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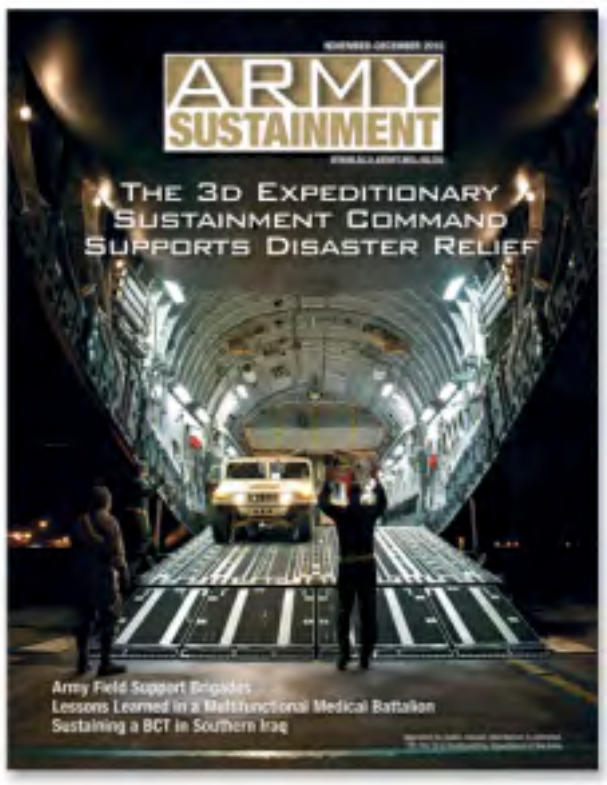

The Battery Manager Maintenance Program

by Lieutenant Colonel Anthony W. Adams, KYARNG

Poorly managed vehicle battery maintenance can lead to early failure and unnecessary replacement costs. It can also take away time from a mechanic's daily schedule and his ability to perform other tasks, such as general troubleshooting and repair. Ultimately, poor battery maintenance will affect the readiness of a unit's rolling stock.

As the surface maintenance manager for the Kentucky Army National Guard (KYARNG), I have instituted a battery manager maintenance (BMM) program with the ongoing consultation of a private contractor, PulseTech Products Corporation. Pulse-Tech incorporates its "smart" charger and maintenance technology into the BMM program and provides strong customer service and support.

The results have been impressive and rewarding. Before having access to PulseTech's smart technology and consultation services, the KYARNG exclusively used flooded-cell (wet) batteries. The average life-span for a typical flooded-cell battery is 2 years on tracked vehicles and 3 years on wheeled vehicles. In the KYARNG, which has 292 full-time maintenance personnel and 40 temporary workers spread among 13 maintenance shops, we had averaged about 2,000 new batteries annually.

AGM Batteries

Two years ago, we began switching to the new Hawker absorbed glass mat (AGM) batteries and instituted our BMM program with the help of Pulse-Tech. Since then, we have had to replace less than 5 percent of our inventory of 2,500 Hawker batteries, representing a 90-percent reduction in year-to-year replacements. We also estimate that we have gained 1 man-year of available productive time because we spend less time replacing and maintaining batteries. Although the cost of AGM batteries is higher than the cost of the flooded-cell batteries we previously used, AGM batteries last longer, perform better, and can be safely shipped by air, ready to use.

To keep those AGM batteries at peak performance, we employ a variety of high-tech smart tools, including analytical testers and charging systems, such as heavy-duty rolling chargers and pallet chargers. Along with the technology, we have instituted a routine "cradle-to-grave" maintenance program that clearly defines procedures for handling and safety, preventive and corrective maintenance, testing and diagnostics, charging, and replacement.

A Customized BMM Program

The KYARNG BMM program covers a wide variety of tracked and wheeled equipment, including multiple launch rocket systems, howitzers, armored personnel carriers, engineer equipment (bulldozers, scrapers, dump trucks, and front-end loaders), heavy equipment transporters, palletized load systems, heavy expanded-mobility tactical trucks, and high-mobility multipurpose wheeled vehicles. With approximately 3,500 vehicles, trailers, and generators, we needed a maintenance plan customized specifically to match our unique blend of battery service and maintenance equipment, battery inventory, and vehicle usage.

Roy Johnson, a retired Army warrant officer and Pulse-Tech's military liaison whom I first met at a conference in 2007, quickly pointed out that "one size doesn't fit all" when it comes to battery maintenance. Using PulseTech's Army BMM program, which the company has refined throughout its 20-year partnership with the military, we worked for several months with Roy to create a custom program that best suited KYARNG needs.

Through congressional plus-up funds, the Communications-Electronics Research, Development, and Engineering Center provided battery testers and chargers, and the KYARNG purchased additional equipment to round out the program. In total, we acquired Pulse-Tech's MBT–1 battery tester, 490PT battery analyzer, Pulse Charger/World Version, Pro-HD heavy-duty rolling charger, HD pallet charger, RediPulse Pro-12 charge/maintenance system, and other battery mobile shop and service equipment. However, it was PulseTech's ongoing consultations and seminars that taught us a battery's real capabilities. PulseTech provided onsite, hands-on training to maximize the benefits of charging and maintenance equipment (even if it was not their brand).

One of the best examples of benefits through this collaboration was the development of the MATES (Maneuver and Training Equipment Site) Battery Room Guidebook, which covers new battery turn-in procedures, battery worksheets, constant charge maintenance, state of charge, types of equipment utilized, and hard-to-charge batteries.

According to the Army TACOM Life Cycle Management Command, the eight major reasons for premature battery failure include—

- Insufficient run time.
- Battery self-discharge.
- Temperature failure.
- Dirty battery cases.
- Intermixing of batteries.
- Operator error.
- Faulty electrical systems.
- Physical damage.

The guidebook outlines our procedures for maintaining vehicle batteries. For example, when new batteries arrive, they are placed on the RediPulse Pro-12 pallet charger, which desulfates the plates and brings the batteries to a complete state of charge. Then they are ready for use. Twelve batteries are kept charged at all times; when one is taken off the charger to be used, it is immediately replaced with another.

When a vehicle is brought into the shop, the batteries are tested to ensure that they are holding a charge within 0.2 volts of each other. When that is verified, the Pro-HD charger is hooked up to the vehicle's slave receptacle. The Pro-HD returns the batteries to a like-new state without having to remove the batteries from the vehicle. Once the batteries are charged, they are checked for serviceability with the advanced battery analyzer. If a battery does not test to standard, it is replaced. That replaced battery then starts the process over again.

Reducing Waste

By using PulseTech equipment with smart technology, we can reduce waste. PulseTech equipment results in the rehabilitation and return to service of many "bad" batteries that had lost their charge while being stockpiled in warehouses.

As a battery ages through use or through sitting unused for a long period of time, lead sulfate crystals enlarge and can build up excessively to the point that they create a physical barrier across the surface of the plate. Before long, this buildup can become so dense that a battery can no longer accept or release energy, so it becomes a dead battery.

In the past, these "bad" batteries were stockpiled and discarded rather than evaluated and restored to service. Pulse technology has changed the way we look at battery life cycles.

Pulse technology, developed by PulseTech and patented in 1989, removes and prevents the buildup of damaging lead-sulfate deposits on battery plates in a nonharmful way so that a battery can accept, store, and release maximum power all the time. What makes pulse technology so unique and effective is the application of a distinct pulse waveform. This waveform has a strictly controlled rise time, pulse width, frequency, and amplitude of current and voltage pulse. No other known battery charging or maintenance system has these specific characteristics.

Although the KYARNG BMM program is essentially designed for keeping good, new batteries in peak condition for a longer period of time, we have also learned how to recover batteries that will not accept and hold a charge using conventional methods and equipment. We do this using new high-tech battery charging and maintenance systems that use pulse technology.

The KYARNG now pays more for batteries, but they last longer. We do not know exactly how much longer yet, but we can already see the cost savings in the amount of money spent on replacement batteries. We also spend less time working with batteries, which allows mechanics to be more productive in performing mechanical troubleshooting and repairs. And because of that, our Soldiers have greater confidence in the performance of their equipment.

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