SineTamer

"we ARE the standard"

Operational Theory

Surge Equalization verse Surge Diversion

Most people view SPD's (Surge Protective Devices) as products that divert surge energy from the incoming line to ground. For a number of products this is absolutely correct. Many devices only provide a single path for the surges to travel. This path is commonly termed a protection "mode". Products designed to the latest understanding of surge protection such as the SineTamer product line, are designed with multiple modes of protection for a variety of reasons.

Products like the SineTamer allow the protective components to equalize the voltages between all modes (i.e. paths between Phases, Neutral and Ground) which inherently prevents flow of current between these modes. Current flow is the most damaging characteristic of a surge event. Without current flow there is no damage. Only products that protect between each and every mode of protection can perform this adequately. For example, in a 3 Phase Wye electrical system there are actually 10 modes: 3 Phase to Neutral Modes (A-N, B-N and C-N), 3 Phase to Ground Modes (A-G, B-G and C-G), 3 Phase to Phase Modes (in the form of a triangle for a visual representation: A-B, B-C and C-A) and then there is the N-G Mode (unless they are bonded as in the case of the Service Entrance of the Electrical System. If a surge event comes in on a given Phase A, then the surge components have the ability to raise and equalize the voltage on all phases which prevents the flow of current (amperage). We have all seen the large Tesla generators where a man has millions of volts flowing through his body with enormous arcing between the conductors. This is a prime example of equalization. There is little to no flow of current (amperage) between the conductors of the generator; therefore, no damage. In this case the man continues to live. In the case of your electrical system and your equipment, the SineTamer allows them to continue to live.

This is only one way in which a properly designed SPD addresses surge events, but it is one that separates good from poor designs. Surge events are often diverted to ground. The extent of which an event is diverted to ground versus "equalization" as described above, is based on the source of the surge. A surge event coming in between two Phases might be addressed from a percentage standpoint more from an equalization standpoint rather than a diversion

standpoint. However, a surge event occurring on a Line to Ground mode, would most likely be addressed via diversion. Although, the equalization of modes would still occur preventing flow of any current to the other Phases, Neutral and Ground.

Some surge components will also absorb some level of surge energy and turn it into heat. This should not be considered as a direct goal of design for a SPD. In fact, using the modes of protection schemes mentioned above which maximize equalization characteristics tend to minimize heating. Surge component heating is one of the major contributors to SPD failure and/or deterioration. Properly designed SPD's will have extreme life expectancies when sized (peak surge current) appropriately to the exposure level of the electrical system. Heating is primarily experienced in SPD's that lack proper modes of protection and rely exclusively on diversion and leaving out key modes of protection.

Seek SPD's in which the manufacturer provides warranties of at least 20 years, like the SineTamer. These designs are most likely to have maximized their designs in order for them to survive due to proper combination of equalization (via proper modes of protection coverage) and adequately sized surge components to handle long term heating when surge diversion is experienced. There are many characteristics that SPD manufacturers will market in order to avoid discussion of realistic performance criteria. A SPD device is designed to prevent damage to attached electrical system and equipment. The best measure of performance is the voltage level that passes the SPD when various common surge events are inserted into the device in a laboratory. This performance characteristic will demonstrate good design and in most cases proper modes of protection; however, ensure that your choice does provide protection between every mode to assure proper equalization technique. Additional consideration should be given to the terms and duration of the SPD's warranty, as this truly demonstrates the manufacturer's experience with the design and confidence in the products' performance. Bottom line, there is one product that meets all of these criteria and that is the SineTamer; longest warranty in the industry, extreme performance, latest applied technology and a proven track record of documented customers saving money, equipment and downtime. It's hard to understand why other manufacturers haven't kept up with the SineTamer, but for you, today, the SineTamer is the product of choice.