

AmTrust Property Zone

Protect Your Business from Dangerous Power Surges

Electricity is one of those things that's easy to take for granted. Every time you flip a light switch, boot up a computer or complete other tasks that require electricity, you assume that power will be there for you.

That's a testament to the reliability of our power grid. But when something goes wrong with that power, everything can come to a screeching halt. If it's a power outage, it usually only means a temporary interruption – although that can be disruptive enough for a business. Other times, power issues can be much more destructive, such as a power surge.

Power Surges 101

Also known as voltage surges or transient voltages, power surges happen when the flow of electricity is interrupted, then started again, or when something sends electricity flowing back through the system.

When most people think about power surges, lightning strikes come to mind, and for a good reason. A lightning strike can wreak havoc on electrical grids and all types of electrical and electronic equipment. According to the [National Weather Service](#), a typical lightning flash produces about 300 million volts and about 30,000 amps. That's enough to fry anything that normally runs on 120 volts! If your building takes a direct hit, the electrical energy will flow through any conductive material it can find, such as phone lines, data cables, copper wires and even your plumbing and ductwork. That can mean serious and costly damage.

However, lightning only causes a small percentage of power surges. The majority are caused by other issues, including:

- **Overloaded outlets or circuits.** AmTrust Loss Control surveys routinely find a tangled web of wires at workstations. It's all too common for people to overload outlets and extension cords by plugging in too many pieces of equipment, appliances and gadgets. The result can be power surges, overheating and electrical fires.
- **Faulty wiring.** Damaged or exposed wires can lead to power surges because the electricity is restricted or directed differently from normal.

- **High-power electrical devices.** High-energy appliances or machines like air conditioners, refrigeration units and elevators can cause energy spikes and power surges. These devices pull large amounts of electricity when powered up, sending excess power throughout the circuit – and overpowering electronics and appliances along the way.
- **Local power grid issues** such as faulty wiring, equipment breakdowns, downed power lines, grid shifting (reallocating energy to match demand) and capacitor switching can all cause power surges and outages.



The Dangers to Your Business Infrastructure

No matter where it originates or what causes it, a dangerous power surge can spell disaster for your critical business systems. What types of businesses and equipment are most at risk? Frankly, every business and every piece of electrical equipment is at risk. Most businesses today rely on all kinds of modern electronic, telecommunications, manufacturing and other equipment, all of which can be weakened or damaged by power surges.

Businesses that may be especially at risk include manufacturers that use motors and other high voltage equipment, healthcare facilities with equipment for monitoring and assisting life support systems, and businesses dependent on computers, printers, faxes, photocopiers and other electronic equipment.

Vulnerable equipment includes:

- Telecommunications equipment
- Computers, printers, fax machines and other electronics
- Elevators, security systems and fire alarms

- Manufacturing machinery
- Retail point-of-sale systems
- Climate control systems for schools, churches and rental units
- Diagnostic equipment for the healthcare and automotive industries
- Refrigerated storage for food retail and warehousing
- Fire alarm systems

Daily Power Fluctuations: The Silent, Cumulative Threat

Of course, not every power surge is quite as dramatic as a lightning bolt or an electrical arc. Power can and does fluctuate daily in most business operations. The simple daily act of turning on power equipment, electric motors, printers, photocopiers and other equipment can create brief spikes in your building's power system. If you're running air conditioners in hot weather along with every other business in your area, brownouts may not be uncommon. And after a temporary power outage, there's a spike when electrical power is restored.

Individually, these daily power fluctuations are insignificant. But over time, they have a cumulative effect and can degrade and weaken equipment, causing it to fail eventually. So even though a power surge may only last a millisecond or two, the resulting problems can affect your business for weeks or even months.

Surge Protection: Your First Line of Defense

While much of your equipment won't likely survive a direct hit from a lightning strike, there are measures you can take to minimize the risk of damage to crucial equipment and data from most power surge events. In fact, if you don't have an effective surge protection system to protect your vital business equipment, you're rolling the dice. That could mean a costly business interruption, lost productivity and damaged or ruined equipment that must be repaired or replaced.

Your best defense against dangerous power surges is to implement surge protection devices (SPDs). These devices detect excess voltage and ground the extra electricity.

For ultimate safeguarding against power irregularities, divide your surge protection strategy into a three-tiered system:

- **Level 1:** At this level, SPDs or surge arrestors are generally installed where your power enters the building, on the electrical service entrance equipment. This level is your first line of defense against the biggest surges such as lightning or power fluctuations from your utility company. At this level, SPDs divert much of the electrical current to ground and reduce the remaining surge as it enters the facility. However, devices at this level won't protect you against surges generated internally.
- **Level 2:** This level protects building branch circuits, distribution panels and lighting systems. SPDs at this level are more likely to detect power surges that originate inside your building. They should be installed on all distribution panels that supply power to critical or sensitive electronic equipment.

- **Level 3:** This level includes typical outlet surge protectors. These should be installed strategically for sensitive equipment such as computers, computer-controlled devices and telecommunications equipment. You should also consider using uninterruptible power supplies (UPS) for your computer systems. These devices provide battery backup in case of a power outage, giving you a chance to save important documents and data before shutting down the equipment. But beware: outlet surge protectors and UPS devices can fail after taking a few significant hits from power surges, so read each unit's instructions and keep an eye on them.

Picking the Right Surge Protector

Surge protectors come in all shapes, sizes and price ranges, so it can be confusing to know which one is right for your application. Here are some things to consider when deciding:

- **Rating:** You want SPDs that conform to UL certified safety standards. Make sure any device you're considering is listed as a transient voltage surge suppressor in Underwriters Laboratory (UL) 1449 second edition of Standard for Safety. Beware of false or counterfeit UL and IEEE labeling. Request certified test results and get your SPDs from reputable companies that have been in business and manufacturing SPDs for at least 10 years.
- **Intended Use:** Get the right SPD for the right level of protection, whether you're protecting against larger surges at your service entrance or protecting computer equipment at individual workstations.
- **Response:** Look for how quickly the SPD can detect a power surge. It should be within a few nano or pico seconds.
- **Clamping Voltage:** This is the voltage the SPD will allow through to the equipment being protected. UL considers 330 volts the minimum, but closer to 120 volts is always better.
- **Alarm Lights:** Your SPDs should have indicators showing when the circuit is grounded and operating properly, and units should be installed so these indicators can be easily monitored.

SPDs Are Smart Business

Although the Occupational Safety and Health Administration (OSHA) doesn't require SPDs, it just makes good business sense to protect your vital equipment against unexpected power surges. By implementing a strategic surge protection strategy for all of your vital systems, you could be saving yourself a costly disruption in business and thousands of dollars in repairs and recovery.

For more in-depth information and guidance on protecting your property, see AmTrust's [Commercial Property Protection and Maintenance](#) Page.

Sources

<https://www.weather.gov/safety/lightning-power#:~:text=A%20typical%20lightning%20flash%20is,bulb%20for%20about%20a%20year>

For additional information and resources on this topic and other safety and risk management subjects be sure to visit the Loss Control section on our website:

www.amtrustfinancial.com/loss-control



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