 mm2 (Al.)	11.5	0.28	0.56	2.5	0.8	2.7	1.8	0.0000	0.0000	0.00007
77	324	325	150 mm2 (Al.)	9.2	0.28	0.56	1.3	0.8	2.7	1.7	0.0000	0.0000	0.00004
78	325	326	150 mm2 (Al.)	10.35	0.28	0.56	1.3	0.8	1.9	1.0	0.0000	0.0000	0.00002
79	326	327	150 mm2 (Al.)	9.2	0.28	0.56	1.3	0.0	1.9	1.7	0.0000	0.0000	0.00003
80	327	328	150 mm2 (Al.)	8.05	0.28	0.56	0.0	0.0	1.9	1.9	0.0000	0.0000	0.00002
81	328	329	150 mm2 (Al.)	11.5	0.28	0.56	0.0	0.0	1.0	1.0	0.0000	0.0000	0.00001
82	AC-PB 2	330	70 mm2 (Al.)	11.5	0.61	1.21	1.9	0.9	4.0	2.7	0.0001	0.0001	0.00025
83	330	331	70 mm2 (Al.)	9.2	0.61	1.21	1.0	0.9	4.0	3.1	0.0001	0.0001	0.00020
84	331	332	70 mm2 (Al.)	9.2	0.61	1.21	1.0	0.9	2.9	2.0	0.0001	0.0000	0.00010
85	332	333	70 mm2 (Al.)	10.35	0.61	1.21	1.0	0.0	2.9	2.6	0.0001	0.0001	0.00014
86	333	334	70 mm2 (Al.)	8.05	0.61	1.21	1.0	0.0	1.7	1.5	0.0000	0.0000	0.00004
87	334	335	70 mm2 (Al.)	11.5	0.61	1.21	1.0	0.0	0.8	0.9	0.0000	0.0000	0.00002
88	335	336	70 mm2 (Al.)	9.2	0.61	1.21	0.0	0.0	0.8	0.8	0.0000	0.0000	0.00001
89	A	13/16	70 mm2 (Al.)	0	0.61	1.21				0.0	0.0000	0.0000	0.00000
90	13/19	c	70 mm2 (Al.)	69	0.61	1.21	5.7	6.0	7.5	1.7	0.0052	0.0002	0.00546
91	c	150	70 mm2 (Al.)	11.5	0.61	1.21	1.1	1.1	1.0	0.1	0.0000	0.0000	0.00002
92	150	149	70 mm2 (Al.)	23	0.61	1.21	1.1	0.0	1.0	1.1	0.0000	0.0000	0.00006
93	149	148	70 mm2 (Al.)	17.25	0.61	1.21	0.0	0.0	1.0	1.0	0.0000	0.0000	0.00003
94	c	151	70 mm2 (Al.)	23	0.61	1.21	4.6	4.9	6.5	1.8	0.0012	0.0001	0.00131
95	151	157	70 mm2 (Al.)	11.5	0.61	1.21	4.6	4.9	5.4	0.7	0.0005	0.0000	0.00053
96	157	152	70 mm2 (Al.)	11.5	0.61	1.21	4.6	4.9	4.8	0.3	0.0005	0.0000	0.00048
97	152	158	70 mm2 (Al.)	9.2	0.61	1.21	3.7	4.9	4.8	1.2	0.0003	0.0000	0.00035
98	158	153	70 mm2 (Al.)	9.2	0.61	1.21	2.7	4.9	4.8	2.2	0.0003	0.0001	0.00036
99	153	159	70 mm2 (Al.)	9.2	0.61	1.21	1.5	3.7	3.6	2.2	0.0002	0.0001	0.00021
100	159	154	70 mm2 (Al.)	11.5	0.61	1.21	0.7	2.9	2.8	2.2	0.0001	0.0001	0.00018
101	154	160	70 mm2 (Al.)	11.5	0.61	1.21	0.7	1.7	2.8	1.8	0.0001	0.0000	0.00012
102	160	155	70 mm2 (Al.)	6.9	0.61	1.21	0.7	1.7	2.0	1.2	0.0000	0.0000	0.00004
103	155	156	70 mm2 (Al.)	11.5	0.61	1.21	0.7	1.7	0.9	0.9	0.0000	0.0000	0.00004
104	156	161	70 mm2 (Al.)	9.2	0.61	1.21	0.0	0.8	0.0	0.8	0.0000	0.0000	0.00001
105	13/20	162	70 mm2 (Al.)	28.75	0.61	1.21	7.6	4.8	7.9	3.0	0.0025	0.0003	0.00281
106	162	d	70 mm2 (Al.)	11.5	0.61	1.21	6.7	4.8	7.9	2.7	0.0009	0.0001	0.00101
107	d	163	70 mm2 (Al.)	9.2	0.61	1.21	0.0	0.0	0.7	0.7	0.0000	0.0000	0.00001
108	d	164	70 mm2 (Al.)	11.5	0.61	1.21	6.7	4.8	7.2	2.2	0.0008	0.0001	0.00090
109	164	e	70 mm2 (Al.)	9.2	0.61	1.21	5.9	4.8	7.2	2.1	0.0006	0.0000	0.00066
110	e	165	70 mm2 (Al.)	9.2	0.61	1.21	3.8	3.6	3.6	0.2	0.0002	0.0000	0.00023
111	165	166	70 mm2 (Al.)	10.35	0.61	1.21	3.8	2.9	3.6	0.8	0.0002	0.0000	0.00023
112	166	f	70 mm2 (Al.)	11.5	0.61	1.21	3.8	2.9	2.9	0.9	0.0002	0.0000	0.00023
113	f	167	70 mm2 (Al.)	6.9	0.61	1.21	1.8	0.9	0.9	0.9	0.0000	0.0000	0.00003
114	167	168	70 mm2 (Al.)	11.5	0.61	1.21	0.9	0.0	0.0	0.9	0.0000	0.0000	0.00002

115	e	169	70 mm2 (Al.)	6.9	0.61	1.21	2.1	1.2	3.6	2.1	0.0001	0.0000	0.00012
116	169	170	70 mm2 (Al.)	8.05	0.61	1.21	2.1	1.2	2.8	1.4	0.0001	0.0000	0.00009
117	170	171	70 mm2 (Al.)	9.2	0.61	1.21	2.1	1.2	2.2	1.0	0.0001	0.0000	0.00007
118	171	172	70 mm2 (Al.)	9.2	0.61	1.21	1.1	1.2	1.2	0.1	0.0000	0.0000	0.00002
119	172	173	70 mm2 (Al.)	6.9	0.61	1.21	1.1	0.0	1.2	1.2	0.0000	0.0000	0.00002
120	173	174	70 mm2 (Al.)	11.5	0.61	1.21	0.0	0.0	1.2	1.2	0.0000	0.0000	0.00003
121	f	175	70 mm2 (Al.)	9.2	0.61	1.21	2.0	2.0	2.0	0.0	0.0001	0.0000	0.00007
122	175	176	70 mm2 (Al.)	6.9	0.61	1.21	2.0	0.9	2.0	1.1	0.0000	0.0000	0.00005
123	176	177	70 mm2 (Al.)	8.05	0.61	1.21	0.8	0.9	2.0	1.2	0.0000	0.0000	0.00004
124	177	180	70 mm2 (Al.)	8.05	0.61	1.21	0.8	0.9	1.0	0.2	0.0000	0.0000	0.00001
125	180	181	70 mm2 (Al.)	6.9	0.61	1.21	0.0	0.9	1.0	1.0	0.0000	0.0000	0.00002
126	181	179	70 mm2 (Al.)	5.75	0.61	1.21	0.0	0.0	1.0	1.0	0.0000	0.0000	0.00001
127	l	g	70 mm2 (Al.)	10.35	0.61	1.21	7.60	7.60	6.10	1.5	0.0010	0.0000	0.00099
128	g	h	70 mm2 (Al.)	9.2	0.61	1.21	4.5	5.3	3.8	1.3	0.0004	0.0000	0.00037
129	h	185	70 mm2 (Al.)	11.5	0.61	1.21	4.5	4.5	3.8	0.7	0.0004	0.0000	0.00039
130	185	186	70 mm2 (Al.)	11.5	0.61	1.21	4.5	4.5	3.0	1.5	0.0003	0.0000	0.00038
131	186	187	70 mm2 (Al.)	6.9	0.61	1.21	3.6	4.5	3.0	1.3	0.0002	0.0000	0.00019
132	187	188	70 mm2 (Al.)	10.35	0.61	1.21	3.6	3.6	3.0	0.6	0.0002	0.0000	0.00022
133	188	189	70 mm2 (Al.)	11.5	0.61	1.21	3.6	3.6	2.1	1.5	0.0002	0.0000	0.00024
134	189	190	70 mm2 (Al.)	11.5	0.61	1.21	2.6	3.6	2.1	1.3	0.0002	0.0000	0.00019
135	190	191	70 mm2 (Al.)	9.2	0.61	1.21	2.6	2.4	2.1	0.4	0.0001	0.0000	0.00010
136	191	192	70 mm2 (Al.)	6.9	0.61	1.21	2.6	2.4	1.1	1.4	0.0001	0.0000	0.00007
137	192	193	70 mm2 (Al.)	8.05	0.61	1.21	1.7	2.4	1.1	1.1	0.0000	0.0000	0.00006
138	193	194	70 mm2 (Al.)	6.9	0.61	1.21	1.1	2.4	1.1	1.3	0.0000	0.0000	0.00005
139	194	196	70 mm2 (Al.)	9.2	0.61	1.21	1.1	1.1	1.1	0.0	0.0000	0.0000	0.00002
140	196	195	70 mm2 (Al.)	13.8	0.61	1.21	1.1	1.1	0.0		0.0000	0.0000	0.00002
141	195	197	70 mm2 (Al.)	11.5	0.61	1.21	0.0	1.1	0.0	1.1	0.0000	0.0000	0.00003
142	g	198	25 mm2 (Al.)	9.2	1.64	3.28	3.1	2.3	2.3	0.8	0.0003	0.0000	0.00032
143	198	199	25 mm2 (Al.)	11.5	1.64	3.28	2.2	2.3	2.3	0.1	0.0003	0.0000	0.00029
144	199	200	25 mm2 (Al.)	11.5	1.64	3.28	1.1	1.1	1.1	0.0	0.0001	0.0000	0.00007
145	13/21	l	70 mm2 (Al.)	13.8	0.61	1.21	13.3	11.4	11.9	1.7	0.0038	0.0000	0.00381
146	l	201	70 mm2 (Al.)	17.25	0.61	1.21	5.7	4.6	5.8	1.2	0.0009	0.0000	0.00094
147	201	202	70 mm2 (Al.)	5.75	0.61	1.21	5.7	4.6	4.9	1.0	0.0003	0.0000	0.00028
148	202	203	70 mm2 (Al.)	9.2	0.61	1.21	5.0	4.6	4.9	0.4	0.0004	0.0000	0.00039
149	203	mini pb 3	70 mm2 (Al.)	9.2	0.61	1.21	5.0	3.8	4.9	1.2	0.0004	0.0000	0.00037
150	mini pb 2	204	70 mm2 (Al.)	23	0.61	1.21	1.0	1.0	3.1	2.1	0.0002	0.0001	0.00029
151	204	205	70 mm2 (Al.)	6.9	0.61	1.21	1.0	1.0	1.9	0.9	0.0000	0.0000	0.00003
152	205	206	70 mm2 (Al.)	9.2	0.61	1.21	0.0	0.0	0.9	0.9	0.0000	0.0000	0.00001
153	mini pb 1	207	70 mm2 (Al.)	23	0.61	1.21	1.1	0.9	1.1	0.2	0.0000	0.0000	0.00005
154	207	208	70 mm2 (Al.)	8.05	0.61	1.21	0.0	0.9	1.1	1.0	0.0000	0.0000	0.00002

155	208	209	70 mm2 (Al.)	10.35	0.61	1.21	0.0	0.0	1.1	1.1	0.0000	0.0000	0.00002
156	mini pb 4	210	70 mm2 (Al.)	17.25	0.61	1.21	2.9	1.9	0.7	1.9	0.0001	0.0001	0.00021
157	210	213	70 mm2 (Al.)	5.75	0.61	1.21	1.9	1.9	0.7	1.2	0.0000	0.0000	0.00004
158	213	211	70 mm2 (Al.)	9.2	0.61	1.21	1.9	1.0	0.7	1.1	0.0000	0.0000	0.00004
159	211	214	70 mm2 (Al.)	6.9	0.61	1.21	1.9	0.0	0.7	1.7	0.0000	0.0000	0.00004
160	214	215	70 mm2 (Al.)	9.2	0.61	1.21	1.9	0.0	0.0	1.9	0.0000	0.0000	0.00006
161	215	212	70 mm2 (Al.)	8.05	0.61	1.21	1.0	0.0	0.0	1.0	0.0000	0.0000	0.00001
162	13/22	j	70 mm2 (Al.)	23	0.61	1.21	5.7	5.7	5.4	0.3	0.0013	0.0000	0.00132
163	j	217	25 mm2 (Al.)	11.5	1.64	3.28	0.0	1.0	0.6	0.9	0.0000	0.0000	0.00005
164	217	216	25 mm2 (Al.)	11.5	1.64	3.28	0.0	1.0	0.0	1.0	0.0000	0.0000	0.00006
165	j	k	70 mm2 (Al.)	5.75	0.61	1.21	5.7	4.7	4.8	1.0	0.0003	0.0000	0.00028
166	k	218	70 mm2 (Al.)	11.5	0.61	1.21	2.5	2.0	1.6	0.8	0.0001	0.0000	0.00010
167	218	219	70 mm2 (Al.)	9.2	0.61	1.21	1.8	2.0	1.6	0.3	0.0001	0.0000	0.00006
168	219	220	70 mm2 (Al.)	6.9	0.61	1.21	1.8	0.9	1.6	0.8	0.0000	0.0000	0.00003
169	220	221	70 mm2 (Al.)	6.9	0.61	1.21	1.8	0.9	0.8	1.0	0.0000	0.0000	0.00003
170	221	222	70 mm2 (Al.)	9.2	0.61	1.21	1.0	0.9	0.8	0.2	0.0000	0.0000	0.00001
171	222	223	70 mm2 (Al.)	11.5	0.61	1.21	1.0	0.0	0.8	0.9	0.0000	0.0000	0.00002
172	223	224	70 mm2 (Al.)	9.2	0.61	1.21	1.0	0.0	0.0	1.0	0.0000	0.0000	0.00002
173	k	225	70 mm2 (Al.)	28.75	0.61	1.21	3.2	2.7	3.2	0.5	0.0005	0.0000	0.00049
174	225	226	70 mm2 (Al.)	9.2	0.61	1.21	3.2	1.9	3.2	1.3	0.0001	0.0000	0.00015
175	226	227	70 mm2 (Al.)	5.75	0.61	1.21	3.2	1.9	2.2	1.2	0.0001	0.0000	0.00008
176	227	228	70 mm2 (Al.)	6.9	0.61	1.21	2.1	1.9	2.2	0.3	0.0001	0.0000	0.00005
177	228	229	70 mm2 (Al.)	11.5	0.61	1.21	2.1	1.2	2.2	1.0	0.0001	0.0000	0.00009
178	229	230	70 mm2 (Al.)	9.2	0.61	1.21	2.1	1.2	1.1	1.0	0.0000	0.0000	0.00005
179	230	231	70 mm2 (Al.)	6.9	0.61	1.21	0.9	1.2	1.1	0.3	0.0000	0.0000	0.00002
180	231	232	70 mm2 (Al.)	6.9	0.61	1.21	0.9	1.2	0.0	1.1	0.0000	0.0000	0.00002
181	232	233	70 mm2 (Al.)	9.2	0.61	1.21	0.9	0.0	0.0	0.9	0.0000	0.0000	0.00001
182	13/24	l	70 mm2 (Al.)	23	0.61	1.21	6.2	5.1	5.4	0.3	0.0011	0.0000	0.00115
183	l	m	70 mm2 (Al.)	17.25	0.61	1.21	1.7	2.8	2.0	1.0	0.0002	0.0000	
184	m	238	25 mm2 (Al.)	11.5	1.64	3.28	0.8	1.0	0.0	0.9	0.0000	0.0000	0.00006
185	238	239	25 mm2 (Al.)	11.5	1.64	3.28	0.8	0.0	0.0	0.8	0.0000	0.0000	0.00004
186	m	240	70 mm2 (Al.)	11.5	0.61	1.21	0.9	1.8	2.0	1.0	0.0001	0.0000	0.00007
187	240	241	70 mm2 (Al.)	9.2	0.61	1.21	0.9	1.8	1.0	0.9	0.0000	0.0000	0.00004
188	241	242	70 mm2 (Al.)	9.2	0.61	1.21	0.9	1.0	1.0	0.1	0.0000	0.0000	0.00002
189	242	243	70 mm2 (Al.)	6.9	0.61	1.21	0.0	1.0	1.0	1.0	0.0000	0.0000	0.00002
190	243	244	70 mm2 (Al.)	10.35	0.61	1.21	0.0	1.0	0.0	1.0	0.0000	0.0000	0.00002
191	l	245	70 mm2 (Al.)	11.5	0.61	1.21	3.5	2.3	3.4	1.2	0.0002	0.0000	0.00022
192	245	246	70 mm2 (Al.)	11.5	0.61	1.21	2.5	2.3	3.4	1.0	0.0002	0.0000	0.00018
193	246	n	70 mm2 (Al.)	5.75	0.61	1.21	2.5	2.3	2.5	0.2	0.0001	0.0000	0.00006
194	n	247	70 mm2 (Al.)	5.75	0.61	1.21	1.2	0.9	1.5	0.5	0.0000	0.0000	0.00002
195	247	248	70 mm2 (Al.)	9.2	0.61	1.21	1.2	0.0	1.5	1.4	0.0000	0.0000	0.00004

196	248	249	70 mm2 (Al.)	11.5	0.61	1.21	0.0	0.0	1.5	1.5	0.0000	0.0000	0.00005
197	249	250	70 mm2 (Al.)	12.65	0.61	1.21	0.0	0.0	0.7	0.7	0.0000	0.0000	0.00001
198	n	251	70 mm2 (Al.)	9.2	0.61	1.21	1.3	1.4	1.0	0.4	0.0000	0.0000	0.00003
199	251	252	70 mm2 (Al.)	6.9	0.61	1.21	0.7	1.4	1.0	0.6	0.0000	0.0000	0.00002
200	252	253	70 mm2 (Al.)	9.2	0.61	1.21	0.7	0.7	1.0	0.3	0.0000	0.0000	0.00001
201	253	254	70 mm2 (Al.)	10.35	0.61	1.21	0.7	0.7	0.0	0.7	0.0000	0.0000	0.00001
202	254	255	70 mm2 (Al.)	9.2	0.61	1.21	0.0	0.7	0.0	0.7	0.0000	0.0000	0.00001
203	13/29	257	70 mm2 (Al.)	17.25	0.61	1.21	2.1	0.8	2.2	1.4	0.0001	0.0000	0.00014
204	257	258	70 mm2 (Al.)	5.75	0.61	1.21	2.1	0.8	1.0	1.2	0.0000	0.0000	0.00003
205	258	259	70 mm2 (Al.)	9.2	0.61	1.21	1.1	0.8	1.0	0.3	0.0000	0.0000	0.00002
206	259	260	70 mm2 (Al.)	6.9	0.61	1.21	1.1	0.0	1.0	1.1	0.0000	0.0000	0.00002
207	260	261	70 mm2 (Al.)	8.05	0.61	1.21	1.1	0.0	0.0	1.1	0.0000	0.0000	0.00002
208	B	337	70 mm2 (Al.)	0	0.61	1.21	3.9	3.7	3.7	0.2	0.0000	0.0000	0.00000
209	337	338	70 mm2 (Al.)	17.25	0.61	1.21	3.9	3.7	2.9	0.9	0.0004	0.0000	0.00041
210	338	339	70 mm2 (Al.)	11.5	0.61	1.21	3.9	2.7	2.9	1.1	0.0002	0.0000	0.00023
211	339	340	70 mm2 (Al.)	11.5	0.61	1.21	3.1	2.7	2.9	0.3	0.0002	0.0000	0.00018
212	340	341	70 mm2 (Al.)	17.25	0.61	1.21	3.1	2.7	1.9	1.1	0.0002	0.0000	0.00024
213	341	342	70 mm2 (Al.)	11.5	0.61	1.21	3.1	1.9	1.9	1.2	0.0001	0.0000	0.00014
214	342	343	70 mm2 (Al.)	17.25	0.61	1.21	2.2	1.9	1.9	0.3	0.0001	0.0000	0.00013
215	343	344	70 mm2 (Al.)	0	0.61	1.21	2.2	1.9	0.9	1.2	0.0000	0.0000	0.00000
216	344	345	70 mm2 (Al.)	18.4	0.61	1.21	2.2	0.9	0.9	1.3	0.0001	0.0000	0.00011
217	345	346	70 mm2 (Al.)	11.5	0.61	1.21	1.2	0.9	0.9	0.3	0.0000	0.0000	0.00002
218	346	347	70 mm2 (Al.)	17.25	0.61	1.21	1.2	0.9	0.0	1.1	0.0000	0.0000	0.00005
219	347	348	70 mm2 (Al.)	8.05	0.61	1.21	1.2	0.0	0.0	1.2	0.0000	0.0000	0.00002
220	A	p	70 mm2 (Al.)	149.5	0.61	1.21	3.5	4.4	5.3	1.6	0.0054	0.0004	0.00586
221	p	349	70 mm2 (Al.)	69	0.61	1.21	0.0	0.6	2.0	1.8	0.0002	0.0003	0.00045
222	349	350	70 mm2 (Al.)	11.5	0.61	1.21	0.0	0.6	1.3	1.1	0.0000	0.0000	0.00003
223	350	351	70 mm2 (Al.)	11.5	0.61	1.21	0.0	0.6	0.7	0.7	0.0000	0.0000	0.00001
224	351	352	70 mm2 (Al.)	34.5	0.61	1.21	0.0	0.0	0.7	0.7	0.0000	0.0000	0.00003
225	p	353	70 mm2 (Al.)	11.5	0.61	1.21	3.5	3.8	3.3	0.4	0.0003	0.0000	0.00027
226	353	354	70 mm2 (Al.)	5.75	0.61	1.21	3.5	3.8	2.5	1.2	0.0001	0.0000	0.00012
227	354	355	70 mm2 (Al.)	5.75	0.61	1.21	3.5	2.8	2.5	0.9	0.0001	0.0000	0.00010
228	355	356	70 mm2 (Al.)	11.5	0.61	1.21	3.5	2.8	1.8	1.5	0.0002	0.0000	0.00019
229	356	357	70 mm2 (Al.)	5.75	0.61	1.21	3.5	1.7	1.8	1.8	0.0001	0.0000	0.00009
230	357	358	70 mm2 (Al.)	6.9	0.61	1.21	2.5	1.7	1.8	0.8	0.0001	0.0000	0.00006
231	358	359	70 mm2 (Al.)	11.5	0.61	1.21	2.5	1.7	0.8	1.5	0.0001	0.0000	0.00010
232	359	360	70 mm2 (Al.)	9.2	0.61	1.21	2.5	0.8	0.8	1.7	0.0000	0.0000	0.00007
233	360	361	70 mm2 (Al.)	11.5	0.61	1.21	2.5	0.8	0.0	2.2	0.0000	0.0001	0.00012
234	361	362	70 mm2 (Al.)	9.2	0.61	1.21	1.7	0.8	0.0	1.5	0.0000	0.0000	0.00004
235	362	q	70 mm2 (Al.)	17.25	0.61	1.21	1.7	4.9	5.4	3.5	0.0006	0.0003	0.00084
236	q	363	70 mm2 (Al.)	9.2	0.61	1.21	0.9	1.6	3.4	2.2	0.0001	0.0001	0.00014

237	363	r	70 mm2 (Al.)	5.75	0.61	1.21	0.9	1.6	2.5	1.4	0.0000	0.0000	0.00005
238	r	364	70 mm2 (Al.)	6.9	0.61	1.21	0.0	0.8	2.5	2.2	0.0000	0.0000	0.00007
239	364	365	70 mm2 (Al.)	5.75	0.61	1.21	0.0	0.8	1.8	1.6	0.0000	0.0000	0.00003
240	365	866	70 mm2 (Al.)	6.9	0.61	1.21	0.0	0.0	1.8	1.8	0.0000	0.0000	0.00004
241	366	367	70 mm2 (Al.)	9.2	0.61	1.21	0.0	0.0	1.0	1.0	0.0000	0.0000	0.00002
242	r	368	70 mm2 (Al.)	17.25	0.61	1.21	0.9	0.8	0.0	0.9	0.0000	0.0000	0.00003
243	368	369	70 mm2 (Al.)	5.75	0.61	1.21	0.0	0.8	0.0	0.8	0.0000	0.0000	0.00001
244				0							0.0000	0.0000	
245	q	t	70 mm2 (Al.)	11.5	0.61	1.21	0.8	3.3	2.0	2.2	0.0001	0.0001	0.00017
246	t	370	70 mm2 (Al.)	5.75	0.61	1.21	0.8	2.3	2.0	1.4	0.0000	0.0000	0.00005
247	370	371	70 mm2 (Al.)	6.9	0.61	1.21	0.8	2.3	1.4	1.3	0.0000	0.0000	0.00005
248	371	372	70 mm2 (Al.)	9.2	0.61	1.21	0.8	1.5	1.4	0.7	0.0000	0.0000	0.00003
249	372	373	70 mm2 (Al.)	5.75	0.61	1.21	0.8	1.5	0.6	0.8	0.0000	0.0000	0.00002
250	373	374	70 mm2 (Al.)	9.2	0.61	1.21	0.8	0.7	0.6	0.2	0.0000	0.0000	0.00001
251	374	375	70 mm2 (Al.)	6.9	0.61	1.21	0.8	0.7	0.0	0.8	0.0000	0.0000	0.00001
252	375	376	70 mm2 (Al.)	11.5	0.61	1.21	0.0	0.7	0.0	0.7	0.0000	0.0000	0.00001
253	t	377	70 mm2 (Al.)	5.75	0.61	1.21	0.0	1.0	0.0	1.0	0.0000	0.0000	0.00001
254											2.8735	0.0662	2.9396
255													
256													
257	13/18	142	10 Sq. mm.	11.5	4.02	8.03	0.9	0.0	0.0	0.9	0.00004	0.00007	0.00011
258	13/18	143	10 Sq. mm.	10.35	4.02	8.03	0.0	0.9	0.0	0.9	0.00003	0.00007	0.00010
259	13/19	144	10 Sq. mm.	11.5	4.02	8.03	0.9	0.0	0.0	0.9	0.00004	0.00007	0.00011
260	13/19	145	10 Sq. mm.	12.65	4.02	8.03	0.0	0.0	0.9	0.9	0.00004	0.00008	0.00012
261	13/20	146	10 Sq. mm.	13.8	4.02	8.03	1.0	0.0	0.0	1.0	0.00006	0.00011	0.00017
262	13/20	147	10 Sq. mm.	9.2	4.02	8.03	0.0	1.0	0.0	1.0	0.00004	0.00007	0.00011
263		148	25 Sq. mm.	10.35	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00003	0.00005
264		149	25 Sq. mm.	9.2	1.64	3.28	1.1	0.0	0.0	1.1	0.00002	0.00004	0.00005
265		150	25 Sq. mm.	13.8	1.64	3.28	0.0	1.1	0.0	1.1	0.00003	0.00005	0.00008
266		151	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	1.1	1.1	0.00002	0.00005	0.00007
267		152	25 Sq. mm.	12.86	1.64	3.28	0.9	0.0	0.0	0.9	0.00002	0.00003	0.00005
268		153	25 Sq. mm.	13.8	1.64	3.28	1.2	1.2	1.2	0.0	0.00010	0.00000	0.00010
269		154	25 Sq. mm.	9.2	1.64	3.28	0.0	1.2	0.0	1.2	0.00002	0.00005	0.00007
270		155	25 Sq. mm.	10.35	1.64	3.28	0.0	0.0	1.1	1.1	0.00002	0.00004	0.00006
271		156	25 Sq. mm.	12.65	1.64	3.28	0.7	0.9	0.9	0.2	0.00004	0.00000	0.00005
272		157	25 Sq. mm.	12.65	1.64	3.28	0.0	0.0	0.6	0.6	0.00001	0.00001	0.00002
273		158	25 Sq. mm.	11.5	1.64	3.28	1.0	0.0	0.0	1.0	0.00002	0.00004	0.00006
274		159	25 Sq. mm.	16.1	1.64	3.28	0.8	0.8	0.8	0.0	0.00005	0.00000	0.00005
275		160	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00002	0.00003
276		161	25 Sq. mm.	10.35	1.64	3.28	0.0	0.8	0.0	0.8	0.00001	0.00002	0.00003
277		162	25 Sq. mm.	9.2	1.64	3.28	0.9	0.0	0.0	0.9	0.00001	0.00002	0.00004

278		163	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	0.7	0.7	0.00001	0.00002	0.00003
279		164	25 Sq. mm.	9.2	1.64	3.28	0.8	0.0	0.0	0.8	0.00001	0.00002	0.00003
280		165	25 Sq. mm.	8.05	1.64	3.28	0.0	0.7	0.0	0.7	0.00001	0.00001	0.00002
281		166	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	0.7	0.7	0.00001	0.00002	0.00003
282		167	25 Sq. mm.	13.8	1.64	3.28	0.9	0.9	0.9	0.0	0.00005	0.00000	0.00005
283		168	25 Sq. mm.	12.65	1.64	3.28	0.9	0.0	0.0	0.9	0.00002	0.00003	0.00005
284		169	25 Sq. mm.	8.05	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00002	0.00003
285		170	25 Sq. mm.	10.35	1.64	3.28	0.0	0.0	0.6	0.6	0.00001	0.00001	0.00002
286		171	25 Sq. mm.	12.65	1.64	3.28	1.0	0.0	1.0	1.0	0.00004	0.00004	0.00008
287		172	25 Sq. mm.	12.65	1.64	3.28	0.0	1.2	0.0	1.2	0.00003	0.00006	0.00009
288		173	25 Sq. mm.	11.5	1.64	3.28	1.1	0.0	0.0	1.1	0.00002	0.00005	0.00007
289		174	25 Sq. mm.	16.1	1.64	3.28	0.0	0.0	1.2	1.2	0.00004	0.00008	0.00011
290		175	25 Sq. mm.	9.2	1.64	3.28	0.0	1.1	0.0	1.1	0.00002	0.00004	0.00005
291		176	25 Sq. mm.	10.35	1.64	3.28	1.2	0.0	0.0	1.2	0.00002	0.00005	0.00007
292		177	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00003	0.00005
293		178	25 Sq. mm.	11.5	1.64	3.28	1.0	1.0	1.0	0.0	0.00006	0.00000	0.00006
294		179	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00003	0.00005
295		180	25 Sq. mm.	8.05	1.64	3.28	0.8	0.0	0.0	0.8	0.00001	0.00002	0.00003
296		181	25 Sq. mm.	11.5	1.64	3.28	0.0	0.9	0.0	0.9	0.00002	0.00003	0.00005
297	13/21	182	10 Sq. mm.	13.8	4.02	8.03	0.0	0.0	0.8	0.8	0.00004	0.00007	0.00011
298	13/21	183	10 Sq. mm.	12.65	4.02	8.03	0.8	0.0	0.0	0.8	0.00003	0.00007	0.00010
299	13/21	184	10 Sq. mm.	17.25	4.02	8.03	0.0	0.8	0.0	0.8	0.00004	0.00009	0.00013
300		185	25 Sq. mm.	10.35	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00002	0.00003
301		186	25 Sq. mm.	9.2	1.64	3.28	0.9	0.0	0.0	0.9	0.00001	0.00002	0.00004
302		187	25 Sq. mm.	12.65	1.64	3.28	0.0	0.9	0.0	0.9	0.00002	0.00003	0.00005
303		188	25 Sq. mm.	13.8	1.64	3.28	0.0	0.0	0.9	0.9	0.00002	0.00004	0.00005
304		189	25 Sq. mm.	11.5	1.64	3.28	1.0	0.0	0.0	1.0	0.00002	0.00004	0.00006
305		190	25 Sq. mm.	11.5	1.64	3.28	0.0	1.2	0.0	1.2	0.00003	0.00005	0.00008
306		191	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00003	0.00005
307		192	25 Sq. mm.	13.8	1.64	3.28	0.9	0.0	0.0	0.9	0.00002	0.00004	0.00005
308		193	25 Sq. mm.	8.05	1.64	3.28	0.6	0.0	0.0	0.6	0.00000	0.00001	0.00001
309		194	25 Sq. mm.	12.65	1.64	3.28	0.0	1.3	0.0	1.3	0.00004	0.00007	0.00011
310		195	25 Sq. mm.	9.2	1.64	3.28	1.1	0.0	0.0	1.1	0.00002	0.00004	0.00005
311		196	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	1.1	1.1	0.00002	0.00005	0.00007
312		197	25 Sq. mm.	10.35	1.64	3.28	0.0	1.1	0.0	1.1	0.00002	0.00004	0.00006
313		198	25 Sq. mm.	11.5	1.64	3.28	0.9	0.0	0.0	0.9	0.00002	0.00003	0.00005
314		199	25 Sq. mm.	12.65	1.64	3.28	1.1	1.2	1.2	0.1	0.00008	0.00000	0.00009
315		200	25 Sq. mm.	13.8	1.64	3.28	1.1	1.1	1.1	0.0	0.00008	0.00000	0.00008
316		201	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	0.9	0.9	0.00001	0.00002	0.00004
317		202	25 Sq. mm.	10.35	1.64	3.28	0.7	0.0	0.0	0.7	0.00001	0.00002	0.00002
318		203	25 Sq. mm.	9.2	1.64	3.28	0.0	0.8	0.0	0.8	0.00001	0.00002	0.00003

319		204	25 Sq. mm.	13.8	1.64	3.28	0.0	0.0	1.2	1.2	0.00003	0.00007	0.00010
320		205	25 Sq. mm.	11.5	1.64	3.28	1.0	1.0	1.0	0.0	0.00006	0.00000	0.00006
321		206	25 Sq. mm.	12.65	1.64	3.28	0.0	0.0	0.9	0.9	0.00002	0.00003	0.00005
322		207	25 Sq. mm.	13.8	1.64	3.28	1.1	0.0	0.0	1.1	0.00003	0.00005	0.00008
323		208	25 Sq. mm.	9.2	1.64	3.28	0.0	0.9	0.0	0.9	0.00001	0.00002	0.00004
324		209	25 Sq. mm.	10.35	1.64	3.28	0.0	0.0	1.1	1.1	0.00002	0.00004	0.00006
325		210	25 Sq. mm.	12.65	1.64	3.28	1.0	0.0	0.0	1.0	0.00002	0.00004	0.00006
326		211	25 Sq. mm.	11.5	1.64	3.28	0.0	1.0	0.0	1.0	0.00002	0.00004	0.00006
327		212	25 Sq. mm.	16.1	1.64	3.28	1.0	0.0	0.0	1.0	0.00003	0.00005	0.00008
328		213	25 Sq. mm.	12.65	1.64	3.28	0.0	0.9	0.0	0.9	0.00002	0.00003	0.00005
329		214	25 Sq. mm.	10.35	1.64	3.28	0.0	0.0	0.7	0.7	0.00001	0.00002	0.00002
330		215	25 Sq. mm.	16.1	1.64	3.28	0.9	0.0	0.0	0.9	0.00002	0.00004	0.00006
331		216	25 Sq. mm.	9.2	1.64	3.28	0.0	1.0	0.0	1.0	0.00002	0.00003	0.00005
332		217	25 Sq. mm.	8.05	1.64	3.28	0.0	0.0	0.6	0.6	0.00000	0.00001	0.00001
333		218	25 Sq. mm.	11.5	1.64	3.28	0.7	0.0	0.0	0.7	0.00001	0.00002	0.00003
334		219	25 Sq. mm.	10.35	1.64	3.28	0.0	1.1	0.0	1.1	0.00002	0.00004	0.00006
335		220	25 Sq. mm.	8.05	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00002	0.00003
336		221	25 Sq. mm.	12.65	1.64	3.28	0.8	0.0	0.0	0.8	0.00001	0.00003	0.00004
337		222	25 Sq. mm.	11.5	1.64	3.28	0.0	0.9	0.0	0.9	0.00002	0.00003	0.00005
338		223	25 Sq. mm.	12.65	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00003	0.00004
339		224	25 Sq. mm.	12.65	1.64	3.28	1.0	0.0	0.0	1.0	0.00002	0.00004	0.00006
340		225	25 Sq. mm.	12.65	1.64	3.28	0.0	0.8	0.0	0.8	0.00001	0.00003	0.00004
341		226	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00003	0.00005
342		227	25 Sq. mm.	11.5	1.64	3.28	1.1	0.0	0.0	1.1	0.00002	0.00005	0.00007
343		228	25 Sq. mm.	10.35	1.64	3.28	0.0	0.7	0.0	0.7	0.00001	0.00002	0.00002
344		229	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	1.1	1.1	0.00002	0.00005	0.00007
345		230	25 Sq. mm.	12.65	1.64	3.28	1.2	0.0	0.0	1.2	0.00003	0.00006	0.00009
346		231	25 Sq. mm.	13.8	1.64	3.28	0.0	0.0	1.1	1.1	0.00003	0.00005	0.00008
347		232	25 Sq. mm.	9.2	1.64	3.28	0.0	1.2	0.0	1.2	0.00002	0.00004	0.00007
348		233	25 Sq. mm.	10.35	1.64	3.28	0.9	0.0	0.0	0.9	0.00001	0.00003	0.00004
349	13/23	234	10 Sq. mm.	12.65	4.02	8.03	0.0	0.0	0.9	0.9	0.00004	0.00008	0.00012
350	13/23	235	10 Sq. mm.	13.8	4.02	8.03	0.0	1.0	0.0	1.0	0.00006	0.00011	0.00017
351	13/24	236	10 Sq. mm.	11.5	4.02	8.03	0.7	0.0	0.0	0.7	0.00002	0.00005	0.00007
352	13/24	237	10 Sq. mm.	20.7	4.02	8.03	0.0	0.0	0.8	0.8	0.00005	0.00011	0.00016
353		238	25 Sq. mm.	13.8	1.64	3.28	0.0	1.0	0.0	1.0	0.00002	0.00005	0.00007
354		239	25 Sq. mm.	9.2	1.64	3.28	0.8	0.0	0.0	0.8	0.00001	0.00002	0.00003
355		240	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00004	0.00006
356		241	25 Sq. mm.	9.2	1.64	3.28	0.0	0.8	0.0	0.8	0.00001	0.00002	0.00003
357		242	25 Sq. mm.	13.8	1.64	3.28	0.9	0.0	0.0	0.9	0.00002	0.00004	0.00005
358		243	25 Sq. mm.	8.05	1.64	3.28	0.0	0.0	1.0	1.0	0.00001	0.00003	0.00004
359		244	25 Sq. mm.	12.65	1.64	3.28	0.0	1.0	0.0	1.0	0.00002	0.00004	0.00006

360		245	25 Sq. mm.	9.2	1.64	3.28	1.0	0.0	0.0	1.0	0.00002	0.00003	0.00005
361		246	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	0.9	0.9	0.00002	0.00003	0.00005
362		247	25 Sq. mm.	10.35	1.64	3.28	0.0	0.9	0.0	0.9	0.00001	0.00003	0.00004
363		248	25 Sq. mm.	11.5	1.64	3.28	1.2	0.0	0.0	1.2	0.00003	0.00005	0.00008
364		249	25 Sq. mm.	12.65	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00003	0.00004
365		250	25 Sq. mm.	13.8	1.64	3.28	0.0	0.0	0.7	0.7	0.00001	0.00002	0.00003
366		251	25 Sq. mm.	9.2	1.64	3.28	0.6	0.0	0.0	0.6	0.00001	0.00001	0.00002
367		252	25 Sq. mm.	10.35	1.64	3.28	0.0	0.7	0.0	0.7	0.00001	0.00002	0.00002
368		253	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00003	0.00005
369		254	25 Sq. mm.	13.8	1.64	3.28	0.7	0.0	0.0	0.7	0.00001	0.00002	0.00003
370		255	25 Sq. mm.	11.5	1.64	3.28	0.0	0.7	0.0	0.7	0.00001	0.00002	0.00003
371	13/29	256	25 Sq. mm.	18.4	1.64	3.28	1.1	1.2	1.1	0.1	0.00012	0.00000	0.00012
372		257	25 Sq. mm.	13.8	1.64	3.28	0.0	0.0	1.2	1.2	0.00003	0.00007	0.00010
373		258	25 Sq. mm.	9.2	1.64	3.28	1.0	0.0	0.0	1.0	0.00002	0.00003	0.00005
374		259	25 Sq. mm.	10.35	1.64	3.28	0.0	0.8	0.0	0.8	0.00001	0.00002	0.00003
375		260	25 Sq. mm.	12.65	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00004	0.00006
376		261	25 Sq. mm.	9.2	1.64	3.28	1.1	0.0	0.0	1.1	0.00002	0.00004	0.00005
377	13/30/1	262	10 Sq. mm.	24.15	4.02	8.03	0.0	1.0	0.0	1.0	0.00010	0.00019	0.00029
378	13/30/1	263	10 Sq. mm.	23	4.02	8.03	1.2	0.0	0.0	1.2	0.00013	0.00027	0.00040
379	13/30/1	264	10 Sq. mm.	24.15	4.02	8.03	0.0	0.0	1.2	1.2	0.00014	0.00028	0.00042
380	13/30/2	265	10 Sq. mm.	23	4.02	8.03	0.0	0.0	1.3	1.3	0.00016	0.00031	0.00047
381		266	25 Sq. mm.	28.75	1.64	3.28	1.3	0.0	0.0	1.3	0.00008	0.00016	0.00024
382		267	25 Sq. mm.	24.15	1.64	3.28	0.0	1.1	0.0	1.1	0.00005	0.00010	0.00014
383		268	25 Sq. mm.	10.35	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00002	0.00003
384	13/30/4	269	10 Sq. mm.	26.45	4.02	8.03	1.1	0.0	0.0	1.1	0.00013	0.00026	0.00039
385		270	10 Sq. mm.	12.65	4.02	8.03	0.0	1.2	0.0	1.2	0.00007	0.00015	0.00022
386		271	10 Sq. mm.	10.35	4.02	8.03	0.0	0.0	0.9	0.9	0.00003	0.00007	0.00010
387		272	10 Sq. mm.	8.05	4.02	8.03	0.0	0.0	1.0	1.0	0.00003	0.00006	0.00010
388		273	10 Sq. mm.	13.8	4.02	8.03	1.0	0.0	0.0	1.0	0.00006	0.00011	0.00017
389		274	10 Sq. mm.	14.95	4.02	8.03	0.0	1.1	0.0	1.1	0.00007	0.00015	0.00022
390		275	25 Sq. mm.	10.35	1.64	3.28	0.0	0.0	1.1	1.1	0.00002	0.00004	0.00006
391		276	25 Sq. mm.	9.2	1.64	3.28	1.2	0.0	0.0	1.2	0.00002	0.00004	0.00007
392		277	25 Sq. mm.	11.5	1.64	3.28	0.0	0.8	0.0	0.8	0.00001	0.00002	0.00004
393		278	25 Sq. mm.	12.65	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00004	0.00006
394		279	25 Sq. mm.	9.2	1.64	3.28	0.9	0.0	0.0	0.9	0.00001	0.00002	0.00004
395		280	25 Sq. mm.	8.05	1.64	3.28	0.0	0.0	1.0	1.0	0.00001	0.00003	0.00004
396		281	25 Sq. mm.	12.65	1.64	3.28	0.0	0.9	0.0	0.9	0.00002	0.00003	0.00005
397	13/31	282	10 Sq. mm.	14.95	4.02	8.03	0.8	0.0	0.0	0.8	0.00004	0.00008	0.00012
398	13/32	283	10 Sq. mm.	17.25	4.02	8.03	0.0	0.0	0.9	0.9	0.00006	0.00011	0.00017
399	13/32	284	10 Sq. mm.	16.1	4.02	8.03	0.8	0.0	0.0	0.8	0.00004	0.00008	0.00012
400	13/33	285	10 Sq. mm.	11.5	4.02	8.03	0.0	0.9	0.0	0.9	0.00004	0.00007	0.00011

401	13/33	286	10 Sq. mm.	21.85	4.02	8.03	0.0	0.0	0.8	0.8	0.00006	0.00011	0.00017
402	13/34	287	10 Sq. mm.	20.7	4.02	8.03	1.0	0.0	0.0	1.0	0.00008	0.00017	0.00025
403	13/35	288	10 Sq. mm.	13.8	4.02	8.03	0.0	0.0	0.8	0.8	0.00004	0.00007	0.00011
404	13/36	289	10 Sq. mm.	14.95	4.02	8.03	0.9	0.9	0.9	0.0	0.00015	0.00000	0.00015
405	13/37	290	10 Sq. mm.	11.5	4.02	8.03	0.0	1.0	0.0	1.0	0.00005	0.00009	0.00014
406		291	25 Sq. mm.	9.2	1.64	3.28	1.0	0.0	0.0	1.0	0.00002	0.00003	0.00005
407		292	25 Sq. mm.	13.8	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00005	0.00007
408		293	25 Sq. mm.	8.05	1.64	3.28	0.0	1.2	0.0	1.2	0.00002	0.00004	0.00006
409		294	25 Sq. mm.	12.65	1.64	3.28	1.1	0.0	0.0	1.1	0.00003	0.00005	0.00008
410		295	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00002	0.00003
411		296	25 Sq. mm.	11.5	1.64	3.28	0.0	0.7	0.0	0.7	0.00001	0.00002	0.00003
412		297	25 Sq. mm.	10.35	1.64	3.28	1.1	0.0	0.0	1.1	0.00002	0.00004	0.00006
413		298	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	0.7	0.7	0.00001	0.00002	0.00003
414		299	25 Sq. mm.	12.65	1.64	3.28	0.0	0.9	0.0	0.9	0.00002	0.00003	0.00005
415		300	25 Sq. mm.	13.8	1.64	3.28	1.2	0.0	0.0	1.2	0.00003	0.00007	0.00010
416		301	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	0.6	0.6	0.00001	0.00001	0.00002
417		302	25 Sq. mm.	10.35	1.64	3.28	0.0	0.8	0.0	0.8	0.00001	0.00002	0.00003
418		303	25 Sq. mm.	9.2	1.64	3.28	1.0	0.0	0.0	1.0	0.00002	0.00003	0.00005
419		304	25 Sq. mm.	13.8	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00005	0.00007
420		305	25 Sq. mm.	11.5	1.64	3.28	0.0	1.1	0.0	1.1	0.00002	0.00005	0.00007
421		306	25 Sq. mm.	12.65	1.64	3.28	0.0	1.1	0.0	1.1	0.00003	0.00005	0.00008
422		307	25 Sq. mm.	13.8	1.64	3.28	0.0	0.0	1.1	1.1	0.00003	0.00005	0.00008
423		308	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00002	0.00003
424		309	25 Sq. mm.	10.35	1.64	3.28	0.8	0.0	0.0	0.8	0.00001	0.00002	0.00003
425		310	25 Sq. mm.	12.65	1.64	3.28	0.0	0.9	0.0	0.9	0.00002	0.00003	0.00005
426		311	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00004	0.00006
427		312	25 Sq. mm.	16.1	1.64	3.28	0.7	0.0	0.0	0.7	0.00001	0.00003	0.00004
428		313	25 Sq. mm.	12.65	1.64	3.28	0.0	0.0	0.9	0.9	0.00002	0.00003	0.00005
429		314	25 Sq. mm.	10.35	1.64	3.28	0.0	0.8	0.0	0.8	0.00001	0.00002	0.00003
430		315	25 Sq. mm.	16.1	1.64	3.28	0.8	0.0	0.0	0.8	0.00002	0.00003	0.00005
431		316	25 Sq. mm.	9.2	1.64	3.28	0.0	1.1	0.0	1.1	0.00002	0.00004	0.00005
432		317	25 Sq. mm.	8.05	1.64	3.28	0.9	0.0	0.0	0.9	0.00001	0.00002	0.00003
433		318	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	0.6	0.6	0.00001	0.00001	0.00002
434		319	25 Sq. mm.	10.35	1.64	3.28	1.0	0.0	0.0	1.0	0.00002	0.00003	0.00005
435		320	25 Sq. mm.	8.05	1.64	3.28	0.0	1.2	0.0	1.2	0.00002	0.00004	0.00006
436		321	25 Sq. mm.	12.65	1.64	3.28	1.1	0.0	0.0	1.1	0.00003	0.00005	0.00008
437		322	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	0.7	0.7	0.00001	0.00002	0.00003
438		323	25 Sq. mm.	12.65	1.64	3.28	0.0	1.1	0.0	1.1	0.00003	0.00005	0.00008
439		324	25 Sq. mm.	12.65	1.64	3.28	1.2	0.0	0.0	1.2	0.00003	0.00006	0.00009
440		325	25 Sq. mm.	12.65	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00003	0.00004
441		326	25 Sq. mm.	9.2	1.64	3.28	0.0	0.8	0.0	0.8	0.00001	0.00002	0.00003

442		327	25 Sq. mm.	11.5	1.64	3.28	1.3	0.0	0.0	1.3	0.00003	0.00006	0.00010
443		328	25 Sq. mm.	10.35	1.64	3.28	0.0	0.0	0.9	0.9	0.00001	0.00003	0.00004
444		329	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00004	0.00006
445		330	25 Sq. mm.	12.65	1.64	3.28	0.9	0.0	0.0	0.9	0.00002	0.00003	0.00005
446		331	25 Sq. mm.	13.8	1.64	3.28	0.0	0.0	1.1	1.1	0.00003	0.00005	0.00008
447		332	25 Sq. mm.	9.2	1.64	3.28	0.0	0.9	0.0	0.9	0.00001	0.00002	0.00004
448		333	25 Sq. mm.	10.35	1.64	3.28	0.0	0.0	1.2	1.2	0.00002	0.00005	0.00007
449		334	25 Sq. mm.	12.65	1.64	3.28	0.0	0.0	0.9	0.9	0.00002	0.00003	0.00005
450		335	25 Sq. mm.	13.8	1.64	3.28	1.0	0.0	0.0	1.0	0.00002	0.00005	0.00007
451		336	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00002	0.00004
452		337	25 Sq. mm.	20.7	1.64	3.28	0.0	0.9	0.0	0.9	0.00003	0.00005	0.00008
453		338	25 Sq. mm.	13.8	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00005	0.00007
454		339	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00002	0.00003
455		340	25 Sq. mm.	13.8	1.64	3.28	0.0	1.2	0.0	1.2	0.00003	0.00007	0.00010
456		341	25 Sq. mm.	10.35	1.64	3.28	1.1	0.0	0.0	1.1	0.00002	0.00004	0.00006
457		342	25 Sq. mm.	10.35	1.64	3.28	0.0	1.1	0.0	1.1	0.00002	0.00004	0.00006
458		343	25 Sq. mm.	12.65	1.64	3.28	0.0	0.0	0.9	0.9	0.00002	0.00003	0.00005
459		344	25 Sq. mm.	11.5	1.64	3.28	0.0	1.0	0.0	1.0	0.00002	0.00004	0.00006
460		345	25 Sq. mm.	16.1	1.64	3.28	0.0	0.0	0.6	0.6	0.00001	0.00002	0.00003
461		346	25 Sq. mm.	12.65	1.64	3.28	0.0	1.0	0.0	1.0	0.00002	0.00004	0.00006
462		347	25 Sq. mm.	10.35	1.64	3.28	1.1	0.0	0.0	1.1	0.00002	0.00004	0.00006
463		348	25 Sq. mm.	16.1	1.64	3.28	0.0	0.9	0.0	0.9	0.00002	0.00004	0.00006
464		349	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	0.7	0.7	0.00001	0.00001	0.00002
465		350	25 Sq. mm.	8.05	1.64	3.28	0.0	0.0	0.6	0.6	0.00000	0.00001	0.00001
466		351	25 Sq. mm.	11.5	1.64	3.28	0.0	0.6	0.0	0.6	0.00001	0.00001	0.00002
467		352	25 Sq. mm.	10.35	1.64	3.28	0.0	0.0	0.7	0.7	0.00001	0.00002	0.00002
468		353	25 Sq. mm.	8.05	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00002	0.00003
469		354	25 Sq. mm.	12.65	1.64	3.28	0.0	1.0	0.0	1.0	0.00002	0.00004	0.00006
470		355	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	0.7	0.7	0.00001	0.00002	0.00003
471		356	25 Sq. mm.	12.65	1.64	3.28	0.0	1.1	0.0	1.1	0.00003	0.00005	0.00008
472		357	25 Sq. mm.	12.65	1.64	3.28	1.0	0.0	0.0	1.0	0.00002	0.00004	0.00006
473		358	25 Sq. mm.	12.65	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00004	0.00006
474		359	25 Sq. mm.	9.2	1.64	3.28	0.0	0.9	0.0	0.9	0.00001	0.00002	0.00004
475		360	25 Sq. mm.	11.5	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00002	0.00004
476		361	25 Sq. mm.	9.2	1.64	3.28	0.8	0.0	0.0	0.8	0.00001	0.00002	0.00003
477		362	25 Sq. mm.	11.5	1.64	3.28	0.0	0.9	0.0	0.9	0.00002	0.00003	0.00005
478		363	25 Sq. mm.	12.65	1.64	3.28	0.0	0.0	0.9	0.9	0.00002	0.00003	0.00005
479		364	25 Sq. mm.	13.8	1.64	3.28	0.0	0.0	0.7	0.7	0.00001	0.00002	0.00003
480		365	25 Sq. mm.	9.2	1.64	3.28	0.0	0.8	0.0	0.8	0.00001	0.00002	0.00003
481		366	25 Sq. mm.	10.35	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00002	0.00003
482		367	25 Sq. mm.	13.8	1.64	3.28	0.0	0.0	1.0	1.0	0.00002	0.00005	0.00007

483		368	25 Sq. mm.	8.05	1.64	3.28	0.9	0.0	0.0	0.9	0.00001	0.00002	0.00003
484		369	25 Sq. mm.	12.65	1.64	3.28	0.0	0.8	0.0	0.8	0.00001	0.00003	0.00004
485		370	25 Sq. mm.	9.2	1.64	3.28	0.0	0.0	0.6	0.6	0.00001	0.00001	0.00002
486		371	25 Sq. mm.	11.5	1.64	3.28	0.0	0.8	0.0	0.8	0.00001	0.00002	0.00004
487		372	25 Sq. mm.	10.35	1.64	3.28	0.0	0.0	0.8	0.8	0.00001	0.00002	0.00003
488		373	25 Sq. mm.	11.5	1.64	3.28	0.0	0.8	0.0	0.8	0.00001	0.00002	0.00004
489		374	25 Sq. mm.	12.65	1.64	3.28	0.0	0.0	0.6	0.6	0.00001	0.00001	0.00002
490		375	25 Sq. mm.	13.8	1.64	3.28	0.8	0.0	0.0	0.8	0.00001	0.00003	0.00004
491		376	25 Sq. mm.	9.2	1.64	3.28	0.0	0.7	0.0	0.7	0.00001	0.00001	0.00002
492		377	25 Sq. mm.	12.65	1.64	3.28	0.0	1.0	0.0	1.0	0.00002	0.00004	0.00006
											0.0060	0.0103	0.0162

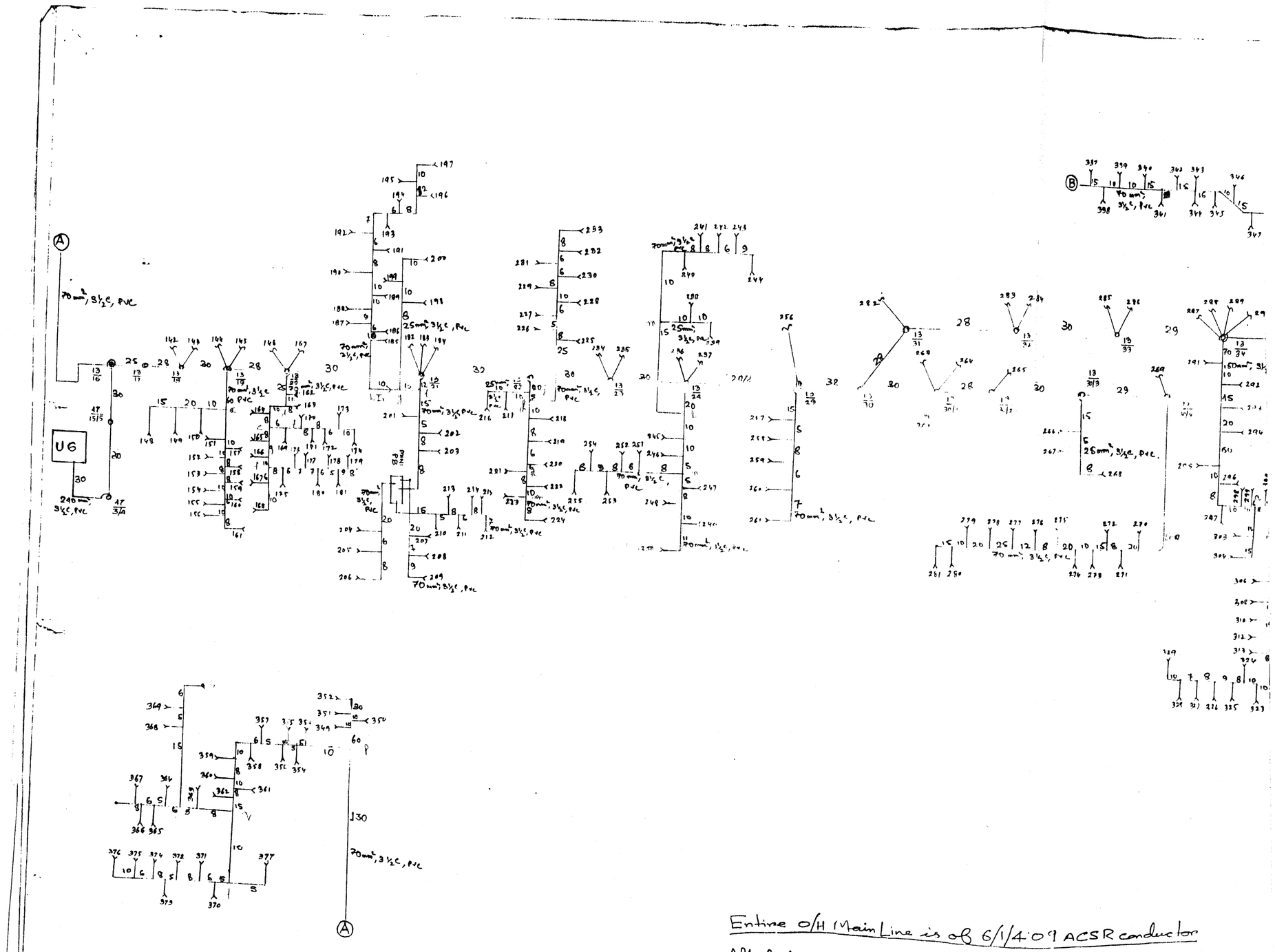
TOTAL POWER LOSS	2.8795	0.0765	2.9559

TRANSFORMER DETAILS : CAPACITY-315 KVA,6/0.42 KV

VOLTAGE	400.00	V
COMPUTED I	50.6236 **	KW

LT NETWORK LOSS

PEAK LOSS 2.9559 KW


A
70 mm², 3½ c, PVC
U6
240 mm², 4P 3½ c, PVC
B
70 mm², 3½ c, PVC
25 mm², 3½ c, PVC
Panel
30
70 mm², 3½ c, PVC
Entire O/H Main Line is of 6/1/4.09 ACSR conductor
All distances are in metres

BAGHAJATIN COLONY O/T

CALCULATION OF LT DISTRIBUTION LOSS

S.No	FROM	TO	CABLE SIZE	LENGTH (M)	RESISTANCE (Ohm/KM)		CURRENT READING (A)				PHASE LOSS	NEUTRAL LOSS	POWER LOSS
					PHASE	NEUTRAL	IR	IB	IY	IN	(KW)	(KW)	(KW)
1	BAGHAJATIN	187/18/6	400 mm2 (Al.)	28.75	0.106	0.106	295.0	295.0	390.0	95.0	0.99394	0.02749	1.02143
	Colony OT											0.00000	
2	187/18/6	187/18/6/1	4 ACSR	20.70	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
3	187/18/6/1	187/18/7	4 ACSR	19.55	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
4	187/18/6	187/17	0 ACSR	27.60	0.499	0.998	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
5	187/17	187/17/0	0 ACSR	25.30	0.499	0.998	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
6	187/17/0	187/16	0 ACSR	21.85	0.499	0.998	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
7	187/16	187/15	4 ACSR	21.85	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
8	187/15	187/14/0	4 ACSR	21.85	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
9	187/14/0	187/14	4 ACSR	34.50	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
10	187/14	187/13	4 ACSR	18.40	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
11	187/13	187/12/1	4 ACSR	19.55	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
12	187/12/1	187/12	4 ACSR	35.65	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
13	187/12	187/11	4 ACSR	39.10	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
14	187/11	187/10	4 ACSR	21.85	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
15	187/10	64	2 Wire Catenary	11.50	4.016	8.032	0.0	0.0	0.0	0.0	0.00000	0.00000	
16	187/18/6	187/18/5	0 ACSR	71.30	0.499	0.998	7.2	0.0	0.0	7.2	0.00184	0.00369	0.00553
17	187/18/5	187/18/4	0 ACSR	42.55	0.499	0.998	7.2	0.0	0.0	7.2	0.00110	0.00220	0.00330
18	187/18/4	187/18/3	4 ACSR	29.90	0.900	1.800	7.2	0.0	0.0	7.2	0.00140	0.00279	0.00419
19	187/18/3	187/18/2	4 ACSR	41.40	0.900	1.800	7.2	0.0	0.0	7.2	0.00193	0.00386	0.00579
20	187/18/2	187/18/1	4 ACSR	41.40	0.900	1.800	7.2	0.0	0.0	7.2	0.00193	0.00386	0.00579
21	187/18/1	187/18	4 ACSR	46.00	0.900	1.800	7.2	0.0	0.0	7.2	0.00215	0.00429	0.00644
22	187/18	187/17	4 ACSR	28.75	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
23	187/17	187/16	4ACSR	34.50	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
24	187/16	98	25 Sq. mm.	28.75	1.639	3.278	0.0	0.0	0.0	0.0	0.00000	0.00000	
25	187/17	187/17/1	4 ACSR	29.90	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
26	187/17/1	187/17/2	4 ACSR	21.85	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
27	187/17/2	95	2 Wire Catenary	11.50	4.016	8.032	0.0	0.0	0.0	0.0	0.00000	0.00000	
28	187/18	187/19	4 ACSR	40.25	0.900	1.800	7.2	0.0	0.0	7.2	0.00188	0.00376	0.00563
29	187/19	187/19/1	4 ACSR	28.75	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
30	187/19/1	187/19/2	4 ACSR	41.40	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
31	187/19/2	187/19/3	4 ACSR	27.60	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
32	187/19/3	187/19/4	4 ACSR	19.55	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000

33	187/19/4	187/19/5	4 ACSR	14.95	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
34	187/19/5	130	2 Wire Catenary	28.75	4.016	8.032	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
35	187/19/3	123	2 Wire Catenary	165.60	4.016	8.032	0.0	0.0	0.0		0.00000	0.00000	
36	187/19/2	187/19/2/1	8 ACSR	40.25	1.600	3.200	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
37	187/19	187/20	4 ACSR	32.20	0.900	1.800	7.2	0.0	0.0	7.2	0.00150	0.00300	0.00451
38	187/20	187/20/1	4 ACSR	40.25	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
39	187/20/1	187/20/2	4 ACSR	39.10	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
41	187/20	187/21	4 ACSR	46.00	0.900	1.800	7.2	0.0	0.0	7.2	0.00215	0.00429	0.00644
42	187/21	187/22	4 ACSR	40.25	0.900	1.800	8.7	1.4	1.0	7.5	0.00285	0.00408	0.00693
43	187/22	187/22/1	4 ACSR	41.40	0.900	1.800	1.5	0.0	0.0	1.5	0.00008	0.00017	0.00025
44	187/22/1	187/22/1/1	4 ACSR	23.00	0.900	1.800	1.5	0.0	0.0	1.5	0.00005	0.00009	0.00014
45	187/22/1/1	187/22/2	4 ACSR	41.40	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
48	187/22	187/23	4 ACSR	46.00	0.900	1.800	7.2	1.4	1.0	6.0	0.00227	0.00299	0.00526
49	187/23	187/23/1	4 ACSR	46.00	0.900	1.800	7.2	1.4	1.0	6.0	0.00227	0.00299	0.00526
50	187/23/1	187/23/2	4 ACSR	37.95	0.900	1.800	5.7	0.0	0.0	5.7	0.00111	0.00222	0.00333
51	187/23/2	186/16/3/7/1/1	4 ACSR	31.05	0.900	1.800	5.7	0.0	0.0	5.7	0.00091	0.00182	0.00272
55	186/16/3/7/1/1	186/16/3/7/1	4 ACSR	17.25	0.900	1.800	5.7	0.0	0.0	5.7	0.00050	0.00101	0.00151
56	186/16/3/7/1/1	186/16/3/7/1/2	4 ACSR	20.70	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
57	186/16/3/7/1/2	186/16/3/7/1/3	4 ACSR	19.55	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
58	186/16/3/7/1/3	202-208	2 Wire Catenary	116.15	4.016	8.032	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
59	187/23	187/24	4 ACSR	27.60	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
60	187/24	187/25	4 ACSR	34.50	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
61	187/25	187/26	4 ACSR	28.75	0.900	1.800	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
62	187/26	183	4 Wire Catenary	17.25	2.527	5.054	0.0	0.0	0.0	0.0	0.00000	0.00000	0.00000
											0.02591	0.04712	0.07304

	LP No.	Service No.											
1	187/18/6	1	4 Wire Catenary	23.00	2.527	5.054	4.5	3.5	4	0.9	0.00282	0.00009	0.00291
2		2	4 Wire Catenary	23.00	2.527	5.054	2	1	1	1.0	0.00035	0.00012	0.00047
3		3	25 Sq. mm.	46.00	1.639	3.278	0.5	1	0.5	0.5	0.00011	0.00004	0.00015
5	187/18/6/1	4	2 Wire Catenary	11.50	4.016	8.032	0.5	0	0	0.5	0.00001	0.00002	0.00003
6		5	25 Sq. mm.	34.50	1.639	3.278	1	1.5	1	0.5	0.00024	0.00003	0.00027
8	187/18/7	6	2 Wire Catenary	17.25	4.016	8.032	0.5	0	0	0.5	0.00002	0.00003	0.00005
9		7	2 Wire Catenary	11.50	4.016	8.032	0	0	1	1.0	0.00005	0.00009	0.00014
10		8	25 Sq. mm.	40.25	1.639	3.278	2.5	3	2.5	0.5	0.00142	0.00003	0.00145
11		9	2 Wire Catenary	11.50	4.016	8.032	0	0	3	3.0	0.00042	0.00083	0.00125
13	180/17	10	4 Wire Catenary	10.35	2.527	5.054	1.5	1.5	2	0.5	0.00022	0.00001	0.00024
14		11	2 Wire Catenary	16.10	4.016	8.032	0	2	0	2.0	0.00026	0.00052	0.00078
16	180/17/0	12	25 Sq. mm.	28.75	1.639	3.278	8	8.5	7.5	0.9	0.00907	0.00007	0.00914
18	180/16	13	2 Wire Catenary	11.50	4.016	8.032	0	0	0.5	0.5	0.00001	0.00002	0.00003

19		14	25 Sq. mm.	18.40	1.639	3.278	6.5	4	6	2.3	0.00284	0.00032	0.00316
20		15	25 Sq. mm.	17.25	1.639	3.278	1	1.5	1.5	0.5	0.00016	0.00001	0.00017
21		16	2 Wire Catenary	46.00	4.016	8.032	0	8	0	8.0	0.01182	0.02365	0.03547
22		17	2 Wire Catenary	11.50	4.016	8.032	3	0	0	3.0	0.00042	0.00083	0.00125
24	180/15	18	25 Sq. mm.	40.25	1.639	3.278	3	3.5	3.5	0.5	0.00221	0.00003	0.00224
25		19	25 Sq. mm.	46.00	1.639	3.278	1.5	2	2	0.5	0.00077	0.00004	0.00081
26		20	4 Wire Catenary	23.00	2.527	5.054	5	3	4.5	1.8	0.00315	0.00038	0.00353
27		21	2 Wire Catenary	17.25	4.016	8.032	0	3	0	3.0	0.00062	0.00125	0.00187
28		22	25 Sq. mm.	17.25	1.639	3.278	3.5	3.5	3	0.5	0.00095	0.00001	0.00096
29		23	25 Sq. mm.	126.50	1.639	3.278	0.5	1	1.5	0.9	0.00073	0.00031	0.00104
30		24	25 Sq. mm.	132.25	1.639	3.278	2.5	2	3.5	1.3	0.00488	0.00076	0.00564
32	180/14/0	25	2 Wire Catenary	13.80	4.016	8.032	0	5	0	5.0	0.00139	0.00277	0.00416
33		26	2 Wire Catenary	9.20	4.016	8.032	4	0	0	4.0	0.00059	0.00118	0.00177
34		27	25 Sq. mm.	28.75	1.639	3.278	2	1.7	1.5	0.4	0.00043	0.00002	0.00045
35		28	2 Wire Catenary	13.80	4.016	8.032	0	0	6	6.0	0.00200	0.00399	0.00599
37	180/14	29	25 Sq. mm.	34.50	1.639	3.278	0.7	0.5	0.5	0.2	0.00006	0.00000	0.00006
38		30	16 Sq. mm.	23.00	2.527	5.054	6.5	5.7	7.2	1.3	0.00736	0.00020	0.00755
39		31	2 Wire Catenary	13.80	4.016	8.032	0	5	0	5.0	0.00139	0.00277	0.00416
40		32	2 Wire Catenary	9.20	4.016	8.032	0	0	5	5.0	0.00092	0.00185	0.00277
41		33	2 Wire Catenary	9.20	4.016	8.032	3	0	0	3.0	0.00033	0.00067	0.00100
42		34	2 Wire Catenary	6.90	4.016	8.032	1	0	0	1.0	0.00003	0.00006	0.00008
43		35	2 Wire Catenary	17.25	4.016	8.032	3	0	0	3.0	0.00062	0.00125	0.00187
44		36	2 Wire Catenary	34.50	4.016	8.032	0	0	3	3.0	0.00125	0.00249	0.00374
45		37	25 Sq. mm.	23.00	1.639	3.278	2.5	3.7	2.5	1.2	0.00099	0.00011	0.00110
47	180/13	38	4 Wire Catenary	23.00	2.527	5.054	2.5	1.7	1.9	0.7	0.00074	0.00006	0.00080
48		39	2 Wire Catenary	23.00	4.016	8.032	1	1	1	0.0	0.00028	0.00000	0.00028
49		40	2 Wire Catenary	13.80	4.016	8.032	0	1.5	0	1.5	0.00012	0.00025	0.00037
50		41	2 Wire Catenary	11.50	4.016	8.032	0	0	0.5	0.5	0.00001	0.00002	0.00003
51		42	2 Wire Catenary	9.20	4.016	8.032	0	0.5	0	0.5	0.00001	0.00002	0.00003
52		43	2 Wire Catenary	13.80	4.016	8.032	0.5	0	0	0.5	0.00001	0.00003	0.00004
54	180/12/1	44	2 Wire Catenary	19.55	4.016	8.032	0	1.2	0	1.2	0.00011	0.00023	0.00034
55		45	25 Sq. mm.	23.00	1.639	3.278	1.2	1.5	1.7	0.4	0.00025	0.00001	0.00026
56		46	2 Wire Catenary	17.25	4.016	8.032	0.5	0	0	0.5	0.00002	0.00003	0.00005
57		47	25 Sq. mm.	40.25	1.639	3.278	1	0.5	0.5	0.5	0.00010	0.00003	0.00013
58		48	2 Wire Catenary	23.00	4.016	8.032	0	0	1.5	1.5	0.00021	0.00042	0.00062
60	180/12	49	4 Wire Catenary	17.25	2.527	5.054	5.5	6	4.7	1.1	0.00385	0.00011	0.00396
61		50	2 Wire Catenary	17.25	4.016	8.032	0	0	1.5	1.5	0.00016	0.00031	0.00047
62		51	25 Sq. mm.	28.75	1.639	3.278	4.5	3.7	4.6	0.9	0.00260	0.00007	0.00267
63		52	2 Wire Catenary	11.50	4.016	8.032	0	0	1.5	0.0	0.00010	0.00000	0.00010
64		53	2 Wire Catenary	17.25	4.016	8.032	0.5	0	0	0.0	0.00002	0.00000	0.00002
66	180/11	54	2 Wire Catenary	13.80	4.016	8.032	0	0	1	1.0	0.00006	0.00011	0.00017

67		55	2 Wire Catenary	11.50	4.016	8.032	1.2	0	0	1.2	0.00007	0.00013	0.00020
68		56	2 Wire Catenary	17.25	4.016	8.032	0	1.5	0	1.5	0.00016	0.00031	0.00047
69		57	2 Wire Catenary	28.75	4.016	8.032	0	0	0.5	0.5	0.00003	0.00006	0.00009
70		58	25 Sq. mm.	23.00	1.639	3.278	2	2.5	2	0.5	0.00054	0.00002	0.00056
71		59	25 Sq. mm.	16.10	1.639	3.278	1.5	2	1.5	0.5	0.00022	0.00001	0.00024
73	180/10	60	2 Wire Catenary	18.40	4.016	8.032	0	1.5	0	1.5	0.00017	0.00033	0.00050
74		61	2 Wire Catenary	13.80	4.016	8.032	0.5	0	0	0.5	0.00001	0.00003	0.00004
75		62	25 Sq. mm.	23.00	1.639	3.278	1	1.5	1.5	0.5	0.00021	0.00002	0.00023
76		63	2 Wire Catenary	20.70	4.016	8.032	0	0	1	1.0	0.00008	0.00017	0.00025
77		64	2 Wire Catenary	11.50	4.016	8.032	0	0	9.9	9.9	0.00453	0.00905	0.01358
79	187/18/6	65	2 Wire Catenary	13.80	4.016	8.032	2	0	0	2.0	0.00022	0.00044	0.00067
80		66	70 Sq. mm.	23.00	0.605	1.210	0.5	0.7	0.6	0.2	0.00002	0.00000	0.00002
82	187/18/5	67	2 Wire Catenary	11.50	4.016	8.032	0	0.5	0	0.5	0.00001	0.00002	0.00003
83		68	2 Wire Catenary	20.70	4.016	8.032	0.5	0	0	0.5	0.00002	0.00004	0.00006
84		69	2 Wire Catenary	28.75	4.016	8.032	0	0	0.5	0.5	0.00003	0.00006	0.00009
85		70	4 Wire Catenary	28.75	2.527	5.054	1.5	1	1.7	0.6	0.00045	0.00006	0.00050
86		71	25 Sq. mm.	34.50	1.639	3.278	0.5	0.4	0.6	0.2	0.00004	0.00000	0.00005
87		72	25 Sq. mm.	36.80	1.639	3.278	1	1	1	0.0	0.00018	0.00000	0.00018
88		73	25 Sq. mm.	28.75	1.639	3.278	0.9	0.7	0.9	0.2	0.00010	0.00000	0.00010
89		74	25 Sq. mm.	69.00	1.639	3.278	1	1.2	1.1	0.2	0.00041	0.00001	0.00042
90		75	25 Sq. mm.	74.75	1.639	3.278	0.5	0.3	0.4	0.2	0.00006	0.00001	0.00007
91		76	25 Sq. mm.	80.50	1.639	3.278	1.5	1.7	1.6	0.2	0.00102	0.00001	0.00102
93	187/18/4	77	4 Wire Catenary	34.50	2.527	5.054	5	6	6	1.0	0.00846	0.00017	0.00863
94		78	25 Sq. mm.	28.75	1.639	3.278	3.5	3	2.5	0.9	0.00130	0.00007	0.00137
95		79	2 Wire Catenary	13.80	4.016	8.032	0	0	0.5	0.5	0.00001	0.00003	0.00004
97	187/18/4/1	80	2 Wire Catenary	9.20	4.016	8.032	0	0.5	0	0.5	0.00001	0.00002	0.00003
99	187/18/3	81	2 Wire Catenary	11.50	4.016	8.032	0	0	9.7	9.7	0.00435	0.00869	0.01304
101	187/18/2	82	2 Wire Catenary	11.50	4.016	8.032	0	0	8.3	8.3	0.00318	0.00636	0.00954
102		83	2 Wire Catenary	20.70	4.016	8.032	0	0	0.5	0.5	0.00002	0.00004	0.00006
103		84	25 Sq. mm.	46.00	1.639	3.278	1.5	1.4	0.5	1.0	0.00034	0.00014	0.00047
105	187/18/1	85	2 Wire Catenary	13.80	4.016	8.032	1.5	0	0	1.5	0.00012	0.00025	0.00037
106		86	2 Wire Catenary	17.25	4.016	8.032	0	1	0	1.0	0.00007	0.00014	0.00021
108	187/17	87	2 Wire Catenary	9.20	4.016	8.032	0	1.5	0	1.5	0.00008	0.00017	0.00025
109		88	2 Wire Catenary	5.75	4.016	8.032	1	0	0	1.0	0.00002	0.00005	0.00007
110		89	2 Wire Catenary	9.20	4.016	8.032	0	0	0.5	0.5	0.00001	0.00002	0.00003
111		90	2 Wire Catenary	6.90	4.016	8.032	0	1.5	0	1.5	0.00006	0.00012	0.00019
113	187/17/1	91	2 Wire Catenary	13.80	4.016	8.032	1.5	0	0	1.5	0.00012	0.00025	0.00037
114		92	2 Wire Catenary	9.20	4.016	8.032	0	1.5	0	1.5	0.00008	0.00017	0.00025
115		93	2 Wire Catenary	13.80	4.016	8.032	0	0	1.5	1.5	0.00012	0.00025	0.00037
117	187/17/2	94	2 Wire Catenary	6.90	4.016	8.032	0	1	0	1.0	0.00003	0.00006	0.00008
118		95	2 Wire Catenary	11.50	4.016	8.032	3	0	0	3.0	0.00042	0.00083	0.00125

119		96	2 Wire Catenary	11.50	4.016	8.032	0	0	1	1.0	0.00005	0.00009	0.00014
121	187/16	97	2 Wire Catenary	9.20	4.016	8.032	0	0	0.5	0.5	0.00001	0.00002	0.00003
122		98	25 Sq. mm.	28.75	1.639	3.278	4.5	4	4	0.5	0.00246	0.00002	0.00249
123		99	2 Wire Catenary	17.25	4.016	8.032	0	1.5	0	1.5	0.00016	0.00031	0.00047
125	187/18	100	2 Wire Catenary	17.25	4.016	8.032	4.2	0	0	4.2	0.00122	0.00244	0.00367
127	187/19	101	2 Wire Catenary	17.25	4.016	8.032	0	0	0.5	0.5	0.00002	0.00003	0.00005
128		102	25 Sq. mm.	34.50	1.639	3.278	1	1	1	0.0	0.00017	0.00000	0.00017
130	187/19/1	103	2 Wire Catenary	11.50	4.016	8.032	0	2.2	0	2.2	0.00022	0.00045	0.00067
131		104	2 Wire Catenary	14.95	4.016	8.032	1.2	0	0	1.2	0.00009	0.00017	0.00026
132		105	2 Wire Catenary	17.25	4.016	8.032	0	0	2.5	2.5	0.00043	0.00087	0.00130
134	187/18	106	2 Wire Catenary	11.50	4.016	8.032	1	0	0	1.0	0.00005	0.00009	0.00014
135	187/19/2	107	2 Wire Catenary	23.00	4.016	8.032	0	0	1.5	1.5	0.00021	0.00042	0.00062
136		108	2 Wire Catenary	8.05	4.016	8.032	0	0	1.5	1.5	0.00007	0.00015	0.00022
137		109	2 Wire Catenary	28.75	4.016	8.032	3.5	0	0	3.5	0.00141	0.00283	0.00424
138		110	2 Wire Catenary	10.35	4.016	8.032	0	3.5	0	3.5	0.00051	0.00102	0.00153
139	187/19/2/1	111	2 Wire Catenary	9.20	4.016	8.032	2.5	0	0	2.5	0.00023	0.00046	0.00069
140		112	2 Wire Catenary	9.20	4.016	8.032	0	4.5	0	4.5	0.00075	0.00150	0.00224
141		113	2 Wire Catenary	28.75	4.016	8.032	0	0	3.5	3.5	0.00141	0.00283	0.00424
142	187/19/2	114	2 Wire Catenary	6.90	4.016	8.032	2.5	0	0	2.5	0.00017	0.00035	0.00052
143		115	2 Wire Catenary	13.80	4.016	8.032	0	0	1.5	1.5	0.00012	0.00025	0.00037
144	187/19/3	116	2 Wire Catenary	6.90	4.016	8.032	0	0	0.5	0.5	0.00001	0.00001	0.00002
145		117	16 Sq. mm.	28.75	2.527	5.054	3	3.5	3.7	0.6	0.00254	0.00006	0.00259
146		118	25 Sq. mm.	115.00	1.639	3.278	1	1	1	0.0	0.00057	0.00000	0.00057
147		119	25 Sq. mm.	120.75	1.639	3.278	1	1	1	0.0	0.00059	0.00000	0.00059
148		120	25 Sq. mm.	132.25	1.639	3.278	1.5	2	1.8	0.4	0.00206	0.00008	0.00214
149		121	25 Sq. mm.	155.25	1.639	3.278	1.5	1	1	0.5	0.00108	0.00013	0.00121
150		122	25 Sq. mm.	143.75	1.639	3.278	2	1.5	1.8	0.4	0.00224	0.00009	0.00233
151		123	25 Sq. mm.	155.25	1.639	3.278	1.7	1.8	2	0.3	0.00258	0.00004	0.00261
152	187/19/4	124	2 Wire Catenary	13.80	4.016	8.032	0	1.5	0	1.5	0.00012	0.00025	0.00037
153		125	2 Wire Catenary	9.20	4.016	8.032	0	0	1.2	1.2	0.00005	0.00011	0.00016
154		126	2 Wire Catenary	14.95	4.016	8.032	2.5	0	0	2.5	0.00038	0.00075	0.00113
155	187/19/5	127	2 Wire Catenary	11.50	4.016	8.032	0	0	0.5	0.5	0.00001	0.00002	0.00003
156		128	2 Wire Catenary	11.50	4.016	8.032	1.5	0	0	1.5	0.00010	0.00021	0.00031
157		129	2 Wire Catenary	6.90	4.016	8.032	0	1.5	0	1.5	0.00006	0.00012	0.00019
158		130	25 Sq. mm.	28.75	1.639	3.278	5	6	7	1.7	0.00518	0.00028	0.00547
159	187/20	131	2 Wire Catenary	11.50	4.016	8.032	0	0	8	8.0	0.00296	0.00591	0.00887
160		132	2 Wire Catenary	9.20	4.016	8.032	0.5	0	0	0.5	0.00001	0.00002	0.00003
161	187/20/1	133	2 Wire Catenary	20.70	4.016	8.032	0	6	0	6.0	0.00299	0.00599	0.00898
162		134	2 Wire Catenary	10.35	4.016	8.032	0	0	5	5.0	0.00104	0.00208	0.00312
163	187/20/2	135	2 Wire Catenary	12.65	4.016	8.032	0	2.5	0	2.5	0.00032	0.00064	0.00095
164		136	2 Wire Catenary	9.20	4.016	8.032	0	0	1.5	1.5	0.00008	0.00017	0.00025

165		137	2 Wire Catenary	10.35	4.016	8.032	2	0	0	2.0	0.00017	0.00033	0.00050
166		138	2 Wire Catenary	6.90	4.016	8.032	0	0	2.5	2.5	0.00017	0.00035	0.00052
167	187/21	139	2 Wire Catenary	6.90	4.016	8.032	0	0	0.8	0.8	0.00002	0.00004	0.00005
168		140	16 Sq. mm.	13.80	2.527	5.054	6	5	8.5	3.1	0.00465	0.00068	0.00533
169		141	25 Sq. mm.	51.75	1.639	3.278	5	4.5	6	1.3	0.00689	0.00030	0.00719
170		142	25 Sq. mm.	40.25	1.639	3.278	1.5	1.7	1.5	0.2	0.00049	0.00001	0.00049
171		143	25 Sq. mm.	103.50	1.639	3.278	1	1.5	2.5	1.3	0.00161	0.00059	0.00221
172		144	25 Sq. mm.	46.00	1.639	3.278	3.5	3	4.5	1.3	0.00313	0.00026	0.00339
173		145	25 Sq. mm.	80.50	1.639	3.278	3.5	2.5	1	2.2	0.00257	0.00125	0.00383
174		146	25 Sq. mm.	115.00	1.639	3.278	1.5	1.4	1	0.5	0.00098	0.00008	0.00106
175		147	2 Wire Catenary	13.80	4.016	8.032	0	0	4	4.0	0.00089	0.00177	0.00266
176	187/22	148	2 Wire Catenary	11.50	4.016	8.032	0	0	4	4.0	0.00074	0.00148	0.00222
177		149	2 Wire Catenary	17.25	4.016	8.032	5	0	0	5.0	0.00173	0.00346	0.00520
178	187/22/1	150	2 Wire Catenary	9.20	4.016	8.032	0	2.5	0	2.5	0.00023	0.00046	0.00069
179		151	2 Wire Catenary	6.90	4.016	8.032	1.5	0	0	1.5	0.00006	0.00012	0.00019
180		152	25 Sq. mm.	48.30	1.639	3.278	1.4	1.5	1.4	0.1	0.00049	0.00000	0.00049
181		153	25 Sq. mm.	40.25	1.639	3.278	1.6	1.4	2.5	1.0	0.00071	0.00014	0.00085
182		154	25 Sq. mm.	43.70	1.639	3.278	1.3	1.5	1.4	0.2	0.00042	0.00000	0.00043
183		155	25 Sq. mm.	28.75	1.639	3.278	1.4	1.3	1.5	0.2	0.00028	0.00000	0.00028
184		156	2 Wire Catenary	8.05	4.016	8.032	0	0	5	5.0	0.00081	0.00162	0.00242
185	187/22/1/1	157	2 Wire Catenary	11.50	4.016	8.032	0.5	0	0	0.5	0.00001	0.00002	0.00003
186	187/22/2	158	2 Wire Catenary	13.80	4.016	8.032	0	1.4	0	1.4	0.00011	0.00022	0.00033
187		159	2 Wire Catenary	8.05	4.016	8.032	1.4	0	0	1.4	0.00006	0.00013	0.00019
188	187/23	160	2 Wire Catenary	10.35	4.016	8.032	0	3.2	0	3.2	0.00043	0.00085	0.00128
189		161	2 Wire Catenary	17.25	4.016	8.032	2	0	0	2.0	0.00028	0.00055	0.00083
190		162	2 Wire Catenary	9.20	4.016	8.032	0	0	2.5	2.5	0.00023	0.00046	0.00069
191		163	2 Wire Catenary	17.25	4.016	8.032	2.5	0	0	2.5	0.00043	0.00087	0.00130
192	187/24	164	2 Wire Catenary	14.95	4.016	8.032	0	1.4	0	1.4	0.00012	0.00024	0.00035
193		165	2 Wire Catenary	25.30	4.016	8.032	1.5	0	0	1.5	0.00023	0.00046	0.00069
194		166	2 Wire Catenary	11.50	4.016	8.032	0	0	2.5	2.5	0.00029	0.00058	0.00087
195		167	2 Wire Catenary	11.50	4.016	8.032	1	0	0	1.0	0.00005	0.00009	0.00014
196		168	2 Wire Catenary	9.20	4.016	8.032	0	2.2	0	2.2	0.00018	0.00036	0.00054
197		169	2 Wire Catenary	9.20	4.016	8.032	1.5	0	0	1.5	0.00008	0.00017	0.00025
198		170	25 Sq. mm.	40.25	1.639	3.278	1.3	1.4	1.5	0.2	0.00039	0.00000	0.00039
199		171	2 Wire Catenary	13.80	4.016	8.032	0	0	3	3.0	0.00050	0.00100	0.00150
200		172	25 Sq. mm.	46.00	1.639	3.278	2	1	3.5	2.2	0.00130	0.00072	0.00202
201		173	25 Sq. mm.	51.75	1.639	3.278	0.5	0.4	2	1.6	0.00037	0.00041	0.00078
202		174	25 Sq. mm.	57.50	1.639	3.278	1.3	1.6	1.5	0.3	0.00061	0.00001	0.00063
203		175	25 Sq. mm.	62.10	1.639	3.278	1.5	1.3	1.5	0.2	0.00063	0.00001	0.00064
204	187/25	176	2 Wire Catenary	9.20	4.016	8.032	0	2	0	2.0	0.00015	0.00030	0.00044
205		177	16 Sq. mm.	13.80	2.527	5.054	3.5	3.5	5.5	2.0	0.00191	0.00028	0.00219

206		178	2 Wire Catenary	17.25	4.016	8.032	1.5	0	0	1.5	0.00016	0.00031	0.00047
207	187/26	179	2 Wire Catenary	11.50	4.016	8.032	2	0	0	2.0	0.00018	0.00037	0.00055
208		180	2 Wire Catenary	19.55	4.016	8.032	0	3.5	0	3.5	0.00096	0.00192	0.00289
209		181	2 Wire Catenary	17.25	4.016	8.032	0	0	3.5	3.5	0.00085	0.00170	0.00255
210		182	2 Wire Catenary	19.55	4.016	8.032	0	0	5.7	5.7	0.00255	0.00510	0.00765
211		183	16 Sq. mm.	17.25	2.527	5.054	4	4.5	5.5	1.3	0.00290	0.00015	0.00305
212	187/23/1	184	2 Wire Catenary	8.05	4.016	8.032	0	5.5	0	5.5	0.00098	0.00196	0.00293
213		185	25 Sq. mm.	16.10	1.639	3.278	3.5	1.5	4.5	2.6	0.00092	0.00037	0.00129
214		186	2 Wire Catenary	17.25	4.016	8.032	2.5	0	0	2.5	0.00043	0.00087	0.00130
215		187	25 Sq. mm.	34.50	1.639	3.278	2.5	2.5	6.5	4.0	0.00310	0.00181	0.00491
216		188	25 Sq. mm.	51.75	1.639	3.278	2.5	3.5	7.5	4.6	0.00634	0.00356	0.00990
217		189	25 Sq. mm.	46.00	1.639	3.278	3.7	2.5	5.6	2.7	0.00387	0.00111	0.00497
218		190	25 Sq. mm.	42.55	1.639	3.278	2.4	2.6	5.5	3.0	0.00298	0.00126	0.00424
219	186/16/3/7/1/1	191	2 Wire Catenary	10.35	4.016	8.032	0	3.5	0	3.5	0.00051	0.00102	0.00153
220		192	25 Sq. mm.	28.75	1.639	3.278	4.4	3.5	7.7	3.8	0.00428	0.00138	0.00567
221		193	25 Sq. mm.	46.00	1.639	3.278	3.6	5.3	5.5	1.8	0.00538	0.00049	0.00587
222		194	25 Sq. mm.	103.50	1.639	3.278	3.5	2.4	5	2.3	0.00730	0.00173	0.00903
223	186/16/3/7/1	195	2 Wire Catenary	9.20	4.016	8.032	5.7	0	0	5.7	0.00120	0.00240	0.00360
224	186/16/3/7/1/1	196	2 Wire Catenary	14.95	4.016	8.032	6.2	0	0	6.2	0.00231	0.00462	0.00692
225		197	2 Wire Catenary	18.40	4.016	8.032	0	0	4.5	4.5	0.00150	0.00299	0.00449
226	186/16/3/7/1/2	198	2 Wire Catenary	16.10	4.016	8.032	0	3.4	0	3.4	0.00075	0.00149	0.00224
227		199	2 Wire Catenary	11.50	4.016	8.032	6.3	0	0	6.3	0.00183	0.00367	0.00550
228		200	2 Wire Catenary	9.20	4.016	8.032	0	0	6.5	6.5	0.00156	0.00312	0.00468
229		201	2 Wire Catenary	18.40	4.016	8.032	0	5.5	0	5.5	0.00224	0.00447	0.00671
230	186/16/3/7/1/3	202	2 Wire Catenary	20.70	4.016	8.032	0	0	5.5	5.5	0.00251	0.00503	0.00754
231		203	2 Wire Catenary	20.70	4.016	8.032	0	0	6	6.0	0.00299	0.00599	0.00898
232		204	2 Wire Catenary	17.25	4.016	8.032	0	3.2	0	3.2	0.00071	0.00142	0.00213
233		205	25 Sq. mm.	46.00	1.639	3.278	5	4.8	5.5	0.6	0.00590	0.00006	0.00596
234		206	2 Wire Catenary	19.55	4.016	8.032	0	0	4.5	4.5	0.00159	0.00318	0.00477
235		207	25 Sq. mm.	48.30	1.639	3.278	4.1	4.5	6	1.7	0.00578	0.00048	0.00626
236		208	25 Sq. mm.	80.50	1.639	3.278	4.3	4.5	5.8	1.4	0.00955	0.00052	0.01007
237	187/18/2	209	25 Sq. mm.	69.00	1.639	3.278	8.5	8	8.7	0.6	0.02397	0.00009	0.02406
											0.19808	0.13437	0.33245

TRANSFORMER DETAILS : CAPACITY-315 KVA,6/0.42 KV		
VOLTAGE	400.00	V
COMPUTED	181.0624 **	KW
PEAK LOAD		

TOTAL POWER LOSS	0.22400	0.18149	0.40549

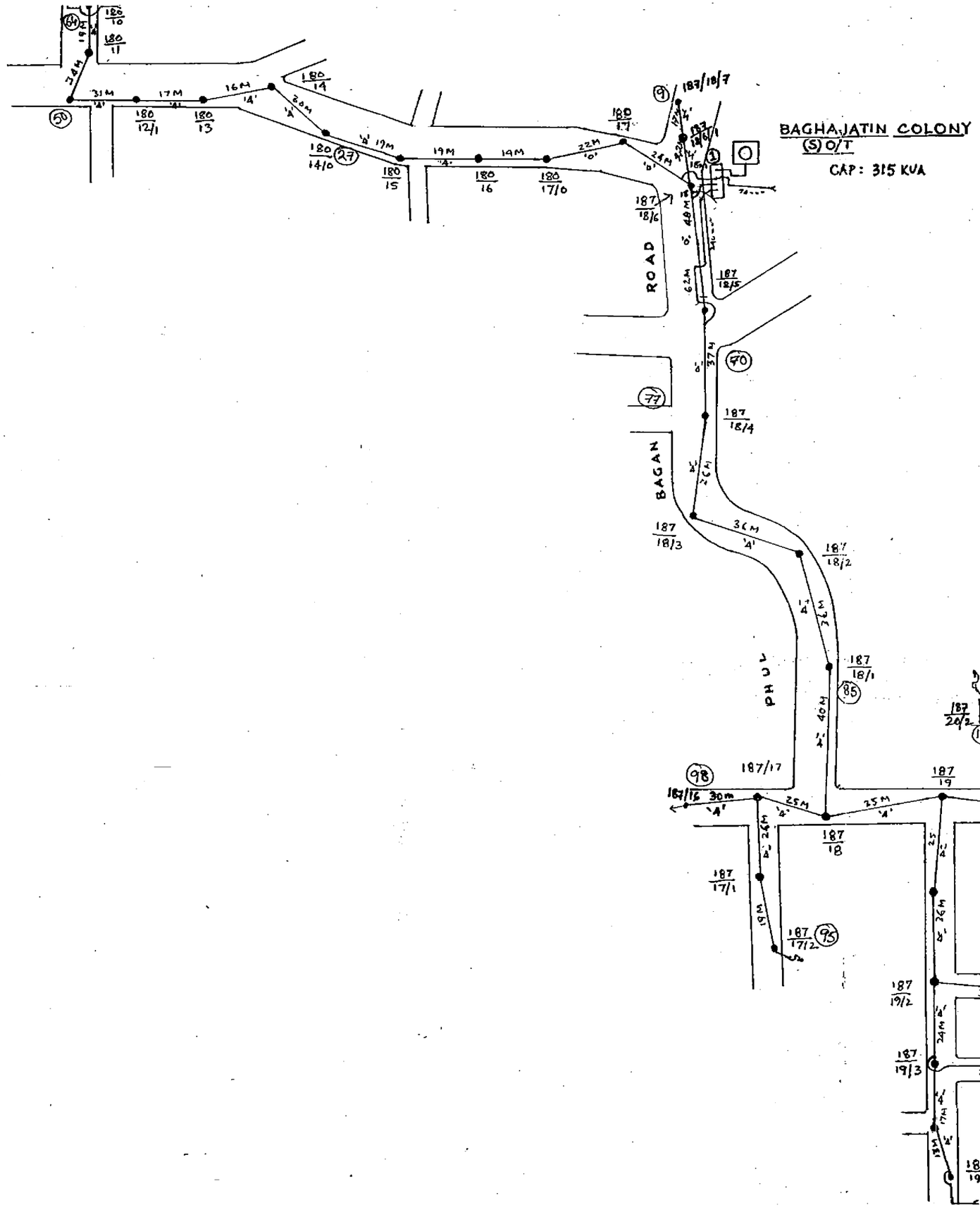
BAGHAJATIN COLONY
(S) O/T

SOUTHERN DISTRICT

LOAD READINGS ON 06.07.05 AT 7.20 P.M.

R	B	Y
~~295A~~	~~295A~~	~~390A~~

O : SERVICE SL. NO.



DEODAR STREET O/T

CALCULATION OF LT DISTRIBUTION LOSS

SL. NO.	FROM	TO	CABLE SIZE	LENGTH	RESISTANCE		CURRENT READING (A)				PHASE	NEUTRAL	POWER
				(M)	(Ohm/KM)		IR	IB	IY	IN	LOSS	LOSS	LOSS
					PHASE	NEUTRAL					(KW)	(KW)	(KW)
1	Deodar	Main	400 mm2 (Al.)	28.75	0.106	0.106	263.5	262.0	257.5	5.4	0.62286	0.00009	0.62295
	Street OT	Kiosk											
2	Main Kiosk	2	70 mm2 (Al.)	11.50	0.607	1.215	227.5	221.0	215.5	10.4	1.02723	0.00152	1.02875
3	2	3	70 mm2 (Al.)	11.50	0.607	1.215	224.0	217.0	212.0	10.5	0.99350	0.00153	0.99503
4	3	4	70 mm2 (Al.)	11.50	0.607	1.215	219.5	214.0	208.0	10.0	0.95879	0.00140	0.96018
5	4	5	70 mm2 (Al.)	11.50	0.607	1.215	210.5	205.5	200.5	8.7	0.88544	0.00106	0.88649
6	5	6	70 mm2 (Al.)	2.30	0.607	1.215	204.5	200.5	196.0	7.4	0.16828	0.00015	0.16843
7	6	7	70 mm2 (Al.)	16.10	0.607	1.215	200.0	197.5	192.5	6.6	1.13517	0.00086	1.13603
8	7	17	70 mm2 (Al.)	16.10	0.607	1.215	197.5	194.5	190.5	6.1	1.10646	0.00073	1.10719
9	17	16	70 mm2 (Al.)	16.10	0.607	1.215	194.0	190.0	186.0	7.0	1.05956	0.00095	1.06051
10	16	15	70 mm2 (Al.)	11.50	0.607	1.215	190.0	186.0	180.5	8.3	0.72151	0.00096	0.72247
11	15	8	70 mm2 (Al.)	16.10	0.607	1.215	186.5	184.0	178.0	7.6	0.98122	0.00113	0.98235
12	8	14	70 mm2 (Al.)	16.10	0.607	1.215	180.5	178.5	173.5	6.3	0.92471	0.00077	0.92548
13	14	13	70 mm2 (Al.)	8.05	0.607	1.215	176.0	175.0	172.5	3.1	0.44677	0.00010	0.44686
14	13	12	70 mm2 (Al.)	8.05	0.607	1.215	173.0	171.5	170.0	2.6	0.43153	0.00007	0.43160
15	12	17A	70 mm2 (Al.)	5.75	0.607	1.215	171.0	168.5	169.0	2.3	0.30108	0.00004	0.30112
16	17A	52	70 mm2 (Al.)	5.75	0.607	1.215	166.7	165.0	165.0	1.7	0.28727	0.00002	0.28729
17	52	9	70 mm2 (Al.)	2.30	0.607	1.215	161.7	159.5	162.0	2.4	0.10875	0.00002	0.10876
18	9	11	70 mm2 (Al.)	2.30	0.607	1.215	158.7	155.0	158.0	3.4	0.10364	0.00003	0.10367
19	11	J-1	70 mm2 (Al.)	2.30	0.607	1.215	152.7	150.0	153.0	2.9	0.09673	0.00002	0.09675
20	J-1	10	150 mm2 (Al.)	16.10	0.281	0.562	152.7	150.0	153.0	2.9	0.31319	0.00007	0.31326
21	10	18	150 mm2 (Al.)	16.10	0.281	0.562	150.2	150.0	153.0	2.9	0.30976	0.00008	0.30984
22	18	21	150 mm2 (Al.)	1.15	0.281	0.562	136.2	134.5	137.0	2.2	0.01791	0.00000	0.01791
23	21	19	150 mm2 (Al.)	1.15	0.281	0.562	134.2	132.0	135.0	2.7	0.01734	0.00000	0.01734
24	19	22	150 mm2 (Al.)	12.65	0.281	0.562	127.7	128.0	129.0	1.2	0.17536	0.00001	0.17537
25	22	23	150 mm2 (Al.)	14.38	0.281	0.562	122.7	125.0	123.0	2.2	0.18504	0.00004	0.18508
26	23	20	150 mm2 (Al.)	14.38	0.281	0.562	121.7	123.5	122.0	1.7	0.18156	0.00002	0.18158
27	20	J-2	150 mm2 (Al.)	40.25	0.281	0.562	111.7	112.5	113.5	1.5	0.42996	0.00005	0.43002
28	J-2	41	150 mm2 (Al.)	43.70	0.281	0.562	111.7	112.5	113.5	1.5	0.46682	0.00006	0.46688
29	41	24-25	150 mm2 (Al.)	13.80	0.281	0.562	102.7	105.5	103.5	2.5	0.12560	0.00005	0.12565
30	24-25	J-3	150 mm2 (Al.)	2.30	0.281	0.562	97.7	99.0	98.0	1.2	0.01871	0.00000	0.01871
31	J-3	45	25 mm2 (Al.)	23.00	1.639	3.278	9.5	11.5	11.3	1.9	0.01320	0.00027	0.01347
32	45	42	25 mm2 (Al.)	5.75	1.639	3.278	7.0	7.8	8.8	1.6	0.00176	0.00005	0.00181

33	42	46	25 mm2 (Al.)	2.88	1.639	3.278	4.5	4.3	4.3	0.2	0.00027	0.00000	0.00027
34	46	43	25 mm2 (Al.)	2.88	1.639	3.278	1.0	1.0	1.5	0.5	0.00002	0.00000	0.00002
35	J-3	J-4	150 mm2 (Al.)	11.50	0.281	0.562	88.2	87.5	86.7	1.3	0.07417	0.00001	0.07418
36	J-4	32	70 mm2 (Al.)	11.50	0.607	1.215	16.0	14.0	16.5	2.3	0.00506	0.00007	0.00513
37	32	26	70 mm2 (Al.)	2.30	0.607	1.215	10.0	10.0	12.0	2.0	0.00048	0.00001	0.00049
38	26	31	70 mm2 (Al.)	11.50	0.607	1.215	9.0	9.0	10.5	1.5	0.00190	0.00003	0.00193
39	31	27	70 mm2 (Al.)	2.30	0.607	1.215	8.0	7.5	9.0	1.3	0.00028	0.00000	0.00029
40	27	28	70 mm2 (Al.)	11.50	0.607	1.215	6.5	6.5	8.0	1.5	0.00104	0.00003	0.00107
41	28	29	70 mm2 (Al.)	11.50	0.607	1.215	3.0	3.0	5.0	2.0	0.00030	0.00006	0.00036
42	29	30	70 mm2 (Al.)	2.30	0.607	1.215	2.5	2.0	3.5	1.3	0.00003	0.00000	0.00004
43	J-4	44	150 mm2 (Al.)	2.30	0.281	0.562	72.2	73.5	70.2	2.9	0.01005	0.00001	0.01006
44	44	47	150 mm2 (Al.)	4.60	0.281	0.562	54.2	49.5	48.2	5.5	0.00997	0.00008	0.01004
45	47	48	150 mm2 (Al.)	23.00	0.281	0.562	51.7	47.9	46.7	4.5	0.04620	0.00027	0.04646
46	48	J-5	150 mm2 (Al.)	2.30	0.281	0.562	50.7	47.4	45.7	4.4	0.00446	0.00003	0.00449
47	J-5	38	70 mm2 (Al.)	2.30	0.607	1.215	12.7	11.4	16.2	4.3	0.00077	0.00005	0.00083
48	38	37	70 mm2 (Al.)	11.50	0.607	1.215	10.2	9.2	9.0	1.1	0.00188	0.00002	0.00190
49	37	33	70 mm2 (Al.)	11.50	0.607	1.215	9.5	8.7	8.5	0.9	0.00166	0.00001	0.00168
50	33	36	70 mm2 (Al.)	2.30	0.607	1.215	6.0	6.2	5.5	0.6	0.00015	0.00000	0.00015
51	36	34	70 mm2 (Al.)	11.50	0.607	1.215	5.0	5.2	4.0	1.1	0.00048	0.00002	0.00049
55	34	35	70 mm2 (Al.)	2.30	0.607	1.215	4.0	3.5	2.5	1.3	0.00005	0.00000	0.00005
56	J-5	49	150 mm2 (Al.)	19.55	0.281	0.562	38.0	36.0	29.5	7.7	0.01983	0.00065	0.02048
57	49	39	150 mm2 (Al.)	9.20	0.281	0.562	33.0	29.5	25.0	7.0	0.00668	0.00025	0.00693
58	39	50	150 mm2 (Al.)	11.50	0.281	0.562	26.0	23.0	21.0	4.4	0.00532	0.00012	0.00544
59	50	40	150 mm2 (Al.)	13.80	0.281	0.562	22.5	19.0	18.0	4.1	0.00462	0.00013	0.00475
60	40	51	150 mm2 (Al.)	2.30	0.281	0.562	1.5	1.0	1.0	0.5	0.00000	0.00000	0.00000
											14.18950	0.01401	14.82637

	LP No.	Service No.											
1	1A	19A, Deod	140 Sq mm	115.00		0.000	12	15	18	5.2	0.00000	0.00000	0.00000
3	1B	19A Deod	140 Sq mm	11.50		0.000	17	15	16	1.7	0.00000	0.00000	0.00000
6	1C	19A Deod	140 Sq mm	9.20		0.000	7	11	8	3.6	0.00000	0.00000	0.00000
10	2	19B Deod	25 Sq. mm.	34.50	1.639	3.278	3.5	4	3.5	0.5	0.00229	0.00003	0.00232
11	3	19C Deod	25 Sq. mm.	9.20	1.639	3.278	4.5	3	4	1.3	0.00068	0.00005	0.00074
13	4	15/3/1 Dec	25 Sq. mm.	34.50	1.639	3.278	9	8.5	7.5	1.3	0.01185	0.00020	0.01204
14	5	15/3 Deod	0225 STA	9.20	3.706	7.412	6	5	4.5	1.3	0.00277	0.00012	0.00289
16	6	15/2/2Deo	0225 STA	8.05	3.706	7.412	4.5	3	3.5	1.3	0.00124	0.00010	0.00134
18	7	15/2/1 Dec	0225 STA	9.20	3.706	7.412	2.5	3	2	0.9	0.00066	0.00005	0.00071
19	8	15/2 Deod	0225 STA	8.05	3.706	7.412	6	5.5	4.5	1.3	0.00258	0.00010	0.00269
20	9	15BDeoda	0225 STA	6.90	3.706	7.412	3	4.5	4	1.3	0.00116	0.00009	0.00125
21	11	15/9 Deod	25 Sq. mm.	11.50	1.639	3.278	6	5	5	1.0	0.00162	0.00004	0.00166

22	12	15/8 Deod	0225 STA	6.90	3.706	7.412	2	3	1	1.7	0.00036	0.00015	0.00051
24	13	15/7 Deod	0225 STA	6.90	3.706	7.412	3	3.5	2.5	0.9	0.00070	0.00004	0.00074
25	14	15/6 Deod	06 STA	17.25		0.000	4.5	3.5	1	3.1	0.00000	0.00000	0.00000
26	15	15/5B Dec	0225 STA	11.50	3.706	7.412	3.5	2	2.5	1.3	0.00096	0.00015	0.00111
27	16	15/5A Dec	0225 STA	9.20	3.706	7.412	4	4	5.5	1.5	0.00212	0.00015	0.00228
28	17	15/4 Deod	0225 STA	6.90	3.706	7.412	3.5	4.5	4.5	1.0	0.00135	0.00005	0.00140
29	17A	15/1/A Deodar Street		0.00		0.000	4.3	3.5	4	0.7	0.00000	0.00000	0.00000
32	10	15A Deodar Street		0.00		0.000	2.5	3	2.5	0.5	0.00000	0.00000	0.00000
33	18	26&26A D	0225 STA	9.20	3.706	7.412	14	15.5	16	1.8	0.02360	0.00022	0.02382
34	19	44/7 Hazra	0225 STA	11.50	3.706	7.412	6.5	4	6	2.3	0.00402	0.00045	0.00446
35	20	44/9B Haz	0225 STA	18.40	3.706	7.412	10	11	8.5	2.2	0.02000	0.00065	0.02064
37	21	15/1 Deod	0225 STA	9.20	3.706	7.412	2	2.5	2	0.5	0.00049	0.00002	0.00050
38	22	13C Deod	0225 STA	13.80	3.706	7.412	5	3	6	2.6	0.00358	0.00072	0.00430
39	23	13D Deod	0225 STA	9.20	3.706	7.412	1	1.5	1	0.5	0.00014	0.00002	0.00016
40	24	13B Deod	0225 STA	8.05	3.706	7.412	1.5	1.5	1	0.5	0.00016	0.00001	0.00018
41	25	13A Deod	0225 STA	17.25	3.706	7.412	3.5	5	4.5	1.3	0.00368	0.00022	0.00390
42	26	11G Deod	0225 STA	11.50	3.706	7.412	1	1	1.5	0.5	0.00018	0.00002	0.00020
43	27	11F Deoda	0225 STA	9.20	3.706	7.412	1.5	1	1	0.5	0.00014	0.00002	0.00016
44	28	11D Deod	25 Sq. mm.	17.25	1.639	3.278	3.5	3.5	3	0.5	0.00095	0.00001	0.00096
45	29	11C Deod	0225 STA	11.50	3.706	7.412	0.5	1	1.5	0.9	0.00015	0.00006	0.00021
47	30	11B Deod	25 Sq. mm.	6.90	1.639	3.278	2.5	2	3.5	1.3	0.00025	0.00004	0.00029
48	31	11A Deod	0225 STA	11.50	3.706	7.412	1	1.5	1.5	0.5	0.00023	0.00002	0.00026
49	32	9/2B Deod	0225 STA	11.50	3.706	7.412	6	4	4.5	1.8	0.00308	0.00028	0.00336
50	33	9/2A Deod	0225 STA	13.80	3.706	7.412	3.5	2.5	3	0.9	0.00141	0.00008	0.00148
51	34	9/1B Deod	0225 STA	9.20	3.706	7.412	1	1.7	1.5	0.6	0.00021	0.00003	0.00024
52	35	9/1A Deod	0225 STA	11.50	3.706	7.412	4	3.5	2.5	1.3	0.00147	0.00015	0.00162
54	36	9D Deodar	25 Sq. mm.	9.20	1.639	3.278	1	1	1.5	0.5	0.00006	0.00001	0.00007
55	37	9C Deodar	0225 STA	6.90	3.706	7.412	0.7	0.5	0.5	0.2	0.00003	0.00000	0.00003
56	38	9B Deodar	0225 STA	5.75	3.706	7.412	2.5	2.2	7.2	4.9	0.00134	0.00101	0.00235
57	39	9A Deodar	0225 STA	6.90	3.706	7.412	7	6.5	4	2.8	0.00274	0.00040	0.00314
58	40	7B Deodar	70 Sq. mm.	46.00	0.605	1.210	21	18	17	3.6	0.02933	0.00072	0.03006
60	41	45 Hazra F	25 Sq. mm.	13.80	1.639	3.278	9	7	10	2.6	0.00520	0.00032	0.00552
61	42	45/2B Haz	0225 STA	9.20	3.706	7.412	2.5	3.5	4.5	1.7	0.00132	0.00020	0.00153
62	43	45/2C Haz	0225 STA	5.75	3.706	7.412	1	1	1.5	0.5	0.00009	0.00001	0.00010
63	44	24 Deodar	25 Sq. mm.	23.00	1.639	3.278	18	24	22	0.0	0.05217	0.00000	0.05217
64	45	22A Deod	0225 STA	6.90	3.706	7.412	2.5	3.7	2.5	0.0	0.00067	0.00000	0.00067
66	46	22B Deod	0225 STA	6.90	3.706	7.412	3.5	3.3	2.8	0.6	0.00079	0.00002	0.00081
67	47	18/2 Deod	0225 STA	6.90	3.706	7.412	2.5	1.6	1.5	1.0	0.00028	0.00005	0.00033
68	48	18/1 Deod	0225 STA	9.20	3.706	7.412	1	0.5	1	0.5	0.00008	0.00002	0.00009
69	49	18 Deodar	0225 STA	17.25	3.706	7.412	5	6.5	4.5	1.8	0.00559	0.00042	0.00601
70	50	16/1 Deod	0225 STA	9.20	3.706	7.412	3.5	4	3	0.9	0.00127	0.00005	0.00132

71	51	16 Deodar	0225 STA	11.50	3.706	7.412	1.5	I	1	0.5	0.00018	0.00002	0.00020
73	52	CMCStree	25 Sq. mm.	5.75	1.639	3.278	5	5.5	3	2.3	0.00061	0.00010	0.00070
74	53	CMCStree	25 Sq. mm.	5.75	1.639	3.278	4.5	5	3	1.8	0.00051	0.00006	0.00057
											0.19635	0.00774	0.20410

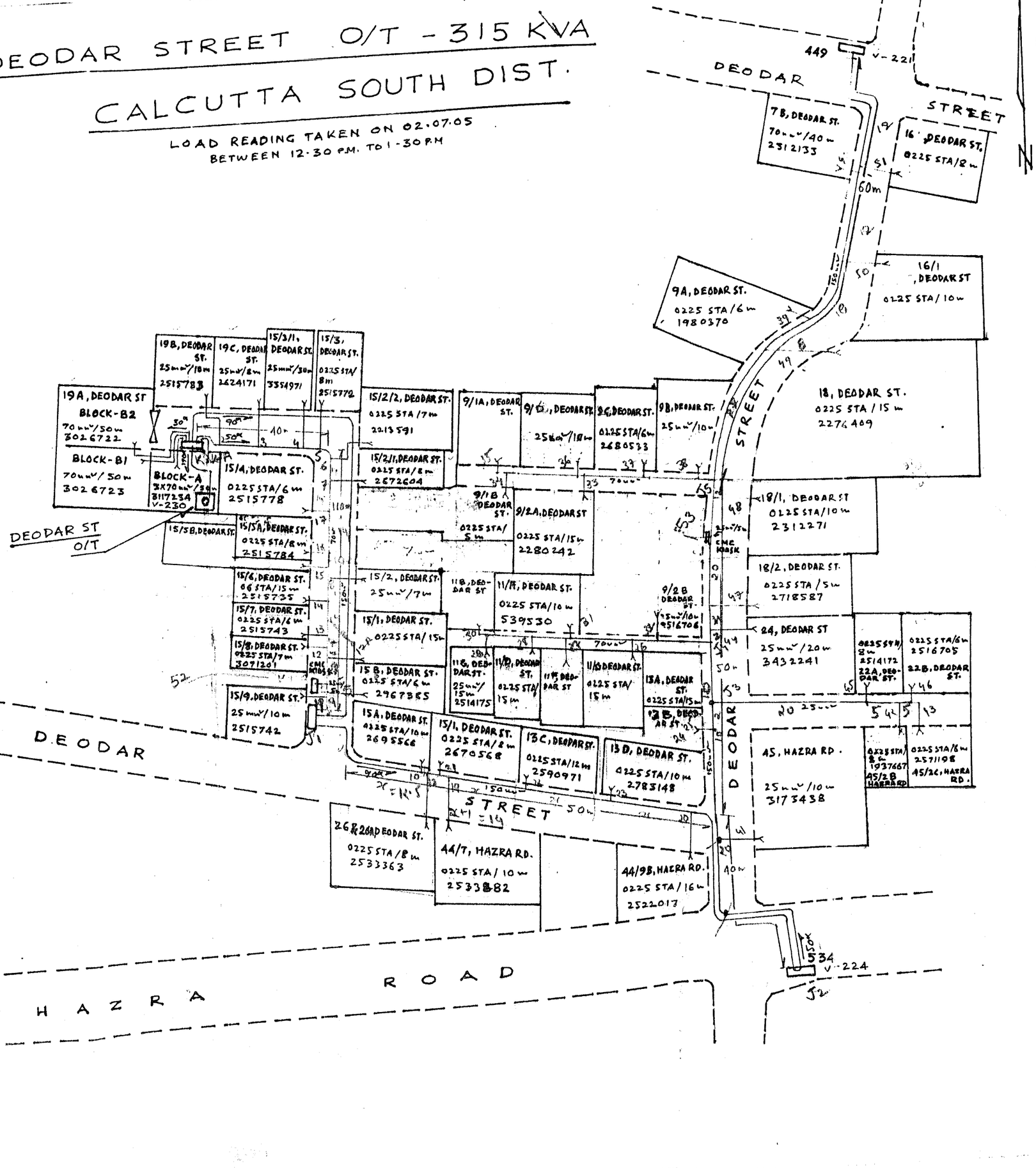
TOTAL POWER LOSS	**14.38585**	**0.02175**	**14.40761**

TRANSFORMER DETAILS : CAPACITY-315 KVA,6/0.42 KV			
VOLTAGE	**400.00**	**V**	
Computed	**144.6651 ****	**KW**	
Peak Load			
LT NETWORK LOSS			
Peak Loss	**14.40761**	**KW**	

DEODAR STREET O/T - 315 KVA

CALCUTTA SOUTH DIST.

LOAD READING TAKEN ON 02.07.05
BETWEEN 12.30 P.M. TO 1.30 P.M



Canning Street O/T
CALCULATION OF LT DISTRIBUTION LOSS

S.No.	FROM	TO	CABLE SIZE	LENGTH	RESISTANCE		CURRENT READING (A)				PHASE	NEUTRAL	POWER
				(M)	(Ohm/KM)		IR	IB	IY	IN	LOSS	LOSS	LOSS
					PHASE	NEUTRAL					(KW)	(KW)	(KW)
1	CANNING	CANNING	400 mm2 (Al.)	13.8	0.11	0.11	332.0	307.0	294.0	33.5	0.4255	0.0016	0.427
	ST(W)P/T	ST(W)P/T F-1											
2	F-1	F-1A	240 mm2 (Al.)	23	0.17	0.34	25.0	20.0	30.0	8.7	0.0076	0.0006	0.00816
3	F-1 A	135 CAN (2)	150 mm2 (Al.)	28.75	0.28	0.56	25.0	20.0	30.0	8.7	0.0156	0.0012	0.01676
4	F-1	135 CAN (1)	70 mm2 (Al.)	28.75	0.61	1.21	12.0	15.0	15.0	3.0	0.0103	0.0003	0.01064
5	F-1	135A CAN (3)	25 mm2 (Al.)	40.25	1.64	3.28	5.0	12.0	10.0	6.2	0.0177	0.0051	0.02289
6	F-1	AC 100	240 mm2 (Al.)	34.5	0.17	0.34	290.0	260.0	239.0	44.4	1.2319	0.0233	1.25524
7	AC 100	138 CAN (1)	70 mm2 (Al.)	17.25	0.61	1.21	50.0	70.0	60.0	17.3	0.1153	0.0063	0.12155
8	AC 100	138 CAN (2)	70 mm2 (Al.)	18.4	0.61	1.21	90.0	75.0	59.0	26.9	0.1923	0.0161	0.20846
9	AC 100	138 CAN (3)	150 mm2 (Al.)	19.55	0.28	0.56	80.0	60.0	65.0	18.0	0.0779	0.0036	0.08143
10	AC 100	10 CAN	120 STA	34.5	0.35	0.70	70.0	55.0	55.0	15.0	0.1330	0.0055	0.13845
										Total Losses	2.2271	0.06364	2.29077

TRANSFORMER DETAILS : CAPACITY-315 KVA,6/0.42 KV			
VOLTAGE	400.00		V
Computed	172.3788	**	KW
Peak Load			
LT Network Loss			
PEAK LOSS	2.290766599		KW
LF	0.69		
LLF	0.54027	*	
ENERGY LOS	29.7031793		KW
UNITS HAND	2854.592148		KW
% LOSS	1.040540216		
NOTE:			
*LLF=0.3xL.F. + 0.7x(L.F.)^2			
** The power factor has been assumed as 0.8.			

L.T. DISTRIBUTION NETWORK OF CANNING STREET(W) P/T.