

Monitor Data Center Batteries

Ensure Backup Power Is Ready When You Need It

WITH SO MANY CRITICAL components to worry about in a data center, it can be easy to put smaller systems on the back burner. One example is the data center's batteries. Even companies that have implemented battery monitoring systems sometimes do not take the proper precautions to ensure their batteries are working as they should. Mike Daffron, director of sales and marketing at API (www.apibattery.com), says it's not unusual to find companies with monitoring systems that aren't in working order, properly wired, or even turned on. "We've found battery systems that would not carry the load if they were called upon," Daffron says. "If they had a working battery monitoring system or regimented battery maintenance in place, this would not happen." Such negligence can leave batteries unable to supply backup power to mission-critical applications, resulting in downtime. To avoid such a costly occurrence, consider the following.

✓ Understand What's At Stake

According to James Hall, marketing manager at Staco Energy Products (www.stacoenergy.com), proactive battery monitoring provides the necessary data to ensure that batteries will be ready when needed to support critical operations. Among the top causes of UPS load losses, he says, batteries rank No.1—responsible for more than one-third of power interruptions—both as primary emergency power backup and as the source of cross-over power for starting backup generators. "This begs the question, why do so many IT managers focus on primary architectures and solutions and treat backup power sources as second citizens?" Hall says.

Mike Phillips, national sales manager at BTECH (www.btechinc.com), cites the saying, "You can't manage it if you don't trend and track it" to illustrate the importance of battery monitoring, which eliminates the guesswork if batteries will be operational when needed. "Many facilities still rely on out-of-date battery data collected manually," he says. "Many times, this data isn't even reviewed until there is a problem." Anu Cherian, Frost & Sullivan senior industry analyst, says aggressive investments in monitoring each battery's strength can ensure downtime doesn't prevent the UPS from functioning optimally. Parameters to check, Cherian says, include internal resistance and DC test current to ensure that measurements are accurate and can be repeated. "Preventive maintenance is the key answer to these problems, and these are offered by many UPS OEMs in achieving high battery uptime and, therefore, optimal UPS performance," Cherian says.

✓ What To Watch For

To mitigate risks, Hall says, monitor and control such conditions as bad cells, which he says must be replaced before they affect other cells, and temperatures. "The IEEE recommends maintaining batteries at 77 degrees Fahrenheit," Hall says. "Changes in temperature, especially extreme heat, can affect batteries' life span. For every 15-degree increase in temperature, battery life is cut in half." You should also account for voltage and resistance level balance in all redundant strings, he says.

Phillips notes that battery monitors possess various feature sets. "A simple monitor will count the depth, duration, and frequency of the discharges on the battery system. More evolved monitors will not only measure the discharge data but

also measure the jar voltages and temperatures," he says. A full-featured monitor will add impedance measurements and cell-level monitoring when possible, he says. Daffron further advises managers to visually inspect battery systems at least

once a month, looking for corrosion and other abnormalities.

✓ Test, Test, Test

A properly designed battery monitoring system, Phillips says, combines a monitoring appliance and software. The appliance should collect data at the system, string, and unit levels (cell or jar) and monitor float and discharge current, unit voltage, impedance, and temperature. Overall, he says, "the appliance should be able to collect IEEE-compliant discharge data. The software should enable the user to analyze data in both graphic and report formats. Data collection should be automatic, and the data should be accessible on a LAN/WAN environment. Integration is key, and some open protocols should be supported (Modbus, SNMP, etc.)."

Critical battery status data, Hall says, enables managers to ensure that capacity conditions and permanent availability of high-quality energy is continually met. "Real-time status should be compared to battery configuration settings and network parameter settings, with deviations recorded in an events log and used to trigger email or dry-contact alarms," he says. "With a proactive battery monitoring system, you can schedule battery replacement at convenient times and ensure that the system is fully charged and operational for peak or high-demand occasions." Cherian notes that different testing parameters have different ideal intervals for execution. For example, impedance testing is non-invasive, quick, and should be done ideally every quarter, and discharge testing should be performed during installation and again in two to three years, while temperatures should be monitored daily, Cherian says.

✓ Consider Going Wireless

With today's IT budgets being challenged with a "show-me-why mentality," Hall says, companies may be less willing to support battery monitoring, as traditional wired battery monitoring solutions carry high initial and installation costs and an inherent lack of flexibility. Conversely, he says, wireless solutions can offer an effective way to increase availability while ensuring low TCO. Further, proactive battery monitoring no longer fits the wired traditional model, he says. With wireless monitoring, he explains, "initial costs are less than half of traditional wired systems. Installation and programming time and costs are dramatically lower, and configuration and flexible future use ensures the lowest TCO." Above all, he says, IT can use wireless systems that are battery type and systems are ideal for all needs.

Beyond providing real-time feedback, Cherian says, wireless monitoring provides an "ideal and aggressive approach to problem-solving with anticipatory measures to keep battery life at its maximum."

However, BTECH's Phillips says, with wireless systems you need to consider the drain the modules put on the battery and the limited ability of the modules to work on large amp hour cells. Companies also need to be aware of any potential security issues with a wireless system, he says. 

Most Practical Tip:

✓ Don't Eliminate Service Contracts

Mike Daffron, director of sales and marketing at API (www.apibattery.com), says that although some managers reason that by installing a battery monitoring system, they can eliminate service contracts with their preventive battery maintenance providers for hands-on inspections, companies should avoid discontinuing such a "check-and-balance" system. "What's important to note is the monitoring system can lower your battery maintenance costs, but we certainly don't want to say it eliminates them," Daffron says.

Smartest Tip:

✓ Don't Neglect Preventive Maintenance

Despite the importance of battery systems, "battery monitoring is sometimes put on the bottom of the list," says Mike Daffron, director of sales and marketing at API (www.apibattery.com). Although some managers have a holistic understanding of why preventive maintenance is necessary, he says, others enlist an "out of sight, out of mind" mentality where their battery monitoring systems are concerned and neglect maintenance. "The battery monitoring systems really help owners see their batteries' general health status in real time," he says.

BONUS TIPS:

✓ Enlist proper disposal.

James Hall, marketing manager at Staco Energy Products (www.stacoenergy.com), says it can't be overstated that "batteries are considered hazardous waste." Federal law, he says, requires all used lead-acid batteries to be managed as universal waste. "For this reason alone, facilities with lead-acid, valve-regulated, or wet cell/flooded batteries should consider hiring approved firms to handle all battery installations, maintenance, and disposal," he says. "The potential for spills, improper disposal, and resulting liability are just too great."

✓ Don't skip reinstallation.

Installing replacement monitoring systems can be daunting, Hall says, as wired monitoring systems require removing and reinstalling hundreds of similar-looking wires leading to termination points that are not always visible. Further, replacement batteries aren't typically the same as those they're replacing, complicating reinstallation and resulting in wiring errors that are difficult to troubleshoot and correct, he says. Still, he says, don't pass on reinstallation systems because "batteries have useful lives of three to five years, max, making battery monitoring a critical part of predicting battery health and premature failure before it results in system downtime."

