Innovative Technology
TVSS Products

Technical Document

Facility-Wide Surge Suppression

FACILITY-WIDE SURGE SUPPRESSION

As recommended by IEEE Std. 1100 - 1999 (Emerald Book), Transient Voltage Surge Suppressors (TVSS) need to be coordinated in a staged or cascaded approach. IEEE provides the following recommendations:

> "...For large surge currents, (transient) diversion is best accomplished in two stages: the first diversion should be performed at the service entrance to the building. Then, any residual voltage resulting from the action (of the suppression device) can be dealt with by a second protective device at the power panel of the computer room (or other critical load). In this manner, the wiring inside the building is not required to carry the large surge current to and from the diverter at the end of a branch circuit."
>
> "...proper attention must be given to coordination of cascaded surge protection devices."

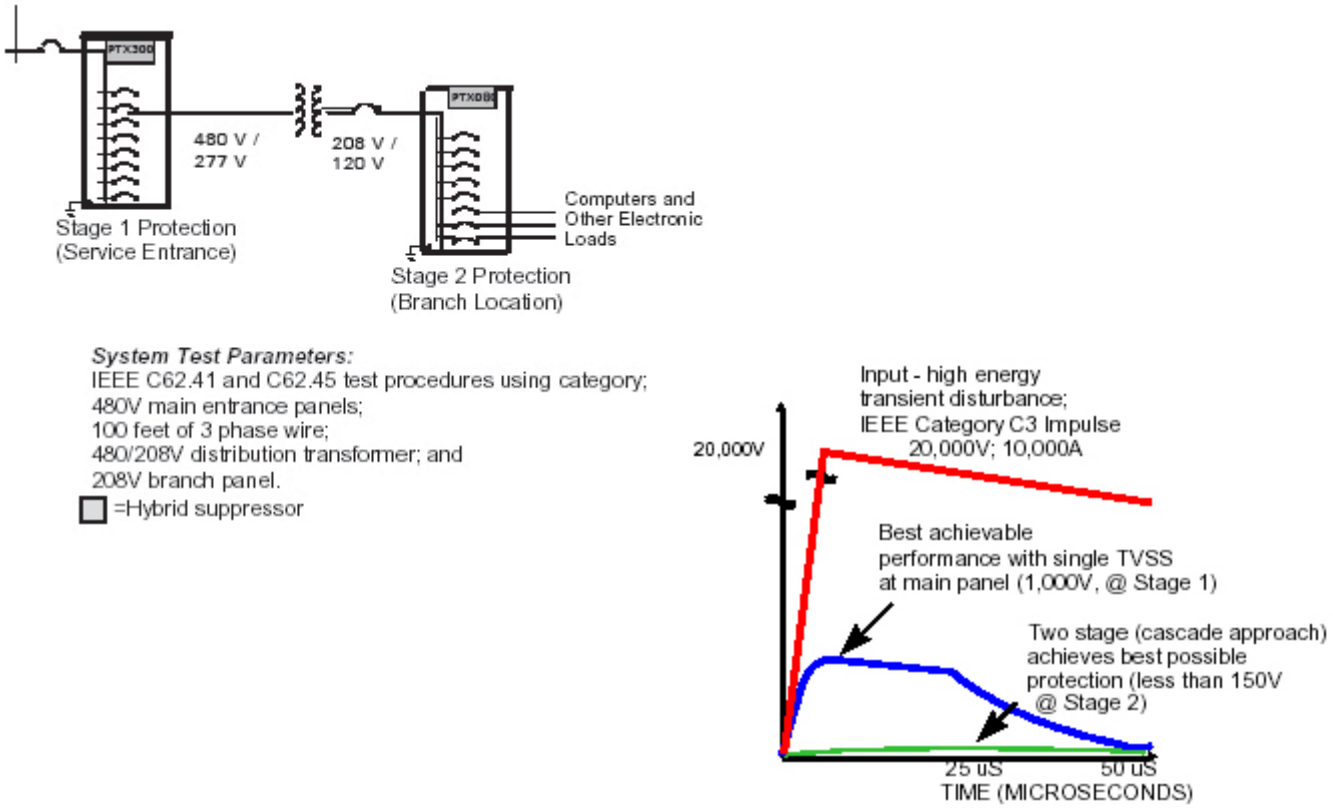
There is significant research and development regarding coordinated suppression systems. Findings clearly indicate that panel TVSS (with EMI RFI filtering) provide the best facility-wide protection. Figure 1 demonstrates the effectiveness of a suppression system when used in a two stage (cascaded) approach.

As demonstrated, the two stage approach ensures that both types of disturbances are suppressed to negligible levels at the branch panel (<150 V Let Through). This prevents high energy transients from damaging components and ensures that fast low level ringwaves will not degrade or disrupt the operation of downstream microprocessors. This ensures the system performance meets the following IEEE (Emerald Book, 1992) recommended performance:

> "While electromechanical devices can generally tolerate voltages of several times their rating for short durations, ***few solid-state devices can tolerate*** much more than twice their normal rating. Furthermore, data processing equipment can be affected by fast changes in voltages with relatively small amplitude compared to the hardware-damaging overvoltages."

Eaton's Innovative Technology® has developed the System Shield® coordinated approach to facility-wide surge protection. Implementing system shield protection on a facility's power, data, phone and coaxial lines greatly reduces the harmful effects of internal and external transient surges. The results are lower maintenance costs, greater facility uptime and far fewer transient related equipment failures.

Figure 1: Facility-Wide Protection Solutions: IEEE Emerald Book recommends a cascade (or 2 stage) approach



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