

## UPS Service Plans: How to Maximize Your Returns

By Art Mulligan  
UPS Product Line Manager  
Eaton Corporation

### Executive Summary

Painfully aware of the devastating impact that downtime can have on their bottom line, most businesses appreciate the wisdom of deploying first-rate uninterruptible power supplies (UPSs). Yet they often invest far more time and energy in deciding which UPS to buy than in selecting an accompanying service plan.

In reality, however, both considerations are vitally important. With proper servicing, a well-made UPS can operate safely and reliably for as long as 20 years. Without proper servicing, even the best UPS is significantly more likely to fail when you can least afford it. Protecting mission-critical IT systems from costly outages, then, involves choosing not just appropriate UPS hardware but also an appropriate UPS service plan from a service provider that delivers real value rather than just a low price.

This white paper explores key issues to consider and questions to ask when selecting a UPS service offering and service provider. It also examines some of the top features to look for when evaluating UPS service plans, and discusses the importance of supplementing emergency assistance with preventive maintenance.

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## The Basics of Selecting UPS Service

The consequences of UPS failure can be expensive. The average annual downtime for the US utility grid was eight hours and 45 minutes as of 2009, according to the Electric Power Research Institute. Should a UPS fail during a power outage, the average cost of the resulting downtime can range from approximately \$330,000 an hour for companies in the media industry to a staggering \$6,450,000 an hour for financial brokerage firms, according to the Fibre Channel Industry Association.

A quality UPS service plan can help you avoid equipment failures and resolve those that do occur quickly. However, in today's economy, no organization can afford to purchase either less or more UPS support than it requires. Thus, UPS buyers should carefully consider their needs and options before selecting a service plan. To begin that process, ask yourself these six basic questions:

### 1. What kind of service provider should I work with?

Generally speaking, there are two kinds of service provider to choose from:

- **Manufacturers:** These are the companies that design and build UPSs.
- **Independent service providers:** These are third-party companies that service UPSs.

Third-party service providers sometimes charge less than manufacturers—but that doesn't necessarily mean they provide greater value. As a rule, the company that designed and assembled your UPS will have the deepest understanding of how it operates, the most qualified technicians, and the fastest access to factory parts. Working with an independent provider may save you money initially, but if they maintain your UPS less effectively or repair problems more slowly than a manufacturer, those upfront savings could evaporate quickly.

### 2. What type of UPS service do I need?

Most service providers offer three basic service options:

**Depot exchange repair or replace:** When a problem occurs, you contact the UPS service provider and ship the UPS to a repair facility. After it arrives, they send you either the repaired unit or a refurbished unit in return.

**Advance swap depot exchange:** After you report a problem, the UPS service provider ships you a refurbished replacement unit immediately. When it arrives, you return the original UPS to a repair facility in exchange.

**On-site repair:** After you report a problem, a factory-trained field technician comes to your site to diagnose and repair it.

Here are a few guidelines to keep in mind when deciding among these options:

- In general, a depot exchange plan is the most cost-effective choice for organizations that use UPS products rated below 1,000 VA.
- If your UPS is rated above 1,000 VA *and* is either hardwired to your data center's electrical infrastructure or too heavy to ship, an on-site repair plan is usually your sole practical option.
- Companies with UPS equipment that is rated above 1,000 VA, light enough to be shipped and not hardwired should choose either an advance swap depot exchange plan or an on-site repair offering. On-site repair is often the quickest way to resolve technical issues, but can also be the most expensive.

### 3. Should I buy a support agreement, extended warranty or pay as I go?

**Support agreements**, or service contracts, usually combine parts and labor coverage for the UPS's electronics, batteries or both, as well as one or more annual preventive maintenance inspections. Plans can be tailored to meet most any need. Special features like remote monitoring, battery replacement insurance and spare part kits may also be added.

**Basic or extended warranties** are also available for many UPS products. A warranty commonly covers specified parts and labor, such as electronic components, for a fixed period of time but does not include 24/7 coverage or guaranteed response times. Nor do warranties typically include preventive maintenance services, though you often have the option of adding them if desired. The more services you add to a warranty, the closer it comes to offering the protection of a full-fledged support agreement.

**Time and Material (T&M)** service is a pay-as-you-go approach in which the service provider conducts repairs as needed and then bills you based on how much work they performed and how many parts they replaced. Though relying on T&M services is often less costly up front than buying a service agreement or warranty, it is often more expensive over the long term, depending on how many problems you experience and how severe they are. Additionally, some organizations find T&M response times unacceptably long. When available field technicians are in short supply, customers with support agreements always take priority. As a result, T&M customers must sometimes wait as long as five days, based on their UPS model and location, before receiving assistance.



*Figure 1: UPS support agreements typically include one or more annual preventive maintenance inspections.*

#### 4. What should a service plan cover?

When evaluating service plans, pay special attention to what is and isn't covered. Support agreements and warranties for large UPS models usually cover internal electronics only, with battery coverage available as an optional extra. A strong, comprehensive service plan should cover all of the following:

**UPS electronics parts and labor coverage:** This covers a UPS's basic electrical components, excluding the battery.

**UPS battery parts and labor coverage:** To prevent UPS failure, batteries should be replaced at least every five years. Batteries that are discharged frequently or used in a warm environment should be replaced more often.

**Preventive maintenance:** Preventive maintenance visits allow field technicians to annually inspect, test, calibrate and upgrade UPS and/or battery components, ensuring factory-specified performance.

**Remote monitoring:** Remote monitoring systems automatically send UPS performance data to expert technicians via the Internet, enabling them to proactively identify and address potential problems. They also send automatic alerts when a UPS fails, resulting in quicker response times.

#### 5. How much service do I need and how fast do I want my service delivered?

Most service providers offer two options with respect to when service is available:

- **7 day, 24 hour coverage:** A service technician will respond or deliver service at any hour of any day, including weekends and holidays.
- **5 day, 8 hour coverage:** Problems will be resolved only during standard business hours (8:00 AM to 5:00 PM), Monday through Friday.

You can also choose how quickly your service provider responds to technical issues. Most providers offer two-hour, four-hour, eight-hour and next business day options. Generally speaking, the shorter the response time, the higher the price. However, shorter response times also usually translate into faster repairs and less downtime. Identifying the best option for your needs, then, entails balancing the cost of your service plan against the cost of downtime.

Note that two- and four-hour service plans are typically available only in markets in which the service provider has enough field technicians to meet its response time commitment 99.9 percent of the time.

#### 6. How long should I plan for a UPS to last and how much should service cost?

As a rule, large UPS products have a 15- to 20-year life span. Small UPS products can last 10 or more years, but are often replaced much sooner. However, routine preventive service can help you extend a UPS's lifespan, as can replacing the unit's batteries, capacitors and other parts, or installing upgrade and modification kits.

As for price, the most basic warranty coverage usually costs five to ten percent of the product purchase price, while a comprehensive, premium support agreement could exceed 35 percent of the original purchase price per year.

## The Importance of Preventive Maintenance

As noted earlier, a quality UPS service plan should include preventive maintenance. That's because every UPS, no matter how well it is designed and manufactured, can fail for a wide range of reasons, including these:

**Batteries:** Studies show that up to 20 percent of UPS failures can be attributed to bad batteries. Lead acid batteries of the kind typically used in UPS products are sensitive to unusually high operating temperatures. In addition, every time you discharge a lead acid battery, you permanently reduce its capacity and shorten its operating life.

**Fans:** Though many UPS fans perform well for 10 years or more, anything from dried-out ball bearings to electrical and mechanical problems can incapacitate a fan far sooner than that, leading to dramatically increased risk of overheating.

**DC Capacitors:** A typical UPS contains a dozen or more electrolytic capacitors that smooth out and filter fluctuations in voltage. Like batteries, electrolytic capacitors degrade over time. When one fails, others must compensate for the additional workload, shortening their useful lives. In many cases, a capacitor failure will cause a UPS to switch to bypass mode, leaving it unable to protect downstream loads.

**Transient spikes:** Sudden power surges can cause fatal damage to a UPS's filter/rectifier side.

A comprehensive preventive maintenance plan is your best defense against such problems. By ensuring that UPS equipment is thoroughly evaluated, cleaned, tested and calibrated on a regular basis, preventive maintenance plans can significantly decrease your exposure to downtime. In fact, organizations that receive two preventive maintenance inspections a year, as recommended, experience approximately one-fourth as many UPS failures as those that don't, according to an analysis of Eaton services data on its own products.

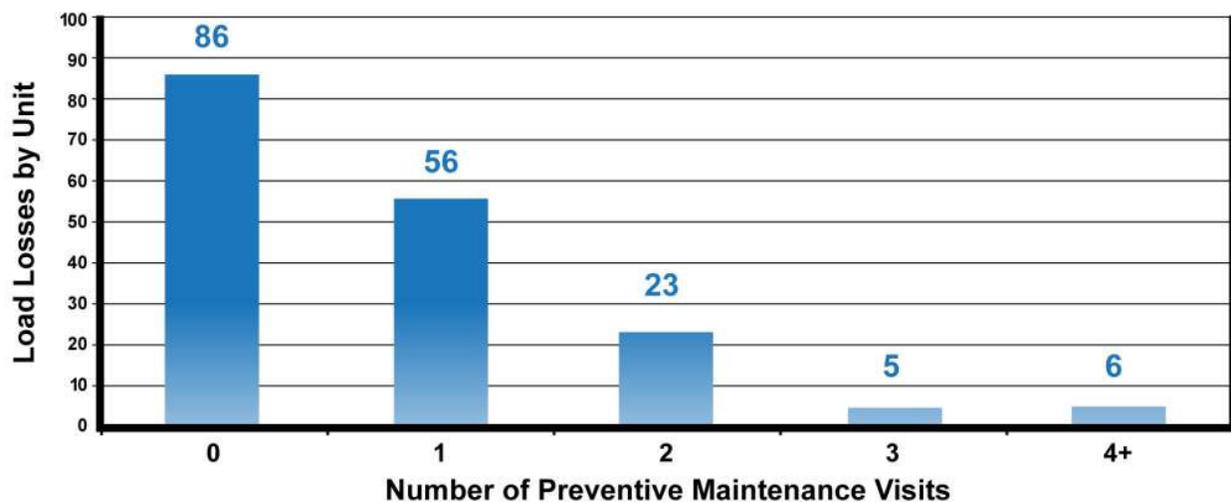


Figure 2: Eaton UPS load losses by preventive maintenance visits delivered in prior year. Companies that received the recommended two annual visits experience roughly one-fourth as many losses.

In addition, preventive maintenance can maximize a UPS's performance, as systematic inspections, testing and cleaning by trained technicians help keep a UPS's electronic and mechanical components functioning at peak potential. A preventive UPS maintenance plan, then, is a cost-effective investment likely to more than pay for itself in increased ROI and greater peace of mind.

## The Top Ten Features of a Strong UPS Service Offering

In addition to preventive maintenance, an effective UPS service plan should also include these ten elements:

### 1. Comprehensive Battery Services

The VRLA batteries used in most UPS products typically wear out after three to five years. Given that batteries are a UPS's most essential component, any well-structured UPS service offering should include a rigorous battery maintenance plan that includes regular inspection, cleaning and testing, as well as prompt replacement of defective batteries as needed.

### 2. A Large Team of Skilled Field Technicians

UPS service providers are ultimately only as good as their support personnel, and especially their field technicians. When evaluating service providers, make sure their technicians receive thorough, ongoing factory training and certification, not only in the latest UPS equipment but in legacy products as well. In addition, find out how many technicians they employ and where those people are stationed. A provider with a limited number of technicians, or none based near your data center, may have trouble responding promptly to service incidents.

### 3. Access to the Technician of Your Choice

Most service providers dispatch whoever is available when an issue arises. The best providers, though, let you request a specific technician who is familiar with your environment and has earned the confidence of your staff.

### 4. A Deep Pool of Escalation Resources

Field technicians are but one part of a complete support team. Your service provider should also offer 24/7 telephone support, as well as senior engineers capable of assisting field technicians remotely or in person when they encounter a problem they can't solve alone.

### 5. A Proven Commitment to Safety

Like any complex electrical product, UPSs are potentially hazardous if mishandled. Your service provider's field technicians should have the OSHA, IEEE and NFPA tools, arc flash training, and personal protection equipment to protect themselves and your employees from unsafe work conditions.

### 6. An Emphasis on Long-Term Solutions, Not Short-Term Fixes

If a component of your UPS keeps malfunctioning, does your service provider just replace it over and over again? A strong provider not only fixes the immediate problem but figures out why it keeps happening, so they can prevent it from happening again.

### 7. Prompt Access to Parts

Even the best-qualified technician will make little progress on a service issue without ready access to replacement parts. To maximize their ability to resolve problems quickly, a service provider's technicians should have a wide array of parts on hand for immediate use, or stock them locally. That can help prevent the need for multiple visits to repair a problem.

## 8. Remote Monitoring Services

As noted previously, some UPS service providers can now monitor the health and status of UPS hardware on a 24/7 basis via the Internet. Choosing a support plan that includes remote monitoring can help you spot potential problems before they cause downtime, address problems that do occur more rapidly, and even extend the lifespan of UPS batteries.

## 9. Multi-Vendor Services

A typical data center power infrastructure includes a variety of products from multiple manufacturers. Working with a service provider capable of supporting all of those systems will help you simplify vendor management, eliminate finger-pointing and keep critical maintenance issues from falling between the cracks.

## 10. Field Upgrades and Product Modifications

A well-designed UPS can adapt and grow over time to accommodate expanding power requirements. To take advantage of this capability, however, you need a service provider equipped to perform field upgrades and install product modifications. Upgrades increase the capacity and performance of your UPS. Modifications enable you to take advantage of new features not available when you purchased your UPS.

## Conclusion

No investment in UPS hardware is complete without an accompanying service plan. Trained service professionals can help you minimize downtime by detecting and addressing problems before they have time to develop. They can also help you swiftly recover from technical issues that couldn't be prevented.

Selecting the right service offering for your needs, however, is essential. Knowing which questions to ask and features to look for simplifies that process and increases your chances of success.

Though there are a wide range of factors to consider when evaluating service offerings, one ultimately outweighs all others: Choosing a service provider with the experience, know-how and resources to provide a comprehensive range of high-quality services. A plan with less coverage from a low-cost provider might save you money in the short run but leave you vulnerable to expensive problems down the road. In the end, nothing will do more to ensure that your UPS performs dependably for many years than partnering with a company equipped in every way to keep you up and running both now and long into the future.

## About Eaton

Eaton Corporation is a diversified power management company with 2009 sales of \$11.9 billion. Eaton is a global technology leader in electrical components and systems for power quality, distribution and control; hydraulics components, systems and services for industrial and mobile equipment; aerospace fuel, hydraulics and pneumatic systems for commercial and military use; and truck and automotive drivetrain and powertrain systems for performance, fuel economy and safety. Eaton has approximately 70,000 employees and sells products to customers in more than 150 countries. For more information, visit [www.eaton.com](http://www.eaton.com).

## About the Author

Art Mulligan is a UPS product line manager for Eaton Corporation where he develops offerings for power quality services.

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