Why Install Surge Protection?

The consequences of an unexpected power surge can be catastrophic to any business or facility. To get a full picture of this expense, it is necessary to add the cost of equipment repair/replacement, the cost of data recovery, the cost of operational downtime and the cost of forgone opportunities. Additionally, personnel may be placed at undue risk through the possible failure of safety systems.

According to the **Insurance Information Institute**, NY, *(NY Press Release 11 August 1989):* Lightning and over-voltage transients cause damage to property, electrical, electronic and communications equipment estimated to be more than US$1.2 billion dollars per year in the US alone. This represents approximately 5% of all insurance claims in the US.

According to Holle, et al., *Journal of Applied Met, Vol 35, No.8, August 1996:* Insurance claims to lightning and over-voltage damage amount to US$332 million annually in the US, but many parties remain uninsured against this form of property damage. On average this represents a claim for one in every 57 lightning strikes in the US.

Cost of transient damage to unprotected systems includes:

- Equipment repair/replacement costs
- Data recovery costs
- Non-productive operational downtime
- Lost commercial opportunities
- Cost of customer dissatisfaction

Although it is the most spectacular form of externally generated transients, lightning is only one source of over-voltage events. Other sources include the switching of power circuits and operational equipment by neighboring industries, the operation of power factor correction devices, the switching and clearing of faults on transmission lines and utility substations. It is important to note that lightning does not need to directly strike a power line for such damage to occur; a strike several hundred feet away can induce large damaging transients, even to underground cables.

Most transients are actually internally generated within one's own facility by the switching on and off of electrical loads such as lights, heating systems, motors and operation of laser printers and photocopiers, etc. It is estimated that 70 to 85% of all transients are generated internally within one's own facility.

Modern industry is highly reliant on electronic equipment and automation to increase productivity and safety. The economic benefits of such devices are well accepted. Computers are commonplace and microprocessor-based Programmable Logic Controllers (PLCs) are used in most manufacturing facilities. Microprocessors can also be found imbedded in many industrial machines, security & fire alarms, time clocks and inventory tracking tools.

Given the wide range of transient sources and the potential cost of disruption, the initial installed cost of surge protection can readily be justified for any facility. As a guide, the cost of protection should be approximately 10% of the cost of the facility's economic risk.

To be effective, the protection concept should follow ERICO's Six Point Plan. Points 5 and 6 in this Plan deal with the need for surge protection on Power and Data circuits respectively. Under Point 5, a coordinated approach of distributed protection is advocated, where the first stage of defense is the installation of primary protection devices at the Service Entrance, followed by secondary protection at distribution Branch Panels or where necessary, at point-of-use applications.