

TWO-STAGE TRANSIENT SUPPRESSION SYSTEM PROVIDES RELIABLE COMPUTER AUTOMATION IN HIGH-ENERGY TRANSIENT ENVIRONMENTS*

D. Kerstiens, LANL; M. Stettler, LANL; M. Thuot, LANL; D. Warren, LANL

* Work supported by the U. S. Department of Energy under contract W-7405-ENG-36.

Computers, PLCs and other state-machine based control systems are often required to operate in environments where they are exposed to transients from high-energy arcs or high power switching surges. A cost-effective two-stage transient suppression system has been implemented in a severe EMI environment at LANL. This system provides reliable protection for the distributed computer control system on the 75kv LEDA CW injector. Computer modeling was employed to optimize transient suppression in a wide range of transient environments. To minimize wiring labor costs, the system is packaged into the field and trunk wiring junction boxes in place of the terminal barrier strips. Use of the transient suppression system simplifies proper grounding and shielding of the field wiring by breaking ground loops and attenuating both common mode and normal mode transients. The computer modeling of transient sources, the design of the transient suppression system, the design of the grounding system, the application of EPICS to injector automation, and experience with controlling a high power CW injector in a high-energy transient environment are presented in this paper.