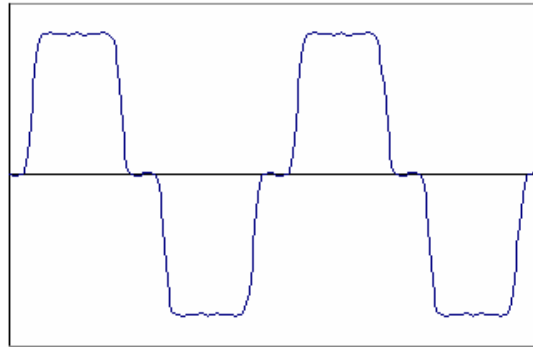


EE368 Homework #10, Due Friday, April 14. (version 4/4/06).
 Analyze the Effectiveness of a Filter Plan for a 454 Bus Ski Area

A 454 bus ski area has 49.7MW of linear load, and 14.6MW of six-pulse line commutated converter loads used to power ski lifts. The individual drives are usually in the 250HP to 500HP range. Data for the case are given in input files bdat_sysa.csv, ldat_sysa.csv, and spectra_sysa.csv. The input files take into account phase angle diversity in the higher-order harmonics by using the following composite current injection spectrum for all drives:

Phase Angle-Diversified Sine Spectrum for Ski Lift Drive Current		
Harmonic	Relative Magnitude	Phase Angle
1	100	0
5	18	180
7	11.43	180
11	4.55	0
13	3.08	0
17	1.176	180
19	1.052	180



Your task is to simulate the system, before and after the following harmonic filters are added:

600 kVAr, 4.8 th at PCFLO #198, "Clipper ..."
600 kVAr, 4.8 th at PCFLO #42, "Bonanza ..."
600 kVAr, 4.8 th at PCFLO #199, "Viking ..."
300 kVAr, 6.6 th at PCFLO #198, "Clipper ..."
300 kVAr, 6.6 th at PCFLO #42, "Bonanza ..."
300 kVAr, 6.6 th at PCFLO #199, "Viking ..."
300 kVAr, 4.8 th at PCFLO #1360, "Crest"
300 kVAr, 4.8 th at PCFLO #1383, "Eagle Express"
300 kVAr, 6.6 th at PCFLO #1360, "Crest"

Write a one or two page report (Word doc) assessing the effectiveness of the filters. Exclude from your analysis the high THDVs at busses 6000 – 6004 (these are capacitor filter busses in the original case, before those capacitors added in the above table). Include in your report the impact of filters on

- THDV,
- displacement power factor,
- fundamental voltage magnitude.

Also, for one of your filters,

- give values for fundamental V1 on the filter capacitor
- convert the filter inductor to millihenries (per phase)
- use I1rms and THDI to compute the rms current in the filter inductor.