Protecting Your Facility from Electrical Surge Damage

One of the leading causes of electrical equipment failure is transient voltage.

Transient Voltage – What You Can't See Can Hurt You

Transient voltage – also known as an electrical surge – is a short surge of electricity or rise in voltage that exceeds safe levels of operation for electrical equipment. Transient voltage can pass through any piece of electrical equipment in just a millisecond. There are several sources of transient voltage, but the main causes are the following:

- A direct or nearby lightning strike;
- Operation of high-power electrical devices, such as elevators, air conditioners and refrigerators;
- Faulty wiring, problems with the utility company's equipment and downed power lines;
- Blackouts or brownouts; and
- Restoration of power during and after storms.

What Damage Does Transient Voltage Cause?

Transient voltage renders electronic equipment useless by damaging sensitive circuits and related components. *This type of loss may not be covered by insurance.* Only about 5 percent of transient voltage damage is noticed immediately. This happens when lightning strikes and the electronic equipment fail simultaneously.

How Can You Protect Your Equipment from Transient Voltage Damage?

Pull the Plug – Having a power outage creates a serious threat to computers and other sensitive electronic equipment. Power restoration can cause an electrical surge of damaging electricity. Whether it's during or after a storm or power outage, the best way to avoid surge damage is to unplug equipment and turn off switches. Once the threat passes or power is restored, plug the equipment back in one piece at a time.

Install Surge Protection Devices (SPD) – In conjunction with your electrical grounding system, the best means of protecting your electrical equipment from transient voltage is to install surge protection devices (SPDs) throughout your facility. SPDs contain electrical components that sense an electrical surge or spike and then divert this excess voltage safely to the ground via

semiconductors and resistors. This is why adequate grounding within your electrical systems is so critical. Even the best surge protector will not function properly if the electrical grounding system is substandard. For the best protection, SPDs should be applied using the following zoned approach:

- **Zone 1:** Install an SPD on electrical service entrance equipment to protect against surges generated from outside the facility.
- **Zone 2:** Install SPDs at each distribution panel supplying critical or sensitive electronic equipment. This will provide protection against internally generated surges.
- **Zone 3:** Install SPDs locally at each piece of equipment requiring protection, such as computers, modems, fax machines, copiers or printers.

Zone 2 and 3 devices protect against both internally and externally generated surges. Commercial locations should have at least two zones of protection: electrical service entrance and point-of-use. By using the zoned approach, critical electrical components will be safely protected from transient voltage.

To assess the feasibility of installing surge protection in your facility to protect critical components, contact a qualified electrical contractor.

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