UPS Maintenance and Service

Best Practices for Minimizing Total Cost of Ownership of Three-Phase UPS Equipment

Maximize the Useful Life of Your 3-Phase UPS
Remote Monitoring
Projected Annual Maintenance Costs
Battery Replacement Needed After 5 Years
Maintenance Costs for Older UPS Equipment
Planning for UPS System Replacement
Special Considerations for Modular UPS Equipment

EXECUTIVE SUMMARY:
Three-phase UPS equipment has an approximate useful life of 10-12 years. The installation environment, maintenance, and services that are performed on your equipment have a direct impact on total cost of ownership and the length of reliable service your UPS equipment can provide. Learn best practices to prolong the useful life of your UPS equipment with these important tips for maintenance and service.

Environmental changes, human error, or product failures can have a sudden impact on system availability requiring a fast, on-site service response. However, implementing a proactive, preventive maintenance plan can minimize predictable events such as worn parts or battery failure. Proper service is the key to preventing downtime.

Regular maintenance of your UPS ensures your system is performing optimally and can extend the life of your equipment.

Included here is a timeline for service that applies to most 3-Phase UPS equipment. Intended as a general guide, this timeline helps you manage the total cost of ownership for your UPS equipment.

MAXIMIZE THE USEFUL LIFE OF YOUR 3-PHASE UPS

Annual factory service allows you to get the most out of your UPS

The typical life cycle of a 3-Phase UPS is 10-12 years. In order to prevent downtime and avoid costly repairs, it is important to keep your UPS operating properly with regularly scheduled preventive maintenance service, proactive replacement of worn parts, and a factory service plan.

Regular maintenance of your UPS ensures your system is performing optimally and can extend the life of your equipment. Protect your data center or facility with annual or semi-annual factory preventive maintenance visits by certified factory technicians. Most UPS manufacturers include scheduled preventive maintenance visits in their 3-Phase power and cooling factory service plans.

REMOTE MONITORING

An early warning system for developing problems

Remote monitoring is a web-based service that lets you respond quickly to environmental or systems changes. This is an extra level of protection that allows your UPS to send push notifications to the manufacturer based on parameters that you set. The monitoring center can alert you of any significant changes in the environment or unauthorized access to your equipment.

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Remote monitoring is configured through the network management card in your UPS. Alerts are pushed to a monitoring center where trained technicians provide 24/7 monitoring of your physical infrastructure. These alerts include important information that enables technicians to diagnose and resolve problems before they become critical. Should a situation that requires immediate attention be detected, a notification is sent to the designated contact in your organization and, if necessary, a factory technician is dispatched to the equipment site to intervene.

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Remote monitoring is an excellent way to have the peace of mind that your equipment is being monitored 24/7 by trained factory personnel. In addition to being offered as a stand-alone service, many factory service plans include remote monitoring so you may already be eligible for this service as part of your existing factory service coverage.

PROJECTED ANNUAL MAINTENANCE COSTS

What to expect 1-3 years after installation

Standard factory warranties for 3-Phase UPS equipment are typically 1 year. Unless an extended warranty was included with the original equipment sale, you will not have any factory coverage after the expiration of your standard warranty. Know when your warranty expires and plan to initiate factory service coverage at the end of the warranty period.

Initiating a factory service contract prior to the expiration of the factory warranty avoids potentially costly recertification preventive maintenance visits and immediately protects you from unexpected failures.

Comprehensive service plans make budgeting for annual maintenance and service costs easy.

Factory service plans vary in price depending upon the size of the equipment, the duration of the service plan, and the specific details and upgrade included in the service. Most manufacturers offered tiered service plans with coverage options that range

from discounted parts and labor to full comprehensive coverage with guaranteed response times. Comprehensive service plans make budgeting for annual maintenance and service costs easy.

Three-phase UPS factory service contracts generally include an annual preventive maintenance visit. During the preventive maintenance visit, the technician conducts a thorough systems check of your equipment including some cleaning of critical components. All system parts are carefully inspected for wear and tear and any parts at risk of failure are either replaced or recommended for replacement. While on site, the technician will check your equipment for available firmware upgrades and complete any required updates to the system.

While regular UPS preventive maintenance visits include basic battery testing, many customers elect to add semi-annual battery maintenance services also. Battery maintenance service includes thorough testing of discharge rates and battery health. The technician will also clean and inspect the battery contacts for proper termination. Additionally, all connectors and cables are carefully inspected for excessive wear and tear. These regular maintenance visits ensure your equipment is operating properly and will protect your critical load in the event of a utility power failure.

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Most manufacturers recommended that certified factory services be used exclusively rather than maintenance and service contracts through third party providers. With factory services, you are guaranteed new, factory approved replacement parts and technicians specifically trained to work on your model UPS will perform the service. Additionally, engineering upgrades and firmware updates are only available from factory certified personnel. There is more discussion on the benefits of factory service over third party service in a later section.

BATTERY REPLACEMENT NEEDED AFTER 5 YEARS

What to expect 4-6 years after installation

When operating within the manufacturer's recommended temperature range, UPS batteries typically last 3-5 years but one bad battery can corrupt the whole string leaving you at risk of down time. Batteries that are installed in high temperature rooms will have significantly reduced useful life. It is important that the temperature and humidity of the environment where your UPS is installed are carefully maintained within manufacturer recommended ranges.

When your UPS is between three and five years old, chances are the factory technician will recommend a battery replacement during your annual preventive maintenance visit. Generally, the testing conducted during the preventive maintenance will give plenty of advanced notice that the batteries are beginning to decline. This should allow ample time to budget and plan for a battery replacement. In most cases, complete proactive battery replacement services are not included in factory service plans so this is an additional expense that will need to be planned for around year 5 of the UPS service life.

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This is a good time to assess your run time requirement. Now that the UPS has been installed for a few years, you probably have a good sense of how much run time you really need. When you replace the batteries, do you need to increase your run time? Do you have too much battery capacity? It is often said that power is cheap, but run time is expensive. If you don't need as much battery capacity as your system currently provides you can potentially save money by using smaller or fewer batteries while still protecting your critical load. Your service technician can help you determine the specifics of your battery requirements.

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MAINTENANCE COSTS FOR OLDER UPS EQUIPMENT

What to expect 7-9 years after installation

The AC and DC capacitors in your UPS need to be replaced approximately every five years. During the 5th year of UPS operation, it is likely that the factory technician will report that it's time to replace the capacitors and fans in your UPS. Capacitors store electric energy once they've been disconnected from the power source. They are critical in the seamless transition to battery power in the event of an outage. Failed capacitors will prevent your UPS from operating properly and can jeopardize your load if there is a loss in utility power.

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Unfortunately, while your service technician can identify wear and tear and signs that your capacitors are drying out, you won't know that your capacitors have failed until there is an outage and your UPS doesn't successfully switch over to battery power. For this reason, service technicians generally recommend a capacitor replacement based on age of the current parts. Service plans for many manufacturers do not include the proactive replacement of capacitors, so this would be an additional expense to plan for in year five, six, or seven of UPS operation.

In the case of modular UPS systems, the capacitors and fans are typically embedded in the power modules. In most cases, the power modules are easily replaced and instead of changing out the capacitors and fans inside the power module, the factory technician may suggest a power module replacement or revitalization service. More detail on this is available in a later section.

PLANNING FOR UPS SYSTEM REPLACEMENT

What to expect at 10 years after installation

Most manufacturers assign a 10-12-year useful life to 3-Phase UPS systems. As your UPS approaches 10 years in service, it's time to start planning and budgeting for a replacement. Most manufacturers have trade in programs that can reduce the replacement cost and assist with the safe removal and recycling of your old equipment.

Alternatively, some manufacturers offer refresh programs for modular UPS equipment. By using your existing chassis and only replacing power modules, intelligence modules, and critical parts, your power protection can be updated and maintained at a significant savings. More detail is below in the next section.

Evaluate how the demand on your IT environment has changed since your UPS was installed. Has the IT load increased? Do you have more virtual servers? Is critical data on the cloud now? The network equipment that connects you to the cloud may have a higher level of criticality than it did when the UPS was installed.

Evaluate how the demand on your IT environment has changed since your UPS was installed.

- *Has the IT load increased?*
- *Do you have more virtual servers?*
- *Is critical data on the cloud now?*
- *Has the criticality of your network increased?*

If you are not ready to replace your UPS, it is now more important than ever to have annual preventive maintenance visits, semi-annual battery preventive maintenance visits, and keep your on-site services contract current so you can be assured the support you need from the factory is available in the event of a problem or failure.

If it's time to start planning for the replacement or refresh of your existing UPS equipment, it is recommended that you work with a knowledgeable, vendor-neutral UPS reseller such as Power Solutions to review your current requirement, the equipment you have installed now, and your options for refresh, trade-in, or replacement.

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SPECIAL CONSIDERATIONS FOR MODULAR UPS EQUIPMENT

Extend the useful life of modular UPS Systems with a Power Revitalization Service

Manufacturers such as Schneider Electric offer a Modular Power Revitalization Service (MPRS) for modular UPS equipment. With the MPRS, all the internal components of the UPS are replaced including power modules, intelligence modules, fans, and displays. Essentially, everything except the chassis is replaced. This leaves you with brand new UPS equipment at a fraction of the cost to replace it.

As an additional benefit, to complete the MPRS, the UPS needs to go into bypass but not taken offline. This virtually eliminates the need for downtime to upgrade the UPS protection and avoids electrical installation costs.

The Modular Power Revitalization Service is ideal for systems in years 8-10 of their service life. For best results, it is recommended that the batteries be replaced at the same time. Customers that have this refresh service completed can expect 5 or more years of reliable service life from their UPS.

WHY FACTORY SERVICE?

Peace of mind comes from knowing that only experts are working on your equipment

Factory certified technicians generally train with the manufacturer's product developers giving them the highest level of system knowledge and ensuring that they are familiar with all product upgrades. Factory trained technicians have to recertify with the manufacturer on a regular basis so their skills and product knowledge remain sharp. This enables them to quickly troubleshoot and accurately diagnose system issues resulting in shorter repair times, minimal downtime, and optimal system performance.

Additionally, the major manufacturers train and support a national and sometime global network of trained technicians so you can have access to factory service when and where you need it. Along the same lines, the major manufacturers give customers with factory service plans supply chain

preference so parts that can have lengthy lead times are almost immediately available through a network of distribution centers. Third party service providers have to purchase their spare parts through traditional channels, which generally have longer lead times - and that translates to increased downtime for your equipment.

UPS and cooling equipment manufacturers frequently release software updates, engineering revisions, and firmware upgrades for their equipment. Usually, these updates are not available to third parties. Using only factory services ensures that your equipment has the latest upgrades available to maximize efficiency and the length of useful service life.

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Finally, many third-party providers specialize in one specific area of the data center infrastructure so your UPS service provider may not be knowledgeable in maintenance and service for your cooling equipment or vice versa. The larger, global manufacturers such as Schneider Electric can service and repair your power and cooling equipment in addition to your switchgear, generator, and other power systems engineering equipment making them a true single source provider for your data center infrastructure.

CONCLUSION

Factory service offers hassle-free system maintenance at a predictable cost

Three-Phase UPS equipment is designed to provide reliable power protection for 10-12 years. As a general rule, expect to proactively change the batteries twice and the capacitors and fans once during the service life of the UPS. In the case of modular equipment, the capacitors and fans are embedded in the power modules and replacement of those parts would follow the same timeline.

Service options from the major UPS manufacturers provide your system with the care it needs to operate efficiently and minimize downtime. Generally included in factory service plans are technical support, preventive

maintenance, fast on-site response, and remote monitoring. This means your UPS system receives both proactive maintenance designed to prevent potential problems from occurring, and, if needed, quick on-site response to diagnose and correct a problem.

At a predictable and fixed annual cost, factory service plans take the guesswork out of budgeting for maintenance or unexpected service charges and ultimately minimize your total cost of ownership. Plus you'll have peace of mind knowing your UPS system has the best, most comprehensive service available.

For more details about factory service plans from the major UPS manufacturers, contact Power Solutions. 1-800-876-9373 or sales@power-solutions.com

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