



Ken's Korner

UPS SYSTEMS PREVENTATIVE MAINTENANCE

POWER ANOMALIES

A spike, surge or swell in voltage, a sag, brownout or blackout of power, are all different types of power anomalies. All of which share a common effect on data centers, they can directly result in downtime and equipment damage. The primary purpose of an uninterruptable power supply (UPS) is to protect critical equipment from these power anomalies and provide emergency power to electrical equipment when the primary power source fails.

Making sure that your UPS systems are functioning properly and available for the next power anomaly is a challenge that is made easier through a few simple steps of preventative maintenance.

First and foremost you should follow your equipment manufacturer's maintenance schedule

UPS Systems & Preventative Maintenance

An uninterruptable power supply (UPS) is designed to provide emergency power to electrical equipment when the primary power source fails. A UPS typically serves as a bridge between the primary power source and an auxiliary power system, like a diesel generator, to provide time to properly shut down sensitive equipment. A UPS can either be battery powered or a flywheel backup system, and is designed to provide short term instantaneous protection from power interruptions, voltage variations, frequency variations and transient disturbances.

Having a UPS system alone doesn't guarantee that your equipment is insulated from power supply interruptions and fluctuations, but regular testing and maintenance of the UPS systems will help to ensure that critical systems are protected and that reliability is maintained.

UPS Preventative Maintenance (PM) Contracts

1. Make sure your PM contract has a minimum of two-to-four hour response time.
2. Be sure that the PM contract call for two-to-four PM visits per year.
3. Make sure that capacitor replacement is included in your PM contract (capacitors should be replaced every five years).

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UPS SYSTEMS

PREVENTATIVE MAINTENANCE (CON'T)

Quarterly Maintenance

- ❑ Check your UPS system under load, this should be done at a time when your data center is in an off peak window.
- ❑ Visually inspect UPS equipment for loose cables and connections, burned insulation and any other signs of wear. Replace indicator lights and any other parts as needed.
- ❑ Perform regular UPS battery testing and maintenance.

Semi-Annual to Annual Maintenance

- ❑ UPS filters need to be checked and changed depending on the environment.
- ❑ UPS equipment and enclosures should be vacuumed and cleaned.
- ❑ Equipment should be infrared (IR) scanned. This will identify if any hot spots exist, and whether any loose connections on buss bars, wire connections and overloaded breakers and relays exist within the equipment.
- ❑ Depending on your ability to shut down equipment, all buss and wire connections should be checked for torque values per manufacturer's specifications.
- ❑ All metering on equipment should be checked and calibrated. Verify the accuracy of the voltage and loads your equipment is supporting.
- ❑ Test and exercise circuit breakers (turn on and off several times), to prevent them from seizing in the closed position causing them to fail to trip when overloaded.
- ❑ Test the entire system, including a monitored rundown test of the batteries.



Thoughts on Preventative Maintenance

- ❑ The maximum life of a UPS system is typically no more than 15 years.
- ❑ A good practice is to keep a basic inventory of replacement UPS parts on site. Ask your vendor what parts they recommend you keep. Some vendors are willing to store parts at your site free of charge as part of your maintenance contract.
- ❑ Keep a maintenance record book; detailing the preventative maintenance performed, including repairs, readings and results measured.
- ❑ Make sure that service technicians or anyone who helps around the UPS's are issued and use the appropriate safety equipment.

Without proper preventative maintenance, a UPS system will deteriorate and expose a data center to possible outages and equipment failure. By performing regular preventative maintenance your UPS system should perform as intended and help to protect sensitive equipment and maintain uptime.

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Ken Koty, former data center facilities manager with over 30 years of hands-on experience shares management practices that made him a 12 year award recipient for continuous uptime from the Uptime Institute. PDU Cables does not guarantee the results of outcomes by using information contained in this document.