Appendix 6-F: Electric and Magnetic Field Study Report

ELECTRIC & MAGNETIC FIELDS (EMFs)
STUDY REPORT

For the

CRICKET VALLEY ENERGY CENTER
TOWN OF DOVER, DUTCHESS COUNTY, NEW YORK

Prepared by

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A	7/23/10	Information	E. Lenge	R. Saini	J. Chiappinneli
B	8/6/10	Information	E. Lenge	R. Saini	J. Chiappinneli

ELECTRIC & MAGNETIC FIELDS (EMFs) STUDY REPORT

Associated with 2-345 kV Interconnection Transmission Lines Advanced Power Cricket Valley Energy Power Plant Project in Town of Dover, Dutchess County, New York

1.0 Introduction

This EMF Study Report for the proposed Cricket Valley Energy Center (CVE) in Dover, NY has been prepared by Burns and Roe Enterprise, Inc. (BREI) Oradell, New Jersey. It describes the results of a BREI investigation on Electric Field and Magnetic Field strengths associated with two (2) - 345 kilovolt (kV) overhead electric transmission lines between the new Consolidated Edison (ConEd) 345 kV substation, to be located at the Cricket Valley Energy Power Plant, and an existing ConEd transmission line immediately adjacent to the site, about ¼ mile from the substation. The two lines will be an extension of an existing transmission line, which will be looped-in and looped-out of the substation. Each line will be run on a set of H-Frame structures and tubular monopoles from the structural steel frame dead-end structure at the substation, as shown on Drawing No. M200, Rev. S attached to this report.

2.0 Electric and Magnetic Field (EMF) Overview

2.1 Electric Fields

Electric fields are invisible lines of force that repel or attract electrical charges. If the charges are of the same polarity (either both positive, or both negative), the charges repel each other. If the charges are of different polarity (one negative and one positive), there would be an attractive force between them.

Electric fields are proportional to the operating voltage of the transmission line, the higher the voltage the stronger the effect. The line voltage is controlled within a small range (usually ± 10 percent) and, hence, little variation is expected in the electric field levels for a given voltage.

2.2 Magnetic Fields

Electric charges move together in an electric current and they create a magnetic field, which can exert force on other electric currents. The strength of the magnetic field depends on the current (higher currents create higher magnetic fields), the configuration or size of the source, the spacing between conductors, and the distance from the source (magnetic fields grow weaker as the distance from the source increases).

Magnetic fields from Alternating Current (AC) sources, such as electric transmission lines, change in direction at a rate of 60 cycles per second or 60 Hertz (Hz).

The characteristics of magnetic fields can differ, depending on the field source. A magnetic field decreases rapidly as distance from line sources (i.e.,high voltage transmission lines) increases, but not as rapidly as it does with low voltage appliances.

The magnetic fields from electric transmission lines attenuate at a rate that is inversely proportional to the distance squared, whereas magnetic fields from appliances attenuate at a rate proportional to the distance cubed. For electric transmission lines, electric field and magnetic field levels are highest next to the transmission lines (typically near the center of the electric transmission line right-of-way (ROW)) and decrease as the distance from the transmission ROW or corridor increases.

Measured magnetic field strengths can be compared with magnetic fields typically associated with existing transmission line rights-of-way and with those typically associated with various electrical devices, such as magnetic imaging systems.

3.0 ELECTRIC AND MAGNETIC FIELD (EMF) STANDARDS

3.1 General

There are no Federal Standards limiting residential or occupational exposure to 60 Hz electric or magnetic fields. However, there are New York State Standards set by the New York Public Service Commission (PSC) as described below.

3.2 New York Public Service Commission Electric Field Standards

The applicable electric field strength standards established by the New York PSC are set forth in Opinion No. 78-13 (issued June 19, 1978). The opinion established an electric field strength interim standard of 1.6 kilovolts per meter (kV/m) for electric transmission lines at the edge of the ROW, one meter above ground level, with the line at the rated voltage.

3.3 New York Public Service Commission Magnetic Field Standards

The magnetic field standards established by the New York PSC are set forth in the PSC's Interim Policy Statement on Magnetic Fields, issued on September 11, 1990. The interim policy established a magnetic field strength interim standard of 200 milligauss (mG), measured at one meter above grade, at the edge of the ROW and at the point of lowest conductor sag. The measurement is based on the expected circuit phase currents being equal to the winter-normal conductor rating.

4.0 STUDY OF ELECTRIC AND MAGNETIC FIELD STRENGTHS

4.1 General

The post-construction EMF levels for the CVE 345 kV interconnection transmission lines were calculated using PLS-CADD, Version 9 Software Program. The software is developed by Power Line, Inc., Madison, Wisconsin, and is capable of performing overhead transmission line EMF calculations. These calculations are based on the methodology described in Chapter 8 of the EPRI Red Book, 2010.

The PLS-CADD software calculates the lateral profile of electric field level along the interconnection transmission lines. In addition, the PLS-CADD software calculates the lateral profiles for magnetic field levels along the interconnection transmission lines. To facilitate the investigation, the calculations were developed along a profile that was oriented to be at right angles to the proposed transmission lines.

Input parameters used in the computer calculations were:

- The physical location and geometry of the transmission line towers, power conductors, and overhead ground wires.
- The physical specifications of the power conductor and overhead ground wires.
- The operating voltages and currents.
- The phasing orientation of the power conductors.

4.2 Overhead Transmission Line

4.2.1 Support Structures

The locations of transmission line structures used to route the 345 kV overhead transmission line conductors are shown on Drawing No. M200, Rev S. The structures at locations No. 2 & 6 will be tubular steel poles. The structures 1 & 4, at the substation will be steel frame dead-end structures. Pole structures 3, 5, & 7 will be H-Frame structures. An appproximately 75 foot ROW will be provided on both sides of the two transmission lines. The structures at locations 1, 3, 4, 5, & 7 will be about 75 feet in height, as shown in Sketch 1. The phase conductors entering and leaving the new ROW will be in an H-frame horizontal configuration. The structures at locations 2 & 6 will be tubular pole type, about 100 feet in height but with phase conductors in a vertical configuration on both sides of the structure, as shown in Sketch 2.

The approximate grade elevation of the transmission lines at the various structures will be as follows:

- Dead-end Structure 1 & 4 - Grade Elevation 435 feet
- Pole 2- Grade Elevation 442 feet
- H-Frame 3- Grade Elevation 454 feet
- H-Frame 5- Grade Elevation 441 feet
- Pole 6- Grade Elevation 455 feet
- H-Frame 7- Grade Elevation 468 feet

4.2.2 Routing and Conductor Size

As stated earlier, ConEd's existing transmission line will be looped-in and looped-out of the new ConEd GIS substation located next to the CVE facility. The existing transmission line consists of a single 2156 Aluminum Conductor, Steel Reinforced (ACSR) "Bluebird" conductor per phase with 9/16", #7 shield wire.

Each transmission line will be able to transmit 1,205 Megawatts (MW) or 2,360 amperes, which is the full winter capability of the power plant.

The EMF calculations are based on the assumption that the power plant output will be equally shared by the two lines. However, an optional worst case was also studied with one line carrying the full output and the other line de-energized.

4.2.3 Phase Conductor Configuration

The conductor phase configuration of the transmission line circuit at H-Frame structures 1, 3, 4, 5, & 7 will be C-B-A from left-to-right and at pole structures 2 & 6, it will be A-B-C from top-to-bottom, as shown in Sketches 1 & 2.

Magnetic and electric field levels were calculated at the structures and at the mid-span of the transmission lines between the structures, at right angles to the centerline of the two structures at 5 foot intervals.

A 10 percent over-voltage factor was used in the electric field Study to provide conservative results.

5.0 STUDY RESULTS

5.1 New York PSC Guidelines Values for EMF

As stated in Section 3.1, the maximum guideline value for electric field strength at the edge of a ROW for a major transmission line in New York is 1.6 kV/m.

Also, the maximum guideline value for magnetic field strength in New York at the edge of a ROW for a major transmission line is 200 mG.

It was assumed that these values are typical for single circuit 345 kV transmission lines at the edge of 75 foot wide ROW.

5.2 Summary of Results

The following Tables summarize the results of the electric and magnetic field strength levels at selected distances from the centerline of the transmission line between various transmission line pole structures:

5.2.1 Electric Field Levels (kV/m rms)

Tables 1 & 2 show electric field levels for transmission line 1 which will be located on structures 1 through 3. Tables 3, 4 & 5 show electric field levels for transmission line 2 which will be located on structures 4 through 7.

Table 1 shows a summary of electric field strength levels for transmission line 1 between structures 1 & 2.

Table 1

Location (ft)	Electric Field Level(kV/m) From Structure #1	Electric Field Level(kV/m) at Midspan	Electric Field Level(kV/m) From Structure #2
-200	0.261	0.250	0.243
-100	0.868	0.632	0.513
-75	1.250	0.785	0.581
-50	1.693	0.860	0.559
-20	1.564	0.498	0.187
-10	1.164	0.279	0.411
0	0.660	0.435	0.783
+10	0.396	0.759	1.080
+20	0.692	0.994	1.200
+50	0.910	0.902	0.917
+75	0.601	0.614	0.736
+100	0.390	0.454	0.612
+200	0.148	0.205	0.273

Table 2 shows a summary of electric field strength levels for transmission line 1 between structures 2 & 3.

Table 2

Location (ft)	Electric Field Level(kV/m) From Structure #2	Electric Field Level(kV/m) at Midspan	Electric Field Level(kV/m) From Structure #3
-200	0.248	0.255	0.268
-100	0.498	0.647	0.905
-75	0.550	0.807	1.313
-50	0.505	0.892	1.793
-20	0.210	0.513	1.668
-10	0.467	0.274	1.252
0	0.804	0.452	0.725
+10	1.058	0.800	0.367
+20	1.151	1.042	0.631
+50	0.899	0.919	0.894
+75	0.748	0.618	0.600
+100	0.631	0.457	0.387
+200	0.283	0.205	0.142

Table 3 shows a summary of electric field strength levels for transmission line 2 between structures 4 & 5.

Table 3

Location (ft)	Electric Field Level(kV/m) From Structure #4	Electric Field Level(kV/m) at Midspan	Electric Field Level(kV/m) From Structure #5
-200	0.144	0.206	0.194
-100	0.697	0.564	0.477
-75	0.988	0.760	0.617
-50	1.358	1.004	0.764
-20	1.466	1.231	0.840
-10	1.263	1.313	0.879
0	0.968	1.689	0.987
+10	0.718	1.131	1.119
+20	0.639	0.921	1.193
+50	0.646	0.731	1.035
+75	0.533	0.603	0.787
+100	0.423	0.478	0.585
+200	0.184	0.198	0.219

Table 4 shows a summary of electric field strength levels for transmission line 2 between structures 5 & 6.

Table 4

Location (ft)	Electric Field Level(kV/m) From Structure #5	Electric Field Level(kV/m) at Midspan	Electric Field Level(kV/m) From Structure #6
-200	0.129	0.166	0.207
-100	0.303	0.293	0.380
-75	0.419	0.288	0.382
-50	0.602	0.249	0.279
-20	0.540	0.391	0.219
-10	0.437	0.484	0.423
0	0.650	0.590	0.615
+10	1.040	0.719	0.744
+20	1.375	0.860	0.798
+50	1.523	1.065	0.780
+75	1.153	0.941	0.728
+100	0.813	0.743	0.626
+200	0.241	0.269	0.272

Table 5 shows a summary of electric field strength levels for transmission line 2 between structures 6 & 7.

Table 5

Location (ft)	Electric Field Level(kV/m) From Structure #6	Electric Field Level(kV/m) at Midspan	Electric Field Level(kV/m) From Structure #7
-200	0.211	0.159	0.123
-100	0.424	0.285	0.355
-75	0.457	0.277	0.552
-50	0.396	0.253	0.826
-20	0.290	0.490	0.594
-10	0.554	0.571	0.337
0	0.840	0.661	0.709
+10	1.030	0.824	1.255
+20	1.077	1.035	1.695
+50	0.896	1.301	1.845
+75	0.789	1.091	1.339
+100	0.660	0.823	0.909
+200	0.274	0.275	0.252

Table 1 shows that the maximum electric field levels for transmission line 1 at (+) 75 feet on the right side, from the centerline of dead-end structure No. 1, is 0.601 kV/m and at pole structure No. 2 is 0.736 kV/m. The maximum electric field level at mid span is 0.614 kV/m. Table 1 also shows that the maximum electric field levels at the edge of the ROW at (-) 75 feet on the left side of the centerline of dead-end structure No. 1 is 1.250 kV/m and at pole structure No. 2 is 0.581 kV/m. The maximum electric field level at mid span is 0.785 kV/m.

Table 2 shows that the maximum electric field levels for transmission line 1 at (+) 75 feet on the right side, from the centerline of pole structure No. 2 is 0.748kV/m and at pole structure No. 3 is 0.600 kV/m. The maximum electric field level at mid span is 0.618 kV/m. Table 2 also shows that the maximum electric field levels at the edge of the ROW at (-) 75 feet on the left side of the centerline of pole structure No. 2 is 0.550 kV/m and at pole structure No. 3 is 1.313 kV/m. The maximum electric field level at mid span is 0.807 kV/m.

Table 3 shows that the maximum electric field levels for transmission line 2 at (-) 75 feet on left side of the centerline of the dead-end structure No. 4 is 0.988 kV/m and at pole structure No. 5 is 0.617 kV/m. The maximum electric field level at mid span is 0.760 kV/m. Table 3 also shows that the maximum electric field levels at the edge of the ROW at (+) 75 feet on the right side of the centerline the dead-end structure No. 4 is 0.533kV/m and at pole structure No. 5 is 0.787 kV/m. The maximum electric field level at mid span is 0.603 kV/m.

Table 4 shows that the maximum electric field levels for transmission line 2 at (-) 75 feet on left side of the centerline of the dead-end structure No. 5 is 0.419 kV/m and at pole structure No. 6 is 0.382 kV/m. The maximum electric field level at mid span is 0.288 kV/m. Table 4 also shows that the maximum electric field levels at the edge of the ROW at (+) 75 feet on the right side of the centerline the dead-end structure No. 5 is 1.153kV/m and at pole structure No. 6 is 0.728 kV/m. The maximum electric field level at mid span is 0.941 kV/m.

Table 5 shows that the maximum electric field levels for transmission line 2 at (-) 75 feet on left side of the centerline of the pole structure No. 6 is 0.457 kV/m and at pole structure No. 7 is 0.552 kV/m. The maximum electric field level at mid span is 0.277 kV/m. Table 5 also shows that the maximum electric field levels at the edge of the ROW at (+) 75 feet on the right side of the centerline of the pole structure No. 6 is 0.789 kV/m and at pole structure No. 7 is 1.339 kV/m. The maximum electric field level at mid span is 1.091 kV/m.

The calculated levels at the 75-foot wide edges of ROW of both lines and beyond are all less than1.6 kV/m, established by the New York PSC.

5.2.2 Magnetic Field Levels (B rms)

Tables 6, & 7 show magnetic field strength levels for transmission line 1 on structures 1 thru 3. Tables 8, 9, & 10 show magnetic field levels for transmission line 2 on structures 4 thru 7.

Table 6 shows a summary of magnetic field strength levels for transmission line 1 between structures 1 & 2.

Table 6

Location (ft)	Magnetic Field Level(mG) From Structure #1	Magnetic Field Level(mG) at Midspan	Magnetic Field Level(mG) From Structure #2
-200	5.735	3.905	4.227
-100	18.587	11.955	13.235
-75	27.894	17.560	19.577
-50	43.169	26.704	30.011
-20	67.172	42.428	48.027
-10	73.099	47.220	53.396
0	75.964	50.347	56.655
+10	75.092	50.986	56.824
+20	70.624	48.922	53.798
+50	46.935	33.930	36.051
+75	30.430	22.612	23.836
+100	20.285	15.410	16.246
+200	6.384	5.165	5.456

Table 7 shows a summary of magnetic field strength levels for transmission line 1 between structures 2 & 3.

Table 7

Location (ft)	Magnetic Field Level(mG) From Structure #2	Magnetic Field Level(mG) at Midspan	Magnetic Field Level(mG) From Structure #3
-200	4.449	3.963	6.097
-100	13.777	12.135	19.806
-75	20.236	17.921	29.770
-50	30.649	27.493	46.032
-20	47.986	44.252	70.766
-10	52.976	49.406	76.490
0	55.937	52.759	78.965
+10	56.030	53.401	77.647
+20	53.203	51.114	72.789
+50	36.560	35.068	48.407
+75	24.700	23.277	31.542
+100	17.105	15.878	21.130
+200	5.939	5.430	6.761

Table 8 shows a summary of magnetic field strength levels for transmission line 2 between structures 4 & 5.

Table 8

Location (ft)	Magnetic Field Level(mG) From Structure #4	Magnetic Field Level(mG) at Midspan	Magnetic Field Level(mG) From Structure #5
-200	77.496	5.584	14.111
-100	18.779	16.267	17.351
-75	27.898	23.986	25.527
-50	43.047	36.917	39.074
-20	67.395	58.240	60.702
-10	73.031	63.198	65.421
0	74.868	64.581	66.425
+10	72.333	61.863	63.296
+20	66.204	55.954	57.026
+50	41.776	34.302	34.711
+75	27.020	21.997	22.164
+100	18.173	14.775	14.823
+200	76.479	4.909	4.841

Table 9 shows a summary of magnetic field strength levels for transmission line 2 between structures 5 & 6.

Table 9

Location (ft)	Magnetic Field Level(mG) From Structure #5	Magnetic Field Level(mG) at Midspan	Magnetic Field Level(mG) From Structure #6
-200	5.382	4.408	4.907
-100	15.890	11.591	13.346
-75	23.244	16.101	18.663
-50	35.044	22.783	26.565
-20	52.779	32.254	38.024
-10	56.618	34.399	40.798
0	57.819	35.257	42.090
+10	56.080	34.615	41.552
+20	51.850	32.620	39.292
+50	33.796	22.974	27.692
+75	22.015	15.836	19.080
+100	14.728	11.004	13.271
+200	4.564	3.642	4.380

Table 10 shows a summary of magnetic field strength levels for transmission line 2 between structures 6 & 7.

Table 10

Location (ft)	Magnetic Field Level(mG) From Structure #6	Magnetic Field Level(mG) at Midspan	Magnetic Field Level(mG) From Structure #7
-200	5.504	5.138	6.935
-100	15.351	13.937	21.160
-75	21.949	19.824	31.350
-50	32.390	29.149	47.874
-20	49.149	43.798	72.405
-10	53.610	47.403	77.632
0	55.842	48.948	79.405
+10	55.120	48.015	77.360
+20	51.586	44.878	71.932
+50	34.206	30.146	47.024
+75	22.535	19.960	30.235
+100	15.218	13.455	19.947
+200	4.805	4.205	5.963

Table 6 shows that the maximum magnetic field levels for transmission line 1 at (+) 75 feet on the right side of the centerline of dead-end structure No. 1 is 30.430 mG and at pole structure No. 2 is 23.836 mG. The maximum magnetic field level at mid span is 22.612 mG . Table 6 also shows that the maximum magnetic field levels at the edge of the ROW at (-) 75 feet on the left side of the centerline of dead-end structure No. 1 is 27.894 mG and at pole structure No. 2 is 19.577 mG. The maximum magnetic field level at mid span is 17.560 mG .

Table 7 shows that the maximum magnetic field levels for transmission line 1 at (+) 75 feet on the right side of the centerline of pole structure No. 2 is 24.700 mG and at pole structure No. 3 is 31.542 mG. The maximum magnetic field level at mid span is 23.277 mG. Table 7 also shows that the maximum magnetic field levels at the edge of the ROW at (-) 75 feet on the left side of the centerline of pole structure No. 2 is 20.236 mG and at structure No. 3 is 29.770 mG. The maximum magnetic field level at mid span is 17.921 mG.

Table 8 shows that the maximum magnetic field levels for transmission line 2 at (-) 75 feet on the left side of the centerline of the dead-end structure No. 4 are 27.898 mG and at structure No. 5 is 25.527 mG. The maximum magnetic field level at mid span is 23.986 mG. Table 8 also shows that the maximum magnetic field levels at the edge of the ROW at (+) 75 feet on the right side of the centerline of the dead-end structure No. 4 are 27.020 mG and at pole structure No. 5 is 22.164 mG. The maximum magnetic field level at mid span is 21.997 mG.

Table 9 shows that the maximum magnetic field levels for transmission line 2 at (-) 75 feet on the left side of the centerline of the pole structure No. 5 are 23.244 mG and at structure No. 6 is 18.663 mG. The maximum magnetic field level at mid span is 16.101 mG. Table 9 also shows that the maximum magnetic field levels at the edge of the ROW at (+) 75 feet on the right side of the centerline of the pole structure No. 5 are 22.015 mG and at pole structure No. 6 is 19.080 mG. The maximum magnetic field level at mid span is 15.836 mG.

Table 10 shows that the maximum magnetic field levels for transmission line 2 at (-) 75 feet on the left side of the centerline of the pole structure No. 6, is 21.949 mG and at pole structure No. 7 is 31.350 mG. The maximum magnetic field level at mid span is 19.824 mG. Table 10 also shows that the maximum magnetic field levels at the edge of the ROW at (+) 75 feet on the right side of the centerline of the pole structure No. 6 is 22.535 mG and at pole structure No. 7 is 30.235 mG. The maximum magnetic field level at mid span is 19.960 mG.

In all cases, the calculated maximum field levels at the 75-foot edges of ROW of both lines and beyond are less than 200m, established by the New York PSC.

5.2.3 Full Load on One Transmission Line (Line 2) on Structures 4, 5, 6 & 7

Table 11 shows a summary of the results of the electric field strength levels for transmission line 2 at the mid-spans between structures 4 & 5, 5 & 6, and 6 & 7.

Table 11

Location (ft)	Electric Field Level(kV/m) at Midspan of 4 & 5	Electric Field Level(kV/m) at Midspan of 5 & 6	Electric Field Level(kV/m) at Midspan of 6 & 7
-200	0.206	0.166	0.159
-100	0.564	0.293	0.285
-75	0.760	0.288	0.277
-50	1.004	0.249	0.253
-20	1.231	0.391	0.490
-10	1.313	0.484	0.571
0	1.689	0.590	0.661
+10	1.131	0.719	0.824
+20	0.921	0.860	1.035
+50	0.731	1.065	1.301
+75	0.603	0.941	1.091
+100	0.478	0.743	0.823
+200	0.198	0.269	0.275

Table 12 shows a summary of results of the magnetic field strength levels for transmission line 2 at the mid-spans between structures 4 & 5, 5 & 6, and 6 & 7.

Table 12

Location (ft)	Magnetic Field Level(mG) at Midspan of 4 & 5	Magnetic Field Level(mG) at Midspan of 5 & 6	Magnetic Field Level(mG) at Midspan of 6 & 7
-200	11.168	8.815	10.275
-100	32.533	23.182	27.874
-75	47.972	32.201	39.648
-50	73.835	45.567	58.299
-20	116.479	64.508	87.597
-10	126.396	68.797	94.807
0	129.162	70.514	97.897
+10	123.726	69.230	96.029
+20	111.909	65.241	89.756
+50	68.603	45.948	60.291
+75	43.994	31.672	39.920
+100	29.550	22.008	26.911
+200	9.817	7.284	8.411

Table 11 shows that the maximum electric field levels at mid-span and (+) 75 feet on the right side of centerline of the structures of structure No. 4 and No. 5 is 0.603 kV/m; structure No. 5 and No. 6 is 0.941 kV/m, and structure No. 6 and No.7 is 1.091 kV/m.

Table 12 shows that the maximum magnetic field levels at the mid-span and (+) 75 feet on the right side of centerline of the structures No. 4 and No. 5 is 43.994 mG; structure No. 5 and No. 6 is 31.672 mG, and structure No. 6 and No. 7 is 39.920 mG.

The calculated maximum electric field levels at and beyond the edge of the ROW are less than 1.6 kV/m, and magnetic field levels are less than 200mG, established by New York PSC.

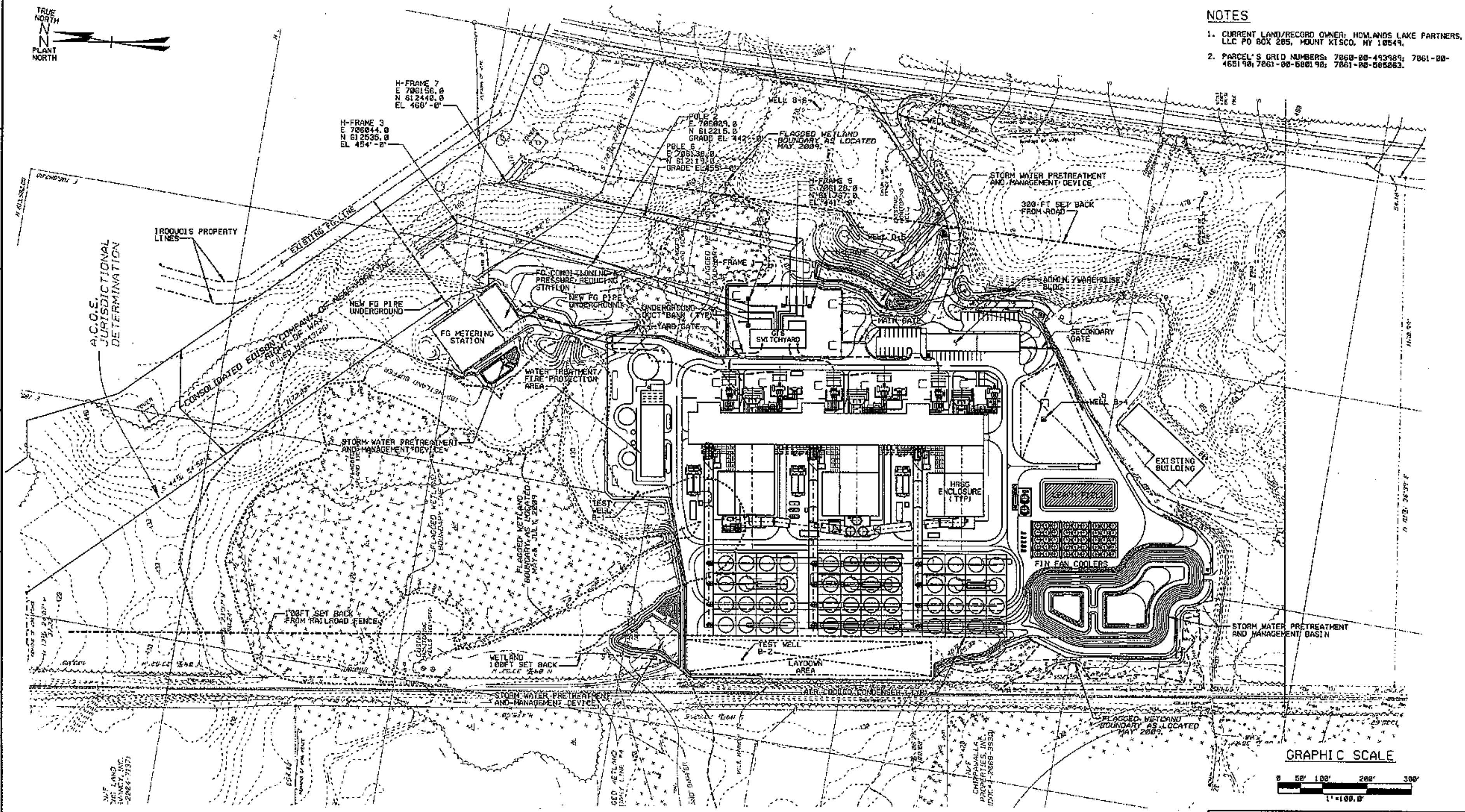
6.0 Conclusions

The EMF Study Report includes the analytical results of electric and magnetic field (EMF) levels for the CVE facility. The study results are computed for two (2) single circuit, 345 kV overhead transmission lines, each running on its own pole structures and transmitting half the power plant maximum capability (1,205 MW). The EMF values are computed at the approximate 300 foot edges of the transmission lines ROW. The study results show that electric field strength values are substantially below 1.6 kV/m and magnetic field strength values are below 200 mG, which are the Interim Standard values established in New York State by the New York Public Service Commission at the edges of a transmission ROW.

BREI has also examined EMF field strength levels for a contingency case in which only one line will carry the full plant output and has found that the EMF strength values are also below the established levels at the edges of the ROW.

NOTES

1. CURRENT LAND/RECORD OWNER: HOWLANDS LAKE PARTNERS, LLC PO BOX 285, MOUNT KISCO, NY 10549.
2. PARCEL'S GRID NUMBERS: 7060-00-453989; 7061-00-465190; 7061-00-580190; 7061-00-565263.



Rev No	Revision	Date	Dwn	Chkd	Approved Chief Engr
S	REVISED SWITCHYARD AND ARRANGEMENT OF TRANSMISSION LINE POLES/FRAMES.	08/4/10	SM		
N	ISSUED FOR PERMITTING	10/6/09	JGF		
P	REVISED TO INCLUDE HRSG AND GENERATOR ENCLOSURES	10/29/09	JFH	JEF	
Q	GENERAL REVISION	6/24/10	ZU		
R	ADDED: WELLS 5&6. REVISED: SWITCHYARD ARRANGEMENT AND RELOCATED TRANSMISSION LINE POLES.	7/22/10	JGF	JEF	

Drawing Control: For Information; For Comment; For Bid; For Fabrication; For Construction

advanced power

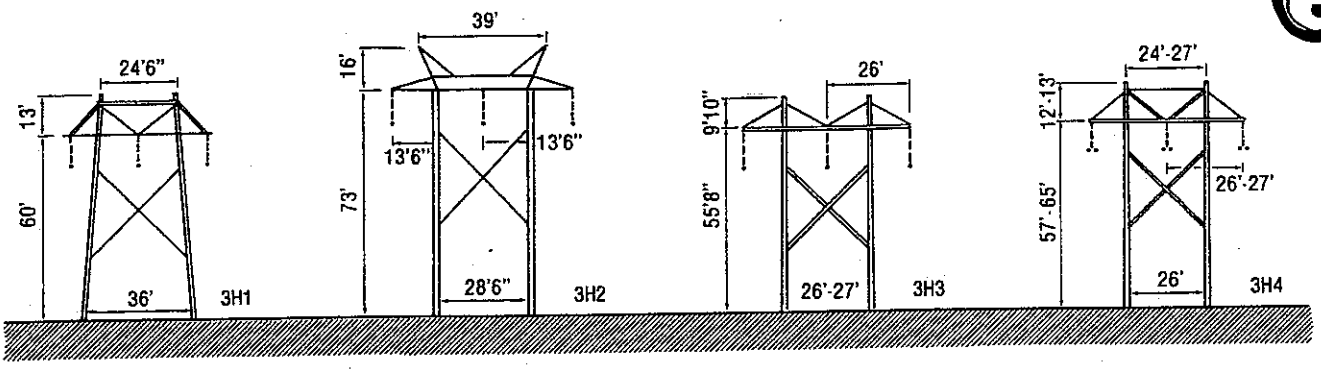
CRICKET VALLEY ENERGY
TOWN OF DOVER
DUTCHESS COUNTY, NEW YORK

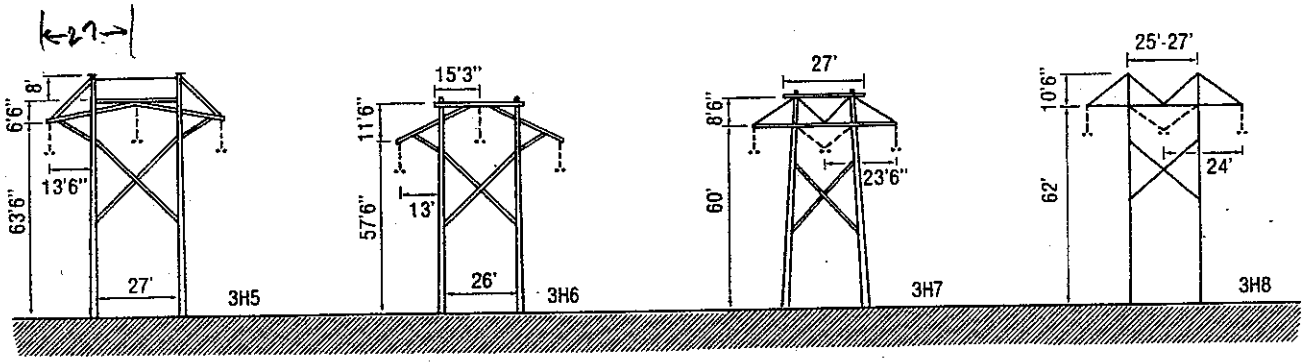
GENERAL ARRANGEMENT
PLOT PLAN STUDY

BURNS AND ROE ENTERPRISES, INC.
Engineers and Constructors - Oradell, NJ
New York Certificate of Authorization No. 0004677

Work Order 3000 | Drawing No M200 | Rev S

M200L.DGN 11:42 04-AUG-2010





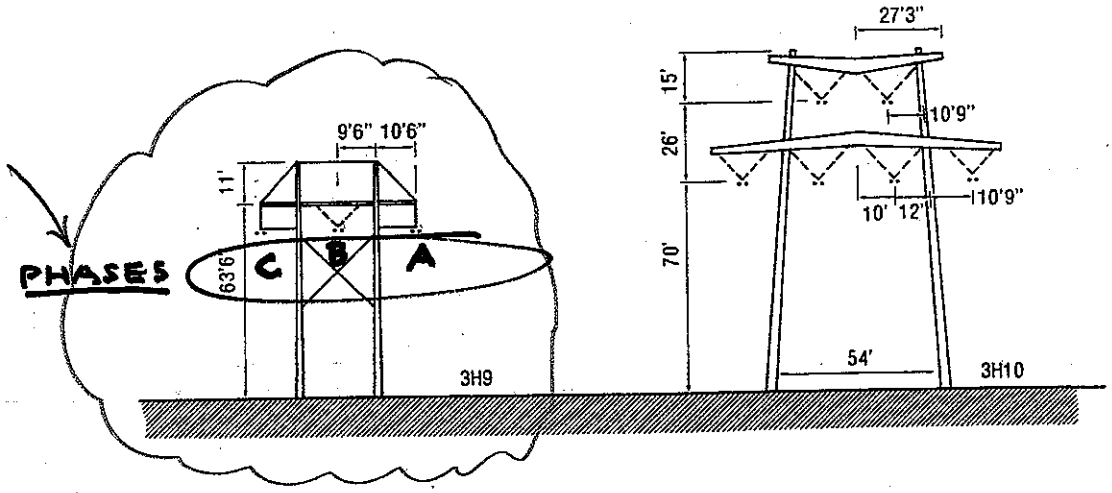
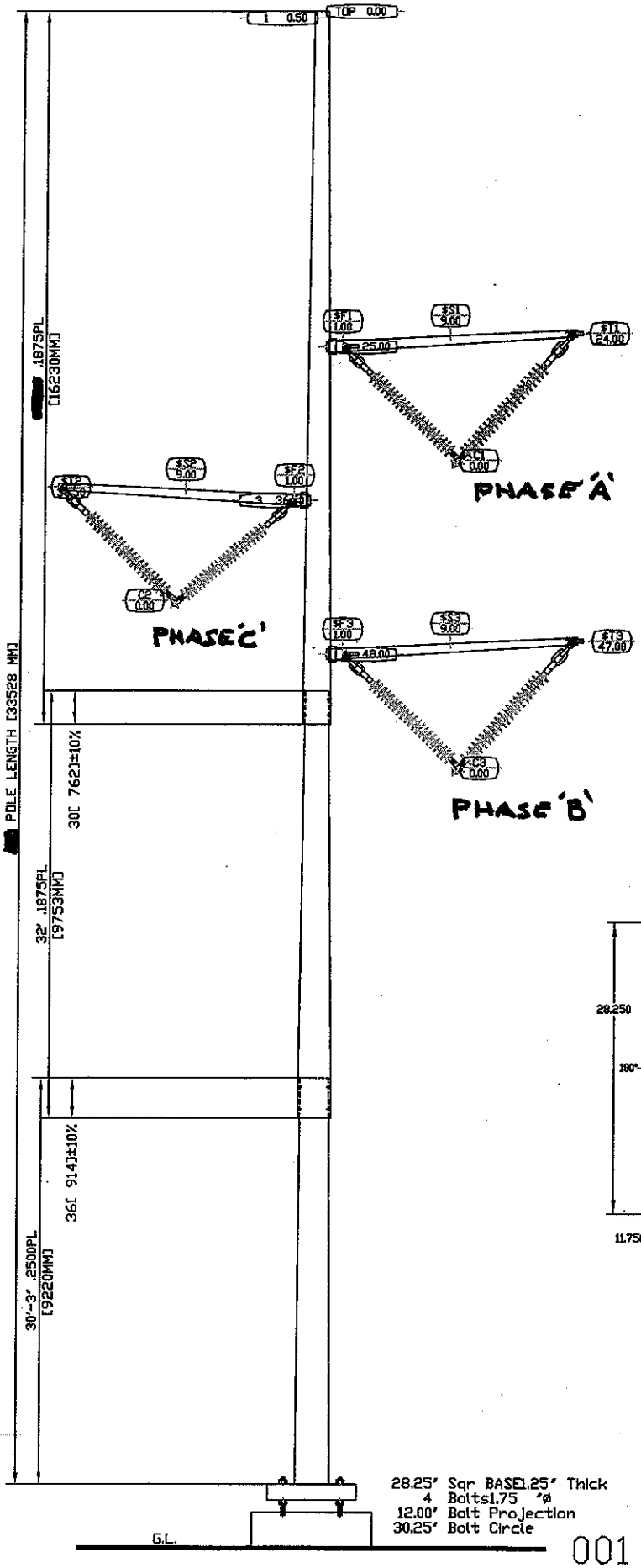


Figure 2.7.3. Typical H-frame-type structures for 345-kV transmission systems.



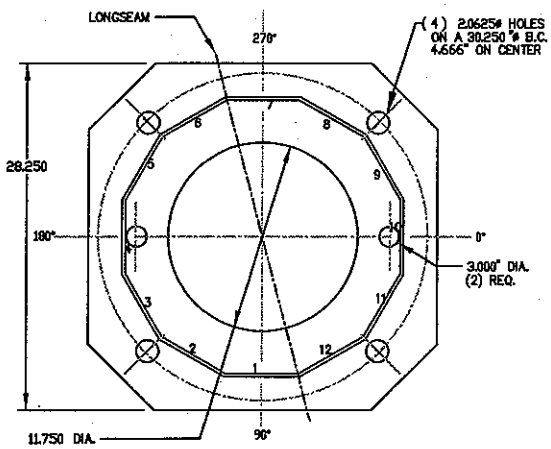
POLE SPECIFICATIONS	
POLE HEIGHT	110.00 FEET
TAPER	.1400 IN/FT
POLE SHAPE	12 SIDED POLYGON
ORIENTATION	FLAT-FLAT

	KSec	Attach Label	X,ft	ARMS / FEATURES Length	Top	Bot	Radius	Rise
1	8	2	25.00	18.00	6.00	9.50	0	12.00
2	8	3	36.50	18.00	6.00	9.50	0	12.00
3	8	4	48.00	18.00	6.00	9.50	0	12.00

LOAD CASE DESCRIPTION	WIND (psf)	RES. BASE REACT Axial (kips)	Shear (kips)	Mom (ft-k)	DISP @TO DEFL. (ft)	SWAY (deg)
1) WITH 75 FT-KIP BAS	.00	22.7	1.2	174	4.4	3.90

Sec	LENGTH (ft)	Flat-Flat TOPø	BOTø	THICK (in)	WEIGHT (lbs)	STEEL SPEC	FINISH
1	53.25	10.50	17.95	.1875	1533	A572-65	Galv
2	32.00	17.23	21.71	.1875	1265	A572-65	Galv
3	30.25	20.91	25.15	.2500	1885	A572-65	Galv
	(in)	#Bolts	Holeø				
BP	28.25	4	11.75	1.250	231	A633-60	Galv
		Boltø	Holeø	TOTAL	4914		
AB	60.00	1.75	2.125		260	A615-75	Galv-18'

CENTER of GRAVITY= 67.40 Ft. UP



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Burns & Roe

Sabre TUBULAR STRUCTURES

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Clean Energy Venture Project
001 345KV MONO POLE (110 FT)
110.00 STEEL POLE

PO#: --

00-00000	SIZE A	DRAWING NO. ~~B5-1666-01~~		REV —
DATE 28May08				
DRAWN BY DRF	REFERENCE DRAWING Ref Draw	SCALE N.T.S.	PAGE 1 of 1	
CHECKED BY hhl				

SKETCH #2

Midspan of Structures 4 & 5 - Full Load Case

PLS-CADD Version 10.40 4:37:29 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10 \345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
  Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
  Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
  Assumed 90 MPH Extreme Wind Loading (Rule 250C)
  Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
  Assumed Maximum Operating Temperature of 212 F
  Assumed 1" Extreme Ice (Non-NESC)
  Assumed Grade B Construction
  <<Illustration of NESC provisions include>>
    > Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
    > Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
    > 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
    > Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
    > Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
    > 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
    > Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
     **** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
     **** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
    > Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
     **** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
     **** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
     **** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE,
          the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL
          values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of
          Composite Line Post Insulators for further clarification. ****
     **** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
     **** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
     **** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
     **** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
    > Structure Loads criteria includes typical Full Structure DE cases
  POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
  THIS FILE IS PROVIDED FOR ILLUSTRATION ONLY. CRITERIA SHOULD BE CHECKED AND MODIFIED AS NECESSARY BY AN ENGINEER IN RESPONSIBLE CHARGE,
  FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
RESPONSIBLE ENGINEER SHOULD VERIFY MAXIMUM OPERATING CONDITION FOR THEIR APPLICABLE PROJECT
RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28	(ft)
Cross section offset for graph +/-:	200.00	(ft)
Result interval for graph:	5.00	(ft)
Electric field limit:	1.60	(kV/m)
Magnetic field limit:	200.00	(mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	3	1	345	2360.000	-120	1.762
2	2	1	345	2360.000	120	1.762
2	1	1	345	2360.000	0	1.762

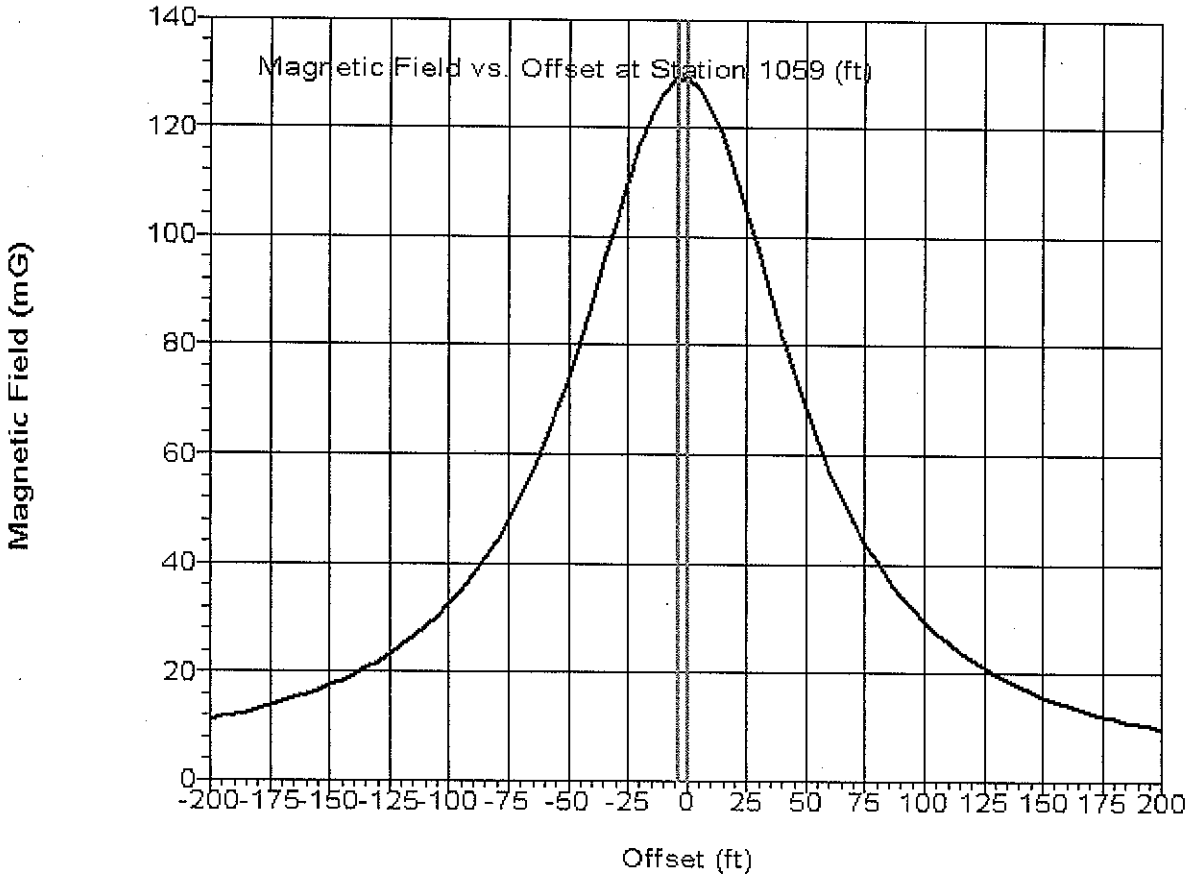
Calculated EMF Circuit Data For Last Point:

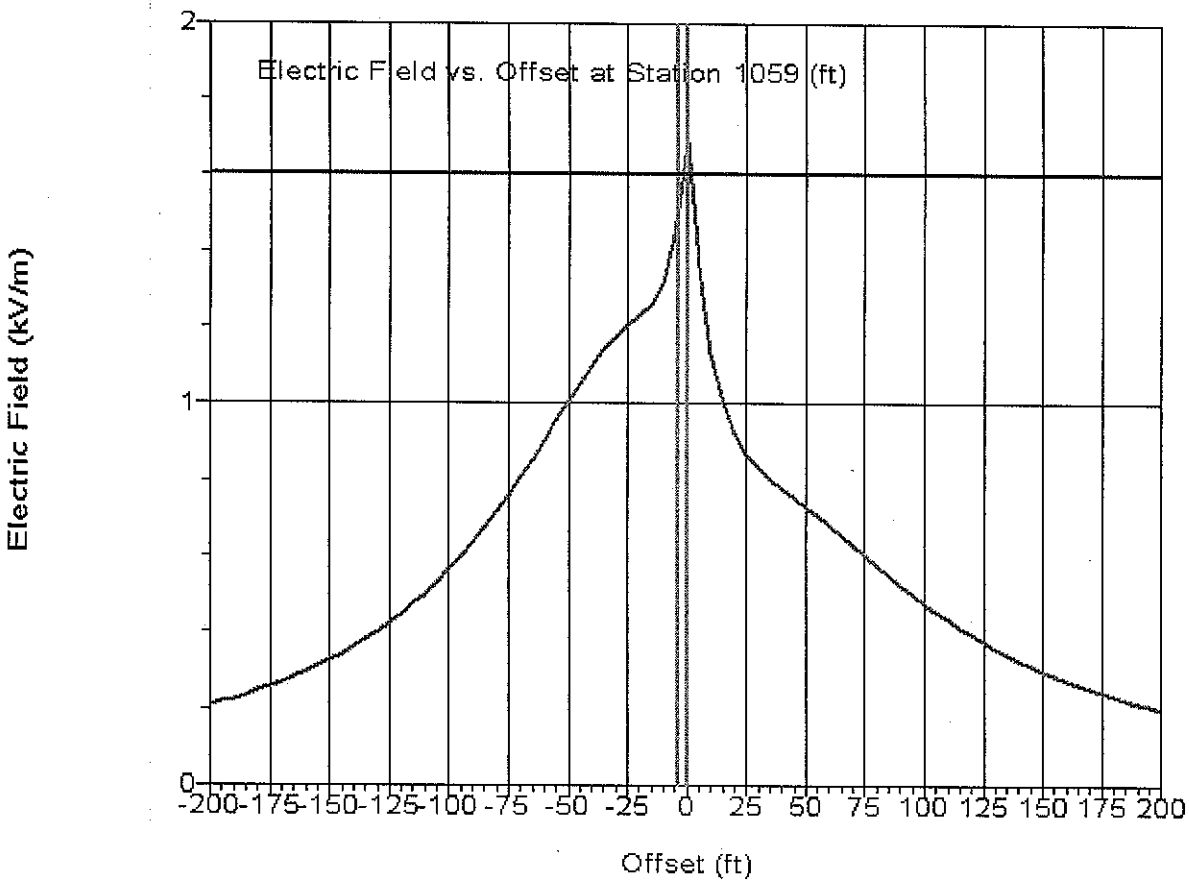
**Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.**

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1 NESC Heavy (250B)	Creep RS	Left	6059.81	11755.88	514.61	1059.46	0.18	0.509	199.2
2	3 NESC Heavy (250B)	Creep RS	Left	6060.01	11755.56	496.81	1059.62	0.53	1.762	199.2
2	2 NESC Heavy (250B)	Creep RS	Left	6059.79	11755.95	496.55	1059.46	0.11	1.762	199.2
2	1 NESC Heavy (250B)	Creep RS	Left	6060.01	11759.59	496.29	1060.27	-3.44	1.762	199.2

Maximum magnetic field of 129.16 (mG) found at station 1059.46, offset 0.00 (ft)
Maximum electric field of 1.689 (kV/m) found at station 1059.46, offset 0.00 (ft) NG





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1059.46	-200.00	6026.85	11953.33	440.11	9.364	6.08727	33.0	11.168	0.191	0.07880	22.4	88.3	0.206
1059.46	-195.00	6027.68	11948.40	440.11	9.750	6.31783	32.9	11.618	0.199	0.08191	22.4	88.2	0.215
1059.46	-190.00	6028.50	11943.47	440.11	10.163	6.56451	32.9	12.099	0.208	0.08519	22.3	88.2	0.225
1059.46	-185.00	6029.32	11938.54	440.11	10.607	6.82885	32.8	12.615	0.217	0.08867	22.2	88.2	0.235
1059.46	-180.00	6030.15	11933.61	440.11	11.084	7.11257	32.7	13.170	0.227	0.09235	22.1	88.1	0.245
1059.46	-175.00	6030.97	11928.67	440.11	11.597	7.41755	32.6	13.766	0.238	0.09625	22.0	88.1	0.256

1059.46	-170.00	6031.79	11923.74	440.11	12.150	7.74595	32.5	14.409	0.249	0.10039	22.0	88.0	0.268	
1059.46	-165.00	6032.62	11918.81	440.11	12.747	8.10017	32.4	15.103	0.261	0.10478	21.9	88.0	0.281	
1059.46	-160.00	6033.44	11913.88	440.11	13.393	8.48292	32.3	15.854	0.274	0.10945	21.8	88.0	0.295	
1059.46	-155.00	6034.26	11908.95	440.11	14.093	8.89725	32.3	16.667	0.288	0.11440	21.7	87.9	0.310	
1059.46	-150.00	6035.08	11904.01	440.11	14.853	9.34661	32.2	17.549	0.303	0.11967	21.6	87.9	0.326	
1059.46	-145.00	6035.91	11899.08	440.11	15.679	9.83489	32.1	18.508	0.319	0.12526	21.5	87.8	0.343	
1059.46	-140.00	6036.73	11894.15	440.11	16.580	10.36653	32.0	19.554	0.336	0.13121	21.3	87.8	0.361	
1059.46	-135.00	6037.55	11889.22	440.11	17.563	10.94653	31.9	20.695	0.354	0.13753	21.2	87.8	0.380	
1059.46	-130.00	6038.38	11884.29	440.11	18.638	11.58062	31.9	21.943	0.374	0.14424	21.1	87.7	0.401	
1059.46	-125.00	6039.20	11879.36	440.11	19.817	12.27528	31.8	23.311	0.396	0.15136	20.9	87.7	0.424	
1059.46	-120.00	6040.02	11874.42	440.11	21.111	13.03790	31.7	24.813	0.419	0.15891	20.8	87.6	0.448	
1059.46	-115.00	6040.85	11869.49	440.11	22.536	13.87691	31.6	26.466	0.443	0.16691	20.6	87.6	0.474	
1059.46	-110.00	6041.67	11864.56	440.11	24.108	14.80190	31.5	28.289	0.470	0.17535	20.5	87.6	0.502	
1059.46	-105.00	6042.49	11859.63	440.11	25.844	15.82375	31.5	30.303	0.499	0.18425	20.3	87.5	0.532	
1059.46	-100.00	6043.31	11854.70	440.11	27.766	16.95485	31.4	32.533	0.529	0.19358	20.1	87.5	0.564	
1059.46	-95.00	6044.14	11849.76	440.11	29.896	18.20917	31.3	35.005	0.563	0.20331	19.9	87.5	0.598	
1059.46	-90.00	6044.96	11844.83	440.11	32.262	19.60240	31.3	37.750	0.598	0.21340	19.6	87.5	0.635	
1059.46	-85.00	6045.78	11839.90	440.11	34.891	21.15206	31.2	40.802	0.636	0.22374	19.4	87.5	0.675	
1059.46	-80.00	6046.61	11834.97	440.11	37.814	22.87736	31.2	44.196	0.677	0.23423	19.1	87.5	0.716	
1059.46	-75.00	6047.43	11830.04	440.11	41.065	24.79906	31.1	47.972	0.720	0.24465	18.8	87.6	0.760	
1059.46	-70.00	6048.25	11825.11	440.11	44.676	26.93891	31.1	52.170	0.766	0.25476	18.4	87.6	0.807	
1059.46	-65.00	6049.08	11820.17	440.11	48.680	29.31870	31.1	56.828	0.813	0.26421	18.0	87.7	0.855	
1059.46	-60.00	6049.90	11815.24	440.11	53.104	31.95865	31.0	61.979	0.862	0.27253	17.5	87.8	0.904	
1059.46	-55.00	6050.72	11810.31	440.11	57.964	34.87483	31.0	67.647	0.913	0.27912	17.0	88.0	0.954	
1059.46	-50.00	6051.54	11805.38	440.11	63.260	38.07531	31.0	73.835	0.963	0.28325	16.4	88.2	1.004	
1059.46	-45.00	6052.37	11800.45	440.11	68.965	41.55475	31.1	80.517	1.013	0.28402	15.7	88.4	1.052	
1059.46	-40.00	6053.19	11795.52	440.11	75.012	45.28721	31.1	87.623	1.061	0.28042	14.8	88.7	1.097	
1059.46	-35.00	6054.01	11790.58	440.11	81.282	49.21751	31.2	95.022	1.105	0.27128	13.8	89.1	1.138	
1059.46	-30.00	6054.84	11785.65	440.11	87.588	53.25200	31.3	102.506	1.146	0.25538	12.6	89.5	1.174	
1059.46	-25.00	6055.66	11780.72	440.11	93.673	57.25134	31.4	109.783	1.181	0.23125	11.1	90.0	1.204	
1059.46	-20.00	6056.48	11775.79	440.11	99.211	61.02863	31.6	116.479	1.215	0.19698	9.2	90.4	1.231	
1059.46	-15.00	6057.31	11770.86	440.11	103.835	64.35790	31.8	122.162	1.252	0.14943	6.8	90.9	1.261	
1059.46	-10.00	6058.13	11765.92	440.11	107.180	66.99627	32.0	126.396	1.310	0.08471	3.7	91.2	1.313	
1059.46	-5.00	6058.95	11760.99	440.11	108.945	68.71974	32.2	128.808	1.441	0.01186	0.5	91.3	1.441	
1059.46	**0.00**	**6059.78**	**11756.06**	**440.11**	**108.956**	**69.36544**	**32.5**	**129.162**	**1.688**	**0.02638**	**0.9**	**91.3**	**1.689**	**NG**
1059.46	5.00	6060.60	11751.13	440.11	107.201	68.86737	32.7	127.416	1.350	0.12917	5.5	91.7	1.356	
1059.46	10.00	6061.42	11746.20	440.11	103.839	67.27218	32.9	123.726	1.113	0.20054	10.2	91.8	1.131	
1059.46	15.00	6062.24	11741.27	440.11	99.159	64.72824	33.1	118.416	0.971	0.24757	14.3	91.6	1.002	
1059.46	20.00	6063.07	11736.33	440.11	93.526	61.45265	33.3	111.909	0.878	0.27967	17.7	91.3	0.921	
1059.46	25.00	6063.89	11731.40	440.11	87.314	57.68896	33.5	104.651	0.814	0.30189	20.4	91.1	0.868	
1059.46	30.00	6064.71	11726.47	440.11	80.860	53.66938	33.6	97.050	0.768	0.31629	22.4	91.1	0.831	
1059.46	35.00	6065.54	11721.54	440.11	74.433	49.58970	33.7	89.439	0.734	0.32396	23.8	91.1	0.802	
1059.46	40.00	6066.36	11716.61	440.11	68.230	45.59849	33.8	82.064	0.706	0.32584	24.8	91.2	0.778	
1059.46	45.00	6067.18	11711.67	440.11	62.379	41.79732	33.8	75.088	0.682	0.32293	25.3	91.3	0.754	
1059.46	50.00	6068.01	11706.74	440.11	56.952	38.24747	33.9	68.603	0.659	0.31625	25.6	91.5	0.731	
1059.46	55.00	6068.83	11701.81	440.11	51.979	34.97902	33.9	62.653	0.637	0.30680	25.7	91.6	0.707	
1059.46	60.00	6069.65	11696.88	440.11	47.461	31.99988	34.0	57.241	0.614	0.29541	25.7	91.7	0.681	

1059.46	65.00	6070.47	11691.95	440.11	43.380	29.30328	34.0	52.350	0.592	0.28282	25.6	91.9	0.656
1059.46	70.00	6071.30	11687.02	440.11	39.709	26.87364	34.1	47.947	0.569	0.26958	25.4	91.9	0.629
1059.46	75.00	6072.12	11682.08	440.11	36.412	24.69065	34.1	43.994	0.546	0.25613	25.1	92.0	0.603
1059.46	80.00	6072.94	11677.15	440.11	33.456	22.73212	34.2	40.448	0.523	0.24278	24.9	92.1	0.576
1059.46	85.00	6073.77	11672.22	440.11	30.805	20.97573	34.3	37.268	0.500	0.22975	24.7	92.1	0.551
1059.46	90.00	6074.59	11667.29	440.11	28.426	19.40008	34.3	34.415	0.478	0.21719	24.4	92.1	0.525
1059.46	95.00	6075.41	11662.36	440.11	26.291	17.98532	34.4	31.854	0.457	0.20520	24.2	92.2	0.501
1059.46	100.00	6076.24	11657.42	440.11	24.370	16.71333	34.4	29.550	0.437	0.19381	23.9	92.2	0.478
1059.46	105.00	6077.06	11652.49	440.11	22.640	15.56788	34.5	27.476	0.417	0.18307	23.7	92.2	0.455
1059.46	110.00	6077.88	11647.56	440.11	21.079	14.53449	34.6	25.604	0.398	0.17296	23.5	92.1	0.434
1059.46	115.00	6078.70	11642.63	440.11	19.668	13.60037	34.7	23.912	0.380	0.16348	23.3	92.1	0.413
1059.46	120.00	6079.53	11637.70	440.11	18.389	12.75425	34.7	22.379	0.363	0.15460	23.1	92.1	0.394
1059.46	125.00	6080.35	11632.77	440.11	17.228	11.98622	34.8	20.988	0.346	0.14630	22.9	92.1	0.376
1059.46	130.00	6081.17	11627.83	440.11	16.173	11.28758	34.9	19.722	0.331	0.13854	22.7	92.1	0.359
1059.46	135.00	6082.00	11622.90	440.11	15.211	10.65071	35.0	18.569	0.316	0.13129	22.5	92.0	0.342
1059.46	140.00	6082.82	11617.97	440.11	14.332	10.06893	35.1	17.515	0.302	0.12452	22.4	92.0	0.327
1059.46	145.00	6083.64	11613.04	440.11	13.528	9.53635	35.2	16.551	0.289	0.11820	22.2	92.0	0.313
1059.46	150.00	6084.47	11608.11	440.11	12.791	9.04782	35.3	15.667	0.277	0.11229	22.1	91.9	0.299
1059.46	155.00	6085.29	11603.17	440.11	12.113	8.59879	35.4	14.855	0.265	0.10677	21.9	91.9	0.286
1059.46	160.00	6086.11	11598.24	440.11	11.490	8.18527	35.5	14.107	0.254	0.10160	21.8	91.9	0.274
1059.46	165.00	6086.93	11593.31	440.11	10.915	7.80371	35.6	13.418	0.244	0.09677	21.6	91.9	0.262
1059.46	170.00	6087.76	11588.38	440.11	10.384	7.45101	35.7	12.781	0.234	0.09224	21.5	91.8	0.252
1059.46	175.00	6088.58	11583.45	440.11	9.893	7.12438	35.8	12.192	0.225	0.08800	21.4	91.8	0.241
1059.46	180.00	6089.40	11578.52	440.11	9.438	6.82137	35.9	11.645	0.216	0.08402	21.3	91.8	0.232
1059.46	185.00	6090.23	11573.58	440.11	9.016	6.53981	36.0	11.138	0.208	0.08028	21.1	91.7	0.223
1059.46	190.00	6091.05	11568.65	440.11	8.623	6.27774	36.1	10.666	0.200	0.07677	21.0	91.7	0.214
1059.46	195.00	6091.87	11563.72	440.11	8.258	6.03343	36.2	10.227	0.192	0.07347	20.9	91.7	0.206
1059.46	200.00	6092.70	11558.79	440.11	7.917	5.80533	36.3	9.817	0.185	0.07037	20.8	91.6	0.198

Midspan of Structures 5 & 6 – Full Load Case

PLS-CADD Version 10.40 4:38:34 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10\345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
  Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
  Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
  Assumed 90 MPH Extreme Wind Loading (Rule 250C)
  Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
  Assumed Maximum Operating Temperature of 212 F
  Assumed 1" Extreme Ice (Non-NESC)
  Assumed Grade B Construction
  <<Illustration of NESC provisions include>>
    > Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
    > Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
    > 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
    > Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
    > Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
    > 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
    > Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
     **** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
     **** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
    > Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
     **** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
     **** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
     **** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE,
          the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL
          values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of
          Composite Line Post Insulators for further clarification. ****
     **** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
     **** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
     **** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
     **** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
    > Structure Loads criteria includes typical Full Structure DE cases
  POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
  THIS FILE IS PROVIDED FOR ILLUSTRATION ONLY. CRITERIA SHOULD BE CHECKED AND MODIFIED AS NECESSARY BY AN ENGINEER IN RESPONSIBLE CHARGE,
  FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
RESPONSIBLE ENGINEER SHOULD VERIFY MAXIMUM OPERATING CONDITION FOR THEIR APPLICABLE PROJECT
RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28	(ft)
Cross section offset for graph +/-:	200.00	(ft)
Result interval for graph:	5.00	(ft)
Electric field limit:	1.60	(kV/m)
Magnetic field limit:	200.00	(mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	1	1	345	2360.000	0	1.762
2	2	1	345	2360.000	120	1.762
2	3	1	345	2360.000	-120	1.762

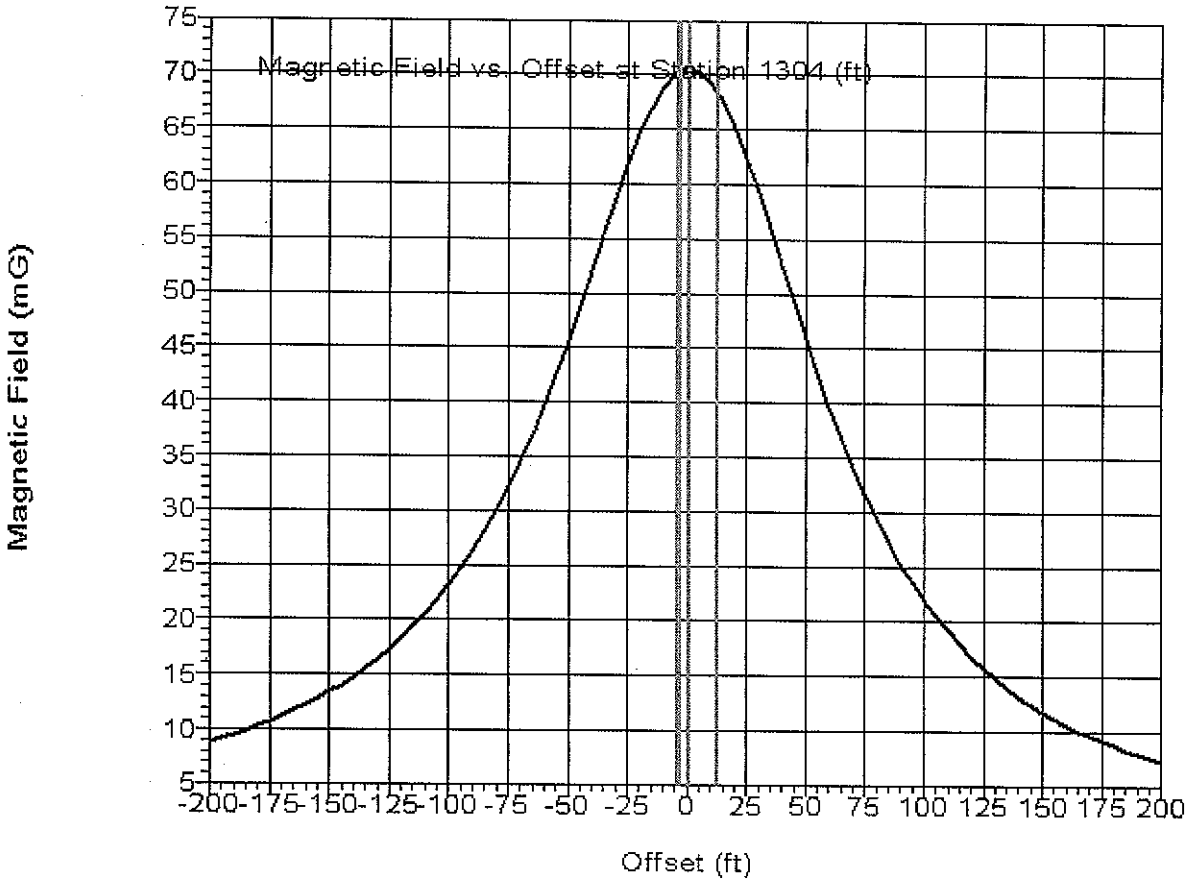
Calculated EMF Circuit Data For Last Point:

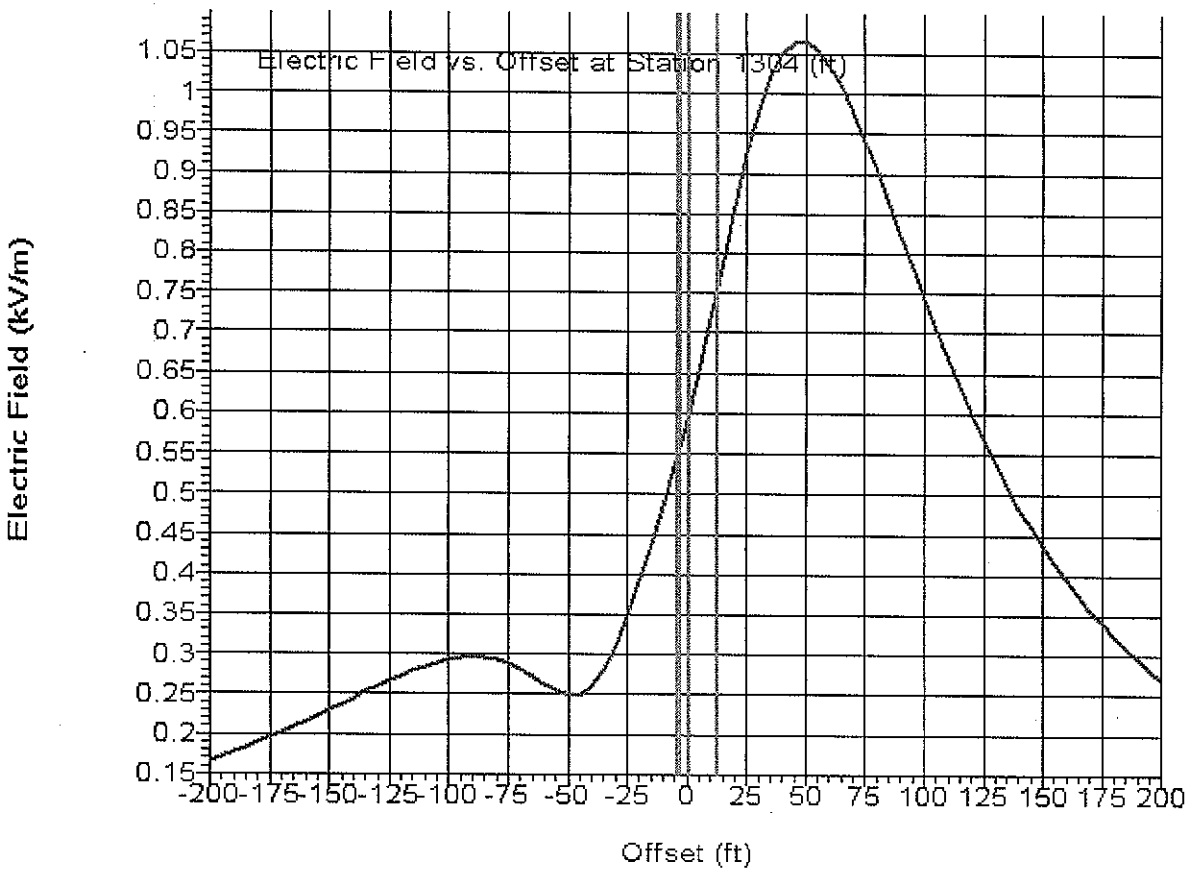
**Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.**

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1	NESC Heavy (250B)	Creep RS	Left	6134.12	11943.00	534.10	1304.15	1.12	0.509	199.2
2	1	NESC Heavy (250B)	Creep RS	Left	6145.85	11942.89	513.02	1304.38	12.85	1.762	199.2
2	2	NESC Heavy (250B)	Creep RS	Left	6129.19	11943.05	506.86	1304.05	-3.81	1.762	199.2
2	3	NESC Heavy (250B)	Creep RS	Left	6129.98	11943.34	501.15	1304.37	-3.02	1.762	199.2

Maximum magnetic field of 70.51 (mG) found at station 1304.15, offset 0.00 (ft)
Maximum electric field of 1.065 (kV/m) found at station 1304.15, offset 50.00 (ft)





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1304.15	-200.00	5933.09	11948.93	438.00	7.555	4.54209	31.0	8.815	0.166	0.00286	1.0	88.9	0.166
1304.15	-195.00	5938.08	11948.78	438.00	7.850	4.69851	30.9	9.149	0.171	0.00317	1.1	88.9	0.171
1304.15	-190.00	5943.08	11948.63	438.00	8.165	4.86478	30.8	9.504	0.177	0.00349	1.1	88.9	0.177
1304.15	-185.00	5948.08	11948.49	438.00	8.500	5.04175	30.7	9.883	0.183	0.00382	1.2	88.9	0.183
1304.15	-180.00	5953.08	11948.34	438.00	8.859	5.23037	30.6	10.287	0.189	0.00415	1.3	88.9	0.189
1304.15	-175.00	5958.08	11948.19	438.00	9.242	5.43165	30.4	10.720	0.196	0.00448	1.3	88.9	0.196

1304.15	-170.00	5963.07	11948.04	438.00	9.652	5.64674	30.3	11.183	0.202	0.00482	1.4	88.9	0.202
1304.15	-165.00	5968.07	11947.90	438.00	10.092	5.87691	30.2	11.679	0.209	0.00514	1.4	89.0	0.209
1304.15	-160.00	5973.07	11947.75	438.00	10.565	6.12355	30.1	12.211	0.216	0.00545	1.4	89.0	0.216
1304.15	-155.00	5978.07	11947.60	438.00	11.073	6.38823	30.0	12.784	0.223	0.00573	1.5	89.0	0.223
1304.15	-150.00	5983.06	11947.46	438.00	11.621	6.67267	29.9	13.400	0.230	0.00597	1.5	89.0	0.230
1304.15	-145.00	5988.06	11947.31	438.00	12.211	6.97879	29.7	14.064	0.238	0.00616	1.5	89.1	0.238
1304.15	-140.00	5993.06	11947.16	438.00	12.848	7.30872	29.6	14.781	0.245	0.00627	1.5	89.1	0.245
1304.15	-135.00	5998.06	11947.01	438.00	13.537	7.66482	29.5	15.556	0.252	0.00627	1.4	89.2	0.252
1304.15	-130.00	6003.06	11946.87	438.00	14.283	8.04970	29.4	16.395	0.259	0.00615	1.4	89.3	0.260
1304.15	-125.00	6008.05	11946.72	438.00	15.092	8.46626	29.3	17.304	0.266	0.00585	1.3	89.3	0.266
1304.15	-120.00	6013.05	11946.57	438.00	15.970	8.91767	29.2	18.291	0.273	0.00533	1.1	89.4	0.273
1304.15	-115.00	6018.05	11946.42	438.00	16.924	9.40744	29.1	19.363	0.279	0.00454	0.9	89.6	0.279
1304.15	-110.00	6023.05	11946.28	438.00	17.963	9.93937	29.0	20.529	0.285	0.00348	0.7	89.7	0.285
1304.15	-105.00	6028.05	11946.13	438.00	19.094	10.51756	28.8	21.799	0.289	0.00238	0.5	89.9	0.289
1304.15	-100.00	6033.04	11945.98	438.00	20.327	11.14643	28.7	23.182	0.293	0.00269	0.5	90.0	0.293
1304.15	-95.00	6038.04	11945.84	438.00	21.671	11.83058	28.6	24.690	0.296	0.00530	1.0	90.3	0.296
1304.15	-90.00	6043.04	11945.69	438.00	23.138	12.57474	28.5	26.334	0.296	0.00939	1.8	90.5	0.296
1304.15	-85.00	6048.04	11945.54	438.00	24.738	13.38357	28.4	28.127	0.295	0.01489	2.9	90.8	0.296
1304.15	-80.00	6053.03	11945.39	438.00	26.483	14.26141	28.3	30.079	0.292	0.02205	4.3	91.1	0.293
1304.15	-75.00	6058.03	11945.25	438.00	28.382	15.21190	28.2	32.201	0.286	0.03121	6.2	91.5	0.288
1304.15	-70.00	6063.03	11945.10	438.00	30.445	16.23737	28.1	34.504	0.278	0.04279	8.7	91.8	0.281
1304.15	-65.00	6068.03	11944.95	438.00	32.679	17.33815	27.9	36.994	0.267	0.05726	12.1	92.1	0.273
1304.15	-60.00	6073.03	11944.80	438.00	35.089	18.51151	27.8	39.672	0.253	0.07513	16.5	92.3	0.263
1304.15	-55.00	6078.02	11944.66	438.00	37.671	19.75037	27.7	42.535	0.236	0.09689	22.3	92.1	0.255
1304.15	-50.00	6083.02	11944.51	438.00	40.417	21.04181	27.5	45.567	0.218	0.12296	29.4	91.4	0.249
1304.15	-45.00	6088.02	11944.36	438.00	43.306	22.36536	27.3	48.741	0.199	0.15355	37.7	90.2	0.250
1304.15	-40.00	6093.02	11944.22	438.00	46.304	23.69142	27.1	52.013	0.180	0.18860	46.3	88.6	0.259
1304.15	-35.00	6098.02	11944.07	438.00	49.360	24.98017	26.8	55.321	0.165	0.22754	54.0	87.2	0.280
1304.15	-30.00	6103.01	11943.92	438.00	52.403	26.18147	26.5	58.580	0.156	0.26919	59.9	86.3	0.310
1304.15	-25.00	6108.01	11943.77	438.00	55.344	27.23663	26.2	61.683	0.156	0.31162	63.4	85.9	0.348
1304.15	-20.00	6113.01	11943.63	438.00	58.075	28.08238	25.8	64.508	0.170	0.35225	64.2	86.0	0.391
1304.15	-15.00	6118.01	11943.48	438.00	60.477	28.65738	25.4	66.923	0.200	0.38800	62.7	86.2	0.437
1304.15	-10.00	6123.00	11943.33	438.00	62.428	28.91050	24.8	68.797	0.249	0.41575	59.1	86.3	0.484
1304.15	-5.00	6128.00	11943.18	438.00	63.819	28.80925	24.3	70.020	0.315	0.43287	54.0	86.3	0.534
1304.15	0.00	6133.00	11943.04	438.00	64.566	28.34622	23.7	70.514	0.397	0.43778	47.8	86.2	0.590
1304.15	5.00	6138.00	11942.89	438.00	64.622	27.54128	23.1	70.246	0.491	0.43025	41.2	86.1	0.651
1304.15	10.00	6143.00	11942.74	438.00	63.983	26.43895	22.5	69.230	0.591	0.41146	34.8	86.1	0.719
1304.15	15.00	6147.99	11942.60	438.00	62.691	25.10135	21.8	67.529	0.692	0.38369	29.0	86.3	0.790
1304.15	20.00	6152.99	11942.45	438.00	60.823	23.59905	21.2	65.241	0.787	0.34981	24.0	86.7	0.860
1304.15	25.00	6157.99	11942.30	438.00	58.484	22.00210	20.6	62.486	0.871	0.31272	19.8	87.2	0.924
1304.15	30.00	6162.99	11942.15	438.00	55.791	20.37315	20.1	59.395	0.940	0.27499	16.3	87.8	0.979
1304.15	35.00	6167.98	11942.01	438.00	52.860	18.76336	19.5	56.092	0.993	0.23858	13.5	88.4	1.021
1304.15	40.00	6172.98	11941.86	438.00	49.800	17.21106	19.1	52.690	1.030	0.20483	11.3	89.0	1.050
1304.15	45.00	6177.98	11941.71	438.00	46.703	15.74237	18.6	49.284	1.050	0.17448	9.4	89.5	1.064
1304.15	50.00	6182.98	11941.56	438.00	43.642	14.37296	18.2	45.948	1.055	0.14781	8.0	89.9	1.065
1304.15	55.00	6187.98	11941.42	438.00	40.676	13.11029	17.9	42.736	1.048	0.12481	6.8	90.3	1.055
1304.15	60.00	6192.97	11941.27	438.00	37.842	11.95574	17.5	39.686	1.031	0.10522	5.8	90.6	1.036

1304.15	65.00	6197.97	11941.12	438.00	35.167	10.90655	17.2	36.819	1.005	0.08872	5.0	90.9	1.009
1304.15	70.00	6202.97	11940.97	438.00	32.663	9.95730	17.0	34.147	0.974	0.07492	4.4	91.1	0.977
1304.15	75.00	6207.97	11940.83	438.00	30.337	9.10106	16.7	31.672	0.939	0.06345	3.9	91.3	0.941
1304.15	80.00	6212.97	11940.68	438.00	28.185	8.33020	16.5	29.391	0.901	0.05393	3.4	91.5	0.902
1304.15	85.00	6217.96	11940.53	438.00	26.204	7.63696	16.2	27.295	0.861	0.04607	3.1	91.6	0.863
1304.15	90.00	6222.96	11940.39	438.00	24.385	7.01377	16.0	25.373	0.821	0.03958	2.8	91.7	0.822
1304.15	95.00	6227.96	11940.24	438.00	22.716	6.45349	15.9	23.615	0.782	0.03422	2.5	91.8	0.782
1304.15	100.00	6232.96	11940.09	438.00	21.189	5.94950	15.7	22.008	0.743	0.02979	2.3	91.8	0.743
1304.15	105.00	6237.95	11939.94	438.00	19.790	5.49578	15.5	20.539	0.705	0.02614	2.1	91.8	0.705
1304.15	110.00	6242.95	11939.80	438.00	18.510	5.08689	15.4	19.197	0.669	0.02312	2.0	91.9	0.669
1304.15	115.00	6247.95	11939.65	438.00	17.339	4.71793	15.2	17.969	0.634	0.02062	1.9	91.9	0.634
1304.15	120.00	6252.95	11939.50	438.00	16.265	4.38457	15.1	16.846	0.601	0.01854	1.8	91.9	0.601
1304.15	125.00	6257.95	11939.35	438.00	15.282	4.08292	15.0	15.818	0.569	0.01681	1.7	91.9	0.570
1304.15	130.00	6262.94	11939.21	438.00	14.379	3.80958	14.8	14.875	0.540	0.01538	1.6	91.9	0.540
1304.15	135.00	6267.94	11939.06	438.00	13.550	3.56149	14.7	14.010	0.512	0.01417	1.6	91.9	0.512
1304.15	140.00	6272.94	11938.91	438.00	12.787	3.33598	14.6	13.215	0.485	0.01317	1.6	91.9	0.485
1304.15	145.00	6277.94	11938.77	438.00	12.085	3.13066	14.5	12.484	0.460	0.01232	1.5	91.9	0.461
1304.15	150.00	6282.93	11938.62	438.00	11.437	2.94343	14.4	11.810	0.437	0.01161	1.5	91.8	0.437
1304.15	155.00	6287.93	11938.47	438.00	10.839	2.77244	14.3	11.188	0.415	0.01101	1.5	91.8	0.415
1304.15	160.00	6292.93	11938.32	438.00	10.286	2.61603	14.3	10.614	0.395	0.01050	1.5	91.8	0.395
1304.15	165.00	6297.93	11938.18	438.00	9.775	2.47274	14.2	10.082	0.375	0.01006	1.5	91.8	0.375
1304.15	170.00	6302.93	11938.03	438.00	9.300	2.34126	14.1	9.590	0.357	0.00969	1.6	91.7	0.357
1304.15	175.00	6307.92	11937.88	438.00	8.860	2.22045	14.1	9.134	0.340	0.00937	1.6	91.7	0.340
1304.15	180.00	6312.92	11937.73	438.00	8.450	2.10927	14.0	8.709	0.324	0.00909	1.6	91.7	0.324
1304.15	185.00	6317.92	11937.59	438.00	8.069	2.00681	14.0	8.315	0.309	0.00885	1.6	91.7	0.309
1304.15	190.00	6322.92	11937.44	438.00	7.714	1.91224	13.9	7.947	0.295	0.00864	1.7	91.7	0.295
1304.15	195.00	6327.92	11937.29	438.00	7.382	1.82483	13.9	7.604	0.282	0.00845	1.7	91.6	0.282
1304.15	200.00	6332.91	11937.15	438.00	7.072	1.74393	13.9	7.284	0.269	0.00829	1.8	91.6	0.269

Midspan of Structures 6 & 7 - Full Load Case

PLS-CADD Version 10.40 4:39:05 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10\345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
Assumed 90 MPH Extreme Wind Loading (Rule 250C)
Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
Assumed Maximum Operating Temperature of 212 F
Assumed 1" Extreme Ice (Non-NESC)
Assumed Grade B Construction
<<Illustration of NESC provisions include>>
> Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
> Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
> 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
> Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
> Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
> 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
> Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
**** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
**** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
> Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
**** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
**** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
**** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE,
the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL
values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of
Composite Line Post Insulators for further clarification. ****
**** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
**** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
**** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
**** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
> Structure Loads criteria includes typical Full Structure DE cases
POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
THIS FILE IS PROVIDED FOR ILLUSTRATION ONLY. CRITERIA SHOULD BE CHECKED AND MODIFIED AS NECESSARY BY AN ENGINEER IN RESPONSIBLE CHARGE,
FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
RESPONSIBLE ENGINEER SHOULD VERIFY MAXIMUM OPERATING CONDITION FOR THEIR APPLICABLE PROJECT
RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28 (ft)
Cross section offset for graph +/-:	200.00 (ft)
Result interval for graph:	5.00 (ft)
Electric field limit:	1.60 (kV/m)
Magnetic field limit:	200.00 (mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	1	1	345	2360.000	0	1.762
2	2	1	345	2360.000	120	1.762
2	3	1	345	2360.000	-120	1.762

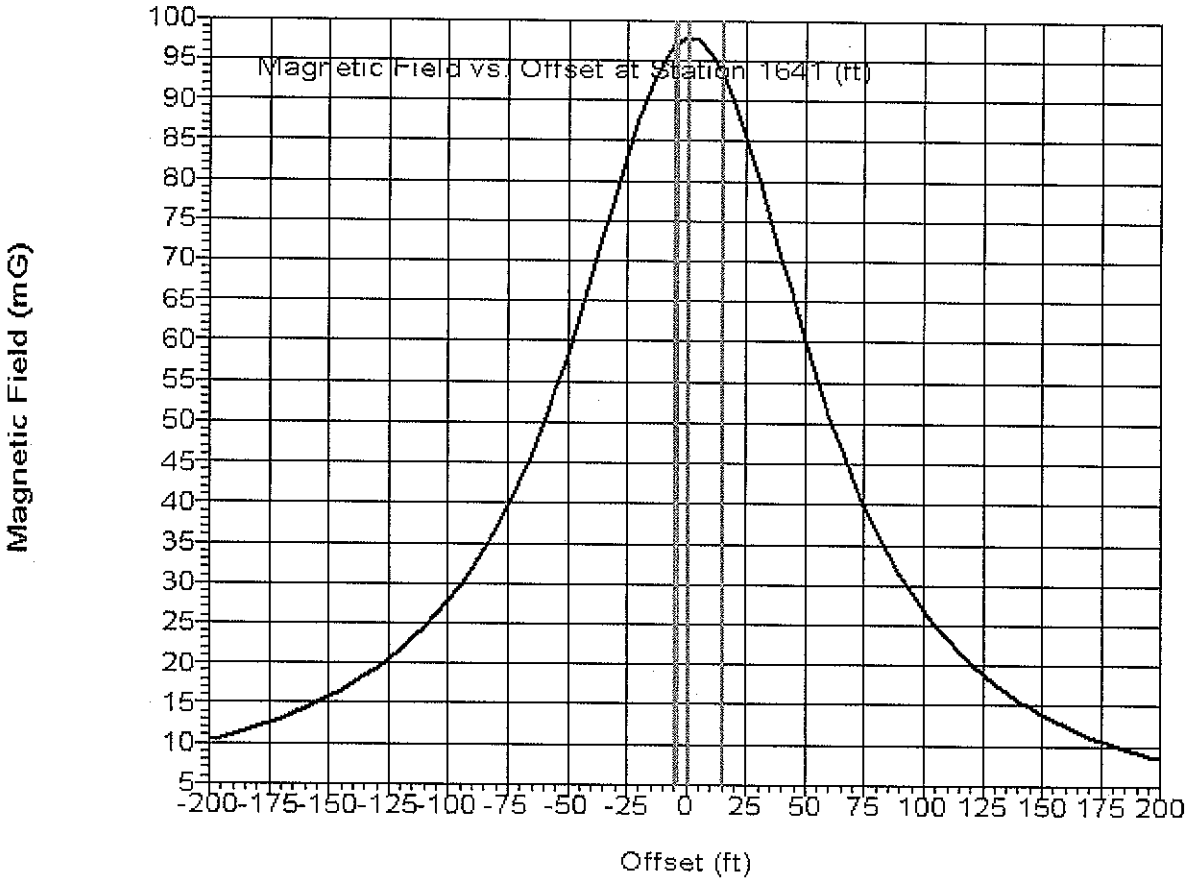
Calculated EMF Circuit Data For Last Point:

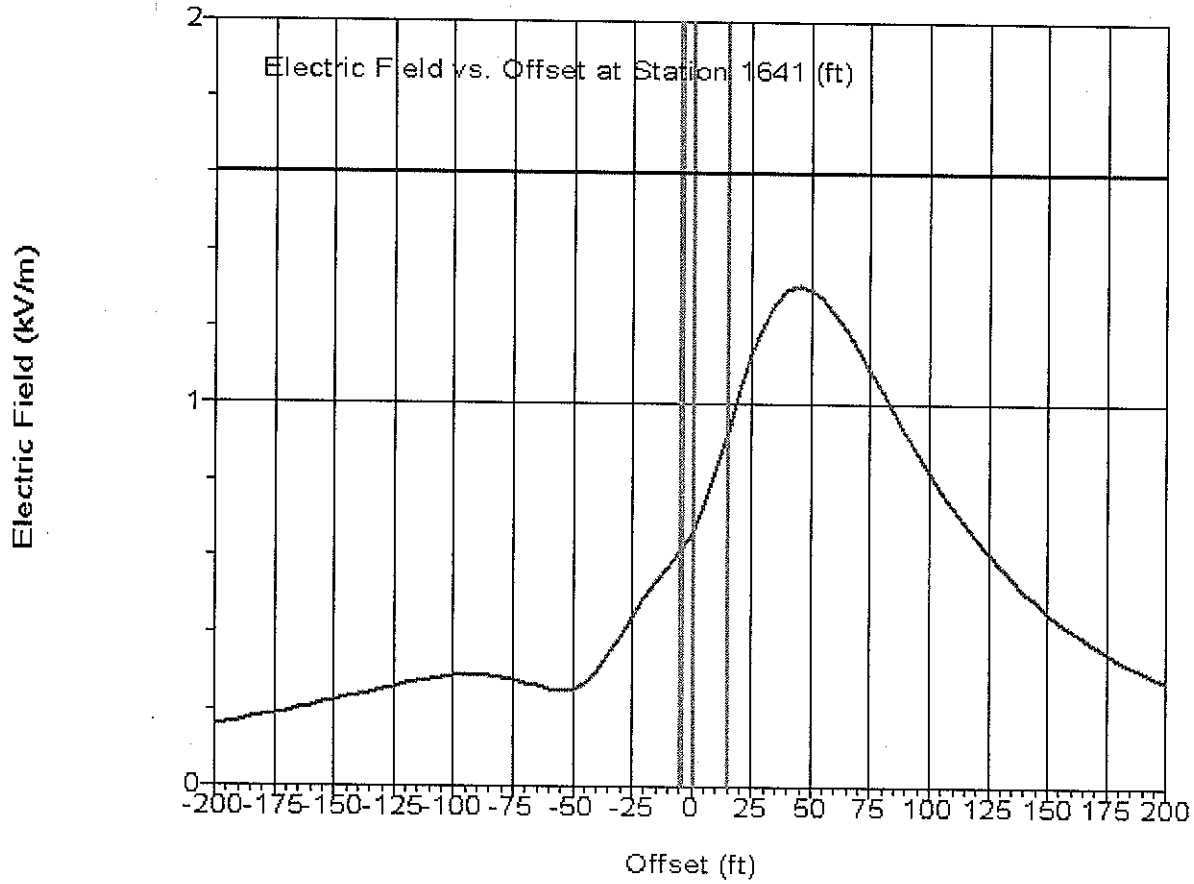
**Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.**

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1	NESC Heavy (250B)	Creep RS	Left	6148.02	12279.19	547.49	1640.68	0.94	0.509	199.2
2	1	NESC Heavy (250B)	Creep RS	Left	6162.09	12277.89	526.10	1640.16	15.06	1.762	199.2
2	2	NESC Heavy (250B)	Creep RS	Left	6143.18	12279.57	520.34	1640.79	-3.92	1.762	199.2
2	3	NESC Heavy (250B)	Creep RS	Left	6142.19	12279.07	514.54	1640.24	-4.87	1.762	199.2

Maximum magnetic field of 97.90 (mG) found at station 1640.68, offset 0.00 (ft)
Maximum electric field of 1.310 (kV/m) found at station 1640.68, offset 45.00 (ft)





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1640.68	-200.00	5947.39	12290.32	458.16	8.943	5.05919	29.5	10.275	0.159	0.00845	3.0	88.9	0.159
1640.68	-195.00	5952.38	12290.04	458.16	9.296	5.23654	29.4	10.670	0.164	0.00854	3.0	88.9	0.165
1640.68	-190.00	5957.37	12289.76	458.16	9.673	5.42543	29.3	11.090	0.170	0.00864	2.9	88.9	0.170
1640.68	-185.00	5962.37	12289.49	458.16	10.075	5.62691	29.2	11.540	0.176	0.00877	2.9	88.9	0.176
1640.68	-180.00	5967.36	12289.21	458.16	10.506	5.84211	29.1	12.021	0.182	0.00892	2.8	88.9	0.182
1640.68	-175.00	5972.35	12288.93	458.16	10.967	6.07233	29.0	12.536	0.188	0.00910	2.8	88.9	0.189

1640.68	-170.00	5977.34	12288.66	458.16	11.462	6.31898	28.9	13.088	0.195	0.00932	2.7	88.9	0.195
1640.68	-165.00	5982.33	12288.38	458.16	11.994	6.58367	28.8	13.682	0.202	0.00959	2.7	88.9	0.202
1640.68	-160.00	5987.33	12288.10	458.16	12.566	6.86816	28.7	14.321	0.208	0.00991	2.7	88.9	0.209
1640.68	-155.00	5992.32	12287.83	458.16	13.183	7.17445	28.6	15.009	0.216	0.01031	2.7	89.0	0.216
1640.68	-150.00	5997.31	12287.55	458.16	13.850	7.50477	28.5	15.752	0.223	0.01081	2.8	89.0	0.223
1640.68	-145.00	6002.30	12287.27	458.16	14.570	7.86164	28.3	16.556	0.230	0.01142	2.8	89.0	0.230
1640.68	-140.00	6007.30	12286.99	458.16	15.351	8.24787	28.2	17.426	0.237	0.01217	2.9	89.1	0.238
1640.68	-135.00	6012.29	12286.72	458.16	16.198	8.66663	28.1	18.371	0.244	0.01310	3.1	89.2	0.245
1640.68	-130.00	6017.28	12286.44	458.16	17.119	9.12146	28.0	19.398	0.252	0.01425	3.2	89.2	0.252
1640.68	-125.00	6022.27	12286.16	458.16	18.122	9.61636	28.0	20.515	0.258	0.01568	3.5	89.3	0.259
1640.68	-120.00	6027.27	12285.89	458.16	19.216	10.15583	27.9	21.734	0.265	0.01745	3.8	89.4	0.266
1640.68	-115.00	6032.26	12285.61	458.16	20.411	10.74488	27.8	23.066	0.271	0.01966	4.1	89.6	0.272
1640.68	-110.00	6037.25	12285.33	458.16	21.719	11.38912	27.7	24.524	0.276	0.02240	4.6	89.7	0.277
1640.68	-105.00	6042.24	12285.06	458.16	23.152	12.09479	27.6	26.121	0.281	0.02582	5.3	89.9	0.282
1640.68	-100.00	6047.23	12284.78	458.16	24.726	12.86875	27.5	27.874	0.284	0.03008	6.1	90.1	0.285
1640.68	-95.00	6052.23	12284.50	458.16	26.456	13.71854	27.4	29.801	0.285	0.03539	7.1	90.4	0.287
1640.68	-90.00	6057.22	12284.23	458.16	28.359	14.65223	27.3	31.920	0.285	0.04202	8.4	90.7	0.288
1640.68	-85.00	6062.21	12283.95	458.16	30.454	15.67837	27.2	34.253	0.282	0.05027	10.1	91.0	0.286
1640.68	-80.00	6067.20	12283.67	458.16	32.763	16.80564	27.2	36.821	0.276	0.06055	12.4	91.4	0.283
1640.68	-75.00	6072.20	12283.40	458.16	35.305	18.04250	27.1	39.648	0.268	0.07333	15.3	91.7	0.277
1640.68	-70.00	6077.19	12283.12	458.16	38.102	19.39640	27.0	42.755	0.255	0.08915	19.3	92.1	0.270
1640.68	-65.00	6082.18	12282.84	458.16	41.173	20.87275	26.9	46.162	0.238	0.10864	24.5	92.2	0.261
1640.68	-60.00	6087.17	12282.56	458.16	44.536	22.47338	26.8	49.885	0.218	0.13248	31.3	92.0	0.253
1640.68	-55.00	6092.17	12282.29	458.16	48.201	24.19437	26.7	53.932	0.193	0.16133	39.9	91.2	0.250
1640.68	-50.00	6097.16	12282.01	458.16	52.168	26.02326	26.5	58.299	0.165	0.19575	49.9	89.6	0.253
1640.68	-45.00	6102.15	12281.73	458.16	56.423	27.93554	26.3	62.960	0.135	0.23603	60.3	87.6	0.269
1640.68	-40.00	6107.14	12281.46	458.16	60.928	29.89091	26.1	67.865	0.104	0.28196	69.7	86.1	0.299
1640.68	-35.00	6112.14	12281.18	458.16	65.617	31.82978	25.9	72.930	0.077	0.33254	77.0	85.3	0.340
1640.68	-30.00	6117.13	12280.90	458.16	70.388	33.67143	25.6	78.027	0.056	0.38573	81.7	85.4	0.389
1640.68	-25.00	6122.12	12280.63	458.16	75.098	35.31546	25.2	82.987	0.048	0.43823	83.7	86.0	0.441
1640.68	-20.00	6127.11	12280.35	458.16	79.562	36.64847	24.7	87.597	0.063	0.48565	82.6	86.7	0.490
1640.68	-15.00	6132.10	12280.07	458.16	83.566	37.55686	24.2	91.618	0.105	0.52292	78.6	87.4	0.533
1640.68	-10.00	6137.10	12279.80	458.16	86.882	37.94482	23.6	94.807	0.176	0.54532	72.2	87.7	0.571
1640.68	-5.00	6142.09	12279.52	458.16	89.298	37.75340	22.9	96.951	0.274	0.54955	63.5	87.4	0.610
1640.68	0.00	6147.08	12279.24	458.16	90.646	36.97470	22.2	97.897	0.398	0.53473	53.3	86.5	0.661
1640.68	5.00	6152.07	12278.97	458.16	90.832	35.65551	21.4	97.580	0.540	0.50264	42.9	85.5	0.732
1640.68	10.00	6157.07	12278.69	458.16	89.851	33.88873	20.7	96.029	0.691	0.45731	33.5	85.1	0.824
1640.68	15.00	6162.06	12278.41	458.16	87.779	31.79554	19.9	93.360	0.840	0.40392	25.7	85.2	0.929
1640.68	20.00	6167.05	12278.13	458.16	84.768	29.50455	19.2	89.756	0.977	0.34761	19.6	85.8	1.035
1640.68	25.00	6172.04	12277.86	458.16	81.010	27.13415	18.5	85.433	1.095	0.29266	15.0	86.7	1.132
1640.68	30.00	6177.04	12277.58	458.16	76.717	24.78143	17.9	80.621	1.187	0.24201	11.5	87.5	1.210
1640.68	35.00	6182.03	12277.30	458.16	72.098	22.51797	17.3	75.533	1.252	0.19731	9.0	88.3	1.267
1640.68	40.00	6187.02	12277.03	458.16	67.335	20.39085	16.8	70.355	1.290	0.15913	7.0	89.1	1.299
1640.68	45.00	6192.01	12276.75	458.16	62.581	18.42651	16.4	65.237	1.304	0.12735	5.6	89.7	1.310
1640.68	50.00	6197.00	12276.47	458.16	57.951	16.63574	16.0	60.291	1.297	0.10139	4.5	90.2	1.301
1640.68	55.00	6202.00	12276.20	458.16	53.527	15.01833	15.7	55.594	1.274	0.08049	3.6	90.7	1.277
1640.68	60.00	6206.99	12275.92	458.16	49.362	13.56703	15.4	51.193	1.239	0.06384	2.9	91.0	1.241

1640.68	65.00	6211.98	12275.64	458.16	45.485	12.27051	15.1	47.111	1.194	0.05069	2.4	91.3	1.195
1640.68	70.00	6216.97	12275.37	458.16	41.907	11.11545	14.9	43.356	1.144	0.04037	2.0	91.5	1.145
1640.68	75.00	6221.97	12275.09	458.16	38.625	10.08797	14.6	39.920	1.090	0.03230	1.7	91.7	1.091
1640.68	80.00	6226.96	12274.81	458.16	35.628	9.17448	14.4	36.790	1.035	0.02602	1.4	91.9	1.035
1640.68	85.00	6231.95	12274.54	458.16	32.900	8.36220	14.3	33.946	0.980	0.02114	1.2	92.0	0.980
1640.68	90.00	6236.94	12274.26	458.16	30.422	7.63940	14.1	31.366	0.925	0.01737	1.1	92.0	0.926
1640.68	95.00	6241.94	12273.98	458.16	28.173	6.99552	13.9	29.029	0.873	0.01446	0.9	92.1	0.873
1640.68	100.00	6246.93	12273.70	458.16	26.133	6.42114	13.8	26.911	0.823	0.01221	0.9	92.1	0.823
1640.68	105.00	6251.92	12273.43	458.16	24.283	5.90794	13.7	24.992	0.775	0.01049	0.8	92.1	0.775
1640.68	110.00	6256.91	12273.15	458.16	22.604	5.44861	13.6	23.251	0.729	0.00918	0.7	92.1	0.730
1640.68	115.00	6261.90	12272.87	458.16	21.079	5.03674	13.4	21.672	0.687	0.00818	0.7	92.1	0.687
1640.68	120.00	6266.90	12272.60	458.16	19.691	4.66672	13.3	20.237	0.647	0.00743	0.7	92.1	0.647
1640.68	125.00	6271.89	12272.32	458.16	18.428	4.33367	13.2	18.931	0.610	0.00686	0.6	92.1	0.610
1640.68	130.00	6276.88	12272.04	458.16	17.276	4.03332	13.1	17.741	0.575	0.00644	0.6	92.1	0.575
1640.68	135.00	6281.87	12271.77	458.16	16.224	3.76193	13.1	16.654	0.542	0.00614	0.6	92.1	0.542
1640.68	140.00	6286.87	12271.49	458.16	15.261	3.51625	13.0	15.661	0.512	0.00592	0.7	92.0	0.512
1640.68	145.00	6291.86	12271.21	458.16	14.380	3.29343	12.9	14.752	0.484	0.00577	0.7	92.0	0.484
1640.68	150.00	6296.85	12270.94	458.16	13.570	3.09097	12.8	13.918	0.458	0.00566	0.7	92.0	0.458
1640.68	155.00	6301.84	12270.66	458.16	12.826	2.90667	12.8	13.152	0.433	0.00560	0.7	92.0	0.433
1640.68	160.00	6306.84	12270.38	458.16	12.141	2.73861	12.7	12.446	0.410	0.00556	0.8	91.9	0.410
1640.68	165.00	6311.83	12270.11	458.16	11.510	2.58509	12.7	11.796	0.389	0.00554	0.8	91.9	0.389
1640.68	170.00	6316.82	12269.83	458.16	10.926	2.44461	12.6	11.196	0.369	0.00554	0.9	91.9	0.369
1640.68	175.00	6321.81	12269.55	458.16	10.386	2.31586	12.6	10.641	0.351	0.00554	0.9	91.8	0.351
1640.68	180.00	6326.81	12269.27	458.16	9.886	2.19765	12.5	10.127	0.334	0.00555	1.0	91.8	0.334
1640.68	185.00	6331.80	12269.00	458.16	9.421	2.08896	12.5	9.650	0.317	0.00557	1.0	91.8	0.318
1640.68	190.00	6336.79	12268.72	458.16	8.990	1.98886	12.5	9.207	0.302	0.00558	1.1	91.7	0.302
1640.68	195.00	6341.78	12268.44	458.16	8.588	1.89652	12.5	8.795	0.288	0.00560	1.1	91.7	0.288
1640.68	200.00	6346.77	12268.17	458.16	8.213	1.81121	12.4	8.411	0.275	0.00561	1.2	91.7	0.275

Structure 1

PLS-CADD Version 10.40 3:50:44 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10 \345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
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Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
Assumed Maximum Operating Temperature of 212 F
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Assumed Grade B Construction
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> 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
> Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
> Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
> 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
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**** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
**** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
**** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
**** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
> Structure Loads criteria includes typical Full Structure DE cases
POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
THIS FILE IS PROVIDED FOR ILLUSTRATION ONLY. CRITERIA SHOULD BE CHECKED AND MODIFIED AS NECESSARY BY AN ENGINEER IN RESPONSIBLE CHARGE,
FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
RESPONSIBLE ENGINEER SHOULD VERIFY MAXIMUM OPERATING CONDITION FOR THEIR APPLICABLE PROJECT
RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28	(ft)
Cross section offset for graph +/-:	200.00	(ft)
Result interval for graph:	5.00	(ft)
Electric field limit:	1.60	(kV/m)
Magnetic field limit:	200.00	(mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	1	1	345	1180.000	0	1.762
2	2	1	345	1180.000	120	1.762
2	3	1	345	1180.000	-120	1.762

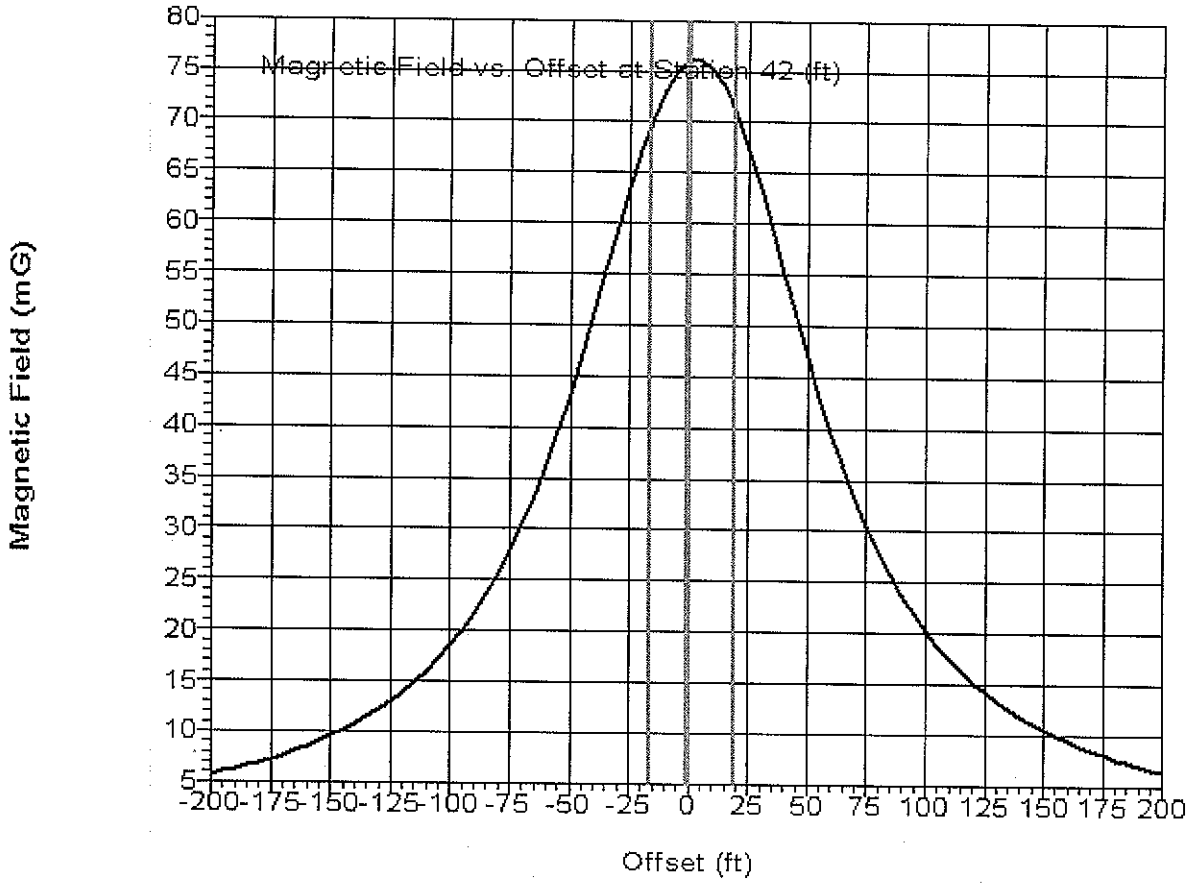
Calculated EMF Circuit Data For Last Point:

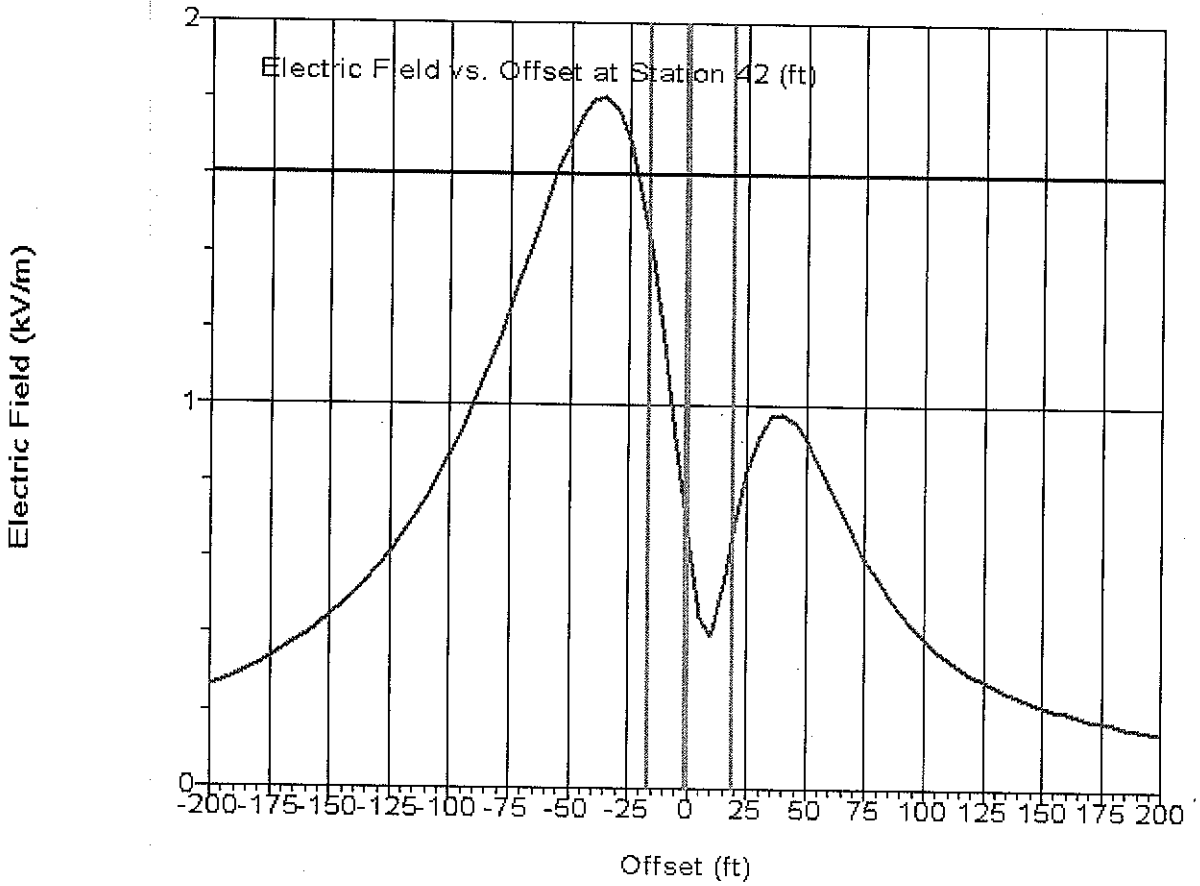
**Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.**

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1	NESC Heavy (250B)	Creep RS	Left	5965.26	11891.09	513.52	41.64	0.49	0.509	199.2
2	1	NESC Heavy (250B)	Creep RS	Left	5948.79	11894.63	494.67	42.92	-16.31	1.762	199.2
2	2	NESC Heavy (250B)	Creep RS	Left	5964.06	11891.23	493.33	41.62	-0.72	1.762	199.2
2	3	NESC Heavy (250B)	Creep RS	Left	5983.72	11889.13	492.02	42.21	19.05	1.762	199.2

Maximum magnetic field of 76.01 (mG) found at station 41.64, offset 5.00 (ft)
Maximum electric field of 1.804 (kV/m) found at station 41.64, offset -35.00 (ft) NG





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
41.64	-200.00	5766.62	11918.26	435.74	4.896	2.98707	31.4	5.735	0.260	0.02437	5.4	88.2	0.261
41.64	-195.00	5771.57	11917.58	435.74	5.128	3.11904	31.3	6.002	0.272	0.02603	5.5	88.1	0.274
41.64	-190.00	5776.53	11916.90	435.74	5.377	3.26018	31.2	6.288	0.286	0.02784	5.6	88.1	0.287
41.64	-185.00	5781.48	11916.22	435.74	5.644	3.41134	31.1	6.595	0.301	0.02981	5.7	88.0	0.302
41.64	-180.00	5786.43	11915.55	435.74	5.932	3.57347	31.1	6.926	0.317	0.03198	5.8	88.0	0.318
41.64	-175.00	5791.39	11914.87	435.74	6.243	3.74762	31.0	7.281	0.334	0.03435	5.9	87.9	0.336

41.64	-170.00	5796.34	11914.19	435.74	6.578	3.93496	30.9	7.665	0.352	0.03696	6.0	87.9	0.354	
41.64	-165.00	5801.30	11913.51	435.74	6.941	4.13682	30.8	8.080	0.372	0.03983	6.1	87.9	0.374	
41.64	-160.00	5806.25	11912.84	435.74	7.334	4.35467	30.7	8.530	0.394	0.04300	6.2	87.8	0.396	
41.64	-155.00	5811.20	11912.16	435.74	7.761	4.59020	30.6	9.017	0.417	0.04649	6.4	87.8	0.420	
41.64	-150.00	5816.16	11911.48	435.74	8.225	4.84527	30.5	9.546	0.443	0.05036	6.5	87.7	0.446	
41.64	-145.00	5821.11	11910.80	435.74	8.731	5.12202	30.4	10.122	0.470	0.05465	6.6	87.7	0.473	
41.64	-140.00	5826.06	11910.12	435.74	9.283	5.42283	30.3	10.751	0.500	0.05942	6.8	87.6	0.504	
41.64	-135.00	5831.02	11909.45	435.74	9.887	5.75043	30.2	11.438	0.533	0.06472	6.9	87.6	0.537	
41.64	-130.00	5835.97	11908.77	435.74	10.549	6.10791	30.1	12.189	0.568	0.07064	7.1	87.5	0.573	
41.64	-125.00	5840.93	11908.09	435.74	11.276	6.49877	30.0	13.014	0.607	0.07724	7.3	87.4	0.612	
41.64	-120.00	5845.88	11907.41	435.74	12.075	6.92699	29.8	13.921	0.649	0.08463	7.4	87.4	0.654	
41.64	-115.00	5850.83	11906.74	435.74	12.956	7.39713	29.7	14.919	0.695	0.09292	7.6	87.3	0.701	
41.64	-110.00	5855.79	11906.06	435.74	13.930	7.91434	29.6	16.021	0.745	0.10221	7.8	87.3	0.752	
41.64	-105.00	5860.74	11905.38	435.74	15.006	8.48453	29.5	17.239	0.800	0.11265	8.0	87.3	0.808	
41.64	-100.00	5865.70	11904.70	435.74	16.198	9.11439	29.4	18.587	0.859	0.12440	8.2	87.2	0.868	
41.64	-95.00	5870.65	11904.03	435.74	17.521	9.81154	29.2	20.081	0.924	0.13761	8.5	87.2	0.934	
41.64	-90.00	5875.60	11903.35	435.74	18.988	10.58457	29.1	21.739	0.993	0.15246	8.7	87.2	1.005	
41.64	-85.00	5880.56	11902.67	435.74	20.617	11.44320	29.0	23.580	1.068	0.16916	9.0	87.2	1.082	
41.64	-80.00	5885.51	11901.99	435.74	22.426	12.39825	28.9	25.625	1.148	0.18789	9.3	87.2	1.164	
41.64	-75.00	5890.47	11901.32	435.74	24.430	13.46167	28.9	27.894	1.233	0.20883	9.6	87.3	1.250	
41.64	-70.00	5895.42	11900.64	435.74	26.647	14.64647	28.8	30.407	1.321	0.23212	10.0	87.4	1.341	
41.64	-65.00	5900.37	11899.96	435.74	29.089	15.96640	28.8	33.182	1.410	0.25782	10.4	87.5	1.434	
41.64	-60.00	5905.33	11899.28	435.74	31.763	17.43546	28.8	36.234	1.499	0.28585	10.8	87.7	1.526	
41.64	**-55.00**	**5910.28**	**11898.61**	**435.74**	**34.668**	**19.06705**	**28.8**	**39.565**	**1.583**	**0.31589**	**11.3**	**88.0**	**1.614**	**NG**
41.64	**-50.00**	**5915.23**	**11897.93**	**435.74**	**37.787**	**20.87258**	**28.9**	**43.169**	**1.657**	**0.34727**	**11.8**	**88.4**	**1.693**	**NG**
41.64	**-45.00**	**5920.19**	**11897.25**	**435.74**	**41.087**	**22.85932**	**29.1**	**47.018**	**1.715**	**0.37873**	**12.5**	**88.8**	**1.756**	**NG**
41.64	**-40.00**	**5925.14**	**11896.57**	**435.74**	**44.509**	**25.02752**	**29.3**	**51.063**	**1.749**	**0.40829**	**13.1**	**89.4**	**1.796**	**NG**
41.64	**-35.00**	**5930.10**	**11895.89**	**435.74**	**47.967**	**27.36650**	**29.7**	**55.225**	**1.752**	**0.43290**	**13.9**	**90.2**	**1.804**	**NG**
41.64	**-30.00**	**5935.05**	**11895.22**	**435.74**	**51.347**	**29.84987**	**30.2**	**59.393**	**1.715**	**0.44834**	**14.7**	**91.1**	**1.772**	**NG**
41.64	**-25.00**	**5940.00**	**11894.54**	**435.74**	**54.512**	**32.43057**	**30.7**	**63.429**	**1.633**	**0.44919**	**15.4**	**92.3**	**1.693**	**NG**
41.64	-20.00	5944.96	11893.86	435.74	57.310	35.03655	31.4	67.172	1.504	0.42919	15.9	93.7	1.564	
41.64	-15.00	5949.91	11893.18	435.74	59.597	37.56899	32.2	70.450	1.332	0.38231	16.0	95.5	1.386	
41.64	-10.00	5954.87	11892.51	435.74	61.246	39.90501	33.1	73.099	1.124	0.30478	15.2	97.8	1.164	
41.64	-5.00	5959.82	11891.83	435.74	62.168	41.90655	34.0	74.973	0.894	0.20014	12.6	100.8	0.914	
41.64	0.00	5964.77	11891.15	435.74	62.321	43.43569	34.9	75.964	0.658	0.11168	9.6	104.3	0.660	
41.64	5.00	5969.73	11890.47	435.74	61.710	44.37425	35.7	76.008	0.434	0.19087	23.7	103.9	0.447	
41.64	10.00	5974.68	11889.80	435.74	60.380	44.64360	36.5	75.092	0.239	0.35714	56.2	82.9	0.396	
41.64	15.00	5979.63	11889.12	435.74	58.415	44.21923	37.1	73.264	0.104	0.52980	78.9	78.0	0.530	
41.64	20.00	5984.59	11888.44	435.74	55.920	43.13584	37.6	70.624	0.116	0.68490	80.4	81.3	0.692	
41.64	25.00	5989.54	11887.76	435.74	53.020	41.48112	38.0	67.319	0.183	0.80877	77.3	84.5	0.829	
41.64	30.00	5994.50	11887.09	435.74	49.846	39.38000	38.3	63.525	0.224	0.89444	75.9	87.0	0.922	
41.64	35.00	5999.45	11886.41	435.74	46.527	36.97400	38.5	59.429	0.236	0.94104	75.9	88.8	0.970	
41.64	40.00	6004.40	11885.73	435.74	43.176	34.40130	38.5	55.205	0.224	0.95237	76.8	90.3	0.978	
41.64	45.00	6009.36	11885.05	435.74	39.889	31.78191	38.5	51.003	0.195	0.93506	78.2	91.3	0.955	
41.64	50.00	6014.31	11884.38	435.74	36.738	29.20985	38.5	46.935	0.156	0.89671	80.1	92.1	0.910	
41.64	55.00	6019.27	11883.70	435.74	33.771	26.75159	38.4	43.083	0.113	0.84455	82.4	92.7	0.852	
41.64	60.00	6024.22	11883.02	435.74	31.014	24.44880	38.2	39.492	0.071	0.78468	84.8	93.1	0.788	

41.64	65.00	6029.17	11882.34	435.74	28.479	22.32325	38.1	36.186	0.034	0.72177	87.3	93.3	0.722
41.64	70.00	6034.13	11881.66	435.74	26.166	20.38201	37.9	33.168	0.027	0.65914	87.7	93.4	0.659
41.64	75.00	6039.08	11880.99	435.74	24.066	18.62222	37.7	30.430	0.052	0.59896	85.0	93.5	0.601
41.64	80.00	6044.04	11880.31	435.74	22.166	17.03484	37.5	27.956	0.079	0.54253	81.8	93.4	0.548
41.64	85.00	6048.99	11879.63	435.74	20.451	15.60741	37.3	25.726	0.102	0.49050	78.3	93.3	0.501
41.64	90.00	6053.94	11878.95	435.74	18.903	14.32596	37.2	23.718	0.120	0.44309	74.8	93.2	0.459
41.64	95.00	6058.90	11878.28	435.74	17.507	13.17626	37.0	21.911	0.136	0.40026	71.3	93.0	0.422
41.64	100.00	6063.85	11877.60	435.74	16.247	12.14454	36.8	20.285	0.148	0.36177	67.8	92.9	0.390
41.64	105.00	6068.80	11876.92	435.74	15.109	11.21795	36.6	18.818	0.157	0.32730	64.4	92.7	0.363
41.64	110.00	6073.76	11876.24	435.74	14.080	10.38475	36.4	17.495	0.163	0.29652	61.2	92.6	0.338
41.64	115.00	6078.71	11875.57	435.74	13.147	9.63437	36.2	16.299	0.168	0.26904	58.1	92.4	0.317
41.64	120.00	6083.67	11874.89	435.74	12.301	8.95736	36.1	15.216	0.170	0.24453	55.1	92.3	0.298
41.64	125.00	6088.62	11874.21	435.74	11.531	8.34539	35.9	14.234	0.172	0.22266	52.4	92.2	0.281
41.64	130.00	6093.57	11873.53	435.74	10.830	7.79109	35.7	13.341	0.172	0.20312	49.7	92.1	0.266
41.64	135.00	6098.53	11872.86	435.74	10.190	7.28798	35.6	12.528	0.171	0.18565	47.3	92.0	0.253
41.64	140.00	6103.48	11872.18	435.74	9.605	6.83038	35.4	11.786	0.170	0.17002	45.0	91.9	0.240
41.64	145.00	6108.44	11871.50	435.74	9.069	6.41330	35.3	11.107	0.168	0.15599	42.9	91.8	0.229
41.64	150.00	6113.39	11870.82	435.74	8.577	6.03237	35.1	10.486	0.165	0.14339	40.9	91.8	0.219
41.64	155.00	6118.34	11870.15	435.74	8.124	5.68374	35.0	9.915	0.163	0.13206	39.1	91.7	0.209
41.64	160.00	6123.30	11869.47	435.74	7.707	5.36403	34.8	9.390	0.160	0.12184	37.4	91.7	0.201
41.64	165.00	6128.25	11868.79	435.74	7.322	5.07027	34.7	8.906	0.156	0.11261	35.8	91.6	0.193
41.64	170.00	6133.20	11868.11	435.74	6.966	4.79984	34.6	8.459	0.153	0.10426	34.3	91.6	0.185
41.64	175.00	6138.16	11867.44	435.74	6.636	4.55043	34.4	8.046	0.150	0.09669	32.9	91.5	0.178
41.64	180.00	6143.11	11866.76	435.74	6.330	4.31998	34.3	7.663	0.146	0.08982	31.6	91.5	0.171
41.64	185.00	6148.07	11866.08	435.74	6.045	4.10668	34.2	7.308	0.142	0.08356	30.4	91.5	0.165
41.64	190.00	6153.02	11865.40	435.74	5.781	3.90894	34.1	6.978	0.139	0.07786	29.3	91.4	0.159
41.64	195.00	6157.97	11864.72	435.74	5.534	3.72530	33.9	6.671	0.136	0.07265	28.2	91.4	0.154
41.64	200.00	6162.93	11864.05	435.74	5.304	3.55450	33.8	6.384	0.132	0.06789	27.2	91.4	0.148

Midspan of Structure 1 & 2

PLS-CADD Version 10.40 3:59:07 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10 \345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
Assumed 90 MPH Extreme Wind Loading (Rule 250C)
Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
Assumed Maximum Operating Temperature of 212 F
Assumed 1" Extreme Ice (Non-NESC)
Assumed Grade B Construction
<<Illustration of NESC provisions include>>
> Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
> Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
> 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
> Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
> Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
> 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
> Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
**** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
**** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
> Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
**** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
**** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
**** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE,
the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL
values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of
Composite Line Post Insulators for further clarification. ****
**** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
**** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
**** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
**** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
> Structure Loads criteria includes typical Full Structure DE cases
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RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28	(ft)
Cross section offset for graph +/-:	200.00	(ft)
Result interval for graph:	5.00	(ft)
Electric field limit:	1.60	(kV/m)
Magnetic field limit:	200.00	(mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	1	1	345	1180.000	0	1.762
2	2	1	345	1180.000	120	1.762
2	3	1	345	1180.000	-120	1.762

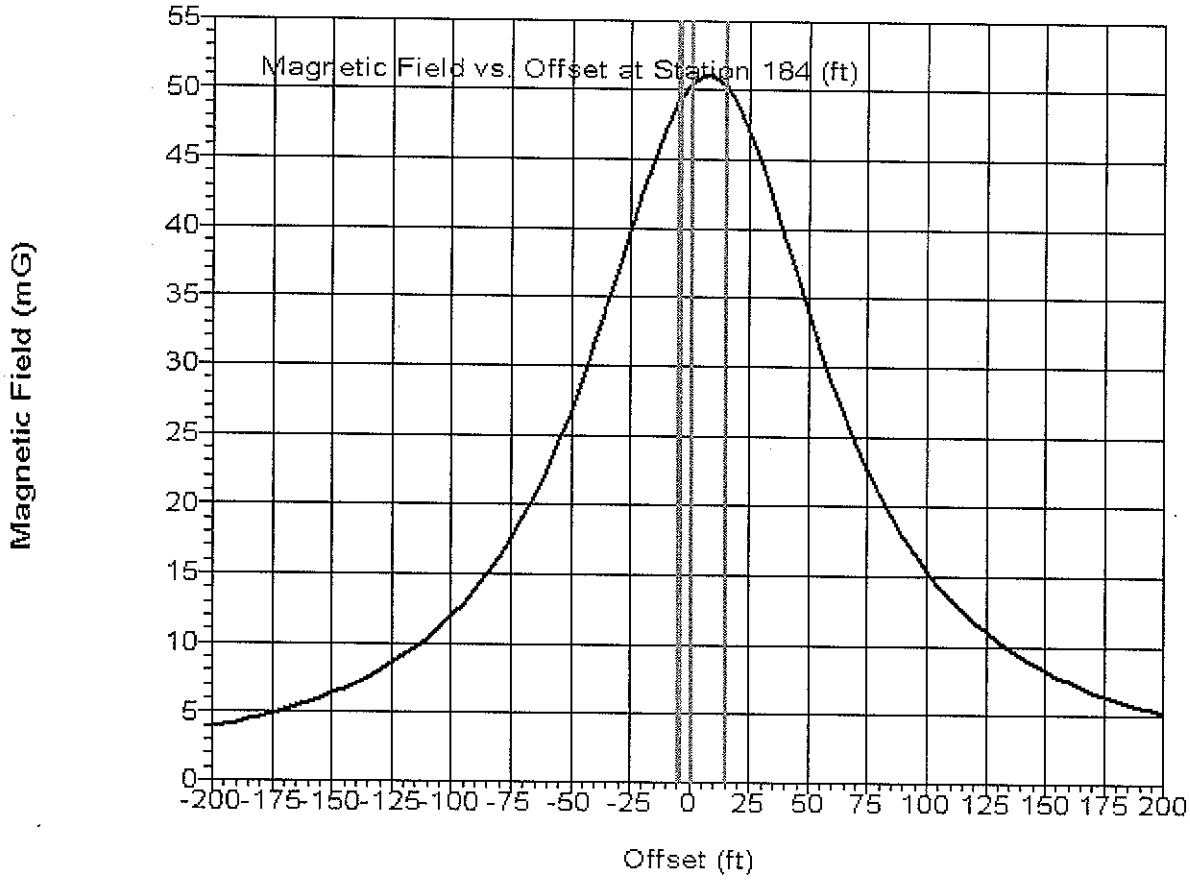
Calculated EMF Circuit Data For Last Point:

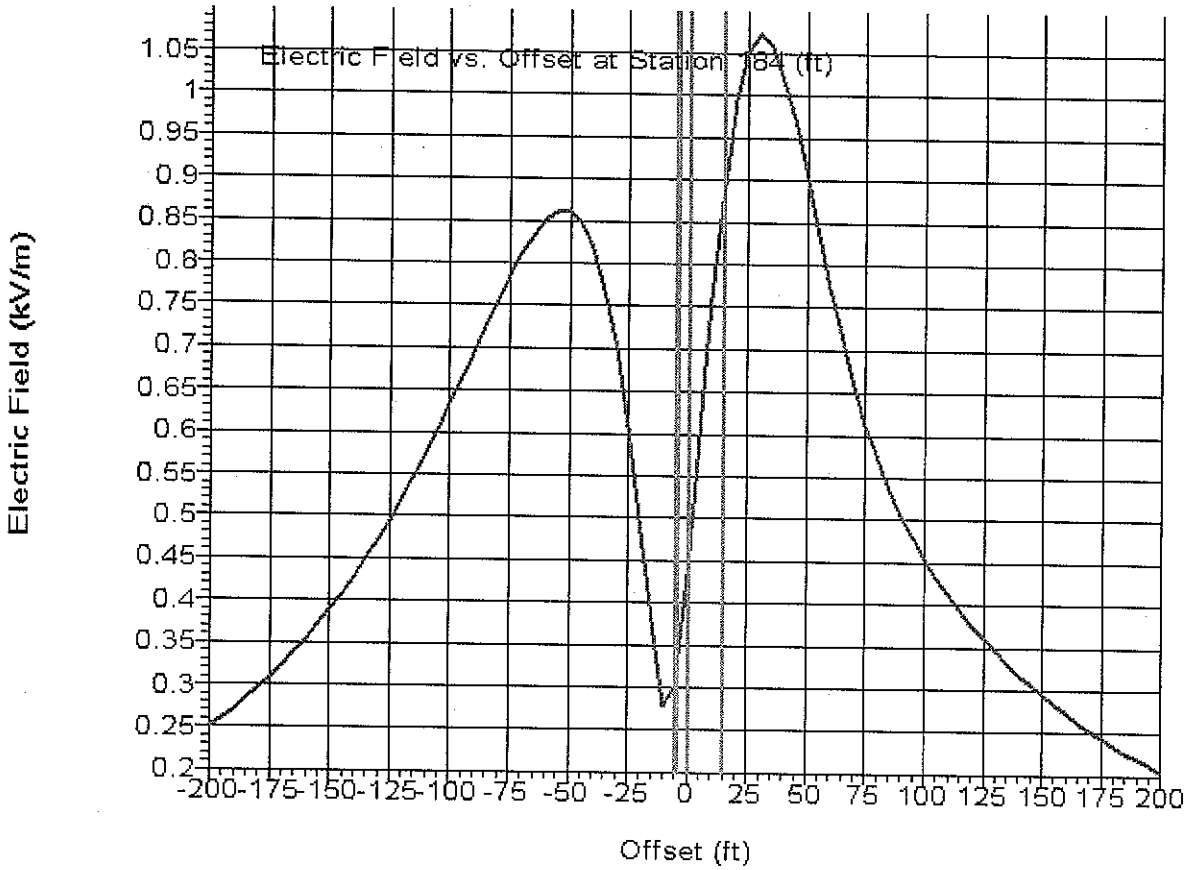
**Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.**

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1	NESC Heavy (250B)	Creep RS	Left	5985.31	12032.29	523.92	184.26	1.22	0.509	199.2
2	1	NESC Heavy (250B)	Creep RS	Left	5979.48	12033.46	502.39	184.63	-4.71	1.762	199.2
2	2	NESC Heavy (250B)	Creep RS	Left	5980.38	12032.87	496.64	184.17	-3.75	1.762	199.2
2	3	NESC Heavy (250B)	Creep RS	Left	5999.26	12030.84	490.89	184.71	15.24	1.762	199.2

Maximum magnetic field of 51.01 (mG) found at station 184.26, offset 5.00 (ft)
Maximum electric field of 1.072 (kV/m) found at station 184.26, offset 30.00 (ft)





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
184.26	-200.00	5785.95	12059.56	434.00	2.425	3.06061	51.6	3.905	0.246	0.04347	10.0	88.4	0.250
184.26	-195.00	5790.90	12058.88	434.00	2.531	3.19674	51.6	4.077	0.257	0.04597	10.2	88.4	0.261
184.26	-190.00	5795.85	12058.20	434.00	2.645	3.34235	51.6	4.262	0.267	0.04866	10.3	88.3	0.272
184.26	-185.00	5800.81	12057.53	434.00	2.767	3.49830	51.7	4.460	0.279	0.05157	10.5	88.3	0.284
184.26	-180.00	5805.76	12056.85	434.00	2.898	3.66558	51.7	4.673	0.291	0.05472	10.7	88.3	0.296
184.26	-175.00	5810.72	12056.17	434.00	3.040	3.84526	51.7	4.902	0.304	0.05813	10.8	88.3	0.309

184.26	-170.00	5815.67	12055.49	434.00	3.192	4.03856	51.7	5.148	0.317	0.06182	11.0	88.2	0.323
184.26	-165.00	5820.62	12054.82	434.00	3.357	4.24682	51.7	5.413	0.332	0.06583	11.2	88.2	0.338
184.26	-160.00	5825.58	12054.14	434.00	3.534	4.47157	51.7	5.700	0.347	0.07019	11.4	88.2	0.354
184.26	-155.00	5830.53	12053.46	434.00	3.727	4.71449	51.7	6.010	0.363	0.07492	11.7	88.2	0.371
184.26	-150.00	5835.49	12052.78	434.00	3.936	4.97751	51.7	6.346	0.380	0.08009	11.9	88.1	0.389
184.26	-145.00	5840.44	12052.10	434.00	4.163	5.26278	51.7	6.710	0.398	0.08571	12.1	88.1	0.407
184.26	-140.00	5845.39	12051.43	434.00	4.410	5.57273	51.6	7.107	0.417	0.09185	12.4	88.1	0.427
184.26	-135.00	5850.35	12050.75	434.00	4.679	5.91009	51.6	7.538	0.438	0.09855	12.7	88.1	0.449
184.26	-130.00	5855.30	12050.07	434.00	4.973	6.27795	51.6	8.009	0.459	0.10588	13.0	88.1	0.471
184.26	-125.00	5860.25	12049.39	434.00	5.295	6.67983	51.6	8.524	0.482	0.11388	13.3	88.0	0.495
184.26	-120.00	5865.21	12048.72	434.00	5.647	7.11966	51.6	9.087	0.505	0.12264	13.6	88.0	0.520
184.26	-115.00	5870.16	12048.04	434.00	6.034	7.60193	51.6	9.705	0.530	0.13220	14.0	88.0	0.546
184.26	-110.00	5875.12	12047.36	434.00	6.458	8.13168	51.5	10.384	0.556	0.14264	14.4	88.0	0.574
184.26	-105.00	5880.07	12046.68	434.00	6.926	8.71463	51.5	11.131	0.583	0.15402	14.8	88.1	0.603
184.26	-100.00	5885.02	12046.01	434.00	7.440	9.35717	51.5	11.955	0.610	0.16639	15.3	88.1	0.632
184.26	-95.00	5889.98	12045.33	434.00	8.008	10.06650	51.5	12.863	0.638	0.17979	15.7	88.1	0.663
184.26	-90.00	5894.93	12044.65	434.00	8.634	10.85060	51.5	13.867	0.666	0.19423	16.3	88.2	0.694
184.26	-85.00	5899.89	12043.97	434.00	9.325	11.71830	51.5	14.976	0.694	0.20968	16.8	88.2	0.725
184.26	-80.00	5904.84	12043.30	434.00	10.088	12.67923	51.5	16.203	0.721	0.22603	17.4	88.4	0.756
184.26	-75.00	5909.79	12042.62	434.00	10.930	13.74366	51.5	17.560	0.746	0.24309	18.0	88.5	0.785
184.26	-70.00	5914.75	12041.94	434.00	11.857	14.92233	51.5	19.060	0.768	0.26050	18.7	88.7	0.811
184.26	-65.00	5919.70	12041.26	434.00	12.876	16.22594	51.6	20.714	0.787	0.27773	19.4	88.9	0.834
184.26	-60.00	5924.65	12040.59	434.00	13.992	17.66453	51.6	22.535	0.799	0.29394	20.2	89.2	0.851
184.26	-55.00	5929.61	12039.91	434.00	15.209	19.24636	51.7	24.530	0.804	0.30797	21.0	89.6	0.861
184.26	-50.00	5934.56	12039.23	434.00	16.525	20.97641	51.8	26.704	0.800	0.31815	21.7	90.0	0.860
184.26	-45.00	5939.52	12038.55	434.00	17.938	22.85428	51.9	29.053	0.783	0.32231	22.4	90.7	0.847
184.26	-40.00	5944.47	12037.87	434.00	19.437	24.87148	52.0	31.566	0.753	0.31764	22.9	91.5	0.818
184.26	-35.00	5949.42	12037.20	434.00	21.003	27.00818	52.1	34.214	0.708	0.30081	23.0	92.6	0.769
184.26	-30.00	5954.38	12036.52	434.00	22.609	29.22968	52.3	36.954	0.647	0.26820	22.5	94.0	0.700
184.26	-25.00	5959.33	12035.84	434.00	24.218	31.48333	52.4	39.721	0.569	0.21674	20.8	96.1	0.609
184.26	-20.00	5964.29	12035.16	434.00	25.782	33.69665	52.6	42.428	0.477	0.14663	17.1	98.8	0.498
184.26	-15.00	5969.24	12034.49	434.00	27.242	35.77809	52.7	44.969	0.375	0.08232	12.4	101.7	0.377
184.26	-10.00	5974.19	12033.81	434.00	28.537	37.62150	52.8	47.220	0.267	0.13756	27.3	97.8	0.279
184.26	-5.00	5979.15	12033.13	434.00	29.600	39.11517	52.9	49.053	0.162	0.27454	59.4	77.3	0.299
184.26	0.00	5984.10	12032.45	434.00	30.372	40.15484	52.9	50.347	0.076	0.43383	80.0	75.7	0.435
184.26	5.00	5989.06	12031.78	434.00	30.803	40.65893	52.9	51.010	0.069	0.59723	83.4	79.1	0.600
184.26	10.00	5994.01	12031.10	434.00	30.864	40.58268	52.7	50.986	0.119	0.75037	81.0	82.3	0.759
184.26	15.00	5998.96	12030.42	434.00	30.548	39.92713	52.6	50.273	0.157	0.88060	79.9	84.8	0.894
184.26	20.00	6003.92	12029.74	434.00	29.875	38.74016	52.4	48.922	0.172	0.97853	80.0	86.8	0.994
184.26	25.00	6008.87	12029.07	434.00	28.892	37.10852	52.1	47.030	0.164	1.03941	81.0	88.4	1.052
184.26	30.00	6013.82	12028.39	434.00	27.660	35.14324	51.8	44.723	0.137	1.06334	82.7	89.7	1.072
184.26	35.00	6018.78	12027.71	434.00	26.251	32.96261	51.5	42.139	0.096	1.05439	84.8	90.8	1.058
184.26	40.00	6023.73	12027.03	434.00	24.736	30.67722	51.1	39.408	0.051	1.01910	87.1	91.6	1.020
184.26	45.00	6028.69	12026.36	434.00	23.179	28.37996	50.8	36.643	0.039	0.96488	87.7	92.2	0.965
184.26	50.00	6033.64	12025.68	434.00	21.630	26.14163	50.4	33.930	0.082	0.89877	84.8	92.6	0.902
184.26	55.00	6038.59	12025.00	434.00	20.127	24.01104	50.0	31.331	0.130	0.82668	81.0	92.8	0.836
184.26	60.00	6043.55	12024.32	434.00	18.696	22.01798	49.7	28.885	0.175	0.75315	76.9	92.9	0.772

184.26	65.00	6048.50	12023.64	434.00	17.353	20.17726	49.3	26.613	0.214	0.68138	72.5	92.9	0.713
184.26	70.00	6053.46	12022.97	434.00	16.104	18.49282	48.9	24.522	0.247	0.61342	68.1	92.8	0.660
184.26	75.00	6058.41	12022.29	434.00	14.954	16.96133	48.6	22.612	0.273	0.55042	63.7	92.6	0.614
184.26	80.00	6063.36	12021.61	434.00	13.898	15.57490	48.3	20.874	0.292	0.49290	59.3	92.5	0.573
184.26	85.00	6068.32	12020.93	434.00	12.932	14.32317	47.9	19.298	0.307	0.44096	55.2	92.3	0.537
184.26	90.00	6073.27	12020.26	434.00	12.052	13.19470	47.6	17.870	0.317	0.39441	51.2	92.2	0.506
184.26	95.00	6078.22	12019.58	434.00	11.249	12.17786	47.3	16.579	0.323	0.35292	47.5	92.1	0.478
184.26	100.00	6083.18	12018.90	434.00	10.519	11.26142	47.0	15.410	0.326	0.31606	44.1	92.0	0.454
184.26	105.00	6088.13	12018.22	434.00	9.853	10.43486	46.6	14.352	0.326	0.28339	41.0	91.9	0.432
184.26	110.00	6093.09	12017.55	434.00	9.247	9.68853	46.3	13.393	0.324	0.25446	38.2	91.8	0.412
184.26	115.00	6098.04	12016.87	434.00	8.693	9.01368	46.0	12.523	0.320	0.22885	35.6	91.8	0.393
184.26	120.00	6102.99	12016.19	434.00	8.188	8.40248	45.7	11.732	0.315	0.20617	33.2	91.7	0.376
184.26	125.00	6107.95	12015.51	434.00	7.725	7.84796	45.5	11.012	0.309	0.18608	31.1	91.7	0.361
184.26	130.00	6112.90	12014.84	434.00	7.301	7.34392	45.2	10.356	0.302	0.16826	29.1	91.6	0.346
184.26	135.00	6117.86	12014.16	434.00	6.913	6.88491	44.9	9.756	0.295	0.15242	27.3	91.6	0.332
184.26	140.00	6122.81	12013.48	434.00	6.555	6.46609	44.6	9.208	0.287	0.13834	25.7	91.6	0.319
184.26	145.00	6127.76	12012.80	434.00	6.227	6.08321	44.3	8.705	0.280	0.12579	24.2	91.6	0.307
184.26	150.00	6132.72	12012.13	434.00	5.923	5.73250	44.1	8.243	0.272	0.11459	22.9	91.6	0.295
184.26	155.00	6137.67	12011.45	434.00	5.643	5.41067	43.8	7.818	0.264	0.10458	21.6	91.5	0.284
184.26	160.00	6142.63	12010.77	434.00	5.384	5.11477	43.5	7.426	0.256	0.09561	20.5	91.5	0.273
184.26	165.00	6147.58	12010.09	434.00	5.143	4.84223	43.3	7.064	0.248	0.08756	19.4	91.5	0.263
184.26	170.00	6152.53	12009.41	434.00	4.920	4.59074	43.0	6.729	0.240	0.08032	18.5	91.5	0.254
184.26	175.00	6157.49	12008.74	434.00	4.713	4.35829	42.8	6.419	0.233	0.07380	17.6	91.5	0.244
184.26	180.00	6162.44	12008.06	434.00	4.520	4.14307	42.5	6.131	0.226	0.06792	16.7	91.5	0.236
184.26	185.00	6167.39	12007.38	434.00	4.340	3.94347	42.3	5.864	0.219	0.06260	16.0	91.4	0.227
184.26	190.00	6172.35	12006.70	434.00	4.172	3.75807	42.0	5.615	0.212	0.05779	15.3	91.4	0.220
184.26	195.00	6177.30	12006.03	434.00	4.014	3.58558	41.8	5.382	0.205	0.05342	14.6	91.4	0.212
184.26	200.00	6182.26	12005.35	434.00	3.867	3.42488	41.5	5.165	0.199	0.04945	14.0	91.4	0.205

Structure 2a

PLS-CADD Version 10.40 4:00:28 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10 \345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
Assumed 90 MPH Extreme Wind Loading (Rule 250C)
Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
Assumed Maximum Operating Temperature of 212 F
Assumed 1" Extreme Ice (Non-NESC)
Assumed Grade B Construction
<<Illustration of NESC provisions include>>
> Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
> Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
> 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
> Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
> Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
> 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
> Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
**** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
**** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
> Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
**** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
**** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
**** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE, the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of Composite Line Post Insulators for further clarification. ****
**** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
**** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
**** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
**** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
> Structure Loads criteria includes typical Full Structure DE cases
POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
THIS FILE IS PROVIDED FOR ILLUSTRATION ONLY. CRITERIA SHOULD BE CHECKED AND MODIFIED AS NECESSARY BY AN ENGINEER IN RESPONSIBLE CHARGE,
FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
RESPONSIBLE ENGINEER SHOULD VERIFY MAXIMUM OPERATING CONDITION FOR THEIR APPLICABLE PROJECT
RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28	(ft)
Cross section offset for graph +/-:	200.00	(ft)
Result interval for graph:	5.00	(ft)
Electric field limit:	1.60	(kV/m)
Magnetic field limit:	200.00	(mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	1	1	345	1180.000	0	1.762
2	2	1	345	1180.000	120	1.762
2	3	1	345	1180.000	-120	1.762

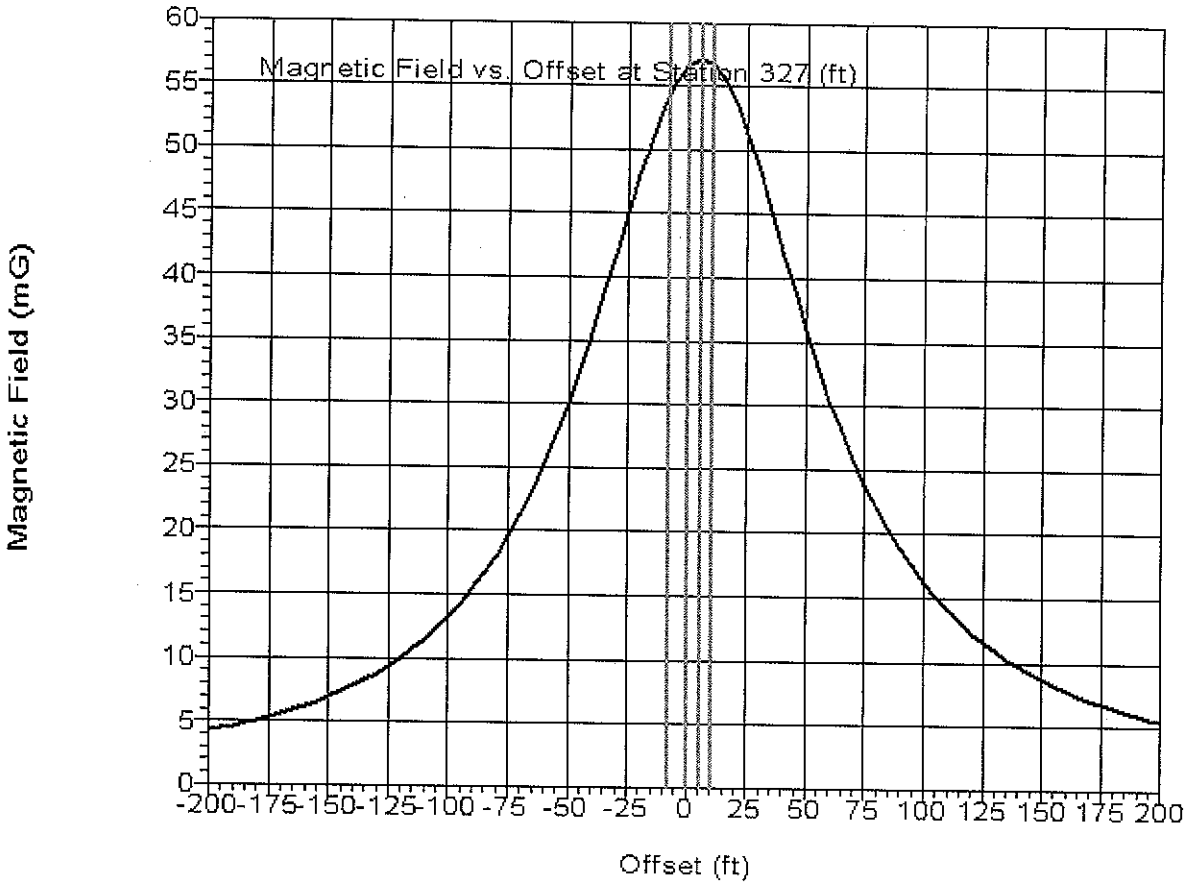
Calculated EMF Circuit Data For Last Point:

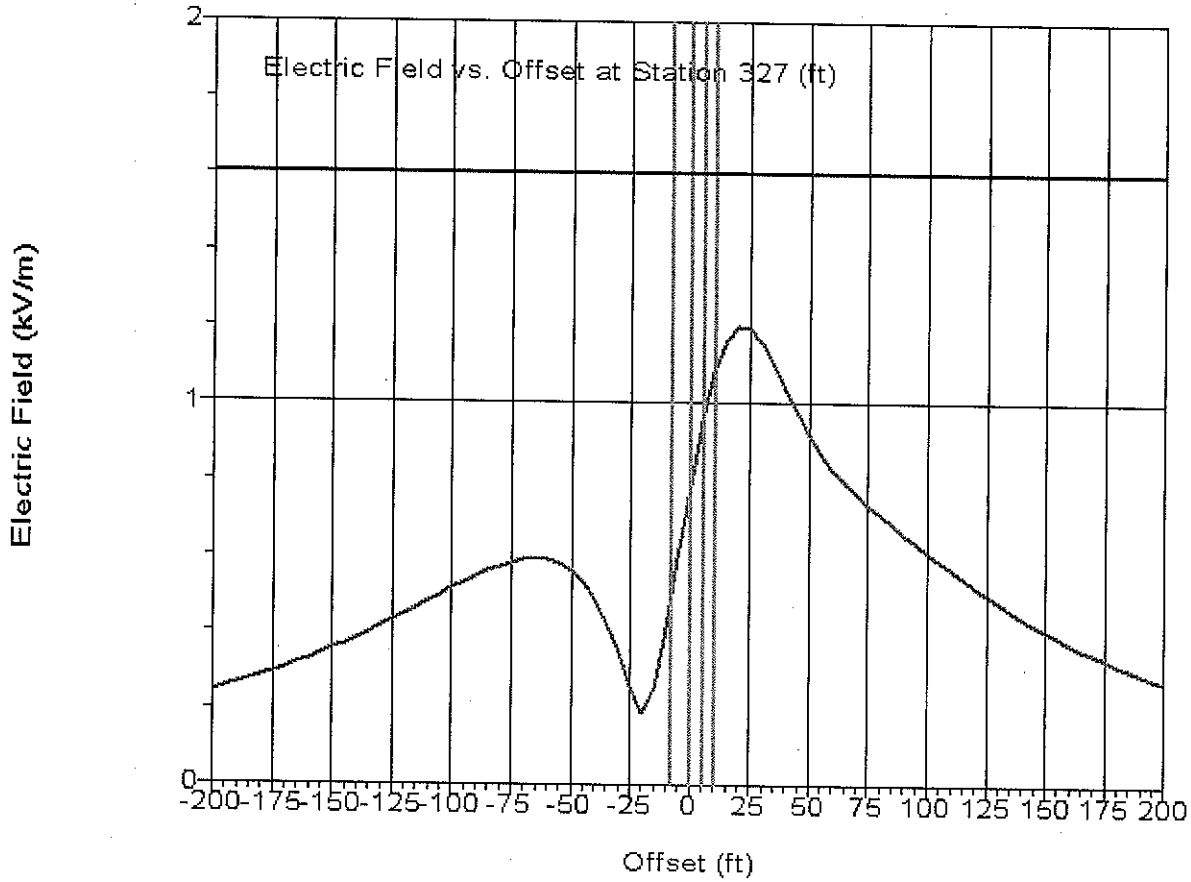
**Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.**

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1	NESC Heavy (250B)	Creep RS	Left	6003.92	12173.69	537.46	326.88	0.49	0.509	199.2
2	1	NESC Heavy (250B)	Creep RS	Left	6009.30	12172.48	513.86	326.41	5.99	1.762	199.2
2	2	NESC Heavy (250B)	Creep RS	Left	5995.80	12174.61	503.72	326.69	-7.68	1.762	199.2
2	3	NESC Heavy (250B)	Creep RS	Left	6013.91	12172.64	493.53	327.19	10.54	1.762	199.2

Maximum magnetic field of 57.16 (mG) found at station 326.88, offset 5.00 (ft)
Maximum electric field of 1.200 (kV/m) found at station 326.88, offset 20.00 (ft)





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
326.88	-200.00	5805.27	12200.86	441.36	2.578	3.35055	52.4	4.227	0.234	0.06460	15.4	88.6	0.243
326.88	-195.00	5810.23	12200.18	441.36	2.692	3.50398	52.5	4.419	0.243	0.06835	15.7	88.6	0.252
326.88	-190.00	5815.18	12199.51	441.36	2.815	3.66836	52.5	4.624	0.251	0.07240	16.1	88.6	0.261
326.88	-185.00	5820.14	12198.83	441.36	2.946	3.84472	52.5	4.844	0.260	0.07679	16.4	88.5	0.271
326.88	-180.00	5825.09	12198.15	441.36	3.087	4.03424	52.6	5.080	0.270	0.08154	16.8	88.5	0.282
326.88	-175.00	5830.04	12197.47	441.36	3.239	4.23819	52.6	5.334	0.279	0.08670	17.2	88.5	0.292

326.88	-170.00	5835.00	12196.79	441.36	3.402	4.45803	52.7	5.608	0.289	0.09230	17.7	88.5	0.304
326.88	-165.00	5839.95	12196.12	441.36	3.578	4.69538	52.7	5.903	0.300	0.09839	18.2	88.5	0.316
326.88	-160.00	5844.91	12195.44	441.36	3.768	4.95207	52.7	6.223	0.311	0.10502	18.7	88.5	0.328
326.88	-155.00	5849.86	12194.76	441.36	3.973	5.23016	52.8	6.568	0.322	0.11225	19.2	88.5	0.341
326.88	-150.00	5854.81	12194.08	441.36	4.195	5.53197	52.8	6.943	0.333	0.12014	19.8	88.5	0.354
326.88	-145.00	5859.77	12193.41	441.36	4.436	5.86013	52.9	7.350	0.345	0.12876	20.5	88.5	0.368
326.88	-140.00	5864.72	12192.73	441.36	4.697	6.21761	52.9	7.792	0.357	0.13819	21.2	88.5	0.383
326.88	-135.00	5869.67	12192.05	441.36	4.981	6.60779	53.0	8.275	0.369	0.14850	21.9	88.5	0.398
326.88	-130.00	5874.63	12191.37	441.36	5.291	7.03447	53.1	8.802	0.382	0.15979	22.7	88.5	0.414
326.88	-125.00	5879.58	12190.70	441.36	5.628	7.50202	53.1	9.379	0.394	0.17216	23.6	88.5	0.430
326.88	-120.00	5884.54	12190.02	441.36	5.997	8.01536	53.2	10.010	0.406	0.18569	24.6	88.5	0.446
326.88	-115.00	5889.49	12189.34	441.36	6.400	8.58010	53.3	10.704	0.417	0.20050	25.7	88.5	0.463
326.88	-110.00	5894.44	12188.66	441.36	6.841	9.20261	53.4	11.467	0.428	0.21667	26.8	88.6	0.480
326.88	-105.00	5899.40	12187.99	441.36	7.325	9.89011	53.5	12.307	0.438	0.23429	28.1	88.6	0.497
326.88	-100.00	5904.35	12187.31	441.36	7.856	10.65075	53.6	13.235	0.446	0.25343	29.6	88.7	0.513
326.88	-95.00	5909.31	12186.63	441.36	8.439	11.49374	53.7	14.259	0.453	0.27411	31.2	88.8	0.529
326.88	-90.00	5914.26	12185.95	441.36	9.079	12.42935	53.9	15.392	0.457	0.29631	32.9	88.9	0.545
326.88	-85.00	5919.21	12185.28	441.36	9.783	13.46899	54.0	16.647	0.459	0.31990	34.9	89.0	0.559
326.88	-80.00	5924.17	12184.60	441.36	10.557	14.62513	54.2	18.037	0.456	0.34464	37.1	89.2	0.571
326.88	-75.00	5929.12	12183.92	441.36	11.406	15.91117	54.4	19.577	0.449	0.37008	39.5	89.4	0.581
326.88	-70.00	5934.08	12183.24	441.36	12.336	17.34106	54.6	21.281	0.436	0.39551	42.2	89.6	0.588
326.88	-65.00	5939.03	12182.56	441.36	13.354	18.92874	54.8	23.165	0.416	0.41985	45.3	269.9	0.591
326.88	-60.00	5943.98	12181.89	441.36	14.464	20.68712	55.0	25.242	0.389	0.44153	48.6	270.3	0.588
326.88	-55.00	5948.94	12181.21	441.36	15.669	22.62655	55.3	27.522	0.353	0.45838	52.4	270.9	0.578
326.88	-50.00	5953.89	12180.53	441.36	16.969	24.75262	55.6	30.011	0.307	0.46751	56.7	271.6	0.559
326.88	-45.00	5958.84	12179.85	441.36	18.362	27.06312	55.8	32.704	0.253	0.46523	61.5	272.6	0.528
326.88	-40.00	5963.80	12179.18	441.36	19.839	29.54413	56.1	35.587	0.189	0.44710	67.1	274.1	0.484
326.88	-35.00	5968.75	12178.50	441.36	21.389	32.16535	56.4	38.628	0.119	0.40829	73.8	276.4	0.423
326.88	-30.00	5973.71	12177.82	441.36	22.992	34.87520	56.6	41.772	0.059	0.34434	80.2	279.9	0.346
326.88	-25.00	5978.66	12177.14	441.36	24.621	37.59657	56.8	44.941	0.084	0.25339	71.7	284.6	0.257
326.88	-20.00	5983.61	12176.47	441.36	26.241	40.22485	56.9	48.027	0.160	0.14693	42.6	276.7	0.187
326.88	-15.00	5988.57	12175.79	441.36	27.806	42.62998	56.9	50.897	0.238	0.13134	28.9	249.4	0.254
326.88	-10.00	5993.52	12175.11	441.36	29.261	44.66460	56.8	53.396	0.307	0.28339	42.7	253.2	0.411
326.88	-5.00	5998.48	12174.43	441.36	30.540	46.17925	56.5	55.364	0.359	0.48045	53.2	77.8	0.597
326.88	0.00	6003.43	12173.76	441.36	31.571	47.04374	56.1	56.655	0.387	0.68302	60.4	81.2	0.783
326.88	5.00	6008.38	12173.08	441.36	32.280	47.17089	55.6	57.159	0.387	0.86928	66.0	84.0	0.950
326.88	10.00	6013.34	12172.40	441.36	32.609	46.53625	55.0	56.824	0.356	1.02154	70.8	86.2	1.080
326.88	15.00	6018.29	12171.72	441.36	32.522	45.18632	54.3	55.673	0.295	1.12762	75.3	88.0	1.164
326.88	20.00	6023.24	12171.05	441.36	32.021	43.23109	53.5	53.798	0.212	1.18267	79.8	89.5	1.200
326.88	25.00	6028.20	12170.37	441.36	31.144	40.82275	52.7	51.346	0.120	1.18912	84.2	90.7	1.193
326.88	30.00	6033.15	12169.69	441.36	29.957	38.12783	51.8	48.489	0.077	1.15493	86.2	91.6	1.155
326.88	35.00	6038.11	12169.01	441.36	28.542	35.30207	51.0	45.397	0.151	1.09083	82.1	92.1	1.099
326.88	40.00	6043.06	12168.33	441.36	26.982	32.47390	50.3	42.221	0.248	1.00781	76.2	92.3	1.035
326.88	45.00	6048.01	12167.66	441.36	25.351	29.73795	49.6	39.077	0.338	0.91539	69.7	92.3	0.973
326.88	50.00	6052.97	12166.98	441.36	23.711	27.15619	48.9	36.051	0.415	0.82088	63.2	92.1	0.917
326.88	55.00	6057.92	12166.30	441.36	22.107	24.76341	48.2	33.196	0.477	0.72931	56.8	91.9	0.869
326.88	60.00	6062.88	12165.62	441.36	20.570	22.57404	47.7	30.540	0.525	0.64373	50.8	91.7	0.829

326.88	65.00	6067.83	12164.95	441.36	19.119	20.58854	47.1	28.097	0.559	0.56575	45.3	91.6	0.794
326.88	70.00	6072.78	12164.27	441.36	17.765	18.79860	46.6	25.865	0.582	0.49591	40.4	91.5	0.764
326.88	75.00	6077.74	12163.59	441.36	16.511	17.19094	46.2	23.836	0.595	0.43412	36.1	91.4	0.736
326.88	80.00	6082.69	12162.91	441.36	15.357	15.74994	45.7	21.997	0.600	0.37991	32.3	91.4	0.710
326.88	85.00	6087.65	12162.24	441.36	14.298	14.45940	45.3	20.335	0.599	0.33260	29.1	91.4	0.684
326.88	90.00	6092.60	12161.56	441.36	13.329	13.30349	44.9	18.832	0.592	0.29146	26.2	91.4	0.660
326.88	95.00	6097.55	12160.88	441.36	12.444	12.26737	44.6	17.474	0.582	0.25575	23.7	91.5	0.636
326.88	100.00	6102.51	12160.20	441.36	11.636	11.33747	44.3	16.246	0.569	0.22477	21.6	91.5	0.612
326.88	105.00	6107.46	12159.53	441.36	10.898	10.50157	43.9	15.135	0.554	0.19790	19.7	91.5	0.588
326.88	110.00	6112.41	12158.85	441.36	10.225	9.74880	43.6	14.128	0.538	0.17457	18.0	91.6	0.565
326.88	115.00	6117.37	12158.17	441.36	9.610	9.06954	43.3	13.214	0.520	0.15429	16.5	91.6	0.543
326.88	120.00	6122.32	12157.49	441.36	9.047	8.45533	43.1	12.383	0.503	0.13663	15.2	91.6	0.521
326.88	125.00	6127.28	12156.82	441.36	8.531	7.89875	42.8	11.626	0.485	0.12123	14.0	91.6	0.500
326.88	130.00	6132.23	12156.14	441.36	8.058	7.39329	42.5	10.936	0.467	0.10778	13.0	91.6	0.479
326.88	135.00	6137.18	12155.46	441.36	7.624	6.93328	42.3	10.305	0.450	0.09599	12.1	91.6	0.460
326.88	140.00	6142.14	12154.78	441.36	7.225	6.51373	42.0	9.727	0.433	0.08565	11.2	91.6	0.441
326.88	145.00	6147.09	12154.11	441.36	6.857	6.13027	41.8	9.198	0.416	0.07656	10.4	91.6	0.423
326.88	150.00	6152.05	12153.43	441.36	6.517	5.77907	41.6	8.710	0.400	0.06854	9.7	91.6	0.406
326.88	155.00	6157.00	12152.75	441.36	6.204	5.45677	41.3	8.262	0.384	0.06146	9.1	91.6	0.389
326.88	160.00	6161.95	12152.07	441.36	5.913	5.16041	41.1	7.848	0.369	0.05519	8.5	91.6	0.374
326.88	165.00	6166.91	12151.39	441.36	5.644	4.88739	40.9	7.466	0.355	0.04964	8.0	91.6	0.359
326.88	170.00	6171.86	12150.72	441.36	5.394	4.63540	40.7	7.112	0.342	0.04470	7.5	91.6	0.344
326.88	175.00	6176.81	12150.04	441.36	5.162	4.40241	40.5	6.784	0.328	0.04030	7.0	91.6	0.331
326.88	180.00	6181.77	12149.36	441.36	4.945	4.18661	40.3	6.479	0.316	0.03637	6.6	91.5	0.318
326.88	185.00	6186.72	12148.68	441.36	4.743	3.98640	40.0	6.196	0.304	0.03286	6.2	91.5	0.306
326.88	190.00	6191.68	12148.01	441.36	4.555	3.80035	39.8	5.932	0.293	0.02972	5.8	91.5	0.294
326.88	195.00	6196.63	12147.33	441.36	4.379	3.62719	39.6	5.686	0.282	0.02690	5.4	91.5	0.283
326.88	200.00	6201.58	12146.65	441.36	4.213	3.46579	39.4	5.456	0.272	0.02437	5.1	91.5	0.273

Structure 26

PLS-CADD Version 10.40 4:01:45 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10 \345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
Assumed 90 MPH Extreme Wind Loading (Rule 250C)
Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
Assumed Maximum Operating Temperature of 212 F
Assumed 1" Extreme Ice (Non-NESC)
Assumed Grade B Construction
<<Illustration of NESC provisions include>>
> Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
> Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
> 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
> Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
> Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
> 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
> Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
**** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
**** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
> Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
**** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
**** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
**** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE, the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of Composite Line Post Insulators for further clarification. ****
**** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
**** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
**** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
**** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
> Structure Loads criteria includes typical Full Structure DE cases
POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
THIS FILE IS PROVIDED FOR ILLUSTRATION ONLY. CRITERIA SHOULD BE CHECKED AND MODIFIED AS NECESSARY BY AN ENGINEER IN RESPONSIBLE CHARGE,
FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
RESPONSIBLE ENGINEER SHOULD VERIFY MAXIMUM OPERATING CONDITION FOR THEIR APPLICABLE PROJECT
RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28 (ft)
Cross section offset for graph +/-:	200.00 (ft)
Result interval for graph:	5.00 (ft)
Electric field limit:	1.60 (kV/m)
Magnetic field limit:	200.00 (mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	1	1	345	1180.000	0	1.762
2	2	1	345	1180.000	120	1.762
2	3	1	345	1180.000	-120	1.762

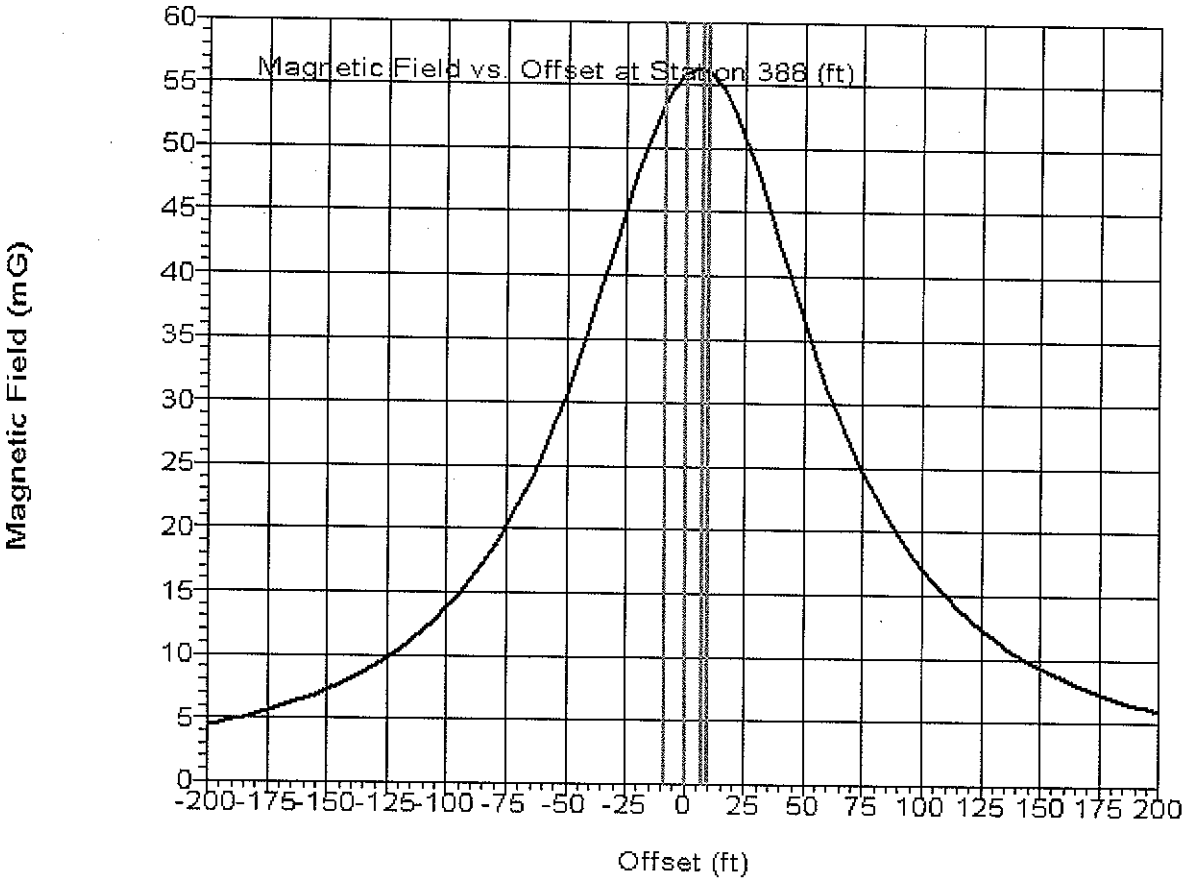
Calculated EMF Circuit Data For Last Point:

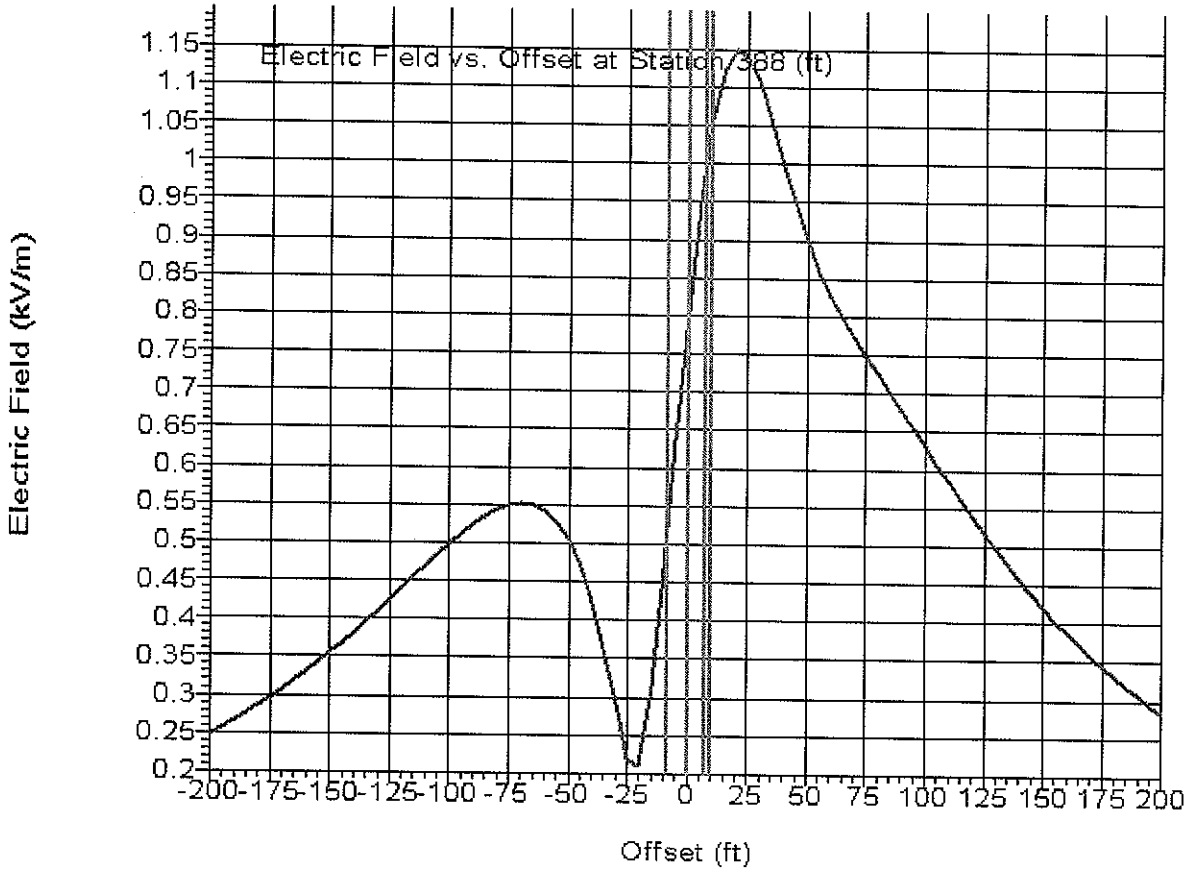
Wire coordinates are printed for the location on the wire closest to the alignment. In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1	NESC Heavy (250B)	Creep RS	Left	6011.43	12234.51	540.75	388.16	0.22	0.509	199.2
2	1	NESC Heavy (250B)	Creep RS	Left	6018.55	12234.39	516.98	388.81	7.30	1.762	199.2
2	2	NESC Heavy (250B)	Creep RS	Left	6002.98	12235.67	506.22	388.39	-8.31	1.762	199.2
2	3	NESC Heavy (250B)	Creep RS	Left	6020.92	12233.13	495.42	387.82	9.79	1.762	199.2

Maximum magnetic field of 56.37 (mG) found at station 388.16, offset 5.00 (ft)
Maximum electric field of 1.151 (kV/m) found at station 388.16, offset 20.00 (ft)





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
388.16	-200.00	5812.42	12256.39	442.00	2.819	3.44262	50.7	4.449	0.239	0.06737	15.8	88.6	0.248
388.16	-195.00	5817.39	12255.85	442.00	2.944	3.59841	50.7	4.649	0.247	0.07124	16.1	88.6	0.257
388.16	-190.00	5822.36	12255.30	442.00	3.078	3.76529	50.7	4.863	0.255	0.07542	16.5	88.6	0.266
388.16	-185.00	5827.33	12254.76	442.00	3.221	3.94428	50.8	5.092	0.264	0.07994	16.9	88.6	0.275
388.16	-180.00	5832.30	12254.21	442.00	3.375	4.13657	50.8	5.339	0.273	0.08483	17.3	88.6	0.285
388.16	-175.00	5837.27	12253.66	442.00	3.540	4.34344	50.8	5.604	0.282	0.09013	17.7	88.6	0.296

388.16	-170.00	5842.24	12253.12	442.00	3.718	4.56635	50.8	5.889	0.291	0.09587	18.2	88.5	0.307
388.16	-165.00	5847.21	12252.57	442.00	3.910	4.80693	50.9	6.196	0.301	0.10211	18.7	88.5	0.318
388.16	-160.00	5852.18	12252.02	442.00	4.117	5.06701	50.9	6.529	0.312	0.10889	19.3	88.5	0.330
388.16	-155.00	5857.15	12251.48	442.00	4.340	5.34864	50.9	6.888	0.322	0.11626	19.9	88.5	0.342
388.16	-150.00	5862.12	12250.93	442.00	4.582	5.65414	51.0	7.278	0.333	0.12430	20.5	88.5	0.355
388.16	-145.00	5867.09	12250.38	442.00	4.844	5.98612	51.0	7.701	0.343	0.13305	21.2	88.5	0.368
388.16	-140.00	5872.06	12249.84	442.00	5.128	6.34755	51.1	8.160	0.354	0.14260	21.9	88.5	0.382
388.16	-135.00	5877.03	12249.29	442.00	5.437	6.74175	51.1	8.661	0.365	0.15302	22.7	88.6	0.396
388.16	-130.00	5882.00	12248.74	442.00	5.773	7.17250	51.2	9.207	0.376	0.16438	23.6	88.6	0.410
388.16	-125.00	5886.97	12248.20	442.00	6.139	7.64407	51.2	9.804	0.386	0.17678	24.6	88.6	0.425
388.16	-120.00	5891.94	12247.65	442.00	6.538	8.16131	51.3	10.457	0.397	0.19029	25.6	88.6	0.440
388.16	-115.00	5896.91	12247.10	442.00	6.974	8.72969	51.4	11.173	0.406	0.20499	26.8	88.7	0.455
388.16	-110.00	5901.88	12246.56	442.00	7.450	9.35540	51.5	11.960	0.414	0.22096	28.1	88.7	0.470
388.16	-105.00	5906.85	12246.01	442.00	7.972	10.04542	51.6	12.824	0.422	0.23826	29.5	88.8	0.484
388.16	-100.00	5911.82	12245.46	442.00	8.543	10.80757	51.7	13.777	0.427	0.25690	31.0	88.8	0.498
388.16	-95.00	5916.79	12244.92	442.00	9.170	11.65061	51.8	14.826	0.431	0.27687	32.7	88.9	0.512
388.16	-90.00	5921.76	12244.37	442.00	9.857	12.58424	51.9	15.985	0.431	0.29808	34.6	89.1	0.524
388.16	-85.00	5926.73	12243.83	442.00	10.610	13.61909	52.1	17.264	0.429	0.32034	36.8	89.2	0.535
388.16	-80.00	5931.70	12243.28	442.00	11.435	14.76662	52.2	18.677	0.422	0.34330	39.1	89.4	0.544
388.16	-75.00	5936.67	12242.73	442.00	12.339	16.03891	52.4	20.236	0.410	0.36642	41.8	89.6	0.550
388.16	-70.00	5941.64	12242.19	442.00	13.327	17.44822	52.6	21.955	0.393	0.38889	44.7	89.9	0.552
388.16	-65.00	5946.61	12241.64	442.00	14.404	19.00634	52.8	23.848	0.368	0.40950	48.0	270.2	0.550
388.16	-60.00	5951.58	12241.09	442.00	15.575	20.72354	53.1	25.924	0.336	0.42659	51.7	270.7	0.543
388.16	-55.00	5956.55	12240.55	442.00	16.841	22.60699	53.3	28.190	0.296	0.43793	55.9	271.3	0.528
388.16	-50.00	5961.52	12240.00	442.00	18.203	24.65862	53.6	30.649	0.248	0.44062	60.7	272.1	0.505
388.16	-45.00	5966.49	12239.45	442.00	19.656	26.87223	53.8	33.294	0.190	0.43111	66.2	273.3	0.470
388.16	-40.00	5971.46	12238.91	442.00	21.193	29.22998	54.1	36.104	0.127	0.40531	72.6	274.9	0.423
388.16	-35.00	5976.43	12238.36	442.00	22.799	31.69832	54.3	39.046	0.065	0.35903	79.7	277.4	0.362
388.16	-30.00	5981.40	12237.81	442.00	24.454	34.22405	54.5	42.063	0.064	0.28896	77.4	280.6	0.290
388.16	-25.00	5986.37	12237.27	442.00	26.129	36.73128	54.6	45.077	0.132	0.19599	56.0	281.1	0.220
388.16	-20.00	5991.34	12236.72	442.00	27.789	39.12066	54.6	47.986	0.208	0.10810	27.4	260.2	0.210
388.16	-15.00	5996.31	12236.17	442.00	29.386	41.27254	54.5	50.665	0.280	0.16479	30.5	253.0	0.313
388.16	-10.00	6001.28	12235.63	442.00	30.866	43.05530	54.4	52.976	0.339	0.32867	44.1	256.3	0.467
388.16	-5.00	6006.25	12235.08	442.00	32.161	44.33956	54.0	54.775	0.379	0.51631	53.7	79.7	0.637
388.16	0.00	6011.22	12234.53	442.00	33.202	45.01691	53.6	55.937	0.394	0.70297	60.7	82.5	0.804
388.16	5.00	6016.19	12233.99	442.00	33.920	45.01968	53.0	56.368	0.381	0.87060	66.4	84.8	0.949
388.16	10.00	6021.16	12233.44	442.00	34.259	44.33622	52.3	56.030	0.339	1.00439	71.4	86.8	1.058
388.16	15.00	6026.13	12232.90	442.00	34.188	43.01578	51.5	54.947	0.270	1.09465	76.1	88.4	1.126
388.16	20.00	6031.10	12232.35	442.00	33.710	41.16051	50.7	53.203	0.182	1.13817	80.9	89.8	1.151
388.16	25.00	6036.07	12231.80	442.00	32.862	38.90650	49.8	50.928	0.095	1.13797	85.3	90.8	1.140
388.16	30.00	6041.04	12231.26	442.00	31.705	36.40033	48.9	48.272	0.094	1.10157	85.1	91.5	1.103
388.16	35.00	6046.01	12230.71	442.00	30.316	33.77841	48.1	45.387	0.185	1.03874	79.9	91.9	1.052
388.16	40.00	6050.98	12230.16	442.00	28.772	31.15345	47.3	42.407	0.284	0.95927	73.5	92.0	0.997
388.16	45.00	6055.95	12229.62	442.00	27.146	28.60918	46.5	39.438	0.373	0.87163	66.8	92.0	0.945
388.16	50.00	6060.92	12229.07	442.00	25.497	26.20130	45.8	36.560	0.448	0.78233	60.2	91.8	0.899
388.16	55.00	6065.89	12228.52	442.00	23.871	23.96189	45.1	33.823	0.509	0.69585	53.8	91.6	0.860
388.16	60.00	6070.86	12227.98	442.00	22.301	21.90517	44.5	31.260	0.556	0.61497	47.9	91.4	0.827

388.16	65.00	6075.83	12227.43	442.00	20.808	20.03283	43.9	28.884	0.589	0.54113	42.6	91.3	0.799
388.16	70.00	6080.80	12226.88	442.00	19.405	18.33855	43.4	26.699	0.611	0.47488	37.9	91.3	0.773
388.16	75.00	6085.77	12226.34	442.00	18.097	16.81129	42.9	24.700	0.623	0.41613	33.7	91.3	0.748
388.16	80.00	6090.74	12225.79	442.00	16.884	15.43764	42.4	22.878	0.627	0.36447	30.2	91.3	0.725
388.16	85.00	6095.71	12225.24	442.00	15.766	14.20341	42.0	21.220	0.625	0.31929	27.1	91.3	0.701
388.16	90.00	6100.68	12224.70	442.00	14.738	13.09459	41.6	19.715	0.617	0.27994	24.4	91.4	0.678
388.16	95.00	6105.65	12224.15	442.00	13.794	12.09787	41.3	18.347	0.606	0.24571	22.1	91.4	0.654
388.16	100.00	6110.62	12223.60	442.00	12.928	11.20098	40.9	17.105	0.593	0.21598	20.0	91.5	0.631
388.16	105.00	6115.59	12223.06	442.00	12.134	10.39279	40.6	15.977	0.577	0.19016	18.2	91.5	0.607
388.16	110.00	6120.56	12222.51	442.00	11.407	9.66333	40.3	14.950	0.560	0.16771	16.7	91.5	0.584
388.16	115.00	6125.53	12221.97	442.00	10.740	9.00372	40.0	14.015	0.542	0.14818	15.3	91.6	0.561
388.16	120.00	6130.50	12221.42	442.00	10.128	8.40612	39.7	13.162	0.523	0.13116	14.1	91.6	0.539
388.16	125.00	6135.47	12220.87	442.00	9.566	7.86362	39.4	12.383	0.504	0.11631	13.0	91.6	0.518
388.16	130.00	6140.44	12220.33	442.00	9.049	7.37013	39.2	11.671	0.486	0.10333	12.0	91.6	0.497
388.16	135.00	6145.41	12219.78	442.00	8.573	6.92030	38.9	11.018	0.468	0.09195	11.1	91.6	0.477
388.16	140.00	6150.38	12219.23	442.00	8.134	6.50943	38.7	10.418	0.450	0.08197	10.3	91.6	0.457
388.16	145.00	6155.35	12218.69	442.00	7.729	6.13340	38.4	9.867	0.433	0.07319	9.6	91.6	0.439
388.16	150.00	6160.32	12218.14	442.00	7.355	5.78857	38.2	9.359	0.416	0.06545	8.9	91.6	0.421
388.16	155.00	6165.29	12217.59	442.00	7.008	5.47174	38.0	8.891	0.400	0.05862	8.3	91.6	0.404
388.16	160.00	6170.26	12217.05	442.00	6.686	5.18009	37.8	8.458	0.384	0.05257	7.8	91.6	0.388
388.16	165.00	6175.23	12216.50	442.00	6.388	4.91111	37.6	8.057	0.369	0.04720	7.3	91.6	0.372
388.16	170.00	6180.20	12215.95	442.00	6.110	4.66261	37.3	7.686	0.355	0.04244	6.8	91.6	0.358
388.16	175.00	6185.17	12215.41	442.00	5.852	4.43264	37.1	7.341	0.342	0.03820	6.4	91.6	0.344
388.16	180.00	6190.14	12214.86	442.00	5.611	4.21944	36.9	7.020	0.329	0.03442	6.0	91.5	0.330
388.16	185.00	6195.11	12214.31	442.00	5.386	4.02147	36.7	6.721	0.316	0.03104	5.6	91.5	0.318
388.16	190.00	6200.08	12213.77	442.00	5.175	3.83737	36.6	6.443	0.304	0.02801	5.3	91.5	0.306
388.16	195.00	6205.05	12213.22	442.00	4.978	3.66589	36.4	6.182	0.293	0.02530	4.9	91.5	0.294
388.16	200.00	6210.02	12212.67	442.00	4.793	3.50594	36.2	5.939	0.282	0.02286	4.6	91.5	0.283

Midspan of Structure 2 & 3

PLS-CADD Version 10.40 4:02:28 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10 \345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
Assumed 90 MPH Extreme Wind Loading (Rule 250C)
Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
Assumed Maximum Operating Temperature of 212 F
Assumed 1" Extreme Ice (Non-NESC)
Assumed Grade B Construction
<<Illustration of NESC provisions include>>
> Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
> Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
> 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
> Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
> Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
> 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
> Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
**** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
**** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
> Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
**** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
**** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
**** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE, the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of Composite Line Post Insulators for further clarification. ****
**** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
**** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
**** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
**** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
> Structure Loads criteria includes typical Full Structure DE cases
POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
THIS FILE IS PROVIDED FOR ILLUSTRATION ONLY. CRITERIA SHOULD BE CHECKED AND MODIFIED AS NECESSARY BY AN ENGINEER IN RESPONSIBLE CHARGE,
FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
RESPONSIBLE ENGINEER SHOULD VERIFY MAXIMUM OPERATING CONDITION FOR THEIR APPLICABLE PROJECT
RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28 (ft)
Cross section offset for graph +/-:	200.00 (ft)
Result interval for graph:	5.00 (ft)
Electric field limit:	1.60 (kV/m)
Magnetic field limit:	200.00 (mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	1	1	345	1180.000	0	1.762
2	2	1	345	1180.000	120	1.762
2	3	1	345	1180.000	-120	1.762

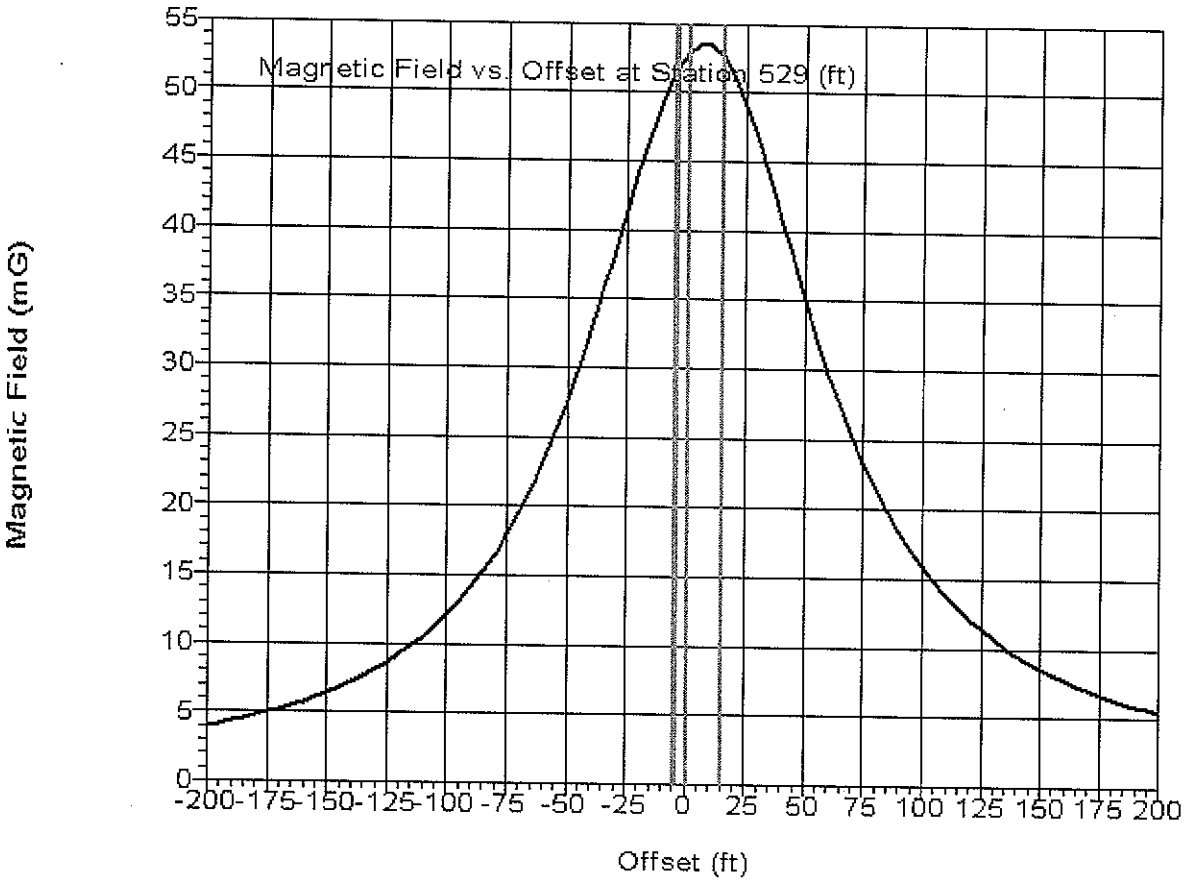
Calculated EMF Circuit Data For Last Point:

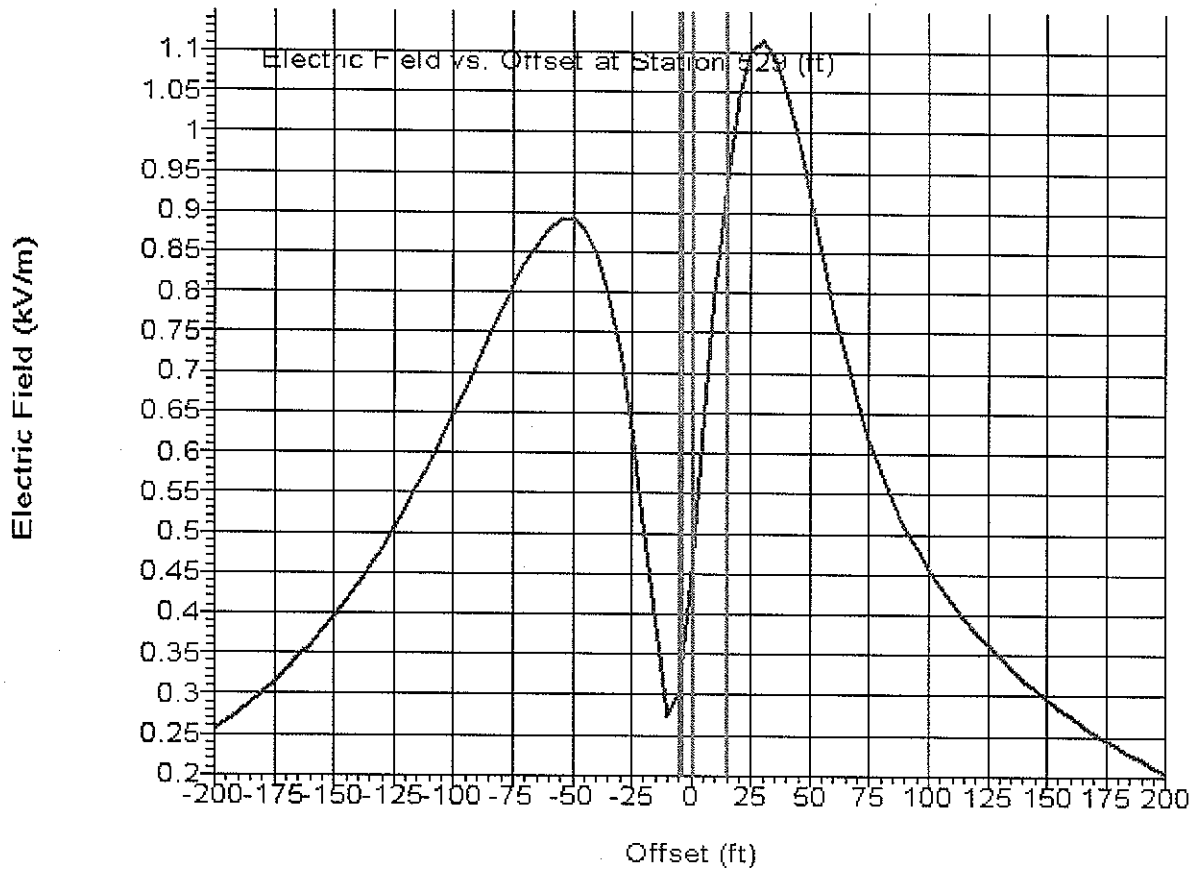
Wire coordinates are printed for the location on the wire closest to the alignment. In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1 NESC Heavy (250B)	Creep RS	Left	6027.60	12374.92	533.49	529.50	0.94	0.509	199.2
2	1 NESC Heavy (250B)	Creep RS	Left	6021.77	12375.12	512.08	529.06	-4.88	1.762	199.2
2	2 NESC Heavy (250B)	Creep RS	Left	6022.78	12375.56	506.34	529.60	-3.92	1.762	199.2
2	3 NESC Heavy (250B)	Creep RS	Left	6041.59	12372.87	500.56	528.98	15.06	1.762	199.2

Maximum magnetic field of 53.45 (mG) found at station 529.50, offset 5.00 (ft)
Maximum electric field of 1.115 (kV/m) found at station 529.50, offset 30.00 (ft)





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
529.50	-200.00	5827.87	12396.89	445.00	2.438	3.12472	52.0	3.963	0.251	0.04456	10.1	88.4	0.255
529.50	-195.00	5832.84	12396.34	445.00	2.543	3.26253	52.1	4.137	0.262	0.04715	10.2	88.4	0.266
529.50	-190.00	5837.81	12395.79	445.00	2.656	3.40998	52.1	4.322	0.273	0.04995	10.4	88.3	0.277
529.50	-185.00	5842.78	12395.25	445.00	2.777	3.56797	52.1	4.521	0.284	0.05297	10.6	88.3	0.289
529.50	-180.00	5847.75	12394.70	445.00	2.907	3.73750	52.1	4.735	0.296	0.05624	10.7	88.3	0.302
529.50	-175.00	5852.72	12394.15	445.00	3.047	3.91969	52.1	4.965	0.309	0.05979	10.9	88.3	0.315

529.50	-170.00	5857.69	12393.61	445.00	3.199	4.11576	52.1	5.213	0.323	0.06364	11.1	88.2	0.329
529.50	-165.00	5862.66	12393.06	445.00	3.362	4.32713	52.2	5.480	0.338	0.06782	11.3	88.2	0.345
529.50	-160.00	5867.63	12392.51	445.00	3.540	4.55536	52.2	5.769	0.353	0.07237	11.6	88.2	0.361
529.50	-155.00	5872.60	12391.97	445.00	3.732	4.80219	52.1	6.082	0.370	0.07733	11.8	88.1	0.378
529.50	-150.00	5877.57	12391.42	445.00	3.941	5.06962	52.1	6.421	0.387	0.08273	12.1	88.1	0.396
529.50	-145.00	5882.54	12390.87	445.00	4.168	5.35988	52.1	6.790	0.406	0.08863	12.3	88.1	0.415
529.50	-140.00	5887.51	12390.33	445.00	4.416	5.67548	52.1	7.191	0.425	0.09508	12.6	88.1	0.436
529.50	-135.00	5892.48	12389.78	445.00	4.687	6.01928	52.1	7.629	0.446	0.10213	12.9	88.1	0.457
529.50	-130.00	5897.45	12389.24	445.00	4.983	6.39451	52.1	8.107	0.468	0.10985	13.2	88.0	0.481
529.50	-125.00	5902.42	12388.69	445.00	5.308	6.80482	52.0	8.630	0.491	0.11830	13.5	88.0	0.505
529.50	-120.00	5907.39	12388.14	445.00	5.664	7.25436	52.0	9.204	0.515	0.12755	13.9	88.0	0.531
529.50	-115.00	5912.36	12387.60	445.00	6.056	7.74783	52.0	9.834	0.541	0.13769	14.3	88.0	0.558
529.50	-110.00	5917.33	12387.05	445.00	6.488	8.29057	52.0	10.527	0.567	0.14878	14.7	88.0	0.586
529.50	-105.00	5922.30	12386.50	445.00	6.964	8.88861	51.9	11.292	0.595	0.16089	15.1	88.0	0.616
529.50	-100.00	5927.27	12385.96	445.00	7.489	9.54875	51.9	12.135	0.623	0.17410	15.6	88.0	0.647
529.50	-95.00	5932.24	12385.41	445.00	8.070	10.27867	51.9	13.068	0.652	0.18845	16.1	88.1	0.679
529.50	-90.00	5937.21	12384.86	445.00	8.713	11.08695	51.8	14.101	0.681	0.20397	16.7	88.1	0.711
529.50	-85.00	5942.18	12384.32	445.00	9.425	11.98309	51.8	15.246	0.710	0.22063	17.3	88.2	0.744
529.50	-80.00	5947.15	12383.77	445.00	10.213	12.97755	51.8	16.514	0.739	0.23834	17.9	88.3	0.776
529.50	-75.00	5952.12	12383.22	445.00	11.085	14.08158	51.8	17.921	0.765	0.25692	18.6	88.4	0.807
529.50	-70.00	5957.09	12382.68	445.00	12.049	15.30704	51.8	19.481	0.789	0.27600	19.3	88.6	0.835
529.50	-65.00	5962.06	12382.13	445.00	13.113	16.66594	51.8	21.206	0.808	0.29505	20.1	88.8	0.860
529.50	-60.00	5967.03	12381.58	445.00	14.281	18.16971	51.8	23.110	0.822	0.31320	20.9	89.1	0.879
529.50	-55.00	5972.00	12381.04	445.00	15.559	19.82810	51.9	25.204	0.828	0.32922	21.7	89.5	0.891
529.50	-50.00	5976.97	12380.49	445.00	16.949	21.64752	51.9	27.493	0.824	0.34135	22.5	90.0	0.892
529.50	-45.00	5981.94	12379.94	445.00	18.445	23.62875	52.0	29.976	0.807	0.34726	23.3	90.6	0.879
529.50	-40.00	5986.91	12379.40	445.00	20.039	25.76386	52.1	32.640	0.777	0.34393	23.9	91.4	0.849
529.50	-35.00	5991.88	12378.85	445.00	21.712	28.03261	52.2	35.457	0.730	0.32770	24.2	92.5	0.800
529.50	-30.00	5996.85	12378.31	445.00	23.434	30.39834	52.4	38.383	0.665	0.29458	23.9	94.0	0.727
529.50	-25.00	6001.82	12377.76	445.00	25.166	32.80428	52.5	41.346	0.583	0.24102	22.4	96.2	0.631
529.50	-20.00	6006.79	12377.21	445.00	26.856	35.17128	52.6	44.252	0.487	0.16655	18.9	99.1	0.513
529.50	-15.00	6011.76	12376.67	445.00	28.441	37.39843	52.7	46.984	0.378	0.09205	13.7	102.7	0.383
529.50	-10.00	6016.73	12376.12	445.00	29.852	39.36808	52.8	49.406	0.264	0.13744	27.5	99.2	0.274
529.50	-5.00	6021.70	12375.57	445.00	31.017	40.95605	52.9	51.375	0.155	0.28159	61.2	75.3	0.300
529.50	0.00	6026.67	12375.03	445.00	31.869	42.04675	52.8	52.759	0.072	0.45143	80.9	74.9	0.452
529.50	5.00	6031.64	12374.48	445.00	32.353	42.55069	52.8	53.454	0.084	0.62552	82.3	78.9	0.630
529.50	10.00	6036.61	12373.93	445.00	32.436	42.42063	52.6	53.401	0.139	0.78778	80.0	82.2	0.800
529.50	15.00	6041.58	12373.39	445.00	32.111	41.66166	52.4	52.600	0.176	0.92428	79.2	84.8	0.941
529.50	20.00	6046.55	12372.84	445.00	31.400	40.33162	52.1	51.114	0.189	1.02498	79.6	86.9	1.042
529.50	25.00	6051.52	12372.29	445.00	30.354	38.53106	51.8	49.051	0.177	1.08514	80.7	88.5	1.099
529.50	30.00	6056.49	12371.75	445.00	29.043	36.38584	51.4	46.556	0.145	1.10543	82.5	89.9	1.115
529.50	35.00	6061.46	12371.20	445.00	27.546	34.02735	51.0	43.779	0.099	1.09090	84.8	91.0	1.095
529.50	40.00	6066.43	12370.65	445.00	25.939	31.57595	50.6	40.864	0.051	1.04906	87.2	91.8	1.050
529.50	45.00	6071.40	12370.11	445.00	24.292	29.13043	50.2	37.930	0.044	0.98816	87.5	92.3	0.988
529.50	50.00	6076.37	12369.56	445.00	22.659	26.76407	49.7	35.068	0.090	0.91582	84.4	92.7	0.919
529.50	55.00	6081.34	12369.01	445.00	21.079	24.52571	49.3	32.340	0.142	0.83831	80.4	92.9	0.849
529.50	60.00	6086.31	12368.47	445.00	19.579	22.44359	48.9	29.784	0.188	0.76027	76.1	93.0	0.782

529.50	65.00	6091.28	12367.92	445.00	18.175	20.53025	48.5	27.419	0.228	0.68491	71.6	92.9	0.721
529.50	70.00	6096.25	12367.38	445.00	16.873	18.78712	48.1	25.252	0.260	0.61417	67.1	92.8	0.666
529.50	75.00	6101.22	12366.83	445.00	15.674	17.20844	47.7	23.277	0.286	0.54910	62.5	92.7	0.618
529.50	80.00	6106.19	12366.28	445.00	14.576	15.78420	47.3	21.485	0.305	0.49009	58.1	92.5	0.577
529.50	85.00	6111.16	12365.74	445.00	13.574	14.50221	46.9	19.864	0.319	0.43712	53.9	92.4	0.541
529.50	90.00	6116.13	12365.19	445.00	12.660	13.34950	46.5	18.398	0.328	0.38989	49.9	92.2	0.509
529.50	95.00	6121.10	12364.64	445.00	11.829	12.31323	46.1	17.074	0.333	0.34798	46.3	92.1	0.481
529.50	100.00	6126.07	12364.10	445.00	11.072	11.38116	45.8	15.878	0.335	0.31091	42.9	92.0	0.457
529.50	105.00	6131.04	12363.55	445.00	10.383	10.54201	45.4	14.796	0.334	0.27817	39.8	91.9	0.435
529.50	110.00	6136.01	12363.00	445.00	9.755	9.78549	45.1	13.817	0.331	0.24928	37.0	91.8	0.414
529.50	115.00	6140.98	12362.46	445.00	9.182	9.10237	44.8	12.929	0.327	0.22378	34.4	91.8	0.396
529.50	120.00	6145.95	12361.91	445.00	8.658	8.48444	44.4	12.122	0.321	0.20127	32.1	91.7	0.379
529.50	125.00	6150.92	12361.36	445.00	8.179	7.92441	44.1	11.389	0.315	0.18137	30.0	91.7	0.363
529.50	130.00	6155.89	12360.82	445.00	7.741	7.41585	43.8	10.720	0.307	0.16377	28.1	91.7	0.348
529.50	135.00	6160.86	12360.27	445.00	7.338	6.95311	43.5	10.109	0.299	0.14816	26.3	91.6	0.334
529.50	140.00	6165.83	12359.72	445.00	6.968	6.53120	43.1	9.550	0.291	0.13431	24.7	91.6	0.321
529.50	145.00	6170.80	12359.18	445.00	6.627	6.14575	42.8	9.038	0.283	0.12199	23.3	91.6	0.308
529.50	150.00	6175.77	12358.63	445.00	6.312	5.79290	42.5	8.567	0.275	0.11102	22.0	91.6	0.296
529.50	155.00	6180.74	12358.08	445.00	6.021	5.46927	42.2	8.134	0.267	0.10122	20.8	91.6	0.285
529.50	160.00	6185.71	12357.54	445.00	5.752	5.17185	42.0	7.735	0.258	0.09246	19.7	91.6	0.274
529.50	165.00	6190.68	12356.99	445.00	5.502	4.89803	41.7	7.367	0.250	0.08460	18.7	91.5	0.264
529.50	170.00	6195.65	12356.45	445.00	5.271	4.64545	41.4	7.026	0.242	0.07755	17.7	91.5	0.254
529.50	175.00	6200.62	12355.90	445.00	5.055	4.41206	41.1	6.709	0.235	0.07121	16.9	91.5	0.245
529.50	180.00	6205.59	12355.35	445.00	4.854	4.19603	40.8	6.416	0.227	0.06550	16.1	91.5	0.236
529.50	185.00	6210.56	12354.81	445.00	4.666	3.99574	40.6	6.143	0.220	0.06033	15.3	91.5	0.228
529.50	190.00	6215.53	12354.26	445.00	4.491	3.80973	40.3	5.889	0.213	0.05567	14.6	91.4	0.220
529.50	195.00	6220.50	12353.71	445.00	4.326	3.63672	40.0	5.652	0.206	0.05143	14.0	91.4	0.212
529.50	200.00	6225.47	12353.17	445.00	4.172	3.47555	39.8	5.430	0.200	0.04759	13.4	91.4	0.205

Structure 3

PLS-CADD Version 10.40 4:03:20 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10 \345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
Assumed 90 MPH Extreme Wind Loading (Rule 250C)
Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
Assumed Maximum Operating Temperature of 212 F
Assumed 1" Extreme Ice (Non-NESC)
Assumed Grade B Construction
<<Illustration of NESC provisions include>>
> Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
> Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
> 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
> Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
> Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
> 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
> Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
**** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
**** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
> Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
**** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
**** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
**** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE,
the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL
values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of
Composite Line Post Insulators for further clarification. ****
**** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
**** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
**** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
**** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
> Structure Loads criteria includes typical Full Structure DE cases
POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
THIS FILE IS PROVIDED FOR ILLUSTRATION ONLY. CRITERIA SHOULD BE CHECKED AND MODIFIED AS NECESSARY BY AN ENGINEER IN RESPONSIBLE CHARGE,
FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
RESPONSIBLE ENGINEER SHOULD VERIFY MAXIMUM OPERATING CONDITION FOR THEIR APPLICABLE PROJECT
RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28 (ft)
Cross section offset for graph +/-:	200.00 (ft)
Result interval for graph:	5.00 (ft)
Electric field limit:	1.60 (kV/m)
Magnetic field limit:	200.00 (mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	1	1	345	1180.000	0	1.762
2	2	1	345	1180.000	120	1.762
2	3	1	345	1180.000	-120	1.762

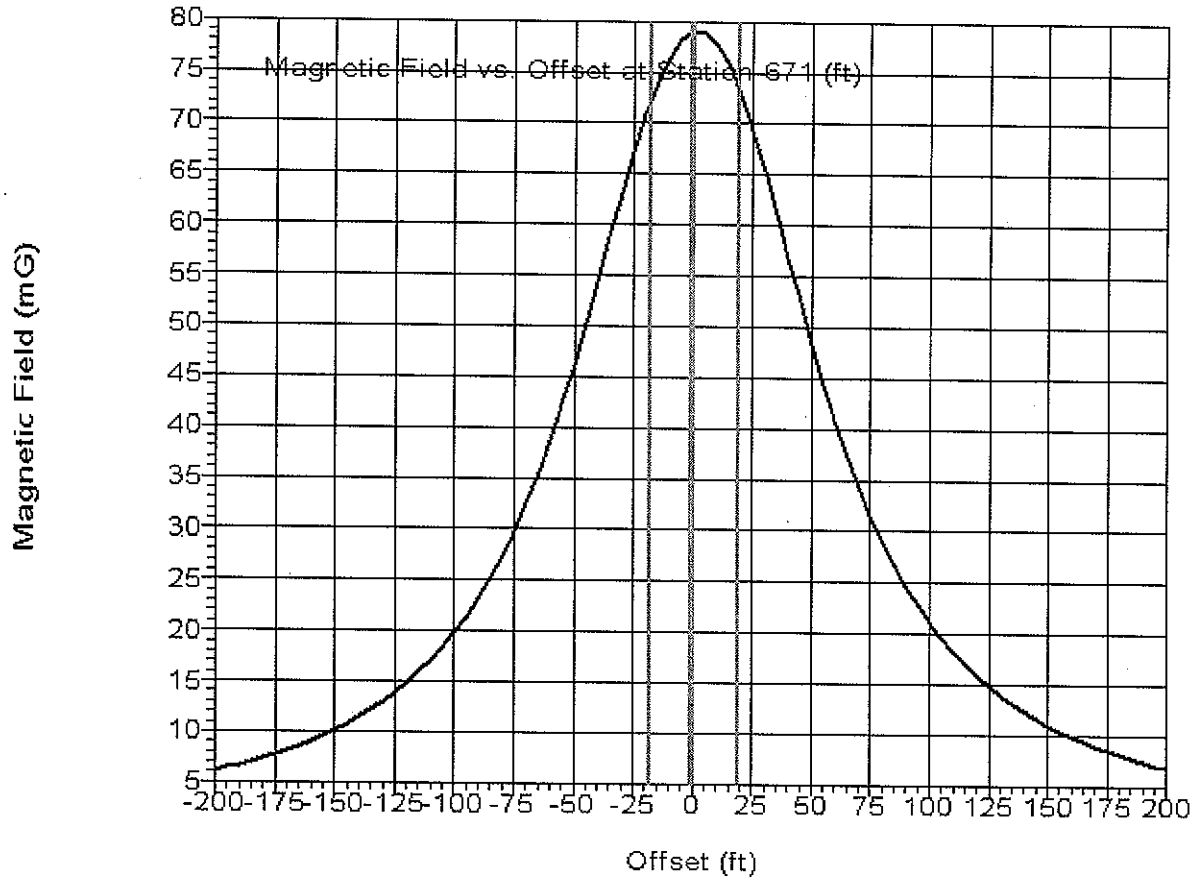
Calculated EMF Circuit Data For Last Point:

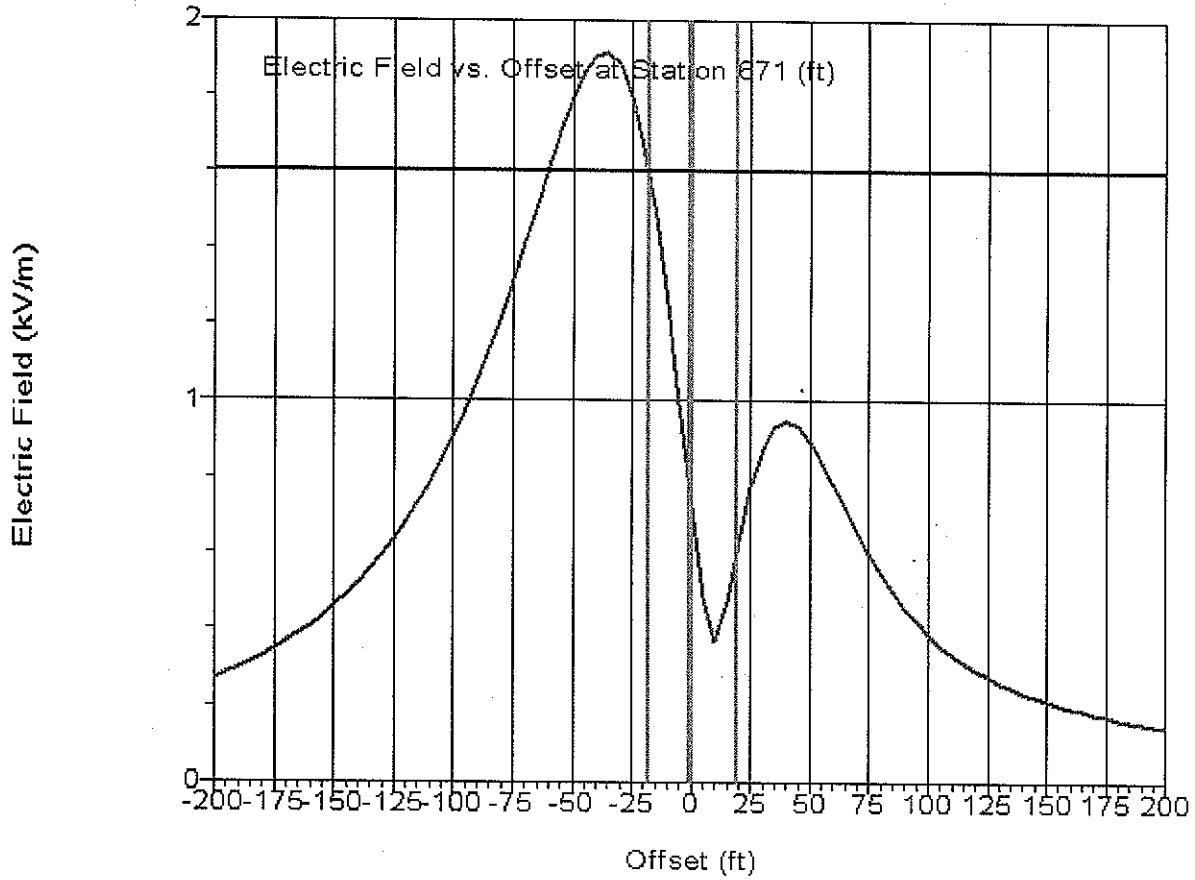
**Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.**

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Station (ft)	Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1 NESC Heavy (250B)	Creep RS	Left	6042.33	12515.49	529.34	670.83	0.22	0.509	199.2
2	1 NESC Heavy (250B)	Creep RS	Left	6024.10	12515.87	510.87	669.22	-17.94	1.762	199.2
2	2 NESC Heavy (250B)	Creep RS	Left	6041.70	12515.57	510.19	670.85	-0.42	1.762	199.2
2	3 NESC Heavy (250B)	Creep RS	Left	6061.37	12512.73	509.43	670.17	19.44	1.762	199.2

Maximum magnetic field of 78.96 (mG) found at station 670.83, offset 0.00 (ft)
Maximum electric field of 1.916 (kV/m) found at station 670.83, offset -35.00 (ft) NG





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
670.83	-200.00	5843.31	12537.38	452.56	5.292	3.02784	29.8	6.097	0.267	0.02364	5.1	88.1	0.268
670.83	-195.00	5848.28	12536.83	452.56	5.543	3.15963	29.7	6.380	0.280	0.02528	5.2	88.1	0.281
670.83	-190.00	5853.25	12536.28	452.56	5.812	3.30056	29.6	6.684	0.294	0.02707	5.3	88.0	0.296
670.83	-185.00	5858.22	12535.74	452.56	6.101	3.45148	29.5	7.010	0.310	0.02902	5.4	88.0	0.311
670.83	-180.00	5863.19	12535.19	452.56	6.413	3.61331	29.4	7.361	0.326	0.03116	5.5	88.0	0.328
670.83	-175.00	5868.16	12534.65	452.56	6.749	3.78711	29.3	7.739	0.344	0.03351	5.6	87.9	0.345

670.83	-170.00	5873.13	12534.10	452.56	7.112	3.97405	29.2	8.147	0.363	0.03610	5.7	87.9	0.365	
670.83	-165.00	5878.10	12533.55	452.56	7.505	4.17544	29.1	8.589	0.384	0.03894	5.8	87.8	0.386	
670.83	-160.00	5883.07	12533.01	452.56	7.931	4.39276	29.0	9.066	0.406	0.04208	5.9	87.8	0.408	
670.83	-155.00	5888.04	12532.46	452.56	8.394	4.62765	28.9	9.585	0.431	0.04556	6.0	87.7	0.433	
670.83	-150.00	5893.01	12531.91	452.56	8.897	4.88200	28.8	10.149	0.457	0.04940	6.2	87.7	0.460	
670.83	-145.00	5897.98	12531.37	452.56	9.446	5.15790	28.6	10.763	0.486	0.05367	6.3	87.6	0.489	
670.83	-140.00	5902.95	12530.82	452.56	10.046	5.45773	28.5	11.433	0.517	0.05841	6.4	87.6	0.520	
670.83	-135.00	5907.92	12530.27	452.56	10.702	5.78419	28.4	12.165	0.551	0.06370	6.6	87.5	0.555	
670.83	-130.00	5912.89	12529.73	452.56	11.421	6.14034	28.3	12.967	0.588	0.06959	6.7	87.5	0.592	
670.83	-125.00	5917.86	12529.18	452.56	12.212	6.52966	28.1	13.848	0.629	0.07619	6.9	87.4	0.634	
670.83	-120.00	5922.83	12528.63	452.56	13.082	6.95609	28.0	14.816	0.673	0.08357	7.1	87.3	0.679	
670.83	-115.00	5927.80	12528.09	452.56	14.042	7.42413	27.9	15.883	0.722	0.09185	7.3	87.3	0.728	
670.83	-110.00	5932.77	12527.54	452.56	15.102	7.93889	27.7	17.061	0.775	0.10115	7.4	87.2	0.782	
670.83	-105.00	5937.74	12526.99	452.56	16.275	8.50620	27.6	18.364	0.833	0.11161	7.6	87.2	0.840	
670.83	-100.00	5942.71	12526.45	452.56	17.575	9.13267	27.5	19.806	0.896	0.12339	7.8	87.2	0.905	
670.83	-95.00	5947.68	12525.90	452.56	19.017	9.82583	27.3	21.406	0.965	0.13666	8.1	87.1	0.974	
670.83	-90.00	5952.65	12525.35	452.56	20.619	10.59417	27.2	23.181	1.039	0.15161	8.3	87.1	1.050	
670.83	-85.00	5957.62	12524.81	452.56	22.397	11.44723	27.1	25.153	1.120	0.16844	8.6	87.1	1.132	
670.83	-80.00	5962.60	12524.26	452.56	24.370	12.39570	27.0	27.342	1.206	0.18737	8.8	87.2	1.220	
670.83	-75.00	5967.57	12523.72	452.56	26.557	13.45132	26.9	29.770	1.297	0.20859	9.1	87.2	1.313	
670.83	-70.00	5972.54	12523.17	452.56	28.975	14.62687	26.8	32.457	1.392	0.23227	9.5	87.3	1.411	
670.83	-65.00	5977.51	12522.62	452.56	31.634	15.93584	26.7	35.421	1.489	0.25851	9.8	87.5	1.511	
670.83	**-60.00**	**5982.48**	**12522.08**	**452.56**	**34.542**	**17.39195**	**26.7**	**38.674**	**1.585**	**0.28730**	**10.3**	**87.7**	**1.611**	**NG**
670.83	**-55.00**	**5987.45**	**12521.53**	**452.56**	**37.694**	**19.00829**	**26.8**	**42.215**	**1.677**	**0.31837**	**10.7**	**88.0**	**1.707**	**NG**
670.83	**-50.00**	**5992.42**	**12520.98**	**452.56**	**41.067**	**20.79594**	**26.9**	**46.032**	**1.758**	**0.35115**	**11.3**	**88.3**	**1.793**	**NG**
670.83	**-45.00**	**5997.39**	**12520.44**	**452.56**	**44.619**	**22.76192**	**27.0**	**50.089**	**1.822**	**0.38450**	**11.9**	**88.8**	**1.862**	**NG**
670.83	**-40.00**	**6002.36**	**12519.89**	**452.56**	**48.280**	**24.90629**	**27.3**	**54.325**	**1.860**	**0.41653**	**12.6**	**89.4**	**1.906**	**NG**
670.83	**-35.00**	**6007.33**	**12519.34**	**452.56**	**51.949**	**27.21833**	**27.7**	**58.648**	**1.864**	**0.44434**	**13.4**	**90.2**	**1.916**	**NG**
670.83	**-30.00**	**6012.30**	**12518.80**	**452.56**	**55.498**	**29.67191**	**28.1**	**62.933**	**1.826**	**0.46378**	**14.3**	**91.1**	**1.884**	**NG**
670.83	**-25.00**	**6017.27**	**12518.25**	**452.56**	**58.776**	**32.22055**	**28.7**	**67.028**	**1.740**	**0.46948**	**15.1**	**92.3**	**1.802**	**NG**
670.83	**-20.00**	**6022.24**	**12517.70**	**452.56**	**61.622**	**34.79323**	**29.5**	**70.766**	**1.604**	**0.45511**	**15.8**	**93.7**	**1.668**	**NG**
670.83	-15.00	6027.21	12517.16	452.56	63.885	37.29266	30.3	73.973	1.423	0.41439	16.2	95.4	1.482	
670.83	-10.00	6032.18	12516.61	452.56	65.443	39.59793	31.2	76.490	1.205	0.34283	15.9	97.6	1.252	
670.83	-5.00	6037.15	12516.06	452.56	66.216	41.57325	32.1	78.185	0.964	0.24135	14.1	100.4	0.993	
670.83	0.00	6042.12	12515.52	452.56	66.176	43.08311	33.1	78.965	0.717	0.13211	10.4	104.1	0.725	
670.83	5.00	6047.09	12514.97	452.56	65.344	44.01156	34.0	78.784	0.482	0.14792	17.0	106.4	0.485	
670.83	10.00	6052.06	12514.42	452.56	63.783	44.28170	34.8	77.647	0.276	0.29967	47.3	89.3	0.367	
670.83	15.00	6057.03	12513.88	452.56	61.586	43.86984	35.5	75.613	0.124	0.46956	75.2	77.2	0.471	
670.83	20.00	6062.00	12513.33	452.56	58.869	42.81024	36.0	72.789	0.105	0.62600	80.5	80.3	0.631	
670.83	25.00	6066.97	12512.79	452.56	55.762	41.18886	36.5	69.325	0.171	0.75401	77.2	83.7	0.772	
670.83	30.00	6071.94	12512.24	452.56	52.398	39.12779	36.8	65.395	0.218	0.84582	75.5	86.4	0.873	
670.83	35.00	6076.91	12511.69	452.56	48.903	36.76519	36.9	61.181	0.237	0.89973	75.3	88.4	0.930	
670.83	40.00	6081.88	12511.15	452.56	45.391	34.23601	37.0	56.855	0.230	0.91874	75.9	89.9	0.947	
670.83	45.00	6086.85	12510.60	452.56	41.956	31.65768	37.0	52.560	0.207	0.90885	77.2	91.0	0.932	
670.83	50.00	6091.82	12510.05	452.56	38.667	29.12251	37.0	48.407	0.172	0.87723	78.9	91.9	0.894	
670.83	55.00	6096.79	12509.51	452.56	35.571	26.69613	36.9	44.474	0.132	0.83086	81.0	92.5	0.841	

670.83	60.00	6101.76	12508.96	452.56	32.695	24.42007	36.8	40.808	0.091	0.77577	83.3	92.9	0.781
670.83	65.00	6106.73	12508.41	452.56	30.050	22.31636	36.6	37.430	0.052	0.71669	85.8	93.2	0.718
670.83	70.00	6111.70	12507.87	452.56	27.634	20.39264	36.4	34.344	0.024	0.65704	87.9	93.4	0.657
670.83	75.00	6116.67	12507.32	452.56	25.440	18.64668	36.2	31.542	0.030	0.59912	87.1	93.4	0.600
670.83	80.00	6121.64	12506.77	452.56	23.453	17.07008	36.0	29.007	0.055	0.54437	84.2	93.4	0.547
670.83	85.00	6126.61	12506.23	452.56	21.657	15.65095	35.9	26.720	0.078	0.49355	81.1	93.4	0.499
670.83	90.00	6131.58	12505.68	452.56	20.036	14.37582	35.7	24.660	0.097	0.44699	77.7	93.3	0.457
670.83	95.00	6136.55	12505.13	452.56	18.572	13.23086	35.5	22.803	0.113	0.40473	74.4	93.1	0.420
670.83	100.00	6141.52	12504.59	452.56	17.251	12.20266	35.3	21.130	0.126	0.36660	71.1	93.0	0.387
670.83	105.00	6146.49	12504.04	452.56	16.056	11.27864	35.1	19.621	0.135	0.33233	67.8	92.8	0.359
670.83	110.00	6151.46	12503.49	452.56	14.974	10.44726	34.9	18.258	0.143	0.30163	64.7	92.7	0.334
670.83	115.00	6156.43	12502.95	452.56	13.993	9.69812	34.7	17.025	0.148	0.27416	61.6	92.5	0.312
670.83	120.00	6161.40	12502.40	452.56	13.102	9.02192	34.5	15.908	0.152	0.24959	58.7	92.4	0.292
670.83	125.00	6166.37	12501.86	452.56	12.292	8.41041	34.4	14.894	0.154	0.22762	55.9	92.3	0.275
670.83	130.00	6171.34	12501.31	452.56	11.554	7.85631	34.2	13.972	0.155	0.20796	53.3	92.2	0.259
670.83	135.00	6176.31	12500.76	452.56	10.879	7.35321	34.1	13.131	0.155	0.19035	50.8	92.1	0.246
670.83	140.00	6181.28	12500.22	452.56	10.262	6.89547	33.9	12.364	0.155	0.17455	48.4	92.0	0.233
670.83	145.00	6186.25	12499.67	452.56	9.696	6.47814	33.7	11.661	0.154	0.16036	46.3	91.9	0.222
670.83	150.00	6191.22	12499.12	452.56	9.177	6.09688	33.6	11.018	0.152	0.14760	44.2	91.8	0.212
670.83	155.00	6196.19	12498.58	452.56	8.699	5.74785	33.5	10.426	0.150	0.13611	42.3	91.8	0.202
670.83	160.00	6201.16	12498.03	452.56	8.258	5.42770	33.3	9.882	0.147	0.12573	40.5	91.7	0.194
670.83	165.00	6206.13	12497.48	452.56	7.851	5.13347	33.2	9.380	0.145	0.11634	38.8	91.7	0.185
670.83	170.00	6211.10	12496.94	452.56	7.474	4.86256	33.0	8.917	0.142	0.10784	37.3	91.6	0.178
670.83	175.00	6216.07	12496.39	452.56	7.125	4.61264	32.9	8.488	0.139	0.10013	35.8	91.6	0.171
670.83	180.00	6221.04	12495.84	452.56	6.801	4.38169	32.8	8.091	0.136	0.09312	34.5	91.5	0.165
670.83	185.00	6226.01	12495.30	452.56	6.500	4.16788	32.7	7.722	0.133	0.08673	33.2	91.5	0.158
670.83	190.00	6230.98	12494.75	452.56	6.220	3.96963	32.5	7.378	0.130	0.08090	32.0	91.5	0.153
670.83	195.00	6235.95	12494.20	452.56	5.958	3.78549	32.4	7.059	0.126	0.07558	30.9	91.4	0.147
670.83	200.00	6240.92	12493.66	452.56	5.714	3.61420	32.3	6.761	0.123	0.07070	29.8	91.4	0.142

Structure 4

PLS-CADD Version 10.40 4:29:51 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10 \345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
  Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
  Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
  Assumed 90 MPH Extreme Wind Loading (Rule 250C)
  Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
  Assumed Maximum Operating Temperature of 212 F
  Assumed 1" Extreme Ice (Non-NESC)
  Assumed Grade B Construction
  <<Illustration of NESC provisions include>>
    > Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
    > Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
    > 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
    > Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
    > Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
    > 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
    > Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
     **** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
     **** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
    > Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
     **** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
     **** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
     **** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE,
          the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL
          values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of
          Composite Line Post Insulators for further clarification. ****
     **** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
     **** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
     **** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
     **** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
    > Structure Loads criteria includes typical Full Structure DE cases
  POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
  THIS FILE IS PROVIDED FOR ILLUSTRATION ONLY. CRITERIA SHOULD BE CHECKED AND MODIFIED AS NECESSARY BY AN ENGINEER IN RESPONSIBLE CHARGE,
  FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
RESPONSIBLE ENGINEER SHOULD VERIFY MAXIMUM OPERATING CONDITION FOR THEIR APPLICABLE PROJECT
RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28	(ft)
Cross section offset for graph +/-:	200.00	(ft)
Result interval for graph:	5.00	(ft)
Electric field limit:	1.60	(kV/m)
Magnetic field limit:	200.00	(mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	3	1	345	1180.000	-120	1.762
2	2	1	345	1180.000	120	1.762
2	1	1	345	1180.000	0	1.762

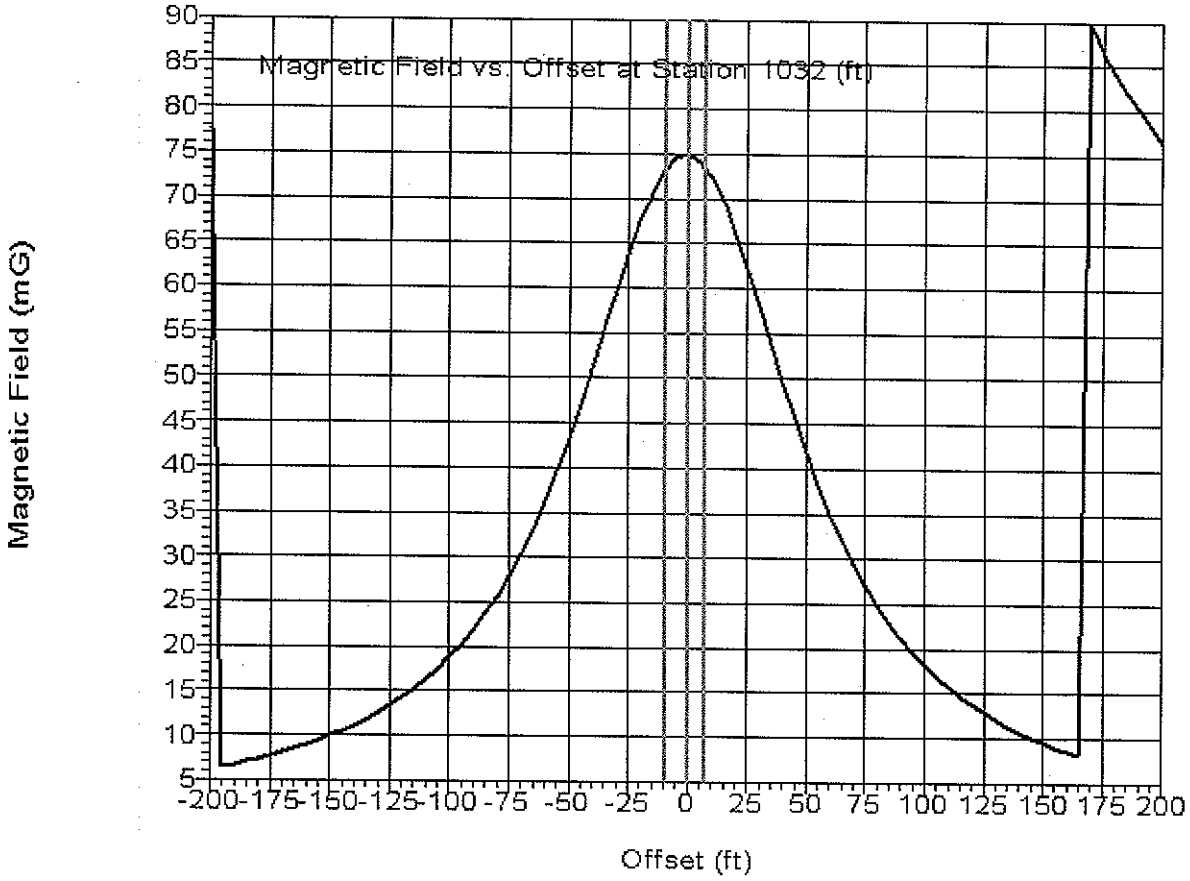
Calculated EMF Circuit Data For Last Point:

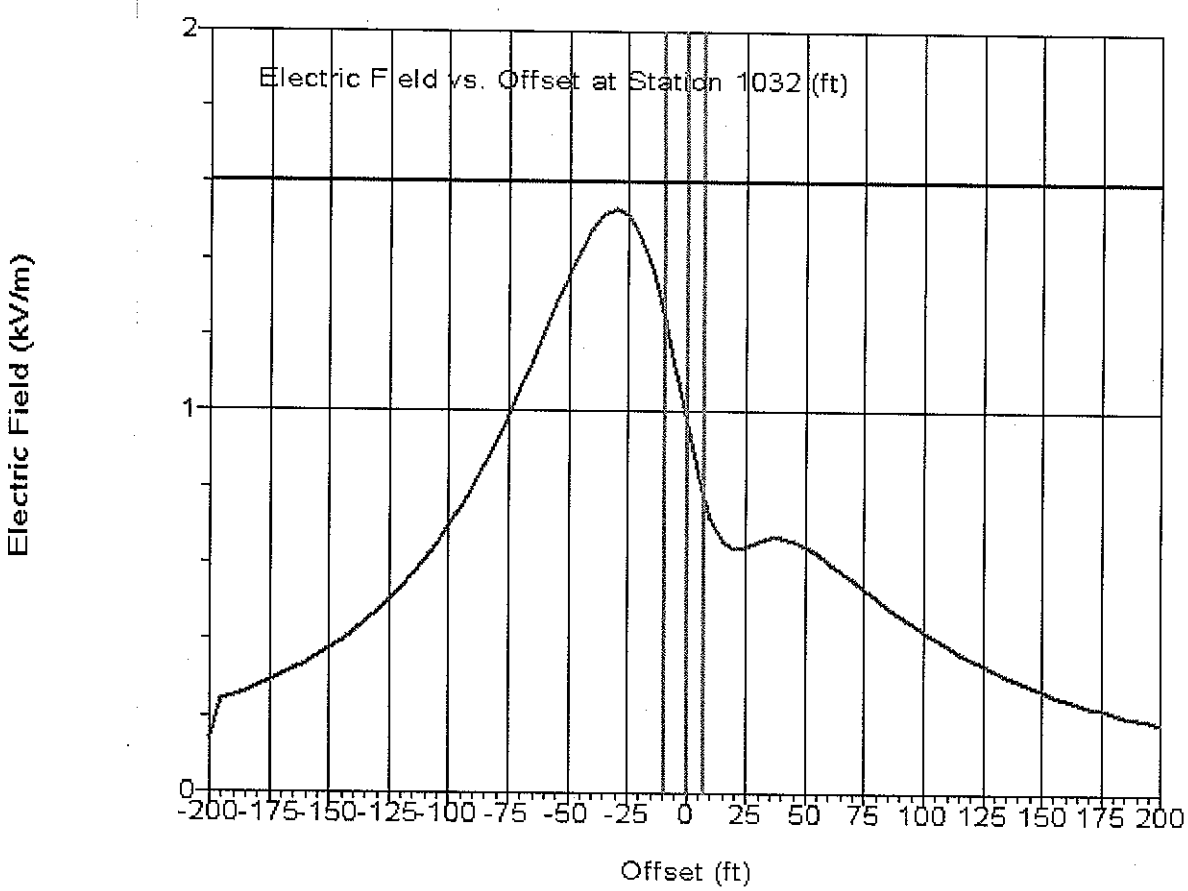
**Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.**

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1	NESC Heavy (250B)	Creep RS	Left	6032.82	11751.41	513.88	1032.11	0.15	0.509	199.2
2	3	NESC Heavy (250B)	Creep RS	Left	6036.21	11744.33	496.03	1034.29	7.69	1.762	199.2
2	2	NESC Heavy (250B)	Creep RS	Left	6032.81	11751.47	495.83	1032.11	0.09	1.762	199.2
2	1	NESC Heavy (250B)	Creep RS	Left	6033.44	11761.36	495.70	1034.36	-9.56	1.762	199.2

Maximum magnetic field of 89.79 (mG) found at station 1032.11, offset 170.00 (ft)
Maximum electric field of 1.531 (kV/m) found at station 1032.11, offset -30.00 (ft)





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1032.11	-200.00	5999.88	11948.83	439.11	77.447	2.77022	2.0	77.496	0.132	0.05608	23.0	88.6	0.144
1032.11	-195.00	6000.70	11943.90	439.11	5.774	2.88221	26.5	6.453	0.231	0.06322	15.3	88.1	0.240
1032.11	-190.00	6001.52	11938.97	439.11	6.028	3.00242	26.5	6.734	0.242	0.06523	15.1	88.1	0.251
1032.11	-185.00	6002.35	11934.04	439.11	6.301	3.13166	26.4	7.036	0.254	0.06732	14.8	88.1	0.263
1032.11	-180.00	6003.17	11929.10	439.11	6.594	3.27081	26.4	7.361	0.267	0.06948	14.6	88.0	0.276
1032.11	-175.00	6003.99	11924.17	439.11	6.910	3.42086	26.3	7.710	0.281	0.07171	14.3	88.0	0.290

1032.11	-170.00	6004.82	11919.24	439.11	7.250	3.58292	26.3	8.087	0.295	0.07402	14.1	87.9	0.304
1032.11	-165.00	6005.64	11914.31	439.11	7.618	3.75825	26.3	8.494	0.311	0.07640	13.8	87.9	0.320
1032.11	-160.00	6006.46	11909.38	439.11	8.016	3.94825	26.2	8.935	0.328	0.07885	13.5	87.9	0.337
1032.11	-155.00	6007.28	11904.44	439.11	8.447	4.15452	26.2	9.413	0.347	0.08136	13.2	87.8	0.356
1032.11	-150.00	6008.11	11899.51	439.11	8.915	4.37886	26.2	9.932	0.366	0.08391	12.9	87.8	0.376
1032.11	-145.00	6008.93	11894.58	439.11	9.424	4.62329	26.1	10.497	0.388	0.08651	12.6	87.7	0.397
1032.11	-140.00	6009.75	11889.65	439.11	9.979	4.89014	26.1	11.113	0.411	0.08912	12.2	87.7	0.421
1032.11	-135.00	6010.58	11884.72	439.11	10.585	5.18201	26.1	11.785	0.437	0.09174	11.9	87.6	0.446
1032.11	-130.00	6011.40	11879.79	439.11	11.248	5.50191	26.1	12.521	0.464	0.09433	11.5	87.6	0.474
1032.11	-125.00	6012.22	11874.85	439.11	11.975	5.85324	26.0	13.329	0.494	0.09685	11.1	87.5	0.503
1032.11	-120.00	6013.05	11869.92	439.11	12.773	6.23987	26.0	14.216	0.527	0.09926	10.7	87.5	0.536
1032.11	-115.00	6013.87	11864.99	439.11	13.652	6.66625	26.0	15.193	0.562	0.10151	10.2	87.4	0.571
1032.11	-110.00	6014.69	11860.06	439.11	14.621	7.13743	26.0	16.270	0.601	0.10351	9.8	87.4	0.610
1032.11	-105.00	6015.51	11855.13	439.11	15.691	7.65920	26.0	17.461	0.643	0.10518	9.3	87.3	0.651
1032.11	-100.00	6016.34	11850.19	439.11	16.875	8.23814	26.0	18.779	0.689	0.10641	8.8	87.3	0.697
1032.11	-95.00	6017.16	11845.26	439.11	18.188	8.88176	26.0	20.240	0.739	0.10705	8.2	87.3	0.747
1032.11	-90.00	6017.98	11840.33	439.11	19.643	9.59852	26.0	21.863	0.793	0.10694	7.7	87.3	0.800
1032.11	-85.00	6018.81	11835.40	439.11	21.259	10.39800	26.1	23.666	0.852	0.10588	7.1	87.3	0.858
1032.11	-80.00	6019.63	11830.47	439.11	23.054	11.29085	26.1	25.670	0.915	0.10361	6.5	87.3	0.921
1032.11	-75.00	6020.45	11825.54	439.11	25.046	12.28881	26.1	27.898	0.983	0.09986	5.8	87.3	0.988
1032.11	-70.00	6021.28	11820.60	439.11	27.253	13.40455	26.2	30.371	1.055	0.09431	5.1	87.4	1.059
1032.11	-65.00	6022.10	11815.67	439.11	29.691	14.65131	26.3	33.109	1.130	0.08660	4.4	87.5	1.133
1032.11	-60.00	6022.92	11810.74	439.11	32.374	16.04235	26.4	36.131	1.206	0.07639	3.6	87.7	1.209
1032.11	-55.00	6023.75	11805.81	439.11	35.305	17.58984	26.5	39.444	1.283	0.06338	2.8	87.9	1.285
1032.11	-50.00	6024.57	11800.88	439.11	38.477	19.30328	26.6	43.047	1.357	0.04737	2.0	88.2	1.358
1032.11	-45.00	6025.39	11795.95	439.11	41.863	21.18705	26.8	46.919	1.425	0.02845	1.1	88.6	1.425
1032.11	-40.00	6026.21	11791.01	439.11	45.414	23.23705	27.1	51.013	1.480	0.00714	0.3	89.0	1.480
1032.11	-35.00	6027.04	11786.08	439.11	49.046	25.43631	27.4	55.249	1.517	0.01539	0.6	89.7	1.518
1032.11	-30.00	6027.86	11781.15	439.11	52.640	27.74990	27.8	59.506	1.531	0.03692	1.4	90.4	1.531
1032.11	-25.00	6028.68	11776.22	439.11	56.040	30.11982	28.3	63.621	1.515	0.05415	2.0	91.3	1.516
1032.11	-20.00	6029.51	11771.29	439.11	59.062	32.46148	28.8	67.395	1.465	0.06275	2.5	92.3	1.466
1032.11	-15.00	6030.33	11766.35	439.11	61.509	34.66396	29.4	70.604	1.380	0.05852	2.4	93.3	1.381
1032.11	-10.00	6031.15	11761.42	439.11	63.200	36.59656	30.1	73.031	1.262	0.04361	2.0	94.4	1.263
1032.11	-5.00	6031.98	11756.49	439.11	63.998	38.12306	30.8	74.492	1.120	0.05487	2.8	95.4	1.120
1032.11	0.00	6032.80	11751.56	439.11	63.833	39.12245	31.5	74.868	0.964	0.11724	6.9	96.1	0.968
1032.11	5.00	6033.62	11746.63	439.11	62.720	39.51152	32.2	74.128	0.806	0.20386	14.2	95.9	0.827
1032.11	10.00	6034.44	11741.70	439.11	60.750	39.26202	32.9	72.333	0.659	0.29912	24.4	94.5	0.718
1032.11	15.00	6035.27	11736.76	439.11	58.075	38.40622	33.5	69.625	0.534	0.39119	36.2	92.3	0.657
1032.11	20.00	6036.09	11731.83	439.11	54.880	37.02891	34.0	66.204	0.437	0.47087	47.2	90.6	0.639
1032.11	25.00	6036.91	11726.90	439.11	51.359	35.24898	34.5	62.291	0.368	0.53250	55.4	89.9	0.646
1032.11	30.00	6037.74	11721.97	439.11	47.685	33.19759	34.8	58.103	0.324	0.57397	60.6	90.0	0.659
1032.11	35.00	6038.56	11717.04	439.11	44.007	30.99908	35.2	53.829	0.300	0.59602	63.3	90.5	0.667
1032.11	40.00	6039.38	11712.10	439.11	40.433	28.75857	35.4	49.618	0.291	0.60124	64.2	91.0	0.668
1032.11	45.00	6040.21	11707.17	439.11	37.041	26.55652	35.6	45.577	0.290	0.59305	63.9	91.4	0.660
1032.11	50.00	6041.03	11702.24	439.11	33.874	24.44886	35.8	41.776	0.295	0.57499	62.9	91.7	0.646
1032.11	55.00	6041.85	11697.31	439.11	30.957	22.47032	36.0	38.253	0.301	0.55026	61.3	92.0	0.627
1032.11	60.00	6042.67	11692.38	439.11	28.294	20.63898	36.1	35.022	0.308	0.52148	59.5	92.2	0.605

1032.11	65.00	6043.50	11687.45	439.11	25.879	18.96088	36.2	32.082	0.313	0.49071	57.5	92.3	0.582
1032.11	70.00	6044.32	11682.51	439.11	23.699	17.43397	36.3	29.421	0.316	0.45942	55.4	92.3	0.558
1032.11	75.00	6045.14	11677.58	439.11	21.736	16.05112	36.4	27.020	0.318	0.42863	53.4	92.3	0.533
1032.11	80.00	6045.97	11672.65	439.11	19.971	14.80241	36.5	24.858	0.317	0.39902	51.5	92.4	0.510
1032.11	85.00	6046.79	11667.72	439.11	18.385	13.67661	36.6	22.914	0.315	0.37099	49.6	92.3	0.487
1032.11	90.00	6047.61	11662.79	439.11	16.959	12.66219	36.7	21.165	0.311	0.34474	47.9	92.3	0.464
1032.11	95.00	6048.44	11657.85	439.11	15.678	11.74796	36.8	19.591	0.307	0.32036	46.3	92.3	0.443
1032.11	100.00	6049.26	11652.92	439.11	14.524	10.92339	36.9	18.173	0.301	0.29783	44.7	92.3	0.423
1032.11	105.00	6050.08	11647.99	439.11	13.483	10.17883	37.1	16.894	0.294	0.27710	43.3	92.2	0.404
1032.11	110.00	6050.90	11643.06	439.11	12.543	9.50550	37.2	15.738	0.286	0.25806	42.0	92.2	0.385
1032.11	115.00	6051.73	11638.13	439.11	11.693	8.89556	37.3	14.692	0.279	0.24060	40.8	92.2	0.368
1032.11	120.00	6052.55	11633.20	439.11	10.922	8.34203	37.4	13.744	0.271	0.22460	39.7	92.1	0.352
1032.11	125.00	6053.37	11628.26	439.11	10.222	7.83870	37.5	12.882	0.263	0.20995	38.6	92.1	0.336
1032.11	130.00	6054.20	11623.33	439.11	9.585	7.38012	37.6	12.097	0.255	0.19652	37.7	92.1	0.322
1032.11	135.00	6055.02	11618.40	439.11	9.004	6.96146	37.7	11.382	0.247	0.18421	36.8	92.0	0.308
1032.11	140.00	6055.84	11613.47	439.11	8.474	6.57847	37.8	10.728	0.239	0.17290	35.9	92.0	0.295
1032.11	145.00	6056.67	11608.54	439.11	7.988	6.22741	37.9	10.129	0.231	0.16252	35.2	92.0	0.282
1032.11	150.00	6057.49	11603.60	439.11	7.543	5.90496	38.1	9.579	0.223	0.15297	34.4	91.9	0.271
1032.11	155.00	6058.31	11598.67	439.11	7.133	5.60823	38.2	9.074	0.216	0.14417	33.8	91.9	0.259
1032.11	160.00	6059.13	11593.74	439.11	6.757	5.33464	38.3	8.609	0.209	0.13606	33.1	91.8	0.249
1032.11	165.00	6059.96	11588.81	439.11	6.409	5.08191	38.4	8.179	0.202	0.12857	32.5	91.8	0.239
1032.11	170.00	6060.78	11583.88	439.11	43.822	78.36869	60.8	89.789	0.195	0.12171	32.0	91.8	0.230
1032.11	175.00	6061.60	11578.95	439.11	42.013	75.53136	60.9	86.430	0.188	0.11565	31.6	91.8	0.221
1032.11	180.00	6062.43	11574.01	439.11	40.996	73.58712	60.9	84.236	0.185	0.10465	29.5	91.7	0.213
1032.11	185.00	6063.25	11569.08	439.11	40.035	71.74938	60.8	82.163	0.180	0.09777	28.5	91.7	0.205
1032.11	190.00	6064.07	11564.15	439.11	39.115	69.99513	60.8	80.183	0.175	0.09148	27.6	91.6	0.198
1032.11	195.00	6064.90	11559.22	439.11	38.234	68.31927	60.8	78.290	0.170	0.08572	26.7	91.6	0.191
1032.11	200.00	6065.72	11554.29	439.11	37.389	66.71703	60.7	76.479	0.166	0.08044	25.9	91.6	0.184

Midspan of Structure 4 & 5

PLS-CADD Version 10.40 4:30:27 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10 \345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
Assumed 90 MPH Extreme Wind Loading (Rule 250C)
Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
Assumed Maximum Operating Temperature of 212 F
Assumed 1" Extreme Ice (Non-NESC)
Assumed Grade B Construction
<<Illustration of NESC provisions include>>
> Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
> Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
> 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
> Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
> Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
> 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
> Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
**** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
**** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
> Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
**** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
**** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
**** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE, the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of Composite Line Post Insulators for further clarification. ****
**** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
**** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
**** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
**** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
> Structure Loads criteria includes typical Full Structure DE cases
POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
THIS FILE IS PROVIDED FOR ILLUSTRATION ONLY. CRITERIA SHOULD BE CHECKED AND MODIFIED AS NECESSARY BY AN ENGINEER IN RESPONSIBLE CHARGE,
FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
RESPONSIBLE ENGINEER SHOULD VERIFY MAXIMUM OPERATING CONDITION FOR THEIR APPLICABLE PROJECT
RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28	(ft)
Cross section offset for graph +/-:	200.00	(ft)
Result interval for graph:	5.00	(ft)
Electric field limit:	1.60	(kV/m)
Magnetic field limit:	200.00	(mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	3	1	345	1180.000	-120	1.762
2	2	1	345	1180.000	120	1.762
2	1	1	345	1180.000	0	1.762

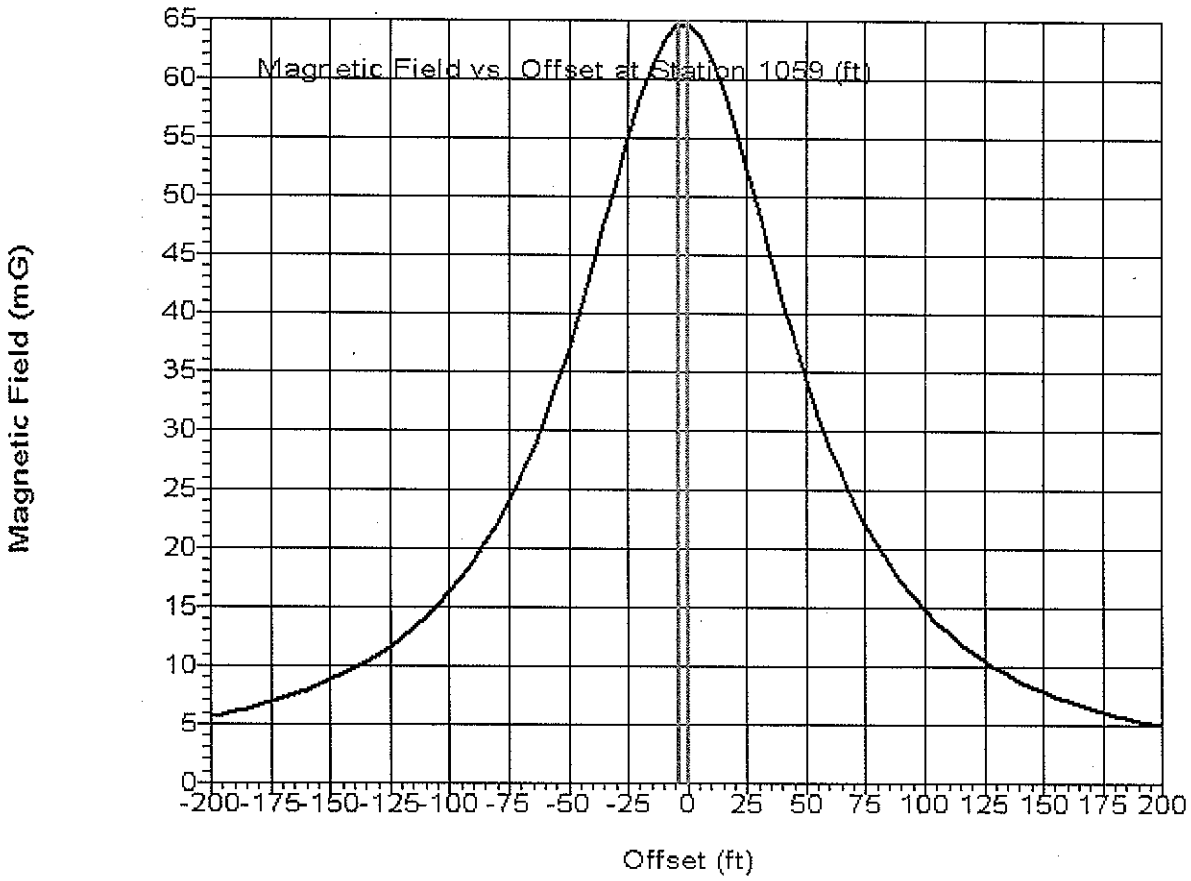
Calculated EMF Circuit Data For Last Point:

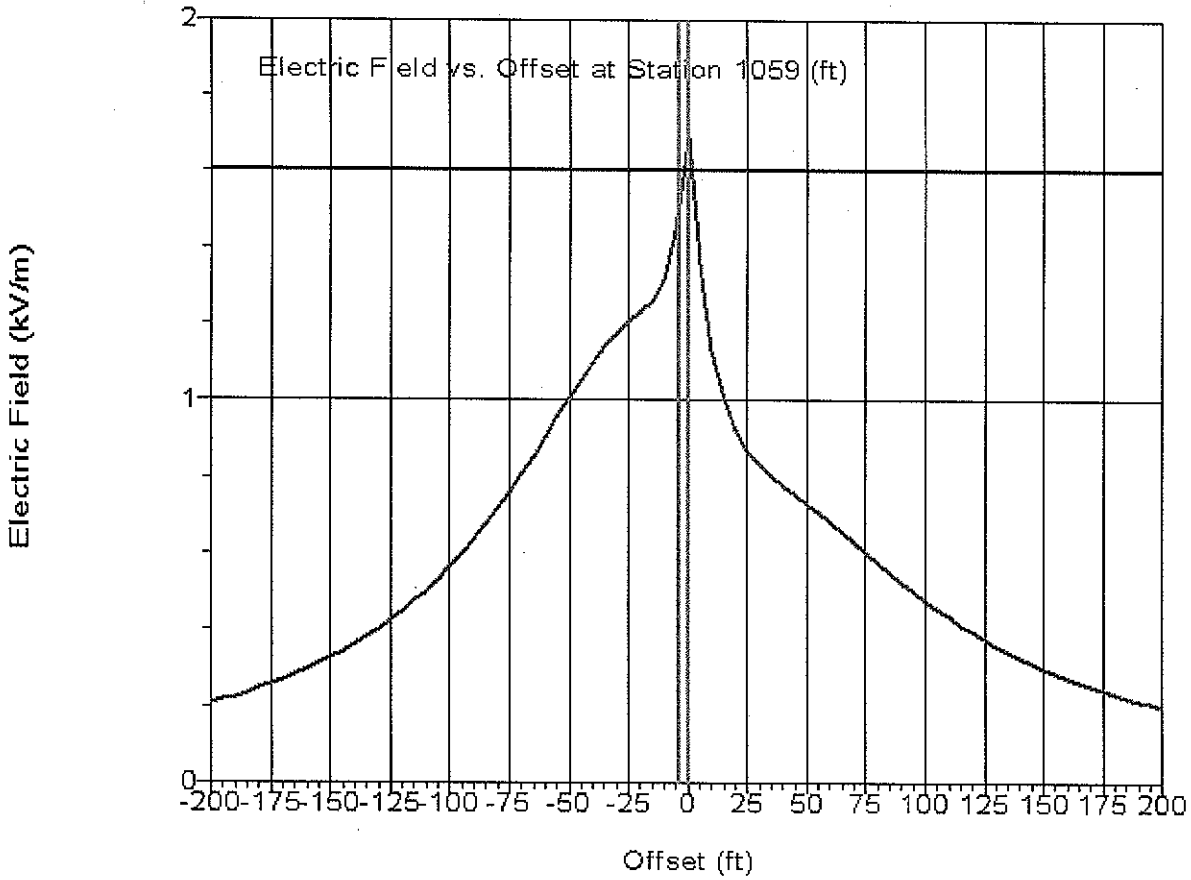
**Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.**

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1 NESC Heavy (250B)	Creep RS	Left	6059.81	11755.88	514.61	1059.46	0.18	0.509	199.2
2	3 NESC Heavy (250B)	Creep RS	Left	6060.01	11755.56	496.81	1059.62	0.53	1.762	199.2
2	2 NESC Heavy (250B)	Creep RS	Left	6059.79	11755.95	496.55	1059.46	0.11	1.762	199.2
2	1 NESC Heavy (250B)	Creep RS	Left	6060.01	11759.59	496.29	1060.27	-3.44	1.762	199.2

Maximum magnetic field of 64.58 (mG) found at station 1059.46, offset 0.00 (ft)
Maximum electric field of 1.689 (kV/m) found at station 1059.46, offset 0.00 (ft) NG





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1059.46	-200.00	6026.85	11953.33	440.11	4.682	3.04364	33.0	5.584	0.191	0.07880	22.4	88.3	0.206
1059.46	-195.00	6027.68	11948.40	440.11	4.875	3.15891	32.9	5.809	0.199	0.08191	22.4	88.2	0.215
1059.46	-190.00	6028.50	11943.47	440.11	5.082	3.28226	32.9	6.049	0.208	0.08519	22.3	88.2	0.225
1059.46	-185.00	6029.32	11938.54	440.11	5.303	3.41443	32.8	6.308	0.217	0.08867	22.2	88.2	0.235
1059.46	-180.00	6030.15	11933.61	440.11	5.542	3.55628	32.7	6.585	0.227	0.09235	22.1	88.1	0.245
1059.46	-175.00	6030.97	11928.67	440.11	5.798	3.70878	32.6	6.883	0.238	0.09625	22.0	88.1	0.256

1059.46	-170.00	6031.79	11923.74	440.11	6.075	3.87298	32.5	7.205	0.249	0.10039	22.0	88.0	0.268	
1059.46	-165.00	6032.62	11918.81	440.11	6.374	4.05009	32.4	7.552	0.261	0.10478	21.9	88.0	0.281	
1059.46	-160.00	6033.44	11913.88	440.11	6.697	4.24146	32.3	7.927	0.274	0.10945	21.8	88.0	0.295	
1059.46	-155.00	6034.26	11908.95	440.11	7.047	4.44863	32.3	8.333	0.288	0.11440	21.7	87.9	0.310	
1059.46	-150.00	6035.08	11904.01	440.11	7.426	4.67330	32.2	8.775	0.303	0.11967	21.6	87.9	0.326	
1059.46	-145.00	6035.91	11899.08	440.11	7.840	4.91745	32.1	9.254	0.319	0.12526	21.5	87.8	0.343	
1059.46	-140.00	6036.73	11894.15	440.11	8.290	5.18326	32.0	9.777	0.336	0.13121	21.3	87.8	0.361	
1059.46	-135.00	6037.55	11889.22	440.11	8.781	5.47327	31.9	10.347	0.354	0.13753	21.2	87.8	0.380	
1059.46	-130.00	6038.38	11884.29	440.11	9.319	5.79031	31.9	10.971	0.374	0.14424	21.1	87.7	0.401	
1059.46	-125.00	6039.20	11879.36	440.11	9.908	6.13764	31.8	11.655	0.396	0.15136	20.9	87.7	0.424	
1059.46	-120.00	6040.02	11874.42	440.11	10.556	6.51895	31.7	12.406	0.419	0.15891	20.8	87.6	0.448	
1059.46	-115.00	6040.85	11869.49	440.11	11.268	6.93846	31.6	13.233	0.443	0.16691	20.6	87.6	0.474	
1059.46	-110.00	6041.67	11864.56	440.11	12.054	7.40095	31.5	14.145	0.470	0.17535	20.5	87.6	0.502	
1059.46	-105.00	6042.49	11859.63	440.11	12.922	7.91188	31.5	15.152	0.499	0.18425	20.3	87.5	0.532	
1059.46	-100.00	6043.31	11854.70	440.11	13.883	8.47742	31.4	16.267	0.529	0.19358	20.1	87.5	0.564	
1059.46	-95.00	6044.14	11849.76	440.11	14.948	9.10458	31.3	17.503	0.563	0.20331	19.9	87.5	0.598	
1059.46	-90.00	6044.96	11844.83	440.11	16.131	9.80120	31.3	18.875	0.598	0.21340	19.6	87.5	0.635	
1059.46	-85.00	6045.78	11839.90	440.11	17.445	10.57603	31.2	20.401	0.636	0.22374	19.4	87.5	0.675	
1059.46	-80.00	6046.61	11834.97	440.11	18.907	11.43868	31.2	22.098	0.677	0.23423	19.1	87.5	0.716	
1059.46	-75.00	6047.43	11830.04	440.11	20.532	12.39953	31.1	23.986	0.720	0.24465	18.8	87.6	0.760	
1059.46	-70.00	6048.25	11825.11	440.11	22.338	13.46945	31.1	26.085	0.766	0.25476	18.4	87.6	0.807	
1059.46	-65.00	6049.08	11820.17	440.11	24.340	14.65935	31.1	28.414	0.813	0.26421	18.0	87.7	0.855	
1059.46	-60.00	6049.90	11815.24	440.11	26.552	15.97933	31.0	30.989	0.862	0.27253	17.5	87.8	0.904	
1059.46	-55.00	6050.72	11810.31	440.11	28.982	17.43742	31.0	33.823	0.913	0.27912	17.0	88.0	0.954	
1059.46	-50.00	6051.54	11805.38	440.11	31.630	19.03765	31.0	36.917	0.963	0.28325	16.4	88.2	1.004	
1059.46	-45.00	6052.37	11800.45	440.11	34.483	20.77737	31.1	40.259	1.013	0.28402	15.7	88.4	1.052	
1059.46	-40.00	6053.19	11795.52	440.11	37.506	22.64361	31.1	43.812	1.061	0.28042	14.8	88.7	1.097	
1059.46	-35.00	6054.01	11790.58	440.11	40.641	24.60875	31.2	47.511	1.105	0.27128	13.8	89.1	1.138	
1059.46	-30.00	6054.84	11785.65	440.11	43.794	26.62600	31.3	51.253	1.146	0.25538	12.6	89.5	1.174	
1059.46	-25.00	6055.66	11780.72	440.11	46.837	28.62567	31.4	54.892	1.181	0.23125	11.1	90.0	1.204	
1059.46	-20.00	6056.48	11775.79	440.11	49.606	30.51432	31.6	58.240	1.215	0.19698	9.2	90.4	1.231	
1059.46	-15.00	6057.31	11770.86	440.11	51.918	32.17895	31.8	61.081	1.252	0.14943	6.8	90.9	1.261	
1059.46	-10.00	6058.13	11765.92	440.11	53.590	33.49813	32.0	63.198	1.310	0.08471	3.7	91.2	1.313	
1059.46	-5.00	6058.95	11760.99	440.11	54.473	34.35987	32.2	64.404	1.441	0.01186	0.5	91.3	1.441	
1059.46	**0.00**	**6059.78**	**11756.06**	**440.11**	**54.478**	**34.68272**	**32.5**	**64.581**	**1.688**	**0.02638**	**0.9**	**91.3**	**1.689**	**NG**
1059.46	5.00	6060.60	11751.13	440.11	53.601	34.43368	32.7	63.708	1.350	0.12917	5.5	91.7	1.356	
1059.46	10.00	6061.42	11746.20	440.11	51.919	33.63609	32.9	61.863	1.113	0.20054	10.2	91.8	1.131	
1059.46	15.00	6062.24	11741.27	440.11	49.580	32.36412	33.1	59.208	0.971	0.24757	14.3	91.6	1.002	
1059.46	20.00	6063.07	11736.33	440.11	46.763	30.72633	33.3	55.954	0.878	0.27967	17.7	91.3	0.921	
1059.46	25.00	6063.89	11731.40	440.11	43.657	28.84448	33.5	52.325	0.814	0.30189	20.4	91.1	0.868	
1059.46	30.00	6064.71	11726.47	440.11	40.430	26.83469	33.6	48.525	0.768	0.31629	22.4	91.1	0.831	
1059.46	35.00	6065.54	11721.54	440.11	37.216	24.79485	33.7	44.720	0.734	0.32396	23.8	91.1	0.802	
1059.46	40.00	6066.36	11716.61	440.11	34.115	22.79925	33.8	41.032	0.706	0.32584	24.8	91.2	0.778	
1059.46	45.00	6067.18	11711.67	440.11	31.190	20.89866	33.8	37.544	0.682	0.32293	25.3	91.3	0.754	
1059.46	50.00	6068.01	11706.74	440.11	28.476	19.12373	33.9	34.302	0.659	0.31625	25.6	91.5	0.731	
1059.46	55.00	6068.83	11701.81	440.11	25.990	17.48951	33.9	31.326	0.637	0.30680	25.7	91.6	0.707	
1059.46	60.00	6069.65	11696.88	440.11	23.731	15.99994	34.0	28.621	0.614	0.29541	25.7	91.7	0.681	

1059.46	65.00	6070.47	11691.95	440.11	21.690	14.65164	34.0	26.175	0.592	0.28282	25.6	91.9	0.656
1059.46	70.00	6071.30	11687.02	440.11	19.854	13.43682	34.1	23.974	0.569	0.26958	25.4	91.9	0.629
1059.46	75.00	6072.12	11682.08	440.11	18.206	12.34533	34.1	21.997	0.546	0.25613	25.1	92.0	0.603
1059.46	80.00	6072.94	11677.15	440.11	16.728	11.36606	34.2	20.224	0.523	0.24278	24.9	92.1	0.576
1059.46	85.00	6073.77	11672.22	440.11	15.402	10.48786	34.3	18.634	0.500	0.22975	24.7	92.1	0.551
1059.46	90.00	6074.59	11667.29	440.11	14.213	9.70004	34.3	17.208	0.478	0.21719	24.4	92.1	0.525
1059.46	95.00	6075.41	11662.36	440.11	13.145	8.99266	34.4	15.927	0.457	0.20520	24.2	92.2	0.501
1059.46	100.00	6076.24	11657.42	440.11	12.185	8.35667	34.4	14.775	0.437	0.19381	23.9	92.2	0.478
1059.46	105.00	6077.06	11652.49	440.11	11.320	7.78394	34.5	13.738	0.417	0.18307	23.7	92.2	0.455
1059.46	110.00	6077.88	11647.56	440.11	10.539	7.26725	34.6	12.802	0.398	0.17296	23.5	92.1	0.434
1059.46	115.00	6078.70	11642.63	440.11	9.834	6.80019	34.7	11.956	0.380	0.16348	23.3	92.1	0.413
1059.46	120.00	6079.53	11637.70	440.11	9.195	6.37713	34.7	11.190	0.363	0.15460	23.1	92.1	0.394
1059.46	125.00	6080.35	11632.77	440.11	8.614	5.99311	34.8	10.494	0.346	0.14630	22.9	92.1	0.376
1059.46	130.00	6081.17	11627.83	440.11	8.086	5.64379	34.9	9.861	0.331	0.13854	22.7	92.1	0.359
1059.46	135.00	6082.00	11622.90	440.11	7.605	5.32536	35.0	9.284	0.316	0.13129	22.5	92.0	0.342
1059.46	140.00	6082.82	11617.97	440.11	7.166	5.03446	35.1	8.758	0.302	0.12452	22.4	92.0	0.327
1059.46	145.00	6083.64	11613.04	440.11	6.764	4.76818	35.2	8.276	0.289	0.11820	22.2	92.0	0.313
1059.46	150.00	6084.47	11608.11	440.11	6.395	4.52391	35.3	7.834	0.277	0.11229	22.1	91.9	0.299
1059.46	155.00	6085.29	11603.17	440.11	6.057	4.29940	35.4	7.427	0.265	0.10677	21.9	91.9	0.286
1059.46	160.00	6086.11	11598.24	440.11	5.745	4.09263	35.5	7.054	0.254	0.10160	21.8	91.9	0.274
1059.46	165.00	6086.93	11593.31	440.11	5.458	3.90186	35.6	6.709	0.244	0.09677	21.6	91.9	0.262
1059.46	170.00	6087.76	11588.38	440.11	5.192	3.72550	35.7	6.390	0.234	0.09224	21.5	91.8	0.252
1059.46	175.00	6088.58	11583.45	440.11	4.947	3.56219	35.8	6.096	0.225	0.08800	21.4	91.8	0.241
1059.46	180.00	6089.40	11578.52	440.11	4.719	3.41069	35.9	5.823	0.216	0.08402	21.3	91.8	0.232
1059.46	185.00	6090.23	11573.58	440.11	4.508	3.26990	36.0	5.569	0.208	0.08028	21.1	91.7	0.223
1059.46	190.00	6091.05	11568.65	440.11	4.312	3.13887	36.1	5.333	0.200	0.07677	21.0	91.7	0.214
1059.46	195.00	6091.87	11563.72	440.11	4.129	3.01672	36.2	5.113	0.192	0.07347	20.9	91.7	0.206
1059.46	200.00	6092.70	11558.79	440.11	3.958	2.90266	36.3	4.909	0.185	0.07037	20.8	91.6	0.198

Structure 5a

PLS-CADD Version 10.40 4:31:19 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10 \345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
  Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
  Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
  Assumed 90 MPH Extreme Wind Loading (Rule 250C)
  Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
  Assumed Maximum Operating Temperature of 212 F
  Assumed 1" Extreme Ice (Non-NESC)
  Assumed Grade B Construction
  <<Illustration of NESC provisions include>>
    > Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
    > Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
    > 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
    > Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
    > Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
    > 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
    > Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
     **** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
     **** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
    > Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
     **** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
     **** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
     **** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE,
          the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL
          values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of
          Composite Line Post Insulators for further clarification. ****
     **** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
     **** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
     **** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
     **** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
    > Structure Loads criteria includes typical Full Structure DE cases
  POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
  THIS FILE IS PROVIDED FOR ILLUSTRATION ONLY. CRITERIA SHOULD BE CHECKED AND MODIFIED AS NECESSARY BY AN ENGINEER IN RESPONSIBLE CHARGE,
  FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
RESPONSIBLE ENGINEER SHOULD VERIFY MAXIMUM OPERATING CONDITION FOR THEIR APPLICABLE PROJECT
RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28	(ft)
Cross section offset for graph +/-:	200.00	(ft)
Result interval for graph:	5.00	(ft)
Electric field limit:	1.60	(kV/m)
Magnetic field limit:	200.00	(mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	3	1	345	1180.000	-120	1.762
2	2	1	345	1180.000	120	1.762
2	1	1	345	1180.000	0	1.762

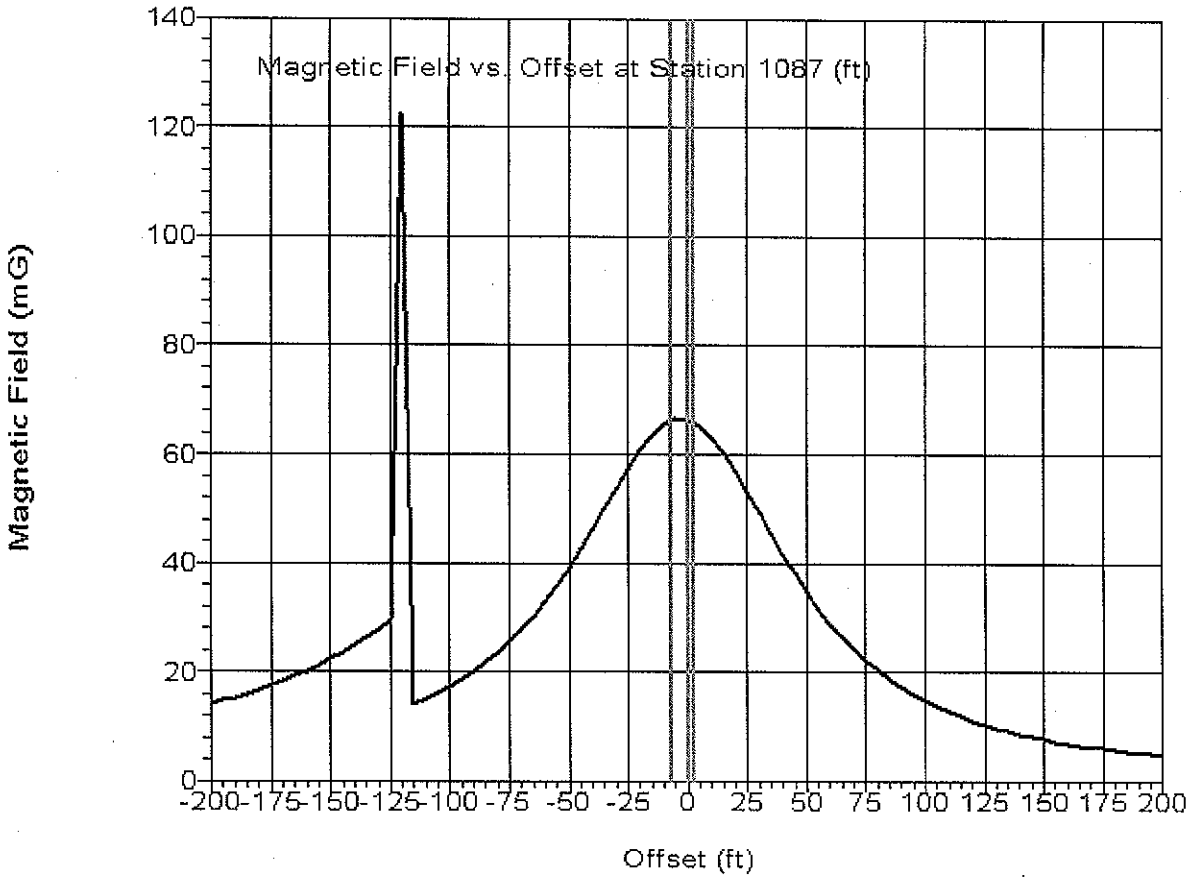
Calculated EMF Circuit Data For Last Point:

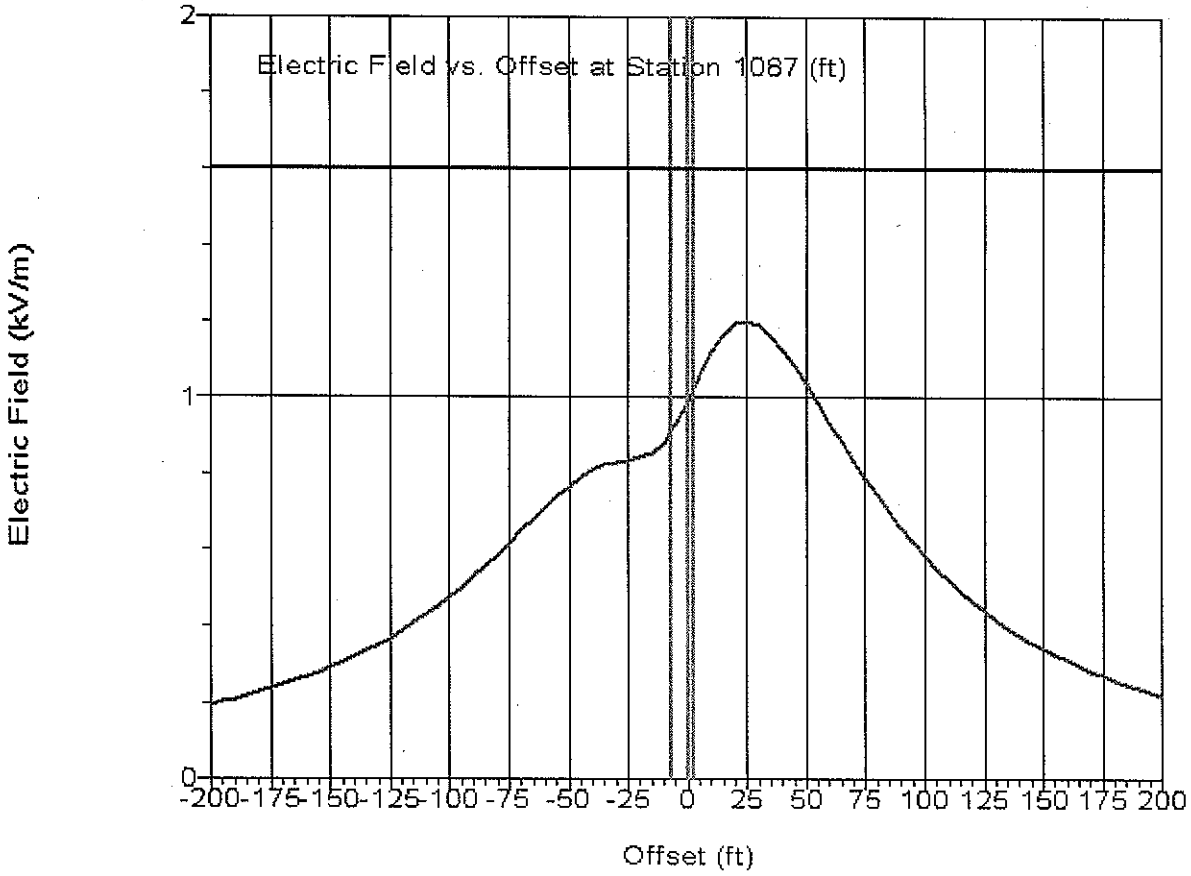
**Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.**

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1 NESC Heavy (250B)	Creep RS	Left	6086.78	11760.41	515.46	1086.81	0.15	0.509	199.2
2	3 NESC Heavy (250B)	Creep RS	Left	6083.80	11766.82	497.72	1084.93	-6.65	1.762	199.2
2	2 NESC Heavy (250B)	Creep RS	Left	6086.77	11760.47	497.41	1086.81	0.09	1.762	199.2
2	1 NESC Heavy (250B)	Creep RS	Left	6086.57	11757.85	497.02	1086.19	2.65	1.762	199.2

Maximum magnetic field of 122.36 (mG) found at station 1086.81, offset -120.00 (ft)
Maximum electric field of 1.199 (kV/m) found at station 1086.81, offset 25.00 (ft)





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1086.81	-200.00	6053.83	11957.83	440.86	8.987	10.87977	50.4	14.111	0.181	0.07031	21.2	88.3	0.194
1086.81	-195.00	6054.65	11952.90	440.86	9.366	11.34799	50.5	14.714	0.187	0.07477	21.8	88.3	0.202
1086.81	-190.00	6055.48	11947.97	440.86	9.770	11.84681	50.5	15.356	0.194	0.07963	22.3	88.3	0.210
1086.81	-185.00	6056.30	11943.04	440.86	10.201	12.37884	50.5	16.041	0.201	0.08493	22.9	88.2	0.218
1086.81	-180.00	6057.12	11938.11	440.86	10.663	12.94699	50.5	16.773	0.208	0.09070	23.6	88.2	0.227
1086.81	-175.00	6057.95	11933.18	440.86	11.157	13.55447	50.5	17.556	0.215	0.09701	24.3	88.2	0.236

1086.81	-170.00	6058.77	11928.24	440.86	11.686	14.20482	50.6	18.394	0.223	0.10392	25.0	88.1	0.246
1086.81	-165.00	6059.59	11923.31	440.86	12.255	14.90198	50.6	19.294	0.231	0.11150	25.8	88.1	0.256
1086.81	-160.00	6060.42	11918.38	440.86	12.866	15.65031	50.6	20.260	0.239	0.11982	26.6	88.1	0.268
1086.81	-155.00	6061.24	11913.45	440.86	13.524	16.45465	50.6	21.299	0.248	0.12898	27.5	88.0	0.279
1086.81	-150.00	6062.06	11908.52	440.86	14.233	17.32038	50.6	22.418	0.257	0.13908	28.4	88.0	0.292
1086.81	-145.00	6062.88	11903.58	440.86	14.998	18.25347	50.6	23.625	0.266	0.15023	29.4	88.0	0.306
1086.81	-140.00	6063.71	11898.65	440.86	15.826	19.26057	50.6	24.929	0.276	0.16256	30.5	87.9	0.320
1086.81	-135.00	6064.53	11893.72	440.86	16.722	20.34908	50.6	26.338	0.285	0.17622	31.7	87.9	0.335
1086.81	-130.00	6065.35	11888.79	440.86	17.694	21.52721	50.6	27.865	0.295	0.19137	33.0	87.8	0.352
1086.81	-125.00	6066.18	11883.86	440.86	18.631	22.61749	50.5	29.303	0.314	0.19335	31.7	87.8	0.368
1086.81	-120.00	6067.00	11878.93	440.86	61.189	105.96334	60.0	122.361	0.318	0.22164	34.9	87.7	0.388
1086.81	-115.00	6067.82	11873.99	440.86	11.150	8.66936	37.9	14.124	0.327	0.24439	36.7	87.7	0.409
1086.81	-110.00	6068.65	11869.06	440.86	11.932	9.24407	37.8	15.094	0.342	0.26064	37.3	87.7	0.430
1086.81	-105.00	6069.47	11864.13	440.86	12.797	9.87760	37.7	16.166	0.357	0.27826	37.9	87.6	0.453
1086.81	-100.00	6070.29	11859.20	440.86	13.754	10.57718	37.6	17.351	0.373	0.29736	38.6	87.6	0.477
1086.81	-95.00	6071.11	11854.27	440.86	14.815	11.35087	37.5	18.663	0.389	0.31801	39.3	87.6	0.502
1086.81	-90.00	6071.94	11849.33	440.86	15.993	12.20758	37.4	20.120	0.405	0.34025	40.0	87.6	0.529
1086.81	-85.00	6072.76	11844.40	440.86	17.302	13.15703	37.3	21.736	0.422	0.36409	40.8	87.6	0.557
1086.81	-80.00	6073.58	11839.47	440.86	18.758	14.20960	37.1	23.532	0.438	0.38946	41.6	87.6	0.586
1086.81	-75.00	6074.41	11834.54	440.86	20.377	15.37604	37.0	25.527	0.455	0.41619	42.5	87.6	0.617
1086.81	-70.00	6075.23	11829.61	440.86	22.175	16.66694	36.9	27.740	0.471	0.44393	43.3	87.7	0.647
1086.81	-65.00	6076.05	11824.68	440.86	24.168	18.09185	36.8	30.190	0.487	0.47216	44.1	87.7	0.678
1086.81	-60.00	6076.88	11819.74	440.86	26.370	19.65797	36.7	32.891	0.502	0.50006	44.9	87.9	0.708
1086.81	-55.00	6077.70	11814.81	440.86	28.790	21.36819	36.6	35.853	0.517	0.52645	45.5	88.0	0.738
1086.81	-50.00	6078.52	11809.88	440.86	31.427	23.21831	36.5	39.074	0.531	0.54975	46.0	88.2	0.764
1086.81	-45.00	6079.34	11804.95	440.86	34.270	25.19351	36.3	42.534	0.546	0.56792	46.1	88.4	0.788
1086.81	-40.00	6080.17	11800.02	440.86	37.286	27.26401	36.2	46.191	0.562	0.57856	45.8	88.7	0.807
1086.81	-35.00	6080.99	11795.09	440.86	40.420	29.38060	36.0	49.970	0.582	0.57910	44.9	89.0	0.821
1086.81	-30.00	6081.81	11790.15	440.86	43.584	31.47100	35.8	53.758	0.605	0.56726	43.1	89.2	0.829
1086.81	-25.00	6082.64	11785.22	440.86	46.654	33.43887	35.6	57.400	0.636	0.54183	40.4	89.4	0.835
1086.81	-20.00	6083.46	11780.29	440.86	49.477	35.16766	35.4	60.702	0.675	0.50369	36.8	89.3	0.840
1086.81	-15.00	6084.28	11775.36	440.86	51.875	36.53122	35.2	63.447	0.723	0.45683	32.3	88.9	0.853
1086.81	-10.00	6085.11	11770.43	440.86	53.669	37.41114	34.9	65.421	0.782	0.40814	27.6	88.3	0.879
1086.81	-5.00	6085.93	11765.49	440.86	54.706	37.71819	34.6	66.448	0.854	0.36233	23.0	87.7	0.925
1086.81	0.00	6086.75	11760.56	440.86	54.888	37.41150	34.3	66.425	0.939	0.31170	18.4	87.4	0.987
1086.81	5.00	6087.57	11755.63	440.86	54.194	36.50890	34.0	65.344	1.029	0.24510	13.4	87.4	1.056
1086.81	10.00	6088.40	11750.70	440.86	52.684	35.08378	33.7	63.296	1.107	0.17512	9.0	87.8	1.119
1086.81	15.00	6089.22	11745.77	440.86	50.486	33.24976	33.4	60.452	1.161	0.12015	5.9	88.4	1.167
1086.81	20.00	6090.04	11740.84	440.86	47.774	31.13875	33.1	57.026	1.190	0.08536	4.1	89.0	1.193
1086.81	25.00	6090.87	11735.90	440.86	44.732	28.87977	32.8	53.245	1.197	0.06790	3.2	89.7	1.199
1086.81	30.00	6091.69	11730.97	440.86	41.531	26.58389	32.6	49.311	1.186	0.06295	3.0	90.2	1.187
1086.81	35.00	6092.51	11726.04	440.86	38.313	24.33672	32.4	45.389	1.160	0.06593	3.3	90.7	1.162
1086.81	40.00	6093.34	11721.11	440.86	35.185	22.19752	32.2	41.601	1.124	0.07305	3.7	91.1	1.126
1086.81	45.00	6094.16	11716.18	440.86	32.217	20.20242	32.1	38.027	1.080	0.08168	4.3	91.4	1.083
1086.81	50.00	6094.98	11711.24	440.86	29.452	18.36929	32.0	34.711	1.031	0.09017	5.0	91.7	1.035
1086.81	55.00	6095.80	11706.31	440.86	26.909	16.70292	31.8	31.672	0.980	0.09763	5.7	91.9	0.985
1086.81	60.00	6096.63	11701.38	440.86	24.593	15.19942	31.7	28.911	0.928	0.10365	6.4	92.1	0.934

1086.81	65.00	6097.45	11696.45	440.86	22.497	13.84962	31.6	26.418	0.877	0.10811	7.0	92.2	0.884
1086.81	70.00	6098.27	11691.52	440.86	20.607	12.64157	31.5	24.176	0.827	0.11108	7.7	92.3	0.834
1086.81	75.00	6099.10	11686.59	440.86	18.909	11.56221	31.4	22.164	0.779	0.11272	8.2	92.4	0.787
1086.81	80.00	6099.92	11681.65	440.86	17.384	10.59842	31.4	20.360	0.733	0.11321	8.8	92.4	0.741
1086.81	85.00	6100.74	11676.72	440.86	16.015	9.73766	31.3	18.743	0.689	0.11276	9.3	92.4	0.699
1086.81	90.00	6101.57	11671.79	440.86	14.787	8.96831	31.2	17.294	0.649	0.11155	9.8	92.4	0.658
1086.81	95.00	6102.39	11666.86	440.86	13.683	8.27982	31.2	15.993	0.611	0.10975	10.2	92.4	0.620
1086.81	100.00	6103.21	11661.93	440.86	12.689	7.66274	31.1	14.823	0.575	0.10749	10.6	92.4	0.585
1086.81	105.00	6104.04	11656.99	440.86	11.794	7.10870	31.1	13.771	0.542	0.10489	11.0	92.4	0.552
1086.81	110.00	6104.86	11652.06	440.86	10.986	6.61029	31.0	12.821	0.511	0.10206	11.3	92.4	0.521
1086.81	115.00	6105.68	11647.13	440.86	10.255	6.16104	31.0	11.963	0.483	0.09907	11.6	92.3	0.493
1086.81	120.00	6106.50	11642.20	440.86	9.592	5.75524	31.0	11.186	0.456	0.09599	11.9	92.3	0.466
1086.81	125.00	6107.33	11637.27	440.86	8.990	5.38794	30.9	10.481	0.431	0.09286	12.1	92.3	0.441
1086.81	130.00	6108.15	11632.34	440.86	8.443	5.05479	30.9	9.840	0.409	0.08973	12.4	92.2	0.418
1086.81	135.00	6108.97	11627.40	440.86	7.944	4.75197	30.9	9.257	0.387	0.08663	12.6	92.2	0.397
1086.81	140.00	6109.80	11622.47	440.86	7.488	4.47616	30.9	8.724	0.367	0.08358	12.8	92.2	0.377
1086.81	145.00	6110.62	11617.54	440.86	7.070	4.22445	30.9	8.236	0.349	0.08059	13.0	92.1	0.358
1086.81	150.00	6111.44	11612.61	440.86	6.687	3.99427	30.8	7.789	0.332	0.07768	13.2	92.1	0.341
1086.81	155.00	6112.27	11607.68	440.86	6.335	3.78338	30.8	7.379	0.316	0.07486	13.3	92.0	0.325
1086.81	160.00	6113.09	11602.75	440.86	6.011	3.58979	30.8	7.001	0.301	0.07214	13.5	92.0	0.309
1086.81	165.00	6113.91	11597.81	440.86	5.712	3.41176	30.8	6.654	0.287	0.06951	13.6	92.0	0.295
1086.81	170.00	6114.73	11592.88	440.86	5.436	3.24775	30.9	6.332	0.274	0.06698	13.7	91.9	0.282
1086.81	175.00	6115.56	11587.95	440.86	5.180	3.09639	30.9	6.035	0.262	0.06455	13.8	91.9	0.270
1086.81	180.00	6116.38	11583.02	440.86	4.944	2.95648	30.9	5.760	0.250	0.06221	14.0	91.8	0.258
1086.81	185.00	6117.20	11578.09	440.86	4.723	2.82693	30.9	5.505	0.240	0.05998	14.0	91.8	0.247
1086.81	190.00	6118.03	11573.15	440.86	4.519	2.70680	30.9	5.267	0.230	0.05783	14.1	91.8	0.237
1086.81	195.00	6118.85	11568.22	440.86	4.328	2.59522	30.9	5.047	0.220	0.05579	14.2	91.7	0.227
1086.81	200.00	6119.67	11563.29	440.86	4.150	2.49143	31.0	4.841	0.212	0.05385	14.3	91.7	0.219

Structure 5b

PLS-CADD Version 10.40 4:32:07 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10 \345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
Assumed 90 MPH Extreme Wind Loading (Rule 250C)
Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
Assumed Maximum Operating Temperature of 212 F
Assumed 1" Extreme Ice (Non-NESC)
Assumed Grade B Construction
<<Illustration of NESC provisions include>>
> Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
> Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
> 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
> Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
> Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
> 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
> Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
**** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
**** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
> Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
**** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
**** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
**** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE,
the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL
values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of
Composite Line Post Insulators for further clarification. ****
**** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
**** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
**** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
**** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
> Structure Loads criteria includes typical Full Structure DE cases
POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
THIS FILE IS PROVIDED FOR ILLUSTRATION ONLY. CRITERIA SHOULD BE CHECKED AND MODIFIED AS NECESSARY BY AN ENGINEER IN RESPONSIBLE CHARGE,
FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
RESPONSIBLE ENGINEER SHOULD VERIFY MAXIMUM OPERATING CONDITION FOR THEIR APPLICABLE PROJECT
RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28	(ft)
Cross section offset for graph +/-:	200.00	(ft)
Result interval for graph:	5.00	(ft)
Electric field limit:	1.60	(kV/m)
Magnetic field limit:	200.00	(mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	1	1	345	1180.000	0	1.762
2	2	1	345	1180.000	120	1.762
2	3	1	345	1180.000	-120	1.762

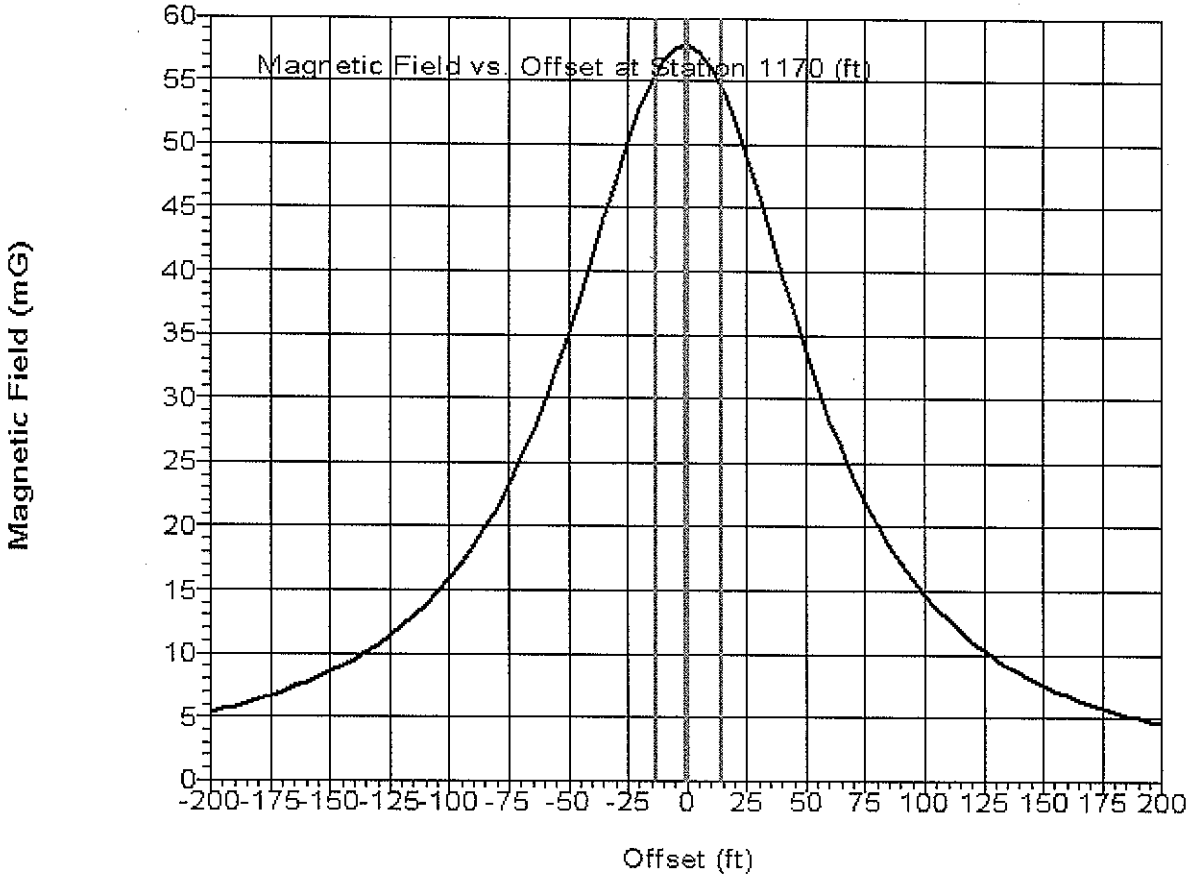
Calculated EMF Circuit Data For Last Point:

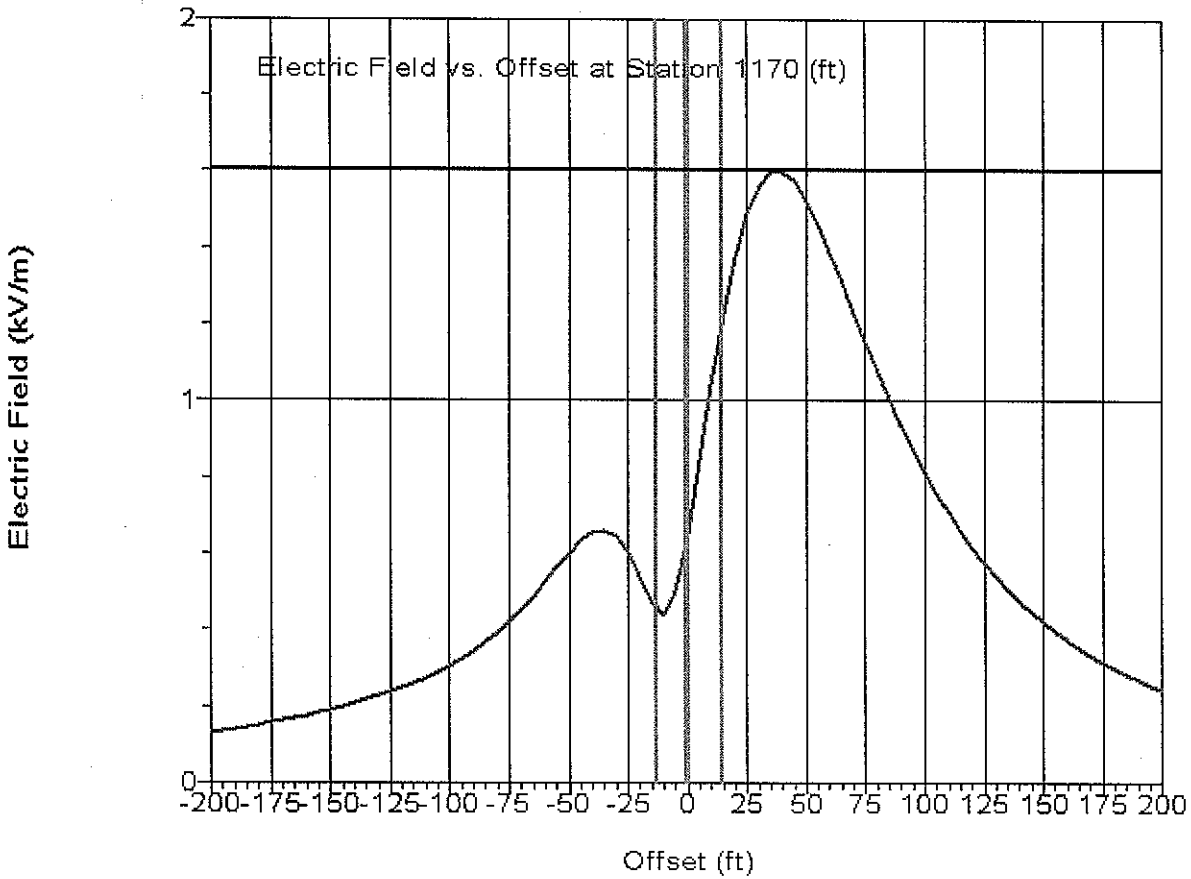
**Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.**

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1	NESC Heavy (250B)	Creep RS	Left	6129.52	11809.03	520.62	1170.09	0.47	0.509	199.2
2	1	NESC Heavy (250B)	Creep RS	Left	6143.91	11808.86	502.38	1170.36	14.86	1.762	199.2
2	2	NESC Heavy (250B)	Creep RS	Left	6128.27	11809.04	500.35	1170.07	-0.78	1.762	199.2
2	3	NESC Heavy (250B)	Creep RS	Left	6116.00	11810.37	499.02	1171.04	-13.09	1.762	199.2

Maximum magnetic field of 57.82 (mG) found at station 1170.09, offset 0.00 (ft)
Maximum electric field of 1.598 (kV/m) found at station 1170.09, offset 40.00 (ft)





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1170.09	-200.00	5929.14	11814.93	440.74	4.458	3.01639	34.1	5.382	0.118	0.05199	23.7	88.8	0.129
1170.09	-195.00	5934.14	11814.78	440.74	4.646	3.14019	34.1	5.608	0.122	0.05517	24.3	88.7	0.134
1170.09	-190.00	5939.13	11814.64	440.74	4.847	3.27272	34.0	5.849	0.126	0.05863	24.9	88.7	0.139
1170.09	-185.00	5944.13	11814.49	440.74	5.063	3.41481	34.0	6.107	0.130	0.06241	25.6	88.7	0.144
1170.09	-180.00	5949.13	11814.34	440.74	5.294	3.56740	34.0	6.384	0.134	0.06655	26.4	88.7	0.150
1170.09	-175.00	5954.13	11814.19	440.74	5.543	3.73151	33.9	6.682	0.138	0.07109	27.2	88.7	0.156

1170.09	-170.00	5959.12	11814.05	440.74	5.810	3.90831	33.9	7.002	0.143	0.07609	28.0	88.7	0.162
1170.09	-165.00	5964.12	11813.90	440.74	6.098	4.09909	33.9	7.348	0.147	0.08159	29.0	88.6	0.168
1170.09	-160.00	5969.12	11813.75	440.74	6.409	4.30533	33.9	7.721	0.152	0.08766	30.0	88.6	0.175
1170.09	-155.00	5974.12	11813.61	440.74	6.746	4.52866	33.9	8.125	0.156	0.09437	31.2	88.6	0.182
1170.09	-150.00	5979.12	11813.46	440.74	7.110	4.77094	33.9	8.562	0.160	0.10181	32.4	88.6	0.190
1170.09	-145.00	5984.11	11813.31	440.74	7.505	5.03427	33.9	9.037	0.165	0.11006	33.8	88.6	0.198
1170.09	-140.00	5989.11	11813.16	440.74	7.935	5.32102	33.8	9.554	0.169	0.11923	35.2	88.5	0.207
1170.09	-135.00	5994.11	11813.02	440.74	8.402	5.63387	33.8	10.116	0.173	0.12944	36.9	88.5	0.216
1170.09	-130.00	5999.11	11812.87	440.74	8.912	5.97584	33.8	10.730	0.176	0.14083	38.7	88.5	0.225
1170.09	-125.00	6004.11	11812.72	440.74	9.470	6.35037	33.8	11.402	0.179	0.15356	40.6	88.4	0.236
1170.09	-120.00	6009.10	11812.57	440.74	10.080	6.76132	33.9	12.138	0.181	0.16779	42.8	88.4	0.247
1170.09	-115.00	6014.10	11812.43	440.74	10.750	7.21305	33.9	12.946	0.183	0.18371	45.1	88.3	0.259
1170.09	-110.00	6019.10	11812.28	440.74	11.486	7.71048	33.9	13.834	0.184	0.20154	47.7	88.2	0.272
1170.09	-105.00	6024.10	11812.13	440.74	12.295	8.25907	33.9	14.812	0.183	0.22150	50.5	88.1	0.287
1170.09	-100.00	6029.09	11811.98	440.74	13.188	8.86494	33.9	15.890	0.181	0.24383	53.5	88.0	0.303
1170.09	-95.00	6034.09	11811.84	440.74	14.173	9.53477	33.9	17.082	0.176	0.26875	56.7	87.9	0.321
1170.09	-90.00	6039.09	11811.69	440.74	15.261	10.27583	34.0	18.398	0.170	0.29649	60.2	87.8	0.341
1170.09	-85.00	6044.09	11811.54	440.74	16.465	11.09579	34.0	19.854	0.161	0.32721	63.8	87.6	0.364
1170.09	-80.00	6049.09	11811.40	440.74	17.795	12.00254	34.0	21.465	0.149	0.36101	67.6	87.5	0.390
1170.09	-75.00	6054.08	11811.25	440.74	19.266	13.00370	34.0	23.244	0.134	0.39781	71.4	87.3	0.419
1170.09	-70.00	6059.08	11811.10	440.74	20.889	14.10601	34.0	25.205	0.115	0.43733	75.3	87.2	0.452
1170.09	-65.00	6064.08	11810.95	440.74	22.675	15.31431	34.0	27.362	0.093	0.47892	79.0	87.2	0.487
1170.09	-60.00	6069.08	11810.81	440.74	24.634	16.63002	34.0	29.722	0.068	0.52146	82.6	87.3	0.525
1170.09	-55.00	6074.07	11810.66	440.74	26.770	18.04923	34.0	32.286	0.042	0.56320	85.7	87.5	0.564
1170.09	-50.00	6079.07	11810.51	440.74	29.078	19.56006	33.9	35.044	0.022	0.60157	87.9	87.8	0.602
1170.09	-45.00	6084.07	11810.36	440.74	31.545	21.13975	33.8	37.973	0.026	0.63315	87.6	88.4	0.633
1170.09	-40.00	6089.07	11810.22	440.74	34.142	22.75162	33.7	41.028	0.042	0.65368	86.3	89.2	0.655
1170.09	-35.00	6094.07	11810.07	440.74	36.823	24.34279	33.5	44.142	0.050	0.65838	85.7	90.3	0.660
1170.09	-30.00	6099.06	11809.92	440.74	39.520	25.84385	33.2	47.220	0.044	0.64258	86.1	91.7	0.644
1170.09	-25.00	6104.06	11809.78	440.74	42.145	27.17184	32.8	50.145	0.031	0.60272	87.1	93.4	0.603
1170.09	-20.00	6109.06	11809.63	440.74	44.590	28.23750	32.3	52.779	0.072	0.53754	82.4	95.0	0.540
1170.09	-15.00	6114.06	11809.48	440.74	46.738	28.95688	31.8	54.981	0.165	0.44913	69.8	94.9	0.470
1170.09	-10.00	6119.06	11809.33	440.74	48.468	29.26508	31.1	56.618	0.296	0.34340	49.2	89.3	0.437
1170.09	-5.00	6124.05	11809.19	440.74	49.674	29.12883	30.4	57.585	0.459	0.23000	26.6	81.5	0.499
1170.09	0.00	6129.05	11809.04	440.74	50.277	28.55361	29.6	57.819	0.645	0.12336	10.8	79.6	0.650
1170.09	5.00	6134.05	11808.89	440.74	50.231	27.58287	28.8	57.306	0.841	0.06536	4.4	81.0	0.841
1170.09	10.00	6139.05	11808.74	440.74	49.537	26.28958	28.0	56.080	1.035	0.11077	6.1	82.9	1.040
1170.09	15.00	6144.04	11808.60	440.74	48.239	24.76301	27.2	54.224	1.211	0.16984	8.0	84.7	1.222
1170.09	20.00	6149.04	11808.45	440.74	46.422	23.09484	26.5	51.850	1.358	0.21285	8.9	86.2	1.375
1170.09	25.00	6154.04	11808.30	440.74	44.195	21.36808	25.8	49.089	1.470	0.23808	9.2	87.5	1.489
1170.09	30.00	6159.04	11808.16	440.74	41.680	19.65038	25.2	46.080	1.543	0.24810	9.1	88.6	1.563
1170.09	35.00	6164.04	11808.01	440.74	38.998	17.99178	24.8	42.948	1.579	0.24654	8.9	89.5	1.598
1170.09	40.00	6169.03	11807.86	440.74	36.256	16.42553	24.4	39.803	1.581	0.23691	8.5	90.3	1.598
1170.09	45.00	6174.03	11807.71	440.74	33.542	14.97086	24.1	36.732	1.556	0.22223	8.1	90.8	1.571
1170.09	50.00	6179.03	11807.57	440.74	30.922	13.63621	23.8	33.796	1.509	0.20481	7.7	91.3	1.523
1170.09	55.00	6184.03	11807.42	440.74	28.441	12.42239	23.6	31.036	1.448	0.18630	7.3	91.7	1.460
1170.09	60.00	6189.02	11807.27	440.74	26.125	11.32522	23.4	28.474	1.378	0.16783	6.9	92.0	1.388

1170.09	65.00	6194.02	11807.12	440.74	23.986	10.33754	23.3	26.119	1.302	0.15011	6.6	92.2	1.311
1170.09	70.00	6199.02	11806.98	440.74	22.027	9.45066	23.2	23.969	1.224	0.13354	6.2	92.3	1.232
1170.09	75.00	6204.02	11806.83	440.74	20.243	8.65532	23.2	22.015	1.147	0.11831	5.9	92.4	1.153
1170.09	80.00	6209.02	11806.68	440.74	18.624	7.94235	23.1	20.247	1.072	0.10450	5.6	92.5	1.077
1170.09	85.00	6214.01	11806.54	440.74	17.159	7.30303	23.1	18.649	1.001	0.09208	5.3	92.6	1.005
1170.09	90.00	6219.01	11806.39	440.74	15.835	6.72927	23.0	17.206	0.933	0.08098	5.0	92.6	0.936
1170.09	95.00	6224.01	11806.24	440.74	14.640	6.21373	23.0	15.904	0.869	0.07111	4.7	92.6	0.872
1170.09	100.00	6229.01	11806.09	440.74	13.559	5.74980	23.0	14.728	0.810	0.06234	4.4	92.6	0.813
1170.09	105.00	6234.01	11805.95	440.74	12.583	5.33161	23.0	13.666	0.755	0.05459	4.1	92.6	0.757
1170.09	110.00	6239.00	11805.80	440.74	11.700	4.95396	22.9	12.705	0.705	0.04773	3.9	92.5	0.706
1170.09	115.00	6244.00	11805.65	440.74	10.900	4.61227	22.9	11.835	0.658	0.04166	3.6	92.5	0.659
1170.09	120.00	6249.00	11805.50	440.74	10.173	4.30250	22.9	11.046	0.615	0.03630	3.4	92.5	0.616
1170.09	125.00	6254.00	11805.36	440.74	9.514	4.02112	22.9	10.329	0.575	0.03156	3.1	92.4	0.576
1170.09	130.00	6258.99	11805.21	440.74	8.913	3.76500	22.9	9.676	0.538	0.02737	2.9	92.4	0.539
1170.09	135.00	6263.99	11805.06	440.74	8.365	3.53141	22.9	9.080	0.504	0.02366	2.7	92.3	0.505
1170.09	140.00	6268.99	11804.92	440.74	7.865	3.31796	22.9	8.536	0.473	0.02038	2.5	92.3	0.474
1170.09	145.00	6273.99	11804.77	440.74	7.407	3.12254	22.9	8.038	0.445	0.01747	2.2	92.3	0.445
1170.09	150.00	6278.99	11804.62	440.74	6.987	2.94328	22.8	7.582	0.418	0.01489	2.0	92.2	0.419
1170.09	155.00	6283.98	11804.47	440.74	6.601	2.77854	22.8	7.162	0.394	0.01259	1.8	92.2	0.394
1170.09	160.00	6288.98	11804.33	440.74	6.246	2.62687	22.8	6.776	0.372	0.01056	1.6	92.1	0.372
1170.09	165.00	6293.98	11804.18	440.74	5.919	2.48700	22.8	6.420	0.351	0.00875	1.4	92.1	0.351
1170.09	170.00	6298.98	11804.03	440.74	5.617	2.35778	22.8	6.091	0.331	0.00713	1.2	92.0	0.331
1170.09	175.00	6303.97	11803.88	440.74	5.337	2.23821	22.8	5.787	0.313	0.00570	1.0	92.0	0.314
1170.09	180.00	6308.97	11803.74	440.74	5.078	2.12739	22.7	5.506	0.297	0.00442	0.9	92.0	0.297
1170.09	185.00	6313.97	11803.59	440.74	4.838	2.02452	22.7	5.244	0.281	0.00328	0.7	91.9	0.282
1170.09	190.00	6318.97	11803.44	440.74	4.614	1.92888	22.7	5.001	0.267	0.00226	0.5	91.9	0.267
1170.09	195.00	6323.97	11803.29	440.74	4.407	1.83984	22.7	4.775	0.254	0.00136	0.3	91.8	0.254
1170.09	200.00	6328.96	11803.15	440.74	4.213	1.75683	22.6	4.564	0.241	0.00058	0.1	91.8	0.241

Midspan of Structure 5 & 6

PLS-CADD Version 10.40 4:32:43 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10 \345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
  Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
  Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
  Assumed 90 MPH Extreme Wind Loading (Rule 250C)
  Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
  Assumed Maximum Operating Temperature of 212 F
  Assumed 1" Extreme Ice (Non-NESC)
  Assumed Grade B Construction
  <<Illustration of NESC provisions include>>
    > Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
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    > Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
    > Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
    > 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
    > Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
     **** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
     **** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
    > Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
     **** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
     **** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
     **** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE,
          the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL
          values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of
          Composite Line Post Insulators for further clarification. ****
     **** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
     **** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
     **** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
     **** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
    > Structure Loads criteria includes typical Full Structure DE cases
  POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
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  FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
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RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28 (ft)
Cross section offset for graph +/-:	200.00 (ft)
Result interval for graph:	5.00 (ft)
Electric field limit:	1.60 (kV/m)
Magnetic field limit:	200.00 (mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	1	1	345	1180.000	0	1.762
2	2	1	345	1180.000	120	1.762
2	3	1	345	1180.000	-120	1.762

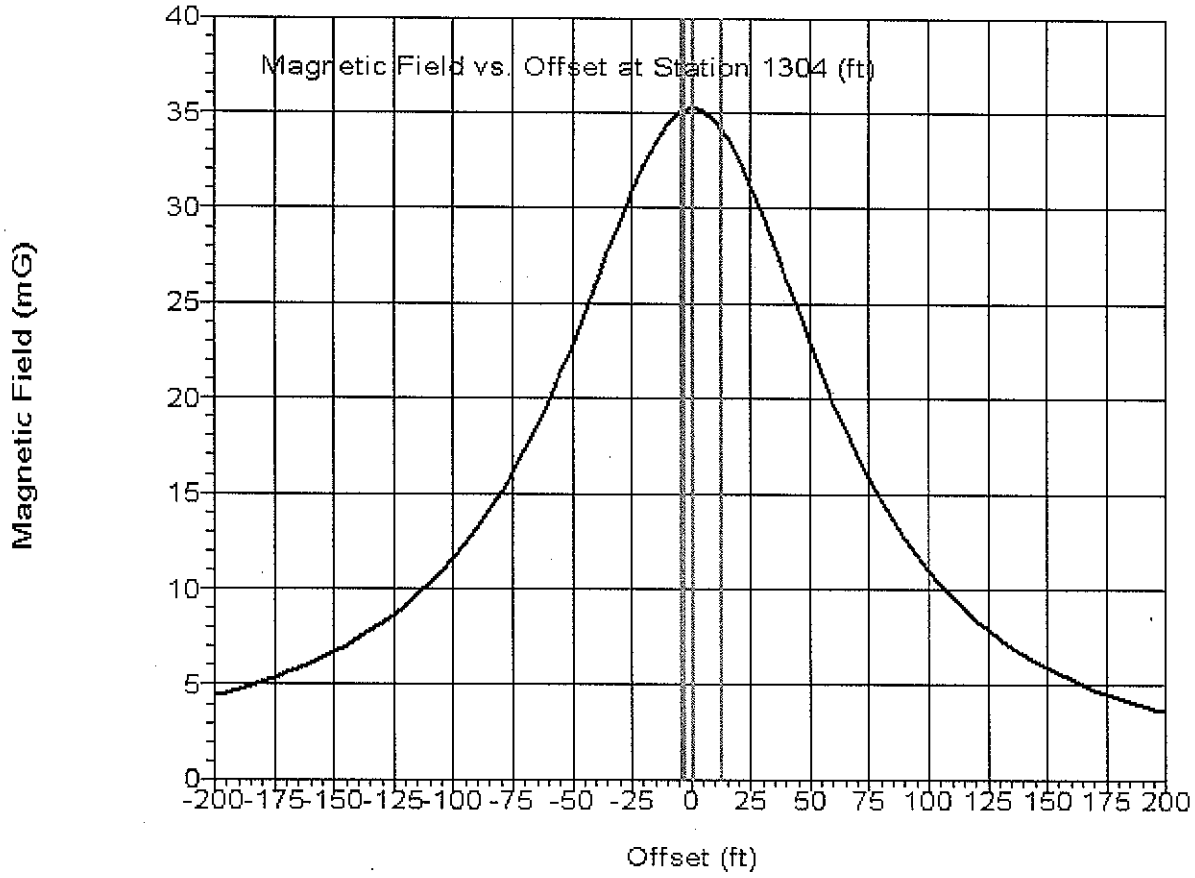
Calculated EMF Circuit Data For Last Point:

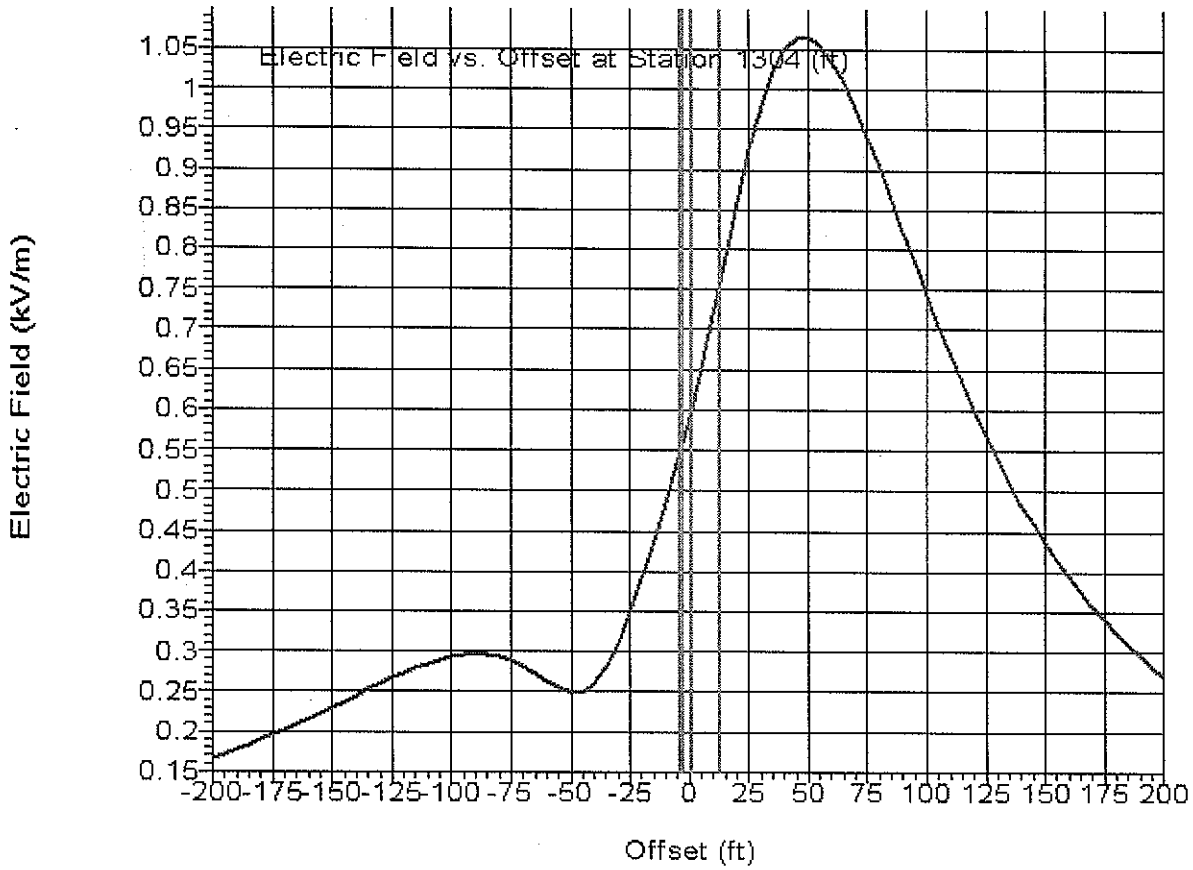
**Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.**

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1	NESC Heavy (250B)	Creep RS	Left	6134.12	11943.00	534.10	1304.15	1.12	0.509	199.2
2	1	NESC Heavy (250B)	Creep RS	Left	6145.85	11942.89	513.02	1304.38	12.85	1.762	199.2
2	2	NESC Heavy (250B)	Creep RS	Left	6129.19	11943.05	506.86	1304.05	-3.81	1.762	199.2
2	3	NESC Heavy (250B)	Creep RS	Left	6129.98	11943.34	501.15	1304.37	-3.02	1.762	199.2

Maximum magnetic field of 35.26 (mG) found at station 1304.15, offset 0.00 (ft)
Maximum electric field of 1.065 (kV/m) found at station 1304.15, offset 50.00 (ft)





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1304.15	-200.00	5933.09	11948.93	438.00	3.778	2.27105	31.0	4.408	0.166	0.00286	1.0	88.9	0.166
1304.15	-195.00	5938.08	11948.78	438.00	3.925	2.34925	30.9	4.574	0.171	0.00317	1.1	88.9	0.171
1304.15	-190.00	5943.08	11948.63	438.00	4.082	2.43239	30.8	4.752	0.177	0.00349	1.1	88.9	0.177
1304.15	-185.00	5948.08	11948.49	438.00	4.250	2.52088	30.7	4.941	0.183	0.00382	1.2	88.9	0.183
1304.15	-180.00	5953.08	11948.34	438.00	4.429	2.61518	30.6	5.144	0.189	0.00415	1.3	88.9	0.189
1304.15	-175.00	5958.08	11948.19	438.00	4.621	2.71582	30.4	5.360	0.196	0.00448	1.3	88.9	0.196

1304.15	-170.00	5963.07	11948.04	438.00	4.826	2.82337	30.3	5.591	0.202	0.00482	1.4	88.9	0.202
1304.15	-165.00	5968.07	11947.90	438.00	5.046	2.93845	30.2	5.839	0.209	0.00514	1.4	89.0	0.209
1304.15	-160.00	5973.07	11947.75	438.00	5.283	3.06177	30.1	6.106	0.216	0.00545	1.4	89.0	0.216
1304.15	-155.00	5978.07	11947.60	438.00	5.537	3.19411	30.0	6.392	0.223	0.00573	1.5	89.0	0.223
1304.15	-150.00	5983.06	11947.46	438.00	5.810	3.33633	29.9	6.700	0.230	0.00597	1.5	89.0	0.230
1304.15	-145.00	5988.06	11947.31	438.00	6.105	3.48939	29.7	7.032	0.238	0.00616	1.5	89.1	0.238
1304.15	-140.00	5993.06	11947.16	438.00	6.424	3.65436	29.6	7.391	0.245	0.00627	1.5	89.1	0.245
1304.15	-135.00	5998.06	11947.01	438.00	6.768	3.83241	29.5	7.778	0.252	0.00627	1.4	89.2	0.252
1304.15	-130.00	6003.06	11946.87	438.00	7.141	4.02485	29.4	8.198	0.259	0.00615	1.4	89.3	0.260
1304.15	-125.00	6008.05	11946.72	438.00	7.546	4.23313	29.3	8.652	0.266	0.00585	1.3	89.3	0.266
1304.15	-120.00	6013.05	11946.57	438.00	7.985	4.45884	29.2	9.145	0.273	0.00533	1.1	89.4	0.273
1304.15	-115.00	6018.05	11946.42	438.00	8.462	4.70372	29.1	9.681	0.279	0.00454	0.9	89.6	0.279
1304.15	-110.00	6023.05	11946.28	438.00	8.981	4.96968	29.0	10.265	0.285	0.00348	0.7	89.7	0.285
1304.15	-105.00	6028.05	11946.13	438.00	9.547	5.25878	28.8	10.899	0.289	0.00238	0.5	89.9	0.289
1304.15	-100.00	6033.04	11945.98	438.00	10.163	5.57322	28.7	11.591	0.293	0.00269	0.5	90.0	0.293
1304.15	-95.00	6038.04	11945.84	438.00	10.836	5.91529	28.6	12.345	0.296	0.00530	1.0	90.3	0.296
1304.15	-90.00	6043.04	11945.69	438.00	11.569	6.28737	28.5	13.167	0.296	0.00939	1.8	90.5	0.296
1304.15	-85.00	6048.04	11945.54	438.00	12.369	6.69178	28.4	14.063	0.295	0.01489	2.9	90.8	0.296
1304.15	-80.00	6053.03	11945.39	438.00	13.241	7.13071	28.3	15.039	0.292	0.02205	4.3	91.1	0.293
1304.15	-75.00	6058.03	11945.25	438.00	14.191	7.60595	28.2	16.101	0.286	0.03121	6.2	91.5	0.288
1304.15	-70.00	6063.03	11945.10	438.00	15.222	8.11869	28.1	17.252	0.278	0.04279	8.7	91.8	0.281
1304.15	-65.00	6068.03	11944.95	438.00	16.340	8.66908	27.9	18.497	0.267	0.05726	12.1	92.1	0.273
1304.15	-60.00	6073.03	11944.80	438.00	17.544	9.25575	27.8	19.836	0.253	0.07513	16.5	92.3	0.263
1304.15	-55.00	6078.02	11944.66	438.00	18.836	9.87518	27.7	21.267	0.236	0.09689	22.3	92.1	0.255
1304.15	-50.00	6083.02	11944.51	438.00	20.209	10.52090	27.5	22.783	0.218	0.12296	29.4	91.4	0.249
1304.15	-45.00	6088.02	11944.36	438.00	21.653	11.18268	27.3	24.370	0.199	0.15355	37.7	90.2	0.250
1304.15	-40.00	6093.02	11944.22	438.00	23.152	11.84571	27.1	26.007	0.180	0.18860	46.3	88.6	0.259
1304.15	-35.00	6098.02	11944.07	438.00	24.680	12.49008	26.8	27.661	0.165	0.22754	54.0	87.2	0.280
1304.15	-30.00	6103.01	11943.92	438.00	26.202	13.09073	26.5	29.290	0.156	0.26919	59.9	86.3	0.310
1304.15	-25.00	6108.01	11943.77	438.00	27.672	13.61831	26.2	30.842	0.156	0.31162	63.4	85.9	0.348
1304.15	-20.00	6113.01	11943.63	438.00	29.037	14.04119	25.8	32.254	0.170	0.35225	64.2	86.0	0.391
1304.15	-15.00	6118.01	11943.48	438.00	30.238	14.32869	25.4	33.461	0.200	0.38800	62.7	86.2	0.437
1304.15	-10.00	6123.00	11943.33	438.00	31.214	14.45525	24.8	34.399	0.249	0.41575	59.1	86.3	0.484
1304.15	-5.00	6128.00	11943.18	438.00	31.909	14.40463	24.3	35.010	0.315	0.43287	54.0	86.3	0.534
1304.15	0.00	6133.00	11943.04	438.00	32.283	14.17311	23.7	35.257	0.397	0.43778	47.8	86.2	0.590
1304.15	5.00	6138.00	11942.89	438.00	32.311	13.77064	23.1	35.123	0.491	0.43025	41.2	86.1	0.651
1304.15	10.00	6143.00	11942.74	438.00	31.991	13.21948	22.5	34.615	0.591	0.41146	34.8	86.1	0.719
1304.15	15.00	6147.99	11942.60	438.00	31.345	12.55067	21.8	33.765	0.692	0.38369	29.0	86.3	0.790
1304.15	20.00	6152.99	11942.45	438.00	30.412	11.79952	21.2	32.620	0.787	0.34981	24.0	86.7	0.860
1304.15	25.00	6157.99	11942.30	438.00	29.242	11.00105	20.6	31.243	0.871	0.31272	19.8	87.2	0.924
1304.15	30.00	6162.99	11942.15	438.00	27.896	10.18658	20.1	29.697	0.940	0.27499	16.3	87.8	0.979
1304.15	35.00	6167.98	11942.01	438.00	26.430	9.38168	19.5	28.046	0.993	0.23858	13.5	88.4	1.021
1304.15	40.00	6172.98	11941.86	438.00	24.900	8.60553	19.1	26.345	1.030	0.20483	11.3	89.0	1.050
1304.15	45.00	6177.98	11941.71	438.00	23.351	7.87118	18.6	24.642	1.050	0.17448	9.4	89.5	1.064
1304.15	50.00	6182.98	11941.56	438.00	21.821	7.18648	18.2	22.974	1.055	0.14781	8.0	89.9	1.065
1304.15	55.00	6187.98	11941.42	438.00	20.338	6.55515	17.9	21.368	1.048	0.12481	6.8	90.3	1.055
1304.15	60.00	6192.97	11941.27	438.00	18.921	5.97787	17.5	19.843	1.031	0.10522	5.8	90.6	1.036

1304.15	65.00	6197.97	11941.12	438.00	17.583	5.45328	17.2	18.410	1.005	0.08872	5.0	90.9	1.009
1304.15	70.00	6202.97	11940.97	438.00	16.332	4.97865	17.0	17.074	0.974	0.07492	4.4	91.1	0.977
1304.15	75.00	6207.97	11940.83	438.00	15.168	4.55053	16.7	15.836	0.939	0.06345	3.9	91.3	0.941
1304.15	80.00	6212.97	11940.68	438.00	14.093	4.16510	16.5	14.695	0.901	0.05393	3.4	91.5	0.902
1304.15	85.00	6217.96	11940.53	438.00	13.102	3.81848	16.2	13.647	0.861	0.04607	3.1	91.6	0.863
1304.15	90.00	6222.96	11940.39	438.00	12.192	3.50689	16.0	12.687	0.821	0.03958	2.8	91.7	0.822
1304.15	95.00	6227.96	11940.24	438.00	11.358	3.22675	15.9	11.808	0.782	0.03422	2.5	91.8	0.782
1304.15	100.00	6232.96	11940.09	438.00	10.594	2.97475	15.7	11.004	0.743	0.02979	2.3	91.8	0.743
1304.15	105.00	6237.95	11939.94	438.00	9.895	2.74789	15.5	10.270	0.705	0.02614	2.1	91.8	0.705
1304.15	110.00	6242.95	11939.80	438.00	9.255	2.54344	15.4	9.598	0.669	0.02312	2.0	91.9	0.669
1304.15	115.00	6247.95	11939.65	438.00	8.669	2.35896	15.2	8.985	0.634	0.02062	1.9	91.9	0.634
1304.15	120.00	6252.95	11939.50	438.00	8.133	2.19228	15.1	8.423	0.601	0.01854	1.8	91.9	0.601
1304.15	125.00	6257.95	11939.35	438.00	7.641	2.04146	15.0	7.909	0.569	0.01681	1.7	91.9	0.570
1304.15	130.00	6262.94	11939.21	438.00	7.189	1.90479	14.8	7.437	0.540	0.01538	1.6	91.9	0.540
1304.15	135.00	6267.94	11939.06	438.00	6.775	1.78075	14.7	7.005	0.512	0.01417	1.6	91.9	0.512
1304.15	140.00	6272.94	11938.91	438.00	6.393	1.66799	14.6	6.607	0.485	0.01317	1.6	91.9	0.485
1304.15	145.00	6277.94	11938.77	438.00	6.042	1.56533	14.5	6.242	0.460	0.01232	1.5	91.9	0.461
1304.15	150.00	6282.93	11938.62	438.00	5.719	1.47172	14.4	5.905	0.437	0.01161	1.5	91.8	0.437
1304.15	155.00	6287.93	11938.47	438.00	5.420	1.38622	14.3	5.594	0.415	0.01101	1.5	91.8	0.415
1304.15	160.00	6292.93	11938.32	438.00	5.143	1.30802	14.3	5.307	0.395	0.01050	1.5	91.8	0.395
1304.15	165.00	6297.93	11938.18	438.00	4.887	1.23637	14.2	5.041	0.375	0.01006	1.5	91.8	0.375
1304.15	170.00	6302.93	11938.03	438.00	4.650	1.17063	14.1	4.795	0.357	0.00969	1.6	91.7	0.357
1304.15	175.00	6307.92	11937.88	438.00	4.430	1.11023	14.1	4.567	0.340	0.00937	1.6	91.7	0.340
1304.15	180.00	6312.92	11937.73	438.00	4.225	1.05464	14.0	4.355	0.324	0.00909	1.6	91.7	0.324
1304.15	185.00	6317.92	11937.59	438.00	4.034	1.00340	14.0	4.157	0.309	0.00885	1.6	91.7	0.309
1304.15	190.00	6322.92	11937.44	438.00	3.857	0.95612	13.9	3.973	0.295	0.00864	1.7	91.7	0.295
1304.15	195.00	6327.92	11937.29	438.00	3.691	0.91241	13.9	3.802	0.282	0.00845	1.7	91.6	0.282
1304.15	200.00	6332.91	11937.15	438.00	3.536	0.87196	13.9	3.642	0.269	0.00829	1.8	91.6	0.269

Structure 6a

PLS-CADD Version 10.40 4:33:28 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10\345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
  Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
  Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
  Assumed 90 MPH Extreme Wind Loading (Rule 250C)
  Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
  Assumed Maximum Operating Temperature of 212 F
  Assumed 1" Extreme Ice (Non-NESC)
  Assumed Grade B Construction
  <<Illustration of NESC provisions include>>
    > Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
    > Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
    > 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
    > Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
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4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28	(ft)
Cross section offset for graph +/-:	200.00	(ft)
Result interval for graph:	5.00	(ft)
Electric field limit:	1.60	(kV/m)
Magnetic field limit:	200.00	(mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	1	1	345	1180.000	0	1.762
2	2	1	345	1180.000	120	1.762
2	3	1	345	1180.000	-120	1.762

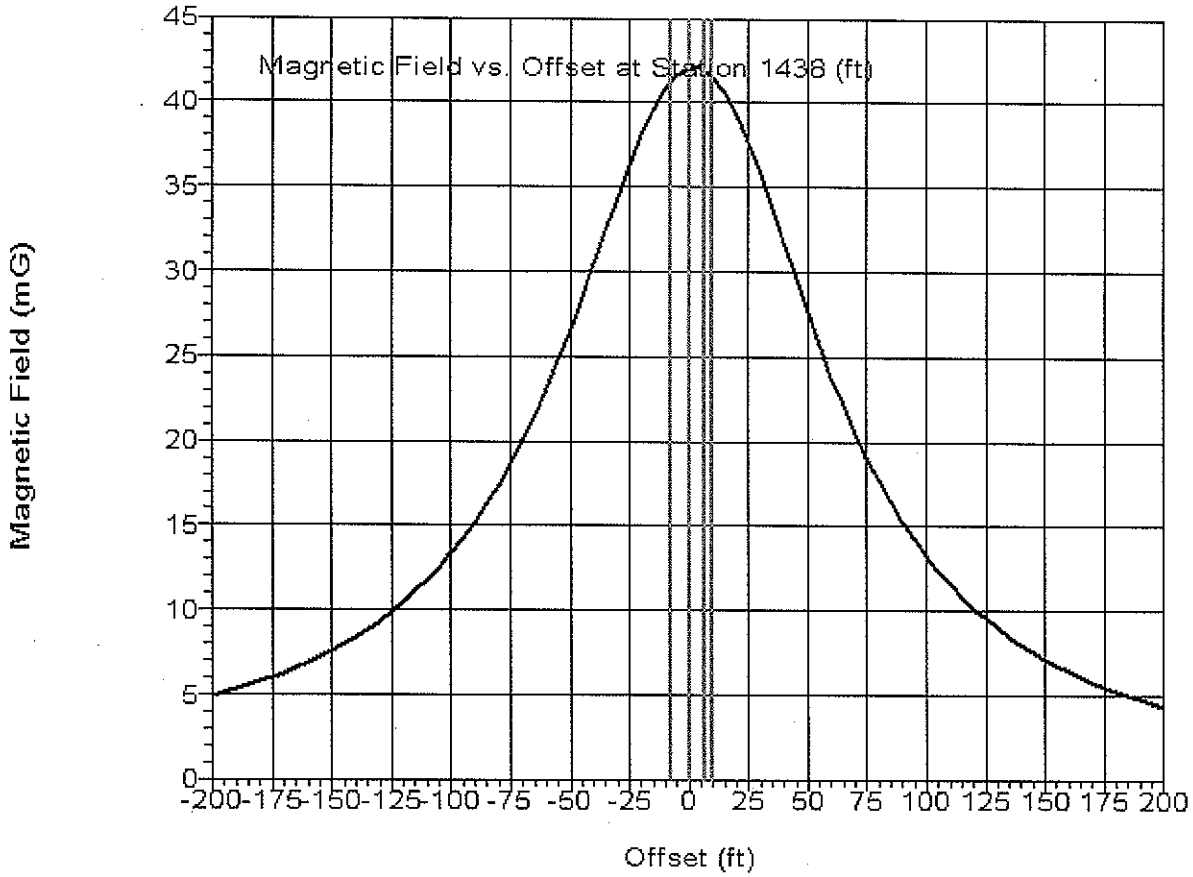
Calculated EMF Circuit Data For Last Point:

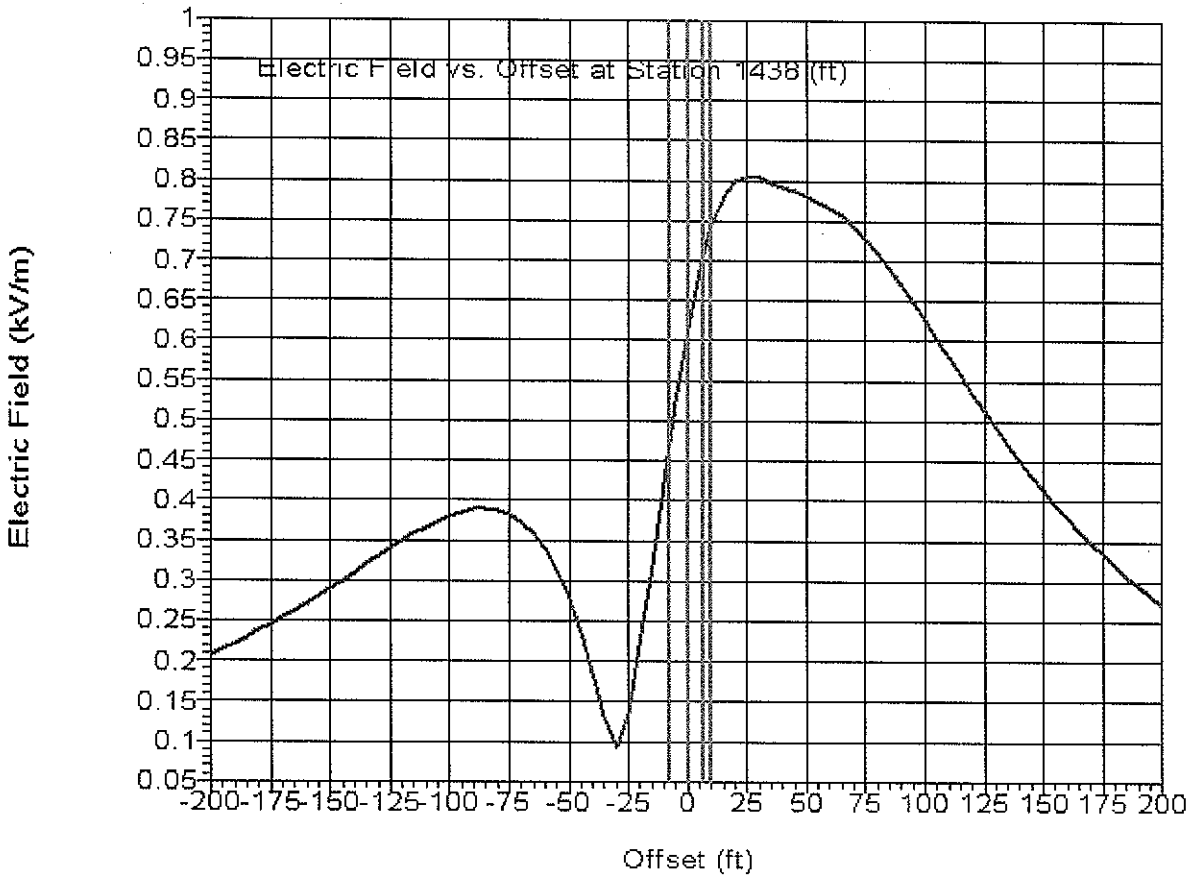
**Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.**

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1 NESC Heavy (250B)	Creep RS	Left	6137.42	12077.02	550.37	1438.21	0.47	0.509	199.2
2	1 NESC Heavy (250B)	Creep RS	Left	6146.98	12076.92	527.01	1438.38	10.03	1.762	199.2
2	2 NESC Heavy (250B)	Creep RS	Left	6129.31	12077.06	516.72	1438.01	-7.64	1.762	199.2
2	3 NESC Heavy (250B)	Creep RS	Left	6143.18	12076.40	506.60	1437.76	6.25	1.762	199.2

Maximum magnetic field of 42.09 (mG) found at station 1438.21, offset 0.00 (ft)
Maximum electric field of 0.804 (kV/m) found at station 1438.21, offset 25.00 (ft)





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1438.21	-200.00	5937.04	12082.93	446.00	3.672	3.25579	41.6	4.907	0.201	0.05003	14.0	88.8	0.207
1438.21	-195.00	5942.03	12082.78	446.00	3.812	3.39022	41.6	5.102	0.207	0.05317	14.4	88.8	0.214
1438.21	-190.00	5947.03	12082.63	446.00	3.962	3.53381	41.7	5.309	0.214	0.05655	14.8	88.8	0.221
1438.21	-185.00	5952.03	12082.48	446.00	4.121	3.68740	41.8	5.530	0.221	0.06019	15.2	88.8	0.229
1438.21	-180.00	5957.03	12082.34	446.00	4.291	3.85189	41.9	5.766	0.228	0.06412	15.7	88.8	0.237
1438.21	-175.00	5962.02	12082.19	446.00	4.472	4.02830	42.0	6.019	0.236	0.06836	16.2	88.8	0.245

1438.21	-170.00	5967.02	12082.04	446.00	4.666	4.21776	42.1	6.290	0.243	0.07293	16.7	88.8	0.254
1438.21	-165.00	5972.02	12081.90	446.00	4.873	4.42152	42.2	6.580	0.251	0.07786	17.2	88.8	0.263
1438.21	-160.00	5977.02	12081.75	446.00	5.096	4.64098	42.3	6.892	0.259	0.08320	17.8	88.8	0.272
1438.21	-155.00	5982.02	12081.60	446.00	5.334	4.87769	42.4	7.228	0.267	0.08895	18.5	88.8	0.281
1438.21	-150.00	5987.01	12081.45	446.00	5.590	5.13340	42.6	7.589	0.274	0.09517	19.1	88.9	0.290
1438.21	-145.00	5992.01	12081.31	446.00	5.865	5.41004	42.7	7.979	0.282	0.10188	19.8	88.9	0.300
1438.21	-140.00	5997.01	12081.16	446.00	6.162	5.70980	42.8	8.400	0.290	0.10912	20.6	88.9	0.310
1438.21	-135.00	6002.01	12081.01	446.00	6.481	6.03508	43.0	8.856	0.298	0.11692	21.4	89.0	0.320
1438.21	-130.00	6007.01	12080.86	446.00	6.826	6.38859	43.1	9.349	0.305	0.12531	22.3	89.0	0.330
1438.21	-125.00	6012.00	12080.72	446.00	7.198	6.77336	43.3	9.884	0.311	0.13432	23.3	89.1	0.339
1438.21	-120.00	6017.00	12080.57	446.00	7.601	7.19274	43.4	10.465	0.318	0.14395	24.4	89.1	0.349
1438.21	-115.00	6022.00	12080.42	446.00	8.037	7.65047	43.6	11.096	0.323	0.15422	25.5	89.2	0.358
1438.21	-110.00	6027.00	12080.28	446.00	8.509	8.15066	43.8	11.783	0.327	0.16510	26.8	89.3	0.366
1438.21	-105.00	6031.99	12080.13	446.00	9.020	8.69785	44.0	12.531	0.329	0.17654	28.2	89.4	0.374
1438.21	-100.00	6036.99	12079.98	446.00	9.575	9.29702	44.2	13.346	0.330	0.18846	29.7	89.6	0.380
1438.21	-95.00	6041.99	12079.83	446.00	10.176	9.95351	44.4	14.234	0.329	0.20071	31.4	89.8	0.385
1438.21	-90.00	6046.99	12079.69	446.00	10.828	10.67302	44.6	15.204	0.325	0.21307	33.3	90.0	0.388
1438.21	-85.00	6051.99	12079.54	446.00	11.534	11.46151	44.8	16.260	0.318	0.22521	35.3	90.2	0.389
1438.21	-80.00	6056.98	12079.39	446.00	12.298	12.32500	45.1	17.411	0.307	0.23668	37.6	90.5	0.388
1438.21	-75.00	6061.98	12079.24	446.00	13.124	13.26930	45.3	18.663	0.292	0.24687	40.2	90.9	0.382
1438.21	-70.00	6066.98	12079.10	446.00	14.014	14.29959	45.6	20.022	0.273	0.25495	43.1	91.4	0.373
1438.21	-65.00	6071.98	12078.95	446.00	14.971	15.41984	45.8	21.492	0.248	0.25986	46.3	272.1	0.359
1438.21	-60.00	6076.97	12078.80	446.00	15.994	16.63197	46.1	23.074	0.218	0.26024	50.0	272.9	0.339
1438.21	-55.00	6081.97	12078.65	446.00	17.082	17.93472	46.4	24.768	0.182	0.25447	54.4	274.0	0.313
1438.21	-50.00	6086.97	12078.51	446.00	18.230	19.32230	46.7	26.565	0.141	0.24069	59.6	275.7	0.279
1438.21	-45.00	6091.97	12078.36	446.00	19.431	20.78268	46.9	28.452	0.097	0.21689	66.0	278.1	0.236
1438.21	-40.00	6096.97	12078.21	446.00	20.673	22.29581	47.2	30.405	0.053	0.18129	73.7	281.9	0.187
1438.21	-35.00	6101.96	12078.07	446.00	21.937	23.83182	47.4	32.391	0.040	0.13325	73.3	287.3	0.133
1438.21	-30.00	6106.96	12077.92	446.00	23.201	25.34976	47.5	34.364	0.079	0.07826	44.7	276.4	0.092
1438.21	-25.00	6111.96	12077.77	446.00	24.435	26.79740	47.6	36.265	0.126	0.06715	28.0	246.8	0.134
1438.21	-20.00	6116.96	12077.62	446.00	25.603	28.11269	47.7	38.024	0.169	0.14402	40.5	252.3	0.219
1438.21	-15.00	6121.96	12077.48	446.00	26.662	29.22759	47.6	39.562	0.201	0.24899	51.0	77.0	0.318
1438.21	-10.00	6126.95	12077.33	446.00	27.569	30.07434	47.5	40.798	0.220	0.36320	58.8	80.3	0.423
1438.21	-5.00	6131.95	12077.18	446.00	28.277	30.59381	47.3	41.660	0.220	0.47732	65.3	82.8	0.524
1438.21	0.00	6136.95	12077.03	446.00	28.746	30.74438	46.9	42.090	0.200	0.58277	71.0	84.7	0.615
1438.21	5.00	6141.95	12076.89	446.00	28.944	30.50929	46.5	42.054	0.161	0.67179	76.5	86.3	0.689
1438.21	10.00	6146.94	12076.74	446.00	28.854	29.90020	46.0	41.552	0.106	0.73847	81.8	87.6	0.744
1438.21	15.00	6151.94	12076.59	446.00	28.476	28.95582	45.5	40.612	0.058	0.77964	85.8	88.6	0.780
1438.21	20.00	6156.94	12076.45	446.00	27.831	27.73568	44.9	39.292	0.093	0.79508	83.3	89.4	0.798
1438.21	25.00	6161.94	12076.30	446.00	26.952	26.31096	44.3	37.665	0.176	0.78720	77.4	89.8	0.804
1438.21	30.00	6166.94	12076.15	446.00	25.885	24.75497	43.7	35.817	0.266	0.76018	70.7	90.1	0.803
1438.21	35.00	6171.93	12076.00	446.00	24.679	23.13519	43.2	33.827	0.351	0.71900	64.0	90.2	0.798
1438.21	40.00	6176.93	12075.86	446.00	23.384	21.50831	42.6	31.771	0.428	0.66862	57.4	90.2	0.792
1438.21	45.00	6181.93	12075.71	446.00	22.045	19.91810	42.1	29.710	0.495	0.61340	51.1	90.2	0.786
1438.21	50.00	6186.93	12075.56	446.00	20.698	18.39561	41.6	27.692	0.549	0.55679	45.4	90.2	0.780
1438.21	55.00	6191.92	12075.41	446.00	19.375	16.96072	41.2	25.750	0.591	0.50133	40.3	90.3	0.774
1438.21	60.00	6196.92	12075.27	446.00	18.096	15.62434	40.8	23.908	0.622	0.44871	35.8	90.4	0.766

1438.21	65.00	6201.92	12075.12	446.00	16.876	14.39060	40.5	22.179	0.642	0.39992	31.9	90.5	0.756
1438.21	70.00	6206.92	12074.97	446.00	15.725	13.25892	40.1	20.569	0.653	0.35545	28.6	90.6	0.743
1438.21	75.00	6211.92	12074.83	446.00	14.648	12.22554	39.8	19.080	0.656	0.31541	25.7	90.8	0.728
1438.21	80.00	6216.91	12074.68	446.00	13.646	11.28481	39.6	17.708	0.653	0.27970	23.2	90.9	0.711
1438.21	85.00	6221.91	12074.53	446.00	12.718	10.43006	39.4	16.448	0.645	0.24806	21.0	91.0	0.691
1438.21	90.00	6226.91	12074.38	446.00	11.861	9.65423	39.1	15.293	0.634	0.22015	19.2	91.1	0.671
1438.21	95.00	6231.91	12074.24	446.00	11.072	8.95025	39.0	14.237	0.619	0.19561	17.5	91.2	0.649
1438.21	100.00	6236.91	12074.09	446.00	10.346	8.31136	38.8	13.271	0.602	0.17407	16.1	91.3	0.626
1438.21	105.00	6241.90	12073.94	446.00	9.680	7.73116	38.6	12.388	0.583	0.15519	14.9	91.4	0.603
1438.21	110.00	6246.90	12073.79	446.00	9.068	7.20380	38.5	11.581	0.564	0.13864	13.8	91.4	0.580
1438.21	115.00	6251.90	12073.65	446.00	8.506	6.72389	38.3	10.843	0.544	0.12412	12.9	91.5	0.558
1438.21	120.00	6256.90	12073.50	446.00	7.990	6.28660	38.2	10.167	0.524	0.11139	12.0	91.5	0.535
1438.21	125.00	6261.89	12073.35	446.00	7.516	5.88757	38.1	9.548	0.503	0.10021	11.3	91.5	0.513
1438.21	130.00	6266.89	12073.21	446.00	7.080	5.52288	38.0	8.979	0.484	0.09038	10.6	91.5	0.492
1438.21	135.00	6271.89	12073.06	446.00	6.679	5.18906	37.8	8.458	0.464	0.08172	10.0	91.6	0.471
1438.21	140.00	6276.89	12072.91	446.00	6.309	4.88299	37.7	7.978	0.445	0.07408	9.4	91.6	0.452
1438.21	145.00	6281.89	12072.76	446.00	5.967	4.60190	37.6	7.536	0.427	0.06733	9.0	91.6	0.432
1438.21	150.00	6286.88	12072.62	446.00	5.652	4.34335	37.5	7.128	0.410	0.06135	8.5	91.6	0.414
1438.21	155.00	6291.88	12072.47	446.00	5.361	4.10512	37.4	6.752	0.393	0.05605	8.1	91.6	0.397
1438.21	160.00	6296.88	12072.32	446.00	5.091	3.88528	37.3	6.404	0.376	0.05133	7.8	91.6	0.380
1438.21	165.00	6301.88	12072.17	446.00	4.841	3.68207	37.3	6.082	0.361	0.04714	7.4	91.6	0.364
1438.21	170.00	6306.88	12072.03	446.00	4.609	3.49396	37.2	5.784	0.346	0.04339	7.1	91.5	0.349
1438.21	175.00	6311.87	12071.88	446.00	4.393	3.31954	37.1	5.506	0.332	0.04004	6.9	91.5	0.334
1438.21	180.00	6316.87	12071.73	446.00	4.192	3.15759	37.0	5.248	0.319	0.03705	6.6	91.5	0.321
1438.21	185.00	6321.87	12071.59	446.00	4.005	3.00699	36.9	5.008	0.306	0.03435	6.4	91.5	0.308
1438.21	190.00	6326.87	12071.44	446.00	3.831	2.86675	36.8	4.785	0.293	0.03193	6.2	91.5	0.295
1438.21	195.00	6331.86	12071.29	446.00	3.668	2.73597	36.7	4.576	0.282	0.02975	6.0	91.5	0.283
1438.21	200.00	6336.86	12071.14	446.00	3.515	2.61386	36.6	4.380	0.271	0.02778	5.9	91.5	0.272

Structure 6b

PLS-CADD Version 10.40 4:34:20 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10 \345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
Assumed 90 MPH Extreme Wind Loading (Rule 250C)
Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
Assumed Maximum Operating Temperature of 212 F
Assumed 1" Extreme Ice (Non-NESC)
Assumed Grade B Construction
<<Illustration of NESC provisions include>>
> Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
> Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
> 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
> Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
> Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
> 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
> Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
**** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
**** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
> Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
**** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
**** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
**** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE,
the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL
values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of
Composite Line Post Insulators for further clarification. ****
**** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
**** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
**** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
**** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
> Structure Loads criteria includes typical Full Structure DE cases
POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
THIS FILE IS PROVIDED FOR ILLUSTRATION ONLY. CRITERIA SHOULD BE CHECKED AND MODIFIED AS NECESSARY BY AN ENGINEER IN RESPONSIBLE CHARGE,
FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
RESPONSIBLE ENGINEER SHOULD VERIFY MAXIMUM OPERATING CONDITION FOR THEIR APPLICABLE PROJECT
RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28	(ft)
Cross section offset for graph +/-:	200.00	(ft)
Result interval for graph:	5.00	(ft)
Electric field limit:	1.60	(kV/m)
Magnetic field limit:	200.00	(mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	1	1	345	1180.000	0	1.762
2	2	1	345	1180.000	120	1.762
2	3	1	345	1180.000	-120	1.762

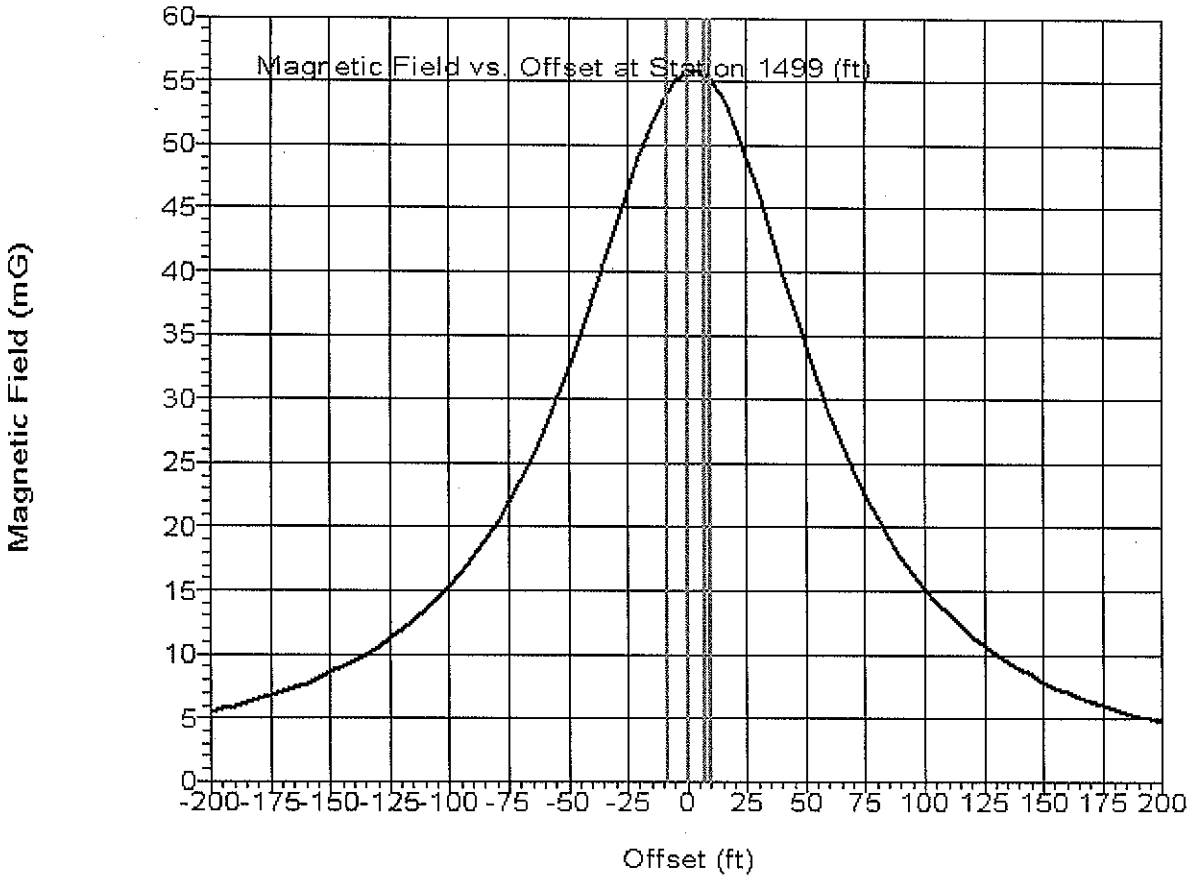
Calculated EMF Circuit Data For Last Point:

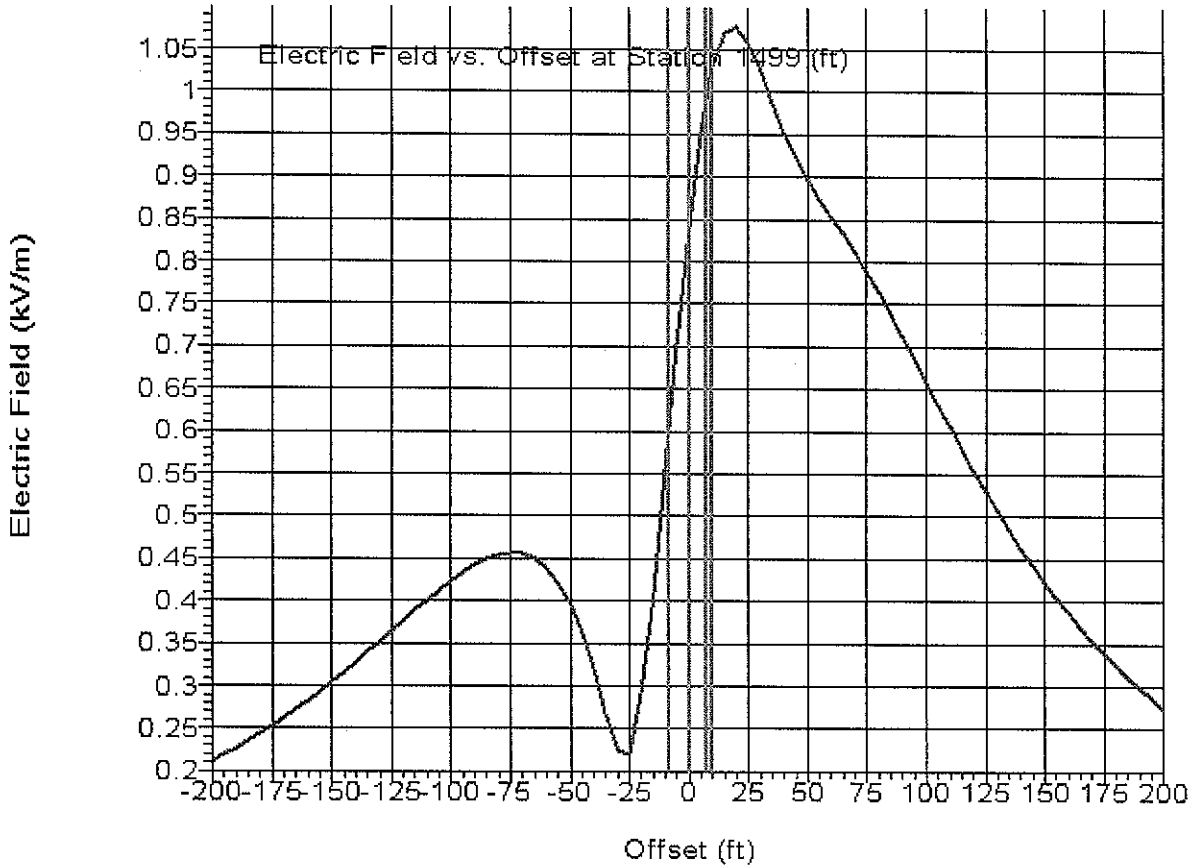
Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1	NESC Heavy (250B)	Creep RS	Left	6139.48	12138.26	554.74	1499.49	0.22	0.509	199.2
2	1	NESC Heavy (250B)	Creep RS	Left	6149.01	12137.39	531.04	1499.15	9.79	1.762	199.2
2	2	NESC Heavy (250B)	Creep RS	Left	6130.98	12138.96	520.22	1499.72	-8.31	1.762	199.2
2	3	NESC Heavy (250B)	Creep RS	Left	6146.60	12138.52	509.43	1500.15	7.32	1.762	199.2

Maximum magnetic field of 55.86 (mG) found at station 1499.49, offset 5.00 (ft)
Maximum electric field of 1.077 (kV/m) found at station 1499.49, offset 20.00 (ft)





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1499.49	-200.00	5939.57	12149.34	456.00	4.086	3.68791	42.1	5.504	0.206	0.04699	12.8	88.7	0.211
1499.49	-195.00	5944.56	12149.07	456.00	4.239	3.84456	42.2	5.723	0.213	0.05038	13.3	88.7	0.219
1499.49	-190.00	5949.55	12148.79	456.00	4.403	4.01223	42.3	5.957	0.221	0.05405	13.8	88.7	0.227
1499.49	-185.00	5954.55	12148.51	456.00	4.578	4.19198	42.5	6.207	0.228	0.05804	14.3	88.7	0.236
1499.49	-180.00	5959.54	12148.23	456.00	4.764	4.38494	42.6	6.475	0.236	0.06237	14.8	88.7	0.244
1499.49	-175.00	5964.53	12147.96	456.00	4.963	4.59240	42.8	6.762	0.245	0.06708	15.3	88.7	0.254

1499.49	-170.00	5969.52	12147.68	456.00	5.176	4.81581	42.9	7.070	0.253	0.07221	15.9	88.7	0.263
1499.49	-165.00	5974.52	12147.40	456.00	5.404	5.05676	43.1	7.401	0.262	0.07779	16.6	88.7	0.273
1499.49	-160.00	5979.51	12147.13	456.00	5.649	5.31706	43.3	7.757	0.271	0.08388	17.2	88.7	0.283
1499.49	-155.00	5984.50	12146.85	456.00	5.912	5.59876	43.4	8.142	0.280	0.09053	17.9	88.7	0.294
1499.49	-150.00	5989.49	12146.57	456.00	6.195	5.90412	43.6	8.558	0.289	0.09778	18.7	88.7	0.305
1499.49	-145.00	5994.49	12146.30	456.00	6.499	6.23574	43.8	9.007	0.298	0.10570	19.5	88.8	0.316
1499.49	-140.00	5999.48	12146.02	456.00	6.828	6.59652	44.0	9.494	0.307	0.11435	20.4	88.8	0.328
1499.49	-135.00	6004.47	12145.74	456.00	7.184	6.98974	44.2	10.023	0.317	0.12380	21.4	88.8	0.340
1499.49	-130.00	6009.46	12145.47	456.00	7.568	7.41913	44.4	10.598	0.325	0.13412	22.4	88.8	0.352
1499.49	-125.00	6014.45	12145.19	456.00	7.985	7.88889	44.7	11.225	0.334	0.14538	23.5	88.9	0.364
1499.49	-120.00	6019.45	12144.91	456.00	8.436	8.40376	44.9	11.908	0.342	0.15765	24.7	88.9	0.377
1499.49	-115.00	6024.44	12144.64	456.00	8.927	8.96913	45.1	12.655	0.349	0.17100	26.1	89.0	0.389
1499.49	-110.00	6029.43	12144.36	456.00	9.461	9.59105	45.4	13.472	0.356	0.18547	27.5	89.0	0.401
1499.49	-105.00	6034.42	12144.08	456.00	10.041	10.27635	45.7	14.368	0.360	0.20111	29.2	89.1	0.413
1499.49	-100.00	6039.42	12143.80	456.00	10.674	11.03267	45.9	15.351	0.363	0.21791	31.0	89.2	0.424
1499.49	-95.00	6044.41	12143.53	456.00	11.364	11.86854	46.2	16.431	0.364	0.23582	32.9	89.4	0.434
1499.49	-90.00	6049.40	12143.25	456.00	12.115	12.79335	46.6	17.620	0.362	0.25472	35.1	89.5	0.442
1499.49	-85.00	6054.39	12142.97	456.00	12.935	13.81737	46.9	18.927	0.356	0.27437	37.6	89.7	0.450
1499.49	-80.00	6059.39	12142.70	456.00	13.829	14.95162	47.2	20.366	0.347	0.29440	40.4	89.9	0.454
1499.49	-75.00	6064.38	12142.42	456.00	14.801	16.20757	47.6	21.949	0.332	0.31420	43.4	90.2	0.457
1499.49	-70.00	6069.37	12142.14	456.00	15.858	17.59675	48.0	23.688	0.311	0.33292	46.9	270.5	0.455
1499.49	-65.00	6074.36	12141.87	456.00	17.005	19.12998	48.4	25.595	0.284	0.34931	50.9	271.0	0.450
1499.49	-60.00	6079.36	12141.59	456.00	18.243	20.81628	48.8	27.679	0.250	0.36169	55.4	271.5	0.439
1499.49	-55.00	6084.35	12141.31	456.00	19.573	22.66119	49.2	29.944	0.207	0.36782	60.6	272.2	0.421
1499.49	-50.00	6089.34	12141.04	456.00	20.995	24.66455	49.6	32.390	0.158	0.36487	66.7	273.2	0.396
1499.49	-45.00	6094.33	12140.76	456.00	22.500	26.81752	50.0	35.006	0.102	0.34945	73.7	274.5	0.362
1499.49	-40.00	6099.32	12140.48	456.00	24.078	29.09890	50.4	37.769	0.054	0.31784	80.4	276.1	0.319
1499.49	-35.00	6104.32	12140.21	456.00	25.711	31.47110	50.8	40.638	0.071	0.26654	75.0	277.7	0.270
1499.49	-30.00	6109.31	12139.93	456.00	27.372	33.87628	51.1	43.552	0.138	0.19420	54.6	276.2	0.225
1499.49	-25.00	6114.30	12139.65	456.00	29.025	36.23369	51.3	46.426	0.211	0.11167	27.9	264.2	0.220
1499.49	-20.00	6119.29	12139.37	456.00	30.626	38.43974	51.5	49.149	0.280	0.11282	21.9	256.3	0.290
1499.49	-15.00	6124.29	12139.10	456.00	32.120	40.37249	51.5	51.591	0.339	0.24245	35.6	257.1	0.410
1499.49	-10.00	6129.28	12138.82	456.00	33.440	41.90192	51.4	53.610	0.380	0.40839	47.1	79.6	0.554
1499.49	-5.00	6134.27	12138.54	456.00	34.515	42.90606	51.2	55.065	0.398	0.58269	55.7	82.1	0.703
1499.49	0.00	6139.26	12138.27	456.00	35.273	43.29086	50.8	55.842	0.387	0.74810	62.6	84.3	0.840
1499.49	5.00	6144.26	12137.99	456.00	35.652	43.00921	50.3	55.865	0.347	0.88924	68.7	86.2	0.952
1499.49	10.00	6149.25	12137.71	456.00	35.611	42.07287	49.8	55.120	0.277	0.99416	74.4	87.8	1.030
1499.49	15.00	6154.24	12137.44	456.00	35.140	40.55228	49.1	53.659	0.187	1.05633	80.0	89.2	1.070
1499.49	20.00	6159.23	12137.16	456.00	34.264	38.56353	48.4	51.586	0.098	1.07541	84.8	90.3	1.077
1499.49	25.00	6164.22	12136.88	456.00	33.039	36.24681	47.7	49.045	0.110	1.05639	84.1	91.0	1.059
1499.49	30.00	6169.22	12136.61	456.00	31.542	33.74354	46.9	46.190	0.212	1.00759	78.1	91.3	1.026
1499.49	35.00	6174.21	12136.33	456.00	29.856	31.17856	46.2	43.168	0.322	0.93850	71.1	91.4	0.988
1499.49	40.00	6179.20	12136.05	456.00	28.062	28.65036	45.6	40.104	0.423	0.85795	63.8	91.3	0.953
1499.49	45.00	6184.19	12135.78	456.00	26.230	26.22873	45.0	37.094	0.508	0.77315	56.7	91.1	0.922
1499.49	50.00	6189.19	12135.50	456.00	24.415	23.95755	44.5	34.206	0.576	0.68935	50.1	91.0	0.896
1499.49	55.00	6194.18	12135.22	456.00	22.658	21.85986	44.0	31.484	0.628	0.60998	44.2	90.9	0.874
1499.49	60.00	6199.17	12134.94	456.00	20.986	19.94353	43.5	28.951	0.665	0.53698	38.9	90.9	0.853

1499.49	65.00	6204.16	12134.67	456.00	19.416	18.20615	43.2	26.617	0.688	0.47122	34.4	90.9	0.833
1499.49	70.00	6209.16	12134.39	456.00	17.957	16.63900	42.8	24.481	0.699	0.41284	30.6	91.0	0.811
1499.49	75.00	6214.15	12134.11	456.00	16.609	15.22987	42.5	22.535	0.702	0.36155	27.3	91.1	0.789
1499.49	80.00	6219.14	12133.84	456.00	15.371	13.96498	42.3	20.768	0.697	0.31679	24.5	91.2	0.765
1499.49	85.00	6224.13	12133.56	456.00	14.238	12.83030	42.0	19.166	0.686	0.27791	22.1	91.3	0.740
1499.49	90.00	6229.12	12133.28	456.00	13.204	11.81223	41.8	17.717	0.671	0.24423	20.0	91.4	0.714
1499.49	95.00	6234.12	12133.01	456.00	12.262	10.89809	41.6	16.405	0.652	0.21510	18.2	91.4	0.687
1499.49	100.00	6239.11	12132.73	456.00	11.404	10.07628	41.5	15.218	0.632	0.18990	16.7	91.5	0.660
1499.49	105.00	6244.10	12132.45	456.00	10.622	9.33634	41.3	14.142	0.610	0.16811	15.4	91.5	0.633
1499.49	110.00	6249.09	12132.18	456.00	9.911	8.66897	41.2	13.167	0.588	0.14923	14.2	91.6	0.607
1499.49	115.00	6254.09	12131.90	456.00	9.262	8.06590	41.1	12.282	0.565	0.13287	13.2	91.6	0.581
1499.49	120.00	6259.08	12131.62	456.00	8.670	7.51986	40.9	11.477	0.543	0.11864	12.3	91.6	0.555
1499.49	125.00	6264.07	12131.35	456.00	8.130	7.02445	40.8	10.744	0.520	0.10626	11.5	91.7	0.531
1499.49	130.00	6269.06	12131.07	456.00	7.636	6.57404	40.7	10.076	0.498	0.09546	10.8	91.7	0.507
1499.49	135.00	6274.06	12130.79	456.00	7.184	6.16371	40.6	9.466	0.477	0.08601	10.2	91.7	0.485
1499.49	140.00	6279.05	12130.51	456.00	6.769	5.78911	40.5	8.907	0.457	0.07772	9.7	91.7	0.463
1499.49	145.00	6284.04	12130.24	456.00	6.389	5.44645	40.4	8.395	0.437	0.07044	9.2	91.7	0.443
1499.49	150.00	6289.03	12129.96	456.00	6.039	5.13238	40.4	7.925	0.418	0.06403	8.7	91.7	0.423
1499.49	155.00	6294.03	12129.68	456.00	5.717	4.84395	40.3	7.493	0.400	0.05836	8.3	91.7	0.404
1499.49	160.00	6299.02	12129.41	456.00	5.419	4.57858	40.2	7.095	0.383	0.05334	7.9	91.6	0.387
1499.49	165.00	6304.01	12129.13	456.00	5.145	4.33397	40.1	6.727	0.367	0.04889	7.6	91.6	0.370
1499.49	170.00	6309.00	12128.85	456.00	4.891	4.10808	40.0	6.387	0.351	0.04493	7.3	91.6	0.354
1499.49	175.00	6313.99	12128.58	456.00	4.656	3.89914	39.9	6.073	0.336	0.04139	7.0	91.6	0.339
1499.49	180.00	6318.99	12128.30	456.00	4.437	3.70553	39.9	5.781	0.322	0.03824	6.8	91.6	0.324
1499.49	185.00	6323.98	12128.02	456.00	4.234	3.52584	39.8	5.510	0.309	0.03540	6.5	91.6	0.311
1499.49	190.00	6328.97	12127.75	456.00	4.046	3.35882	39.7	5.258	0.296	0.03286	6.3	91.5	0.298
1499.49	195.00	6333.96	12127.47	456.00	3.870	3.20332	39.6	5.024	0.284	0.03057	6.1	91.5	0.286
1499.49	200.00	6338.96	12127.19	456.00	3.706	3.05834	39.5	4.805	0.273	0.02851	6.0	91.5	0.274

Midspan of Structure 6 & 7

PLS-CADD Version 10.40 4:34:49 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10 \345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
Assumed 90 MPH Extreme Wind Loading (Rule 250C)
Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
Assumed Maximum Operating Temperature of 212 F
Assumed 1" Extreme Ice (Non-NESC)
Assumed Grade B Construction
<<Illustration of NESC provisions include>>
> Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
> Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
> 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
> Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
> Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
> 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
> Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
**** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
**** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
> Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
**** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
**** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
**** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE, the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of Composite Line Post Insulators for further clarification. ****
**** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
**** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
**** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
**** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
> Structure Loads criteria includes typical Full Structure DE cases
POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
THIS FILE IS PROVIDED FOR ILLUSTRATION ONLY. CRITERIA SHOULD BE CHECKED AND MODIFIED AS NECESSARY BY AN ENGINEER IN RESPONSIBLE CHARGE,
FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
RESPONSIBLE ENGINEER SHOULD VERIFY MAXIMUM OPERATING CONDITION FOR THEIR APPLICABLE PROJECT
RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28 (ft)
Cross section offset for graph +/-:	200.00 (ft)
Result interval for graph:	5.00 (ft)
Electric field limit:	1.60 (kV/m)
Magnetic field limit:	200.00 (mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	1	1	345	1180.000	0	1.762
2	2	1	345	1180.000	120	1.762
2	3	1	345	1180.000	-120	1.762

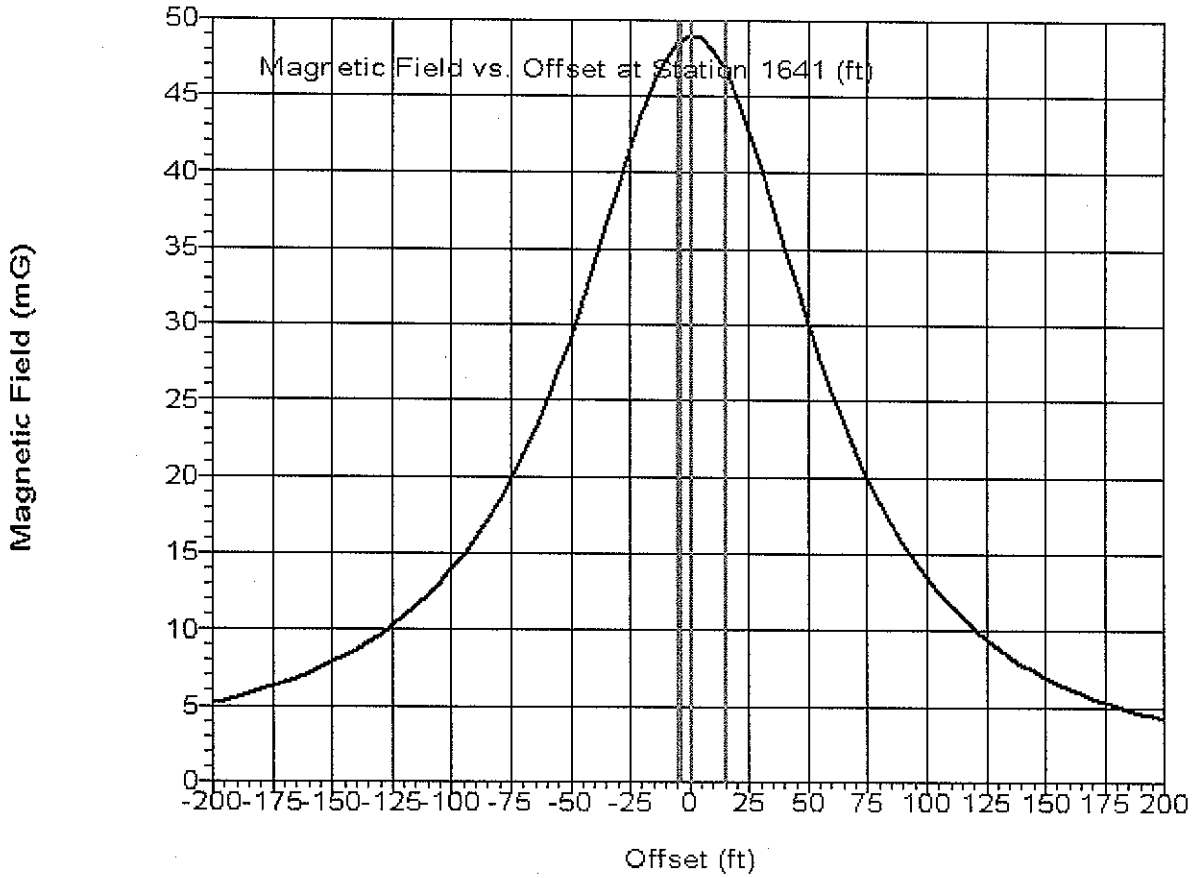
Calculated EMF Circuit Data For Last Point:

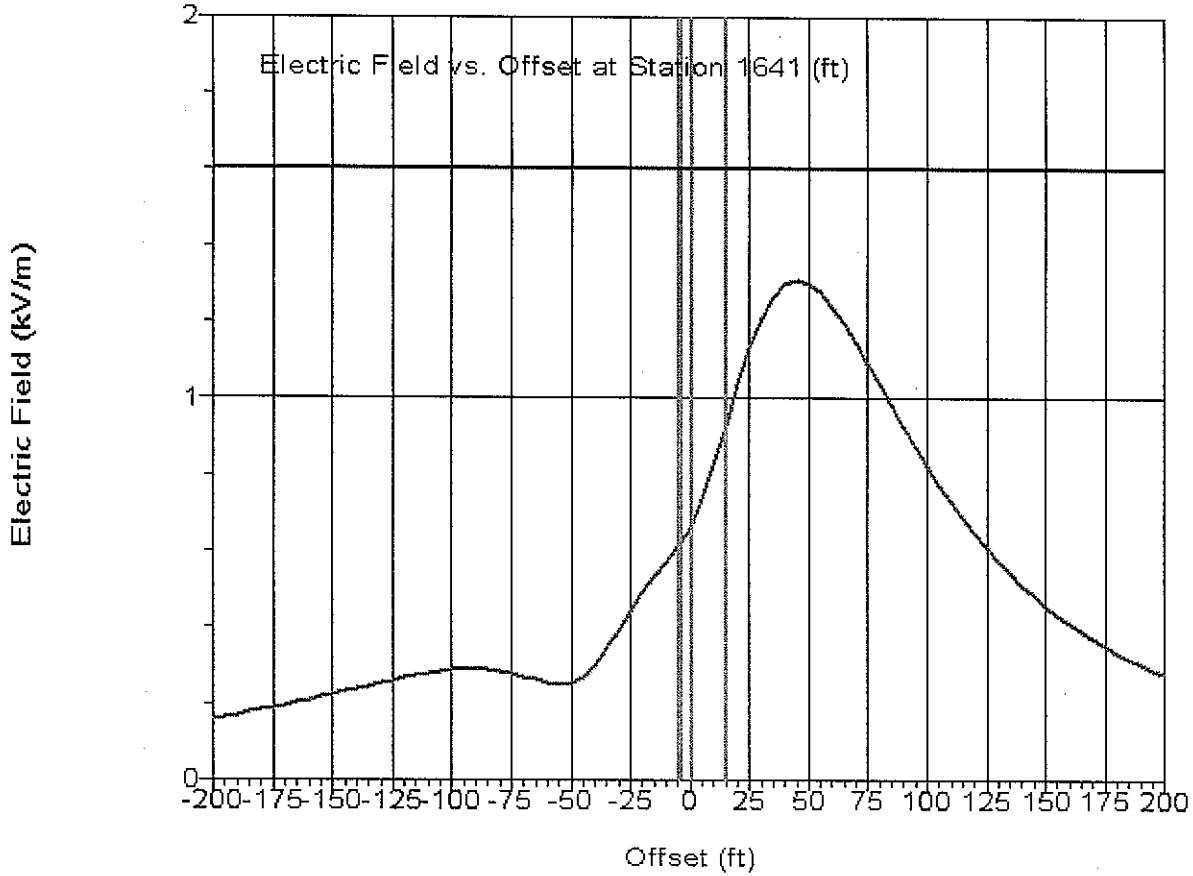
**Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.**

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1	NESC Heavy (250B)	Creep RS	Left	6148.02	12279.19	547.49	1640.68	0.94	0.509	199.2
2	1	NESC Heavy (250B)	Creep RS	Left	6162.09	12277.89	526.10	1640.16	15.06	1.762	199.2
2	2	NESC Heavy (250B)	Creep RS	Left	6143.18	12279.57	520.34	1640.79	-3.92	1.762	199.2
2	3	NESC Heavy (250B)	Creep RS	Left	6142.19	12279.07	514.54	1640.24	-4.87	1.762	199.2

Maximum magnetic field of 48.95 (mG) found at station 1640.68, offset 0.00 (ft)
Maximum electric field of 1.310 (kV/m) found at station 1640.68, offset 45.00 (ft)





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1640.68	-200.00	5947.39	12290.32	458.16	4.472	2.52960	29.5	5.138	0.159	0.00845	3.0	88.9	0.159
1640.68	-195.00	5952.38	12290.04	458.16	4.648	2.61827	29.4	5.335	0.164	0.00854	3.0	88.9	0.165
1640.68	-190.00	5957.37	12289.76	458.16	4.836	2.71272	29.3	5.545	0.170	0.00864	2.9	88.9	0.170
1640.68	-185.00	5962.37	12289.49	458.16	5.038	2.81345	29.2	5.770	0.176	0.00877	2.9	88.9	0.176
1640.68	-180.00	5967.36	12289.21	458.16	5.253	2.92106	29.1	6.010	0.182	0.00892	2.8	88.9	0.182
1640.68	-175.00	5972.35	12288.93	458.16	5.483	3.03617	29.0	6.268	0.188	0.00910	2.8	88.9	0.189

1640.68	-170.00	5977.34	12288.66	458.16	5.731	3.15949	28.9	6.544	0.195	0.00932	2.7	88.9	0.195
1640.68	-165.00	5982.33	12288.38	458.16	5.997	3.29183	28.8	6.841	0.202	0.00959	2.7	88.9	0.202
1640.68	-160.00	5987.33	12288.10	458.16	6.283	3.43408	28.7	7.160	0.208	0.00991	2.7	88.9	0.209
1640.68	-155.00	5992.32	12287.83	458.16	6.592	3.58722	28.6	7.505	0.216	0.01031	2.7	89.0	0.216
1640.68	-150.00	5997.31	12287.55	458.16	6.925	3.75239	28.5	7.876	0.223	0.01081	2.8	89.0	0.223
1640.68	-145.00	6002.30	12287.27	458.16	7.285	3.93082	28.3	8.278	0.230	0.01142	2.8	89.0	0.230
1640.68	-140.00	6007.30	12286.99	458.16	7.676	4.12394	28.2	8.713	0.237	0.01217	2.9	89.1	0.238
1640.68	-135.00	6012.29	12286.72	458.16	8.099	4.33331	28.1	9.185	0.244	0.01310	3.1	89.2	0.245
1640.68	-130.00	6017.28	12286.44	458.16	8.560	4.56073	28.0	9.699	0.252	0.01425	3.2	89.2	0.252
1640.68	-125.00	6022.27	12286.16	458.16	9.061	4.80818	28.0	10.258	0.258	0.01568	3.5	89.3	0.259
1640.68	-120.00	6027.27	12285.89	458.16	9.608	5.07792	27.9	10.867	0.265	0.01745	3.8	89.4	0.266
1640.68	-115.00	6032.26	12285.61	458.16	10.205	5.37244	27.8	11.533	0.271	0.01966	4.1	89.6	0.272
1640.68	-110.00	6037.25	12285.33	458.16	10.859	5.69456	27.7	12.262	0.276	0.02240	4.6	89.7	0.277
1640.68	-105.00	6042.24	12285.06	458.16	11.576	6.04739	27.6	13.061	0.281	0.02582	5.3	89.9	0.282
1640.68	-100.00	6047.23	12284.78	458.16	12.363	6.43438	27.5	13.937	0.284	0.03008	6.1	90.1	0.285
1640.68	-95.00	6052.23	12284.50	458.16	13.228	6.85927	27.4	14.901	0.285	0.03539	7.1	90.4	0.287
1640.68	-90:00	6057.22	12284.23	458.16	14.179	7.32612	27.3	15.960	0.285	0.04202	8.4	90.7	0.288
1640.68	-85.00	6062.21	12283.95	458.16	15.227	7.83918	27.2	17.127	0.282	0.05027	10.1	91.0	0.286
1640.68	-80.00	6067.20	12283.67	458.16	16.381	8.40282	27.2	18.411	0.276	0.06055	12.4	91.4	0.283
1640.68	-75.00	6072.20	12283.40	458.16	17.652	9.02125	27.1	19.824	0.268	0.07333	15.3	91.7	0.277
1640.68	-70.00	6077.19	12283.12	458.16	19.051	9.69820	27.0	21.377	0.255	0.08915	19.3	92.1	0.270
1640.68	-65.00	6082.18	12282.84	458.16	20.587	10.43637	26.9	23.081	0.238	0.10864	24.5	92.2	0.261
1640.68	-60.00	6087.17	12282.56	458.16	22.268	11.23669	26.8	24.943	0.218	0.13248	31.3	92.0	0.253
1640.68	-55.00	6092.17	12282.29	458.16	24.101	12.09719	26.7	26.966	0.193	0.16133	39.9	91.2	0.250
1640.68	-50.00	6097.16	12282.01	458.16	26.084	13.01163	26.5	29.149	0.165	0.19575	49.9	89.6	0.253
1640.68	-45.00	6102.15	12281.73	458.16	28.211	13.96777	26.3	31.480	0.135	0.23603	60.3	87.6	0.269
1640.68	-40.00	6107.14	12281.46	458.16	30.464	14.94546	26.1	33.932	0.104	0.28196	69.7	86.1	0.299
1640.68	-35.00	6112.14	12281.18	458.16	32.808	15.91489	25.9	36.465	0.077	0.33254	77.0	85.3	0.340
1640.68	-30.00	6117.13	12280.90	458.16	35.194	16.83571	25.6	39.014	0.056	0.38573	81.7	85.4	0.389
1640.68	-25.00	6122.12	12280.63	458.16	37.549	17.65773	25.2	41.493	0.048	0.43823	83.7	86.0	0.441
1640.68	-20.00	6127.11	12280.35	458.16	39.781	18.32424	24.7	43.798	0.063	0.48565	82.6	86.7	0.490
1640.68	-15.00	6132.10	12280.07	458.16	41.783	18.77843	24.2	45.809	0.105	0.52292	78.6	87.4	0.533
1640.68	-10.00	6137.10	12279.80	458.16	43.441	18.97241	23.6	47.403	0.176	0.54532	72.2	87.7	0.571
1640.68	-5.00	6142.09	12279.52	458.16	44.649	18.87670	22.9	48.475	0.274	0.54955	63.5	87.4	0.610
1640.68	0.00	6147.08	12279.24	458.16	45.323	18.48735	22.2	48.948	0.398	0.53473	53.3	86.5	0.661
1640.68	5.00	6152.07	12278.97	458.16	45.416	17.82775	21.4	48.790	0.540	0.50264	42.9	85.5	0.732
1640.68	10.00	6157.07	12278.69	458.16	44.925	16.94437	20.7	48.015	0.691	0.45731	33.5	85.1	0.824
1640.68	15.00	6162.06	12278.41	458.16	43.890	15.89777	19.9	46.680	0.840	0.40392	25.7	85.2	0.929
1640.68	20.00	6167.05	12278.13	458.16	42.384	14.75227	19.2	44.878	0.977	0.34761	19.6	85.8	1.035
1640.68	25.00	6172.04	12277.86	458.16	40.505	13.56707	18.5	42.717	1.095	0.29266	15.0	86.7	1.132
1640.68	30.00	6177.04	12277.58	458.16	38.359	12.39071	17.9	40.310	1.187	0.24201	11.5	87.5	1.210
1640.68	35.00	6182.03	12277.30	458.16	36.049	11.25899	17.3	37.766	1.252	0.19731	9.0	88.3	1.267
1640.68	40.00	6187.02	12277.03	458.16	33.668	10.19542	16.8	35.177	1.290	0.15913	7.0	89.1	1.299
1640.68	45.00	6192.01	12276.75	458.16	31.290	9.21326	16.4	32.619	1.304	0.12735	5.6	89.7	1.310
1640.68	50.00	6197.00	12276.47	458.16	28.975	8.31787	16.0	30.146	1.297	0.10139	4.5	90.2	1.301
1640.68	55.00	6202.00	12276.20	458.16	26.763	7.50916	15.7	27.797	1.274	0.08049	3.6	90.7	1.277
1640.68	60.00	6206.99	12275.92	458.16	24.681	6.78352	15.4	25.596	1.239	0.06384	2.9	91.0	1.241

1640.68	65.00	6211.98	12275.64	458.16	22.743	6.13525	15.1	23.556	1.194	0.05069	2.4	91.3	1.195
1640.68	70.00	6216.97	12275.37	458.16	20.953	5.55772	14.9	21.678	1.144	0.04037	2.0	91.5	1.145
1640.68	75.00	6221.97	12275.09	458.16	19.312	5.04398	14.6	19.960	1.090	0.03230	1.7	91.7	1.091
1640.68	80.00	6226.96	12274.81	458.16	17.814	4.58724	14.4	18.395	1.035	0.02602	1.4	91.9	1.035
1640.68	85.00	6231.95	12274.54	458.16	16.450	4.18110	14.3	16.973	0.980	0.02114	1.2	92.0	0.980
1640.68	90.00	6236.94	12274.26	458.16	15.211	3.81970	14.1	15.683	0.925	0.01737	1.1	92.0	0.926
1640.68	95.00	6241.94	12273.98	458.16	14.087	3.49776	13.9	14.514	0.873	0.01446	0.9	92.1	0.873
1640.68	100.00	6246.93	12273.70	458.16	13.067	3.21057	13.8	13.455	0.823	0.01221	0.9	92.1	0.823
1640.68	105.00	6251.92	12273.43	458.16	12.142	2.95397	13.7	12.496	0.775	0.01049	0.8	92.1	0.775
1640.68	110.00	6256.91	12273.15	458.16	11.302	2.72431	13.6	11.626	0.729	0.00918	0.7	92.1	0.730
1640.68	115.00	6261.90	12272.87	458.16	10.539	2.51837	13.4	10.836	0.687	0.00818	0.7	92.1	0.687
1640.68	120.00	6266.90	12272.60	458.16	9.846	2.33336	13.3	10.118	0.647	0.00743	0.7	92.1	0.647
1640.68	125.00	6271.89	12272.32	458.16	9.214	2.16684	13.2	9.465	0.610	0.00686	0.6	92.1	0.610
1640.68	130.00	6276.88	12272.04	458.16	8.638	2.01666	13.1	8.870	0.575	0.00644	0.6	92.1	0.575
1640.68	135.00	6281.87	12271.77	458.16	8.112	1.88097	13.1	8.327	0.542	0.00614	0.6	92.1	0.542
1640.68	140.00	6286.87	12271.49	458.16	7.631	1.75813	13.0	7.831	0.512	0.00592	0.7	92.0	0.512
1640.68	145.00	6291.86	12271.21	458.16	7.190	1.64672	12.9	7.376	0.484	0.00577	0.7	92.0	0.484
1640.68	150.00	6296.85	12270.94	458.16	6.785	1.54548	12.8	6.959	0.458	0.00566	0.7	92.0	0.458
1640.68	155.00	6301.84	12270.66	458.16	6.413	1.45333	12.8	6.576	0.433	0.00560	0.7	92.0	0.433
1640.68	160.00	6306.84	12270.38	458.16	6.071	1.36930	12.7	6.223	0.410	0.00556	0.8	91.9	0.410
1640.68	165.00	6311.83	12270.11	458.16	5.755	1.29254	12.7	5.898	0.389	0.00554	0.8	91.9	0.389
1640.68	170.00	6316.82	12269.83	458.16	5.463	1.22231	12.6	5.598	0.369	0.00554	0.9	91.9	0.369
1640.68	175.00	6321.81	12269.55	458.16	5.193	1.15793	12.6	5.321	0.351	0.00554	0.9	91.8	0.351
1640.68	180.00	6326.81	12269.27	458.16	4.943	1.09883	12.5	5.064	0.334	0.00555	1.0	91.8	0.334
1640.68	185.00	6331.80	12269.00	458.16	4.711	1.04448	12.5	4.825	0.317	0.00557	1.0	91.8	0.318
1640.68	190.00	6336.79	12268.72	458.16	4.495	0.99443	12.5	4.603	0.302	0.00558	1.1	91.7	0.302
1640.68	195.00	6341.78	12268.44	458.16	4.294	0.94826	12.5	4.397	0.288	0.00560	1.1	91.7	0.288
1640.68	200.00	6346.77	12268.17	458.16	4.107	0.90560	12.4	4.205	0.275	0.00561	1.2	91.7	0.275

Structure 7

PLS-CADD Version 10.40 4:35:37 PM Wednesday, August 04, 2010
Burns & Roe Enterprises
Project Name: 'c:\documents and settings\lengee.roe\desktop\pls-cadd cricket valley\transmission line model 08-04-10 \345kv tapoff 7 h-frame structures 8-4-10.DON'

Criteria notes:
  Typical 2007 NESC C2-2007 Criteria File for PLS-CADD Created December 31, 2006 Version 8.10
  Assumed NESC Heavy Combined Ice and Wind Loading District (Rule 250B)
  Assumed 90 MPH Extreme Wind Loading (Rule 250C)
  Assumed 1" Extreme Ice with 30 MPH Concurrent Wind Loading (Rule 250D)
  Assumed Maximum Operating Temperature of 212 F
  Assumed 1" Extreme Ice (Non-NESC)
  Assumed Grade B Construction
  <<Illustration of NESC provisions include>>
    > Combined Ice and Wind District Loading NESC Heavy per Rule 250B, Page 177
    > Extreme Wind Loading per Rule 250C, Page 177, Coefficients and Gust Response Factors per Equations in Tables 250-2 and 250-3
    > 90 MPH Basic Wind Speed, 3 second Gust Wind Speed, Figure 250-2 Beginning on Page 180
    > Grade B Construction "Method A" per Table 253-1, Page 197 and Table 261-1A, Page 207
    > Extreme Ice with Concurrent Wind Loading per Rule 250D, Page 179
    > 1" Basic Ice Diameter with Concurrent 30 MPH Basic Wind Speed, Figure 250-3 Beginning on Page 184
    > Cable Tension and Automatic Sagging Limits per Rule 261H1, Page 204
     **** PLEASE NOTE - Many experts consider these limits to be high and could lead to severe aeolian vibration ****
     **** PLS recommends checking with your cable manufacturer and/or other standards for recommended values ****
    > Insulator Mechanical Strengths per Rule 277 - Important Note for Strength Check:
     **** NESC Rule 277 specifically excludes Rule 253 Load Factors for checking the mechanical strength of insulators ****
     **** This Criteria checks Insulators for ALL cases using a Strength Factor of 1.0 applied to insulator working load properties. ****
     **** When specifying the insulator strength properties in Components/Insulators in TOWER and PLS-POLE,
          the manufacturer`s recommended load capacities shall be used per NESC Table 277-1. This is normally the RTL and RCL
          values published by the non-ceramic insulator manufacturers. See IEEE Std 1572™-2004 IEEE Guide for Application of
          Composite Line Post Insulators for further clarification. ****
     **** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****
     **** User may prefer to add other specific load cases utilizing alternative Strength Factors ****
     **** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****
     **** See Tech Note at http://www.powline.com/products/nesc_insulators.html for additional discussion ****
    > Structure Loads criteria includes typical Full Structure DE cases
  POWER LINE SYSTEMS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE CONTENT HEREIN OR RESULTS OBTAINED FROM ITS USE ON ANY PROJECT.
  THIS FILE IS PROVIDED FOR ILLUSTRATION ONLY. CRITERIA SHOULD BE CHECKED AND MODIFIED AS NECESSARY BY AN ENGINEER IN RESPONSIBLE CHARGE,
  FAMILIAR WITH THE NESC AND LOCAL REQUIREMENTS OF THE AREA IN WHICH THE PROJECT IS LOCATED, AND ITS APPLICATION.

RESPONSIBLE ENGINEER SHOULD VERIFY EXTREME WIND, CONCURRENT ICE AND WIND, AND EXTREME ICE PARAMETERS FOR THEIR APPLICABLE REGION.
RESPONSIBLE ENGINEER SHOULD VERIFY MAXIMUM OPERATING CONDITION FOR THEIR APPLICABLE PROJECT
RESPONSIBLE ENGINEER SHOULD VERIFY CONDITIONS AND FACTORS USED FOR INSULATOR STRENGTH CHECKS
RESPONSIBLE ENGINEER SHOULD ADD ANY ADDITIONAL CRITERIA THAT MAY BE REQUIRED BEYOND THE NESC
RESPONSIBLE ENGINEER SHOULD REMOVE THIS DISCLAIMER AND MODIFY NOTES ABOVE AS APPLICABLE WHEN ASSUMING CHARGE OF THIS CRITERIA

EMF Calculation Notes:
1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
5) Wire position is determined by the currently displayed weather case.
6) Wire height used is the height of the wire where the target point is projected upon it.
7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground:	3.28 (ft)
Cross section offset for graph +/-:	200.00 (ft)
Result interval for graph:	5.00 (ft)
Electric field limit:	1.60 (kV/m)
Magnetic field limit:	200.00 (mG)

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
1	1	1	345	0.000	0	0.000
2	1	1	345	1180.000	0	1.762
2	2	1	345	1180.000	120	1.762
2	3	1	345	1180.000	-120	1.762

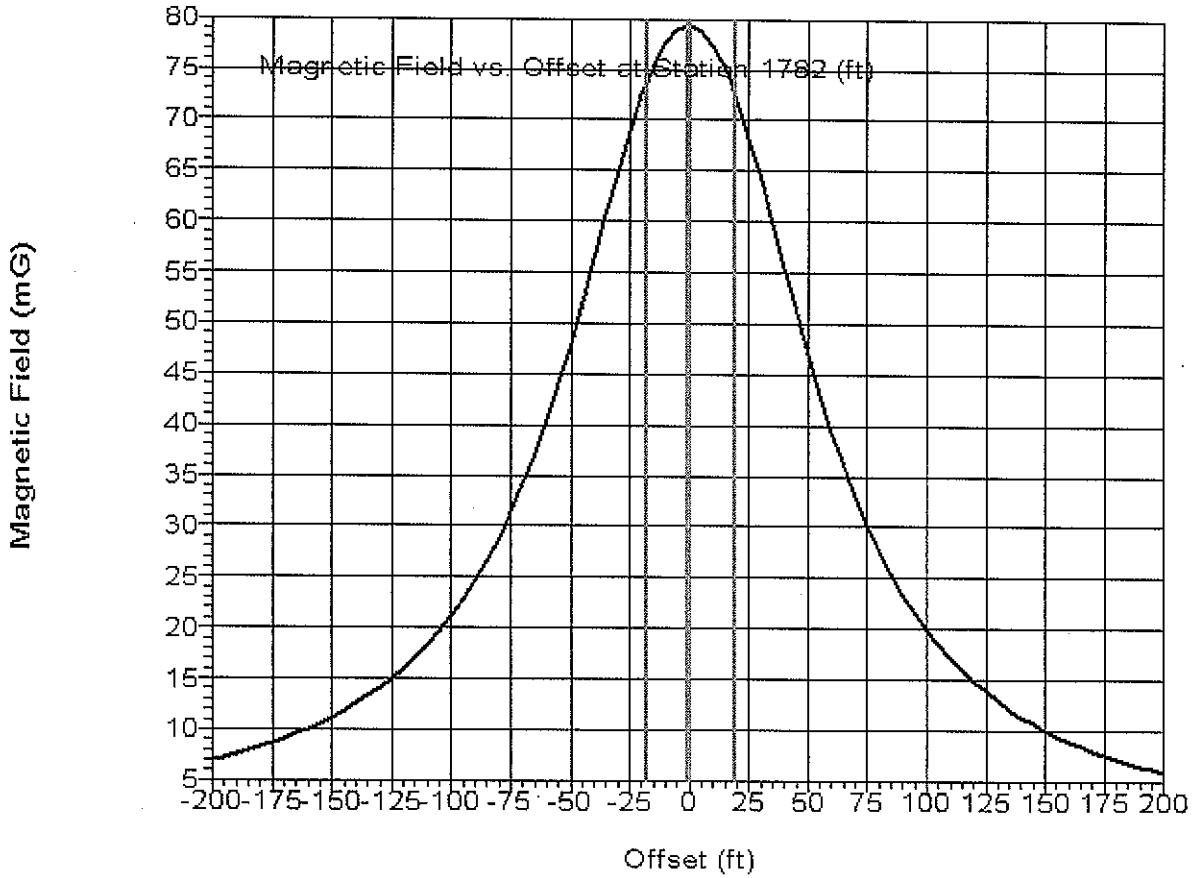
Calculated EMF Circuit Data For Last Point:

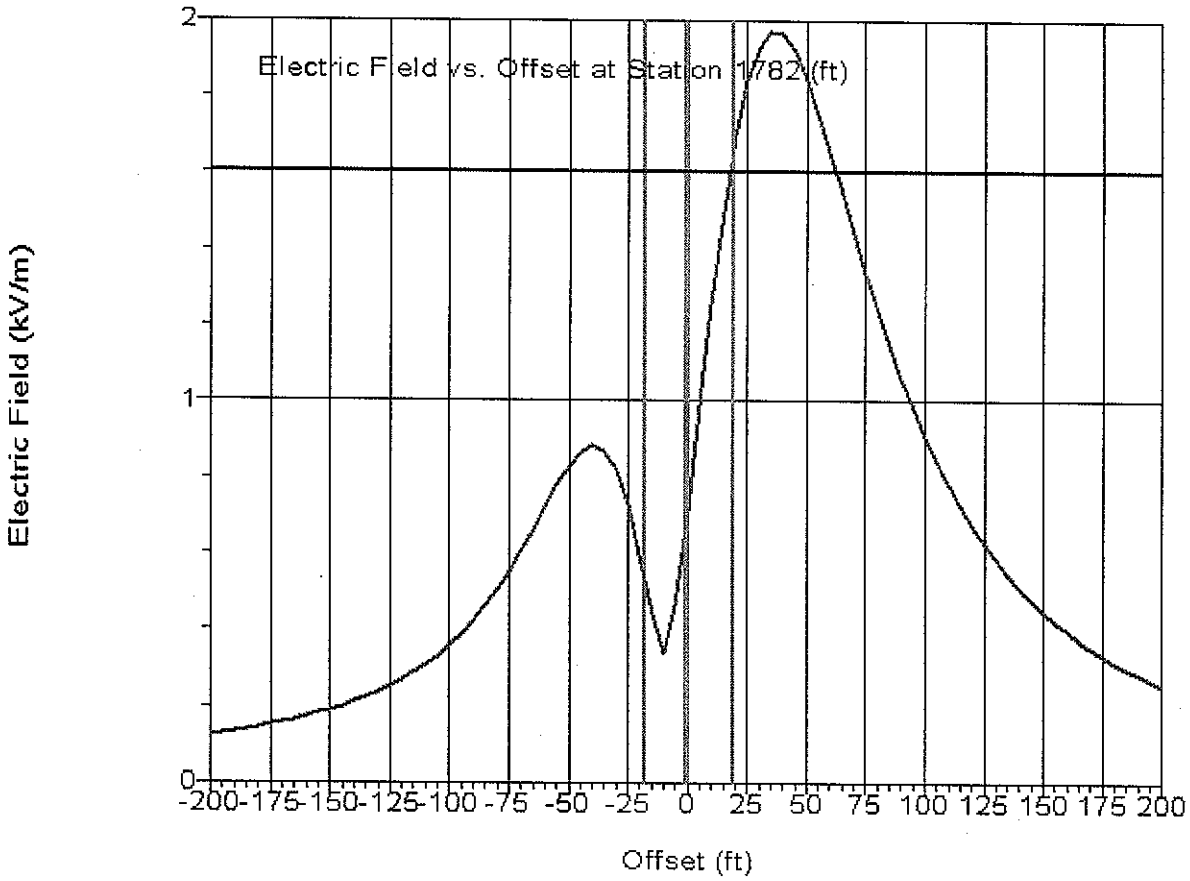
**Wire coordinates are printed for the location on the wire closest to the alignment.
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.**

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Voltage To Gnd. (kV)

1	1	NESC Heavy (250B)	Creep RS	Left	6155.12	12420.21	543.33	1781.87	0.22	0.509	199.2
2	1	NESC Heavy (250B)	Creep RS	Left	6174.27	12418.48	524.87	1781.21	19.44	1.762	199.2
2	2	NESC Heavy (250B)	Creep RS	Left	6154.48	12420.25	524.17	1781.88	-0.42	1.762	199.2
2	3	NESC Heavy (250B)	Creep RS	Left	6136.90	12419.60	523.34	1780.25	-17.94	1.762	199.2

Maximum magnetic field of 79.41 (mG) found at station 1781.87, offset 0.00 (ft)
Maximum electric field of 1.969 (kV/m) found at station 1781.87, offset 35.00 (ft) NG





EMF Calculation Results:

Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1781.87	-200.00	5955.21	12431.29	466.81	5.721	3.91949	34.4	6.935	0.097	0.07618	38.2	88.6	0.123
1781.87	-195.00	5960.20	12431.02	466.81	5.968	4.08947	34.4	7.234	0.100	0.08067	39.0	88.6	0.128
1781.87	-190.00	5965.19	12430.74	466.81	6.231	4.27179	34.4	7.555	0.102	0.08555	39.9	88.6	0.133
1781.87	-185.00	5970.18	12430.46	466.81	6.514	4.46767	34.4	7.899	0.105	0.09089	40.9	88.5	0.139
1781.87	-180.00	5975.18	12430.18	466.81	6.817	4.67845	34.5	8.268	0.107	0.09672	42.0	88.5	0.145
1781.87	-175.00	5980.17	12429.91	466.81	7.143	4.90563	34.5	8.665	0.110	0.10311	43.2	88.4	0.151

1781.87	-170.00	5985.16	12429.63	466.81	7.494	5.15091	34.5	9.094	0.112	0.11013	44.4	88.4	0.157
1781.87	-165.00	5990.15	12429.35	466.81	7.873	5.41621	34.5	9.556	0.115	0.11784	45.7	88.4	0.165
1781.87	-160.00	5995.15	12429.08	466.81	8.282	5.70368	34.6	10.056	0.117	0.12635	47.2	88.3	0.172
1781.87	-155.00	6000.14	12428.80	466.81	8.725	6.01574	34.6	10.598	0.119	0.13574	48.7	88.2	0.181
1781.87	-150.00	6005.13	12428.52	466.81	9.205	6.35516	34.6	11.186	0.121	0.14613	50.4	88.2	0.190
1781.87	-145.00	6010.12	12428.25	466.81	9.726	6.72506	34.7	11.825	0.122	0.15764	52.2	88.1	0.199
1781.87	-140.00	6015.11	12427.97	466.81	10.294	7.12897	34.7	12.521	0.123	0.17043	54.1	88.0	0.210
1781.87	-135.00	6020.11	12427.69	466.81	10.913	7.57092	34.8	13.282	0.124	0.18465	56.2	87.9	0.222
1781.87	-130.00	6025.10	12427.42	466.81	11.588	8.05548	34.8	14.113	0.123	0.20049	58.4	87.8	0.235
1781.87	-125.00	6030.09	12427.14	466.81	12.328	8.58784	34.9	15.024	0.122	0.21816	60.8	87.7	0.250
1781.87	-120.00	6035.08	12426.86	466.81	13.139	9.17389	34.9	16.025	0.120	0.23790	63.3	87.6	0.266
1781.87	-115.00	6040.08	12426.59	466.81	14.030	9.82029	35.0	17.126	0.116	0.25995	65.9	87.4	0.285
1781.87	-110.00	6045.07	12426.31	466.81	15.011	10.53461	35.1	18.339	0.111	0.28460	68.7	87.3	0.305
1781.87	-105.00	6050.06	12426.03	466.81	16.093	11.32531	35.1	19.678	0.104	0.31214	71.6	87.2	0.329
1781.87	-100.00	6055.05	12425.75	466.81	17.287	12.20187	35.2	21.160	0.095	0.34286	74.6	87.0	0.355
1781.87	-95.00	6060.05	12425.48	466.81	18.609	13.17475	35.3	22.800	0.083	0.37705	77.6	86.8	0.386
1781.87	-90.00	6065.04	12425.20	466.81	20.072	14.25535	35.4	24.619	0.068	0.41496	80.7	86.7	0.420
1781.87	-85.00	6070.03	12424.92	466.81	21.693	15.45576	35.5	26.636	0.050	0.45674	83.7	86.6	0.459
1781.87	-80.00	6075.02	12424.65	466.81	23.489	16.78843	35.6	28.872	0.031	0.50237	86.5	86.5	0.503
1781.87	-75.00	6080.01	12424.37	466.81	25.479	18.26543	35.6	31.350	0.021	0.55159	87.8	86.5	0.552
1781.87	-70.00	6085.01	12424.09	466.81	27.679	19.89731	35.7	34.089	0.041	0.60375	86.1	86.6	0.605
1781.87	-65.00	6090.00	12423.82	466.81	30.106	21.69145	35.8	37.106	0.074	0.65760	83.6	86.7	0.661
1781.87	-60.00	6094.99	12423.54	466.81	32.770	23.64951	35.8	40.413	0.112	0.71115	81.1	87.0	0.720
1781.87	-55.00	6099.98	12423.26	466.81	35.677	25.76409	35.8	44.008	0.152	0.76137	78.7	87.4	0.776
1781.87	-50.00	6104.98	12422.99	466.81	38.821	28.01449	35.8	47.874	0.191	0.80407	76.6	88.0	0.826
1781.87	-45.00	6109.97	12422.71	466.81	42.181	30.36187	35.7	51.972	0.226	0.83382	74.8	88.8	0.864
1781.87	-40.00	6114.96	12422.43	466.81	45.717	32.74475	35.6	56.234	0.251	0.84427	73.5	89.9	0.881
1781.87	-35.00	6119.95	12422.16	466.81	49.364	35.07616	35.4	60.557	0.259	0.82873	72.7	91.4	0.868
1781.87	-30.00	6124.95	12421.88	466.81	53.034	37.24456	35.1	64.805	0.243	0.78148	72.7	93.4	0.818
1781.87	-25.00	6129.94	12421.60	466.81	56.613	39.12058	34.6	68.815	0.198	0.69935	74.2	96.2	0.726
1781.87	-20.00	6134.93	12421.32	466.81	59.970	40.57055	34.1	72.405	0.126	0.58348	77.8	99.9	0.594
1781.87	-15.00	6139.92	12421.05	466.81	62.963	41.47554	33.4	75.396	0.109	0.44069	76.1	103.6	0.441
1781.87	-10.00	6144.92	12420.77	466.81	65.448	41.75195	32.5	77.632	0.250	0.28456	48.6	90.9	0.337
1781.87	-5.00	6149.91	12420.49	466.81	67.294	41.36796	31.6	78.992	0.460	0.14310	17.3	72.2	0.463
1781.87	0.00	6154.90	12420.22	466.81	68.389	40.35034	30.5	79.405	0.703	0.11858	9.6	75.2	0.709
1781.87	5.00	6159.89	12419.94	466.81	68.655	38.77945	29.5	78.851	0.962	0.21528	12.6	79.1	0.985
1781.87	10.00	6164.88	12419.66	466.81	68.061	36.77398	28.4	77.360	1.217	0.30719	14.2	82.0	1.255
1781.87	15.00	6169.88	12419.39	466.81	66.624	34.47039	27.4	75.013	1.450	0.37130	14.4	84.3	1.497
1781.87	**20.00**	**6174.87**	**12419.11**	**466.81**	**64.421**	**32.00291**	**26.4**	**71.932**	**1.645**	**0.40657**	**13.9**	**86.0**	**1.695**	**NG**
1781.87	**25.00**	**6179.86**	**12418.83**	**466.81**	**61.572**	**29.48870**	**25.6**	**68.269**	**1.793**	**0.41726**	**13.1**	**87.5**	**1.840**	**NG**
1781.87	**30.00**	**6184.85**	**12418.56**	**466.81**	**58.235**	**27.01983**	**24.9**	**64.198**	**1.887**	**0.40940**	**12.2**	**88.7**	**1.931**	**NG**
1781.87	**35.00**	**6189.85**	**12418.28**	**466.81**	**54.577**	**24.66155**	**24.3**	**59.891**	**1.930**	**0.38900**	**11.4**	**89.7**	**1.969**	**NG**
1781.87	**40.00**	**6194.84**	**12418.00**	**466.81**	**50.764**	**22.45483**	**23.9**	**55.508**	**1.928**	**0.36118**	**10.6**	**90.5**	**1.961**	**NG**
1781.87	**45.00**	**6199.83**	**12417.73**	**466.81**	**46.935**	**20.42105**	**23.5**	**51.185**	**1.888**	**0.32982**	**9.9**	**91.1**	**1.917**	**NG**
1781.87	**50.00**	**6204.82**	**12417.45**	**466.81**	**43.203**	**18.56717**	**23.3**	**47.024**	**1.821**	**0.29763**	**9.3**	**91.6**	**1.845**	**NG**
1781.87	**55.00**	**6209.82**	**12417.17**	**466.81**	**39.647**	**16.89030**	**23.1**	**43.095**	**1.735**	**0.26632**	**8.7**	**92.0**	**1.755**	**NG**

1781.87	**60.00**	**6214.81**	**12416.89**	**466.81**	**36.318**	**15.38146**	**23.0**	**39.441**	**1.637**	**0.23691**	**8.2**	**92.3**	**1.654**	**NG**
1781.87	65.00	6219.80	12416.62	466.81	33.241	14.02829	22.9	36.080	1.534	0.20990	7.8	92.5	1.548	
1781.87	70.00	6224.79	12416.34	466.81	30.425	12.81695	22.8	33.015	1.431	0.18546	7.4	92.7	1.443	
1781.87	75.00	6229.78	12416.06	466.81	27.865	11.73337	22.8	30.235	1.329	0.16360	7.0	92.8	1.339	
1781.87	80.00	6234.78	12415.79	466.81	25.550	10.76397	22.8	27.725	1.233	0.14416	6.7	92.8	1.241	
1781.87	85.00	6239.77	12415.51	466.81	23.461	9.89606	22.9	25.462	1.141	0.12696	6.3	92.9	1.148	
1781.87	90.00	6244.76	12415.23	466.81	21.579	9.11811	22.9	23.427	1.056	0.11179	6.0	92.9	1.062	
1781.87	95.00	6249.75	12414.96	466.81	19.886	8.41972	22.9	21.595	0.977	0.09843	5.8	92.9	0.982	
1781.87	100.00	6254.75	12414.68	466.81	18.363	7.79165	23.0	19.947	0.905	0.08668	5.5	92.8	0.909	
1781.87	105.00	6259.74	12414.40	466.81	16.990	7.22574	23.0	18.463	0.838	0.07635	5.2	92.8	0.842	
1781.87	110.00	6264.73	12414.13	466.81	15.753	6.71480	23.1	17.124	0.778	0.06726	4.9	92.8	0.780	
1781.87	115.00	6269.72	12413.85	466.81	14.636	6.25254	23.1	15.915	0.722	0.05926	4.7	92.7	0.724	
1781.87	120.00	6274.72	12413.57	466.81	13.626	5.83343	23.2	14.822	0.671	0.05221	4.4	92.7	0.673	
1781.87	125.00	6279.71	12413.30	466.81	12.710	5.45263	23.2	13.830	0.625	0.04600	4.2	92.6	0.627	
1781.87	130.00	6284.70	12413.02	466.81	11.879	5.10593	23.3	12.930	0.583	0.04051	4.0	92.6	0.584	
1781.87	135.00	6289.69	12412.74	466.81	11.124	4.78961	23.3	12.111	0.544	0.03566	3.8	92.5	0.545	
1781.87	140.00	6294.69	12412.46	466.81	10.436	4.50042	23.3	11.365	0.509	0.03137	3.5	92.5	0.509	
1781.87	145.00	6299.68	12412.19	466.81	9.807	4.23552	23.4	10.683	0.476	0.02757	3.3	92.4	0.477	
1781.87	150.00	6304.67	12411.91	466.81	9.232	3.99238	23.4	10.058	0.446	0.02420	3.1	92.3	0.447	
1781.87	155.00	6309.66	12411.63	466.81	8.705	3.76881	23.4	9.486	0.419	0.02120	2.9	92.3	0.420	
1781.87	160.00	6314.65	12411.36	466.81	8.221	3.56284	23.4	8.960	0.394	0.01854	2.7	92.2	0.395	
1781.87	165.00	6319.65	12411.08	466.81	7.776	3.37276	23.4	8.476	0.371	0.01616	2.5	92.2	0.371	
1781.87	170.00	6324.64	12410.80	466.81	7.365	3.19704	23.5	8.029	0.350	0.01405	2.3	92.1	0.350	
1781.87	175.00	6329.63	12410.53	466.81	6.986	3.03432	23.5	7.617	0.330	0.01216	2.1	92.1	0.330	
1781.87	180.00	6334.62	12410.25	466.81	6.636	2.88340	23.5	7.235	0.312	0.01047	1.9	92.1	0.312	
1781.87	185.00	6339.62	12409.97	466.81	6.311	2.74320	23.5	6.881	0.295	0.00896	1.7	92.0	0.296	
1781.87	190.00	6344.61	12409.70	466.81	6.009	2.61276	23.5	6.553	0.280	0.00761	1.6	92.0	0.280	
1781.87	195.00	6349.60	12409.42	466.81	5.729	2.49124	23.5	6.247	0.265	0.00640	1.4	91.9	0.266	
1781.87	200.00	6354.59	12409.14	466.81	5.468	2.37785	23.5	5.963	0.252	0.00531	1.2	91.9	0.252	