

Confidential Release

Case Number: 95-600-EL-BTX

**Date of Confidential Document:
September 4, 1996**

**Today's Date:
August 24, 2009**

**ICN #0046 Confidential supplemental responses to
Citizens for a Better Way's second set of
interrogatories and re- quest for production of
documents filed on behalf of applicant by M.
Kempic. (76 pgs.) (FILED UNDER SEAL)**

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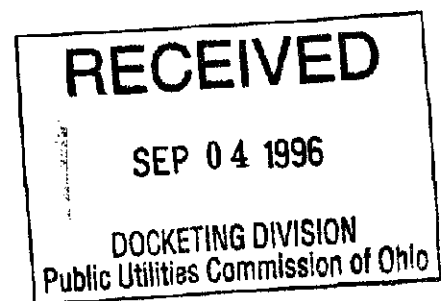
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**BEFORE
THE OHIO POWER SITING BOARD**

In the Matter of the Application)
of The Cleveland Electric)
Illuminating Company for) 0046
Certification of the Rachel 138kV) Case No. 95-600-EL-BTX
Electric Transmission Line Project)

**The Cleveland Electric Illuminating Company's
Supplemental
Responses to Citizens for a Better Way's Second Set of
Interrogatories and Request
for Production of Documents**

CONFIDENTIAL - TO BE FILED UNDER SEAL



**The Cleveland Electric Illuminating Company's
Supplemental Responses to
Citizens for a Better Way's Second Set of Interrogatories and
Request for Production of Documents
Case No. 95-600-EL-BTX**

Response Date: September 3, 1996

**Request Date: July 23, 1996
Responding Person: Mike Kovach**

18. Please provide CEI system average and marginal energy costs.

Response:

The average and marginal energy costs for the Centerior system shown below are being provided to Staff and to Citizens under the terms and conditions of the protective agreement, and will be filed with the Siting Board under seal.

Centerior's system average energy cost is:	\$12.00 - 13.00/mWh
Centerior's system marginal energy cost is:	\$17.00/mWh

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**The Cleveland Electric Illuminating Company's
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Citizens for a Better Way's Second Set of Interrogatories and
Request for Production of Documents
Case No. 95-600-EL-BTX**

Response Date: September 3, 1996

**Request Date: July 23, 1996
Responding Person: Mike Kovach**

19. Please provide CEI system average and marginal capacity costs.

Response:

The average and marginal capacity costs for the Centerior system shown below are being provided to Staff and to Citizens under the terms and conditions of the protective agreement, and will be filed with the Siting Board under seal.

Centerior's system average capacity cost is:	\$0.00/mWh
Centerior's system marginal capacity cost is:	\$0.00/mWh

Centerior has no plans to add new capacity until after 2004, therefore average and marginal capacity costs are both \$0.00 / mWh.

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**The Cleveland Electric Illuminating Company's
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Citizens for a Better Way's Second Set of Interrogatories and
Request for Production of Documents
Case No. 95-600-EL-BTX**

Response Date: September 3, 1996

**Request Date: July 23, 1996
Responding Person: Mike Kovach**

20. Please provide CEI System average transmission avoided cost.

Response:

The average transmission avoided costs for the Centerior system shown below are being provided to Staff and to Citizens under the terms and conditions of the protective agreement, and will be filed with the Siting Board under seal.

Centerior's average transmission avoided cost is: \$0.30/mWh

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**The Cleveland Electric Illuminating Company's
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Citizens for a Better Way's Second Set of Interrogatories and
Request for Production of Documents
Case No. 95-600-EL-BTX**

Response Date: September 3, 1996

**Request Date: July 23, 1996
Responding Person: Mike Kovach**

21. Please provide CEI System average distribution avoided cost.

Response:

The average distribution avoided costs for the Centerior system shown below are being provided to Staff and to Citizens under the terms and conditions of the protective agreement, and will be filed with the Siting Board under seal.

Centerior's system average distribution avoided cost is: \$1.00/mWh

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**The Cleveland Electric Illuminating Company's
Supplemental Responses to
Citizens for a Better Way's Second Set of Interrogatories and
Request for Production of Documents
Case No. 95-600-EL-BTX**

Response Date: September 3, 1996

**Request Date: July 23, 1996
Responding Person: Pat Shamray-Bertaud**

24. Please provide the distribution system expansion plans for the Centerior system including the Rachel area--planned additions, retirements and timing.

Response:

The distribution system in the Rachel project area (as well as throughout CEI's system) grow in response to requests from homeowners and developers for new service in the area. Therefore, plans are not available at the individual pole line level, as those plans are developed when requested by the homeowner or developer. Nevertheless, based upon historic and forecasted load growth, the following is CEI's distribution expansion plan for the general project area:

<u>Project Name</u>	<u>In Service Date</u>	<u>Cost</u>
36 kV System Rebuild	1997 - 2004	\$24,000,000
Spruce - Ruth Tie (New 13 kV Circuit)	1998	\$300,000
New Sharon Substation (36 kV - 13 kV)	1999	\$2,500,000
New Osage/Opal Sub. (36 kV - 13 kV)	1999	\$2,500,000
Auburn Containment (4 kV - 13 kV Conversion)	1999	\$400,000
Convert Circuit (4 kV - 13 kV Conversion) (Circuit 2-BT to 2-QZ)	2000	\$500,000
Burton Relief (4 kV - 13 kV Conversion) (Circuit RU-PG-NL)	2001	\$300,000
New Violet Substation (36 kV - 13 kV)	2005	\$2,500,000

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**The Cleveland Electric Illuminating Company's
Supplemental Responses to
Citizens for a Better Way's Second Set of Interrogatories and
Request for Production of Documents
Case No. 95-600-EL-BTX**

Response Date: September 3, 1996

**Request Date: July 23, 1996
Responding Person: Pat Shamray-Bertaud**

26. Please provide copies of all load flow analysis performed for Geauga County in support of the Rachel transmission line. Include all input and output data and all summary reports. Identify any and all scenarios or contingencies that result in unacceptable system, line, or component operations.

Response:

Attached are the load flow studies for various scenarios examined for the Rachel project, along with input assumptions and descriptions of the contingencies and results.

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VERIFICATION

State of Ohio)
)
County of Cuyahoga) ss:

I, Patricia Shamray-Bertaud, being first duly sworn, state that: I am the Supervisor of Electric System Planning at The Cleveland Electric Illuminating Company, Inc., and I was responsible for the planning involved with respect to the Rachel 138 kV Transmission Line Project.; I am authorized by The Cleveland Electric Illuminating Company, Inc. to respond to the foregoing Interrogatories on its behalf; and the foregoing answers are true and accurate to the best of my knowledge, information and belief.

Patricia Shamray-Bertaud

Sworn to and subscribed before me, this 3rd day of September, 1996.

Mark Kempic

Notary Public



MARK R. KEMPIC, Attorney At Law
NOTARY PUBLIC, STATE OF OHIO
My commission has no expiration date
Section 147.03 R.C.

VERIFICATION

State of Ohio)
)
County of Cuyahoga) ss:

I, Michael A. Kovach, being first duly sworn, state that: I am the Manger of Resource Planning at The Cleveland Electric Illuminating Company, Inc., and I was responsible for the planning involved with respect to the Rachel 138 kV Transmission Line Projet.; I am authorized by The Cleveland Electric Illuminating Company, Inc. to respond to the foregoing Interrogatories on its behalf; and the foregoing answers are true and accurate to the best of my knowledge, information and belief.

Michael A Kovach

Sworn to and subscribed before me, this 3rd day of September, 1996.

Mark Kempic

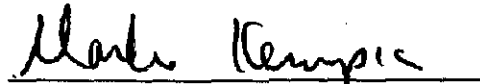
Notary Public



MARK R. KEMPIC, Attorney At Law
NOTARY PUBLIC, STATE OF OHIO
My commission has no expiration date.
Section 147.03 R.C.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was served upon the following persons by either hand delivery or ordinary U.S. Mail, postage prepaid, on or before this 3rd day of September, 1996.


Mark R. Kempic

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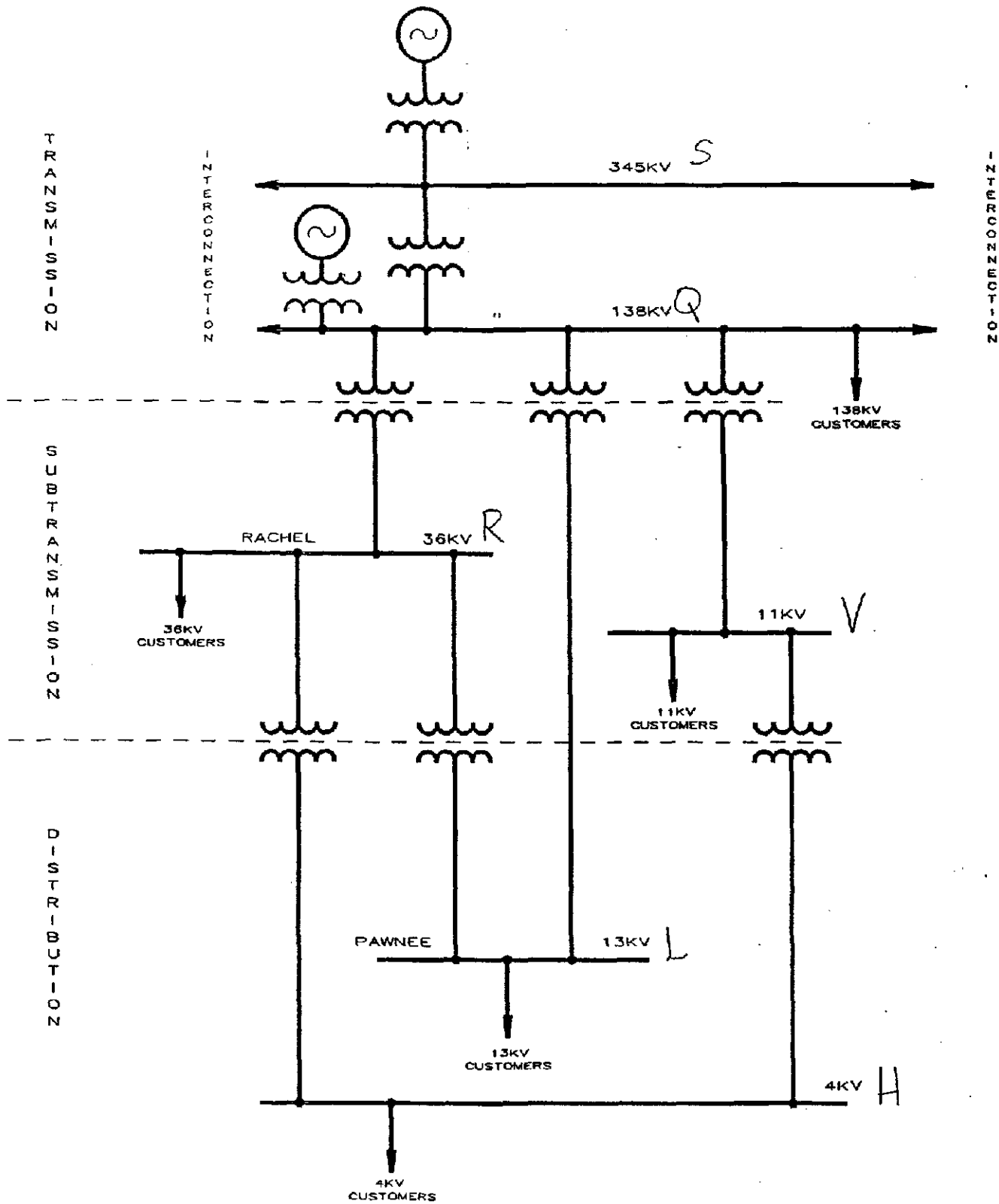
Janine Migden
Maureen Grady
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10 West Broad Street, Suite 1800
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Attorneys for
Citizens for a Better Way and
Sustainable Energy for Economic Development

**RACHEL 138KV
TRANSMISSION LINE PROJECT CASE # 95-600-EL-BTX
THE CLEVELAND ELECTRIC ILLUMINATING COMPANY**

1. 94pkopsb.sav	1994 Base Case -- without Rachel	No Contingencies
2. 94pkopsb1.sav	1994 Base Case -- without Rachel	Single Transformer Contingency
3. 94pkopsb2.sav	1994 Base Case -- without Rachel	Single Circuit Outage
4. 98opsb.sav.Z	1998 Base Case -- without Rachel	No Contingencies
5. 98opsb1.sav	1998 Base Case -- without Rachel	Single Transformer Contingency
6. 98rach.sav	1998 Base Case -- with Rachel	No Contingencies
7. 98rach1.sav	1998 Base Case -- with Rachel	Single Transformer Contingency
8. 2000opsb.sav	2000 Base Case -- with Rachel	No Contingencies
9. 36kValt982.sav	1998 Base Case -- 36kV Distribution Alternative	No Contingencies
10. 36kValt983.sav	2000Base Case -- 36kV Distribution Alternative	No Contingencies

CENTERIOR ENERGY - CLEVELAND ELECTRIC ILLUMINATING COMPANY



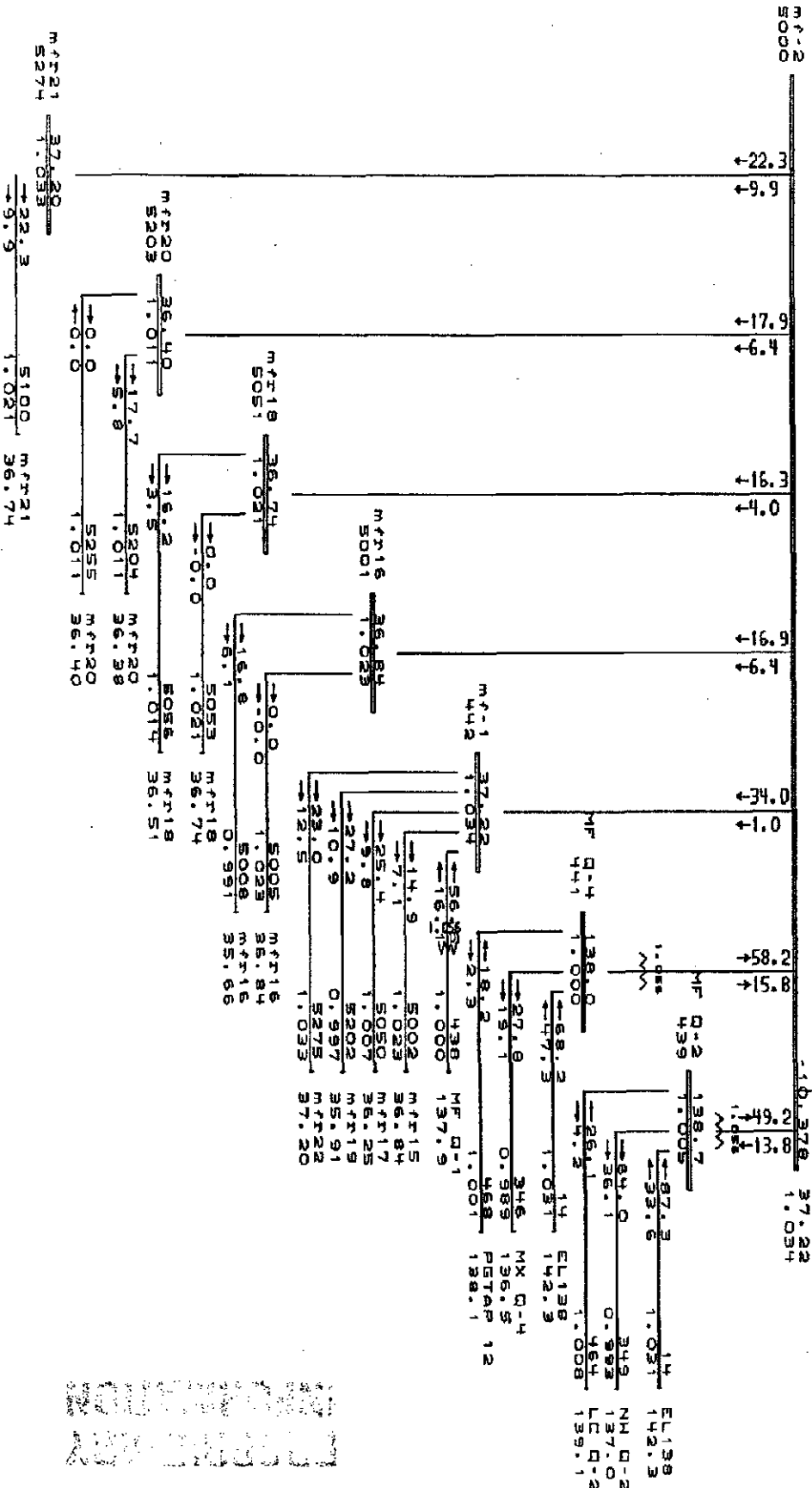
BASE CASE STUDY: 94PKOPSB.SAV.Z

- **1994 Actual Load Data**
- **Rachel not in service**
- **No contingencies**
- **No overloads at Mayfield substation**
- **3 voltage violations at customer busses**

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MIS = 0.0000 MW
MIS = 0.0000 MVAR
94PHOPsb. sav. 2

No overhead
MF @ 167 MVA



TRIBUTION 1994 BASE CASE - WITHOUT RACHEL - (94PKPSB.SAV), using...

mission 1993 Base Case 93SECARS.ESAV92EQ REFERENCE CASE: VEMNTR3F.SAV9

BUS-NO-	--KV--	TP	VSCHEG	-V-PU-	--DEG-	AR	ZONE	-Vmax-	-Vmin-	YI	MI	DI	YO	MO	DO
5013	13.20	1	1.0000	1.0017	-14.15	4	3	1.0200	0.9500	90	01	1	89	12	31
5020	13.20	1	1.0000	0.9971	-16.42	4	3	1.0200	0.9500	90	01	1	89	12	31
5023	13.20	1	1.0000	1.0024	-20.10	4	3	1.0200	0.9500	90	01	1	89	12	31
5030	13.20	1	1.0000	1.0019	-19.53	4	3	1.0200	0.9500	90	01	1	89	12	31
5054	13.20	1	1.0000	1.0038	-19.23	4	3	1.0200	0.9500	90	01	1	89	12	31
5059	4.16	1	1.0000	0.9655	-15.07	4	3	1.0200	0.9500	90	01	1	89	12	31
5066	4.80	1	1.0000	1.0088	-14.91	4	3	1.0200	0.9500	90	01	1	89	12	31
5071	4.16	1	1.0000	1.0259	-15.29	4	3	1.0200	0.9500	90	01	1	89	12	31
5076	4.60	1	1.0000	1.0031	-16.88	4	3	1.0200	0.9500	90	01	1	89	12	31
5077	4.60	1	1.0000	1.0031	-16.88	4	3	1.0200	0.9500	90	01	1	89	12	31
5078	4.60	1	1.0000	1.0031	-16.88	4	3	1.0200	0.9500	90	01	1	89	12	31
5083	13.20	1	1.0000	1.0010	-16.79	4	3	1.0200	0.9500	90	01	1	89	12	31
5104	4.60	1	1.0000	0.9719	-12.99	4	3	1.0200	0.9500	90	01	1	89	12	31
5114	0.48	1	1.0000	0.9815	-14.77	4	3	1.0200	0.9500	90	01	1	89	12	31
5117	0.48	1	1.0000	1.0028	-14.94	4	3	1.0200	0.9500	90	01	1	89	12	31
5119	4.60	1	1.0000	1.0795	-14.20	4	3	1.0200	0.9500	90	01	1	89	12	31
5120	4.60	1	1.0000	1.0795	-14.21	4	3	1.0200	0.9500	90	01	1	89	12	31
5127	4.80	1	1.0000	1.0265	-15.86	4	3	1.0200	0.9500	90	01	1	89	12	31
5131	4.60	1	1.0000	1.0998	-17.01	4	3	1.0200	0.9500	90	01	1	89	12	31
5136	4.60	1	1.0000	1.0014	-16.94	4	3	1.0200	0.9500	90	01	1	89	12	31
5143	4.60	1	1.0000	1.0065	-19.08	4	3	1.0200	0.9500	90	01	1	89	12	31
5146	4.16	1	1.0000	0.9543	-19.13	4	3	1.0200	0.9500	90	01	1	89	12	31
5149	4.60	1	1.0000	1.0891	-19.50	4	3	1.0200	0.9500	90	01	1	89	12	31
5152	13.20	1	1.0000	1.0014	-19.53	4	3	1.0200	0.9500	90	01	1	89	12	31
5155	0.48	1	1.0000	0.9500	-16.79	4	3	1.0200	0.9500	90	01	1	89	12	31
5158	4.60	1	1.0000	1.0121	-18.46	4	3	1.0200	0.9500	90	01	1	89	12	31
5161	4.60	1	1.0000	1.0000	-20.30	4	3	1.0200	0.9500	90	01	1	89	12	31
5166	2.40	1	1.0000	0.9856	-18.05	4	3	1.0200	0.9500	90	01	1	89	12	31
5168	4.16	1	1.0000	0.9187	-18.76	4	3	1.0200	0.9500	90	01	1	89	12	31
5210	0.48	1	1.0000	0.9923	-15.93	4	3	1.0200	0.9500	90	01	1	89	12	31
5213	4.60	1	1.0000	1.0018	-18.80	4	3	1.0200	0.9500	90	01	1	89	12	31
5219	4.60	1	1.0000	1.0891	-19.50	4	3	1.0200	0.9500	90	01	1	89	12	31
5222	2.40	1	1.0000	0.9737	-21.34	4	3	1.0200	0.9500	90	01	1	89	12	31
5227	0.48	1	1.0000	0.9507	-20.59	4	3	1.0200	0.9500	90	01	1	89	12	31
5228	0.48	1	1.0000	0.9914	-19.48	4	3	1.0200	0.9500	90	01	1	89	12	31
5231	0.48	1	1.0000	0.9609	-21.08	4	3	1.0200	0.9500	90	01	1	89	12	31
5234	4.16	1	1.0000	0.9737	-19.89	4	3	1.0200	0.9500	90	01	1	89	12	31
5237	2.40	1	1.0000	1.0028	-20.61	4	3	1.0200	0.9500	90	01	1	89	12	31
5240	4.16	1	1.0000	0.9854	-21.71	4	3	1.0200	0.9500	90	01	1	89	12	31
5243	13.20	1	1.0000	0.9592	-22.85	4	3	1.0200	0.9500	90	01	1	89	12	31
5247	4.60	1	1.0000	0.9272	-21.79	4	3	1.0200	0.9500	90	01	1	89	12	31
5251	0.48	1	1.0000	0.9473	-17.70	4	3	1.0200	0.9500	90	01	1	89	12	31
5253	0.48	1	1.0000	0.9463	-17.55	4	3	1.0200	0.9500	90	01	1	89	12	31
5262	4.60	1	1.0000	0.9518	-17.77	4	3	1.0200	0.9500	90	01	1	89	12	31
5265	2.40	1	1.0000	0.9902	-17.26	4	3	1.0200	0.9500	90	01	1	89	12	31
5268	13.20	1	1.0000	1.0017	-19.16	4	3	1.0200	0.9500	90	01	1	89	12	31
5270	0.48	1	1.0000	0.9844	-20.25	4	3	1.0200	0.9500	90	01	1	89	12	31
5282	13.20	1	1.0000	1.0016	-14.16	4	3	1.0200	0.9500	90	01	1	89	12	31
5283	0.48	1	1.0000	0.9811	-14.81	4	3	1.0200	0.9500	90	01	1	89	12	31
5284	0.24	1	1.0000	0.9935	-15.88	4	3	1.0200	0.9500	90	01	1	89	12	31

RECEIVED
12-1-1996

Voltage
Violation
< 95%

U	0.	0000	M
E	=	0000	M
E	=	0000	R
S	-	0000	
S	=	0000	

@PKOPsb.sav.z



60 HWA

60 HWA

transmission 1993 Base Case 93SECARS.ESAV9ZEQ REFERENCE CASE: VEMNTR3F.SAV9

[illegible]

[illegible]

DISTRIBUTION 1994 BASE CASE - WITHOUT RACHEL - SINGLE CONTINGENCY

1pkOPSE2.SAV using Transmission 1993 Base Case 93SECARS.ESAV92EQ

cont-	-Pavd--	-Qavd--	-Int_mv	-Int_mv	Loss_mv	Loss_mv	buses	lines	trans	gens	load	shnt	svds	dcv	dcv	dcl
0.0	0.0	0.0	0.0	0.0	0.00	0.00	0	0	0	0	0	0	0	0	0	0
-231.1	0.0	0.0	1522.5	219.8	44.52	377.89	355	317	175	14	109	13	0	0	0	0
-45.7	0.0	0.0	-169.6	-68.3	3.63	49.22	204	169	44	0	42	3	0	0	0	0
-79.3	0.0	0.0	-173.7	22.1	3.26	23.39	137	115	28	0	29	2	0	0	0	0
-29.2	0.0	0.0	-167.4	-66.2	8.54	51.47	223	171	52	0	50	3	0	0	0	0
0.0	0.0	0.0	-107.9	-51.5	4.74	26.48	222	180	44	0	42	0	0	0	0	0
-74.0	0.0	0.0	-112.9	18.0	2.02	12.60	249	203	52	0	53	2	0	0	0	0
-62.3	0.0	0.0	-159.7	-21.5	3.87	36.62	330	279	66	0	63	2	0	0	0	0
-46.9	0.0	0.0	-131.8	-11.3	2.55	21.12	334	276	67	0	63	2	0	0	0	0
-53.8	0.0	0.0	-35.7	39.2	0.45	3.25	87	75	13	0	13	2	0	0	0	0
-23.6	0.0	0.0	-97.2	-19.7	3.20	20.37	208	180	38	0	35	2	0	0	0	0
-23.4	0.0	0.0	-137.1	-35.1	1.82	20.24	226	181	62	0	58	2	0	0	0	0
-58.1	0.0	0.0	-185.2	-28.8	3.20	37.33	224	180	58	0	53	2	0	0	0	0
-31.6	0.0	0.0	-44.4	3.2	0.34	4.49	45	36	13	0	9	2	0	0	0	0
0.0	0.0	0.0	0.0	0.0	0.00	0.00	0	0	0	0	0	0	0	0	0	0

1994
10/10/94

DISTRIBUTION 1994 BASE CASE - WITHOUT RACHEL - (94PKOPSB.SAV), using...
Transmission 1993 Base Case 93SECARS.ESAV92EQ REFERENCE CASE: VEMNTR3F.SAV9
ai distribution detail system only

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: time stamp is: Tue Mar 19 14:48:56 1996

ystem base	100.00 MVA		
ises	2844	Max	5000
ranch Sections	2964	Max	7500
ransformers	733	Max	2000
enerators	16	Max	1500
oads	619	Max	4000
nunts	37	Max	4000
s	50	Max	100
es	164	Max	1000

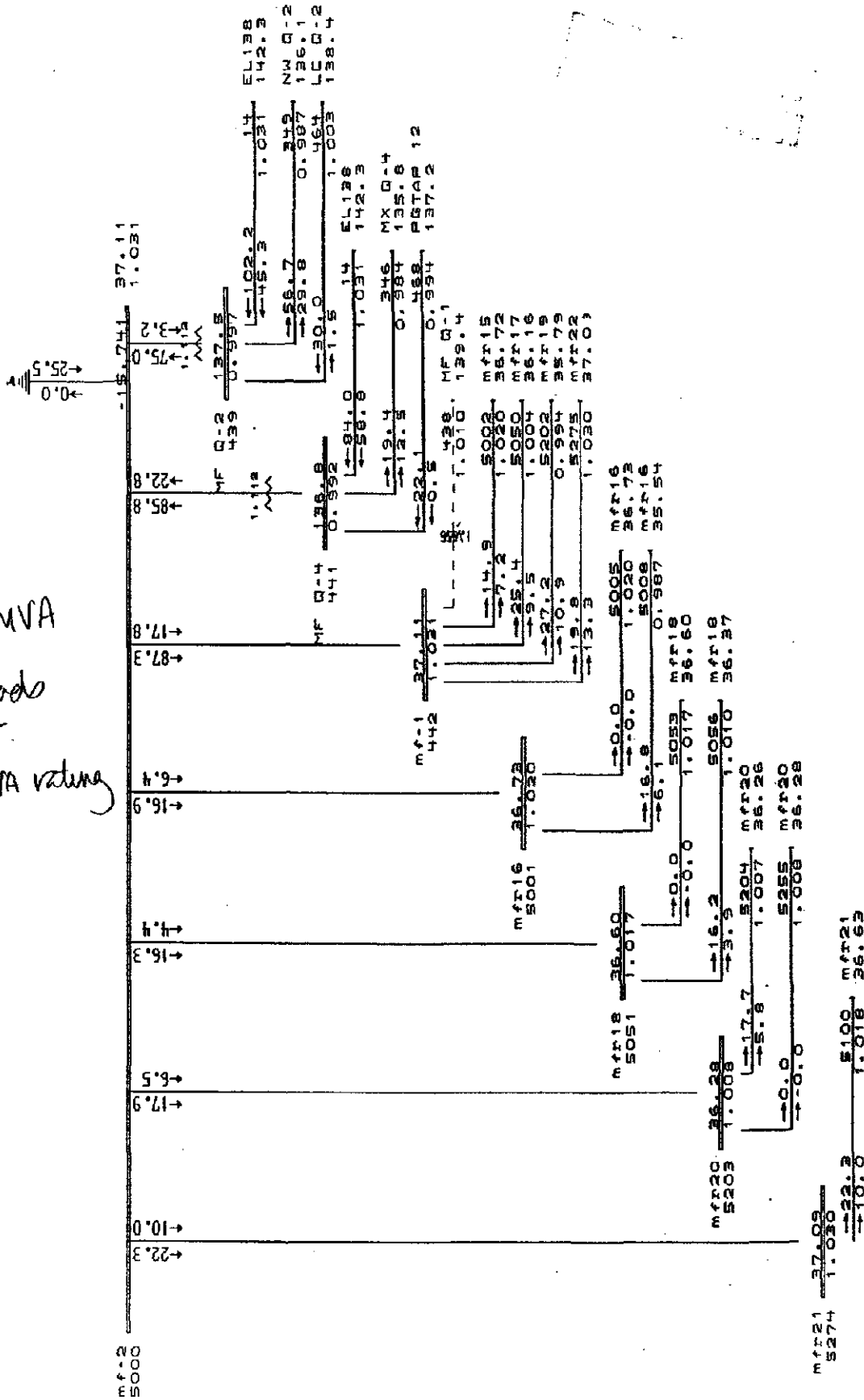
1996 MAR 19 14:48:56

BASE CASE STUDY: 94PKOPSB1.SAV

- **1994 Actual Load Data**
- **Rachel not in service**
- **Single transformer contingency**
- **1 Transformer overload**
- **6 voltage violations at customer busses**

P MIS = 0.0000 MW
Q MIS = -0.0000 MVAR
94pkopsb1.sav

MF @ 167 MVA
trf overloads
4-MF-T
> 82 MVA rating
Volt.



[illegible]

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DISTRIBUTION 1994 BASE CASE - WITHOUT RACHEL - SINGLE CONTINGENCY

PKOPSBL.SAV using Transmission 1993 Base Case 93SECARS.E5AV92EQ

ne	Zone_name	-Pgen--	-Qgen--	-Pload-	-Qload-	Ipload-	Iqload-	-Gload-	-Bload-	Pshunt-
0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zone0	3638.7	1377.8	2071.8	1000.9	0.0	0.0	0.0	0.0	0.0
1	Ivy	0.0	0.0	165.9	64.8	0.0	0.0	0.0	0.0	0.0
2	Dawson	0.0	0.0	170.5	33.8	0.0	0.0	0.0	0.0	0.0
3	Mayfield	0.0	0.0	158.9	43.9	0.0	0.0	0.0	0.0	0.0
4	Sanborn	0.0	0.0	103.1	25.0	0.0	0.0	0.0	0.0	0.0
5	Groveswood	0.0	0.0	110.9	43.3	0.0	0.0	0.0	0.0	0.0
6	Hummel	0.0	0.0	155.8	47.1	0.0	0.0	0.0	0.0	0.0
7	Northfield	0.0	0.0	129.2	37.0	0.0	0.0	0.0	0.0	0.0
8	Nathan	0.0	0.0	35.2	11.3	0.0	0.0	0.0	0.0	0.0
9	Nursery	0.0	0.0	94.0	22.9	0.0	0.0	0.0	0.0	0.0
0	Lloyd	0.0	0.0	135.2	38.2	0.0	0.0	0.0	0.0	0.0
1	Jordan	0.0	0.0	182.0	49.6	0.0	0.0	0.0	0.0	0.0
2	Avondale	0.0	0.0	44.1	23.9	0.0	0.0	0.0	0.0	0.0
3	Zone13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

165 (≈ 167 MVA)

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DISTRIBUTION 1994 BASE CASE - WITHOUT RACHEL - SINGLE CONTINGENCY

PKOPSBL.SAV using Transmission 1993 Base Case 93SECARS.E5AV92EQ

BUS-NO-	--KV--	TP	VSCHED	-V-PU-	--DEG-	AR	ZONE	-Vmax-	-Vmin-	YI	MI	DI	YO	MO	DO
5013	13.20	1	1.0000	0.9983	-19.54	4	3	1.0200	0.9500	90	01	1	89	12	31
5020	13.20	1	1.0000	0.9937	-21.82	4	3	1.0200	0.9500	90	01	1	89	12	31
5023	13.20	1	1.0000	0.9985	-25.53	4	3	1.0200	0.9500	90	01	1	89	12	31
5030	13.20	1	1.0000	0.9983	-24.95	4	3	1.0200	0.9500	90	01	1	89	12	31
5054	13.20	1	1.0000	0.9951	-24.65	4	3	1.0200	0.9500	90	01	1	89	12	31
5059	4.16	1	1.0000	0.9632	-20.47	4	3	1.0200	0.9500	90	01	1	89	12	31
5066	4.80	1	1.0000	1.0047	-20.29	4	3	1.0200	0.9500	90	01	1	89	12	31
5071	4.16	1	1.0000	1.0215	-20.68	4	3	1.0200	0.9500	90	01	1	89	12	31
5076	4.60	1	1.0000	0.9942	-22.29	4	3	1.0200	0.9500	90	01	1	89	12	31
5077	4.60	1	1.0000	0.9942	-22.29	4	3	1.0200	0.9500	90	01	1	89	12	31
5078	4.60	1	1.0000	0.9942	-22.29	4	3	1.0200	0.9500	90	01	1	89	12	31
5083	13.20	1	1.0000	0.9963	-22.19	4	3	1.0200	0.9500	90	01	1	89	12	31
5104	4.60	1	1.0000	0.9690	-18.22	4	3	1.0200	0.9500	90	01	1	89	12	31
5114	0.48	1	1.0000	0.9780	-20.17	4	3	1.0200	0.9500	90	01	1	89	12	31
5117	0.48	1	1.0000	0.9992	-20.33	4	3	1.0200	0.9500	90	01	1	89	12	31
5119	4.60	1	1.0000	1.0758	-19.59	4	3	1.0200	0.9500	90	01	1	89	12	31
5120	4.60	1	1.0000	1.0758	-19.59	4	3	1.0200	0.9500	90	01	1	89	12	31
5127	4.80	1	1.0000	1.0231	-20.56	4	3	1.0200	0.9500	90	01	1	89	12	31
5131	4.60	1	1.0000	1.0963	-21.72	4	3	1.0200	0.9500	90	01	1	89	12	31
5136	4.60	1	1.0000	0.9982	-21.64	4	3	1.0200	0.9500	90	01	1	89	12	31
5143	4.60	1	1.0000	1.0027	-24.50	4	3	1.0200	0.9500	90	01	1	89	12	31
5146	4.16	1	1.0000	0.9499	-24.55	4	3	1.0200	0.9500	90	01	1	89	12	31
5149	4.60	1	1.0000	1.0847	-24.92	4	3	1.0200	0.9500	90	01	1	89	12	31
5152	13.20	1	1.0000	0.9970	-23.88	4	3	1.0200	0.9500	90	01	1	89	12	31
5155	0.48	1	1.0000	0.9463	-22.20	4	3	1.0200	0.9500	90	01	1	89	12	31
5158	4.60	1	1.0000	1.0084	-23.88	4	3	1.0200	0.9500	90	01	1	89	12	31
5161	4.60	1	1.0000	0.9936	-23.80	4	3	1.0200	0.9500	90	01	1	89	12	31
5166	2.40	1	1.0000	0.9785	-21.08	4	3	1.0200	0.9500	90	01	1	89	12	31
5168	4.16	1	1.0000	0.9117	-21.81	4	3	1.0200	0.9500	90	01	1	89	12	31
5210	0.48	1	1.0000	0.9887	-21.33	4	3	1.0200	0.9500	90	01	1	89	12	31
5213	4.60	1	1.0000	0.9981	-24.22	4	3	1.0200	0.9500	90	01	1	89	12	31
5219	4.60	1	1.0000	1.0847	-24.92	4	3	1.0200	0.9500	90	01	1	89	12	31
5222	2.40	1	1.0000	0.9696	-26.78	4	3	1.0200	0.9500	90	01	1	89	12	31
5227	0.48	1	1.0000	0.9465	-26.02	4	3	1.0200	0.9500	90	01	1	89	12	31
5228	0.48	1	1.0000	0.9872	-24.90	4	3	1.0200	0.9500	90	01	1	89	12	31
5231	0.48	1	1.0000	0.9567	-26.52	4	3	1.0200	0.9500	90	01	1	89	12	31
5234	4.16	1	1.0000	0.9696	-25.32	4	3	1.0200	0.9500	90	01	1	89	12	31
5237	2.40	1	1.0000	0.9984	-26.04	4	3	1.0200	0.9500	90	01	1	89	12	31
5240	4.16	1	1.0000	0.9809	-27.15	4	3	1.0200	0.9500	90	01	1	89	12	31
5243	13.20	1	1.0000	0.9547	-28.31	4	3	1.0200	0.9500	90	01	1	89	12	31
5247	4.60	1	1.0000	0.9232	-27.23	4	3	1.0200	0.9500	90	01	1	89	12	31
5251	0.48	1	1.0000	0.9434	-23.12	4	3	1.0200	0.9500	90	01	1	89	12	31
5253	0.48	1	1.0000	0.9424	-22.96	4	3	1.0200	0.9500	90	01	1	89	12	31
5262	4.60	1	1.0000	0.9484	-23.18	4	3	1.0200	0.9500	90	01	1	89	12	31
5265	2.40	1	1.0000	0.9867	-22.67	4	3	1.0200	0.9500	90	01	1	89	12	31
5268	13.20	1	1.0000	0.9979	-24.58	4	3	1.0200	0.9500	90	01	1	89	12	31
5270	0.48	1	1.0000	0.9801	-25.68	4	3	1.0200	0.9500	90	01	1	89	12	31
5282	13.20	1	1.0000	0.9983	-19.54	4	3	1.0200	0.9500	90	01	1	89	12	31
5283	0.48	1	1.0000	0.9776	-20.20	4	3	1.0200	0.9500	90	01	1	89	12	31
5284	0.24	1	1.0000	0.9899	-21.27	4	3	1.0200	0.9500	90	01	1	89	12	31
7014	4.60	1	1.0000	1.0803	-18.23	4	4	1.0200	0.9500	90	01	1	89	12	31
7017	4.60	1	1.0000	1.0128	-20.80	4	4	1.0200	0.9500	90	01	1	89	12	31
7020	4.60	1	1.0000	1.0094	-22.83	4	4	1.0200	0.9500	90	01	1	89	12	31
7026	13.20	1	1.0000	0.9973	-20.29	4	4	1.0200	0.9500	90	01	1	89	12	31
7029	4.16	1	1.0000	0.9470	-16.56	4	4	1.0200	0.9500	90	01	1	89	12	31
7030	4.16	1	1.0000	0.9475	-16.50	4	4	1.0200	0.9500	90	01	1	89	12	31

DISTRIBUTION 1994 BASE CASE - WITHOUT RACHEL - SINGLE CONTINGENCY

PKDPSB1.SAV using Transmission 1993 Base Case 93SECARS.ESAV92EQ

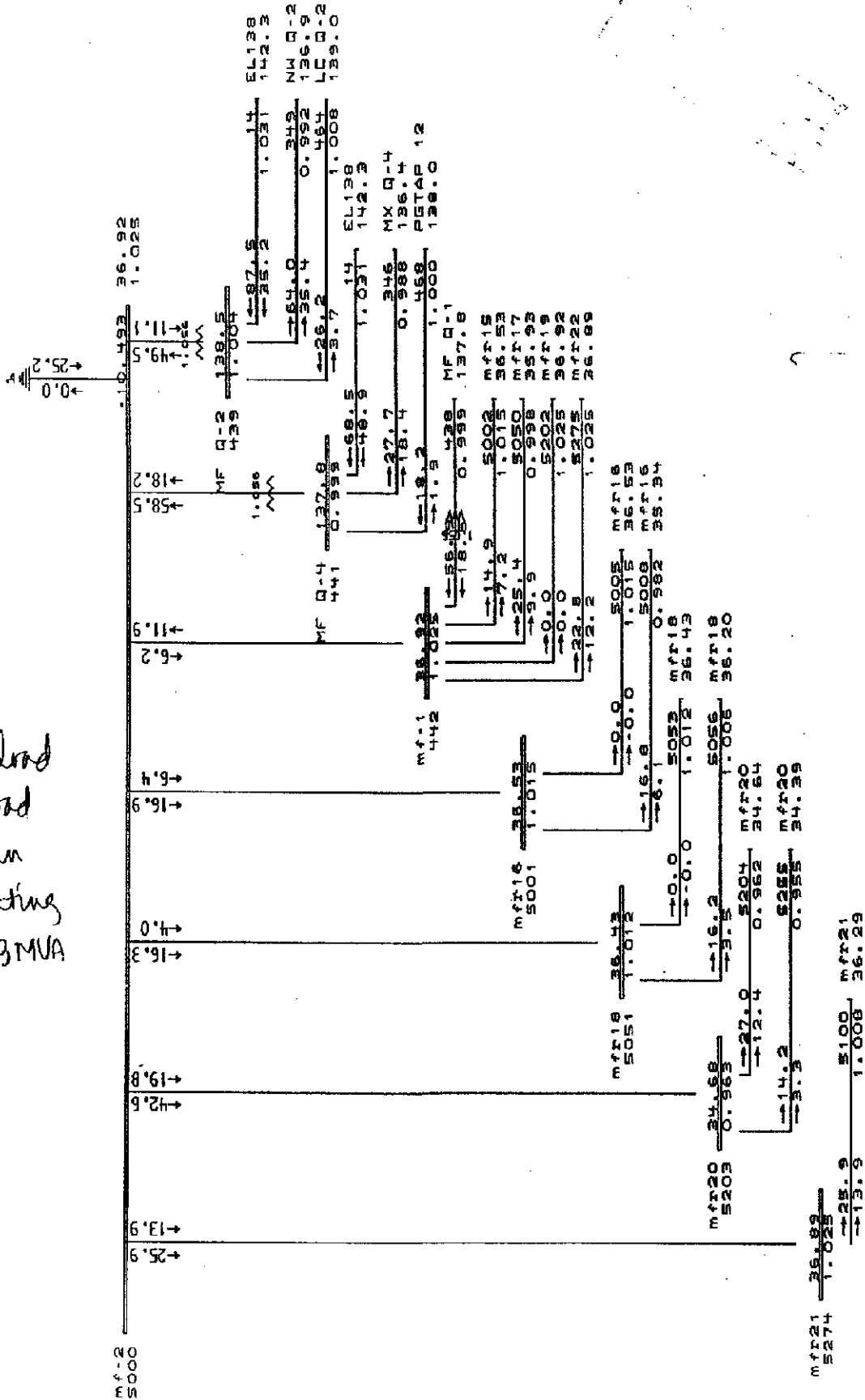
BUS-MO-	--KV--	TP	VSCHED	-V-PU-	--DEG-	AR	ZONE	-Vmax-	-Vmin-	YI	MI	DI	YO	MO	DO
7037	4.60	1	1.0000	1.0924	-9.88	4	4	1.0200	0.9500	90	01	1	89	12	31
7053	0.21	1	1.0000	1.0210	-7.73	4	4	1.0200	0.9500	90	01	1	89	12	31
7054	0.48	1	1.0000	1.0427	-8.04	4	4	1.0200	0.9500	90	01	1	89	12	31
7066	13.80	1	1.0000	1.0018	-10.06	4	4	1.0200	0.9500	90	01	1	89	12	31
7069	13.20	1	1.0000	1.0088	-9.62	4	4	1.0200	0.9500	90	01	1	89	12	31
7070	13.20	1	1.0000	1.0088	-9.62	4	4	1.0200	0.9500	90	01	1	89	12	31
7076	4.60	1	1.0000	1.0324	-11.26	4	4	1.0200	0.9500	90	01	1	89	12	31
7083	4.16	1	1.0000	0.9642	-11.47	4	4	1.0200	0.9500	90	01	1	89	12	31
7088	0.48	1	1.0000	0.9834	-9.95	4	4	1.0200	0.9500	90	01	1	89	12	31
7093	4.16	1	1.0000	0.9990	-11.91	4	4	1.0200	0.9500	90	01	1	89	12	31
7098	0.48	1	1.0000	0.9665	-10.67	4	4	1.0200	0.9500	90	01	1	89	12	31
7103	0.48	1	1.0000	0.9732	-11.17	4	4	1.0200	0.9500	90	01	1	89	12	31
7107	4.60	1	1.0000	1.0924	-9.88	4	4	1.0200	0.9500	90	01	1	89	12	31
7113	4.60	1	1.0000	1.0049	-14.55	4	4	1.0200	0.9500	90	01	1	89	12	31
7120	0.48	1	1.0000	0.9635	-10.75	4	4	1.0200	0.9500	90	01	1	89	12	31
7122	4.16	1	1.0000	0.9512	-11.63	4	4	1.0200	0.9500	90	01	1	89	12	31
7134	0.48	1	1.0000	0.9514	-10.08	4	4	1.0200	0.9500	90	01	1	89	12	31
7135	0.48	1	1.0000	0.9984	-8.12	4	4	1.0200	0.9500	90	01	1	89	12	31
7136	0.48	1	1.0000	0.9592	-7.27	4	4	1.0200	0.9500	90	01	1	89	12	31
7139	4.80	1	1.0000	1.0862	-7.42	4	4	1.0200	0.9500	90	01	1	89	12	31
7144	4.16	1	1.0000	1.0456	-7.67	4	4	1.0200	0.9500	90	01	1	89	12	31
7150	0.48	1	1.0000	1.0623	-7.38	4	4	1.0200	0.9500	90	01	1	89	12	31
7157	0.48	1	1.0000	1.0092	-7.42	4	4	1.0200	0.9500	90	01	1	89	12	31
7162	0.48	1	1.0000	1.0147	-6.97	4	4	1.0200	0.9500	90	01	1	89	12	31
7165	0.48	1	1.0000	0.9969	-8.49	4	4	1.0200	0.9500	90	01	1	89	12	31
7191	13.20	1	1.0000	0.9997	-13.09	4	4	1.0200	0.9500	90	01	1	89	12	31
7194	4.16	1	1.0000	1.0081	-7.04	4	4	1.0200	0.9500	90	01	1	89	12	31
7199	13.20	1	1.0000	0.9989	-17.12	4	4	1.0200	0.9500	90	01	1	89	12	31
7204	4.60	1	1.0000	1.0174	-10.10	4	4	1.0200	0.9500	90	01	1	89	12	31
7205	4.60	1	1.0000	1.0174	-10.10	4	4	1.0200	0.9500	90	01	1	89	12	31
7210	0.48	1	1.0000	1.0836	-6.55	4	4	1.0200	0.9500	90	01	1	89	12	31
7213	4.16	1	1.0000	1.0135	-10.14	4	4	1.0200	0.9500	90	01	1	89	12	31
7218	0.48	1	1.0000	0.9635	-10.75	4	4	1.0200	0.9500	90	01	1	89	12	31
7219	4.16	1	1.0000	0.9645	-10.68	4	4	1.0200	0.9500	90	01	1	89	12	31
7220	0.21	1	1.0000	1.0210	-7.73	4	4	1.0200	0.9500	90	01	1	89	12	31
7221	0.21	1	1.0000	1.0210	-7.73	4	4	1.0200	0.9500	90	01	1	89	12	31

BASE CASE STUDY: 94PKOPSB2.SAV

- **1994 Actual Load Data**
- **Rachel not in service**
- **Single circuit contingency**
- **15 voltage violations at customer busses**
- **1 Circuit overload**

P MIS = 0.0000 MW
Q MIS = 0.0000 MVAR
94pkopsb2.sav

ckt overload
R-20 load
is > than
ckt rating
43 MVA



PSLF Properties

General Electric Company

GENERAL
ELECTRIC
COMPANY

DISTRIBUTION 1994 BASE CASE - WITHOUT RACHEL - SINGLE CONTINGENCY
94pkopsb1.sav using Transmission 1993 Base Case 93SECARS.ESAP02CQ
cel distribution detail system only

R-19-MF OUT OF SERVICE, LOAD TRANSFERRED TO R-20-MF

PMU/MVAR

Wed Mar 20 10:27:47 1996

94pkopsb2.sav

CONFIDENTIAL

DISTRIBUTION 1994 BASE CASE - WITHOUT RACHEL - SINGLE CONTINGENCY

pkopsb2.sav using Transmission 1993 Base Case 93SECARS.E5AV9ZEQ

BUS-NO-	--KV--	TP	VSCHED	-V-FU-	--DEG-	AR	ZONE	-Vmax-	-Vmin-	YI	MI	DI	YO	MO	DO
5013	13.20	1	1.0000	0.9924	-14.33	4	3	1.0200	0.9500	90	01	1	89	12	31
5020	13.20	1	1.0000	0.9877	-16.54	4	3	1.0200	0.9500	90	01	1	89	12	31
5023	13.20	1	1.0000	0.9976	-20.41	4	3	1.0200	0.9500	90	01	1	89	12	31
5030	13.20	1	1.0000	0.9978	-19.81	4	3	1.0200	0.9500	90	01	1	89	12	31
5054	13.20	1	1.0000	0.9943	-19.51	4	3	1.0200	0.9500	90	01	1	89	12	31
5059	4.16	1	1.0000	0.9564	-15.27	4	3	1.0200	0.9500	90	01	1	89	12	31
5056	4.80	1	1.0000	1.0000	-15.10	4	3	1.0200	0.9500	90	01	1	89	12	31
5071	4.16	1	1.0000	1.0169	-15.49	4	3	1.0200	0.9500	90	01	1	89	12	31
5076	4.60	1	1.0000	0.9938	-17.11	4	3	1.0200	0.9500	90	01	1	89	12	31
5077	4.60	1	1.0000	0.9938	-17.11	4	3	1.0200	0.9500	90	01	1	89	12	31
5078	4.60	1	1.0000	0.9938	-17.11	4	3	1.0200	0.9500	90	01	1	89	12	31
5083	13.20	1	1.0000	0.9980	-17.02	4	3	1.0200	0.9500	90	01	1	89	12	31
5104	4.60	1	1.0000	0.9639	-13.14	4	3	1.0200	0.9500	90	01	1	89	12	31
5114	0.48	1	1.0000	0.9604	-15.34	4	3	1.0200	0.9500	90	01	1	89	12	31
5117	0.48	1	1.0000	0.9810	-15.51	4	3	1.0200	0.9500	90	01	1	89	12	31
5119	4.60	1	1.0000	1.0572	-14.74	4	3	1.0200	0.9500	90	01	1	89	12	31
5120	4.60	1	1.0000	1.0572	-14.74	4	3	1.0200	0.9500	90	01	1	89	12	31
5127	4.80	1	1.0000	1.0175	-16.05	4	3	1.0200	0.9500	90	01	1	89	12	31
5131	4.60	1	1.0000	1.0905	-17.22	4	3	1.0200	0.9500	90	01	1	89	12	31
5136	4.60	1	1.0000	0.9992	-17.15	4	3	1.0200	0.9500	90	01	1	89	12	31
5143	4.60	1	1.0000	0.9657	-20.64	4	3	1.0200	0.9500	90	01	1	89	12	31
5146	4.16	1	1.0000	0.9025	-20.90	4	3	1.0200	0.9500	90	01	1	89	12	31
5149	4.60	1	1.0000	1.0063	-23.54	4	3	1.0200	0.9500	90	01	1	89	12	31
5152	13.20	1	1.0000	0.9984	-19.76	4	3	1.0200	0.9500	90	01	1	89	12	31
5155	0.48	1	1.0000	0.9163	-17.89	4	3	1.0200	0.9500	90	01	1	89	12	31
5158	4.60	1	1.0000	0.9785	-19.67	4	3	1.0200	0.9500	90	01	1	89	12	31
5161	4.60	1	1.0000	0.9928	-20.51	4	3	1.0200	0.9500	90	01	1	89	12	31
5166	2.40	1	1.0000	0.9791	-18.22	4	3	1.0200	0.9500	90	01	1	89	12	31
5168	4.16	1	1.0000	0.9123	-18.94	4	3	1.0200	0.9500	90	01	1	89	12	31
5210	0.48	1	1.0000	0.9172	-20.36	4	3	1.0200	0.9500	90	01	1	89	12	31
5213	4.60	1	1.0000	0.9732	-23.77	4	3	1.0200	0.9500	90	01	1	89	12	31
5219	4.60	1	1.0000	1.0063	-23.54	4	3	1.0200	0.9500	90	01	1	89	12	31
5222	2.40	1	1.0000	0.8727	-27.96	4	3	1.0200	0.9500	90	01	1	89	12	31
5227	0.48	1	1.0000	0.8483	-27.03	4	3	1.0200	0.9500	90	01	1	89	12	31
5228	0.48	1	1.0000	0.8883	-25.65	4	3	1.0200	0.9500	90	01	1	89	12	31
5231	0.48	1	1.0000	0.8597	-27.64	4	3	1.0200	0.9500	90	01	1	89	12	31
5234	4.16	1	1.0000	0.8730	-26.16	4	3	1.0200	0.9500	90	01	1	89	12	31
5237	2.40	1	1.0000	0.8960	-27.06	4	3	1.0200	0.9500	90	01	1	89	12	31
5240	4.16	1	1.0000	0.8759	-28.45	4	3	1.0200	0.9500	90	01	1	89	12	31
5243	13.20	1	1.0000	0.9417	-27.22	4	3	1.0200	0.9500	90	01	1	89	12	31
5247	4.60	1	1.0000	0.8627	-28.93	4	3	1.0200	0.9500	90	01	1	89	12	31
5251	0.48	1	1.0000	0.8605	-25.27	4	3	1.0200	0.9500	90	01	1	89	12	31
5253	0.48	1	1.0000	0.8595	-25.09	4	3	1.0200	0.9500	90	01	1	89	12	31
5262	4.60	1	1.0000	0.9265	-19.02	4	3	1.0200	0.9500	90	01	1	89	12	31
5265	2.40	1	1.0000	0.9644	-18.49	4	3	1.0200	0.9500	90	01	1	89	12	31
5268	13.20	1	1.0000	0.9983	-20.49	4	3	1.0200	0.9500	90	01	1	89	12	31
5270	0.48	1	1.0000	0.8803	-26.61	4	3	1.0200	0.9500	90	01	1	89	12	31
5282	13.20	1	1.0000	0.9924	-14.34	4	3	1.0200	0.9500	90	01	1	89	12	31
5283	0.48	1	1.0000	0.9600	-15.37	4	3	1.0200	0.9500	90	01	1	89	12	31
5284	0.24	1	1.0000	0.9184	-20.30	4	3	1.0200	0.9500	90	01	1	89	12	31
7014	4.60	1	1.0000	1.0827	-16.59	4	4	1.0200	0.9500	90	01	1	89	12	31
7017	4.60	1	1.0000	1.0149	-18.66	4	4	1.0200	0.9500	90	01	1	89	12	31
7020	4.60	1	1.0000	1.0105	-20.12	4	4	1.0200	0.9500	90	01	1	89	12	31
7026	13.20	1	1.0000	0.9996	-19.47	4	4	1.0200	0.9500	90	01	1	89	12	31
7029	4.16	1	1.0000	0.9492	-15.75	4	4	1.0200	0.9500	90	01	1	89	12	31
7030	4.16	1	1.0000	0.9497	-15.69	4	4	1.0200	0.9500	90	01	1	89	12	31

Volt. Violations
for customers -
voltage are < 95%

ISTRIBUTION 1994 BASE CASE - WITHOUT RACHEL - SINGLE CONTINGENCY

4pkOPSE2.SAV using Transmission 1993 Base Case 93SECARS.E5AV92EQ

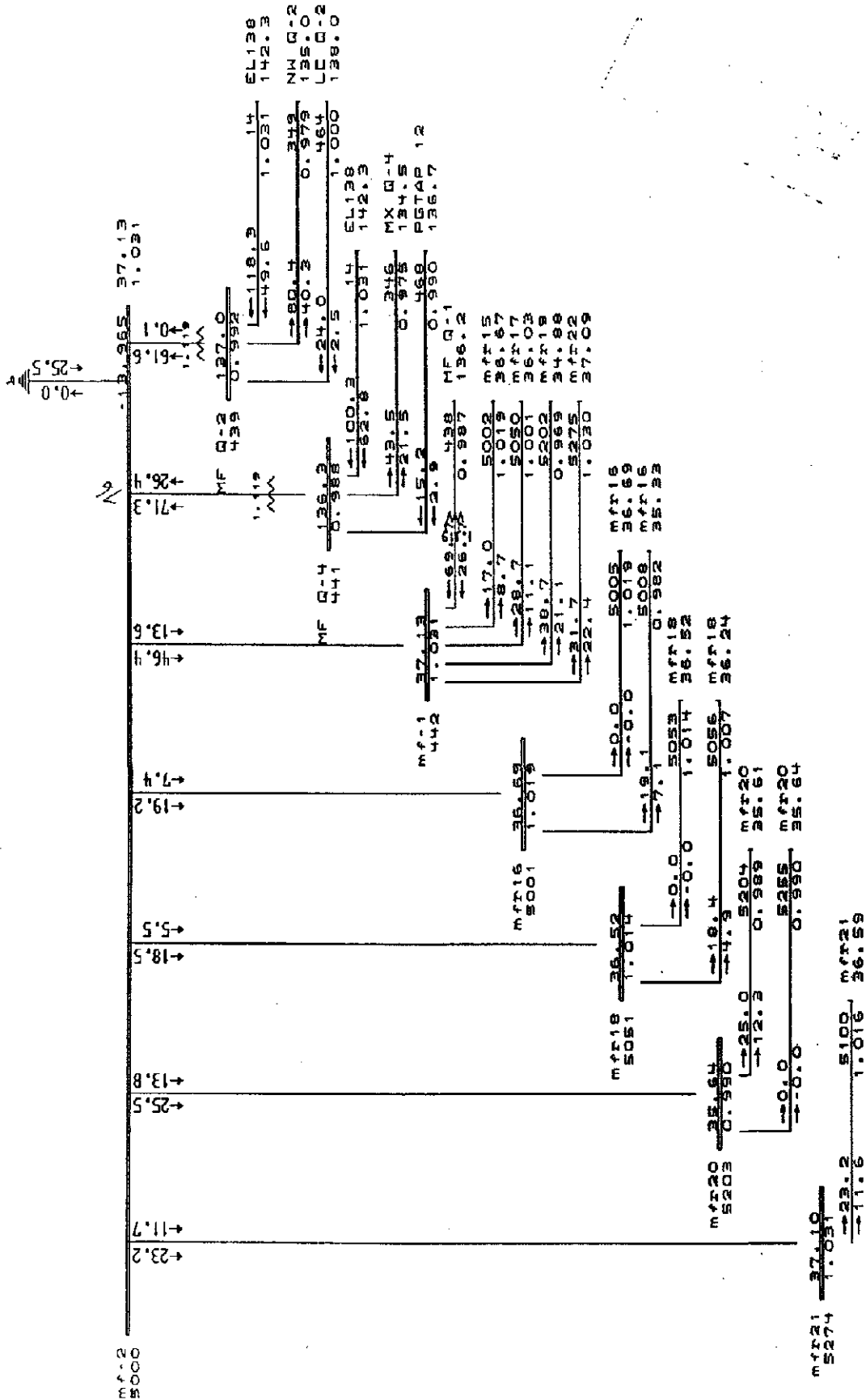
WUS-NO-	--KV--	TP	VSCHED	-V-PU-	--DEG-	AR	ZONE	-Vmax-	-Vmin-	YI	MI	DI	YO	MO	DO
7037	4.60	1	1.0000	1.0927	-9.66	4	4	1.0200	0.9500	90	01	1	89	12	31
7053	0.21	1	1.0000	1.0212	-7.52	4	4	1.0200	0.9500	90	01	1	89	12	31
7054	0.48	1	1.0000	1.0429	-7.83	4	4	1.0200	0.9500	90	01	1	89	12	31
7066	13.80	1	1.0000	1.0020	-9.85	4	4	1.0200	0.9500	90	01	1	89	12	31
7069	13.20	1	1.0000	1.0091	-9.41	4	4	1.0200	0.9500	90	01	1	89	12	31
7070	13.20	1	1.0000	1.0091	-9.41	4	4	1.0200	0.9500	90	01	1	89	12	31
7076	4.60	1	1.0000	1.0327	-11.04	4	4	1.0200	0.9500	90	01	1	89	12	31
7083	4.16	1	1.0000	0.9645	-11.26	4	4	1.0200	0.9500	90	01	1	89	12	31
7088	0.48	1	1.0000	0.9836	-9.74	4	4	1.0200	0.9500	90	01	1	89	12	31
7093	4.16	1	1.0000	0.9993	-11.70	4	4	1.0200	0.9500	90	01	1	89	12	31
7098	0.48	1	1.0000	0.9668	-10.45	4	4	1.0200	0.9500	90	01	1	89	12	31
7103	0.48	1	1.0000	0.9734	-10.95	4	4	1.0200	0.9500	90	01	1	89	12	31
7107	4.60	1	1.0000	1.0927	-9.66	4	4	1.0200	0.9500	90	01	1	89	12	31
7113	4.60	1	1.0000	0.9991	-14.33	4	4	1.0200	0.9500	90	01	1	89	12	31
7120	0.48	1	1.0000	0.9637	-10.54	4	4	1.0200	0.9500	90	01	1	89	12	31
7122	4.16	1	1.0000	0.9514	-11.41	4	4	1.0200	0.9500	90	01	1	89	12	31
7134	0.48	1	1.0000	0.9517	-9.86	4	4	1.0200	0.9500	90	01	1	89	12	31
7135	0.48	1	1.0000	0.9986	-7.91	4	4	1.0200	0.9500	90	01	1	89	12	31
7136	0.48	1	1.0000	0.9595	-7.06	4	4	1.0200	0.9500	90	01	1	89	12	31
7139	4.80	1	1.0000	1.0865	-7.21	4	4	1.0200	0.9500	90	01	1	89	12	31
7144	4.16	1	1.0000	1.0458	-7.46	4	4	1.0200	0.9500	90	01	1	89	12	31
7150	0.48	1	1.0000	1.0625	-7.17	4	4	1.0200	0.9500	90	01	1	89	12	31
7157	0.48	1	1.0000	1.0095	-7.21	4	4	1.0200	0.9500	90	01	1	89	12	31
7162	0.48	1	1.0000	1.0150	-6.76	4	4	1.0200	0.9500	90	01	1	89	12	31
7165	0.48	1	1.0000	0.9972	-8.28	4	4	1.0200	0.9500	90	01	1	89	12	31
7191	13.20	1	1.0000	0.9999	-12.88	4	4	1.0200	0.9500	90	01	1	89	12	31
7194	4.16	1	1.0000	1.0083	-6.83	4	4	1.0200	0.9500	90	01	1	89	12	31
7199	13.20	1	1.0000	0.9992	-16.91	4	4	1.0200	0.9500	90	01	1	89	12	31
7204	4.60	1	1.0000	1.0177	-9.89	4	4	1.0200	0.9500	90	01	1	89	12	31
7205	4.60	1	1.0000	1.0177	-9.89	4	4	1.0200	0.9500	90	01	1	89	12	31
7210	0.48	1	1.0000	1.0839	-6.34	4	4	1.0200	0.9500	90	01	1	89	12	31
7213	4.16	1	1.0000	1.0138	-9.92	4	4	1.0200	0.9500	90	01	1	89	12	31
7218	0.48	1	1.0000	0.9637	-10.54	4	4	1.0200	0.9500	90	01	1	89	12	31
7219	4.16	1	1.0000	0.9648	-10.47	4	4	1.0200	0.9500	90	01	1	89	12	31
7220	0.21	1	1.0000	1.0212	-7.52	4	4	1.0200	0.9500	90	01	1	89	12	31
7221	0.21	1	1.0000	1.0212	-7.52	4	4	1.0200	0.9500	90	01	1	89	12	31

BASE CASE STUDY: 98OPSB.SAV

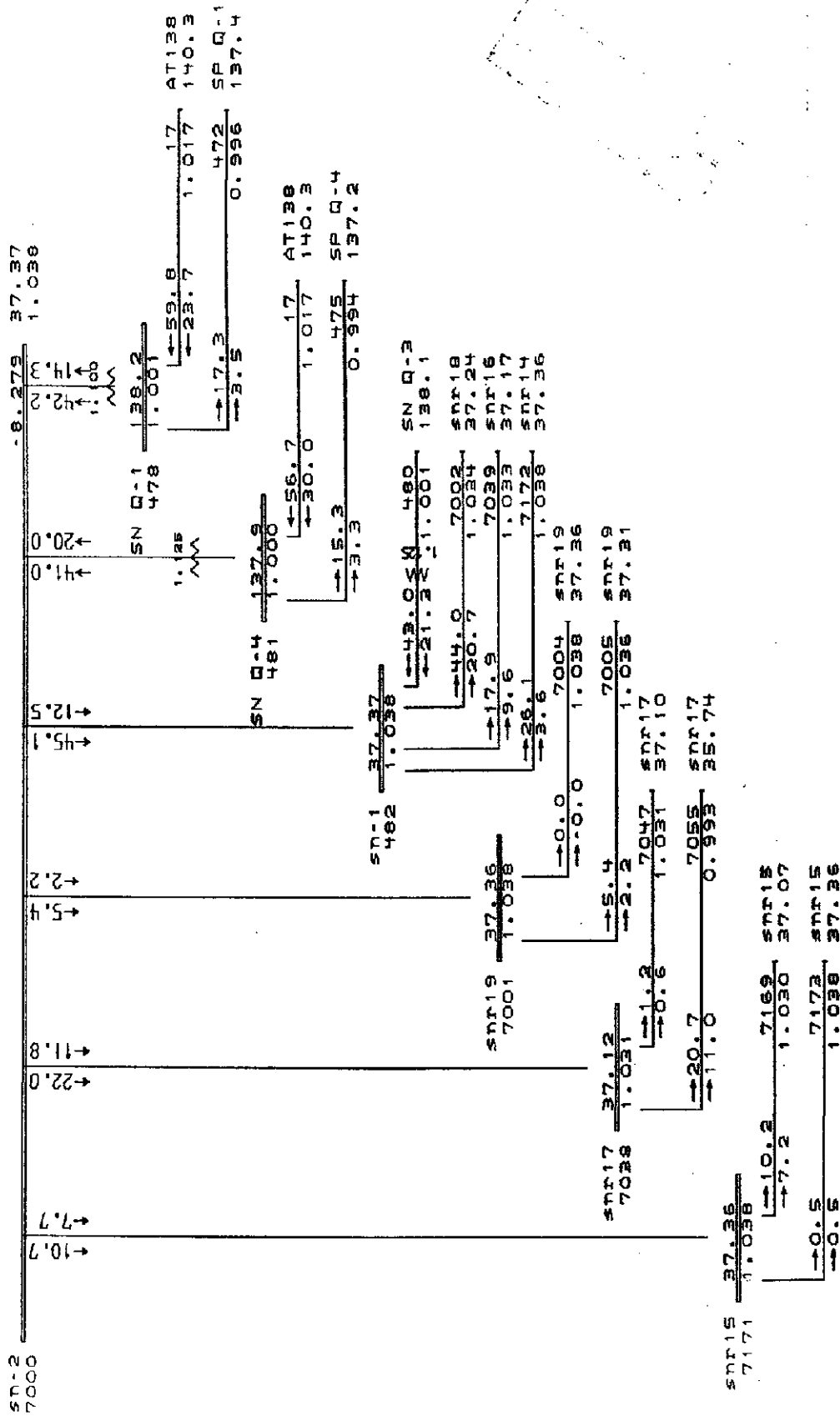
- **1994 Forecast Load**
- **Rachel not in service**
- **No contingencies**
- **17 voltage violations at customer busses**
- **No transformer overloads**
- **No circuit overloads**

E mis = -0.0000 MW
 D mis = -0.0000 MVAR
 980PSB.SAV.2

No
 overloads



P mis = 0.0000 MW
 Q mis = -0.0000 MVAR
 - 980psb.sav.z



DISTRIBUTION 1998 BASE CASE - WITHOUT RACHEL - 98OPSB.SAV

1994 system configuration under 1998 load

BUS-NO-	--KV--	TP	VSCHED	-V-PU-	--DEG--	AR	ZONE	-Vmax-	-Vmin-	YI	MI	DI	YO	MO	DO
5013	13.20	1	1.0000	0.9912	-18.28	4	3	1.0200	0.9500	90	01	1	89	12	31
5020	13.20	1	1.0000	0.9858	-20.89	4	3	1.0200	0.9500	90	01	1	89	12	31
5023	13.20	1	1.0000	1.0023	-25.25	4	3	1.0200	0.9500	90	01	1	89	12	31
5030	13.20	1	1.0000	1.0033	-23.62	4	3	1.0200	0.9500	90	01	1	89	12	31
5054	13.20	1	1.0000	1.0035	-24.12	4	3	1.0200	0.9500	90	01	1	89	12	31
5059	4.16	1	1.0000	0.9548	-19.34	4	3	1.0200	0.9500	90	01	1	89	12	31
5066	4.80	1	1.0000	1.0001	-19.12	4	3	1.0200	0.9500	90	01	1	89	12	31
5071	4.16	1	1.0000	1.0163	-19.56	4	3	1.0200	0.9500	90	01	1	89	12	31
5076	4.60	1	1.0000	1.0004	-21.42	4	3	1.0200	0.9500	90	01	1	89	12	31
5077	4.60	1	1.0000	1.0004	-21.42	4	3	1.0200	0.9500	90	01	1	89	12	31
5078	4.60	1	1.0000	1.0004	-21.42	4	3	1.0200	0.9500	90	01	1	89	12	31
5083	13.20	1	1.0000	0.9998	-21.31	4	3	1.0200	0.9500	90	01	1	89	12	31
5104	4.60	1	1.0000	0.9594	-17.11	4	3	1.0200	0.9500	90	01	1	89	12	31
5114	0.48	1	1.0000	0.9677	-18.82	4	3	1.0200	0.9500	90	01	1	89	12	31
5117	0.48	1	1.0000	0.9890	-18.94	4	3	1.0200	0.9500	90	01	1	89	12	31
5119	4.60	1	1.0000	1.0690	-18.08	4	3	1.0200	0.9500	90	01	1	89	12	31
5120	4.60	1	1.0000	1.0690	-18.09	4	3	1.0200	0.9500	90	01	1	89	12	31
5127	4.80	1	1.0000	0.9671	-21.37	4	3	1.0200	0.9500	90	01	1	89	12	31
5131	4.60	1	1.0000	1.0466	-22.00	4	3	1.0200	0.9500	90	01	1	89	12	31
5136	4.60	1	1.0000	1.0023	-21.11	4	3	1.0200	0.9500	90	01	1	89	12	31
5143	4.60	1	1.0000	0.9942	-23.09	4	3	1.0200	0.9500	90	01	1	89	12	31
5146	4.16	1	1.0000	0.9741	-21.68	4	3	1.0200	0.9500	90	01	1	89	12	31
5149	4.60	1	1.0000	1.0674	-22.77	4	3	1.0200	0.9500	90	01	1	89	12	31
5152	13.20	1	1.0000	0.9030	-29.76	4	3	1.0200	0.9500	90	01	1	89	12	31
5155	0.48	1	1.0000	0.9341	-20.73	4	3	1.0200	0.9500	90	01	1	89	12	31
5158	4.60	1	1.0000	1.0014	-21.87	4	3	1.0200	0.9500	90	01	1	89	12	31
5161	4.60	1	1.0000	0.9207	-27.37	4	3	1.0200	0.9500	90	01	1	89	12	31
5166	2.40	1	1.0000	0.9088	-24.32	4	3	1.0200	0.9500	90	01	1	89	12	31
5168	4.16	1	1.0000	0.8387	-25.29	4	3	1.0200	0.9500	90	01	1	89	12	31
5210	0.48	1	1.0000	0.9456	-21.58	4	3	1.0200	0.9500	90	01	1	89	12	31
5213	4.60	1	1.0000	1.0035	-24.97	4	3	1.0200	0.9500	90	01	1	89	12	31
5219	4.60	1	1.0000	0.9976	-28.87	4	3	1.0200	0.9500	90	01	1	89	12	31
5222	2.40	1	1.0000	0.8810	-30.17	4	3	1.0200	0.9500	90	01	1	89	12	31
5227	0.48	1	1.0000	0.8549	-29.05	4	3	1.0200	0.9500	90	01	1	89	12	31
5228	0.48	1	1.0000	0.8973	-27.51	4	3	1.0200	0.9500	90	01	1	89	12	31
5231	0.48	1	1.0000	0.8630	-30.26	4	3	1.0200	0.9500	90	01	1	89	12	31
5234	4.16	1	1.0000	0.8764	-28.58	4	3	1.0200	0.9500	90	01	1	89	12	31
5237	2.40	1	1.0000	0.8969	-29.57	4	3	1.0200	0.9500	90	01	1	89	12	31
5240	4.16	1	1.0000	0.9040	-29.06	4	3	1.0200	0.9500	90	01	1	89	12	31
5243	13.20	1	1.0000	0.7707	-36.77	4	3	1.0200	0.9500	90	01	1	89	12	31
5247	4.60	1	1.0000	0.8187	-28.61	4	3	1.0200	0.9500	90	01	1	89	12	31
5251	0.48	1	1.0000	0.8456	-24.80	4	3	1.0200	0.9500	90	01	1	89	12	31
5253	0.48	1	1.0000	0.8319	-25.36	4	3	1.0200	0.9500	90	01	1	89	12	31
5262	4.60	1	1.0000	0.9068	-23.73	4	3	1.0200	0.9500	90	01	1	89	12	31
5265	2.40	1	1.0000	0.9454	-23.10	4	3	1.0200	0.9500	90	01	1	89	12	31
5268	13.20	1	1.0000	1.0037	-25.47	4	3	1.0200	0.9500	90	01	1	89	12	31
5270	0.48	1	1.0000	0.8724	-29.68	4	3	1.0200	0.9500	90	01	1	89	12	31
5282	13.20	1	1.0000	0.9912	-18.29	4	3	1.0200	0.9500	90	01	1	89	12	31
5283	0.48	1	1.0000	0.9671	-18.87	4	3	1.0200	0.9500	90	01	1	89	12	31
5284	0.24	1	1.0000	0.9471	-21.52	4	3	1.0200	0.9500	90	01	1	89	12	31

Volt Violations

34 system configuration under 1998 load

[illegible]

CONFIDENTIAL

EQM

93 Base Case

DISTRIBUTION 1998 BASE CASE - WITHOUT RACHEL - 98OPSB.SAV

14 system configuration under 1998 load

1e	Zone_name	Pgen	Qgen	Pload	Qload	Ipload	Iqload	Gload	Bload	Pehunt
0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zone0	3262.27	4004.4	1826.5	2071.8	1000.9	0.0	0.0	0.0	0.0
1	Ivy	0.0	0.0	198.8	77.7	0.0	0.0	0.0	0.0	0.0
2	Dawson	0.0	0.0	210.8	41.8	0.0	0.0	0.0	0.0	0.0
3	Mayfield	0.0	0.0	192.8	55.5	0.0	0.0	0.0	0.0	0.0
4	Sanborn	0.0	0.0	115.7	27.7	0.0	0.0	0.0	0.0	0.0
5	Groveswood	0.0	0.0	131.4	51.4	0.0	0.0	0.0	0.0	0.0
6	Hummel	0.0	0.0	179.2	54.2	0.0	0.0	0.0	0.0	0.0
7	Northfield	0.0	0.0	161.5	46.3	0.0	0.0	0.0	0.0	0.0
8	Nathan	0.0	0.0	44.5	14.3	0.0	0.0	0.0	0.0	0.0
9	Nursery	0.0	0.0	116.2	28.3	0.0	0.0	0.0	0.0	0.0
0	Lloyd	0.0	0.0	165.5	46.8	0.0	0.0	0.0	0.0	0.0
1	Jordan	0.0	0.0	235.2	64.1	0.0	0.0	0.0	0.0	0.0
2	Avondale	0.0	0.0	63.4	34.4	0.0	0.0	0.0	0.0	0.0
3	Zone13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

98

MF load @ 200 MVA

BASE CASE STUDY: 98OPSB1.SAV

- **1994 Forecasted Load Data**
- **Rachel not in service**
- **Single transformer contingency**
- **2 transformer overloads**
- **12 voltage violations at customer busses**

DISTRIBUTION 1998 BASE CASE - WITHOUT RACHEL - SINGLE CONTINGENCY

994 System Configuration under 1998 load

one	Zone_name	-Pgen--	-Qgen--	-Pload-	-Qload-	Ipload-	Iqload-	-Gload-	-Bload-	Pshunt-
0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0	Zone0	3982.6	1806.0	2071.8	1000.9	0.0	0.0	0.0	0.0	0.0
1	Ivy	0.0	0.0	198.8	77.7	0.0	0.0	0.0	0.0	0.0
2	Dawson	0.0	0.0	210.8	41.8	0.0	0.0	0.0	0.0	0.0
3	Mayfield	0.0	0.0	192.8	55.5	0.0	0.0	0.0	0.0	0.0
4	Sanborn	0.0	0.0	115.7	27.7	0.0	0.0	0.0	0.0	0.0
5	Groveswood	0.0	0.0	131.4	51.4	0.0	0.0	0.0	0.0	0.0
6	Hummel	0.0	0.0	179.2	54.2	0.0	0.0	0.0	0.0	0.0
7	Northfield	0.0	0.0	161.5	46.3	0.0	0.0	0.0	0.0	0.0
8	Nathan	0.0	0.0	44.5	14.3	0.0	0.0	0.0	0.0	0.0
9	Nursery	0.0	0.0	116.2	28.3	0.0	0.0	0.0	0.0	0.0
10	Lloyd	0.0	0.0	165.5	46.8	0.0	0.0	0.0	0.0	0.0
11	Jordan	0.0	0.0	235.2	64.1	0.0	0.0	0.0	0.0	0.0
12	Avondale	0.0	0.0	63.4	34.4	0.0	0.0	0.0	0.0	0.0
13	Zone13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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8661

DISTRIBUTION 1998 BASE CASE - WITHOUT RACHEL - SINGLE CONTINGENCY

994 System Configuration under 1998 load

[illegible]

DISTRIBUTION 1998 BASE CASE - WITHOUT RACHEL - SINGLE CONTINGENCY

1994 System Configuration under 1998 load

BUS-NO-	--KV--	TP	VSCHED	-V-PU-	--DEG--	AR	ZONE	-Vmax-	-Vmin-	YI	MI	DI	YO	MO	DO
5013	13.20	1	1.0000	0.9950	-21.44	4	3	1.0200	0.9500	90	01	1	89	12	31
5020	13.20	1	1.0000	0.9899	-23.96	4	3	1.0200	0.9500	90	01	1	89	12	31
5023	13.20	1	1.0000	1.0037	-28.13	4	3	1.0200	0.9500	90	01	1	89	12	31
5030	13.20	1	1.0000	1.0028	-26.58	4	3	1.0200	0.9500	90	01	1	89	12	31
5054	13.20	1	1.0000	1.0019	-27.08	4	3	1.0200	0.9500	90	01	1	89	12	31
5059	4.16	1	1.0000	0.9586	-22.47	4	3	1.0200	0.9500	90	01	1	89	12	31
5066	4.80	1	1.0000	1.0028	-22.26	4	3	1.0200	0.9500	90	01	1	89	12	31
5071	4.16	1	1.0000	1.0192	-22.68	4	3	1.0200	0.9500	90	01	1	89	12	31
5076	4.60	1	1.0000	0.9982	-24.47	4	3	1.0200	0.9500	90	01	1	89	12	31
5077	4.60	1	1.0000	0.9982	-24.47	4	3	1.0200	0.9500	90	01	1	89	12	31
5078	4.60	1	1.0000	0.9982	-24.47	4	3	1.0200	0.9500	90	01	1	89	12	31
5083	13.20	1	1.0000	1.0038	-24.36	4	3	1.0200	0.9500	90	01	1	89	12	31
5104	4.60	1	1.0000	0.9620	-20.23	4	3	1.0200	0.9500	90	01	1	89	12	31
5114	0.48	1	1.0000	0.9722	-21.96	4	3	1.0200	0.9500	90	01	1	89	12	31
5117	0.48	1	1.0000	0.9938	-22.08	4	3	1.0200	0.9500	90	01	1	89	12	31
5119	4.60	1	1.0000	1.0730	-21.25	4	3	1.0200	0.9500	90	01	1	89	12	31
5120	4.60	1	1.0000	1.0730	-21.25	4	3	1.0200	0.9500	90	01	1	89	12	31
5127	4.80	1	1.0000	0.9751	-24.01	4	3	1.0200	0.9500	90	01	1	89	12	31
5131	4.60	1	1.0000	1.0542	-24.62	4	3	1.0200	0.9500	90	01	1	89	12	31
5136	4.60	1	1.0000	1.0028	-23.76	4	3	1.0200	0.9500	90	01	1	89	12	31
5143	4.60	1	1.0000	0.9994	-26.07	4	3	1.0200	0.9500	90	01	1	89	12	31
5146	4.16	1	1.0000	0.9817	-24.71	4	3	1.0200	0.9500	90	01	1	89	12	31
5149	4.60	1	1.0000	1.0740	-25.75	4	3	1.0200	0.9500	90	01	1	89	12	31
5152	13.20	1	1.0000	0.9145	-31.77	4	3	1.0200	0.9500	90	01	1	89	12	31
5155	0.48	1	1.0000	0.9400	-23.79	4	3	1.0200	0.9500	90	01	1	89	12	31
5158	4.60	1	1.0000	1.0063	-24.90	4	3	1.0200	0.9500	90	01	1	89	12	31
5161	4.60	1	1.0000	0.9273	-29.01	4	3	1.0200	0.9500	90	01	1	89	12	31
5166	2.40	1	1.0000	0.9145	-25.82	4	3	1.0200	0.9500	90	01	1	89	12	31
5168	4.16	1	1.0000	0.8454	-26.74	4	3	1.0200	0.9500	90	01	1	89	12	31
5210	0.48	1	1.0000	0.9539	-24.61	4	3	1.0200	0.9500	90	01	1	89	12	31
5213	4.60	1	1.0000	1.0015	-27.85	4	3	1.0200	0.9500	90	01	1	89	12	31
5219	4.60	1	1.0000	1.0130	-31.54	4	3	1.0200	0.9500	90	01	1	89	12	31
5222	2.40	1	1.0000	0.8960	-32.75	4	3	1.0200	0.9500	90	01	1	89	12	31
5227	0.48	1	1.0000	0.8708	-31.69	4	3	1.0200	0.9500	90	01	1	89	12	31
5228	0.48	1	1.0000	0.9126	-30.25	4	3	1.0200	0.9500	90	01	1	89	12	31
5231	0.48	1	1.0000	0.8786	-32.84	4	3	1.0200	0.9500	90	01	1	89	12	31
5234	4.16	1	1.0000	0.8916	-31.26	4	3	1.0200	0.9500	90	01	1	89	12	31
5237	2.40	1	1.0000	0.9136	-32.19	4	3	1.0200	0.9500	90	01	1	89	12	31
5240	4.16	1	1.0000	0.9204	-31.70	4	3	1.0200	0.9500	90	01	1	89	12	31
5243	13.20	1	1.0000	1.0000	8.97	4	3	1.0200	0.9500	90	01	1	89	12	31
5247	4.60	1	1.0000	0.9912	-24.78	4	3	1.0200	0.9500	90	01	1	89	12	31
5251	0.48	1	1.0000	0.9884	-22.97	4	3	1.0200	0.9500	90	01	1	89	12	31
5253	0.48	1	1.0000	0.9773	-23.36	4	3	1.0200	0.9500	90	01	1	89	12	31
5262	4.60	1	1.0000	0.9628	-24.23	4	3	1.0200	0.9500	90	01	1	89	12	31
5265	2.40	1	1.0000	1.0023	-23.68	4	3	1.0200	0.9500	90	01	1	89	12	31
5268	13.20	1	1.0000	1.0059	-25.72	4	3	1.0200	0.9500	90	01	1	89	12	31
5270	0.48	1	1.0000	0.8890	-32.28	4	3	1.0200	0.9500	90	01	1	89	12	31
5282	13.20	1	1.0000	0.9949	-21.45	4	3	1.0200	0.9500	90	01	1	89	12	31
5283	0.48	1	1.0000	0.9716	-22.01	4	3	1.0200	0.9500	90	01	1	89	12	31
5284	0.24	1	1.0000	0.9553	-24.55	4	3	1.0200	0.9500	90	01	1	89	12	31

Volt.
Violation
< 95%

BASE CASE STUDY: 98RACH.SAV

- **1994 Forecast Load**
- **Rachel in service**
- **No voltage violations**
- **No transformer overload**
- **No circuit overloads**

998 CASE 36KV DISTRIBUTION ALTERNATIVE (36KVALT982.SAV)

Added 4th transformer at Mayfield Sub and two new Mayfield (r24&26mf) Circuits

BUS-NO-	--KV--	TP	VSCHED	-V-PU-	--DEG-	AR	ZONE	-Vmax-	-Vmin-	YI	MI	DI	YO	MO	DO
5013	13.20	1	1.0000	0.9839	-15.46	4	3	1.0200	0.9500	90	01	1	89	12	31
5020	13.20	1	1.0000	0.9776	-18.21	4	3	1.0200	0.9500	90	01	1	89	12	31
5023	13.20	1	1.0000	0.9943	-22.83	4	3	1.0200	0.9500	90	01	1	89	12	31
5030	13.20	1	1.0000	0.9952	-21.09	4	3	1.0200	0.9500	90	01	1	89	12	31
5054	13.20	1	1.0000	0.9962	-21.59	4	3	1.0200	0.9500	90	01	1	89	12	31
5059	4.16	1	1.0000	0.9493	-16.57	4	3	1.0200	0.9500	90	01	1	89	12	31
5066	4.80	1	1.0000	0.9927	-16.32	4	3	1.0200	0.9500	90	01	1	89	12	31
5071	4.16	1	1.0000	1.0087	-16.79	4	3	1.0200	0.9500	90	01	1	89	12	31
5076	4.60	1	1.0000	0.9993	-18.75	4	3	1.0200	0.9500	90	01	1	89	12	31
5077	4.60	1	1.0000	0.9993	-18.75	4	3	1.0200	0.9500	90	01	1	89	12	31
5078	4.60	1	1.0000	0.9993	-18.75	4	3	1.0200	0.9500	90	01	1	89	12	31
5083	13.20	1	1.0000	0.9984	-18.64	4	3	1.0200	0.9500	90	01	1	89	12	31
5104	4.60	1	1.0000	0.9549	-14.19	4	3	1.0200	0.9500	90	01	1	89	12	31
5114	0.48	1	1.0000	0.9616	-16.05	4	3	1.0200	0.9500	90	01	1	89	12	31
5117	0.48	1	1.0000	0.9829	-16.19	4	3	1.0200	0.9500	90	01	1	89	12	31
5119	4.60	1	1.0000	1.0611	-15.27	4	3	1.0200	0.9500	90	01	1	89	12	31
5120	4.60	1	1.0000	1.0611	-15.27	4	3	1.0200	0.9500	90	01	1	89	12	31
5127	4.80	1	1.0000	0.9725	-18.63	4	3	1.0200	0.9500	90	01	1	89	12	31
5131	4.60	1	1.0000	1.0499	-19.27	4	3	1.0200	0.9500	90	01	1	89	12	31
5136	4.60	1	1.0000	0.9993	-18.35	4	3	1.0200	0.9500	90	01	1	89	12	31
5143	4.60	1	1.0000	0.9860	-20.55	4	3	1.0200	0.9500	90	01	1	89	12	31
5146	4.16	1	1.0000	0.9693	-19.10	4	3	1.0200	0.9500	90	01	1	89	12	31
5149	4.60	1	1.0000	1.0596	-20.23	4	3	1.0200	0.9500	90	01	1	89	12	31
5152	13.20	1	1.0000	0.9160	-27.11	4	3	1.0200	0.9500	90	01	1	89	12	31
5155	0.48	1	1.0000	0.9289	-18.08	4	3	1.0200	0.9500	90	01	1	89	12	31
5158	4.60	1	1.0000	0.9933	-19.26	4	3	1.0200	0.9500	90	01	1	89	12	31
5161	4.60	1	1.0000	0.9401	-24.51	4	3	1.0200	0.9500	90	01	1	89	12	31
5166	2.40	1	1.0000	1.0227	-16.92	4	3	1.0200	0.9500	90	01	1	89	12	31
5168	4.16	1	1.0000	0.9536	-17.71	4	3	1.0200	0.9500	90	01	1	89	12	31
5210	0.48	1	1.0000	0.9787	-16.38	4	3	1.0200	0.9500	90	01	1	89	12	31
5213	4.60	1	1.0000	0.9985	-19.62	4	3	1.0200	0.9500	90	01	1	89	12	31
5219	4.60	1	1.0000	1.0234	-24.04	4	3	1.0200	0.9500	90	01	1	89	12	31
5222	2.40	1	1.0000	0.9058	-25.32	4	3	1.0200	0.9500	90	01	1	89	12	31
5227	0.48	1	1.0000	0.8817	-24.23	4	3	1.0200	0.9500	90	01	1	89	12	31
5228	0.48	1	1.0000	0.9233	-22.73	4	3	1.0200	0.9500	90	01	1	89	12	31
5231	0.48	1	1.0000	0.8888	-25.42	4	3	1.0200	0.9500	90	01	1	89	12	31
5234	4.16	1	1.0000	0.9020	-23.77	4	3	1.0200	0.9500	90	01	1	89	12	31
5237	2.40	1	1.0000	0.9251	-24.74	4	3	1.0200	0.9500	90	01	1	89	12	31
5240	4.16	1	1.0000	0.9317	-24.24	4	3	1.0200	0.9500	90	01	1	89	12	31
5243	13.20	1	1.0000	0.9938	-22.59	4	3	1.0200	0.9500	90	01	1	89	12	31
5247	4.60	1	1.0000	0.9779	-19.13	4	3	1.0200	0.9500	90	01	1	89	12	31
5251	0.48	1	1.0000	0.9761	-17.16	4	3	1.0200	0.9500	90	01	1	89	12	31
5253	0.48	1	1.0000	0.9652	-17.60	4	3	1.0200	0.9500	90	01	1	89	12	31
5262	4.60	1	1.0000	0.9512	-18.50	4	3	1.0200	0.9500	90	01	1	89	12	31
5265	2.40	1	1.0000	0.9903	-17.90	4	3	1.0200	0.9500	90	01	1	89	12	31
5268	13.20	1	1.0000	0.9991	-20.14	4	3	1.0200	0.9500	90	01	1	89	12	31
5270	0.48	1	1.0000	0.9003	-24.85	4	3	1.0200	0.9500	90	01	1	89	12	31
5282	13.20	1	1.0000	0.9838	-15.47	4	3	1.0200	0.9500	90	01	1	89	12	31
5283	0.48	1	1.0000	0.9610	-16.11	4	3	1.0200	0.9500	90	01	1	89	12	31
5284	0.24	1	1.0000	0.9800	-16.31	4	3	1.0200	0.9500	90	01	1	89	12	31

ided 4th transformer at Mayfield Sub and two new Mayfield (x24&26mf) Circuits

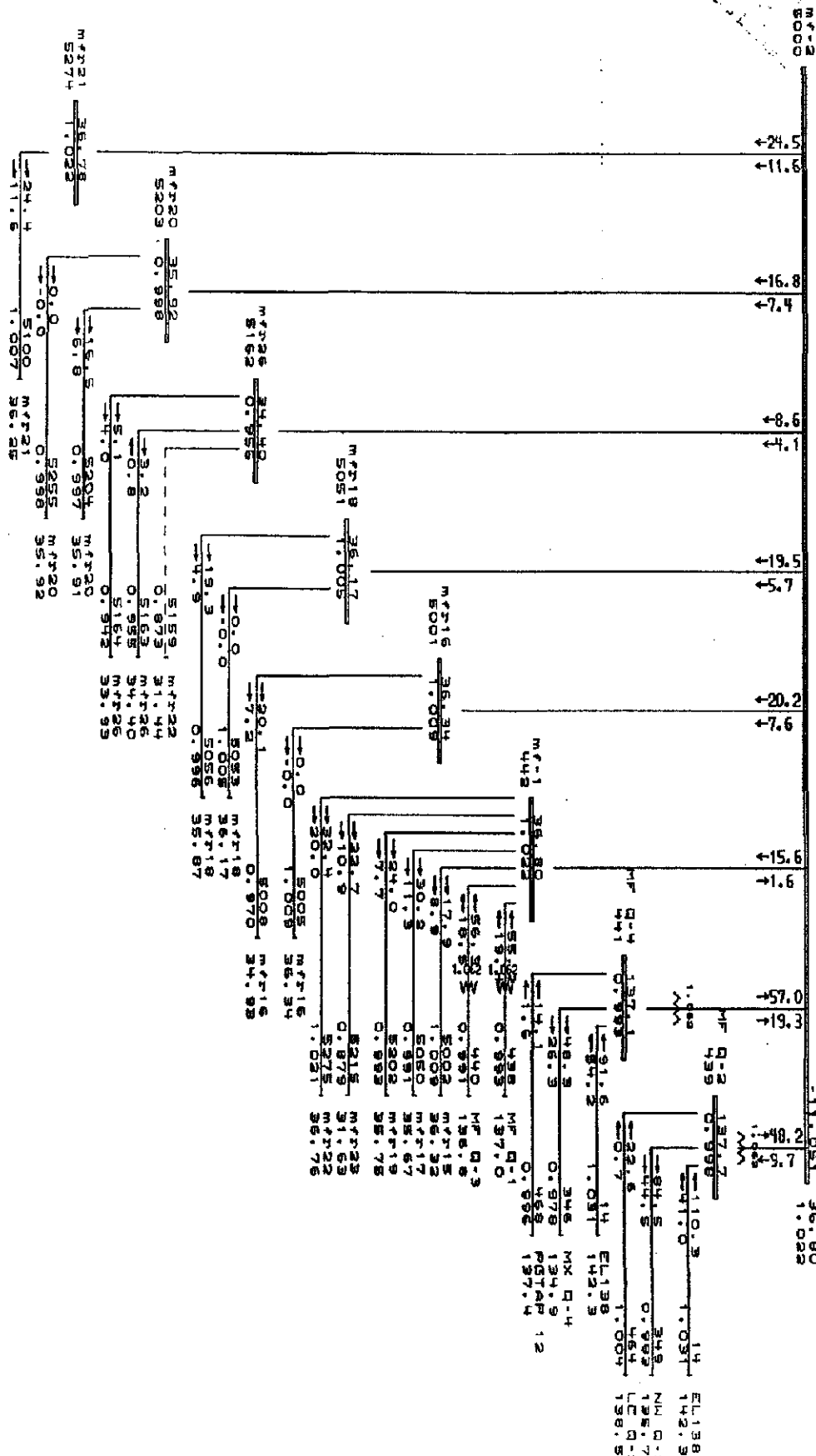
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BASE CASE STUDY: 36KVALT983.SAV

- **2000 Forecasted Load Data**
- **No contingencies**
- **Add transformer at Mayfield**
- **Add 2 new Mayfield distribution circuits**
- **12 voltage violations**
- **No overloads**

MIS = 0.0000 MW
 MIS = 0.0000 MVAR
 36KV11983.5KV



NOO BASE CASE 36KV DISTRIBUTION ALTERNATIVE No Contingencies

Added 4th transformer at Mayfield Sub and two new Mayfield (x24x26mf) Circuits

BUS-NO-	--KV--	TP	VSCHED	-V-FU-	--DEG--	AR	ZONE	-Vmax-	-Vmin-	YI	MI	DI	YO	MO	DO
5013	13.20	1	1.0000	0.9802	-15.71	4	3	1.0200	0.9500	90	01	1	89	12	31
5020	13.20	1	1.0000	0.9737	-18.52	4	3	1.0200	0.9500	90	01	1	89	12	31
5023	13.20	1	1.0000	0.9946	-23.25	4	3	1.0200	0.9500	90	01	1	89	12	31
5030	13.20	1	1.0000	0.9965	-21.47	4	3	1.0200	0.9500	90	01	1	89	12	31
5054	13.20	1	1.0000	0.9980	-21.97	4	3	1.0200	0.9500	90	01	1	89	12	31
5059	4.16	1	1.0000	0.9458	-16.85	4	3	1.0200	0.9500	90	01	1	89	12	31
5066	4.80	1	1.0000	0.9896	-16.59	4	3	1.0200	0.9500	90	01	1	89	12	31
5071	4.16	1	1.0000	1.0054	-17.06	4	3	1.0200	0.9500	90	01	1	89	12	31
5076	4.60	1	1.0000	0.9956	-19.07	4	3	1.0200	0.9500	90	01	1	89	12	31
5077	4.60	1	1.0000	0.9956	-19.07	4	3	1.0200	0.9500	90	01	1	89	12	31
5078	4.60	1	1.0000	0.9956	-19.07	4	3	1.0200	0.9500	90	01	1	89	12	31
5083	13.20	1	1.0000	0.9946	-18.95	4	3	1.0200	0.9500	90	01	1	89	12	31
5104	4.60	1	1.0000	0.9518	-14.41	4	3	1.0200	0.9500	90	01	1	89	12	31
5114	0.48	1	1.0000	0.9578	-16.32	4	3	1.0200	0.9500	90	01	1	89	12	31
5117	0.48	1	1.0000	0.9789	-16.45	4	3	1.0200	0.9500	90	01	1	89	12	31
5119	4.60	1	1.0000	1.0572	-15.51	4	3	1.0200	0.9500	90	01	1	89	12	31
5120	4.60	1	1.0000	1.0572	-15.52	4	3	1.0200	0.9500	90	01	1	89	12	31
5127	4.80	1	1.0000	0.9666	-18.97	4	3	1.0200	0.9500	90	01	1	89	12	31
5131	4.60	1	1.0000	1.0438	-19.62	4	3	1.0200	0.9500	90	01	1	89	12	31
5136	4.60	1	1.0000	0.9939	-18.67	4	3	1.0200	0.9500	90	01	1	89	12	31
5143	4.60	1	1.0000	0.9816	-20.92	4	3	1.0200	0.9500	90	01	1	89	12	31
5146	4.16	1	1.0000	0.9641	-19.44	4	3	1.0200	0.9500	90	01	1	89	12	31
5149	4.60	1	1.0000	1.0544	-20.60	4	3	1.0200	0.9500	90	01	1	89	12	31
5152	13.20	1	1.0000	0.9078	-27.70	4	3	1.0200	0.9500	90	01	1	89	12	31
5155	0.48	1	1.0000	0.9245	-18.39	4	3	1.0200	0.9500	90	01	1	89	12	31
5158	4.60	1	1.0000	0.9890	-19.59	4	3	1.0200	0.9500	90	01	1	89	12	31
5161	4.60	1	1.0000	0.9329	-25.02	4	3	1.0200	0.9500	90	01	1	89	12	31
5166	2.40	1	1.0000	1.0202	-17.09	4	3	1.0200	0.9500	90	01	1	89	12	31
5168	4.16	1	1.0000	0.9509	-17.89	4	3	1.0200	0.9500	90	01	1	89	12	31
5210	0.48	1	1.0000	0.9749	-16.64	4	3	1.0200	0.9500	90	01	1	89	12	31
5213	4.60	1	1.0000	0.9943	-19.96	4	3	1.0200	0.9500	90	01	1	89	12	31
5219	4.60	1	1.0000	1.0152	-24.52	4	3	1.0200	0.9500	90	01	1	89	12	31
5222	2.40	1	1.0000	0.8980	-25.84	4	3	1.0200	0.9500	90	01	1	89	12	31
5227	0.48	1	1.0000	0.8738	-24.72	4	3	1.0200	0.9500	90	01	1	89	12	31
5228	0.48	1	1.0000	0.9154	-23.17	4	3	1.0200	0.9500	90	01	1	89	12	31
5231	0.48	1	1.0000	0.8809	-25.95	4	3	1.0200	0.9500	90	01	1	89	12	31
5234	4.16	1	1.0000	0.8943	-24.25	4	3	1.0200	0.9500	90	01	1	89	12	31
5237	2.40	1	1.0000	0.9167	-25.25	4	3	1.0200	0.9500	90	01	1	89	12	31
5240	4.16	1	1.0000	0.9234	-24.73	4	3	1.0200	0.9500	90	01	1	89	12	31
5243	13.20	1	1.0000	0.9944	-23.00	4	3	1.0200	0.9500	90	01	1	89	12	31
5247	4.60	1	1.0000	0.9736	-19.47	4	3	1.0200	0.9500	90	01	1	89	12	31
5251	0.48	1	1.0000	0.9719	-17.45	4	3	1.0200	0.9500	90	01	1	89	12	31
5253	0.48	1	1.0000	0.9608	-17.90	4	3	1.0200	0.9500	90	01	1	89	12	31
5262	4.60	1	1.0000	0.9475	-18.81	4	3	1.0200	0.9500	90	01	1	89	12	31
5265	2.40	1	1.0000	0.9865	-18.20	4	3	1.0200	0.9500	90	01	1	89	12	31
5268	13.20	1	1.0000	0.9948	-20.49	4	3	1.0200	0.9500	90	01	1	89	12	31
5270	0.48	1	1.0000	0.8921	-25.36	4	3	1.0200	0.9500	90	01	1	89	12	31
5282	13.20	1	1.0000	0.9801	-15.72	4	3	1.0200	0.9500	90	01	1	89	12	31
5283	0.48	1	1.0000	0.9571	-16.38	4	3	1.0200	0.9500	90	01	1	89	12	31
5284	0.24	1	1.0000	0.9762	-16.58	4	3	1.0200	0.9500	90	01	1	89	12	31

00 BASE CASE 36KV DISTRIBUTION ALTERNATIVE No Contingencies

ded 4th transformer at Mayfield Sub and two new Mayfield (r24&26mf) Circuits

ne	Zone_name	-Pgen--	-Qgen--	-Pload-	-Qload-	Ipload-	Iqload-	-Gload-	-Bload-	Pshunt-
^		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zone0	4008.5	1795.4	2071.8	1000.9	0.0	0.0	0.0	0.0	0.0
1	Ivy	0.0	0.0	198.8	77.7	0.0	0.0	0.0	0.0	0.0
2	Dawson	0.0	0.0	210.8	41.8	0.0	0.0	0.0	0.0	0.0
3	Mayfield	0.0	0.0	202.4	52.1	0.0	0.0	0.0	0.0	0.0
4	Sanborn	0.0	0.0	115.7	27.7	0.0	0.0	0.0	0.0	0.0
5	Groveswood	0.0	0.0	131.4	51.4	0.0	0.0	0.0	0.0	0.0
6	Hummel	0.0	0.0	179.2	54.2	0.0	0.0	0.0	0.0	0.0
7	Northfield	0.0	0.0	161.5	46.3	0.0	0.0	0.0	0.0	0.0
8	Nathan	0.0	0.0	44.5	14.3	0.0	0.0	0.0	0.0	0.0
9	Nursery	0.0	0.0	116.2	28.3	0.0	0.0	0.0	0.0	0.0
10	Lloyd	0.0	0.0	165.5	46.8	0.0	0.0	0.0	0.0	0.0
11	Jordan	0.0	0.0	235.2	64.1	0.0	0.0	0.0	0.0	0.0
12	Avondale	0.0	0.0	63.4	34.4	0.0	0.0	0.0	0.0	0.0

NO BASE CASE 36KV DISTRIBUTION ALTERNATIVE No Contingencies

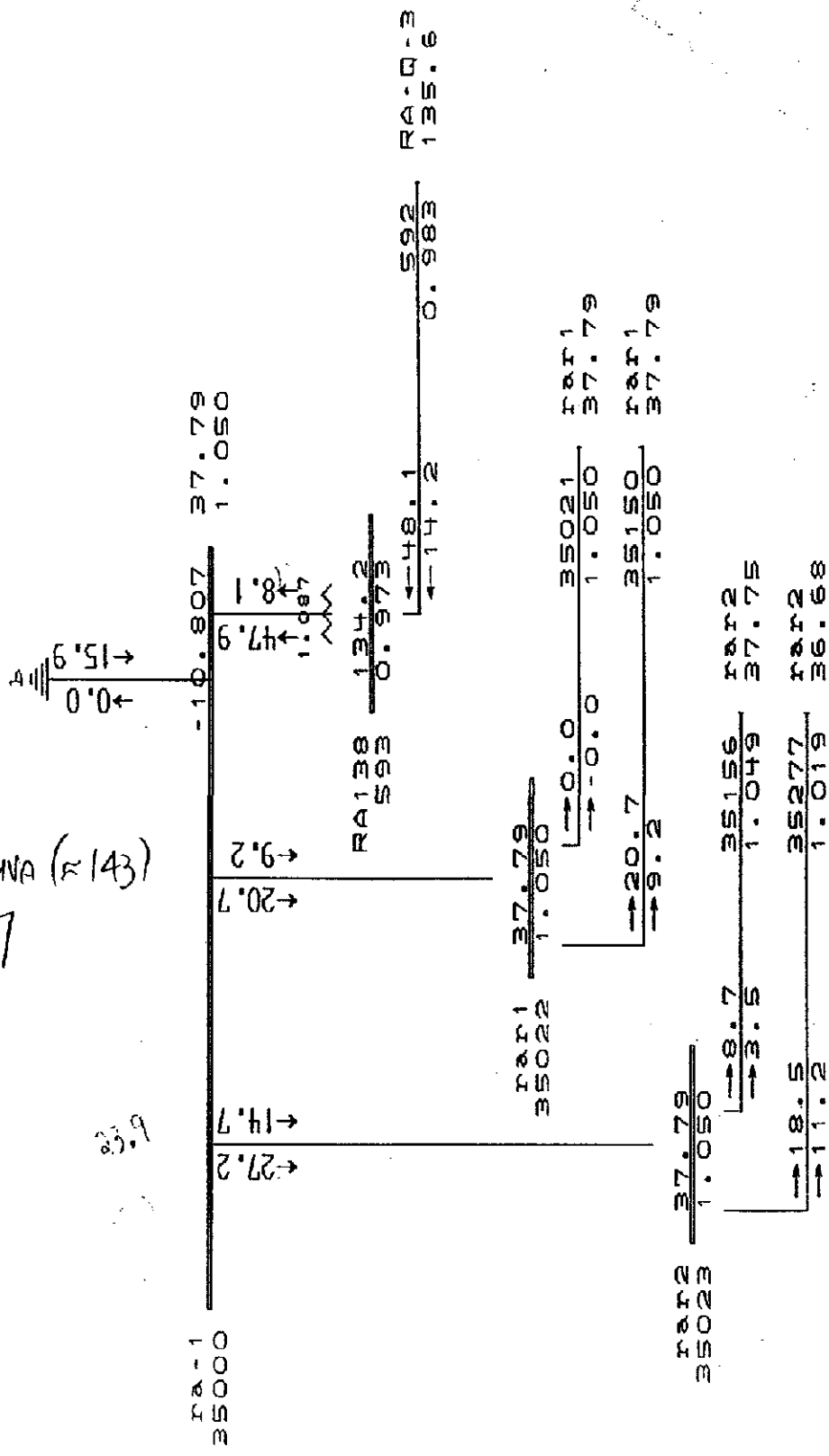
led 4th transformer at Mayfield Sub and two new Mayfield (r24&26mf) Circuits

cont	-Pevd--	-Qevd--	-Int_mw	-Int_mv	Loss_mw	Loss_mv	buses	lines	trans	gens	load	shnt	svds	dcb	dcc	dcl
0	0.0	0.0	0.0	0.0	0.00	0.00	0	0	0	0	0	0	0	0	0	0
29.2	0.0	0.0	1878.8	503.5	57.96	520.16	355	318	176	14	109	13	0	0	0	0
45.5	0.0	0.0	-204.3	-109.3	5.53	77.17	204	169	44	0	42	3	0	0	0	0
65.2	0.0	0.0	-217.4	-23.9	6.59	47.31	137	115	28	0	29	2	0	0	0	0
29.3	0.0	0.0	-211.3	-79.2	8.84	56.34	223	169	52	0	50	3	0	0	0	0
0.0	0.0	0.0	-120.8	-58.0	5.08	30.37	222	180	44	0	42	0	0	0	0	0
68.8	0.0	0.0	-134.6	-2.4	3.19	19.82	249	203	52	0	53	2	0	0	0	0
59.8	0.0	0.0	-184.8	-47.6	5.54	53.23	330	279	66	0	63	2	0	0	0	0
45.7	0.0	0.0	-165.7	-35.2	4.18	34.57	334	276	67	0	63	2	0	0	0	0
53.0	0.0	0.0	-45.3	33.2	0.76	5.46	87	75	13	0	13	2	0	0	0	0
23.0	0.0	0.0	-121.5	-39.1	5.27	33.76	208	180	38	0	35	2	0	0	0	0
23.2	0.0	0.0	-168.3	-55.5	2.85	31.92	226	181	62	0	58	2	0	0	0	0
58.1	0.0	0.0	-240.8	-73.2	5.61	67.44	224	180	58	0	53	2	0	0	0	0
31.2	0.0	0.0	-64.1	-13.2	0.75	10.05	45	36	13	0	9	2	0	0	0	0

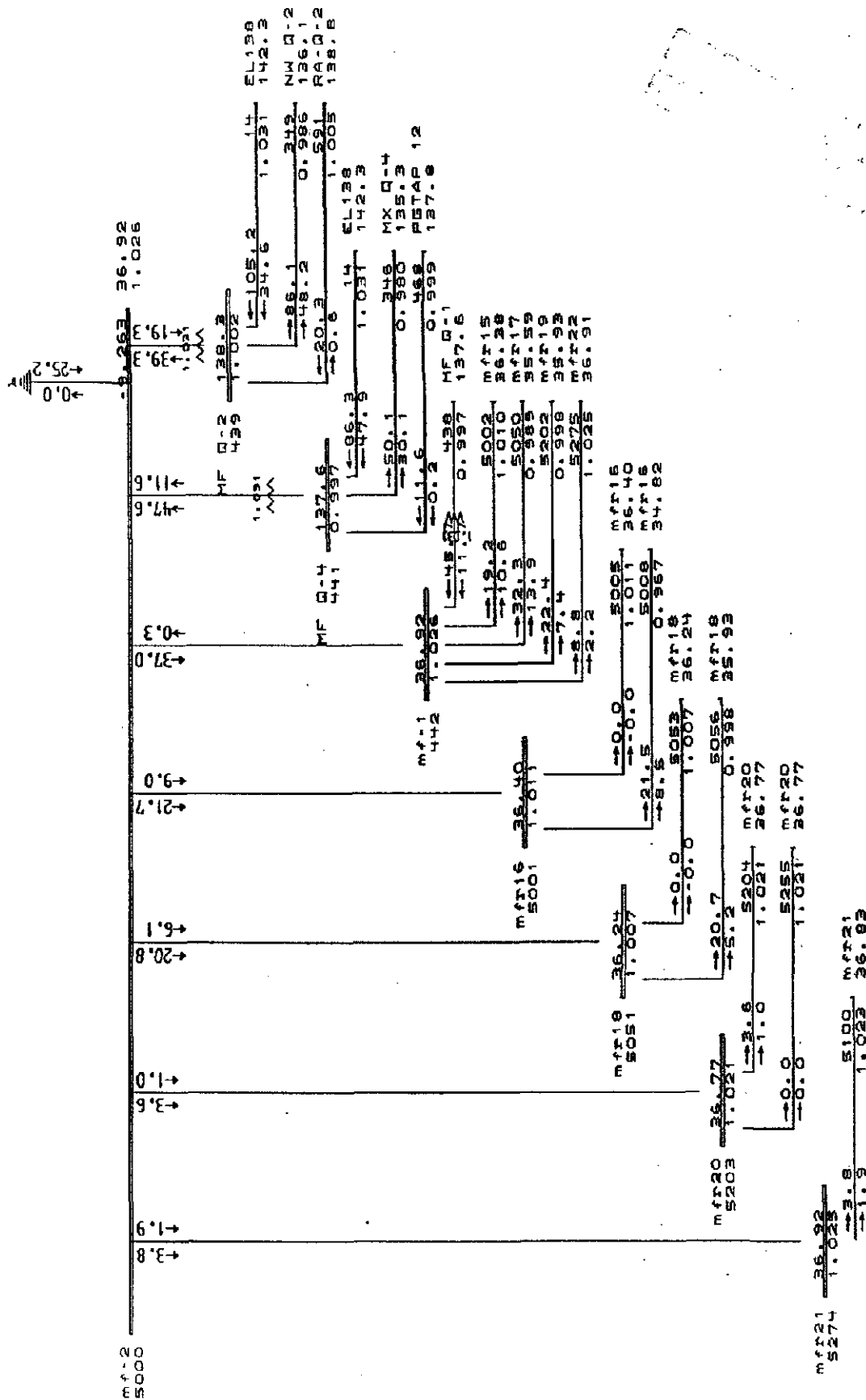
P mis = -0.0054 MW
Q mis = -0.0154 MVAR

-98rach.sav

MP @ 142 MVA (K143)
RA @ 57



P MIS = 0.0000 MW
 Q MIS = -0.0000 MVAR
 98rach.sav



PSLF Program

General Electric Company

GENERAL
ELECTRIC
COMPANY

DISTRIBUTION 1998 BASE CASE - WITH RACHEL - 98RACH.SAV
 Transmission Base Case 93502ARS.E5A02EQ REFERENCE CASE: VENTNOR.SA0935
 cel distribution system detail system only

1998 36KV Base Case - w/ Rachel

14/11/98

14/11/98 15:12:31:50 1998

98rach.sav

DISTRIBUTION 1998 BASE CASE - WITH RACHEL - 98RACH.SAV

Transmission Base Case 93SECARS.ESAV92EQ REFERENCE CASE: VEMTRJF.SAV93S

Zone	Zone_name	Pgen	Qgen	Pload	Qload	Ipload	Iqload	Gload	Bload	Pshunt
0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0	Zone0	3974.2	1761.8	2071.8	1000.9	0.0	0.0	0.0	0.0	0.0
1	Ivy	0.0	0.0	198.8	77.7	0.0	0.0	0.0	0.0	0.0
2	Dawson	0.0	0.0	210.8	41.8	0.0	0.0	0.0	0.0	0.0
3	Mayfield	0.0	0.0	138.5	30.7	0.0	0.0	0.0	0.0	0.0
4	Sanborn	0.0	0.0	113.8	27.9	0.0	0.0	0.0	0.0	0.0
5	Groveswood	0.0	0.0	131.4	51.4	0.0	0.0	0.0	0.0	0.0
6	Hummel	0.0	0.0	179.2	54.2	0.0	0.0	0.0	0.0	0.0
7	Northfield	0.0	0.0	161.5	46.3	0.0	0.0	0.0	0.0	0.0
8	Nathan	0.0	0.0	44.5	14.3	0.0	0.0	0.0	0.0	0.0
9	Nursery	0.0	0.0	116.2	28.3	0.0	0.0	0.0	0.0	0.0
10	Lloyd	0.0	0.0	165.5	46.8	0.0	0.0	0.0	0.0	0.0
11	Jordan	0.0	0.0	235.2	64.1	0.0	0.0	0.0	0.0	0.0
12	Avondale	0.0	0.0	63.4	34.4	0.0	0.0	0.0	0.0	0.0
13	Rachel	0.0	0.0	54.0	20.3	0.0	0.0	0.0	0.0	0.0
14	Zone14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

LS

641 ~ 241 ~

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DISTRIBUTION 1990 BASE CASE - WITH RACHEL - 90RACH.SAV

Transmission Base Case 93SECARS.ESAV92EQ REFERENCE CASE: VEMNTRJF.SAV93S

[illegible]

DISTRIBUTION 1998 BASE CASE - WITH RACHEL - 98RACH.SAV

Transmission Base Case 93SECARS.E5AV92EQ REFERENCE CASE: VEMNTRJF.SAV93S

BUS-NO-	--KV--	TP	VSCHED	-V-FU-	--DEG-	AR	ZONE	-Vmax-	-Vmin-	YI	MI	DI	YO	MO	DO
5013	13.20	1	1.0000	0.9752	-14.20	4	3	1.0200	0.9500	90	01	1	89	12	31
5020	13.20	1	1.0000	0.9685	-17.22	4	3	1.0200	0.9500	90	01	1	89	12	31
5023	13.20	1	1.0000	0.9869	-22.44	4	3	1.0200	0.9500	90	01	1	89	12	31
5030	13.20	1	1.0000	0.9973	-20.42	4	3	1.0200	0.9500	90	01	1	89	12	31
5054	13.20	1	1.0000	0.9949	-20.97	4	3	1.0200	0.9500	90	01	1	89	12	31
5059	4.16	1	1.0000	0.9363	-15.42	4	3	1.0200	0.9500	90	01	1	89	12	31
5066	4.80	1	1.0000	0.9906	-15.15	4	3	1.0200	0.9500	90	01	1	89	12	31
5071	4.16	1	1.0000	1.0062	-15.66	4	3	1.0200	0.9500	90	01	1	89	12	31
5076	4.60	1	1.0000	0.9990	-17.81	4	3	1.0200	0.9500	90	01	1	89	12	31
5077	4.60	1	1.0000	0.9990	-17.81	4	3	1.0200	0.9500	90	01	1	89	12	31
5078	4.60	1	1.0000	0.9990	-17.81	4	3	1.0200	0.9500	90	01	1	89	12	31
5083	13.20	1	1.0000	0.9978	-17.68	4	3	1.0200	0.9500	90	01	1	89	12	31
5104	4.60	1	1.0000	0.9743	-11.61	4	3	1.0200	0.9500	90	01	1	89	12	31
5114	0.48	1	1.0000	0.9955	-12.39	4	3	1.0200	0.9500	90	01	1	89	12	31
5117	0.48	1	1.0000	1.0177	-12.50	4	3	1.0200	0.9500	90	01	1	89	12	31
5119	4.60	1	1.0000	1.0977	-11.70	4	3	1.0200	0.9500	90	01	1	89	12	31
5120	4.60	1	1.0000	1.0977	-11.71	4	3	1.0200	0.9500	90	01	1	89	12	31
5127	4.80	1	1.0000	1.0725	-11.98	4	3	1.0200	0.9500	90	01	1	89	12	31
5131	4.60	1	1.0000	1.1550	-12.50	4	3	1.0200	0.9500	90	01	1	89	12	31
5136	4.60	1	1.0000	1.0002	-12.06	4	3	1.0200	0.9500	90	01	1	89	12	31
5152	13.20	1	1.0000	0.9959	-18.40	4	13	1.0200	0.9500	90	01	1	89	12	31
5155	0.48	1	1.0000	1.0028	-14.05	4	13	1.0200	0.9500	90	01	1	89	12	31
5210	0.48	1	1.0000	1.0233	-11.49	4	3	1.0200	0.9500	90	01	1	89	12	31
5213	4.60	1	1.0000	0.9968	-14.25	4	3	1.0200	0.9500	90	01	1	89	12	31
5219	4.60	1	1.0000	1.0000	-22.17	4	13	1.0200	0.9500	90	01	1	89	12	31
5237	2.40	1	1.0000	1.0000	-24.00	4	13	1.0200	0.9500	90	01	1	89	12	31
5240	4.16	1	1.0000	1.0000	-25.08	4	13	1.0200	0.9500	90	01	1	89	12	31
5243	13.20	1	1.0000	1.0000	-26.13	4	3	1.0200	0.9500	90	01	1	89	12	31
5247	4.60	1	1.0000	0.9813	-17.00	4	3	1.0200	0.9500	90	01	1	89	12	31
5251	0.48	1	1.0000	0.9785	-15.13	4	3	1.0200	0.9500	90	01	1	89	12	31
5253	0.48	1	1.0000	0.9671	-15.54	4	3	1.0200	0.9500	90	01	1	89	12	31
5262	4.60	1	1.0000	0.9539	-16.43	4	3	1.0200	0.9500	90	01	1	89	12	31
5265	2.40	1	1.0000	0.9933	-15.87	4	3	1.0200	0.9500	90	01	1	89	12	31
5268	13.20	1	1.0000	0.9961	-17.97	4	3	1.0200	0.9500	90	01	1	89	12	31
5282	13.20	1	1.0000	0.9751	-14.20	4	3	1.0200	0.9500	90	01	1	89	12	31
5283	0.48	1	1.0000	0.9949	-12.44	4	3	1.0200	0.9500	90	01	1	89	12	31
5284	0.24	1	1.0000	1.0246	-11.43	4	3	1.0200	0.9500	90	01	1	89	12	31
7014	4.60	1	1.0000	1.0908	-17.88	4	4	1.0200	0.9500	90	01	1	89	12	31

DISTRIBUTION 1998 BASE CASE - WITH RACHEL - 98RACH.SAV

Transmission Base Case 93SECARS.ESAV92EQ REFERENCE CASE: VEMNTR3F.SAV93S

BUS-NO-	--KV--	TP	VSCHED	-V-PU-	--DEG-	AR	ZONE	-Vmax-	-Vmin-	YI	MI	DI	YO	MO	DO
35143	4.60	1	1.0000	1.0762	-15.11	4	13	1.0200	0.9500	90	01	1	89	12	31
35146	4.16	1	1.0000	1.0575	-16.45	4	13	1.0200	0.9500	90	01	1	89	12	31
35149	4.60	1	1.0000	1.1487	-15.93	4	13	1.0200	0.9500	90	01	1	89	12	31
35158	4.60	1	1.0000	1.1042	-12.61	4	13	1.0200	0.9500	90	01	1	89	12	31
35161	4.60	1	1.0000	1.1329	-13.29	4	13	1.0200	0.9500	90	01	1	89	12	31
35166	2.40	1	1.0000	1.1142	-12.74	4	13	1.0200	0.9500	90	01	1	89	12	31
35168	4.16	1	1.0000	1.0501	-13.21	4	13	1.0200	0.9500	90	01	1	89	12	31
35222	2.40	1	1.0000	1.0299	-16.69	4	13	1.0200	0.9500	90	01	1	89	12	31
35227	0.48	1	1.0000	1.0107	-16.10	4	13	1.0200	0.9500	90	01	1	89	12	31
35228	0.48	1	1.0000	1.0491	-15.25	4	13	1.0200	0.9500	90	01	1	89	12	31
35231	0.48	1	1.0000	1.0152	-16.80	4	13	1.0200	0.9500	90	01	1	89	12	31
35234	4.16	1	1.0000	1.0249	-15.93	4	13	1.0200	0.9500	90	01	1	89	12	31
35270	0.48	1	1.0000	1.0289	-16.82	4	13	1.0200	0.9500	90	01	1	89	12	31

BASE CASE STUDY: 98RACH1.SAV

- **1998 Forecasted Loads**
- **Rachel in service**
- **Single transformer contingency**
- **No overloads**
- **No voltage violations**

DISTRIBUTION 1998 BASE CASE - WITH RACHEL - single contingency

US-NO-	--KV--	TP	VSCHED	-V-PG-	--DEG-	AR	ZONE	-Vmax-	-Vmin-	YI	MI	DI	YO	MO	DO
5013	13.20	1	1.0000	0.9860	-18.32	4	3	1.0200	0.9500	90	01	1	89	12	31
5020	13.20	1	1.0000	0.9795	-21.29	4	3	1.0200	0.9500	90	01	1	89	12	31
5023	13.20	1	1.0000	0.9949	-26.36	4	3	1.0200	0.9500	90	01	1	89	12	31
5030	13.20	1	1.0000	0.9977	-24.41	4	3	1.0200	0.9500	90	01	1	89	12	31
5054	13.20	1	1.0000	0.9957	-24.94	4	3	1.0200	0.9500	90	01	1	89	12	31
5059	4.16	1	1.0000	0.9484	-19.53	4	3	1.0200	0.9500	90	01	1	89	12	31
5066	4.80	1	1.0000	0.9992	-19.26	4	3	1.0200	0.9500	90	01	1	89	12	31
5071	4.16	1	1.0000	1.0148	-19.76	4	3	1.0200	0.9500	90	01	1	89	12	31
5076	4.60	1	1.0000	0.9949	-21.87	4	3	1.0200	0.9500	90	01	1	89	12	31
5077	4.60	1	1.0000	0.9949	-21.87	4	3	1.0200	0.9500	90	01	1	89	12	31
5078	4.60	1	1.0000	0.9949	-21.87	4	3	1.0200	0.9500	90	01	1	89	12	31
5083	13.20	1	1.0000	0.9942	-21.74	4	3	1.0200	0.9500	90	01	1	89	12	31
5104	4.60	1	1.0000	0.9836	-15.79	4	3	1.0200	0.9500	90	01	1	89	12	31
5114	0.48	1	1.0000	1.0058	-16.55	4	3	1.0200	0.9500	90	01	1	89	12	31
5117	0.48	1	1.0000	1.0283	-16.66	4	3	1.0200	0.9500	90	01	1	89	12	31
5119	4.60	1	1.0000	1.1085	-15.88	4	3	1.0200	0.9500	90	01	1	89	12	31
5120	4.60	1	1.0000	1.1085	-15.89	4	3	1.0200	0.9500	90	01	1	89	12	31
5127	4.80	1	1.0000	1.0835	-16.16	4	3	1.0200	0.9500	90	01	1	89	12	31
5131	4.60	1	1.0000	1.1654	-16.67	4	3	1.0200	0.9500	90	01	1	89	12	31
5136	4.60	1	1.0000	0.9968	-16.23	4	3	1.0200	0.9500	90	01	1	89	12	31
5152	13.20	1	1.0000	0.9959	-18.40	4	13	1.0200	0.9500	90	01	1	89	12	31
5155	0.48	1	1.0000	1.0028	-14.04	4	13	1.0200	0.9500	90	01	1	89	12	31
5210	0.48	1	1.0000	1.0333	-15.67	4	3	1.0200	0.9500	90	01	1	89	12	31
5213	4.60	1	1.0000	0.9942	-18.38	4	3	1.0200	0.9500	90	01	1	89	12	31
5219	4.60	1	1.0000	1.0000	-22.17	4	13	1.0200	0.9500	90	01	1	89	12	31
5237	2.40	1	1.0000	1.0000	-24.00	4	13	1.0200	0.9500	90	01	1	89	12	31
5240	4.16	1	1.0000	1.0000	-25.08	4	13	1.0200	0.9500	90	01	1	89	12	31
5243	13.20	1	1.0000	1.0000	-26.13	4	3	1.0200	0.9500	90	01	1	89	12	31
5247	4.60	1	1.0000	0.9925	-21.07	4	3	1.0200	0.9500	90	01	1	89	12	31
5251	0.48	1	1.0000	0.9897	-19.24	4	3	1.0200	0.9500	90	01	1	89	12	31
5253	0.48	1	1.0000	0.9785	-19.64	4	3	1.0200	0.9500	90	01	1	89	12	31
5262	4.60	1	1.0000	0.9643	-20.51	4	3	1.0200	0.9500	90	01	1	89	12	31
5265	2.40	1	1.0000	1.0039	-19.96	4	3	1.0200	0.9500	90	01	1	89	12	31
5268	13.20	1	1.0000	0.9948	-22.02	4	3	1.0200	0.9500	90	01	1	89	12	31
5282	13.20	1	1.0000	0.9859	-18.33	4	3	1.0200	0.9500	90	01	1	89	12	31
5283	0.48	1	1.0000	1.0051	-16.60	4	3	1.0200	0.9500	90	01	1	89	12	31
5284	0.24	1	1.0000	1.0345	-15.62	4	3	1.0200	0.9500	90	01	1	89	12	31

ISTRIBUTION 1998 BASE CASE - WITH RACHEL - single contingency

-----Zone_name-----	-Pgen--	-Qgen--	-Pload-	-Qload-	Ipload-	Iqload-	-Gload-	-Bload-	Pshunt-
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Zone0	3974.6	1771.9	2071.8	1000.9	0.0	0.0	0.0	0.0	0.0
1 Ivy	0.0	0.0	198.8	77.7	0.0	0.0	0.0	0.0	0.0
2 Dawson	0.0	0.0	210.8	41.8	0.0	0.0	0.0	0.0	0.0
3 Mayfield	0.0	0.0	138.5	30.7	0.0	0.0	0.0	0.0	0.0
4 Sanborn	0.0	0.0	113.8	27.9	0.0	0.0	0.0	0.0	0.0
5 Grovewood	0.0	0.0	131.4	51.4	0.0	0.0	0.0	0.0	0.0
6 Hummel	0.0	0.0	179.2	54.2	0.0	0.0	0.0	0.0	0.0
7 Northfield	0.0	0.0	161.5	46.3	0.0	0.0	0.0	0.0	0.0
8 Nathan	0.0	0.0	44.5	14.3	0.0	0.0	0.0	0.0	0.0
9 Nursery	0.0	0.0	116.2	28.3	0.0	0.0	0.0	0.0	0.0
10 Lloyd	0.0	0.0	165.5	46.8	0.0	0.0	0.0	0.0	0.0
11 Jordan	0.0	0.0	235.2	64.1	0.0	0.0	0.0	0.0	0.0
12 Avondale	0.0	0.0	63.4	34.4	0.0	0.0	0.0	0.0	0.0
13 Rachel	0.0	0.0	54.0	20.3	0.0	0.0	0.0	0.0	0.0

DISTRIBUTION 1998 BASE CASE - WITH RACHEL - single contingency

rt	-Psvd--	-Qsvd--	-Int_mw	-Int_mv	Loss_mw	Loss_mv	buses	lines	trans	gens	load	shnt	svds	dcb	dcc	dcl
0.0	0.0	0.0	0.0	0.0	0.00	0.00	0	0	0	0	0	0	0	0	0	0
229.1	0.0	0.0	1847.1	496.5	55.75	503.61	358	320	174	14	109	13	0	0	0	0
-46.0	0.0	0.0	-204.3	-106.3	5.56	74.64	204	169	44	0	42	3	0	0	0	0
-64.6	0.0	0.0	-217.5	-25.0	6.66	47.84	137	115	28	0	29	2	0	0	0	0
-25.7	0.0	0.0	-146.7	-62.0	4.96	49.14	161	124	34	0	32	1	0	0	0	0
0.0	0.0	0.0	-119.2	-59.6	5.38	31.72	224	181	44	0	42	0	0	0	0	0
-62.5	0.0	0.0	-135.0	-11.0	3.56	22.16	249	203	52	0	53	2	0	0	0	0
-59.6	0.0	0.0	-184.9	-48.7	5.63	54.09	330	279	66	0	63	2	0	0	0	0
-45.8	0.0	0.0	-165.7	-35.1	4.17	34.60	334	276	67	0	63	2	0	0	0	0
-53.0	0.0	0.0	-45.3	33.2	0.76	5.46	87	75	13	0	13	2	0	0	0	0
-23.0	0.0	0.0	-121.5	-39.1	5.27	33.76	208	180	38	0	35	2	0	0	0	0
-23.2	0.0	0.0	-168.3	-55.5	2.85	31.90	226	181	62	0	58	2	0	0	0	0
-58.4	0.0	0.0	-240.8	-73.1	5.60	67.38	224	180	58	0	53	2	0	0	0	0
-30.8	0.0	0.0	-64.1	-13.8	0.76	10.28	45	36	13	0	9	2	0	0	0	0
-21.3	0.0	0.0	-32.8	-0.0	1.72	15.91	73	54	19	0	18	3	0	0	0	0

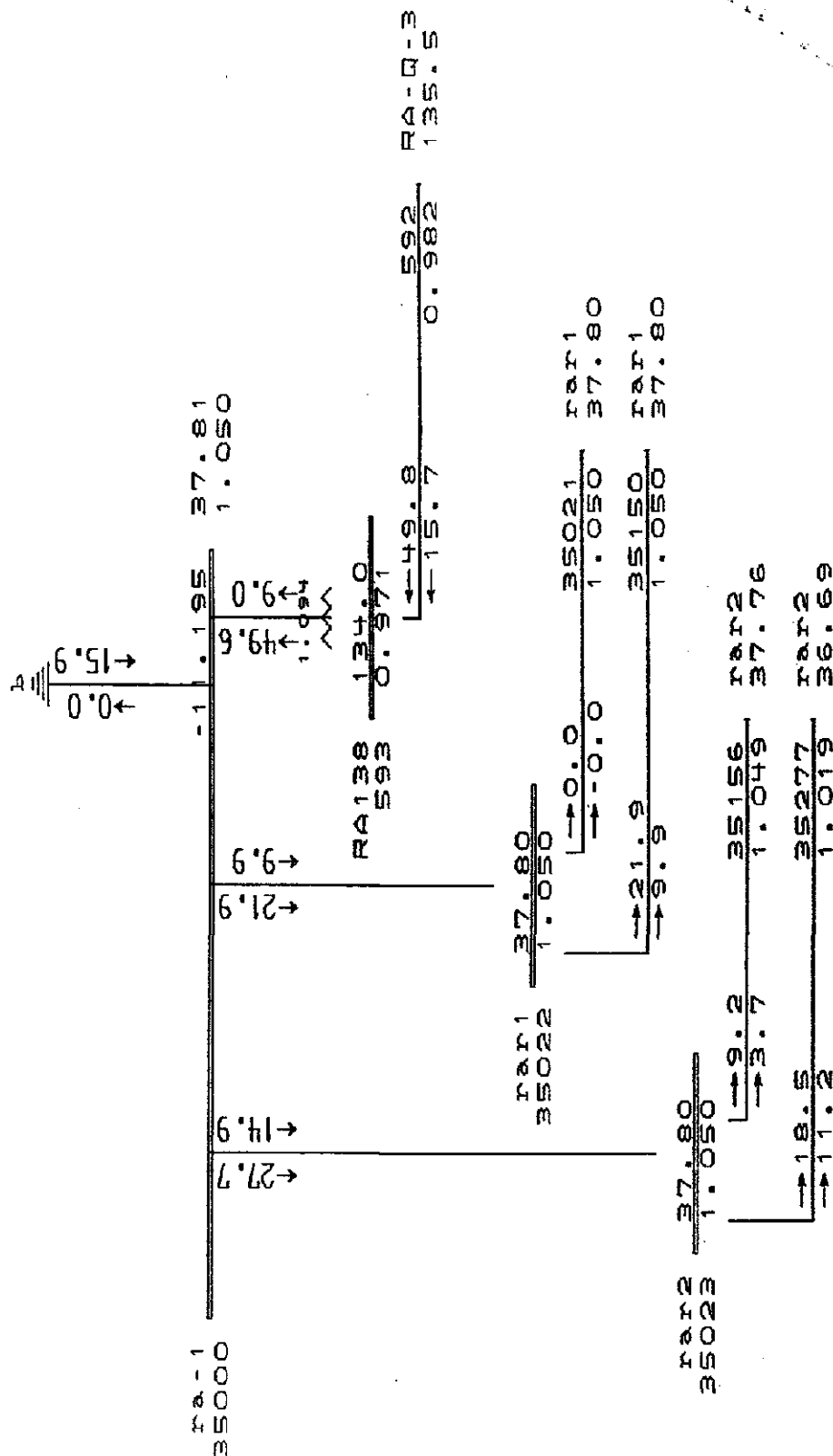
CONFIDENTIAL

DISTRIBUTION 1998 BASE CASE - WITH RACHEL - single contingency

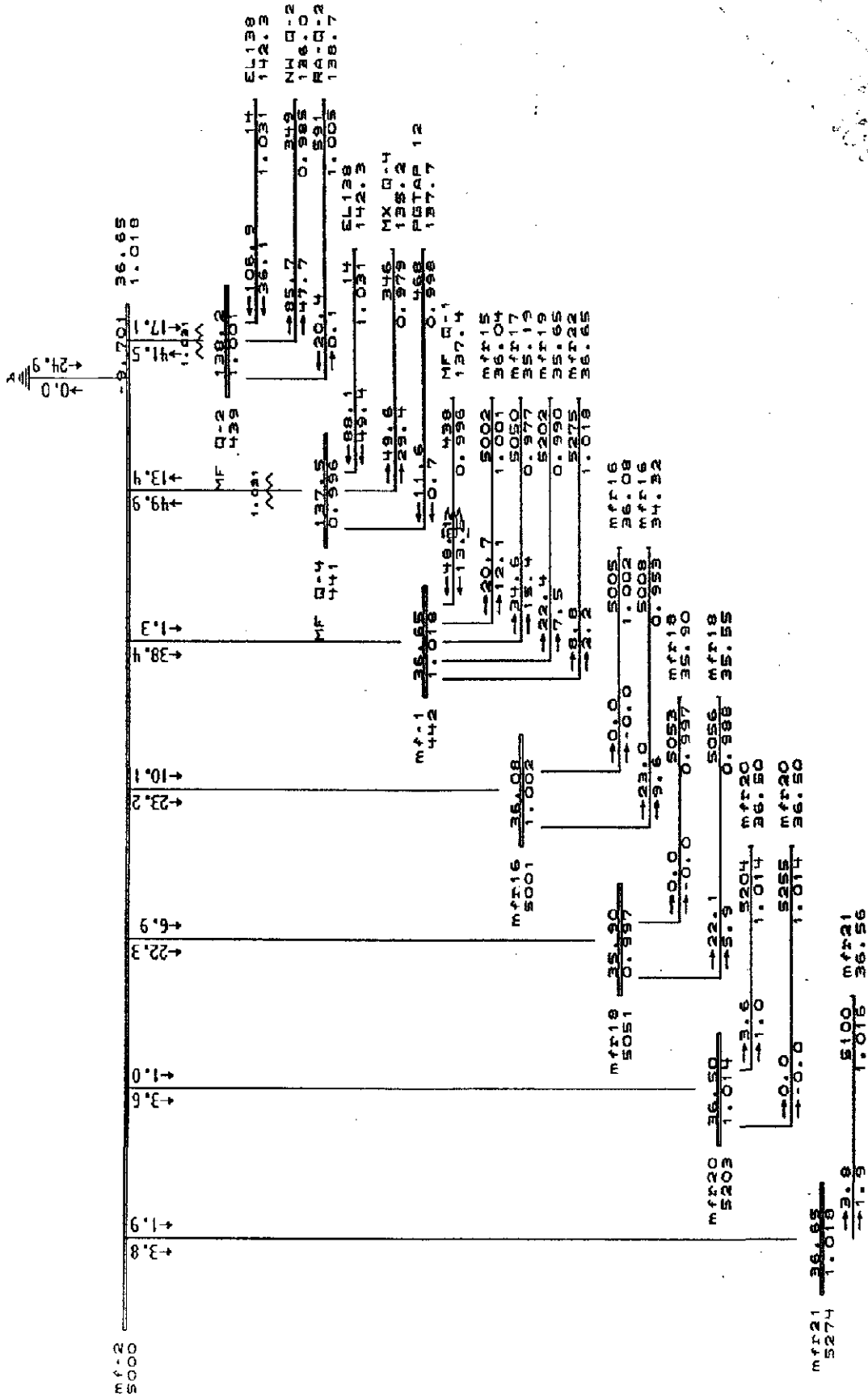
US-NO-	--KV--	TP	VSCHED	-V-PU-	--DEG--	AR	ZONE	-Vmax-	-Vmin-	YI	MI	DI	YO	MO	DO
35017	4.60	1	1.0000	1.0329	-18.99	4	4	1.0200	0.9500	90	01	1	89	12	31
35020	4.60	1	1.0000	1.0353	-20.10	4	4	1.0200	0.9500	90	01	1	89	12	31
35030	0.48	1	1.0000	1.0784	-13.07	4	132	1.0200	0.9500	90	01	1	89	12	31
35143	4.60	1	1.0000	1.0763	-15.10	4	13	1.0200	0.9500	90	01	1	89	12	31
35146	4.16	1	1.0000	1.0576	-16.44	4	13	1.0200	0.9500	90	01	1	89	12	31
35149	4.60	1	1.0000	1.1488	-15.92	4	13	1.0200	0.9500	90	01	1	89	12	31
35158	4.60	1	1.0000	1.1042	-12.60	4	13	1.0200	0.9500	90	01	1	89	12	31
35161	4.60	1	1.0000	1.1330	-13.28	4	13	1.0200	0.9500	90	01	1	89	12	31
35166	2.40	1	1.0000	1.1143	-12.73	4	13	1.0200	0.9500	90	01	1	89	12	31
35168	4.16	1	1.0000	1.0502	-13.20	4	13	1.0200	0.9500	90	01	1	89	12	31
35222	2.40	1	1.0000	1.0299	-16.69	4	13	1.0200	0.9500	90	01	1	89	12	31
35227	0.48	1	1.0000	1.0107	-16.10	4	13	1.0200	0.9500	90	01	1	89	12	31
35228	0.48	1	1.0000	1.0491	-15.25	4	13	1.0200	0.9500	90	01	1	89	12	31
35231	0.48	1	1.0000	1.0152	-16.80	4	13	1.0200	0.9500	90	01	1	89	12	31
35234	4.16	1	1.0000	1.0249	-15.92	4	13	1.0200	0.9500	90	01	1	89	12	31
35270	0.48	1	1.0000	1.0289	-16.81	4	13	1.0200	0.9500	90	01	1	89	12	31

BASE CASE STUDY: 2000OPSB.SAV

- **2000 Forecasted Load Data**
- **Rachel in service**
- **No overloads**
- **No voltage violations**



E mis = 0.0000 MW
Q mis = 0.0000 MVAR
2000rachopsb.sa



PSLF Program

GENERAL ELECTRIC COMPANY
ELECTRIC
COMPANY

DISTRIBUTION 2000 BASE CASE - WITH RACHEL - NO CONTINGENCIES

cell distribution system detail only

2000 35MW Base Case - w/ Rachel

PM/PMR

MEF May 15 16:01:21 1996

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DISTRIBUTION 2000 BASE CASE - WITH RACHEL - no contingencies

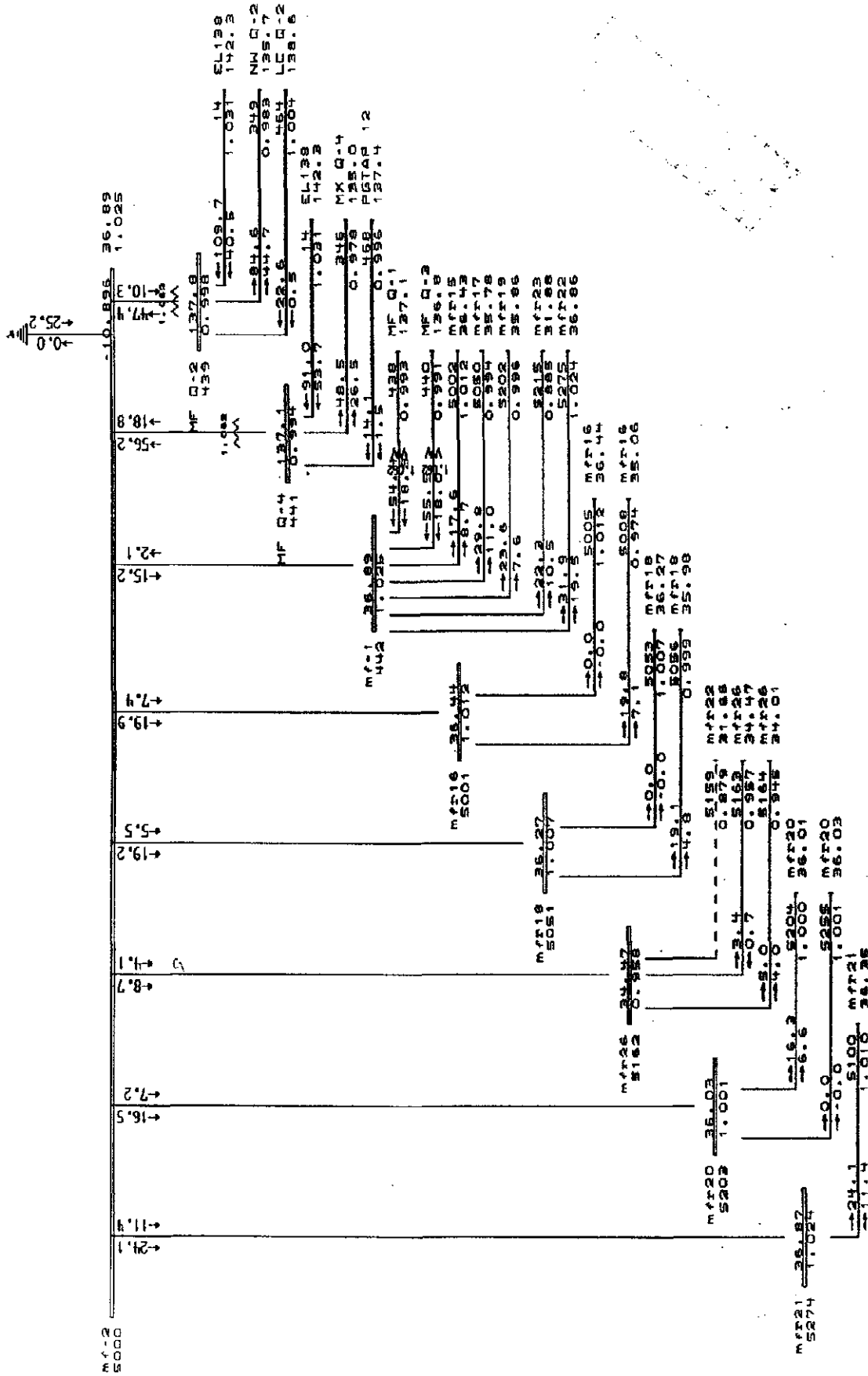
BUS-NO-	--KV--	TP	VSCHED	-V-PU-	--DEG-	AR	ZONE	-Vmax-	-Vmin-	YI	MI	DI	YO	MO	DO
5013	13.20	1	1.0000	0.9602	-15.08	4	3	1.0200	0.9500	90	01	1	89	12	31
5020	13.20	1	1.0000	0.9526	-18.41	4	3	1.0200	0.9500	90	01	1	89	12	31
5023	13.20	1	1.0000	0.9586	-24.31	4	3	1.0200	0.9500	90	01	1	89	12	31
5030	13.20	1	1.0000	0.9991	-21.97	4	3	1.0200	0.9500	90	01	1	89	12	31
5054	13.20	1	1.0000	0.9946	-22.53	4	3	1.0200	0.9500	90	01	1	89	12	31
5059	4.16	1	1.0000	0.9209	-16.42	4	3	1.0200	0.9500	90	01	1	89	12	31
5066	4.80	1	1.0000	0.9794	-16.11	4	3	1.0200	0.9500	90	01	1	89	12	31
5071	4.16	1	1.0000	0.9943	-16.67	4	3	1.0200	0.9500	90	01	1	89	12	31
5076	4.60	1	1.0000	0.9952	-19.04	4	3	1.0200	0.9500	90	01	1	89	12	31
5077	4.60	1	1.0000	0.9952	-19.04	4	3	1.0200	0.9500	90	01	1	89	12	31
5078	4.60	1	1.0000	0.9952	-19.04	4	3	1.0200	0.9500	90	01	1	89	12	31
5083	13.20	1	1.0000	0.9945	-18.90	4	3	1.0200	0.9500	90	01	1	89	12	31
5104	4.60	1	1.0000	0.9671	-12.08	4	3	1.0200	0.9500	90	01	1	89	12	31
5114	0.48	1	1.0000	0.9875	-12.87	4	3	1.0200	0.9500	90	01	1	89	12	31
5117	0.48	1	1.0000	1.0094	-12.99	4	3	1.0200	0.9500	90	01	1	89	12	31
5119	4.60	1	1.0000	1.0893	-12.18	4	3	1.0200	0.9500	90	01	1	89	12	31
5120	4.60	1	1.0000	1.0893	-12.18	4	3	1.0200	0.9500	90	01	1	89	12	31
5127	4.80	1	1.0000	1.0638	-12.46	4	3	1.0200	0.9500	90	01	1	89	12	31
5131	4.60	1	1.0000	1.1461	-12.99	4	3	1.0200	0.9500	90	01	1	89	12	31
5136	4.60	1	1.0000	0.9992	-12.54	4	3	1.0200	0.9500	90	01	1	89	12	31
5152	13.20	1	1.0000	1.0024	-18.78	4	13	1.0200	0.9500	90	01	1	89	12	31
5155	0.48	1	1.0000	1.0032	-14.43	4	13	1.0200	0.9500	90	01	1	89	12	31
5210	0.48	1	1.0000	1.0155	-11.96	4	3	1.0200	0.9500	90	01	1	89	12	31
5213	4.60	1	1.0000	0.9952	-14.76	4	3	1.0200	0.9500	90	01	1	89	12	31
5219	4.60	1	1.0000	1.0000	-22.17	4	13	1.0200	0.9500	90	01	1	89	12	31
5237	2.40	1	1.0000	1.0000	-24.00	4	13	1.0200	0.9500	90	01	1	89	12	31
5240	4.16	1	1.0000	1.0000	-25.08	4	13	1.0200	0.9500	90	01	1	89	12	31
5243	13.20	1	1.0000	1.0000	-26.13	4	3	1.0200	0.9500	90	01	1	89	12	31
5247	4.60	1	1.0000	0.9726	-17.57	4	3	1.0200	0.9500	90	01	1	89	12	31
5251	0.48	1	1.0000	0.9697	-15.67	4	3	1.0200	0.9500	90	01	1	89	12	31
5253	0.48	1	1.0000	0.9582	-16.08	4	3	1.0200	0.9500	90	01	1	89	12	31
5262	4.60	1	1.0000	0.9457	-16.98	4	3	1.0200	0.9500	90	01	1	89	12	31
5265	2.40	1	1.0000	0.9850	-16.41	4	3	1.0200	0.9500	90	01	1	89	12	31
5268	13.20	1	1.0000	0.9996	-18.56	4	3	1.0200	0.9500	90	01	1	89	12	31
5282	13.20	1	1.0000	0.9601	-15.08	4	3	1.0200	0.9500	90	01	1	89	12	31
5283	0.48	1	1.0000	0.9868	-12.92	4	3	1.0200	0.9500	90	01	1	89	12	31
5284	0.24	1	1.0000	1.0168	-11.90	4	3	1.0200	0.9500	90	01	1	89	12	31

BASE CASE STUDY: 36KVALT982.SAV

- **1998 Forecasted Load Data**
- **36KV Distribution alternative**
- **No contingencies**
- **New transformer at Mayfield**
- **2 new 36KV circuits**
- **No transformer overloads**
- **8 voltage violations**

P MIS = -0.0000 MW
Q MIS = 0.0000 MVAR

-36kvalt982.sav



CONFIDENTIAL

DISTRIBUTION 2000 BASE CASE - WITH RACHEL - no contingencies

BUS-NO-	--KV--	TP	VSCHED	-V-PU-	--DEG-	AR	ZONE	-Vmax-	-Vmin-	YI	MI	DI	YO	MO	DO
35143	4.60	1	1.0000	1.0746	-15.75	4	13	1.0200	0.9500	90	01	1	89	12	31
35146	4.16	1	1.0000	1.0518	-17.17	4	13	1.0200	0.9500	90	01	1	89	12	31
35149	4.60	1	1.0000	1.1447	-16.62	4	13	1.0200	0.9500	90	01	1	89	12	31
35158	4.60	1	1.0000	1.1045	-13.09	4	13	1.0200	0.9500	90	01	1	89	12	31
35161	4.60	1	1.0000	1.1321	-13.81	4	13	1.0200	0.9500	90	01	1	89	12	31
35166	2.40	1	1.0000	1.1123	-13.23	4	13	1.0200	0.9500	90	01	1	89	12	31
35168	4.16	1	1.0000	1.0472	-13.73	4	13	1.0200	0.9500	90	01	1	89	12	31
35222	2.40	1	1.0000	1.0253	-17.44	4	13	1.0200	0.9500	90	01	1	89	12	31
35227	0.48	1	1.0000	1.0054	-16.81	4	13	1.0200	0.9500	90	01	1	89	12	31
35228	0.48	1	1.0000	1.0443	-15.90	4	13	1.0200	0.9500	90	01	1	89	12	31
35231	0.48	1	1.0000	1.0101	-17.55	4	13	1.0200	0.9500	90	01	1	89	12	31
35234	4.16	1	1.0000	1.0201	-16.62	4	13	1.0200	0.9500	90	01	1	89	12	31
35270	0.48	1	1.0000	1.0228	-17.57	4	13	1.0200	0.9500	90	01	1	89	12	31

CONFIDENTIAL

DISTRIBUTION 2000 BASE CASE - WITH RACHEL - no contingencies

ne	Zone_name	-Pgen-	-Qgen-	-Pload-	-Qload-	Ipload-	Iqload-	-Cload-	-Bload-	Pshunt-
0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zone0	3983.5	1774.5	2071.8	1000.9	0.0	0.0	0.0	0.0	0.0
1	Ivy	0.0	0.0	198.8	77.7	0.0	0.0	0.0	0.0	0.0
2	Dawson	0.0	0.0	210.8	41.8	0.0	0.0	0.0	0.0	0.0
3	Mayfield	0.0	0.0	144.6	32.1	0.0	0.0	0.0	0.0	0.0
4	Sanborn	0.0	0.0	114.1	27.9	0.0	0.0	0.0	0.0	0.0
5	Groveswood	0.0	0.0	131.4	51.4	0.0	0.0	0.0	0.0	0.0
6	Hummel	0.0	0.0	179.2	54.2	0.0	0.0	0.0	0.0	0.0
7	Northfield	0.0	0.0	161.5	46.3	0.0	0.0	0.0	0.0	0.0
8	Nathan	0.0	0.0	44.5	14.3	0.0	0.0	0.0	0.0	0.0
9	Nursery	0.0	0.0	116.2	28.3	0.0	0.0	0.0	0.0	0.0
10	Lloyd	0.0	0.0	165.5	46.8	0.0	0.0	0.0	0.0	0.0
11	Jordan	0.0	0.0	235.2	54.1	0.0	0.0	0.0	0.0	0.0
12	Avondale	0.0	0.0	63.4	34.4	0.0	0.0	0.0	0.0	0.0
13	Rachel	0.0	0.0	55.5	20.8	0.0	0.0	0.0	0.0	0.0

DISTRIBUTION 2000 BASE CASE - WITH RACHEL - no contingencies

hunt-	-Psvd--	-Qsvd--	-Int_mw	-Int_mv	Loss_mw	Loss_mv	buses	lines	trans	gens	load	shnt	svds	dob	doc	dcl
.0	0.0	0.0	0.0	0.0	0.00	0.00	0	0	0	0	0	0	0	0	0	0
228.3	0.0	0.0	1855.5	490.7	56.20	511.33	358	320	175	14	109	13	0	0	0	0
-46.0	0.0	0.0	-204.3	-106.4	5.56	74.70	204	169	44	0	42	3	0	0	0	0
-64.6	0.0	0.0	-217.5	-25.0	6.66	47.82	137	115	28	0	29	2	0	0	0	0
-24.9	0.0	0.0	-153.0	-54.4	5.19	39.38	161	124	34	0	32	1	0	0	0	0
0.0	0.0	0.0	-119.6	-59.9	5.45	32.04	224	181	44	0	42	0	0	0	0	0
-62.5	0.0	0.0	-135.0	-11.0	1.56	22.16	249	203	52	0	53	2	0	0	0	0
-59.6	0.0	0.0	-184.9	-48.7	5.63	54.09	330	279	66	0	63	2	0	0	0	0
-45.8	0.0	0.0	-165.7	-35.0	4.17	34.50	334	276	67	0	63	2	0	0	0	0
-53.0	0.0	0.0	-45.3	33.2	0.76	5.46	87	75	13	0	13	2	0	0	0	0
-23.0	0.0	0.0	-121.5	-39.1	5.27	33.76	208	180	38	0	35	2	0	0	0	0
-23.2	0.0	0.0	-168.3	-55.5	2.85	31.91	226	181	62	0	58	2	0	0	0	0
-58.3	0.0	0.0	-240.8	-73.1	5.60	67.41	224	180	58	0	53	2	0	0	0	0
-30.9	0.0	0.0	-64.1	-13.8	0.76	10.27	45	36	13	0	9	2	0	0	0	0
-21.3	0.0	0.0	-34.4	-1.5	1.83	16.82	73	54	19	0	16	3	0	0	0	0