

### **(1) Does lightning ever strike more than once in the same place?**

Yes, very often. The fact that lightning strikes multiple times in a location is a good indication that it will strike again if the object or building is still standing after the first strike. Localized conditions, mineral contents in the sub-soil, etc., are all reasons why lightning may strike many times within a given area.

### **(2) We have good grounding, do we still need surge protection?**

A good ground is important for surge protection devices (SPD) to work properly. AC mains SPD's are designed to divert surge current to ground by providing the least resistive path. Without surge protection on the AC mains, the surge current will look for other paths to a good ground. In many cases this path is found through electric/electronic equipment. Once the dielectric strength of the components in electronic equipment has been surpassed large currents begin to flow through the sensitive electronics thus causing failure.

### **(3) Our equipment is connected to a UPS, do we still need surge protection?**

UPS systems play a very important part in an overall power protection plan. They are designed to provide good clean uninterruptible power to critical equipment. They provide no protection for the communication and control lines found in today's network type environments. They also do not normally provide AC power protection to the many nodes connected within the network. The surge protection elements found within even a very large UPS is very small in comparison to stand-alone SPD's. Normally around 25 to 40kA. In comparison, our smallest AC entrance mains protector is 25kA and our largest is 200kA.

### **(4) We've never had any problems with surges, why do we need surge protection?**

There are not many areas of the world today that do not experience surge-related incidents. Lightning is only one of the many causes of transient surge related problems. Today's modern electronic equipment is much smaller, much faster, and much more susceptible to transient related problems than was the last generation of equipment. The sheer number of control and communication devices interlinked together in today's networks make their susceptibility many times greater. These are new problems that were not nearly as frequent with previous generations of control equipment.

### **(5) We are based in an area with very little lightning, why do we need surge protection?**

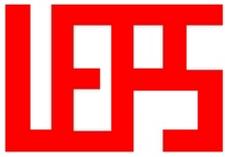
Many areas of the world do not experience as much lightning related problems as others. As much as companies today depend on their control and network systems, the system availability has become paramount. For most companies, a single surge related incident in a ten-year period, which causes the loss of system availability, would more than pay for proper protection.

### **(6) Why do I need to protect data/control lines?**

Data and control interfaces suffer many times more damage from surges than do power supplies. Power supplies normal have some type of filtering and operate at higher voltages than do control or communication interfaces. Low voltage control and communication interfaces normally interface directly into the equipment through a driver or receiver chip. This chip normally has both a logic ground reference as well as the communication reference. Any substantial difference between these two references will damage the chip.

### **(7) All my data lines run inside the building, why do I need to protect them?**

Even though all data lines stay within the building communication interfaces are still susceptible to damage. This can be caused by two reasons. 1. Induced voltages from a near by lightning strike when control/communications lines run near electrical power wires, metal in the building structure, or near lightning rod ground leads. 2. Differences in AC mains voltages references between two devices connected together by control/communication lines. When an event as a near by lightning strike migrates in on the AC mains power, individual equipment within the building can see large voltage reference differences. When these devices are connected together by low voltage control/communication lines, the control/communication lines try to equalize the difference, thus causing damage to the interface chips.



Let your Electronics be Protected and Safeguarded



Leader in Electronic Protection System

### **(8) Why is your protection more expensive than others I have found?**

The LEPS surge protection devices are actually medium priced. There are many more expensive devices on the market as well as the low cost commodity devices. If you look at the four main factors: Price, Packaging, Performance, and Safety, the LEPS product offering is the best in the industry. LEPS offers complete solution plans, from the AC mains service entrance down to the individual equipment and all the control/communication lines in between.

### **(9) The Phone Company has already protected the incoming phone lines, why do I need additional protection?**

The protection the Phone Company provides is there mainly for personal safety to prevent lightning from migrating in on their wires and causing personal injury. It provides little protection for sensitive electronic communications equipment. It provides primary protection but not eliminate the need for secondary protection at the equipment.

### **(10) Why are your protectors uses metal casing instead of plastic enclosure as commonly found on the market place ?**

We use metal housings for our SPD because of the risk of failure causing fires or even explosions. UL1449 2nd Edition dictates that SPD units MUST have safety features that prevent fires or explosion in the event of failure. All LEPS products are complied to UL to ensure that they fail safely.

### **(11) Why bother with lightning protection, doesn't our insurance pay for any damage?**

The cost to recover from losses caused by lightning can be very high. In addition to repair of actual damage to electrical or electronic equipment, there are other costs such as loss of data held on computer, delays whilst staff cannot use their computers, make or receive phone calls, send or receive faxes etc.

These losses are not always covered by insurance and the inconvenience, stress and long hours to co-ordinate repairs and catch up, are almost certainly excluded.

It is therefore in everyone's interest to identify cost effective ways to reduce the incidence and severity of lightning damage.

### **(12) How does lightning cause damage to electrical and electronic equipment?**

A lightning strike is an electrical discharge resulting from a build-up of electrical charge in a thunderstorm. This discharge can be from cloud to cloud or cloud to ground. The current that flows from cloud to ground can be very high, sometimes even in the hundreds of thousands of Amps, but the duration is often less than one tenth of a second.

When lightning strikes the ground or a structure, it causes the voltage at that point to rise dramatically, causing electrical current to flow from the that point to points further away from the strike.

If lightning strikes a structure or the ground close-by and that structure has electrical cabling connecting it to another structure further away, the increase in voltage at the point where the lightning strikes, will cause current to flow down the cable. This can cause damage to equipment at both ends of the cable.

A lightning strike also creates electrostatic and electromagnetic field which can induce currents in exposed cables, again causing damage to equipment at both ends of the cable.

### **(13) What About Fibre Optics?**

For new installations or installations where there are long cable runs between buildings, fibre optics can be considered. As the optical fibre cable sends signals by modulating light rather than electrical current, the cable is unaffected by lightning. Typical costs are \$1,200.00 each end for termination and conversion to electrical signal plus around \$7.00 per meter for cable. Even if fibre optics is used, it is still necessary to protect power lines.