

The four factors that impact the life of your UPS battery

By : Mark Lafont

Research shows that up to 20 percent of all UPS failures can be attributed to bad batteries. To help protect your organization from the significant costs and harmful consequences of unexpected downtime, it is important to understand the four primary elements that influence the lifespan — and reliability — of UPS batteries.

1. **Ambient temperature** — The rated capacity of a UPS battery is based on an ambient temperature of 77°F. Varying from this recommended temperature can significantly impact a battery's performance, as well as dramatically shorten its lifespan. To help determine battery life in relation to temperature, consider that for every 15°F average annual temperature above 77°F, the life of the battery is reduced by 50 percent. While maintaining ambient temperature may not be a problem for UPS batteries deployed within air-conditioned data centers, it can be a factor for other environments such as industrial locations and manufacturing sites.
2. **Chemistry** — No matter how pristinely UPS batteries are cared for, they will nonetheless require replacement at some point. That's because they are electrochemical energy storage devices that convert chemical energy into the electrical energy UPSs use to operate, and over time the chemicals deplete. As a result, batteries will deliver less power and for shorter periods of time. Even if you follow all guidelines for proper storage, usage and maintenance, batteries still have limited life and will usually exhibit a slow degradation of capacity until they reach 80 percent of their initial rating, followed by a comparatively rapid failure.
3. **Cycling** — During a utility power failure, a UPS does its job by switching to battery power in order to keep connected equipment up and running. However, once utility power is restored, the battery goes through a discharge cycle, where it is recharged

for future use. Each time the battery is discharged and recharged, its capacity is slightly reduced.

4. **Maintenance** — Perhaps the most important of the four factors, battery service and maintenance are essential to ensuring ongoing UPS reliability. Without it, a UPS battery becomes susceptible to a number of threats that can ultimately result in a reduced level of protection and premature failure.

On the other hand, proper maintenance allows the end of battery life to be accurately estimated, enabling scheduled replacement without unexpected downtime or loss of backup power. In addition, preventive maintenance helps extend the life of battery strings, providing the opportunity to detect loose connections, remove corrosion and isolate bad batteries before they affect the entire string. Finally, gradual decreases in battery life can be monitored and evaluated through periodic voltage assessments and load testing completed during a PM visit.

Even if sealed batteries are deemed “maintenance-free,” they still require periodic checkups, as maintenance-free simply refers to the fact that regularly adding water is not required.

During regularly scheduled PM visits, trained technicians should perform a number of inspections, including visually scrutinizing batteries, racks or cabinets for signs of corrosion and leakage; measuring the float voltage and current of the entire bank; recording the terminal voltage of selected batteries; checking the electrolyte level in each cell; noting the ambient temperature; and comparing the findings against previous maintenance inspections.