

## **Best Practices for Managing Fleet Battery Costs** **By Zena Johnson, PulseTech Products Corp.**

Vehicles that don't start quickly disrupt the day to day running of a business leading to frustration and expensive downtime. With a properly implemented Battery Maintenance Management Program this problem can be quickly eliminated. A proactive approach to battery maintenance can also extend battery life, improve battery performance, reduce maintenance costs and drastically reduce the money spent on new batteries and old battery disposal.

While over the last 100 years science has improved materials, manufacturing methods and overall performance for lead-acid batteries, today's power demands continue to grow with a plethora of onboard gadgets drawing down on batteries, literally sapping energy like a parasitic vampire. The lifespan of today's lead-acid battery typically ranges from as little as 6 months to 48 months—though only 30 % survive the entire four years.

For those charged with keeping rolling stock and equipment on-the-road and fully operational, battery performance and extending lifecycles is a critical budget line item. Failure is simply not an acceptable option.

Fleet and equipment batteries, if properly maintained, can far outperform the standard lifecycle, saving thousands of dollars in annual replacement costs and keeping downtime to a minimum... if routine maintenance procedures are followed.

Consider the battery's basic responsibilities:

- Stores electrical energy
- Provides current for starter
- Provides current for electrical system
- Provides current for key-off demands
- Provides current to memory chips
- Acts as a voltage stabilizer

The workhorse lead-acid battery handles the lion's share of stored electrical power requirements in most of today's commercial vehicle and mobile equipment fleets. This includes VRLA, standard flooded and the newer sealed AGM types. As good as these batteries are they all suffer from the same main failure mode—80% of all lead-acid batteries fail due to the damaging effects of sulfation build up. If left unmanaged, sulfates found in the electrolyte will crystallize and root onto the battery plates and eventually result in premature battery failure. This is especially true with seasonally used vehicles and vehicles with key off parasitic loads on the electrical system.

There is no single fix to keep those lead-acid based batteries at peak performance. Fleet managers should employ a series of high tech smart tools, including analytical testers, battery stock maintainers, heavy-duty rolling multiple battery chargers and the single station recovery chargers for seriously under maintained batteries. Recommended is a scheduled routine “cradle to the grave” maintenance program that clearly defines procedures in handling and safety, preventative and corrective maintenance, testing and diagnostics, charging and ultimately battery replacement.

The three main components of a battery maintenance program are:

- Diagnostic testing to enable users to take proactive steps to improve the life of the battery and eliminate unnecessary failure
- Preventative maintenance to prevent or mitigate premature battery failure
- Corrective maintenance to reverse or correct a problem that has occurred.

Several years ago, PulseTech® Products Corporation instituted a Battery Manager Maintenance Program (BMMP), which incorporates its charger conditioning and maintenance technology and patented Pulse Technology® along with strong service and support for both military and civilian commercial fleet managers.

As one example, PulseTech crafted a maintenance plan for the Kentucky Army National Guard (KYARNG) that met their unique blend of battery service and maintenance equipment, battery inventory and vehicle usage, involving more than 3,500 vehicles. Since the KYARNG implemented the BMMP, they have experienced a 90% reduction in battery year-to-year replacements and gained 1 man-year of productivity due to the reductions in time spent replacing and maintaining batteries.

A BMMP is not a case of one procedure or set of products fitting all but utilizing certain products based on types of equipment, functionality and work schedule demands. The BMMP shows managers and technicians how to institute and maintain a good diagnostic, preventative and corrective maintenance program enabling them to consistently reduce man-hours, extend battery life and achieve impressive overall cost savings.

### **Keeping Stored 12-Volt Batteries Factory Fresh**

Most fleet maintenance managers keep lead-acid batteries in stock to avoid the downtime of a lengthy replacement process and to keep rolling stock rolling.

As a battery sits unused for periods of time—even a new battery—it can discharge up to 50% by the time it is installed and can also suffer from a buildup of lead sulfate crystals to the point where they create a physical barrier across the surface of the

plate. Before long, this buildup can become so dense that a battery is no longer able to accept or release energy.

When new batteries arrive it is recommended that they be placed on a fully automatic battery maintenance system. Multi-station battery maintenance systems are designed for any service facility or shop that services multiple batteries and vehicles by keeping stored 12-Volt lead-acid batteries factory fresh. Stock batteries are maintained with a continuous cycle of low amp charging that rotates through the channels offsetting the normal discharge rate. PulseTech's patented Pulse Technology is also used to keep battery plates free from sulfates so each battery can accept, retain and release maximum energy. When one battery is used, it is immediately replaced with another.

### **Stop Throwing Away "Bad" Batteries—Recover Them**

A 12-Volt lead-acid battery thought to be bad can in many cases be recharged by feeding it electrical current—restoring the chemical difference between the plates and returning the battery to full operational power. A diagnostics program enables fleet managers to test batteries quickly, safely and efficiently in order to receive a snapshot of the batteries' condition. Such testing allows managers to take proactive steps to improve the life of the battery and eliminate unnecessary failure.

When vehicles are brought into the shop, batteries should be tested to ensure they are holding a charge within 0.2 volts of each other. Using an electronic battery tester this can be done in under a minute.

Causes of Battery Failure:

- Sulfation buildup on plates
- Engine alternator voltage and/or amperage is too low
- High accessory loads (lights, radios, GPS)
- Battery imbalance
- Mixing different battery types together
- Leaving stored batteries in a discharged condition
- Acid on the outside of the battery case

Technicians can then employ a shop charger to recover, maintain and return the batteries to a like new state. Once the batteries are charged they are again checked; this time for full serviceability with an advanced battery analyzer. If a battery then does not test to its CCA rated standards, it can be placed back on the shop charger tested again and disposed of if it still doesn't meet standards.

### **Tech Tips to Extend Battery Life Cycles**

In addition to regular, routine maintenance it's important to find charging systems that combine scientifically validated desulfation technologies.

Battery sulfation is a wasting disease that claims the life of 80% of batteries in use worldwide. A comparison would be your home computer, when infected with a virus or spyware and overloaded with temporary and junk files, loses speed and efficiency. A utilities tune up to clear up the operating hard drive is necessary to bring systems back to normal operations.

The patented Pulse Technology system, for example, is unique in its ability to reduce the buildup of sulfation on battery plates resulting in allowing the battery to operate at peak efficiency. Pulse Technology features a distinct waveform which has a strictly controlled rise time, pulse-width, frequency and amplitude of current and voltage pulse.

Batteries routinely maintained with chargers incorporating desulfation technology have gained many years of extended life—in some cases up to 5 times the normal life cycle.

### **What to Look For in a 12-Volt Battery Charger**

Safety, “plug and play” functionality and an ability to combine maintenance charging with desulfation to keep battery plates clean and capable of holding a full charge are key elements in selecting a 12-Volt battery charger.

It's also recommended to find a desulfation maintenance charger that can also evaluate and test all types of 12-Volt lead-acid batteries regardless of size of CCA rating, including AGM, gel-cell and VRLA. This battery charger makes maintenance and bulk charging simple with proprietary algorithms and microprocessor controlled technology that measures voltage and current to determine the proper operating charge. The variable float charge, of this battery charger, improves battery condition by increasing the charge rate safely to optimal levels and protecting it from being overcharged.

Battery maintenance chargers completely shut off the charge current output to allow the battery to settle, and when the battery's voltage drops to a certain point, the charger will automatically turn back on and top off the battery. This is safer than a trickle charger which if left unattended for too long might lead to overheating, causing the battery to boil the electrolyte.

### **Don't Fall Victim to Premature Battery Failure**

A validated Battery Maintenance Management Program followed faithfully by personnel trained at every echelon, can reduce a fleet's annual battery consumption by 70 percent or more.

Preventative maintenance consists of scheduled servicing, inspections and vehicle repairs to prevent potential problems and maximize vehicle availability. Schedules are typically based on time, mileage, engine hours or gallons of fuel used. Without a maintenance management program in place, fleet and equipment managers can be assured of spending more downtime and more budget dollars on replacing batteries unnecessarily.

### **About PulseTech Products Corporation**

[www.pulsetech.net](http://www.pulsetech.net)

Maximizing battery performance while minimizing battery-related expenses for individuals, companies, fleets and military forces since 1994, PulseTech offers a full line of products that will help protect the environment from the hazards of lead waste from discarded lead-acid batteries.