



## **Energy Savings with Surge Protection Devices ??**

By: Dan Maxcy 12/19/08

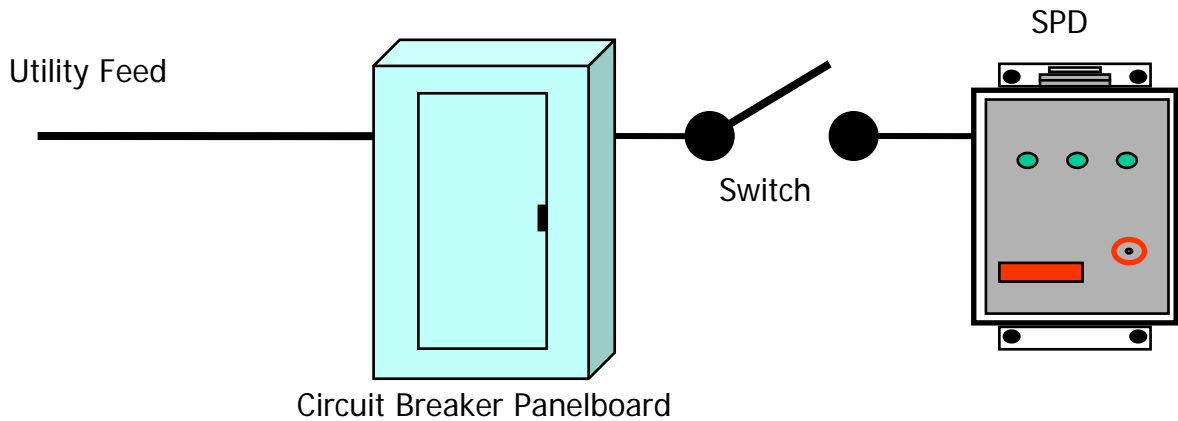
We had heard of a theory wherein a Surge Protection Device (SPD) (sometimes called Transient Voltage Surge Suppressors) could be used to save money on a facility's electrical utility bill. The theory suggested the following:

1. Transient voltage surges occur in all our facilities.
2. These transient surges create voltages and currents above our normal facility levels.
3. These higher voltages and currents cause us to use more electricity than normal.
4. Using more electricity causes our watt-hour meter (the electric meter) to measure higher electrical use.
5. We pay more on our electrical bill due to this higher reading.

At first glance this theory seems like a good idea. Like most theories it would be nice to get proof. That's what we tried to do.

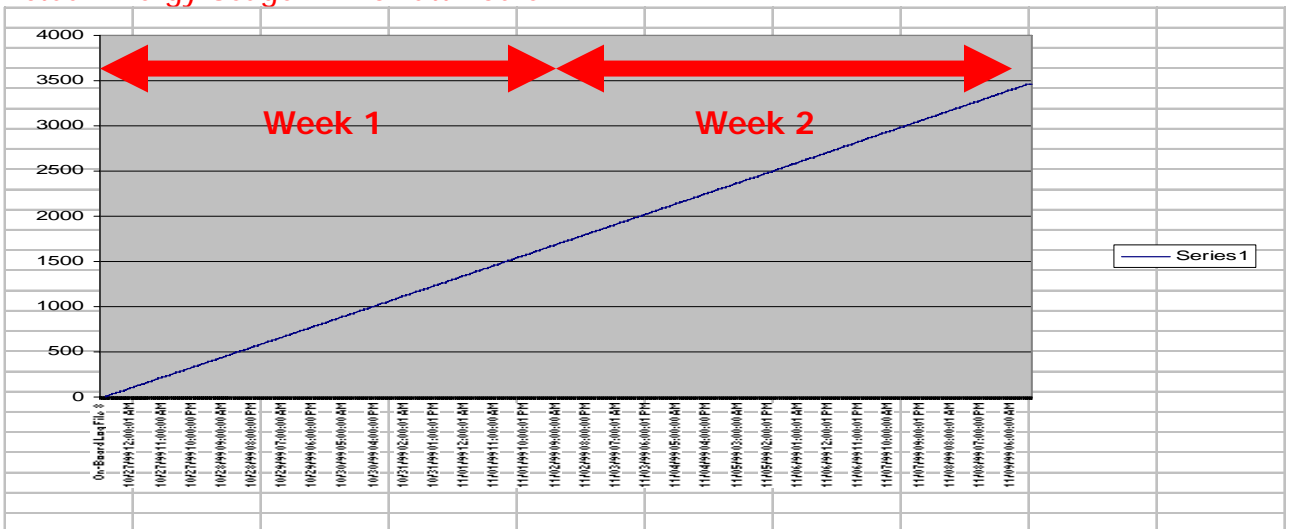
The following test was performed at a local grocery store during a two-week period. A revenue class Square D Power Logic KWH meter along with revenue class current transformers was used to record the watt hour data at a 225 Amp 208Y volt circuit breaker Panelboard. The equipment fed from this Panelboard is compressor motors and lighting equipment in the grocery store.

The test was performed to indicate the exact KWH savings that could be expected from installing a SPD on the above Panelboard. An IEEE 587 – UL 1449 2<sup>nd</sup> edition SPD was installed on this panel. We recorded readings on this Panelboard showing the exact kilowatt usage with and without a SPD. The following is a one line drawing of the installation.



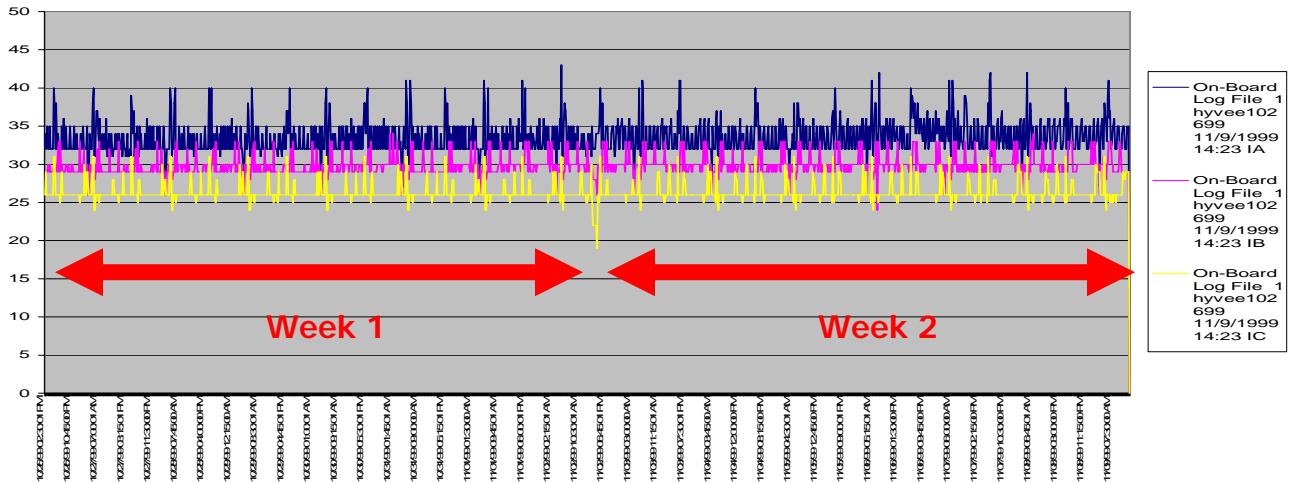
During the first week the SPD unit was NOT connected to the Panelboard (switch open). During the second week the SPD WAS connected to the Panelboard (switch closed). **The data below shows absolutely NO energy savings from week one to week two.** The KWH graph shows a steady increase from week one to week two. If ANY energy savings were to be realized the chart would have shown some kind of decrease in week two after turning on the SPD. There was no decrease. The KWH data was also backed up by the actual current data (also shown) taken at the same time showing no increase or decrease in the actual equipment usage.

Actual Energy Usage in kilowatt-hours





Actual current flow



In conclusion, the addition of a SPD on a Panelboard with both motors and lighting equipment has no effect on watt-hour usage, therefore, no energy savings. Also if you were to look at a specification sheet of a typical watt-hour meter from the Shallenberger Electric Company, which supplies a majority of the meters in the United States, the specifications show the meter is only responsive to currents and voltage at 60 hertz plus or minus 3 hertz. IEEE confirms and specifies that transient voltages occur at frequencies well above 35 thousand hertz, therefore, the watt-hour meters used by the utility companies cannot even read these transients much less record them as actual energy to be billed.

Proper installation of SPDs will save you money on equipment damage and malfunction. This actual savings should be your main consideration, NOT energy savings.