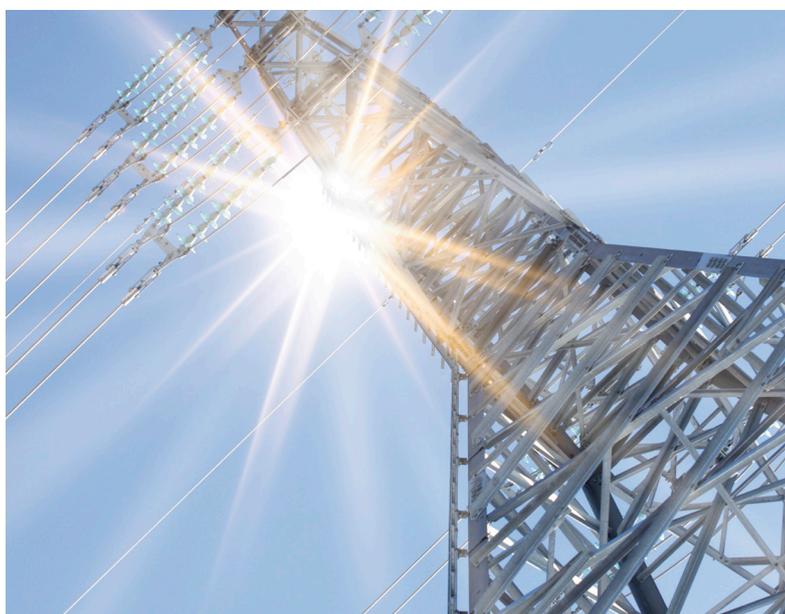


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The importance of power protection for modern industries

Power supply events such as power outages, sags and surges represent one of the biggest threats to manufacturers and industrial facilities around the world.



For these organizations, the damage caused even by a momentary interruption to an otherwise clean supply of electricity can be devastating. With the frequency and severity of power interruptions on the rise, many such facilities are opting to install power protection systems to safeguard equipment and maintain productivity even under extreme power conditions. Here, we look at the dangers of power supply fluctuations and how equipment such as voltage conditioners and uninterruptible power supplies can protect our industries from harm.

For most people, power cuts are nothing more than an infrequent nuisance. However, for large organizations and industrial facilities, they are a serious threat: General Electric estimate that a third of businesses would lose over \$50,000 in just an hour without electricity, while for larger companies this figure could rise as high as \$6.5 million.¹

Manufacturers and industrial organizations are particularly vulnerable to power supply anomalies. For industries that produce cars, electronics, food and drink, pharmaceuticals or operate medical equipment; a power outage lasting ten seconds can mean much more than a momentary lapse in production. Even an incredibly brief loss of power can cause serious damage to sensitive equipment, machinery, final products, materials and the ensuing restarts can be incredibly time-consuming and expensive.

The extent of the damage caused by a power outage and subsequent surge can be difficult to comprehend. Electronic control system configurations may revert to their default settings and require reprogramming. Power loss in the middle of a critical stage in production or synthesis can ruin yields and end up wasting expensive materials.² Increased levels of automation in the modern industry mean that the negative impact of power cuts is greater than ever before.

Even temporary voltage drops can cause a mind-boggling array of problems for industrial facilities. These voltage 'sags' make up over 92 percent of all power-quality events, making them by far the most common power supply problem for businesses.³ These, as well as voltage 'spikes', can wreak havoc with computers, servers and other sensitive electrical equipment. In May 2017, British Airways hit the headlines when a momentary power supply event forced a crucial data center to undergo an uncontrolled restart, resulting in around 800 flights from London Gatwick being cancelled. Though the interruption to normal power supply was only brief, this incident was estimated to have cost British Airways over \$100 million.^{4,5}

References

- [1] General Electric - Critical Power Infographic. (2013).
- [2] Power Outage at Samsung's Fab Destroys 3.5% of Global NAND Flash Output For March. Available at: <https://www.anandtech.com/show/12535/power-outage-at-samsungs-fab-destroys-3-5-percent-of-global-nand-flash-output>. (Accessed: 3rd August 2018)
- [3] Protecting the most sensitive equipment for high-end technology. Available at: <http://search.abb.com/library/Download.aspx?DocumentID=2UC-D401188&LanguageCode=en&DocumentPartId=&Action=Launch>. (Accessed: 3rd August 2018)
- [4] British Airways Owner Says Power Outage Cost 80 Million Pounds - Bloomberg. Bloomberg Markets Available at: <https://www.bloomberg.com/news/articles/2017-06-15/british-airways-owner-says-power-outage-cost-80-million-pounds>. (Accessed: 25th April 2018)
- [5] British Airways system outage 'caused by IT worker accidentally switching off power supply' | The Independent. Available at: <https://www.independent.co.uk/news/business/news/british-airways-system-outage-it-worker-power-supply-switch-off-accident-flights-delayed-cancelled-a7768581.html>. (Accessed: 25th April 2018)
- [6] Exergy and the City: The Technology and Sociology of Power (Failure). Byrd, H. & Matthewman, S. J. Urban Technol. 21, 85–102 (2014).
- [7] Power Outages On The Rise Across The U.S. | Inside Energy. Available at: <http://insideenergy.org/2014/08/18/power-outages-on-the-rise-across-the-u-s/>. (Accessed: 3rd August 2018)

Unfortunately, power supply problems are worsening worldwide, both in frequency and severity.⁶ For example, the average number of power outages in the USA doubled every five years between 2000 and 2014.⁷ Our electrical distribution infrastructures were originally designed to handle much smaller loads, and are now struggling to bear the strain of an ever-growing population and an increasing reliance on electrical and electronic equipment.

With this in mind, an increasing number of manufacturing and industrial facilities are opting to install power protection hardware to safeguard themselves against the spikes, sags, surges and blackouts of our aging and overworked power grids.

Power protection equipment for industry and manufacturing

ABB is aware of the damage that can be caused by unpredictable power supplies and have designed a PCS100 range of advanced power protection solutions to keep industries on their feet even under the most demanding conditions.

The PCS100 range includes two Active Voltage Conditioners – PCS100 AVC-40 and PCS100 AVC-40 – developed to ensure a continuous and clean power supply during grid disturbances. The PCS100 AVC-40 was designed for especially demanding or sensitive machinery, offering a power range of 150 – 3600 kVA. The PCS100 AVC-20 has a power range of 250 – 3000 kVA, making it the ideal voltage regulator for most commercial and industrial applications.

These products detect anomalies in utility voltage and apply correcting voltages rapidly without relying on energy storage to ensure a perpetually clean and reliable 3-phase power supply. The units are built to act quickly and effectively: each unit can detect voltage disturbance within 250 μ s.

The PCS100 UPS-I (Industrial Uninterruptable Power Supply) is a power protection product that protects customers' loads during outages and major voltage disturbances. Such events can be caused by faults in the electricity network and, more commonly, weather events such as lightning.

The PCS100 UPS-I is a solution for recloser events, deep voltage sags (dips) or swells and it supports critical loads until the utility voltage returns to within specification or a standby generator starts. The length of the backup time is dependent on the power requirement of the load and the capacity of the storage system. The PCS100 UPS-I range has models up to 3 MVA at low voltage, making it suitable for even large industrial processes.

To find out more about ABB's power protection solutions:

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