

TO SAFEGUARD BUSINESS CONTINUITY, ADEQUATE POWER PROTECTION FOR IT EQUIPMENT IS CRITICAL.

This white paper provides relevant information regarding the importance of surge protection for IT equipment and environments.

ABSTRACT

Today, business and profitability is driven by the exchange of information. Access to networks, internet, shared servers, applications, as well as other important data transfers all fall within the realm of IT. But when a change in power quality occurs, power disruptions can cause these systems to go off-line, malfunction, or be damaged.

According to Electric Light and Power magazine, it is estimated that 30 to 40 percent of all business downtime is due to power quality [source: ELP (www.elp.com)]. As a result, the downtime from a related power event, such as over/under voltage, power outages, noise, and surge events, can jeopardize the operations of a business and can have a serious impact on the bottom line.

Power related IT downtime issues can degrade the operations of a business, including: lost productivity, lost orders and customer dissatisfaction. These problems can accrue significant hourly losses and the cost of **hourly downtime** can have a serious financial impact across a variety of businesses [source: Contingency Planning Research, Inc /APS (www.aps.com)]:

- Airline reservation centers: \$67,000 - \$112,000
- ATM network and service fees: \$12,000 - \$17,000
- Brokerage (retail): \$5.6 – \$7.3 million
- Credit card sales authorizations: \$2.2 – \$3.1 million
- Telephone ticket sales: \$56,000 – \$82,000
- Catalog sales centers (large retailers): \$60,000 - \$120,000

Due to the financial burden, modern business should recognize the importance of proper power protection to ensure business continuity.

INTRODUCTION

The IT industry relies on some of the most advanced mission critical equipment on the market today. Typically, the IT infrastructure is considered to be the lifeblood of any company's day to day operations, where failure of any IT equipment can lead to catastrophic losses. A single downtime event now has the potential to significantly impact the profitability of an enterprise.

According to International Data Corporation, power disturbances account for about one third of all server failures [source: IDC (www.idc.com)]. In fact, power related problems annually equate to \$26 Billion of lost time and revenue [source: Business Week (www.businessweek.com)]. Depending upon the industry, the cost of this downtime can range from \$330,000 to \$2,800,000 per hour in lost revenue [source: Emerson (www.emersonnetworkpower.com)]. The U.S. Bureau of Labor also reports that 93 percent of companies that suffer a significant data loss are out of business within five years. It is clear that it is more costly than ever to be without adequate power protection.

For most small and medium sized businesses, proper power protection is not utilized. Most businesses operate with a few network servers and do not have a dedicated server room. IT equipment is commonly installed in a dark closet where various PC server and phone equipment reside – and over the years, as the company grows more and more equipment gets haphazardly added. Dedicated circuits are not typically used and IT equipment is installed alongside a rat's nest of wires and power cords. Typically inexpensive multiple outlet strips are commonly found plugged into other outlet strips, leaving the IT equipment inadequately protected.

In some instances the server closet also shares circuits with the office environment which includes refrigerators, microwaves, and multi-functional printers. In a multi-tenant building the server closet could be connected to anything "plugged in" by other tenants in the building. If there is a retail portion of the building there could be additional appliances including portable heaters, air conditioners or a variety of other equipment.

For small and medium businesses, the IT "closet" typically is in fact a "hostile AC power environment." The outlets connecting to the server equipment are not dedicated, redundant, isolated, or protected. Electric Light and Power magazine reports that 80% of all electrical disturbances have been shown to originate from inside facilities [source: ELP (www.elp.com)]. Therefore, just about anything could trigger a power surge, fluctuation or outage and cause IT equipment to shut down, reboot or be rendered inoperable.

In order to protect critical equipment from these power anomalies a comprehensive power protection solution is required.

THE NEED – SURGE PROTECTION

Surge protection is critical to safeguarding IT equipment. Power surges can cause the server equipment to fail, but could also result in valuable data being corrupted or lost.

Data from the office equipment and audio visual industries proves the devastating effects that these power anomalies can have on power supplies and, consequently, the equipment that they reside in. High frequency noise can cause lock-ups, error codes, and erratic equipment operation. Surges and spikes, particularly those generated within a building, can damage power supplies by dramatically shortening their lifespan. Extreme over/under voltage can tax power supplies and shorten lifespan, in addition to causing erratic equipment operation. Power outages will result in equipment downtime, and can cause damage to hard drives/systems that are not shut down properly.

Server equipment is similar to other sensitive electronic equipment in that switched mode power supplies are key components of these devices. The switched mode power supply basically provides regulated power to the device so that all electrical components can operate properly. The power supply does a good job of keeping voltage levels consistent over a varying range of input voltages, but it can't protect devices from other common power anomalies such as surges, spikes, extreme over/under voltage, power outages, and high frequency noise.

The solution to fully protecting a server requires a combination of equipment. UPS devices should be a key consideration to protect servers from power outages, and to insure a proper shutdown sequence to prevent hard drive damage and data loss. A UPS however, will not provide adequate protection against surges, spikes, and high frequency noise. UPS products generally only contain rudimentary levels of surge protection or noise filtering. They are not capable of handling catastrophic surge events or repeated low energy surge events, as these types of power anomalies will dramatically reduce their useful life. UPS system failures are one of the primary root causes of unplanned outages.

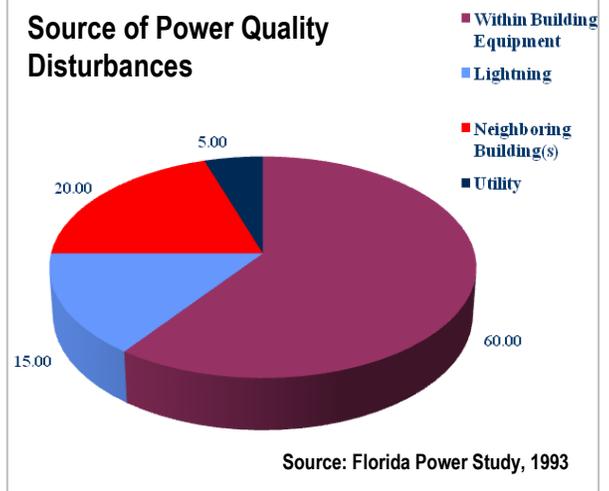
In order to fully protect the UPS, server, and other associated equipment, a professional -grade multi-stage surge protector should be used as the primary line of defense against surges, spikes, and high frequency noise. Traditional surge protectors typically rely only on Metal Oxide Varistors (MOV's) as the primary surge protection component, and generally offer very little in the way of noise filtering. The performance of an MOV degrades with every surge that it is subjected to, allowing more and more surge energy to reach the connected equipment.

In addition, most "power strip" type surge suppressors are typically little more than multi-outlet extension cords and offer very limited protection and should never be used to connect any mission critical business equipment.

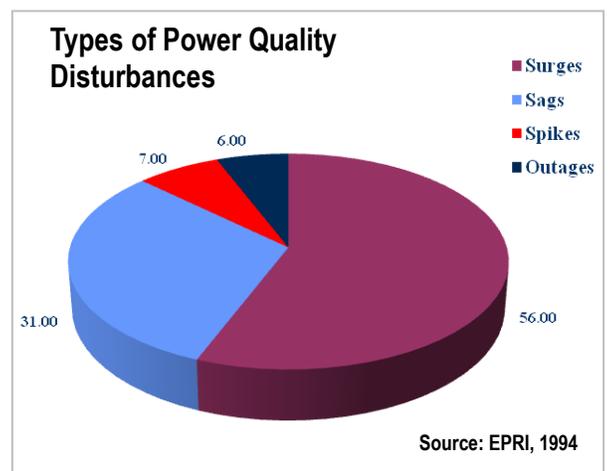
SURGES CAN BE CAUSED BY:

- HVAC and lighting systems
- Tripped power circuits due to overloading
- Appliances and other electronic equipment
- Power fluctuations
- Surges originating from outside the building
- Lightning strikes

Source of Power Quality Disturbances



Types of Power Quality Disturbances



THE SOLUTION – INDUSTRIAL GRADE, MULTI-STAGE PROTECTION

To ensure that IT equipment is properly protected, a strategic power protection plan is required to protect the integrity of any business. Strategic power plans start with proper surge protection that provides protection beyond UPS equipment and traditional “surge strips”. Proper protection solutions provide multi-stage surge protection and guard against damaging power events. They also are designed to minimize “noise” that can cause erratic equipment operation.

The newest generation of industrial-grade, multi-stage protection solutions combine the functionality of a power distribution unit (PDU) with the highest level of protection available, into a single (1 Rack Unit) package. These specialized hybrid products, such as the ESP/SurgeX rack product line, use a patented technology incorporating a combination of MOV's, gas tubes, and silicon avalanche diodes. This combination insures the highest level of protection without any degradation in performance over the life of the product.

Superior to conventional single-stage MOV circuitry found in most surge protectors, industrial-grade ESP/SurgeX protection solutions are engineered with patented Multi-Stage hybrid power protection technology and a robust electronic noise filter to improve the reliability of sensitive electronics. Unlike typical protectors, this robust protection solution eliminates power disturbances generated from power lines and other nearby equipment and provides industrial-strength power conditioning technology and intelligence. This type of solution protects IT equipment against surges, spikes, noise, over/under voltage anomalies and wiring faults that impact the performance of mission critical systems.

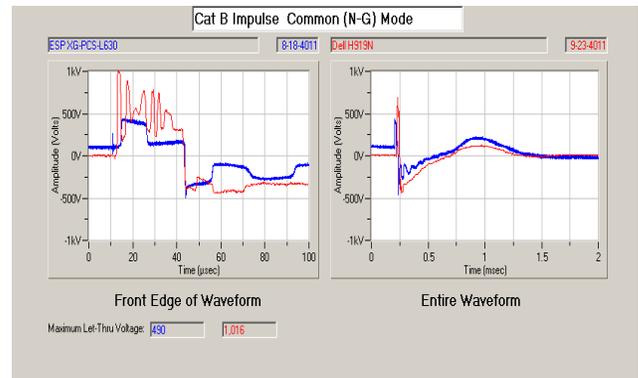
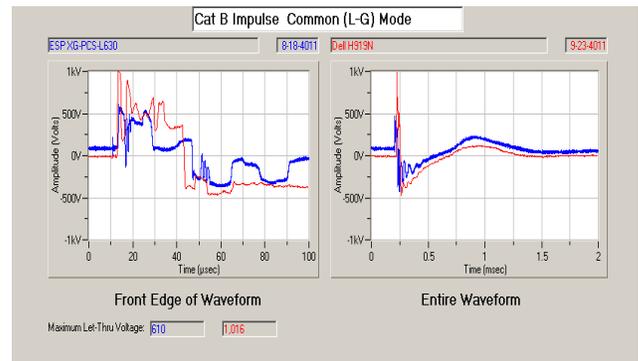
In addition to superior surge and noise protection, industrial-grade, multi-stage protection solutions also provide protection against other common power anomalies. Zero voltage turn-on and in-rush current limiting insure that the UPS and connected equipment are protected from high line voltage/current during start-up. Over-voltage protection insures that connected equipment is protected against sustained voltage swells, preventing damage to power supplies.

CONCLUSION

Successful companies utilize industrial-grade, multi-stage Surge plus PDU solutions to protect their IT equipment and business infrastructure. When selecting power protection, it is critical to have a solution that includes industrial-grade, multi-stage surge protection to safeguard the functionality and performance of your IT equipment, as well as to maintain the continuity of your business.

WHY UPS PROTECTION ALONE IS NOT ADAQUATE

Tests demonstrate the results of IEEE Cat B surge event passing through a UPS, with and without ESP/SurgeX Multi-Stage surge protection. Note the dramatic difference in let-thru voltage that connected equipment would be subjected to.



To find out more about how ESP/SurgeX can help you protect and manage your IT environment, visit espei.com.

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