

Régie de l'énergie - Dossier R-3960-2016
Investissements Grand-Brûlé-Saint-Sauveur d'Hydro-Québec TransÉnergie

CANADA

PROVINCE DE QUÉBEC
DISTRICT DE MONTRÉAL

DOSSIER R-3960-2016

RÉGIE DE L'ÉNERGIE

INVESTISSEMENTS
GRAND-BRÛLÉ-SAINT-SAUVEUR
D'HYDRO-QUÉBEC TRANSÉNERGIE

HYDRO-QUÉBEC
En sa qualité de Transporteur

Demanderesse

-et-

STRATÉGIES ÉNERGÉTIQUES (S.É.)

ASSOCIATION QUÉBÉCOISE DE LUTTE
CONTRE LA POLLUTION ATMOSPHÉRIQUE
(AQLPA)

Intervenantes

NSTAR SYSTEM PLANNING (NOTE: FOR THE PURPOSE OF ISO-NE)
345kV Transmission Reliability Project. 18.4 Steady State Analysis. Final Draft 2
July 2004, 179 pages

http://www.iso-ne.com/committees/comm_wkgrps/reliability_comm/reliability/mrds/2004/jul222004/345kV%20Project%20-%2018.4%20Report-%20Final%20Draft%202.pdf

L'ensemble de ce document public contient de nombreuses informations techniques sur le réseau, dont de nombreux schémas unifilaires aux pp. 84-123 (reproduits ici).

SÉ-AQLPA invitent respectueusement la Régie à considérer la totalité des 179 pages de ce document public, comme si elles étaient déposées intégralement en preuve au présent dossier. À défaut, SÉ-AQLPA invitent la Régie à permettre le dépôt électronique intégral mais sans copie papier.

Déposé par :
Stratégies Énergétiques (S.É.)
Association québécoise de lutte contre la pollution atmosphérique (AQLPA)
Le 27 avril 2016

SÉ-AQLPA-3 Doc. 3 - NSTAR SYSTEM PLANNING (NOTE: FOR THE PURPOSE OF ISO-NE)
345kV Transmission Reliability Project
Déposé par :
Stratégies Énergétiques – Association québécoise de lutte contre la pollution atmosphérique (SÉ-AQLPA)

*Régie de l'énergie - Dossier R-3960-2016
Investissements Grand-Brûlé-Saint-Sauveur d'Hydro-Québec TransÉnergie*

*SÉ-AQLPA-3 Doc. 3 - NSTAR SYSTEM PLANNING (NOTE: FOR THE PURPOSE OF ISO-NE)
345kV Transmission Reliability Project*

*Déposé par :
Stratégies Énergétiques – Association québécoise de lutte contre la pollution atmosphérique (SÉ-AQLPA)*



345kV Transmission Reliability Project

18.4 Steady State Analysis

Final Draft 2

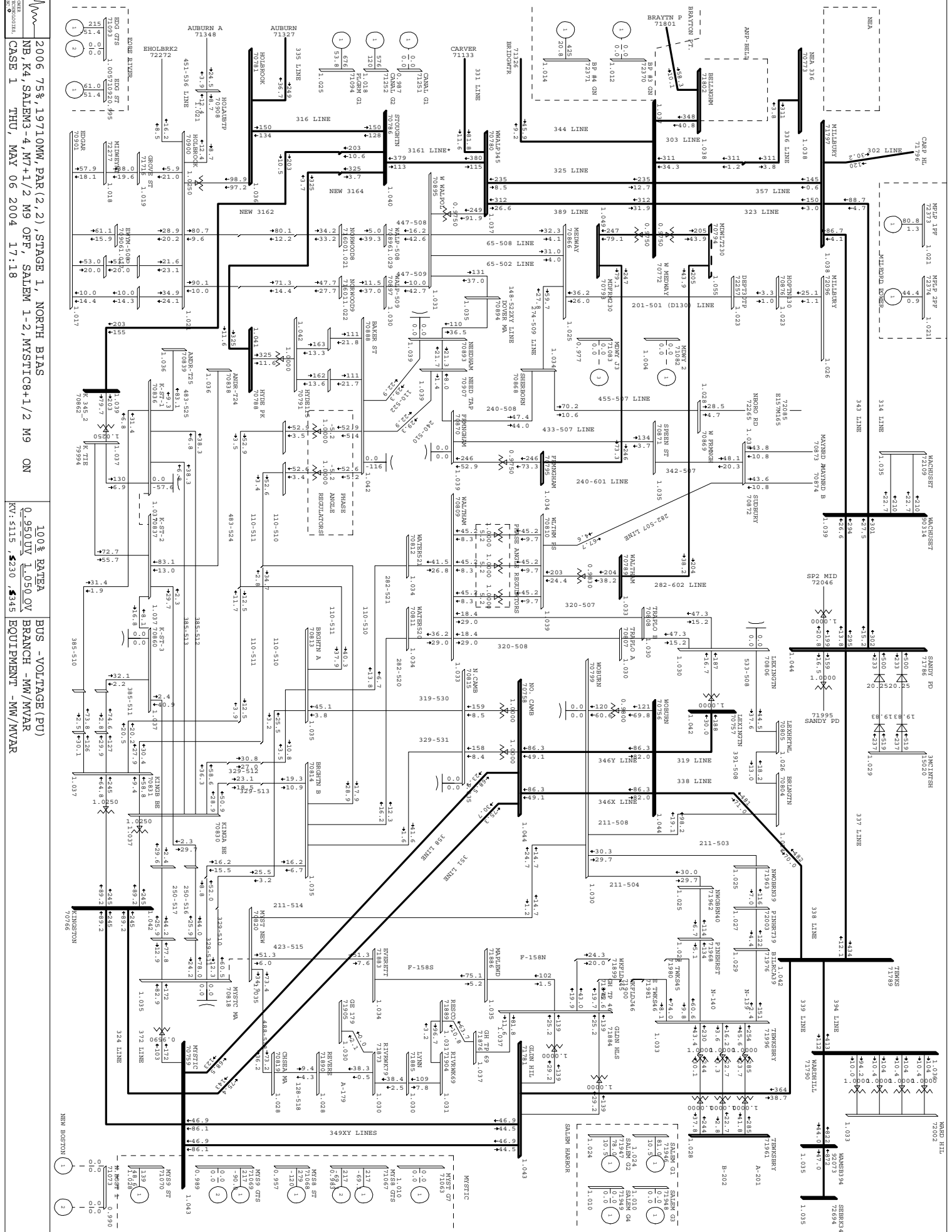
Prepared for the Transmission Task Force
July 2004

Report prepared by: Steven Masse, NSTAR System Planning

Contributors: Carl Jayko, Consulting Engineers Group, Inc
Aditya Upadhye, ISO-NE
Sang Y. Lee, General Electric
Elizabeth R. Pratico, General Electric

Appendix 3

Base Case Loadflow Diagrams

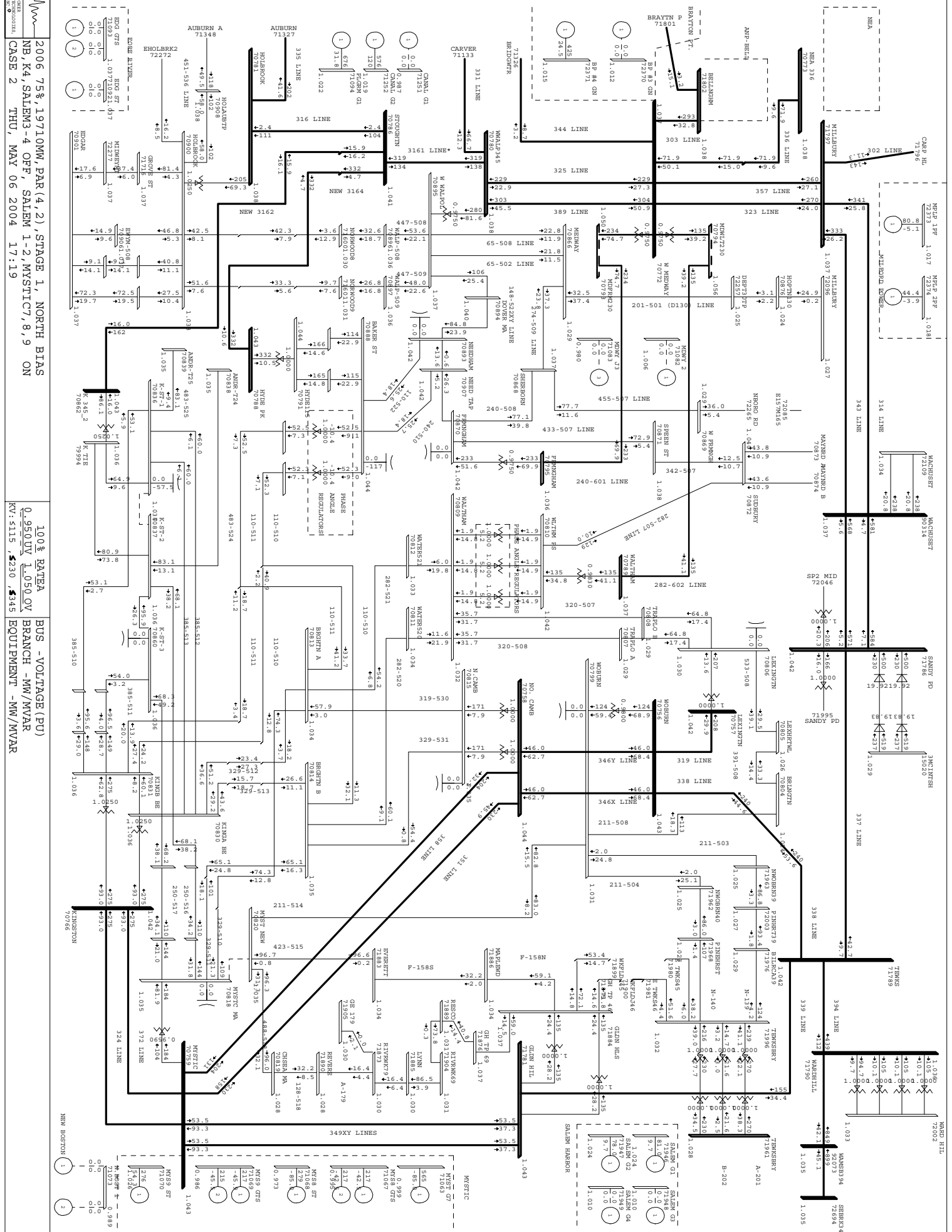


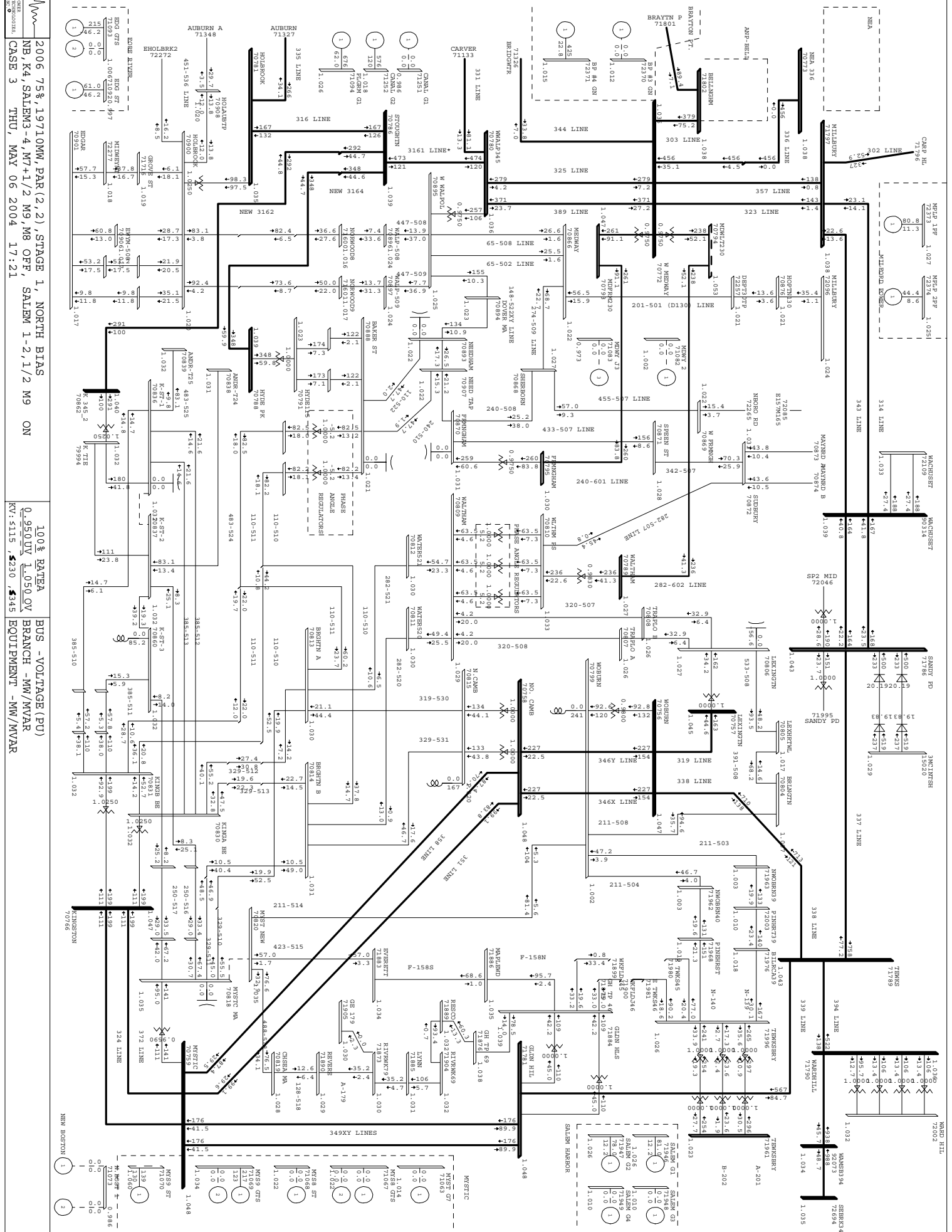
2006 75% 19710MW, PAR(2,2), STAGE 1, NORTH BIAS
 NB, K4, SALEM-4, M7+1/2 M9 OFF, SALEM 1-2, MYSTIC8+1/2 M9 ON
 CASE 1 THU, MAY 06 2004 17:18

100% RATEA
 0.950UV 1.050OV
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

NEW BOSTON
 100% RATEA
 0.950UV 1.050OV
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

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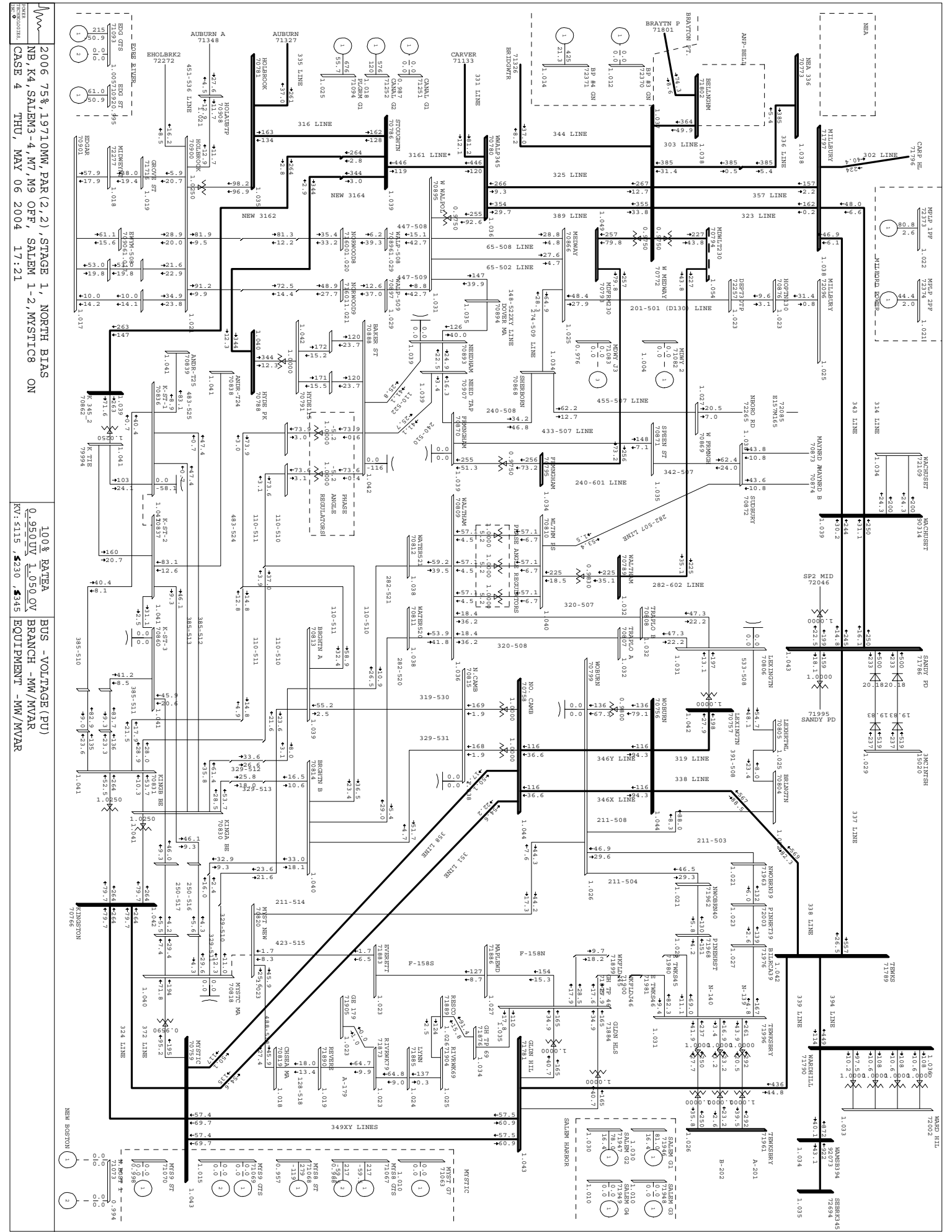


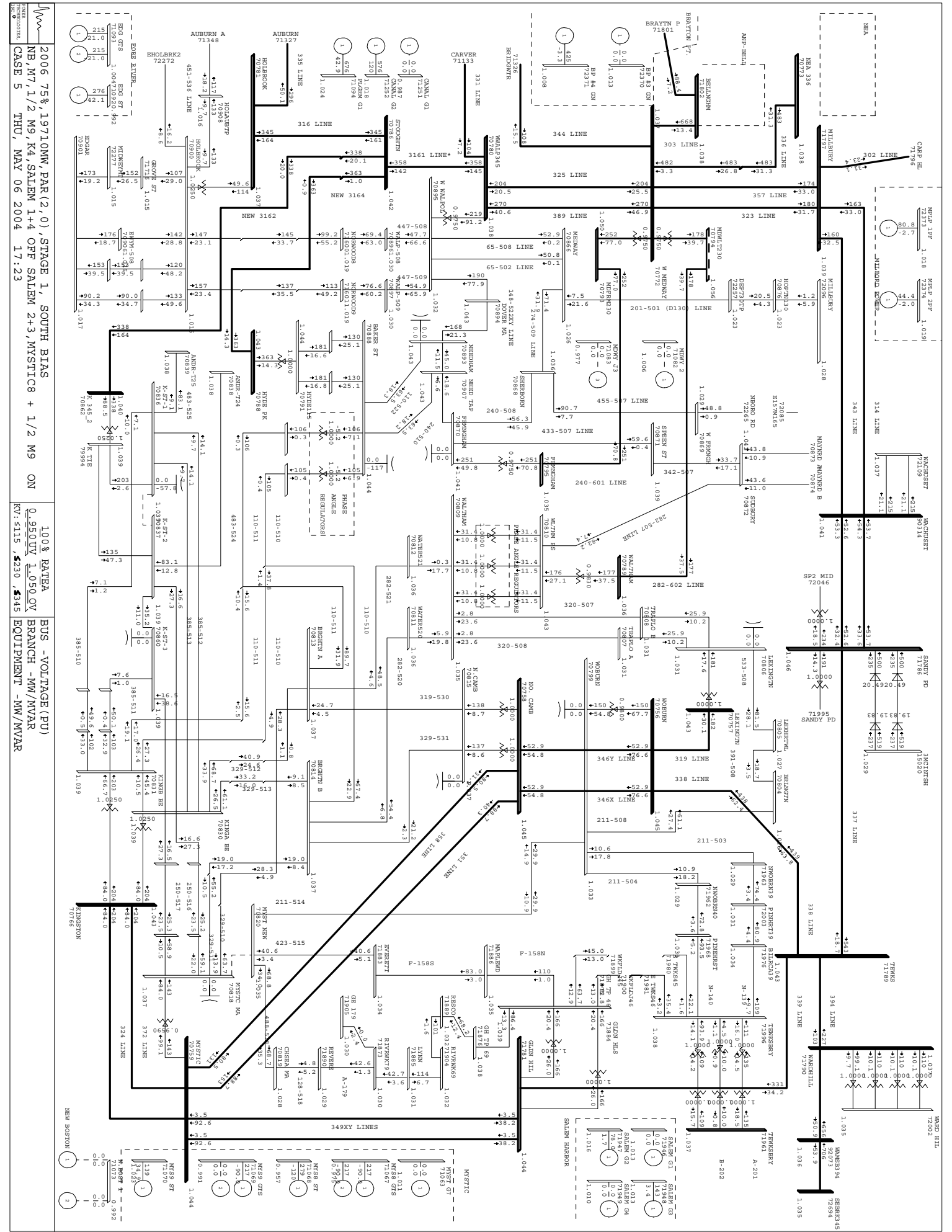


2006 75% 19710MW, PAR(2,2), STAGE 1, NORTH BIAS
 NB, K4, SALEM5-4, M7+1/2 M9, M8 OFF, SALEM 1-2, 1/2 M9 ON
 CASE 3 THU, MAY 06 2004 17:21

100% RATEA BUS - VOLTAGE (KV)
 0.950UV 1.050OV
 BRANCH - MW/WVAR
 EQUIPMENT - MW/WVAR

NEW BOSTON
 SALMON HARBOR



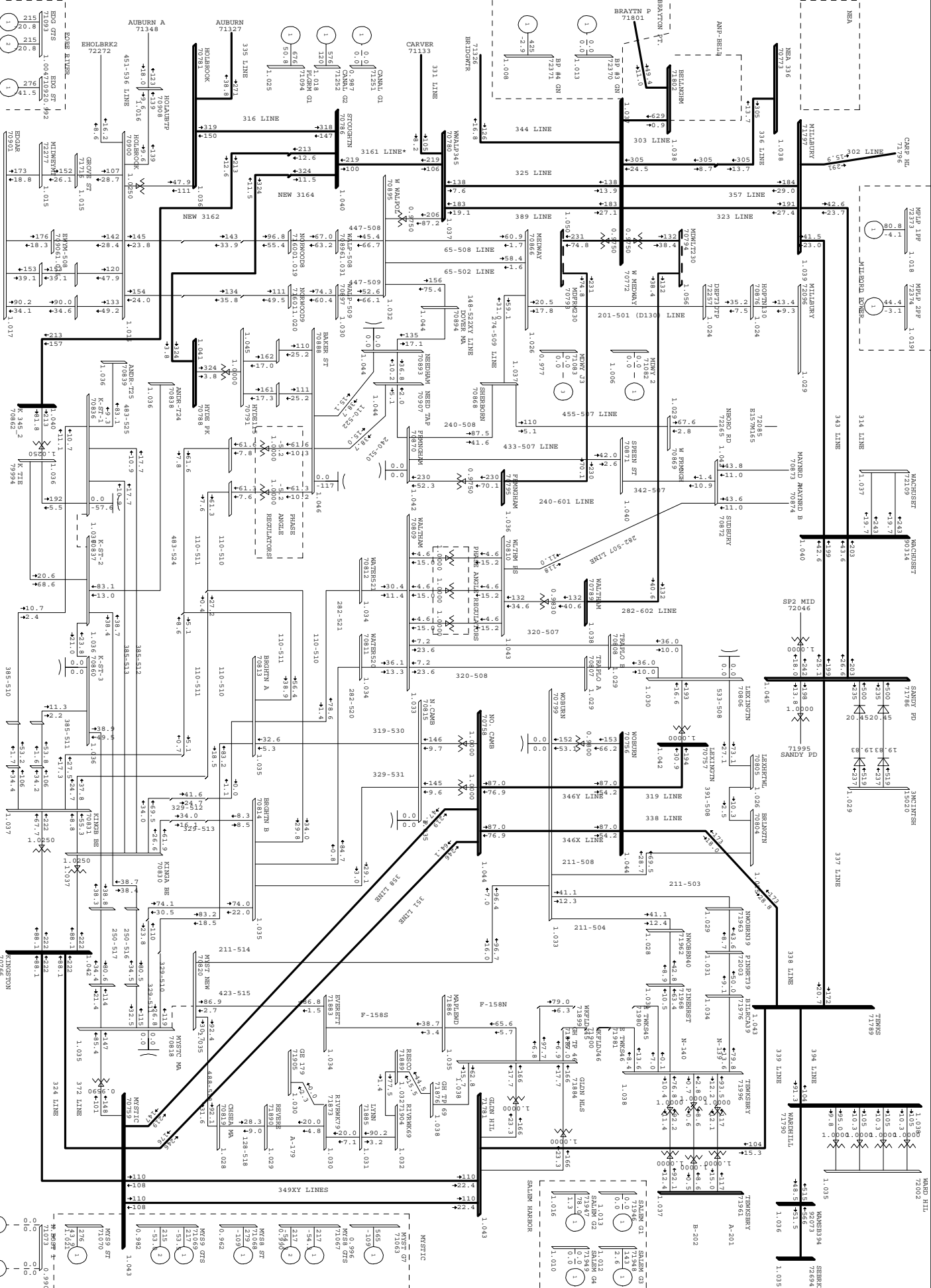


2006 75% 19710MW, PAR(2,0), STAGE 1, SOUTH BIAS
 NB, M7, 1/2 M9, K4, SALEM 144 OFF SALEM 2+3, MYSTIC8 + 1/2 M9 ON
 CASE 5 THU, MAY 06 2004 17:23

100% RATEA
 0.950UV 1.050LV
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

2006 75% 19710MW, PAR(2,0), STAGE 1, SOUTH BIAS
 NB, M7, 1/2 M9, K4, SALEM 144 OFF SALEM 2+3, MYSTIC8 + 1/2 M9 ON
 CASE 5 THU, MAY 06 2004 17:23

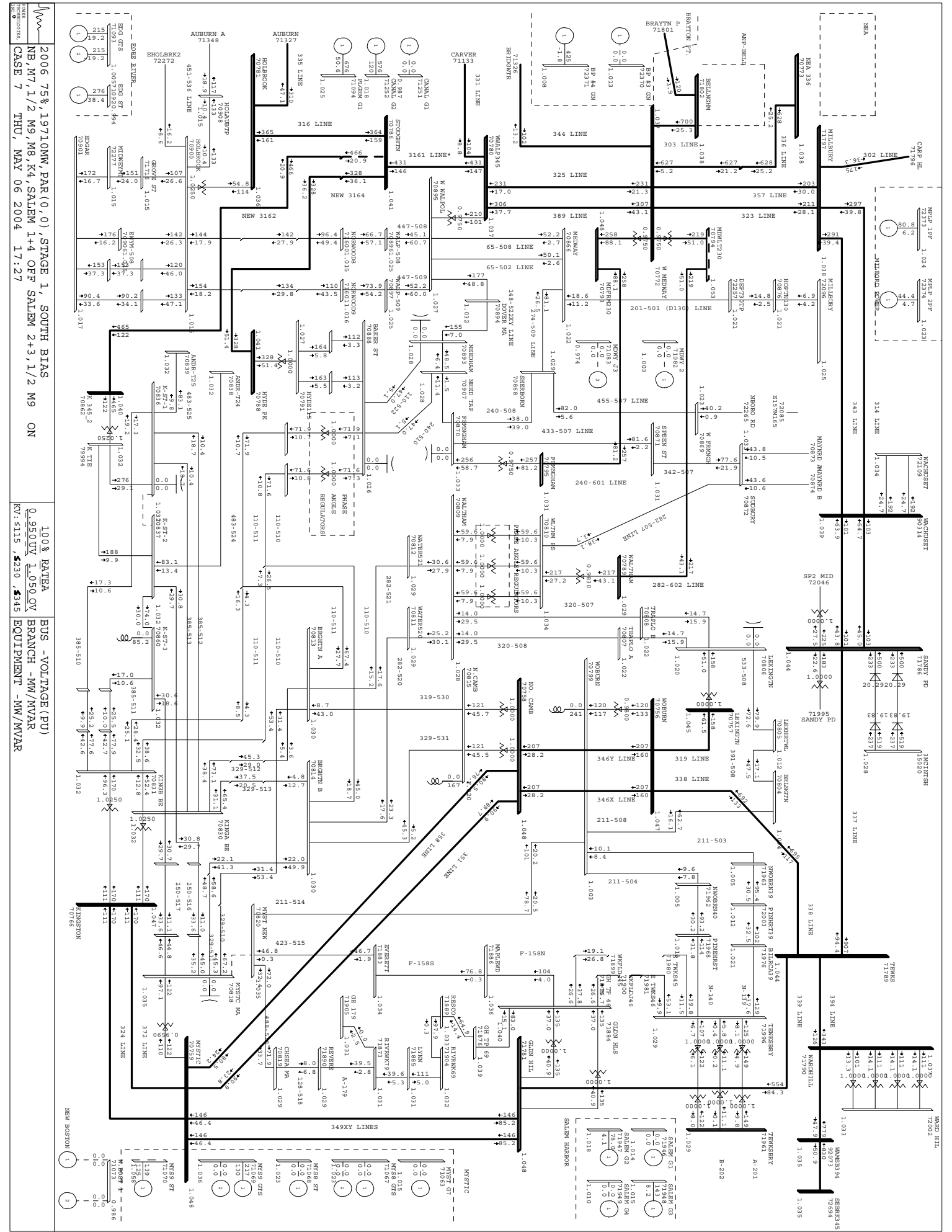
100% RATEA
 0.950UV 1.050LV
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR



2006 75% 19710MW, PAR (2, 0), STAGE 1, SOUTH BIAS
MB, K4, SALEM 1+4 OFF SALEM 2+3, MISTIC 7, 8, 9 ON
CASE 6 THU, MAY 06 2004 17:26

100% RATEA BUS - VOLTAGE (PU)
0.950 UV 1.050 OV BRANCH - MW/MVAR
KV: 5115, 5330, 5345 EQUIPMENT - MW/MVAR

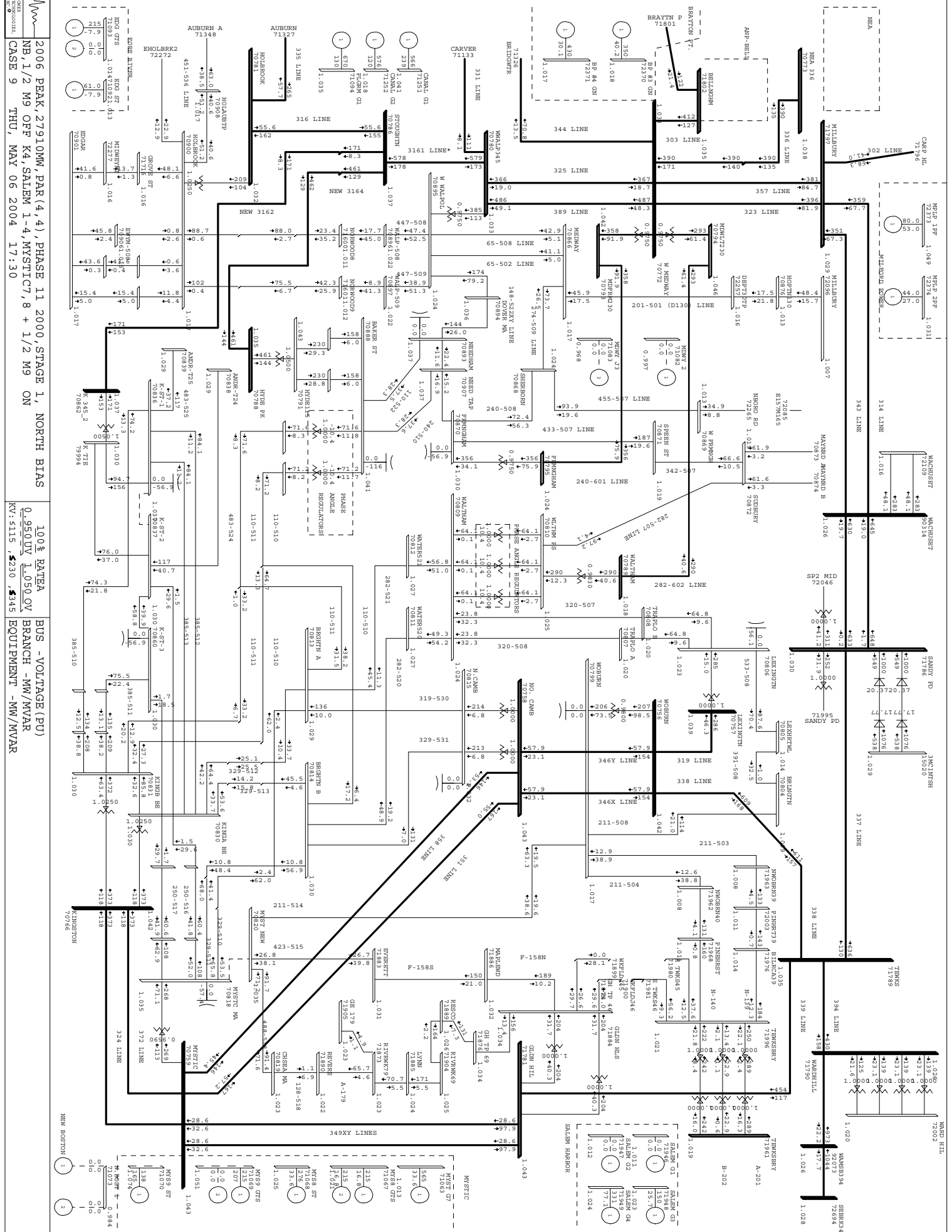
SALLEN G3
SALLEN G2
SALLEN G1
SALEM HARBOR



2006 75% 19710MW, PAR(0,0), STAGE 1, SOUTH BIAS
 NB, W7, 1/2 M9, M8, K4, SALEM 1+4 OFF SALEM 2+3, 1/2 M9 ON
 CASE 7 THU, MAY 06 2004 17:27

100% RATEA BUS - VOLTAGE (PU)
 0.950UV 1.050OV
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

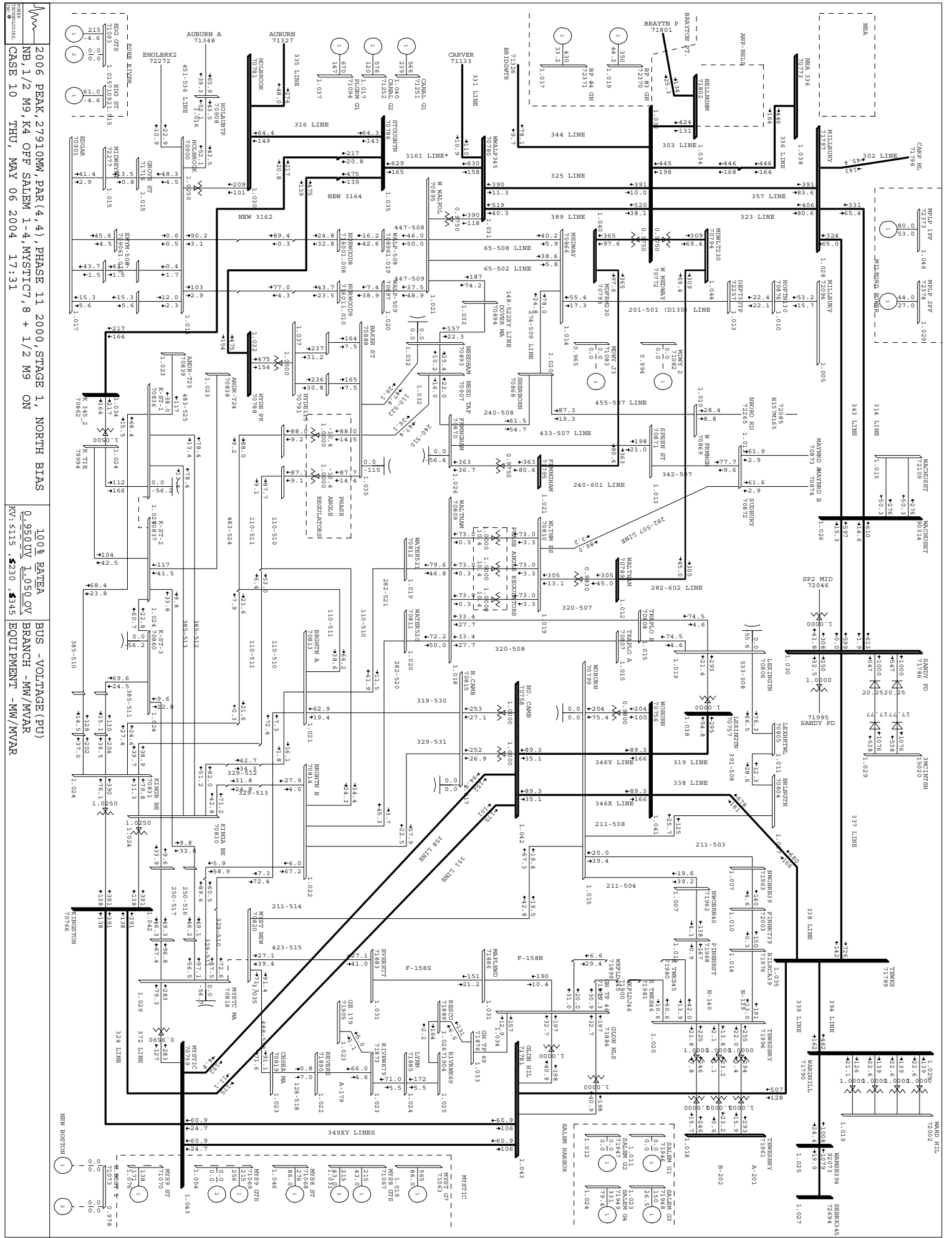
KV: 5115, 5230, 5345
 NEW BOSTON



2006 PEAK, 27910MW, PAR(4,4), PHASE 11 2000, STAGE 1, NORTH BIAS
 NB, 1/2 M9 OFF K4, SALEM 1-4, MYSTIC 7, 8 + 1/2 M9 ON
 CASE 9 THU, MAY 06 2004 17:30

100% RATEA BUS - VOLTAGE (PU)
 0.950UV 1.050LV BRANCH - MW/MVAR
 KV: 5115, 5330, 5345 EQUIPMENT - MW/MVAR

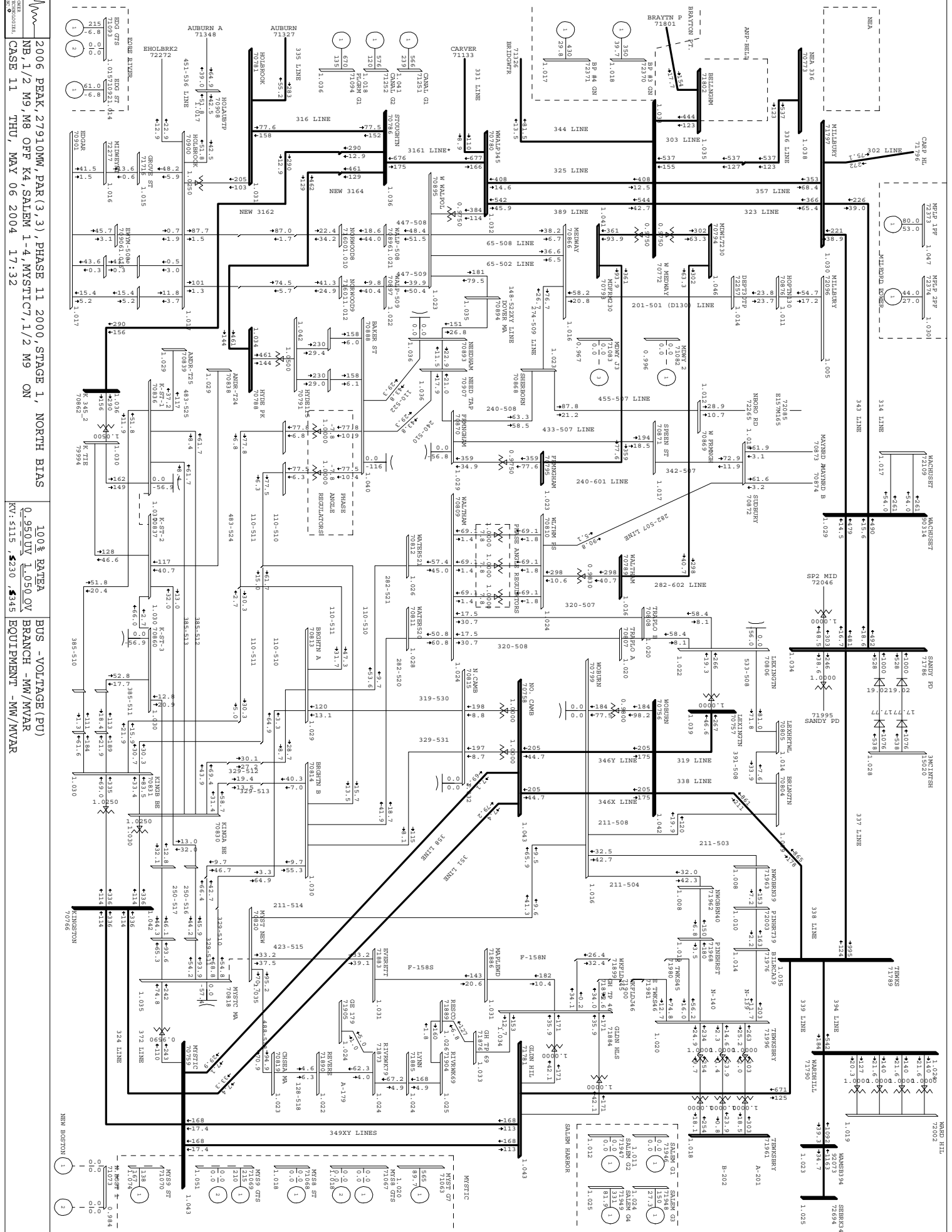
NEW BOSTON



2006 PEAK, 27910MW, PAR(4,4), PHASE 1, 2000, STAGE 1, NORTH BIAS
 NB, 1/2 M9, K4 OFF SALEM 1-4, MYSTIC 7, 8 + 1/2 M9 ON
 CASE 10 THU, MAY 06 2004 17:31

100% RATEA
 0.950UV 1.050OV
 KV: 5115, 5330, 5345

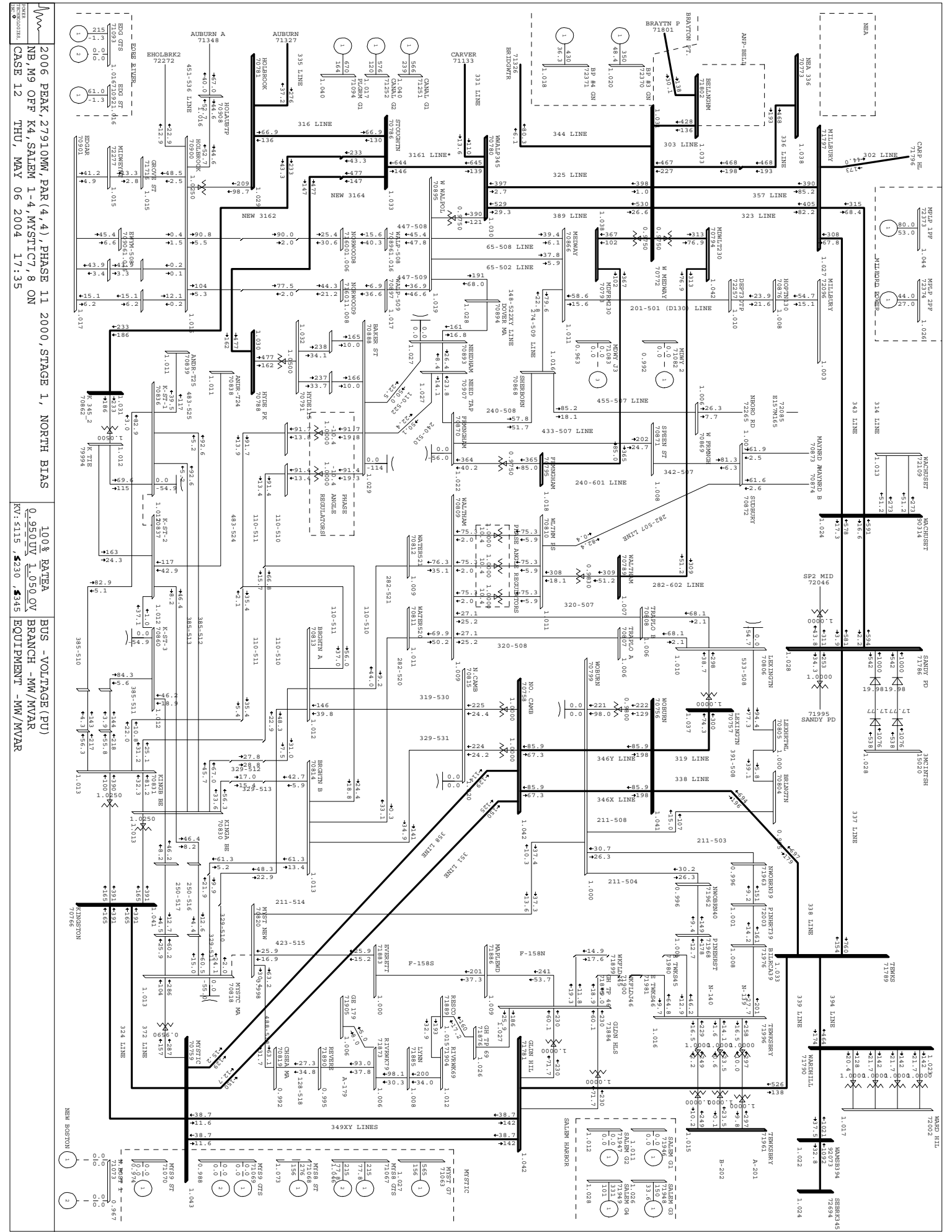
BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

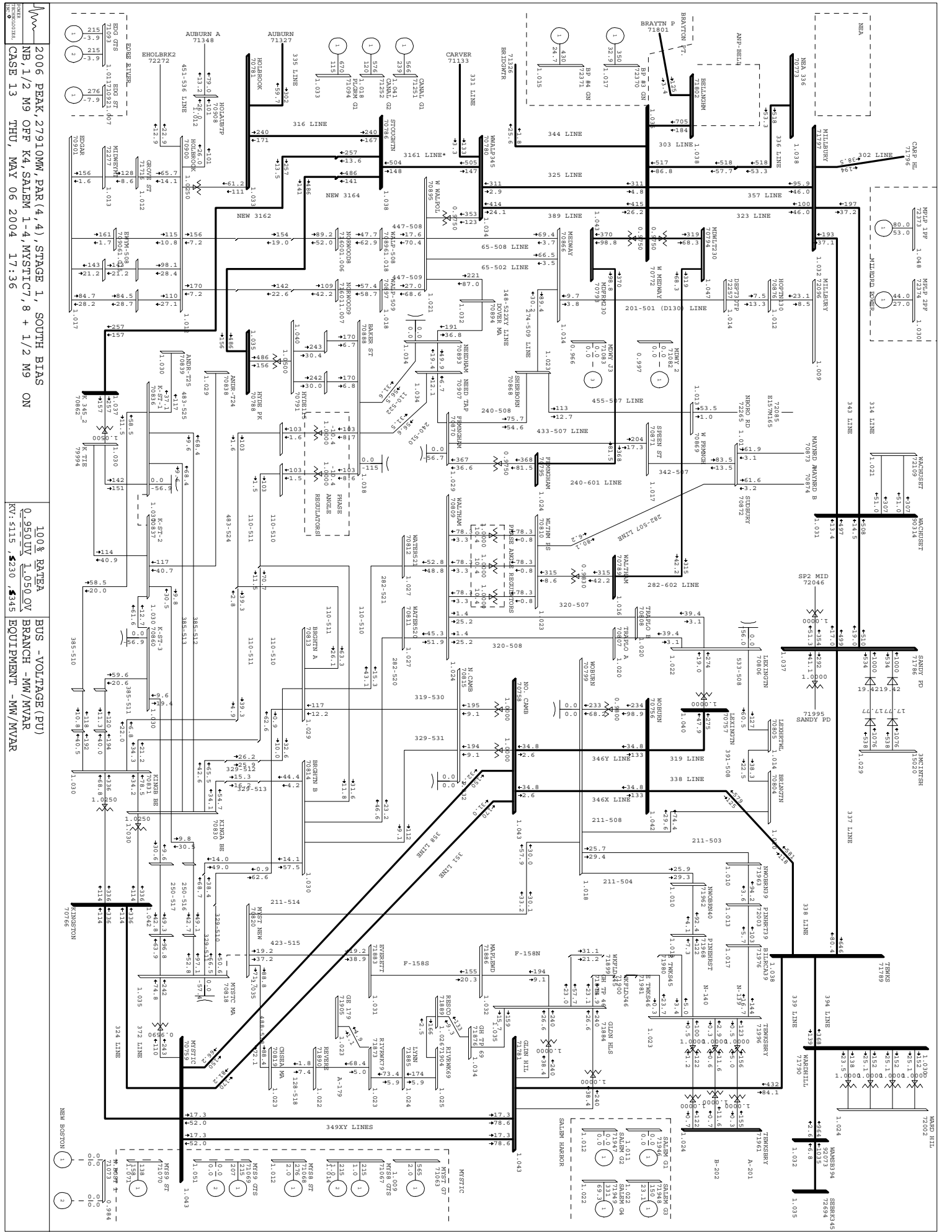


2006 PEAK, 27910MW, PAR(3,3), PHASE 11 2000, STAGE 1, NORTH BIAS
 NB, 1/2 M9, M8 OFF K4, SALEM 1-4, M5TIC7, 1/2 M9 ON
 CASE 11 THU, MAY 06 2004 17:32

100% RATEA BUS - VOLTAGE (PU)
 0.950UV 1.050OV
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

100% RATEA BUS - VOLTAGE (PU)
 0.950UV 1.050OV
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

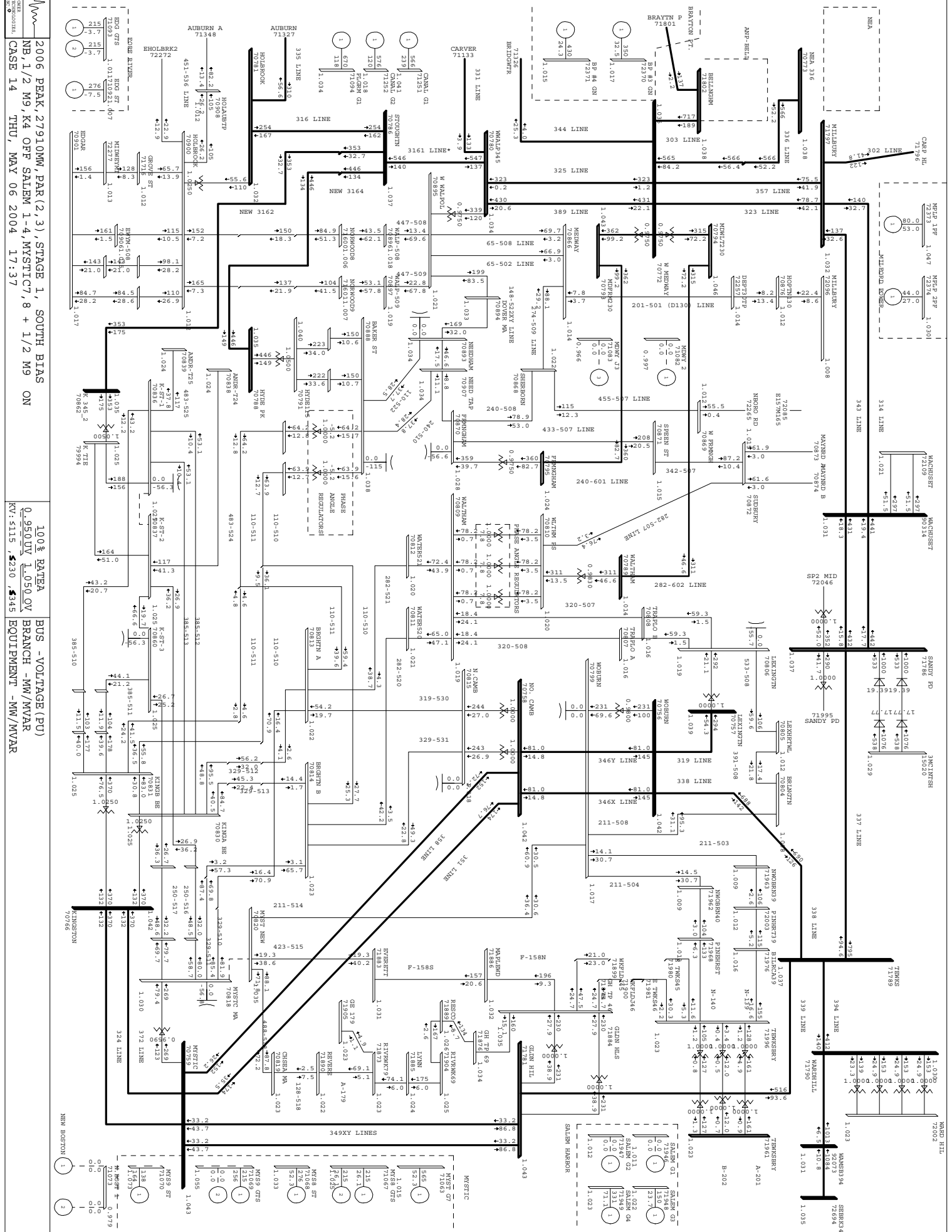




2006 PEAK, 27910MW, PAR(4,4), STAGE 1, SOUTH BIAS
 NB, 1/2 M9 OFF K4, SALEM 1-4, MYSTIC 7, 8 + 1/2 M9 ON
 CASE 13 THU, MAY 06 2004 17:36

100% RATEA BUS - VOLTAGE (PU)
 0.950UV 1.050OV BRANCH - MW/MVAR
 KV: 5115, 5330, 5345 EQUIPMENT - MW/MVAR

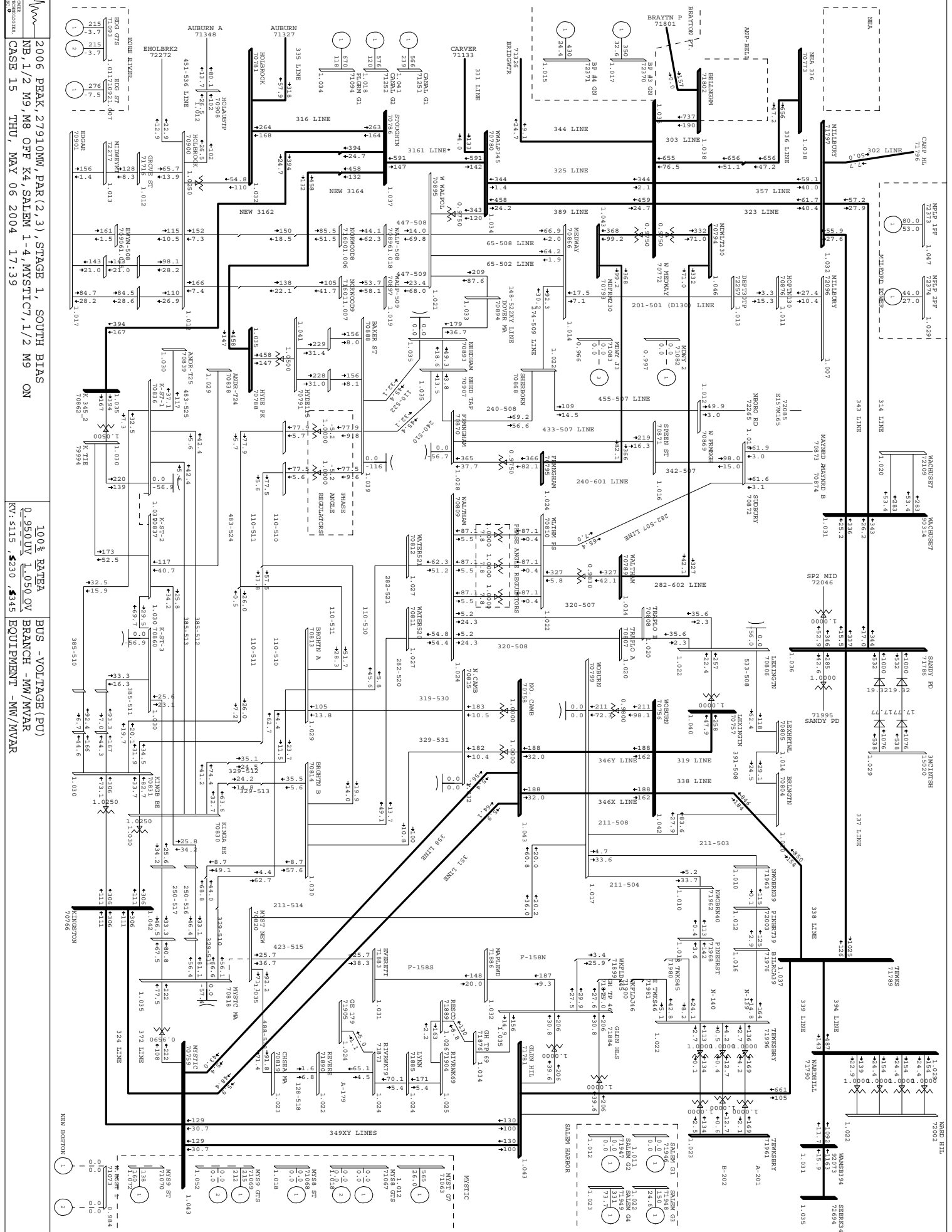
100% RATEA BUS - VOLTAGE (PU)
 0.950UV 1.050OV BRANCH - MW/MVAR
 KV: 5115, 5330, 5345 EQUIPMENT - MW/MVAR

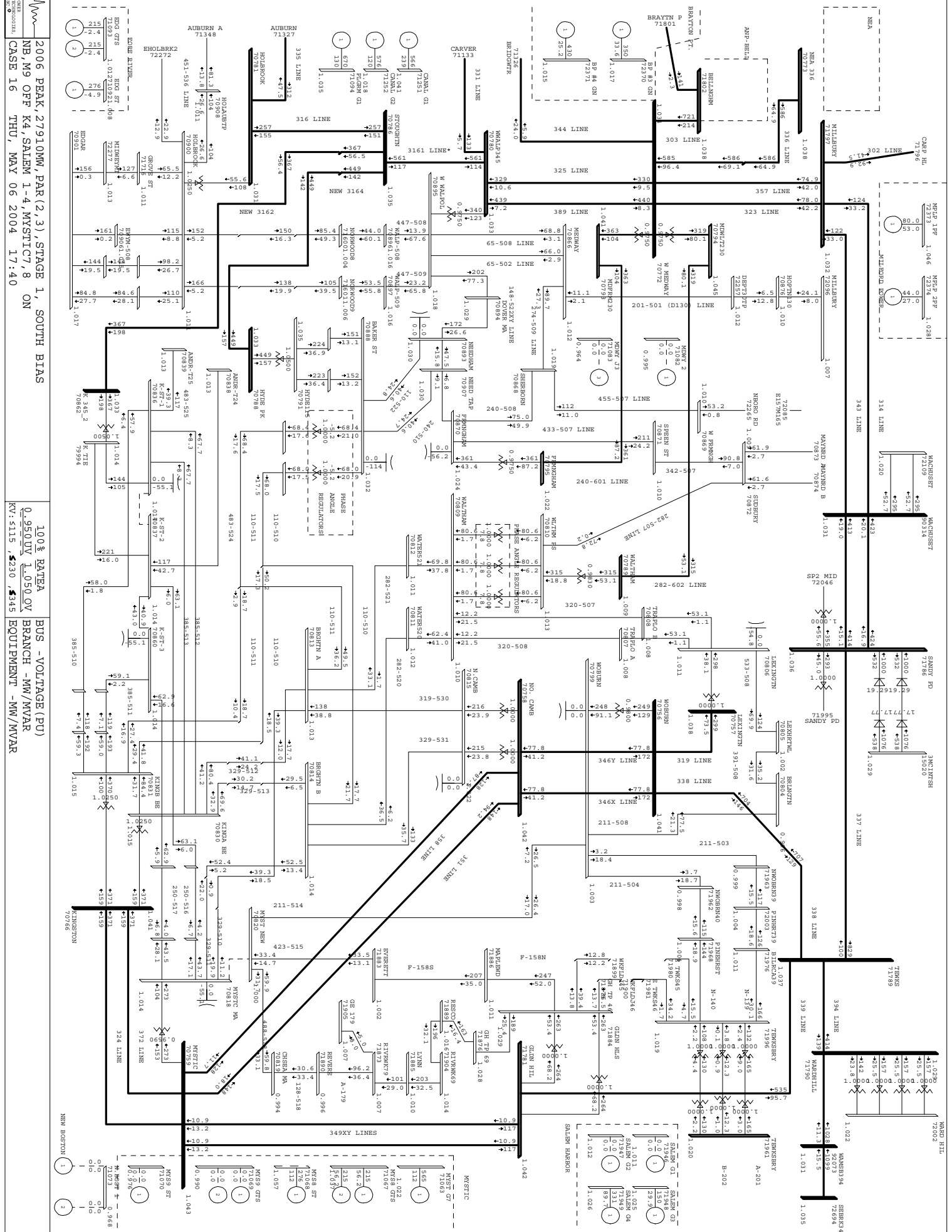


2006 PEAK, 27910MW, PAR(2,3), STAGE 1, SOUTH BIAS
 NB, 1/2 M9, K4 OFF SALEM 1-4, MYSTIC 7, 8 + 1/2 M9 ON
 CASE 14 THU, MAY 06 2004 17:37

100% RATEA
 0.950UV 1.050UV
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

NEW BOSTON



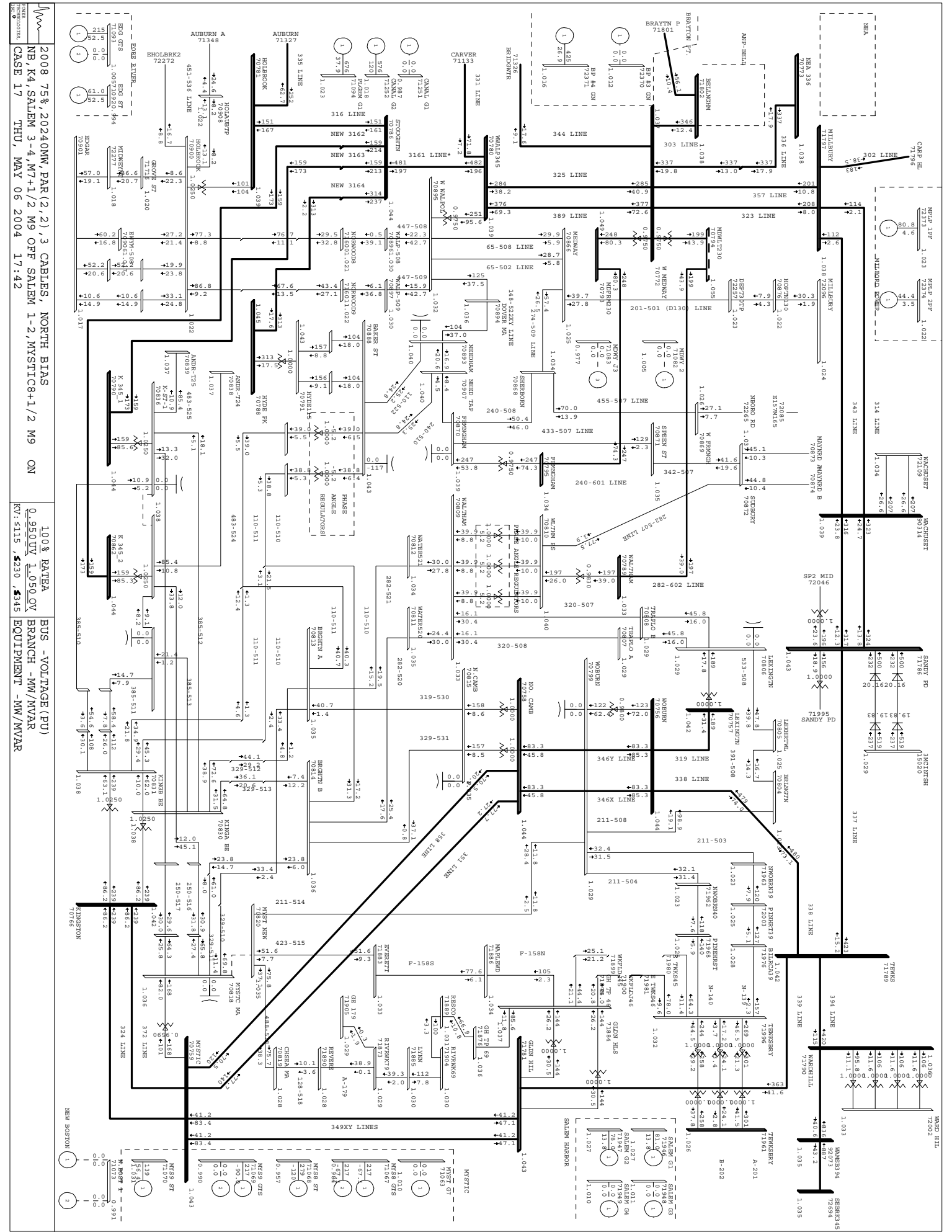


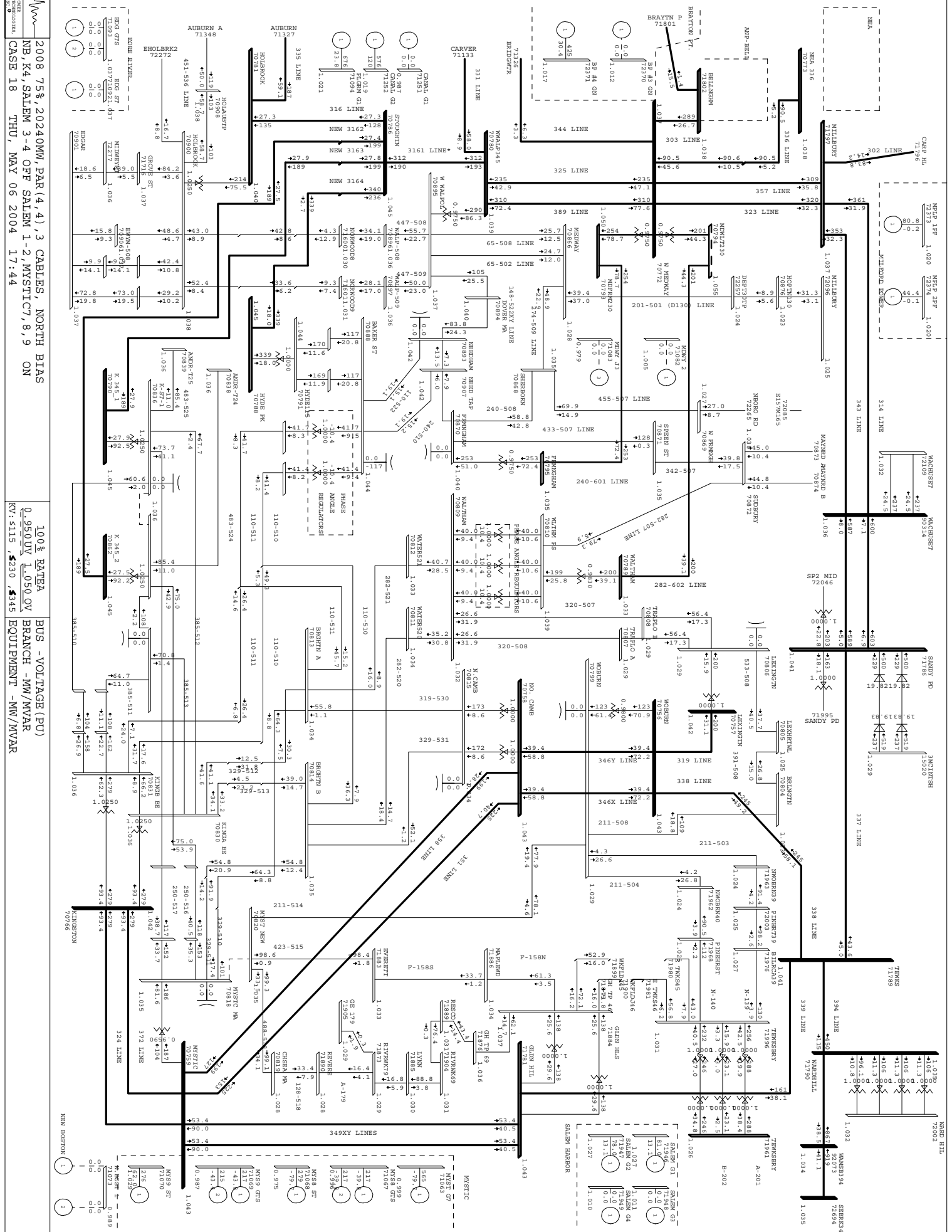
2006 PEAK 27910MW, PAR(2.3)/STAGE 1, SOUTH BIAS
 NB, M9 OFF K4, SALEM 1-4, MYS1C7, 8 ON
 CASE 16 THU, MAY 06 2004 17:40

100% RATEA BUS - VOLTAGE (PU)
 0.950UV 1.050LV
 BRANCH - MW/WVAR
 KV: 5115, 5330, 5345 EQUIPMENT - MW/WVAR

2006 PEAK 27910MW, PAR(2.3)/STAGE 1, SOUTH BIAS
 NB, M9 OFF K4, SALEM 1-4, MYS1C7, 8 ON
 CASE 16 THU, MAY 06 2004 17:40

100% RATEA BUS - VOLTAGE (PU)
 0.950UV 1.050LV
 BRANCH - MW/WVAR
 KV: 5115, 5330, 5345 EQUIPMENT - MW/WVAR

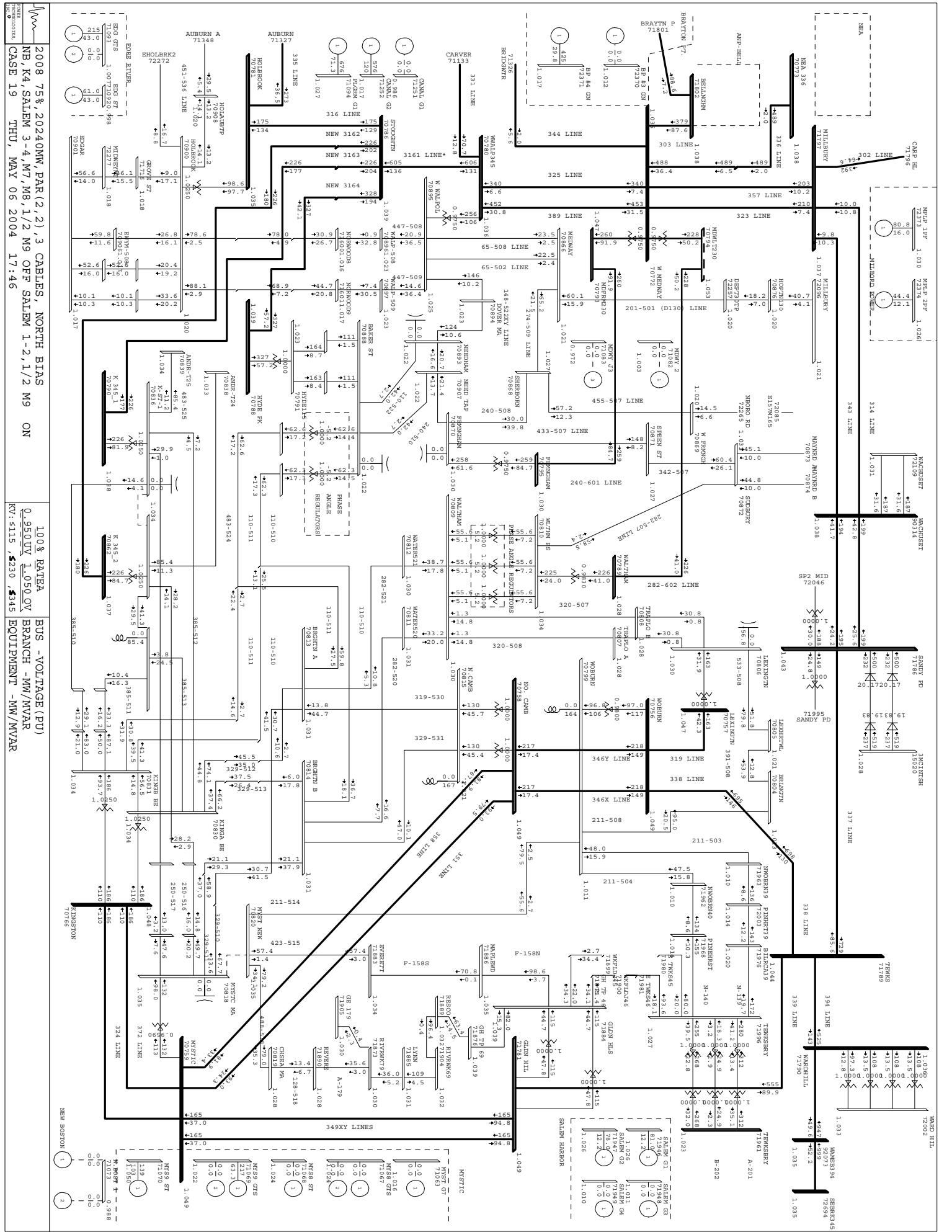




2008 75% 20240MM, PAR(4,4), 2 CABLES, NORTH BIAS
 NB,K4, SALEM 3-4 OFF SALEM 1-2, MYSTIC 7, 8, 9 ON
 CASE 18 THU, MAY 06 2004 17:44

100% RATEA
 0.950UV 1.050UV
 BUS - VOLTAGE (PV)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

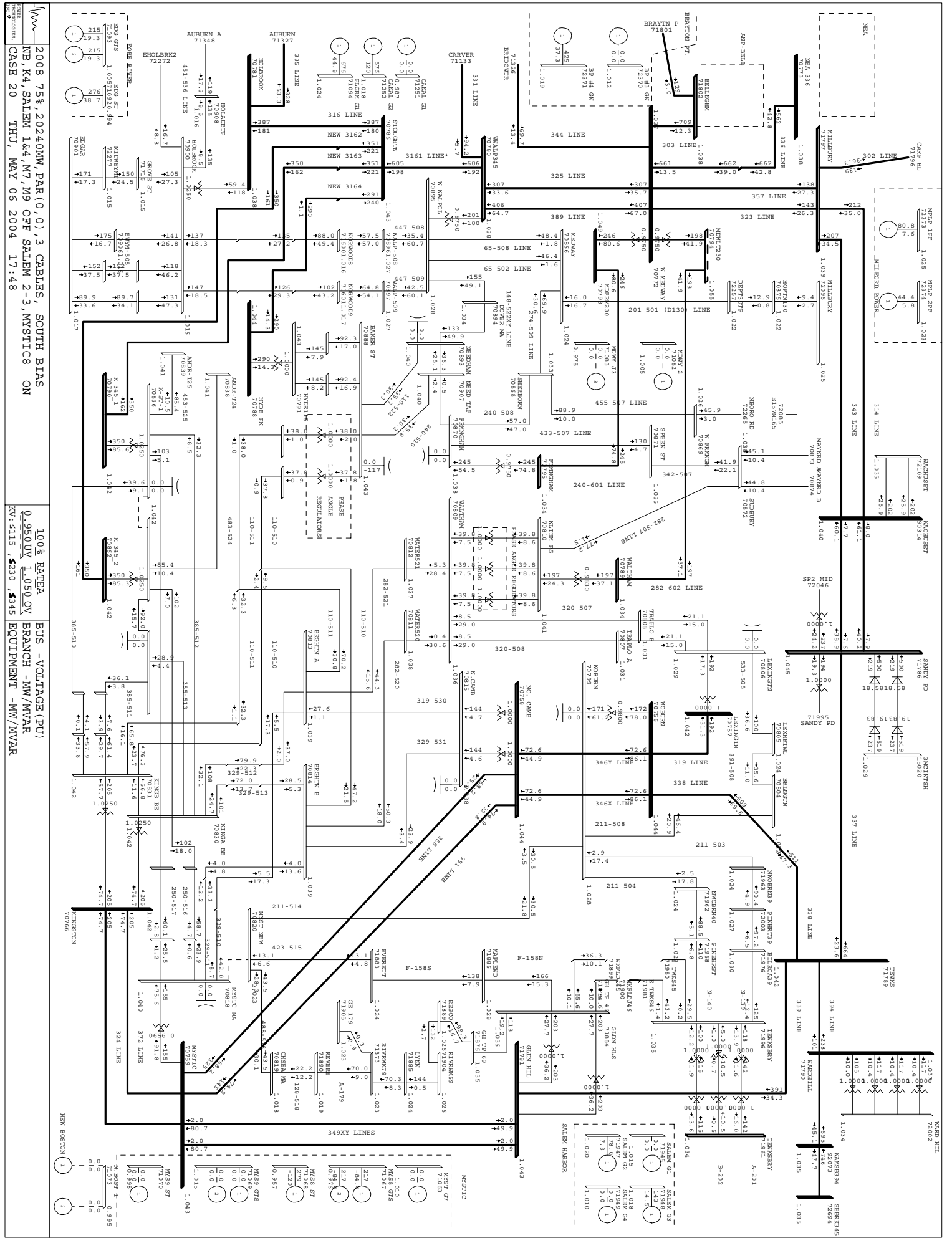
100% RATEA
 0.950UV 1.050UV
 BUS - VOLTAGE (PV)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR



2008 75% 20240MM, PAR(2,2) 3 CABLES, NORTH BIAS
 NB, K4, SALEM 3-4, M7, M8, 1/2 M9 OFF SALEM 1-2, 1/2 M9 ON
 CASE 19 THU, MAY 06 2004 17:46

100% RATEA BUS - VOLTAGE (PU)
 0.950UV 1.050UV BRANCH - MW/MVAR
 KV: 5115, 5330, 5345 EQUIPMENT - MW/MVAR

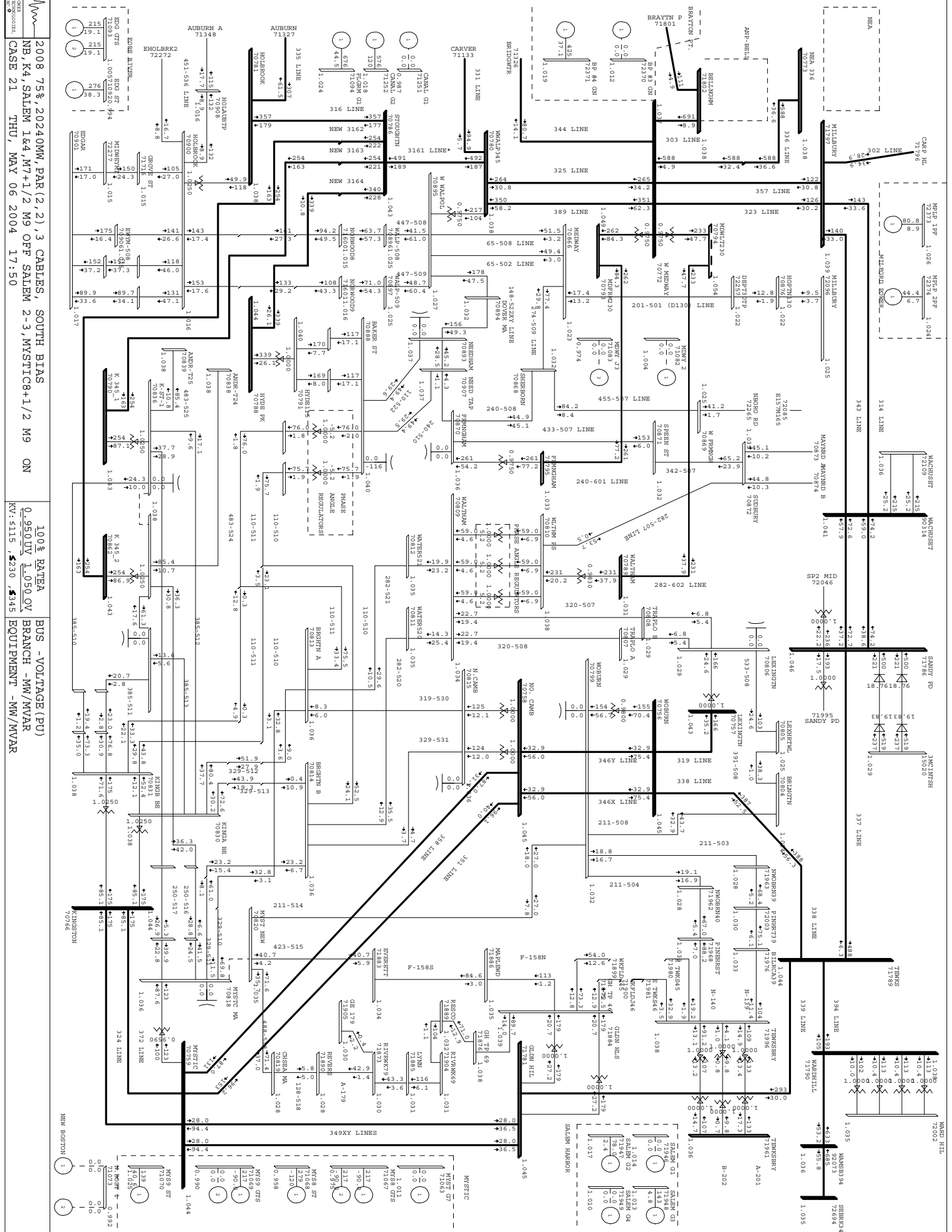
100% RATEA BUS - VOLTAGE (PU)
 0.950UV 1.050UV BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR



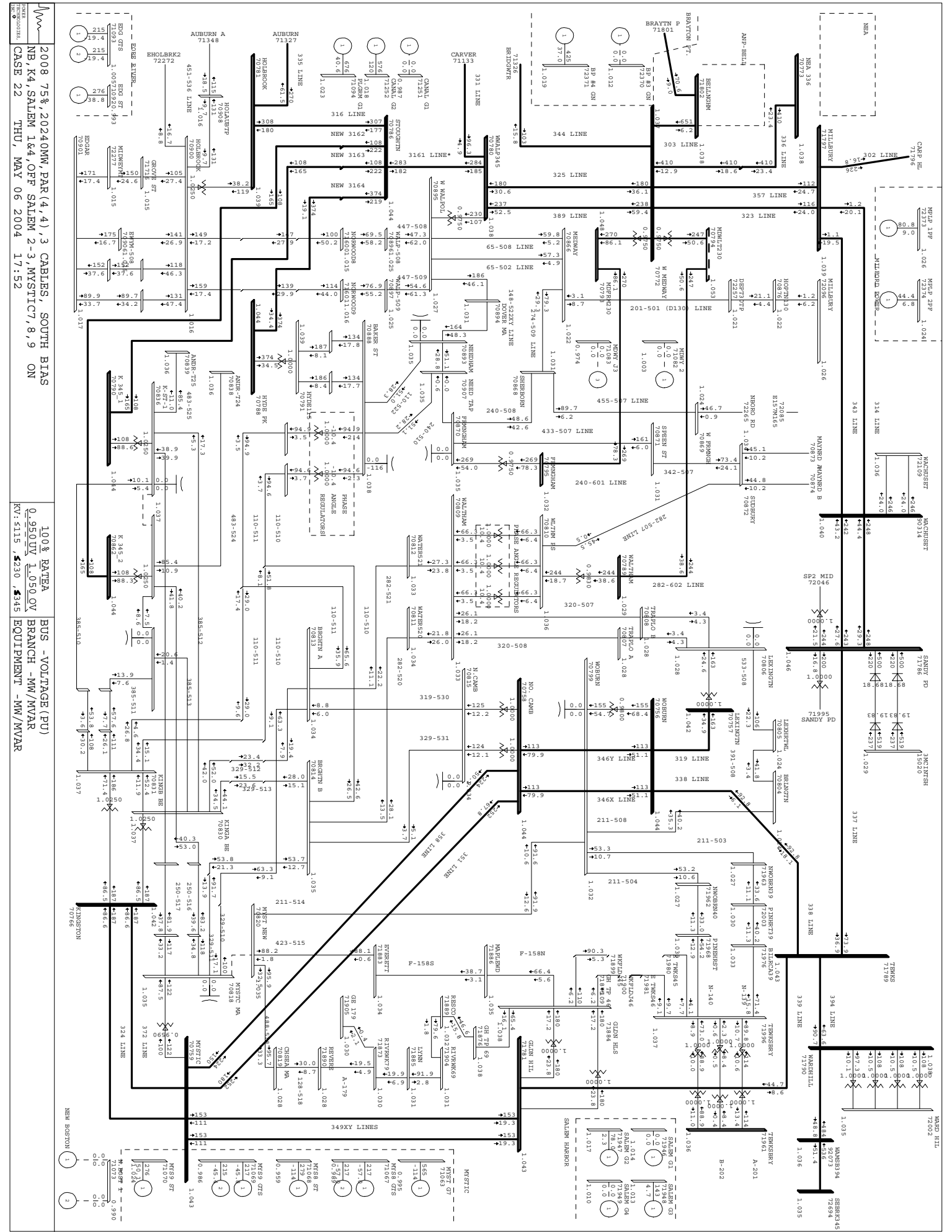
2008 75% 20240MM, PAR(0,0), 3 CABLES, SOUTH BIAS
NB, K4, SALEM 1&4, M7, M9 OFF SALEM 2-3, MYSTIC 8 ON
CASE 20 THU, MAY 06 2004 17:48

100% RATEA BUS - VOLTAGE (PU)
0.950UV 1.050OV BRANCH - MW/MVAR
KV: 5115, 5230, 5345 EQUIPMENT - MW/MVAR

NEW BOSTON



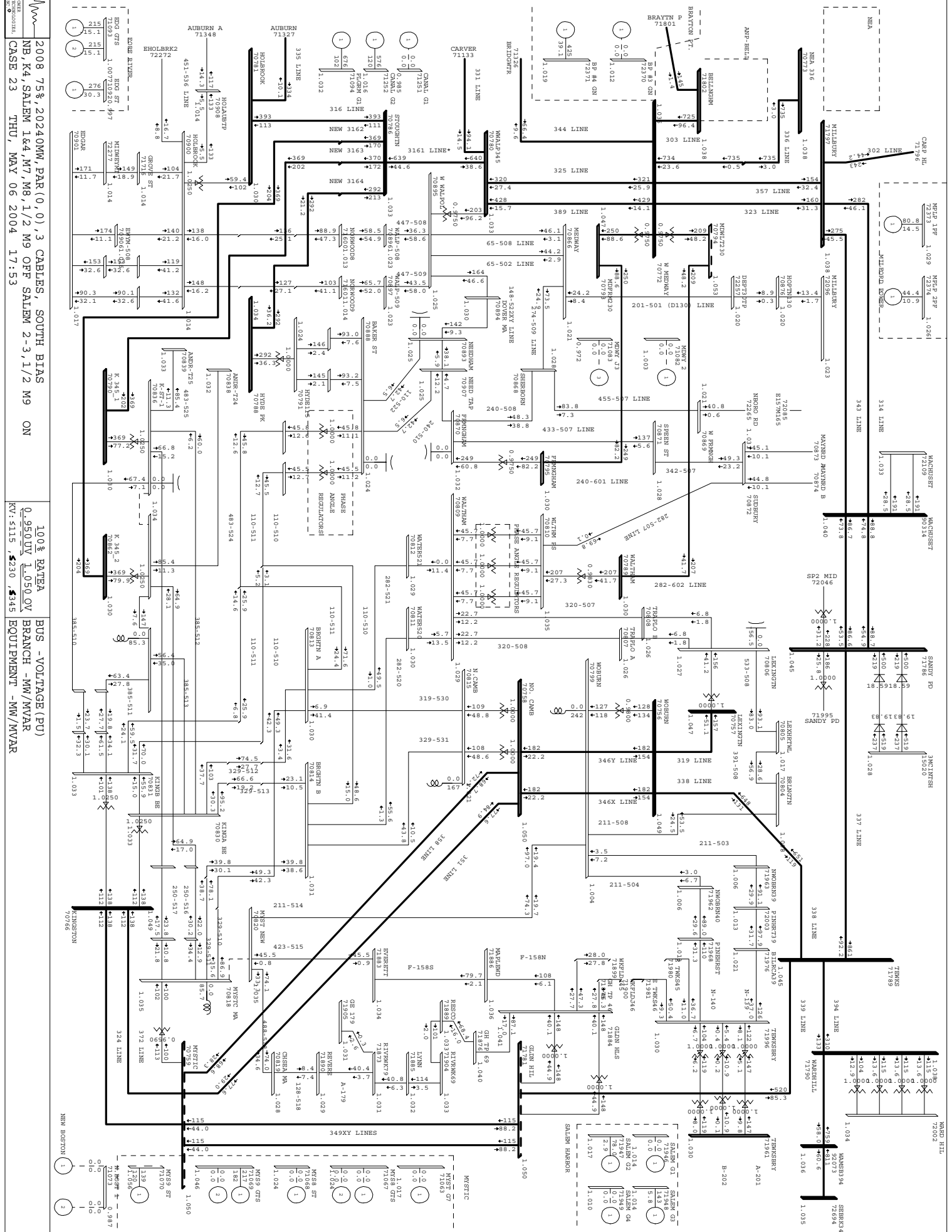
2008 75% 20240MM, PAR (2,2), 3 CABLES, SOUTH BIAS
 NB, K4, SALEM 1&4, M7+1/2 M9 OFF SALEM 2-3, MYSTIC8+1/2 M9 ON
 CASE 21 THU, MAY 06 2004 17:50
 100% RATERA BUS - VOLTAGE (PU)
 0.950UV 1.050UV BRANCH - MW/MVAR
 KV: 5115, 5330, 5345 EQUIPMENT - MW/MVAR
 NEW BOSTON



2008 75% 20240MM, PAR(4,4), 3 CABLES, SOUTH BIAS
 NB-K4, SALEM 1&4 OFF SALEM 2-3, MYSTIC 7, 8, 9 ON
 CASE 22 THU, MAY 06 2004 17:52

100% RATEA
 0.950UV 1.050UV
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

NEW BOSTON
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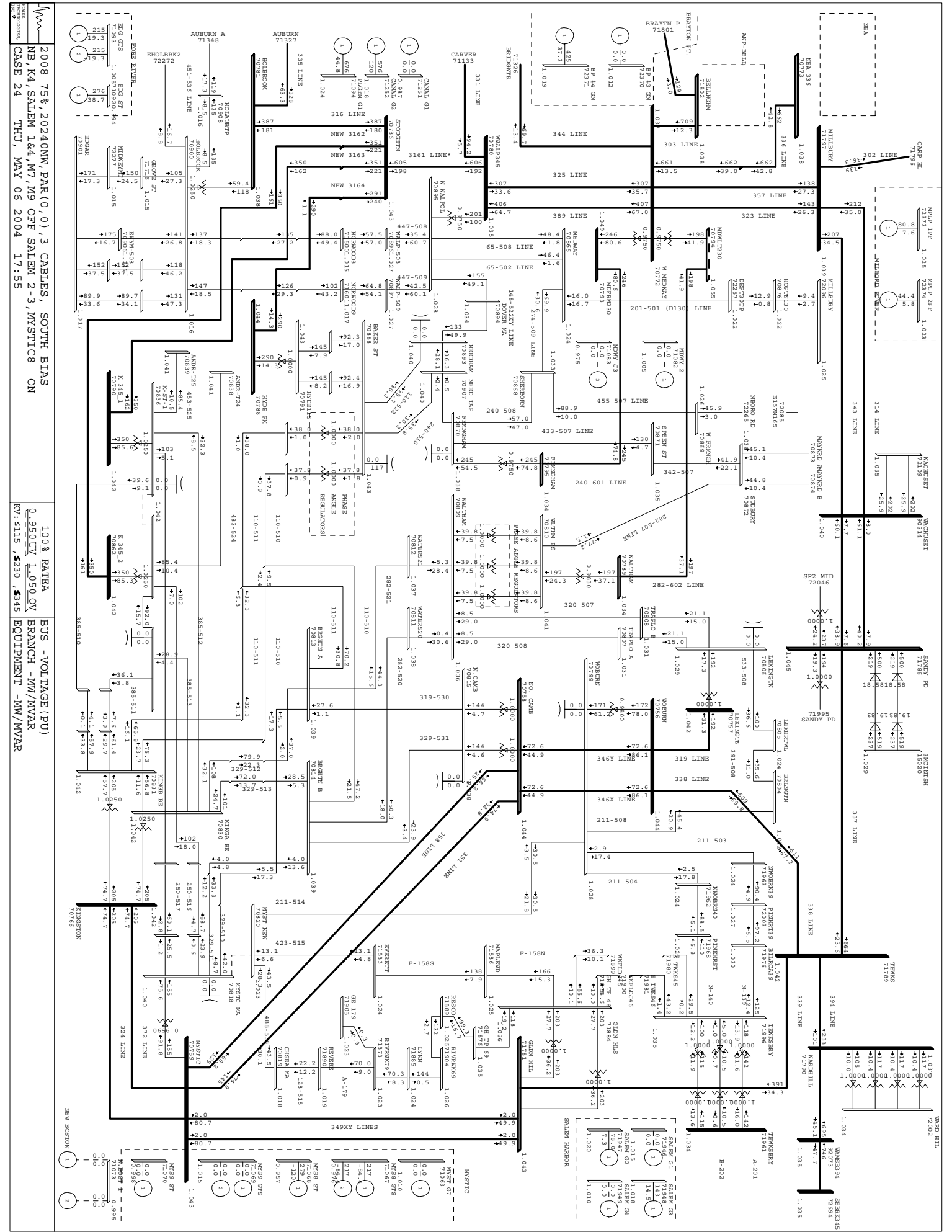


2008 75% 20240MM, PAR(0,0), 3 CABLES, SOUTH BIAS
NB, K4, SALEM 1&4, M7, M8, 1/2 M9 OFF SALEM 2-3, 1/2 M9 ON
CASE# 23 THU, MAY 06 2004 17:53

100% RATEA
0.950UV 1.050OV
KV: 5115, 5330, 5345

BUS - VOLTAGE (PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR

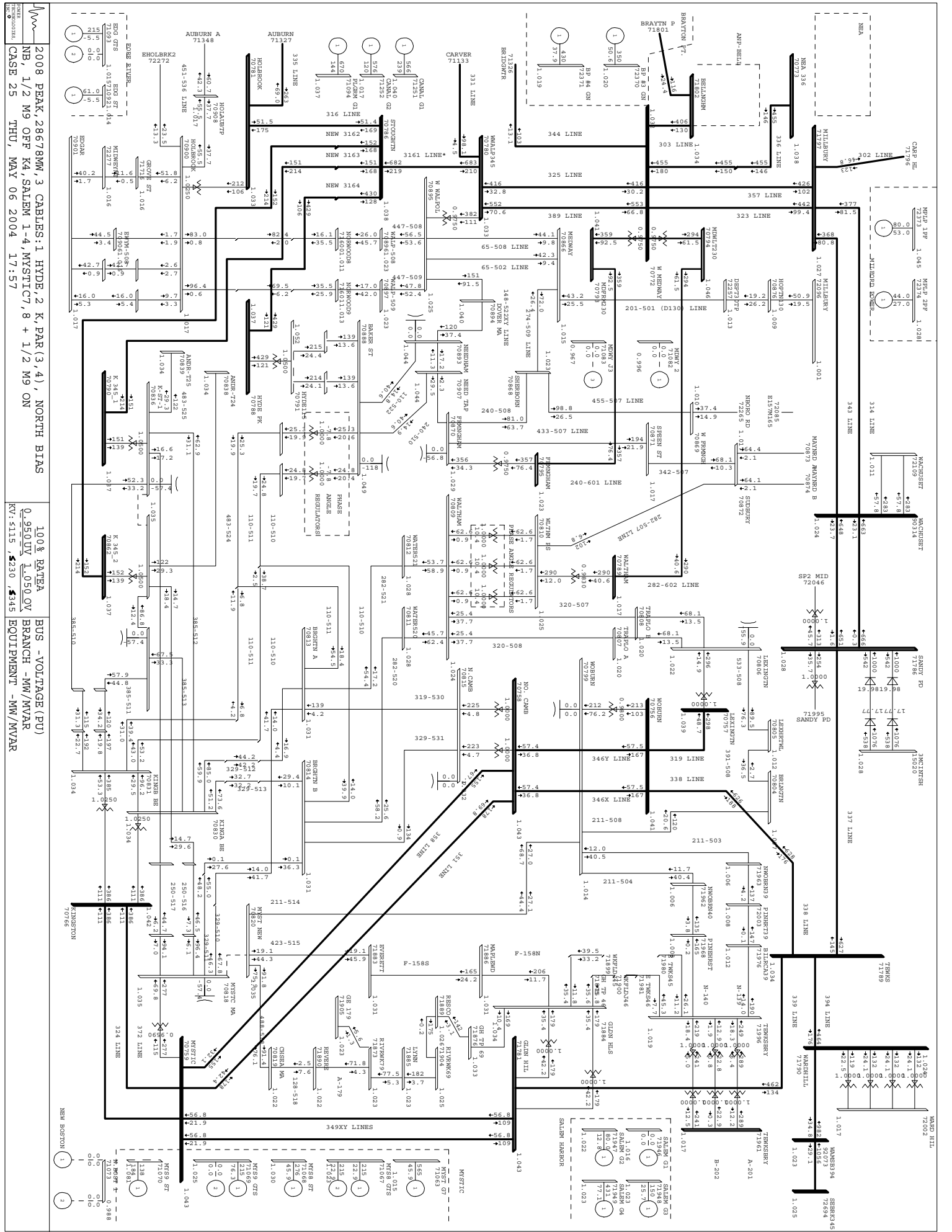
NEW BOSTON



2008 75% 20240MM, PAR(0,0), 3 CABLES, SOUTH BIAS
 NB, K4, SALEM 1&4, M7, M9 OFF SALEM 2-3, MYSTIC ON
 CASE 24 THU, MAY 06 2004 17:55

100% RATEA BUS - VOLTAGE (PU)
 0.950UV 1.050OV BRANCH - MW/MVAR
 KV: 5115, 5330, 5345 EQUIPMENT - MW/MVAR

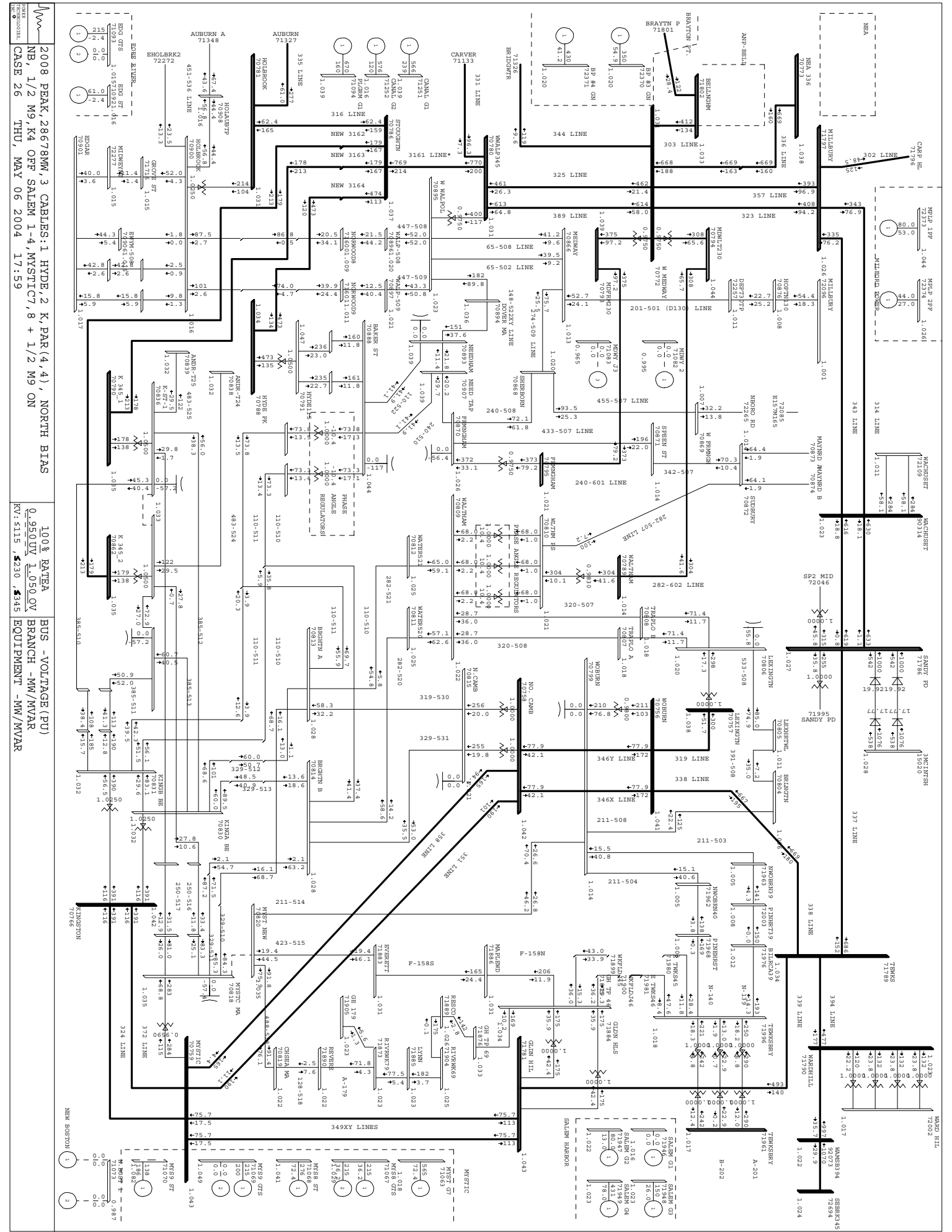
NEW BOSTON 1
 NEW BOSTON 2



2008 PEAK, 26678MW, 3 CABLES: 1 HYDE, 2 K, PAR(3, 4), NORTH BIAS
 NB, 1/2 M9 OFF K4, SALEM 1-4, M5TIC7, 8 + 1/2 M9 ON
 CASE: 25 THU, MAY 06 2004 17:57

100% RATEA
 0.950UV 1.050UV
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

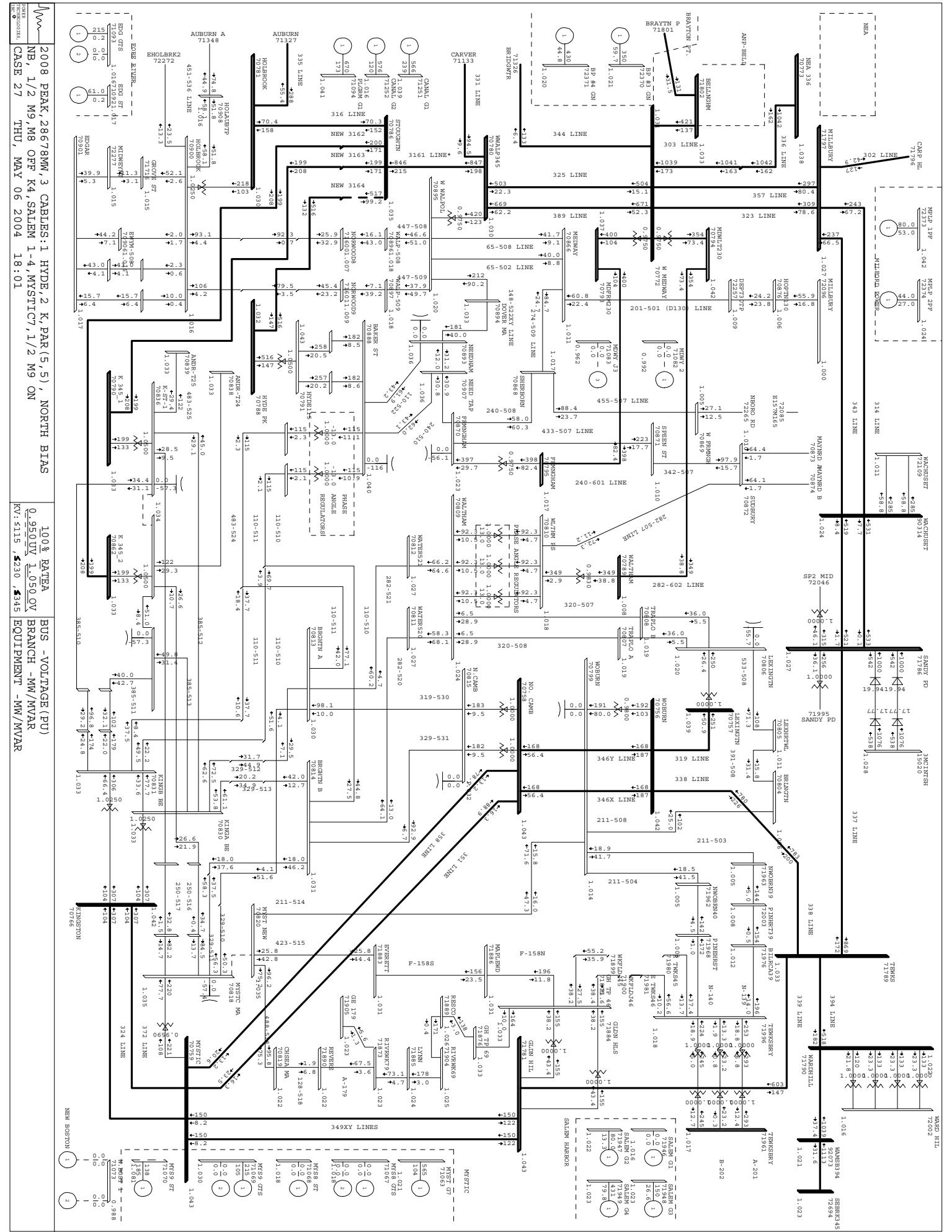
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 1.725
 1.730
 1.735
 1.740
 1.745
 1.750
 1.755
 1.760
 1.765
 1.770
 1.775
 1.780
 1.785
 1.790
 1.795
 1.800
 1.805
 1.810
 1.815
 1.820
 1.825
 1.830
 1.835
 1.840
 1.845
 1.850
 1.855
 1.860
 1.865
 1.870
 1.875
 1.880
 1.885
 1.890
 1.895
 1.900
 1.905
 1.910
 1.915
 1.920
 1.925
 1.930
 1.935
 1.940
 1.945
 1.950
 1.955
 1.960
 1.965
 1.970
 1.975
 1.980
 1.985
 1.990
 1.995
 2.000



2008 PEAK, 26678MW, 3 CABLES: 1 HYDE, 2 K, PAR(4,4), NORTH BIAS
 NB, 1/2 M9, K4 OFF SALEM 1-4, MYSITC7, 8 + 1/2 M9 ON
 CASE 26 THU, MAY 06 2004 17:59

100% RATEA
 0.950UV 1.050OV
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

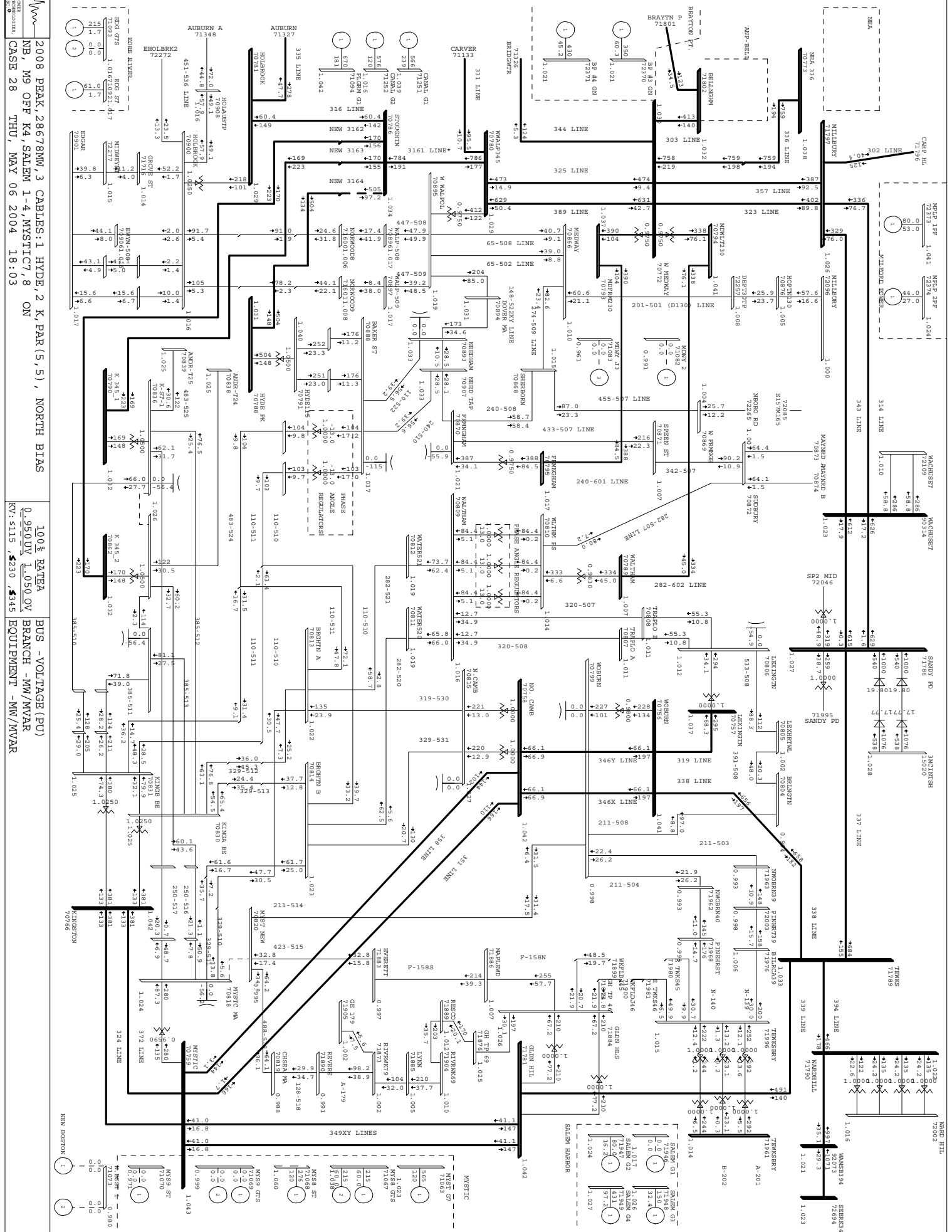
NEW BOSTON



2008 PEAK, 26678MW, 3 CABLES: 1 HYDE, 2 K, PAR (5, 5), NORTH BIAS
 NB, 1/2 M9, M8 OFF, K4, SALEM 1-4, MYSTIC7, 1/2 M9 ON
 CASE 27 THU, MAY 06 2004 18:01

100% RATEA
 0.950UV 1.050OV
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

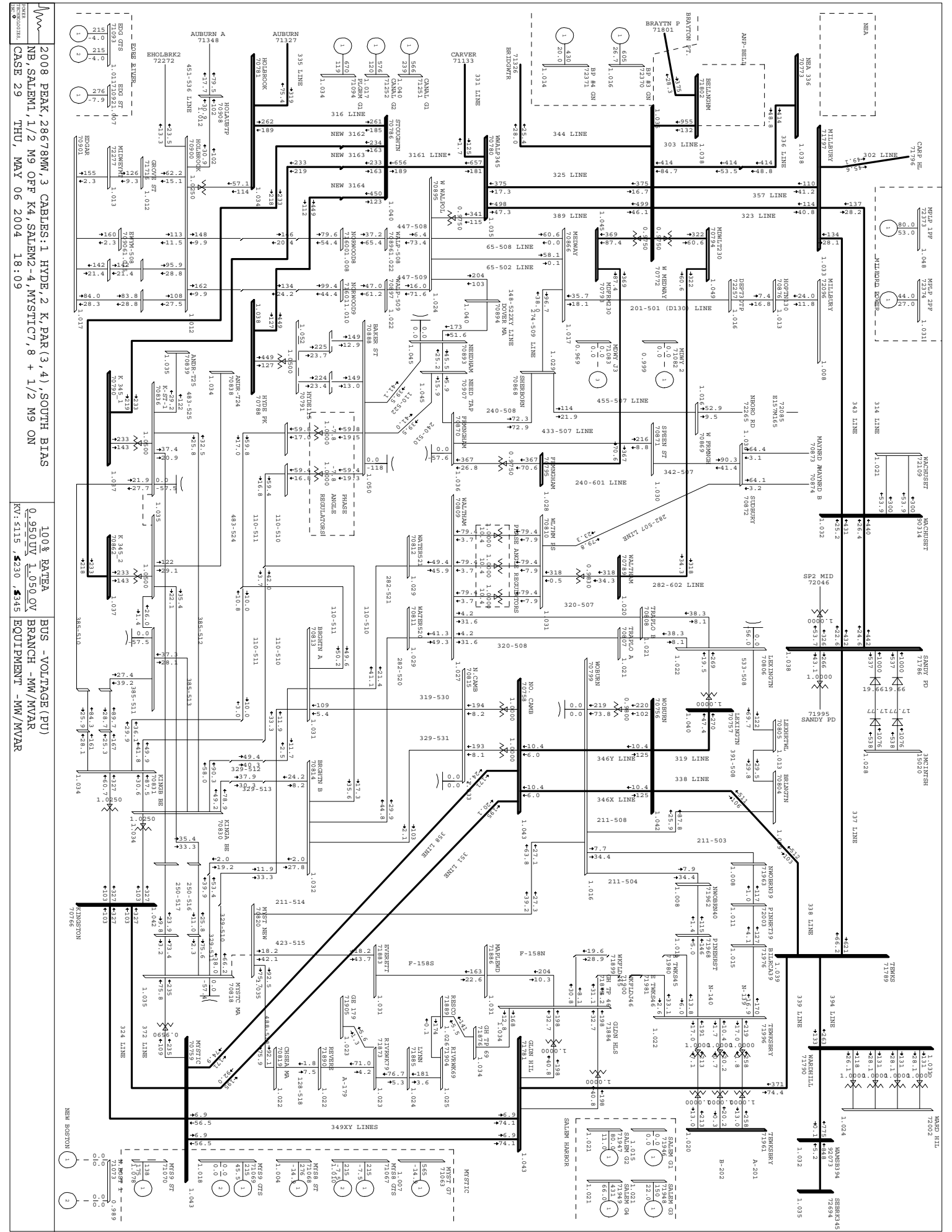
NEW BOSTON
 1000
 500
 250
 125
 62.5
 31.25
 15.625
 7.8125
 3.90625
 1.953125
 0.9765625
 0.48828125
 0.244140625
 0.1220703125
 0.06103515625
 0.030517578125
 0.0152587890625
 0.00762939453125
 0.003814697265625
 0.0019073486328125
 0.00095367431640625
 0.000476837158203125
 0.0002384185791015625
 0.00011920928955078125
 5.988



2008 PEAK, 26678MW, 3 CABLES: 1 HYDE, 2 K, PAR (5, 5), NORTH BIAS
 NB, M9 OFF K4, SALEM 1-4 MYSTIC 7, 8 ON
 CASE 28 THU, MAY 06 2004 18:03

100% RATEA BUS - VOLTAGE (PU)
 0.950UV 1.050UV BRANCH - MW/WVAR
 KV: 5115, 5330, 5345 EQUIPMENT - MW/WVAR

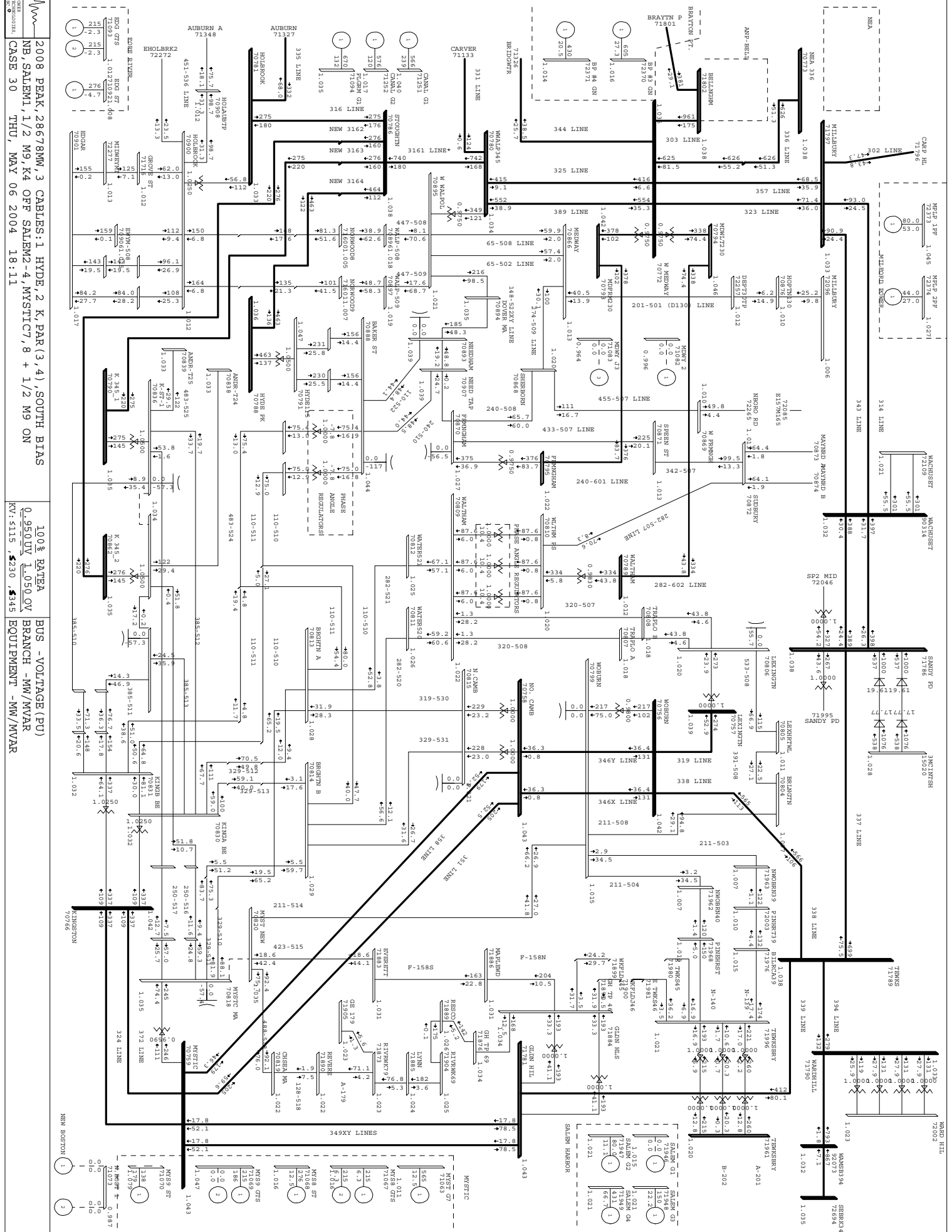
NEW BOSTON
 1
 2



2008 PEAK, 28678MW, 3 CABLES: 1 HYDE, 2 K, PAR (3, 4), SOUTH BIAS
 NB, SALEM1, 1/2 M9 OFF K4, SALM2-4, MYSTIC7, 8 + 1/2 M9 ON
 CASE 29 THU, MAY 06 2004 18:09

100% RATEA
 0.950UV 1.050OV
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

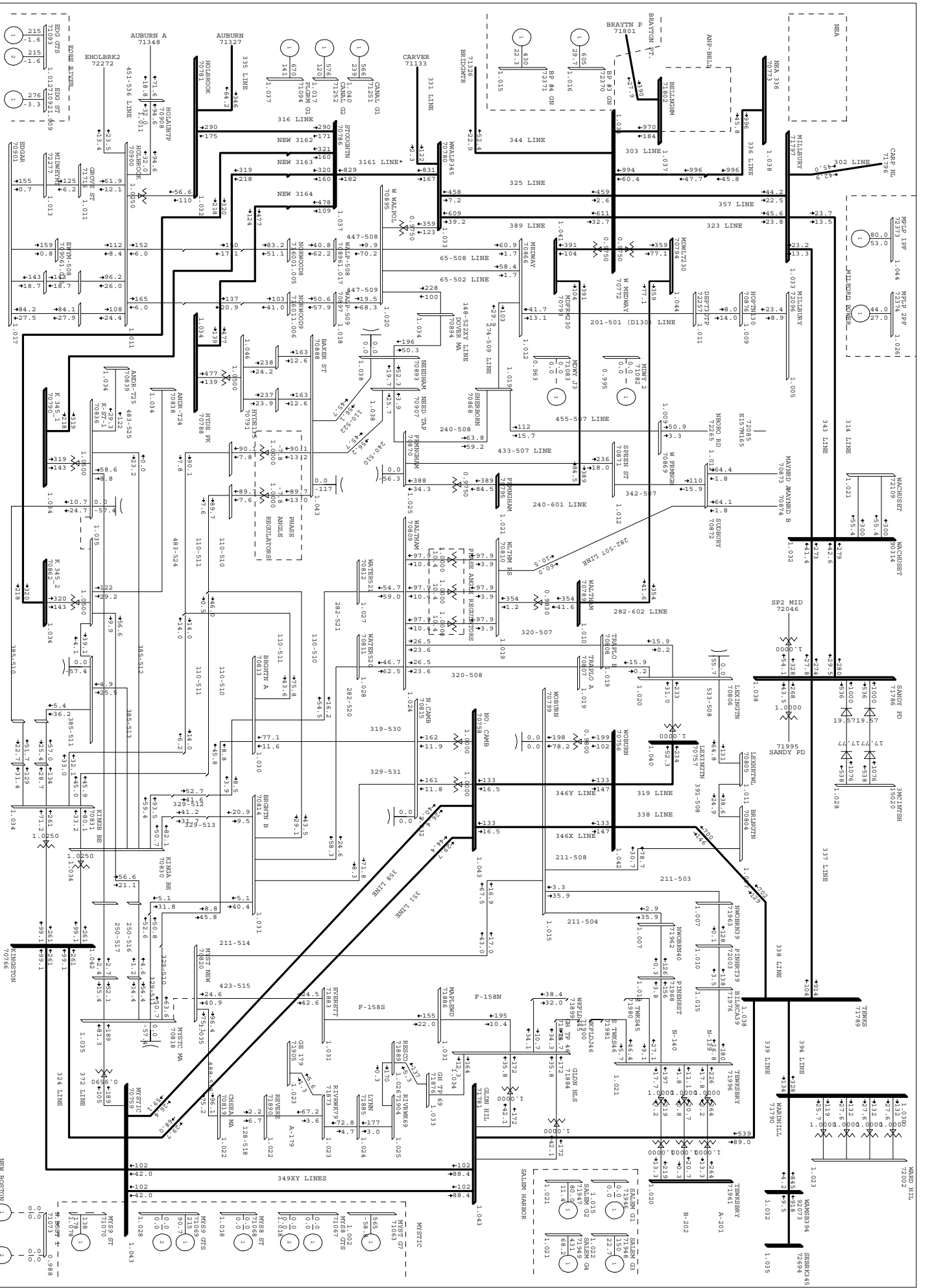
NEW BOSTON
 100% RATEA
 0.950UV 1.050OV
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR



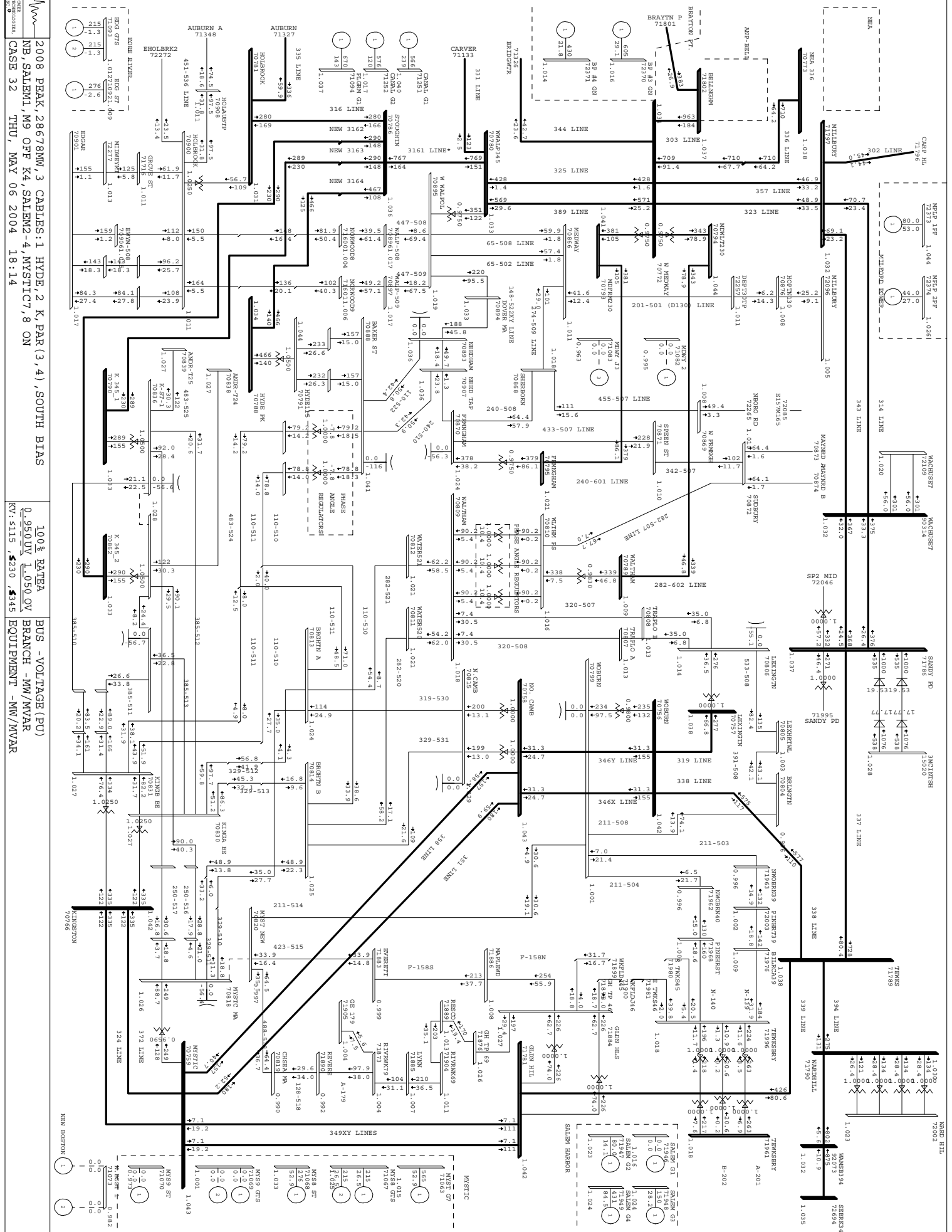
2008 PEAK, 28678MW, 3 CABLES: 1 HYDE, 2 K, PAR (3, 4), SOUTH BIAS
 NB, SALEM1, 1/2 M9, K4 OFF SALEM2-4, MYSTIC7, 8 + 1/2 M9 ON
 CASE 30 THU, MAY 06 2004 18:11

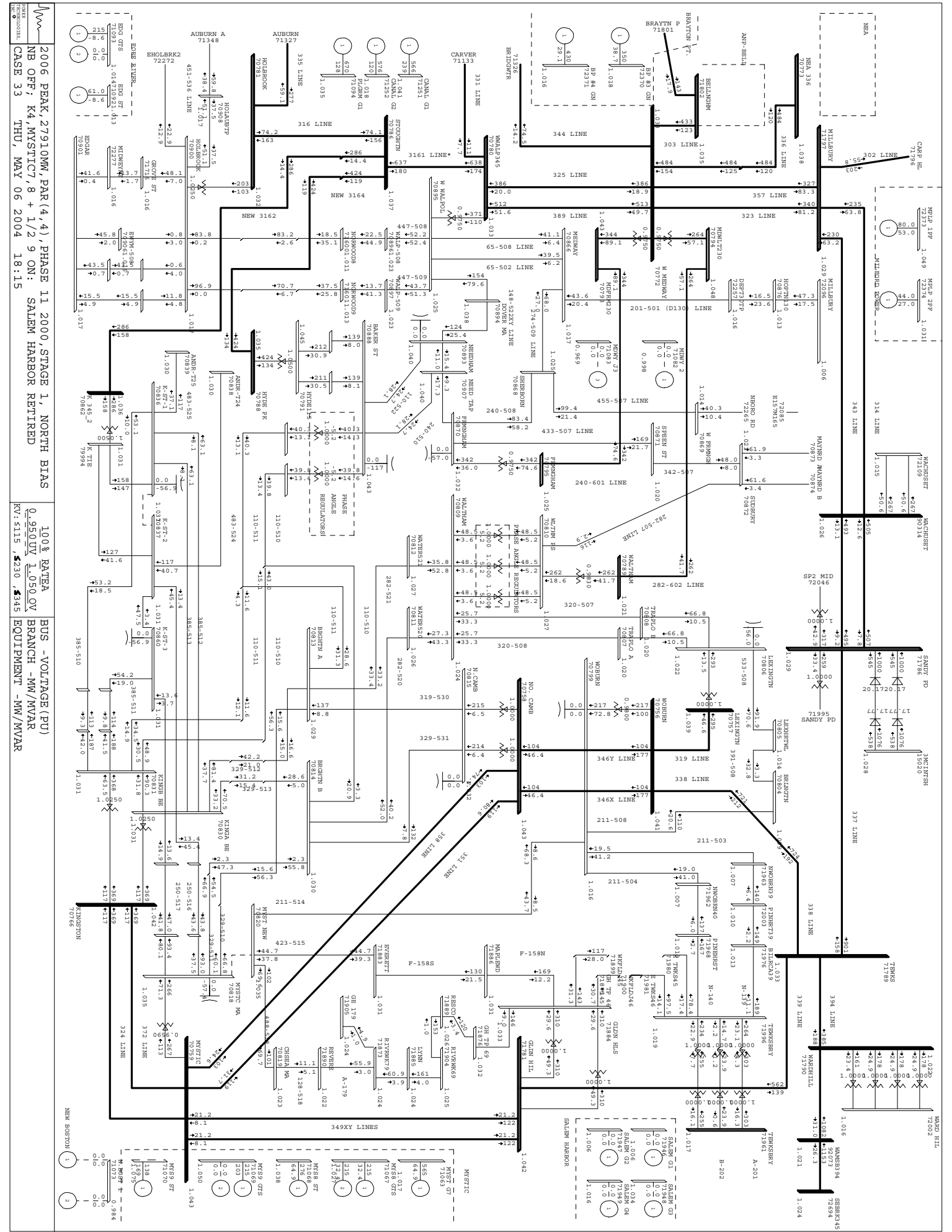
100% RATEA
 0.950UV 1.050OV
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

NEW BOSTON



2008 PEAK, 28678MW, 3 CABLES: 1 HYDE, 2 K, PAR(3, 4), SOUTH BIAS
 NB, SALEM1, 1/2 M9, M8 OFF K4, SALEM2-4, MYSTIC7, 1/2 M9 ON
 CASE 31 THU, MAY 06 2004 18:12
 100% RATEA
 0.950UV 1.050OV
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR
 KV: 5115, 5330, 5345
 NEW BOSTON

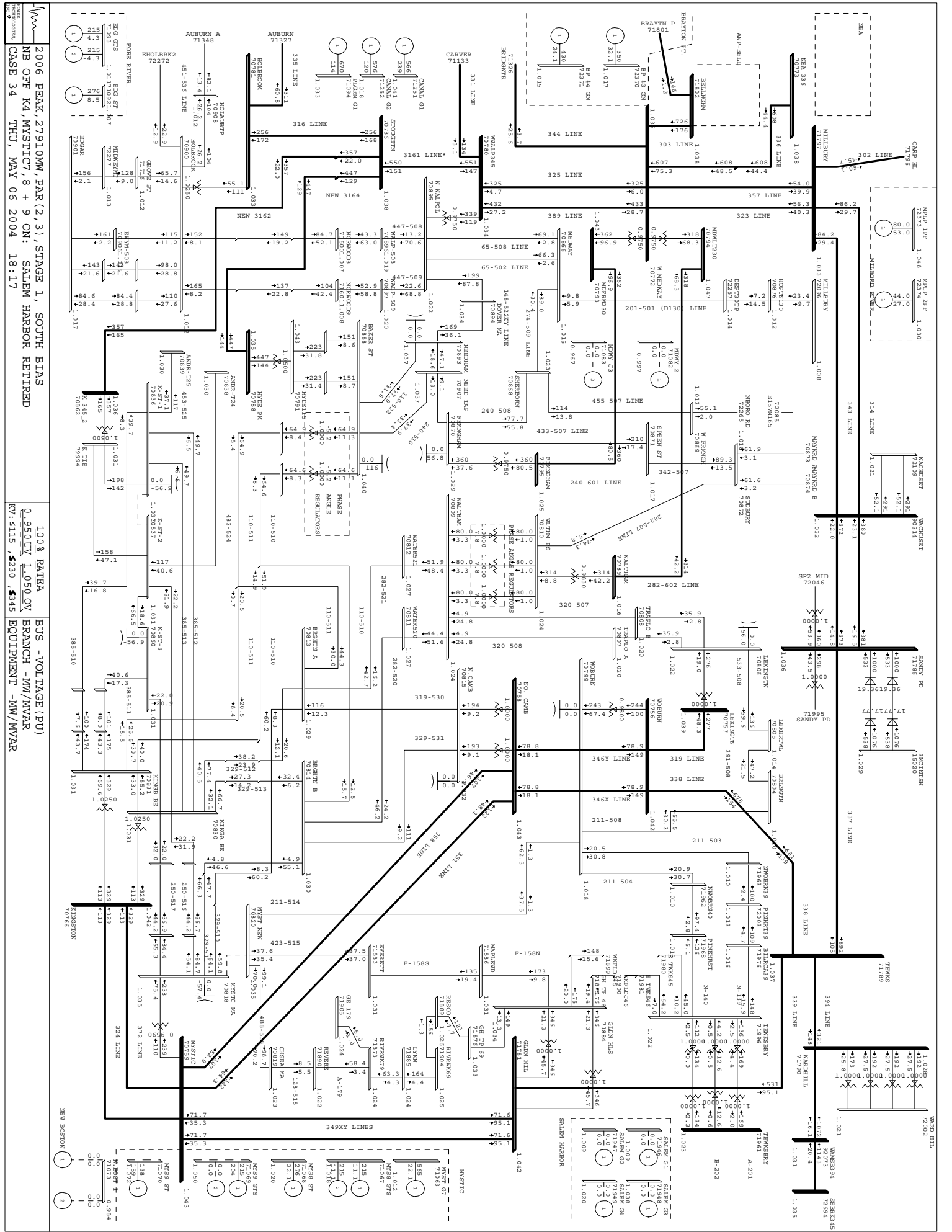




2006 PEAK, 27910MW, PAR(4,4), PHASE 11 2000, STAGE 1, NORTH BIAS
 NB OFF; K4, MYSTIC7, 8 + 1/2 9 ON; SALEM HARBOR RETIRED
 CASE 33 THU, MAY 06 2004 18:15

100% RATEA BUS - VOLTAGE (PU)
 0.950UV 1.050OV
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

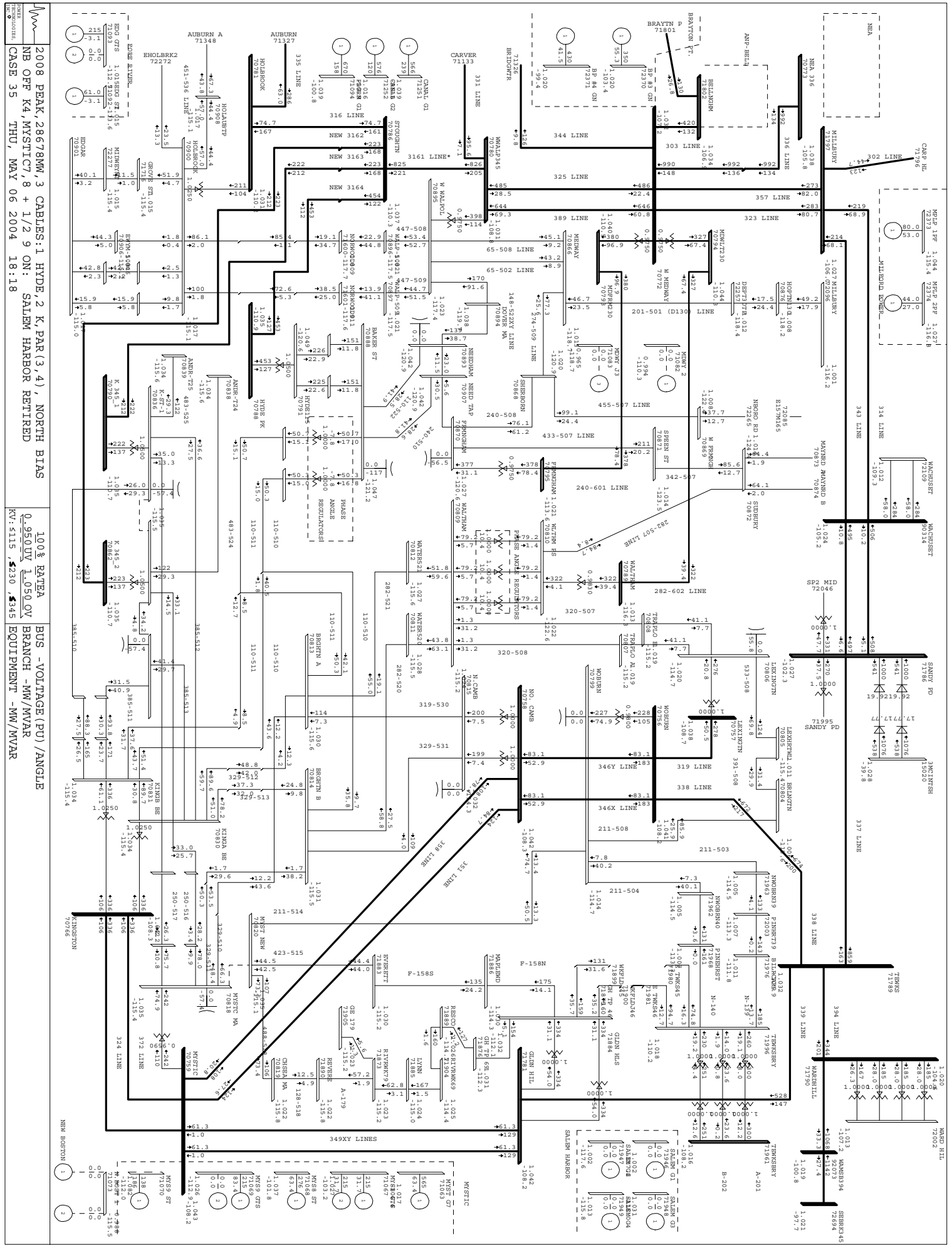
KV: 5115, 5330, 5345
 NEW BOSCON 1 2



2006 PEAK, 27910MW, PAR(2.3), STAGE 1, SOUTH BIAS
 NB OFF K4, MYSTIC, 8 + 9 ON: SALEM HARBOR RETIRED
 CASE 34 THU, MAY 06 2004 18:17

100% RATEA BUS - VOLTAGE (PU)
 0.950UV 1.050LV
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

100% RATEA BUS - VOLTAGE (PU)
 0.950UV 1.050LV
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

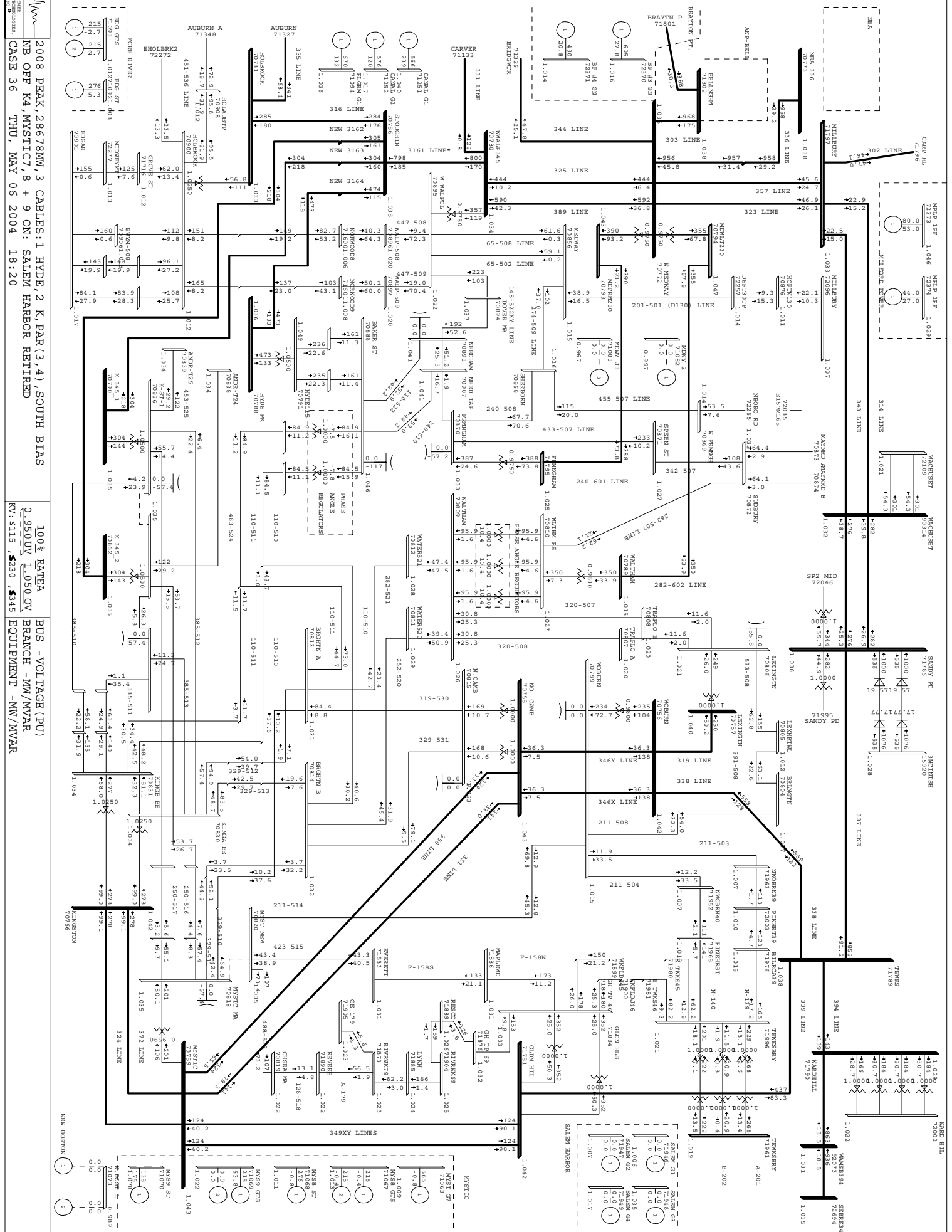


2008 PEAK, 26678MW, 3 CABLES: 1 HYDE, 2 K, PAR (3, 4), NORTH BIAS
NB OFF K4, MISTIC7, 8 + 1/2 ON: SALEM HARBOR RETIRED
CASE 35 THU, MAY 06 2004 18:18

100% RATEA
0.950UV 1.050OV
KV: 5115, 5230, 5345

BUS - VOLTAGE (PU) / ANGLE
BRANCH - MW / MVAR
EQUIPMENT - MW / MVAR

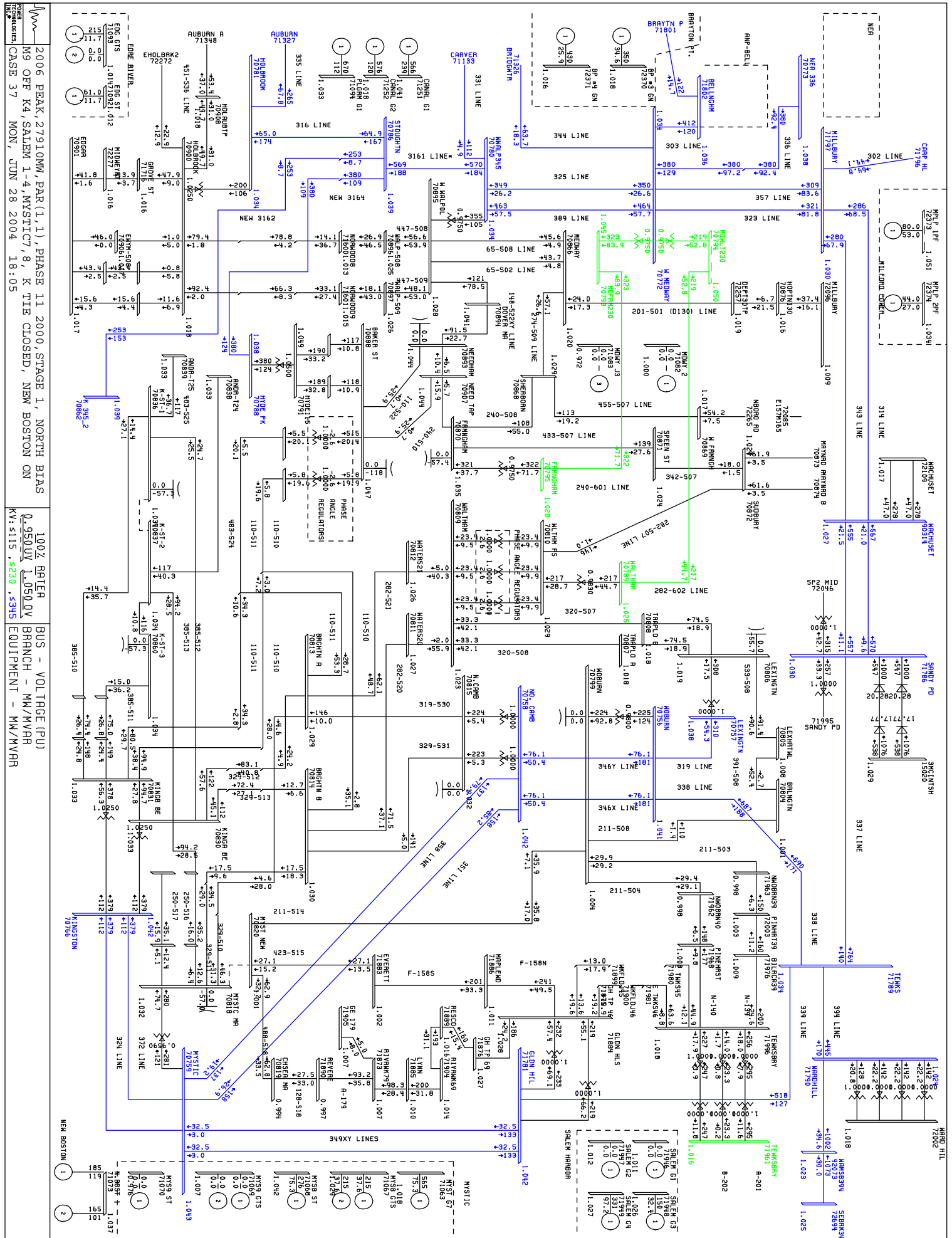
NEW BOSTON 1 2



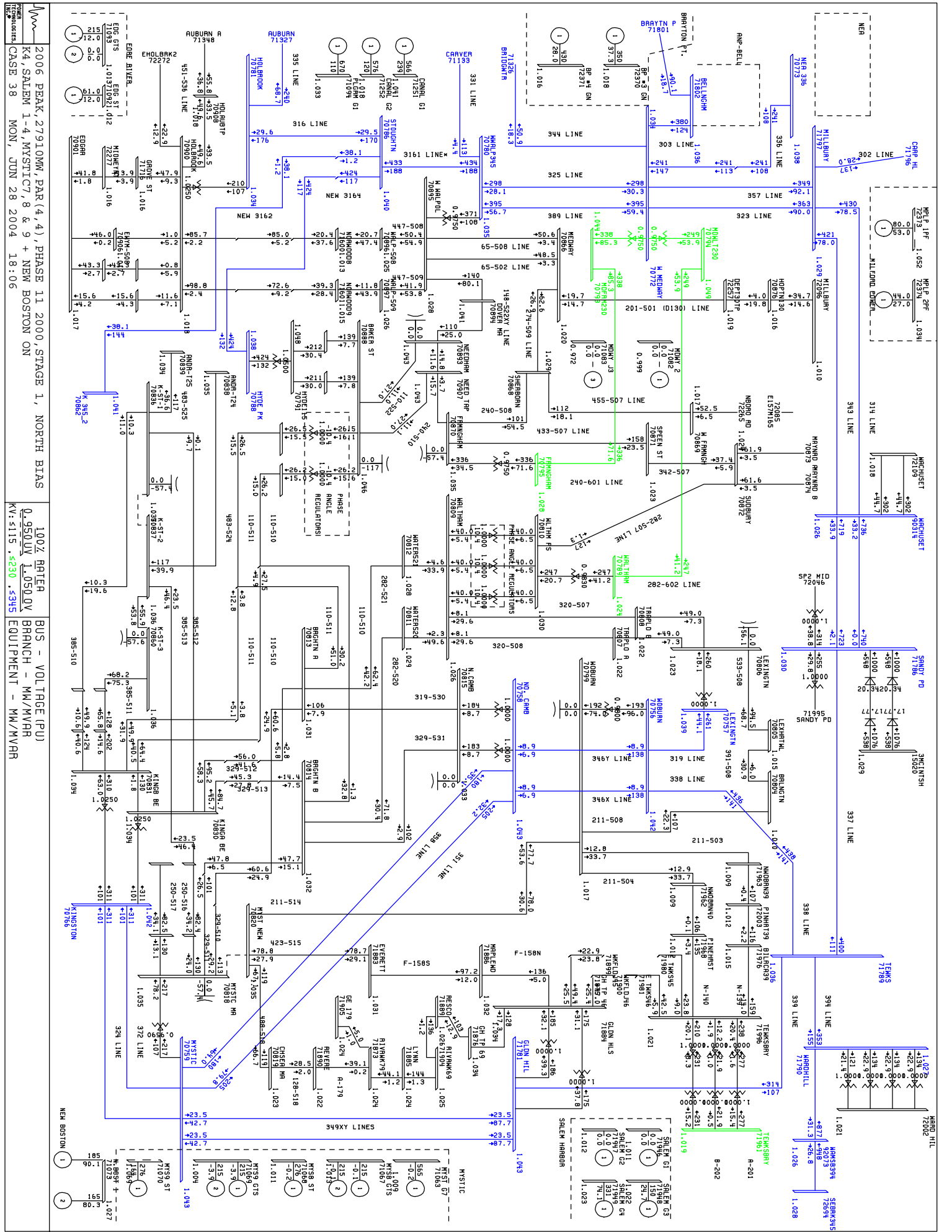
2008 PEAK, 26678MW, 3 CABLES: 1 HYDE, 2 K, PAR (3, 4), SOUTH BIAS
 NB OFF K4, MISTIC, 8 + 9 ON: SALM HARBOR RETIRED
 CASE 36 THU, MAY 06 2004 18:20

100% RATEA
 0.950UV 1.050OV
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

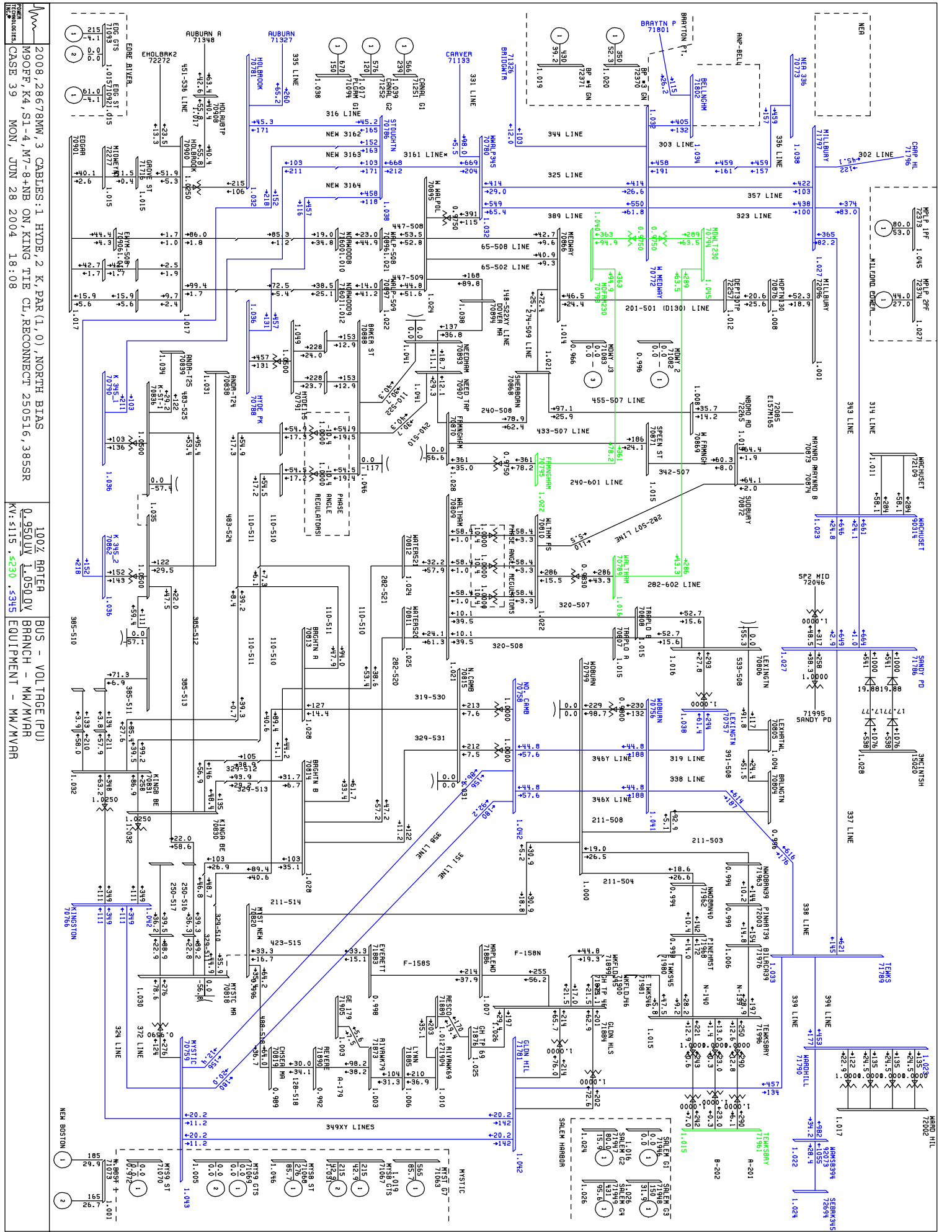
NEW BOSTON



2006 PEAK, 27910MW, PAR(1,1), PHASE 11 2000, STAGE 1, NORTH BIAS
 M9 OPF K4, SALEM 1-4, MYSYCT7, 8, K TIE CLOSED, NEW BOSTON ON
 CASE 37 MON, JUN 28 2004 18:05
 100% RATER
 0.950DV 1.050DV
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 KW: 515, 530, 534S
 EQUIPMENT - MW/MVAR



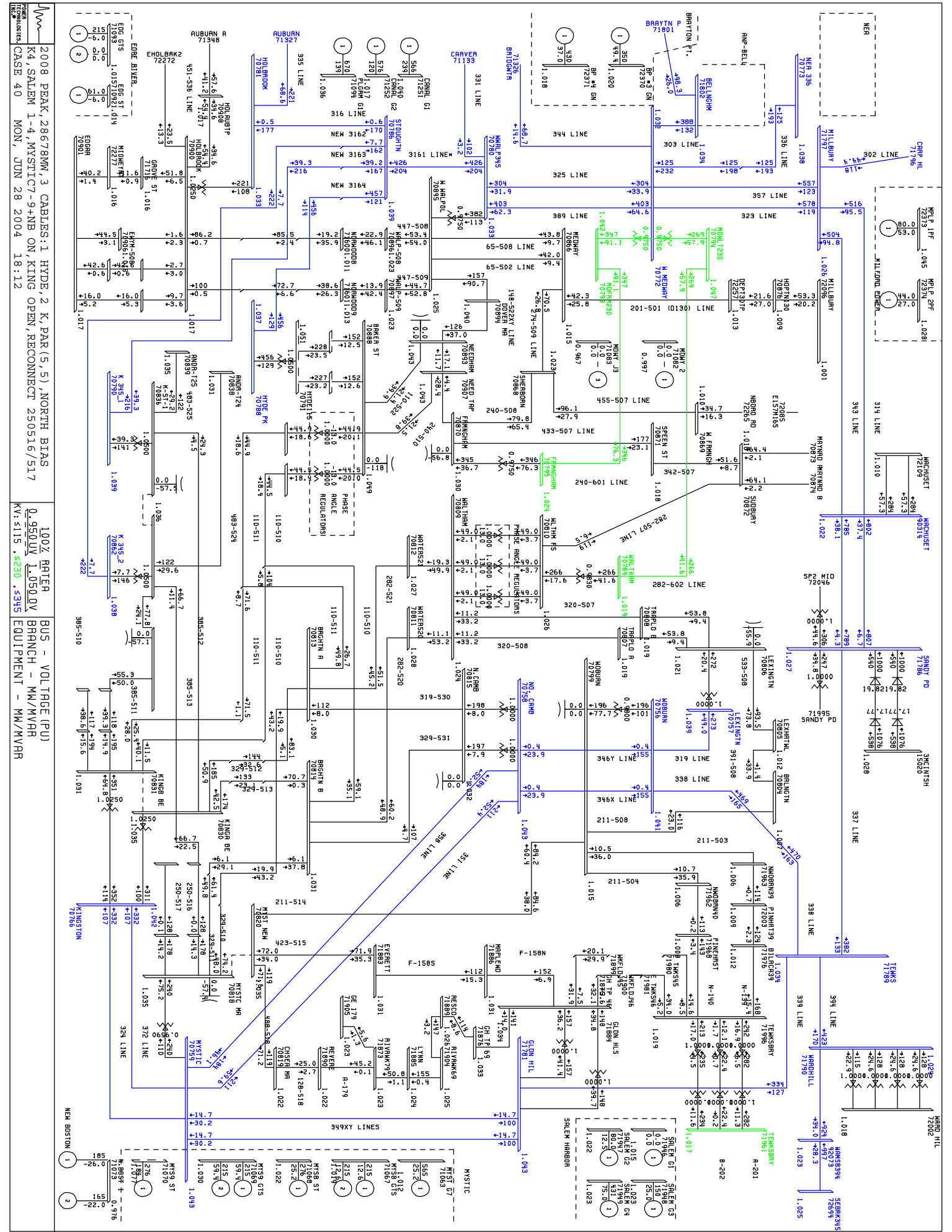
2006 PEAK, 27910MW, PAR(4,4), PHASE 11 2000, STAGE 1, NORTH BIAS
 K4, SALEM 1-4, MYSTIC 7, 8 & 9 + NEW BOSTON ON
 CASE 38 MON, JUN 28 2004 18:06
 100% RATER
 0.950DV 1.050DV
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 KW: 5115, 5230, 5345
 EQUIPMENT - MW/MVAR



2008, 28678MW, 3 CABLES: 1 HYDE, 2 K, PAR (1.0), NORTH BIAS
 M90PF, K4, S1.4, M7-8+NB ON, KING TIE CL, RECONNECT, 250516, 385SR
 CASE# 39 MON, JUN 28 2004 18:08

100% RATER
 0.950DV 1.050DV
 KW: 5115, 5230, 5345
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

100% RATER
 0.950DV 1.050DV
 KW: 5115, 5230, 5345
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR



2008 PEAK, 28678MW, 3 CABLES: 1 HYDE, 2 K, PAR (5, 5), NORTH BIAS
 K4, SALEM 1-4, MYSTIC 7-9+NB ON, KING OPEN, RECONNECT 250516/517
 CASE# 40 MON, JUN 28 2004 18:12

100% RATER
 0.950DVY 1.050DVY
 BUS - VOLTAGE (PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

NEAR BOSTON