IEEE 34 Node Test Feeder

Impedances

Configuration 300:

--------- Z & B Matrices Before Changes ---------

Z (R +jX) in ohms per mile

1.3368	1.3343	0.2101	0.5779	0.2130	0.5015
		1.3238	1.3569	0.2066	0.4591
				1.3294	1.3471

B in micro Siemens per mile

5.3350	-1.5313	-0.9943
	5.0979	-0.6212
		4.8880

Configuration 301:

Z (R +jX) in ohms per mile

1.9300	1.4115	0.2327	0.6442	0.2359	0.5691
		1.9157	1.4281	0.2288	0.5238
				1.9219	1.4209

B in micro Siemens per mile

5.1207	-1.4364	-0.9402
	4.9055	-0.5951
		4.7154

Configuration 302:

Z (R +jX) in ohms per mile

2.7995	1.4855	0.0000	0.0000	0.0000	0.0000
		0.0000	0.0000	0.0000	0.0000
				0.0000	0.0000

B in micro Siemens per mile

4.2251	0.0000	0.0000
	0.0000	0.0000
		0.0000

Configuration 303:

Z (R +jX) in ohms per mile

0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		2.7995	1.4855	0.0000	0.0000
				0.0000	0.0000

B in micro Siemens per mile

0.0000	0.0000	0.0000
	4.2251	0.0000
		0.0000

Configuration 304:

Z (R +jX) in ohms per mile

0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		1.9217	1.4212	0.0000	0.0000
				0.0000	0.0000

B in micro Siemens per mile

0.0000	0.0000	0.0000
	4.3637	0.0000
		0.0000

Power Flow Results

```
 -  R A D I A L   F L O W   S U M M A R Y  - DATE:  6-24-2004 AT 16:34:11 HOURS --
-
 SUBSTATION:  IEEE 34;   FEEDER:  IEEE 34
 ------------------------------------------------------------------------------
-
 SYSTEM         PHASE              PHASE              PHASE              TOTAL
 INPUT --------(A)-------|--------(B)-------|--------(C)-------|-------------------
 kW    :        759.136   |         666.663   |         617.072   |       2042.872
 kVAr  :        171.727   |          90.137   |          28.394   |        290.258
 kVA   :        778.318   |         672.729   |         617.725   |       2063.389
 PF    :         .9754    |          .9910    |          .9989    |         .9901

 LOAD   --(A-N)----(A-B)-|--(B-N)----(B-C)-|--(C-N)----(C-A)-|---WYE-----DELTA--
 kW    :   359.9    246.4|   339.3    243.3|   221.8    359.0|   921.0    848.8
  TOT  :        606.322   |        582.662   |        580.840   |       1769.824
                          |                  |                  |
 kVAr  :   230.9    128.7|   216.9    128.7|   161.8    184.6|   609.6    441.9
  TOT  :        359.531   |        345.609   |        346.407   |       1051.547
                          |                  |                  |
 kVA   :   427.6    278.0|   402.7    275.3|   274.6    403.7|  1104.5    957.0
  TOT  :        704.903   |        677.452   |        676.293   |       2058.647
                          |                  |                  |
 PF    :   .8417    .8864|   .8425    .8840|   .8078    .8894|   .8339    .8870
  TOT  :         .8601    |         .8601    |         .8589    |         .8597

 LOSSES ------(A)-------|-------(B)-------|-------(C)-------|-------------------
 kW    :        114.836   |          80.389   |          77.824   |        273.049
 kVAr  :         14.200   |          10.989   |           9.810   |         34.999
 kVA   :        115.711   |          81.137   |          78.440   |        275.283

 CAPAC --(A-N)----(A-B)-|--(B-N)----(B-C)-|--(C-N)----(C-A)-|---WYE-----DELTA--
 R-kVA:   250.0       .0|   250.0       .0|   250.0       .0|   750.0       .0
  TOT  :        250.000   |        250.000   |        250.000   |        750.000
                          |                  |                  |
 A-kVA:   265.7       .0|   264.8       .0|   265.9       .0|   796.3       .0
  TOT  :        265.658   |        264.760   |        265.869   |        796.287
```

--- **V O L T A G E P R O F I L E** ---- DATE: 6-24-2004 AT 16:34:18 HOURS ----
SUBSTATION: IEEE 34; FEEDER: IEEE 34

NODE	MAG	ANGLE	MAG	ANGLE	MAG	ANGLE	mi.to SR
	A-N		B-N		C-N		
800	1.0500 at	.00	1.0500 at	-120.00	1.0500 at	120.00	.000
802	1.0475 at	-.05	1.0484 at	-120.07	1.0484 at	119.95	.489
806	1.0457 at	-.08	1.0474 at	-120.11	1.0474 at	119.92	.816
808	1.0136 at	-.75	1.0296 at	-120.95	1.0289 at	119.30	6.920
810			1.0294 at	-120.95			8.020
812	.9763 at	-1.57	1.0100 at	-121.92	1.0069 at	118.59	14.023
814	.9467 at	-2.26	.9945 at	-122.70	.9893 at	118.01	19.653
RG10	1.0177 at	-2.26	1.0255 at	-122.70	1.0203 at	118.01	19.654
850	1.0176 at	-2.26	1.0255 at	-122.70	1.0203 at	118.01	19.655
816	1.0172 at	-2.26	1.0253 at	-122.71	1.0200 at	118.01	19.714
818	1.0163 at	-2.27					20.038
820	.9926 at	-2.32					29.157
822	.9895 at	-2.33					31.760
824	1.0082 at	-2.37	1.0158 at	-122.94	1.0116 at	117.76	21.648
826			1.0156 at	-122.94			22.222
828	1.0074 at	-2.38	1.0151 at	-122.95	1.0109 at	117.75	21.807
830	.9894 at	-2.63	.9982 at	-123.39	.9938 at	117.25	25.678
854	.9890 at	-2.64	.9978 at	-123.40	.9934 at	117.24	25.777
852	.9581 at	-3.11	.9680 at	-124.18	.9637 at	116.33	32.752
RG11	1.0359 at	-3.11	1.0345 at	-124.18	1.0360 at	116.33	32.752
832	1.0359 at	-3.11	1.0345 at	-124.18	1.0360 at	116.33	32.754
858	1.0336 at	-3.17	1.0322 at	-124.28	1.0338 at	116.22	33.682
834	1.0309 at	-3.24	1.0295 at	-124.39	1.0313 at	116.09	34.786
842	1.0309 at	-3.25	1.0294 at	-124.39	1.0313 at	116.09	34.839
844	1.0307 at	-3.27	1.0291 at	-124.42	1.0311 at	116.06	35.095
846	1.0309 at	-3.32	1.0291 at	-124.46	1.0313 at	116.01	35.784
848	1.0310 at	-3.32	1.0291 at	-124.47	1.0314 at	116.00	35.885
860	1.0305 at	-3.24	1.0291 at	-124.39	1.0310 at	116.09	35.169
836	1.0303 at	-3.23	1.0287 at	-124.39	1.0308 at	116.09	35.677
840	1.0303 at	-3.23	1.0287 at	-124.39	1.0308 at	116.09	35.839
862	1.0303 at	-3.23	1.0287 at	-124.39	1.0308 at	116.09	35.730
838			1.0285 at	-124.39			36.650
864	1.0336 at	-3.17					33.989
XF10	.9997 at	-4.63	.9983 at	-125.73	1.0000 at	114.82	32.754
888	.9996 at	-4.64	.9983 at	-125.73	1.0000 at	114.82	32.754
890	.9167 at	-5.19	.9235 at	-126.78	.9177 at	113.98	34.754
856			.9977 at	-123.41			30.195

---------- **VOLTAGE REGULATOR DATA** ---- DATE: 6-24-2004 AT 16:34:22 HOURS --
SUBSTATION: IEEE 34; FEEDER: IEEE 34

[NODE]	[VREG]	[SEG]	[NODE]	MODEL	OPT	BNDW
814	RG10	850	850	Phase A & B & C, Wye	RX	2.00

PHASE	LDCTR	VOLT HOLD	R-VOLT	X-VOLT	PT RATIO	CT RATE	TAP
1		122.000	2.700	1.600	120.00	100.00	12
2		122.000	2.700	1.600	120.00	100.00	5
3		122.000	2.700	1.600	120.00	100.00	5

[NODE]	[VREG]	[SEG]	[NODE]	MODEL	OPT	BNDW
852	RG11	832	832	Phase A & B & C, Wye	RX	2.00

PHASE	LDCTR	VOLT HOLD	R-VOLT	X-VOLT	PT RATIO	CT RATE	TAP
1		124.000	2.500	1.500	120.00	100.00	13
2		124.000	2.500	1.500	120.00	100.00	11
3		124.000	2.500	1.500	120.00	100.00	12

```
- R A D I A L   P O W E R   F L O W  ---  DATE:  6-24-2004 AT 16:34:32 HOURS ---
SUBSTATION:  IEEE 34;   FEEDER:  IEEE 34
--------------------------------------------------------------------------------
   NODE      VALUE         PHASE A         PHASE B         PHASE C     UNT O/L<
                           (LINE A)        (LINE B)        (LINE C)        60.%
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 800       VOLTS:   1.050     .00   1.050 -120.00   1.050  120.00 MAG/ANG
kVll  24.900           NO LOAD OR CAPACITOR REPRESENTED AT SOURCE NODE

TO NODE 802   .......:   51.56  -12.74   44.57 -127.70   40.92  117.37 AMP/DG
<802   > LOSS=  3.472:    (  1.637)       (   .978)       (   .858)    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 802       VOLTS:   1.047    -.05   1.048 -120.07   1.048  119.95 MAG/ANG
                  -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900      CAP:             .00             .00             .00 kVR

FROM NODE 800   .....:   51.58  -12.80   44.57 -127.76   40.93  117.31 AMP/DG
<802   > LOSS=  3.472:    (  1.637)       (   .978)       (   .858)    kW
TO NODE 806   .......:   51.58  -12.80   44.57 -127.76   40.93  117.31 AMP/DG
<806   > LOSS=  2.272:    (  1.102)       (   .618)       (   .552)    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 806       VOLTS:   1.046    -.08   1.047 -120.11   1.047  119.92 MAG/ANG
                  -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900      CAP:             .00             .00             .00 kVR

FROM NODE 802   .....:   51.59  -12.83   42.47 -126.83   39.24  118.52 AMP/DG
<806   > LOSS=  2.272:    (  1.102)       (   .618)       (   .552)    kW
TO NODE 808   .......:   51.59  -12.83   42.47 -126.83   39.24  118.52 AMP/DG
<808   > LOSS= 41.339:    ( 20.677)       ( 10.780)       (  9.882)    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 808       VOLTS:   1.014    -.75   1.030 -120.95   1.029  119.30 MAG/ANG
                  -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900      CAP:             .00             .00             .00 kVR

FROM NODE 806   .....:   51.76  -13.47   42.46 -127.59   39.28  117.76 AMP/DG
<808   > LOSS= 41.339:    ( 20.677)       ( 10.780)       (  9.882)    kW
TO NODE 810   .......:                    1.22 -144.62                 AMP/DG
<810   > LOSS=   .002:                    (   .002)                    kW
TO NODE 812   .......:   51.76  -13.47   41.30 -127.10   39.28  117.76 AMP/DG
<812   > LOSS= 47.531:    ( 24.126)       ( 11.644)       ( 11.761)    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 810       VOLTS:                   1.029 -120.95                 MAG/ANG
                  -LD:                     .00     .00                 kW/kVR
kVll  24.900      CAP:                             .00                 kVR

FROM NODE 808   .....:                     .00     .00                 AMP/DG
<810   > LOSS=   .002:                    (   .002)                    kW
```

```
- R A D I A L   P O W E R   F L O W  ---  DATE:  6-24-2004 AT 16:34:32 HOURS ---
SUBSTATION:  IEEE 34;   FEEDER:  IEEE 34
-------------------------------------------------------------------------------
   NODE      VALUE         PHASE A         PHASE B         PHASE C     UNT O/L<
                           (LINE A)        (LINE B)        (LINE C)        60.%
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 812        VOLTS:    .976   -1.57   1.010 -121.92   1.007  118.59 MAG/ANG
                   -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900       CAP:             .00             .00             .00 kVR

FROM NODE 808    .....:   51.95  -14.18   41.29 -127.99   39.33  116.90 AMP/DG
<812    > LOSS= 47.531:    ( 24.126)       ( 11.644)       ( 11.761)    kW
TO NODE 814    .......:   51.95  -14.18   41.29 -127.99   39.33  116.90 AMP/DG
<814    > LOSS= 37.790:    ( 19.245)       (  9.140)       (  9.404)    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 814        VOLTS:    .947   -2.26    .994 -122.70    .989  118.01 MAG/ANG
                   -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900       CAP:             .00             .00             .00 kVR

FROM NODE 812    .....:   52.10  -14.73   41.29 -128.69   39.37  116.23 AMP/DG
<814    > LOSS= 37.790:    ( 19.245)       (  9.140)       (  9.404)    kW
TO NODE RG10  .<VRG>.:   52.10  -14.73   41.29 -128.69   39.37  116.23 AMP/DG
<RG10   > LOSS=   .000:    (   .000)       (   .000)       (   .000)    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: RG10       VOLTS:   1.018   -2.26   1.026 -122.70   1.020  118.01 MAG/ANG
                   -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900       CAP:             .00             .00             .00 kVR

FROM NODE 814    <VRG>:   48.47  -14.73   40.04 -128.69   38.17  116.23 AMP/DG
<RG10   > LOSS=   .000:    (   .000)       (   .000)       (   .000)    kW
TO NODE 850    .......:   48.47  -14.73   40.04 -128.69   38.17  116.23 AMP/DG
<850    > LOSS=   .017:    (   .008)       (   .005)       (   .005)    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 850        VOLTS:   1.018   -2.26   1.026 -122.70   1.020  118.01 MAG/ANG
                   -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900       CAP:             .00             .00             .00 kVR

FROM NODE RG10   .....:   48.47  -14.73   40.04 -128.69   38.17  116.23 AMP/DG
<850    > LOSS=   .017:    (   .008)       (   .005)       (   .005)    kW
TO NODE 816    .......:   48.47  -14.73   40.04 -128.69   38.17  116.23 AMP/DG
<816    > LOSS=   .538:    (   .254)       (   .145)       (   .139)    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 816        VOLTS:   1.017   -2.26   1.025 -122.71   1.020  118.01 MAG/ANG
                   -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900       CAP:             .00             .00             .00 kVR

FROM NODE 850    .....:   48.47  -14.74   40.04 -128.70   38.17  116.23 AMP/DG
<816    > LOSS=   .538:    (   .254)       (   .145)       (   .139)    kW
TO NODE 818    .......:   13.02  -26.69                                 AMP/DG
<818    > LOSS=   .154:    (   .154)                                      kW
TO NODE 824    .......:   35.83  -10.42   40.04 -128.70   38.17  116.23 AMP/DG
<824    > LOSS= 14.181:    (  4.312)       (  5.444)       (  4.425)    kW
```

```
- R A D I A L   P O W E R   F L O W  ---  DATE:  6-24-2004 AT 16:34:32 HOURS ---
SUBSTATION:  IEEE 34;   FEEDER:  IEEE 34
-------------------------------------------------------------------------------
   NODE      VALUE          PHASE A          PHASE B          PHASE C     UNT O/L<
                            (LINE A)         (LINE B)         (LINE C)        60.%
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 818        VOLTS:   1.016   -2.27                                  MAG/ANG
                   -LD:     .00     .00                                  kW/kVR
kVll  24.900       CAP:             .00                                  kVR

FROM NODE 816   .....:   13.03  -26.77                                  AMP/DG
<818   > LOSS=   .154:    (   .154)                                     kW
TO NODE 820    .......:   13.03  -26.77                                  AMP/DG
<820   > LOSS=  3.614:    (  3.614)                                     kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 820        VOLTS:    .993   -2.32                                  MAG/ANG
                   -LD:     .00     .00                                  kW/kVR
kVll  24.900       CAP:             .00                                  kVR

FROM NODE 818   .....:   10.62  -28.98                                  AMP/DG
<820   > LOSS=  3.614:    (  3.614)                                     kW
TO NODE 822    .......:   10.62  -28.98                                  AMP/DG
<822   > LOSS=   .413:    (   .413)                                     kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 822        VOLTS:    .990   -2.33                                  MAG/ANG
                   -LD:     .00     .00                                  kW/kVR
kVll  24.900       CAP:             .00                                  kVR

FROM NODE 820   .....:     .00     .00                                  AMP/DG
<822   > LOSS=   .413:    (   .413)                                     kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 824        VOLTS:   1.008   -2.37   1.016 -122.94   1.012  117.76 MAG/ANG
                   -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900       CAP:             .00             .00             .00 kVR

FROM NODE 816   .....:   35.87  -10.70   39.82 -129.02   38.05  116.25 AMP/DG
<824   > LOSS= 14.181:    (  4.312)       (  5.444)       (  4.425)     kW
TO NODE 826    .......:                    3.10 -148.92                  AMP/DG
<826   > LOSS=   .008:                     (   .008)                     kW
TO NODE 828    .......:   35.87  -10.70   36.93 -127.39   38.05  116.25 AMP/DG
<828   > LOSS=  1.108:    (   .361)       (   .393)       (   .354)     kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 826        VOLTS:                  1.016 -122.94                  MAG/ANG
                   -LD:                    .00     .00                  kW/kVR
kVll  24.900       CAP:                            .00                  kVR

FROM NODE 824   .....:                     .00     .00                  AMP/DG
<826   > LOSS=   .008:                    (   .008)                     kW
```

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- R A D I A L   P O W E R   F L O W  ---  DATE:  6-24-2004 AT 16:34:32 HOURS ---
SUBSTATION:  IEEE 34;   FEEDER:  IEEE 34
--------------------------------------------------------------------------------
   NODE      VALUE          PHASE A          PHASE B          PHASE C     UNT O/L<
                            (LINE A)         (LINE B)         (LINE C)        60.%
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 828        VOLTS:   1.007   -2.38   1.015 -122.95   1.011  117.75 MAG/ANG
                   -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900       CAP:             .00             .00             .00 kVR

FROM NODE 824   .....:   35.87  -10.72   36.93 -127.41   37.77  116.42 AMP/DG
<828   > LOSS=  1.108:    (   .361)       (   .393)       (   .354)    kW
TO NODE 830   .......:   35.87  -10.72   36.93 -127.41   37.77  116.42 AMP/DG
<830   > LOSS= 26.587:    (  8.443)       (  9.214)       (  8.930)    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 830        VOLTS:    .989   -2.63    .998 -123.39    .994  117.25 MAG/ANG
                 D-LD:    9.95    4.98    9.86    4.93   24.55    9.82 kW/kVR
kVll  24.900    Y CAP:             .00             .00             .00 kVR

FROM NODE 828   .....:   35.43  -11.06   36.91 -127.92   37.79  115.96 AMP/DG
<830   > LOSS= 26.587:    (  8.443)       (  9.214)       (  8.930)    kW
TO NODE 854   .......:   34.22   -9.97   36.19 -127.47   36.49  116.26 AMP/DG
<854   > LOSS=   .635:    (   .197)       (   .227)       (   .211)    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 854        VOLTS:    .989   -2.64    .998 -123.40    .993  117.24 MAG/ANG
                   -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900       CAP:             .00             .00             .00 kVR

FROM NODE 830   .....:   34.23   -9.99   36.19 -127.48   36.49  116.25 AMP/DG
<854   > LOSS=   .635:    (   .197)       (   .227)       (   .211)    kW
TO NODE 852   .......:   34.23   -9.99   35.93 -127.72   36.49  116.25 AMP/DG
<852   > LOSS= 44.798:    ( 13.996)       ( 15.778)       ( 15.023)    kW
TO NODE 856   .......:                     .31  -98.70                 AMP/DG
<856   > LOSS=   .001:                    (   .001)                    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 852        VOLTS:    .958   -3.11    .968 -124.18    .964  116.33 MAG/ANG
                   -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900       CAP:             .00             .00             .00 kVR

FROM NODE 854   .....:   34.35  -11.00   35.90 -128.66   36.52  115.41 AMP/DG
<852   > LOSS= 44.798:    ( 13.996)       ( 15.778)       ( 15.023)    kW
TO NODE RG11  .<VRG>.:   34.35  -11.00   35.90 -128.66   36.52  115.41 AMP/DG
<RG11  > LOSS=   .000:    (   .000)       (   .000)       (   .000)    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: RG11       VOLTS:   1.036   -3.11   1.035 -124.18   1.036  116.33 MAG/ANG
                   -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900       CAP:             .00             .00             .00 kVR

FROM NODE 852   <VRG>:   31.77  -11.00   33.59 -128.66   33.98  115.41 AMP/DG
<RG11  > LOSS=   .000:    (   .000)       (   .000)       (   .000)    kW
TO NODE 832   .......:   31.77  -11.00   33.59 -128.66   33.98  115.41 AMP/DG
<832   > LOSS=   .011:    (   .003)       (   .004)       (   .004)    kW
```

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- R A D I A L   P O W E R   F L O W  ---  DATE:  6-24-2004 AT 16:34:32 HOURS ---
SUBSTATION:  IEEE 34;   FEEDER:  IEEE 34
--------------------------------------------------------------------------------
   NODE      VALUE         PHASE A         PHASE B         PHASE C     UNT O/L<
                           (LINE A)        (LINE B)        (LINE C)        60.%
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 832       VOLTS:   1.036   -3.11   1.035 -124.18   1.036  116.33 MAG/ANG
                  -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900      CAP:             .00             .00             .00 kVR

FROM NODE RG11  .....:   31.77  -11.00   33.59 -128.66   33.98  115.41 AMP/DG
<832   > LOSS=   .011:    (   .003)       (   .004)       (   .004)    kW
TO NODE 858   .......:   21.31     .47   23.40 -116.89   24.34  128.36 AMP/DG
<858   > LOSS=  2.467:    (   .643)       (   .997)       (   .827)    kW
TO NODE XF10  .......:   11.68  -32.29   11.70 -152.73   11.61   87.39 AMP/DG <
<XF10  > LOSS=  9.625:    (  3.196)       (  3.241)       (  3.187)    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 858       VOLTS:   1.034   -3.17   1.032 -124.28   1.034  116.22 MAG/ANG
                  -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900      CAP:             .00             .00             .00 kVR

FROM NODE 832   .....:   20.86     .86   23.13 -116.39   24.02  128.48 AMP/DG
<858   > LOSS=  2.467:    (   .643)       (   .997)       (   .827)    kW
TO NODE 834   .......:   20.73    1.01   23.13 -116.39   24.02  128.48 AMP/DG
<834   > LOSS=  2.798:    (   .717)       (  1.145)       (   .936)    kW
TO NODE 864   .......:     .14  -22.82                                 AMP/DG
<864   > LOSS=   .000:    (   .000)                                    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 834       VOLTS:   1.031   -3.24   1.029 -124.39   1.031  116.09 MAG/ANG
                  -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900      CAP:             .00             .00             .00 kVR

FROM NODE 858   .....:   20.29    2.18   22.37 -116.07   23.23  130.06 AMP/DG
<834   > LOSS=  2.798:    (   .717)       (  1.145)       (   .936)    kW
TO NODE 842   .......:   14.75   34.68   16.30  -95.63   15.12  151.05 AMP/DG
<842   > LOSS=   .064:    (   .015)       (   .032)       (   .017)    kW
TO NODE 860   .......:   11.16  -43.05    9.09 -154.82   10.60   99.34 AMP/DG
<860   > LOSS=   .141:    (   .021)       (   .104)       (   .017)    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 842       VOLTS:   1.031   -3.25   1.029 -124.39   1.031  116.09 MAG/ANG
                  -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900      CAP:             .00             .00             .00 kVR

FROM NODE 834   .....:   14.74   34.67   16.30  -95.64   15.12  151.03 AMP/DG
<842   > LOSS=   .064:    (   .015)       (   .032)       (   .017)    kW
TO NODE 844   .......:   14.74   34.67   16.30  -95.64   15.12  151.03 AMP/DG
<844   > LOSS=   .306:    (   .068)       (   .156)       (   .083)    kW
```

- **R A D I A L P O W E R F L O W** --- DATE: 6-24-2004 AT 16:34:32 HOURS ---
SUBSTATION: IEEE 34;   FEEDER: IEEE 34

NODE	VALUE	PHASE A (LINE A)		PHASE B (LINE B)		PHASE C (LINE C)		UNT O/L< 60.%
NODE: 844	VOLTS:	1.031	-3.27	1.029	-124.42	1.031	116.06	MAG/ANG
	Y-LD:	143.41	111.54	142.97	111.20	143.51	111.62	kW/kVR
kVll 24.900	Y CAP:		106.23		105.90		106.31	kVR
FROM NODE 842 ..... :		14.47	37.12	16.29	-95.71	15.11	150.97	AMP/DG
<844 > LOSS= .306:		(.068)		(.156)		(.083)		kW
TO NODE 846 ..... :		9.83	78.88	9.40	-63.87	9.40	-170.67	AMP/DG
<846 > LOSS= .323:		(.043)		(.212)		(.068)		kW
NODE: 846	VOLTS:	1.031	-3.32	1.029	-124.46	1.031	116.01	MAG/ANG
	-LD:	.00	.00	.00	.00	.00	.00	kW/kVR
kVll 24.900	CAP:		.00		.00		.00	kVR
FROM NODE 844 ..... :		9.76	78.80	9.40	-52.54	9.78	-161.93	AMP/DG
<846 > LOSS= .323:		(.043)		(.212)		(.068)		kW
TO NODE 848 ..... :		9.76	78.80	9.40	-52.54	9.78	-161.93	AMP/DG
<848 > LOSS= .048:		(.007)		(.031)		(.010)		kW
NODE: 848	VOLTS:	1.031	-3.32	1.029	-124.47	1.031	116.00	MAG/ANG
	D-LD:	20.00	16.00	20.00	16.00	20.00	16.00	kW/kVR
kVll 24.900	Y CAP:		159.43		158.86		159.56	kVR
FROM NODE 846 ..... :		9.76	78.79	9.77	-42.47	9.78	-161.94	AMP/DG
<848 > LOSS= .048:		(.007)		(.031)		(.010)		kW
NODE: 860	VOLTS:	1.030	-3.24	1.029	-124.39	1.031	116.09	MAG/ANG
	Y-LD:	20.00	16.00	20.00	16.00	20.00	16.00	kW/kVR
kVll 24.900	Y CAP:		.00		.00		.00	kVR
FROM NODE 834 ..... :		5.87	-33.62	7.68	-156.52	5.29	86.10	AMP/DG
<860 > LOSS= .141:		(.021)		(.104)		(.017)		kW
TO NODE 836 ..... :		4.16	-30.19	5.96	-154.63	3.60	90.25	AMP/DG
<836 > LOSS= .039:		(-.035)		(.103)		(-.028)		kW
NODE: 836	VOLTS:	1.030	-3.23	1.029	-124.39	1.031	116.09	MAG/ANG
	-LD:	.00	.00	.00	.00	.00	.00	kW/kVR
kVll 24.900	CAP:		.00		.00		.00	kVR
FROM NODE 860 ..... :		1.49	-19.83	4.42	-150.74	1.74	68.08	AMP/DG
<836 > LOSS= .039:		(-.035)		(.103)		(-.028)		kW
TO NODE 840 ..... :		1.50	-20.01	2.33	-151.97	1.75	68.00	AMP/DG
<840 > LOSS= .002:		(-.014)		(.026)		(-.010)		kW
TO NODE 862 ..... :		.00	.00	2.09	-149.38	.00	.00	AMP/DG
<862 > LOSS= .000:		(-.005)		(.009)		(-.004)		kW

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- R A D I A L   P O W E R   F L O W  ---  DATE:  6-24-2004 AT 16:34:32 HOURS ---
SUBSTATION:  IEEE 34;   FEEDER:  IEEE 34
--------------------------------------------------------------------------------
   NODE      VALUE          PHASE A          PHASE B          PHASE C     UNT O/L<
                            (LINE A)         (LINE B)         (LINE C)         60.%
---------------------*--------A-------*-------B-------*-------C-------*---------
NODE: 840        VOLTS:   1.030   -3.23   1.029 -124.39   1.031  116.09 MAG/ANG
                  Y-LD:    9.27    7.21    9.26    7.20    9.28    7.22 kW/kVR
kVll  24.900     Y CAP:             .00             .00             .00 kVR

FROM NODE 836    .....:     .79  -41.11     .79 -162.26     .79   78.21 AMP/DG
<840   > LOSS=   .002:    (  -.014)       (   .026)       (  -.010)    kW
---------------------*--------A-------*-------B-------*-------C-------*---------
NODE: 862        VOLTS:   1.030   -3.23   1.029 -124.39   1.031  116.09 MAG/ANG
                  -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll  24.900      CAP:             .00             .00             .00 kVR

FROM NODE 836    .....:     .00     .00    2.09 -149.50     .00     .00 AMP/DG
<862   > LOSS=   .000:    (  -.005)       (   .009)       (  -.004)    kW
TO NODE 838    ........:                  2.09 -149.50                 AMP/DG
<838   > LOSS=   .004:                   (   .004)                    kW
---------------------*--------A-------*-------B-------*-------C-------*---------
NODE: 838        VOLTS:                 1.029 -124.39                 MAG/ANG
                  -LD:                    .00     .00                 kW/kVR
kVll  24.900      CAP:                            .00                 kVR

FROM NODE 862    .....:                    .00     .00                 AMP/DG
<838   > LOSS=   .004:                   (   .004)                    kW
---------------------*--------A-------*-------B-------*-------C-------*---------
NODE: 864        VOLTS:   1.034   -3.17                                MAG/ANG
                  -LD:     .00     .00                                 kW/kVR
kVll  24.900      CAP:             .00                                 kVR

FROM NODE 858    .....:     .00     .00                                 AMP/DG
<864   > LOSS=   .000:    (   .000)                                    kW
---------------------*--------A-------*-------B-------*-------C-------*---------
NODE: XF10       VOLTS:   1.000   -4.63    .998 -125.73   1.000  114.82 MAG/ANG
                  -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll   4.160      CAP:             .00             .00             .00 kVR

FROM NODE 832    .....:   69.90  -32.29   70.04 -152.73   69.50   87.39 AMP/DG <
<XF10  > LOSS=  9.625:    (  3.196)       (  3.241)       (  3.187)    kW
TO NODE 888    ........:   69.90  -32.29   70.04 -152.73   69.50   87.39 AMP/DG
<888   > LOSS=   .000:    (   .000)       (   .000)       (   .000)    kW
---------------------*--------A-------*-------B-------*-------C-------*---------
NODE: 888        VOLTS:   1.000   -4.64    .998 -125.73   1.000  114.82 MAG/ANG
                  -LD:     .00     .00     .00     .00     .00     .00 kW/kVR
kVll   4.160      CAP:             .00             .00             .00 kVR

FROM NODE XF10   .....:   69.90  -32.29   70.04 -152.73   69.50   87.39 AMP/DG
<888   > LOSS=   .000:    (   .000)       (   .000)       (   .000)    kW
TO NODE 890    ........:   69.90  -32.29   70.04 -152.73   69.50   87.39 AMP/DG
<890   > LOSS= 32.760:    ( 11.638)       (  9.950)       ( 11.173)    kW
```

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- R A D I A L   P O W E R   F L O W  ---  DATE:  6-24-2004 AT 16:34:32 HOURS ---
SUBSTATION:  IEEE 34;   FEEDER:  IEEE 34
-------------------------------------------------------------------------------
   NODE      VALUE          PHASE A          PHASE B          PHASE C     UNT O/L<
                           (LINE A)         (LINE B)         (LINE C)         60.%
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 890        VOLTS:     .917   -5.19    .924 -126.78    .918  113.98 MAG/ANG
                  D-LD:  139.11   69.55  137.56   68.78  137.01   68.50 kW/kVR
kVll   4.160     Y CAP:              .00              .00              .00 kVR

FROM NODE 888   .....:    69.91  -32.31   70.05 -152.75   69.51   87.37 AMP/DG
<890   > LOSS= 32.760:     ( 11.638)        (  9.950)        ( 11.173)    kW
---------------------*--------A-------*-------B-------*-------C-------*--------
NODE: 856        VOLTS:                      .998 -123.41                 MAG/ANG
                   -LD:                      .00     .00                  kW/kVR
kVll  24.900       CAP:                              .00                  kVR

FROM NODE 854   .....:                      .00     .00                  AMP/DG
<856   > LOSS=   .001:                    (   .001)                      kW
```