



HOW WEATHER EXTREMES PLACE ADDED
STRESS ON YOUR ELECTRICITY SUPPLY
REGARDLESS OF SEASON

ENERGY CONTROL SYSTEMS WHITE PAPER





Weather has been full of surprises and major impacts so far this year. In February, many areas across the U.S. experienced spring-like weather, with higher than normal temperatures kickstarting early bloomers before the cold snap came back with snow and freezing conditions. With spring now in full swing, transitioning to summer, storms and strong winds have impacted large portions of the country. These types of weather extremes place added stress on your supply of electricity, making it necessary to prepare for these events appropriately.



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WEATHER INCREASING IN DAMAGE AND COSTS

A lot of the weather events within May are coming from the omega block pattern. According to The Weather Channel, this type of phenomenon is caused when the jet stream buckles, forming a wave that inhibits regular weather progression. This means that the same weather conditions can persist in one area for multiple days, causing major events like droughts, heat waves, arctic outbreaks and storms.

Severe weather events can cause a lot of damage and cost a lot to recover from. According to the National Oceanic and Atmospheric Administration, there were 15 billion-dollar weather and climate events in 2016, making it the second-highest annual number of such costly disasters in the U.S.. The severe weather caused \$46 billion in total, direct costs and led to 138 fatalities.

The majority of these damages were from tornadoes, flooding and storms. NOAA's data shows a rising number of events that cause significant amounts of damage per year, and this trend is expected to continue as the atmosphere warms with more water vapor, and infrastructure is established along vulnerable areas.

BUSINESS HVAC USE BRINGS POWER SURGES

As an organization, it can be easy to chug along with your daily operations and forget about power usage. Instead, you're more likely concerned with providing an optimal environment and sensitive equipment for your employees. However, extreme conditions put the electrical supply and your facility at risk, increasing the chance for surges and outages to damage and bring down your systems.

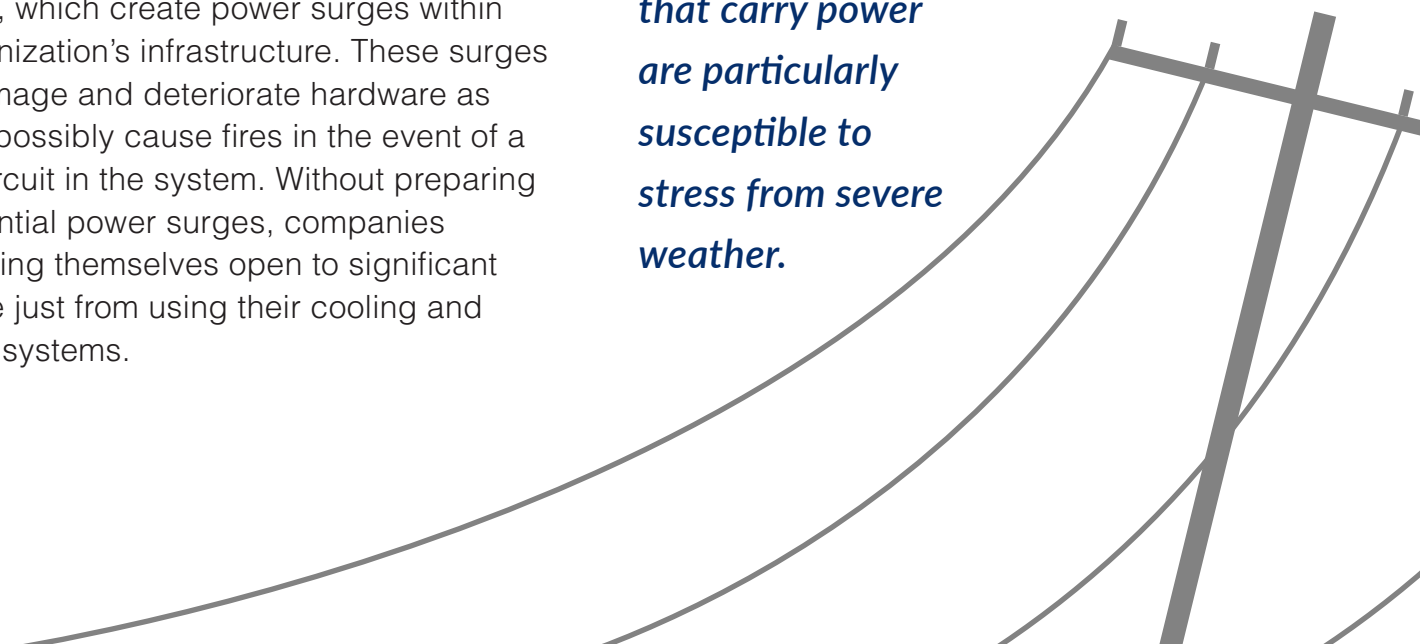
For example, during the hottest and coldest months of the year, most businesses use an industrial-sized HVAC system to keep conditions comfortable. However, these machines have sudden startup and shut-off triggers, which create power surges within an organization's infrastructure. These surges can damage and deteriorate hardware as well as possibly cause fires in the event of a short circuit in the system. Without preparing for potential power surges, companies are leaving themselves open to significant damage just from using their cooling and heating systems.

TEMPERATURES IMPACT POWER DELIVERY CAPACITY

The electrical system is made up a number of moving parts that work together to deliver enough power to run your organization. According to National Geographic, these components are optimal in the middle of the temperature and humidity ranges they were designed for. The life of electrical infrastructure equipment can be extended within these limits. Some components might even be effective in extreme temperatures when they are new. However, as the electrical system ages, it will operate less predictably, particularly when performing hard work.

Transmission lines that carry power are particularly susceptible to stress from severe weather. Newswise contributor Dr. Ray Klump noted that these lines have limited capacity that decreases when it's hot. As the line heats up, it can sag and come into contact with trees, causing it to short circuit. With one transmission line out of commission, others

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have to make up for it, becoming overloaded and prone to the same problem. Ultimately, lost capacity will cause voltages to fall where they're supposed to be, placing an even greater burden on appliance motors and system operations.

The problem with weather-related stress on power supply is that it's compounded by increasing demands during peak weather conditions. For abnormally hot or cold conditions, areas will look to use their HVAC systems more often to keep conditions at a reasonable level within the facility. The Electric Reliability Council of Texas is expecting peak usage this summer to top out at 73,000 megawatts, beating the 71,110 megawatts hit last year, Dallas News reported. The state's total generation capacity supports a maximum of 82,000 megawatts. As power demands grow during extreme weather conditions, considerable pressure will be placed on the power grid, resulting in new potential for outages and delivery issues.



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PREVENTING POWER OUTAGES, REGARDLESS OF SEASON

As shown within the first five months of this year, extreme weather from snow storms to tornadoes to fires can occur at virtually any time. A database from the Department of Energy revealed that, of the 1,652 power outages that occurred between 1999 and 2014, 866 were caused by severe weather. Organizations must keep a close watch on their highest sources of electricity demand like portable heaters to AC systems. Tracking power usage can lower energy bills and create less strain on their electrical supply.

Regardless of what season it is, organizations must create a comprehensive plan to effectively prevent power outages. Organizations lose a considerable amount of money and resources as a result of missed opportunities from downtime and reputational damage from the inability to meet customer service needs. Many businesses never recover following a disaster, and those that do can struggle to restore their standing with consumers. Rather than face these consequences as a result of an outage, implement solutions to avoid downtime due to electrical outages and power surges altogether.

A surge suppression system and uninterruptible power supply will be important parts of a business continuity plan. Surge suppressors will help mitigate spikes from large machines like the HVAC system every time they turn on. This will help maximize the

life of other electronics and make power-voltage delivery more consistent.

Significant benefits will also come from implementing a UPS unit. Organizations can take advantage of UPS systems that range from small desktop solutions to large three-phase systems that protect entire facilities. Business leaders can choose a battery runtime that will fit their continuity strategy in case of an outage. The battery runtime will

be long enough to at least allow employees to save their work and gracefully power down their machines, preventing data loss and hardware damage. Other units are equipped with runtimes long enough to continue operations to serve customers. To learn more about how UPS units and surge suppression can keep your power supply running even during weather extremes, contact Energy Control Systems today.



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