



## 5 Tips to Ensure Power Quality in Your Data Center and Facility

- *Prepare a Backup Plan*
- *Identify Possible Points of Vulnerability*
- *Know Operating Environment Standards*
- *Check Service and Maintenance Schedule*
- *Consider Modernization Over Replacement*

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### **EXECUTIVE SUMMARY:**

*Power problems, such as surges, spikes, sags, distortion, brownouts, and line noise, are inevitable. While some common power problems are minor, others can bring your facility to a standstill. Planning for power problems will allow you to minimize their impact on your business and protect your equipment.*

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If the responsibility to ensure power quality in your facility falls on your shoulders, you know that major power quality problem can lead to an equipment failure, down time and angry customers. As power professionals, we need to plan for the worst-case scenario and assume that a major power failure could happen at any time.

We've all heard the chatter about the sensitivity of electronics to power variations and the increasing criticality of networks. The Internet of Things and Big Data are now ubiquitous terms in our industry and while it's fun for some to throw these buzzwords around the board room, those of us behind the scenes are the ones losing sleep at night because these new trends put extra strain on our electrical systems and data centers. In this world of 24/7 connectivity and instant availability of information, down time has evolved from an inconvenience to simply not an option.

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## Power Quality Problems

Power quality problems can come in many forms such as power surges, high voltage spikes, power sags, transients, frequency variation, electrical line noise and brownouts. Some of these are very minor and nearly undetectable while others are catastrophic. Any change in power, voltage, current or frequency that interferes with the normal operation of electrical equipment is a threat and can interrupt the normal operation of your facility. There are many common power problems that can interfere with a facility's ability to ensure power quality.

### *Common Power Problems*

- *Power Surges*
- *Voltage spikes*
- *Power sags*
- *Transients*
- *Line noise*
- *Brownouts*
- *Blackouts*

So how do you prevent power quality problems and ensure power quality? You can't. But you can plan for them and you can take steps to minimize their impact on your business. To help, we've put together the top 5 tips to ensure power quality in your data center and facility.

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## Tip #1 – Have a Plan B

There is tremendous pressure on IT and facilities personnel to save money where possible. We often see corners being cut as a result. Sometimes that

means that the battery back-up for the UPS is reduced to the absolute minimum. Consider the sequence of events when there is an outage. It only takes a couple of minutes for the generator to come fully online when there is an outage. But is there any room for error? An industry standard for UPS run time is around 5 minutes. That is generally enough time to allow for the generator to start up and start producing clean power (by generator standards) or for the site personnel to recognize that the generator isn't going to start as expected and initiate Plan B. Speaking of, what is your Plan B? A gentle shut-down? Another power source?

*If power does not come back on before the UPS runtime is over, what is the next step? Do you have a backup generator or redundant power source? The time to consider this is now, before you need it.*

Sometimes procrastinating on a UPS battery replacement seems like a good way to save some money. Keep in mind that run time is gradually reduced as your batteries age. If your batteries are more than 5 years old or installed in less than ideal environments, you probably don't have as much run time as you think.

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### Tip #2 – Identify possible points of vulnerability

No one likes to think that the worst-case scenario can happen, but occasionally it does. That's why you have a Disaster Recovery plan. When was the last time it was thoroughly reviewed? Best practices suggest a review of the Disaster Recovery Plan every 12 months or whenever there is an equipment change that affects the power path. Have you ever tested the DR plan and the cut-over to the DR site?

Sometimes figuring out what can go wrong requires a fresh perspective from someone specifically trained to look for the absolute worst-case scenario. A [Risk Assessment Service](#) can be the perfect way to get a set of trained eyes looking at your power systems and data center infrastructure to help identify possible points of vulnerability. A risk assessment is a complete mechanical, electrical, security technology, and data center checkup that will identify points of vulnerability and reduce the risk of critical equipment failure. This report rates your facility's risks based on multiple impact levels

and the probability of occurrence. It then provides suggestions on the best ways to mitigate these issues along with the estimated costs. You determine the next steps to correct deficiencies based on your organization's criteria and timelines.

We're seeing more and more problems resulting from aging infrastructure. Because they are usually restricted to card access only, electrical rooms housing switchgear and the major electrical systems for your site frequently go unseen and unchecked. Regular maintenance and inspection of all equipment is important but even more so for aging infrastructure. Consider keeping your power system equipment under a [service and maintenance contract](#) for added peace of mind.

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### Tip #3 - Confirm the operating environment is within recommended standards

Did you know that each 15°F rise in temperature cuts the life of a sealed battery in half? Batteries need to be protected from the elements, heat can interfere with the proper operation of servers, and humidity can cause water damage. There is no doubt that your data center environment is carefully monitored and managed. But what about equipment outside of the data center? Do you have battery banks in the electrical room? If so, it's important that the temperature and humidity in the electrical room is controlled as carefully as it is in the data center.

*Don't lose track of the UPS units housed in forgettable places. With space at a premium, any closet can become a mini data center. But that doesn't mean it is temperature controlled.*

What about all of those networking closets in your facility? Or branch offices that connect back to the central data center? These areas can also go unseen and forgotten and it's less likely that they are monitored for ideal temperature and humidity levels. If you have servers or UPS systems in network closets, they are generating heat which can damage your equipment and shorten its lifespan. Consider a [network closet assessment](#) service to review the condition of all these non-data center areas of your facility. This analysis of the critical infrastructure components of your network wiring

closet reviews the power systems, cooling systems, rack configurations and room analysis.

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#### Tip #4 - Check the service and maintenance schedule for your equipment

The hardest problems to fix are the ones you didn't see coming. Regular periodic preventive maintenance visits for your data center power and cooling equipment and the facility electrical systems helps predict failures before they occur. When possible, service by the manufacturer is recommended as they typically have the most highly trained technicians and can guarantee genuine factory replacement parts. Most manufacturers offer extended warranties and factory service plans for data center power and cooling equipment. Many can also offer regular preventive maintenance and service coverage for switchgear, chillers, generators, and other electric power system equipment.

*With budgets tight, regular, scheduled service and maintenance can help you get the most out of your investment. Plus, it is an operating budget line item rather than a last-minute capital fund request for unexpected repairs.*

With a factory trained technician inspecting your equipment at regular intervals, it's easier to keep track of wear and tear on the equipment and predict when upgrades or replacements are needed. Go through your facility from the point where the utility power enters the building to where it leaves the data center. Has all of that equipment been inspected in the past 12 months? If not, it's time to start working on a maintenance and service schedule.

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#### Tip #5 - Consider modernizing aging equipment rather than replacing it

Budgets are tight and for many, getting approval for capital expenses and new equipment has never been more difficult. Aging infrastructure and systems are becoming ubiquitous. In response to these challenges, many manufacturers are offering [modernization services](#) for their equipment. These large-scale upgrades can have almost the same net effect as purchasing new equipment, but at a fraction of the cost. With [UPS](#)

[modernization](#), customers are saving money on equipment, avoiding installation costs, and eliminating the need for downtime. Switchgear and power systems modernization are having a similar effect.

For many customers, space is becoming a scarce commodity. In response, many manufacturers are working on outdoor power solutions such as the [APC Micro Data Center](#). These temperature and humidity controlled cabinets feature complete data center physical infrastructure and management software in a single self-contained and secure enclosure. They can be deployed in just about any environment – including outdoors and in extreme conditions. With a wide range of sizes and adaptability, facilities and IT managers are no longer restricted to the space available in climate-controlled data centers. On a larger scale, some manufacturers, such as Schneider Electric, are even offering portable data center modules housed in a container and offering up to 1MW of additional power protection.

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## Conclusion

Today, power quality goes well beyond thinking about surges and sags. Those industry buzzwords – Internet of Things, Big Data, Cloud Computing – all create their own challenges for facilities and IT managers charged with maintaining uptime. The tolerance for an interruption is zero. Power Solutions has partnered with the best in the business at power protection and conditioning. We are experts when it comes to planning for the worst-case scenario and we can help you put together a comprehensive service and maintenance plan so you can be prepared for the next outage.

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**For more details about how to ensure power quality, contact Power Solutions. 800-876-9373 or [sales@power-solutions.com](mailto:sales@power-solutions.com)**

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