



MEMORANDUM FOR RECORD

Colorado Springs, CO
Facilities Engineering
Department 3365

DATE: 08-24-04

PROJECT: Site TVSS System Functionality Review

BUILDING: 8 Buildings, 1,000,000. Sq. Foot, Semi Conductor Manufacturing Campus

TO: Russ Burcher Facilities Engineering Manager

FROM: Dale Pickering Principal Electrical Engineer, Site Power Quality / Power Distribution

CC: Rich Michael Senior Electrical Engineer, Manufacturing Power Quality

REGARDING: A recap of the effectiveness, maintenance, ongoing system costs, R.O.I., and the concluding recommendation for completion of the installation base of the "TVSS System".

In 1994 the objective to confine the "ravaging damage" from spikes riding in on service wiring and noise generated between our manufacturing tool sets (damaging our: manufacturing equipment, life safety alarm systems, I.S. computer systems, security monitoring systems, and to actual I.C. products) resulted in the selection of "Innovative Control Systems" (I.C.S.) Transient Voltage Surge Suppression (TVSS) equipment. Our site losses were in the tens of millions of dollars per quarter. With I.C.S.'s help, we embarked on an eight building, three tiered, proactive installation of TVSS mitigation design, totaling some 805 locations (i.e. service entrance switchgear, distribution panels, branch panels, and motor control centers).

I am pleased to report to you that our sizable investment in TVSS mitigation has more than paid for itself many times over, and is still fully functional now, ten years later. It was just like a valve someplace that was supplying transients to our electrical systems and slowly burning up our site, was simply turned off! So much so that management takes the elimination of such "old problems" as a thing of the distant pass. They now forecast and manufacture with great confidence and commitment to global excellence.

The beauty of the product application, from a Facilities Engineering and Operations standpoint, is that these three interactive levels of TVSS require absolutely no investment in maintenance labor nor parts expense budgeting to maintain them! We have only lost two branch circuit TVSS units in the last ten years, and that was due to our own fault. First, we incorrectly re-tapped the upstream 75 kVA dry type transformer feeding this branch panel, as a planned shutdown voltage drop corrective action. This error increased the peak voltage beyond the peak to peak spec. window of the TVSS "Sine Wave Tracking" window's limits. Secondly, unseen roof top construction damage to our lightning protection system allowed an ensuing lightning strike to get onto the building steel and into a sole manufacturing branch panel with TVSS. However, the TVSS product sacrificed itself in order to shunt this lightning energy safely to ground, with no damage to any manufacturing tool sets and no product losses or production!

Our site projects the Return On Investment (R.O.I.) was less than two months, after completing the installation of the three level TVSS System. This meant that the millions of dollars that we saved in losses, was turned into increased profitability and we even gained profit margins.

Now, the only remaining action required to complete this ongoing site mitigation project is to: formalize this final phase of "Scope Of Work"; funding for procurement; release the electrical contractor with non-shutdown installation instructions; to notify production of this site wide project's completion; and that ALL of the "back doors" for transient access have been closed!

In conclusion, I.C.S.'s assistance with this "TVSS Mitigation Solution" not only reaped the above benefits directly to our company's global success, but also gained the Facilities Engineering Department's respect from Production Management.