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Battery Optimization as a "Green" Alternative

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Industry is rapidly shifting their operational emphasis towards the conservation of resources, particularly the reduction of electrical inefficiencies and "carbon footprint." The warehousing industry is well aware of electrical conservation with regards to lighting, heating, and air conditioning inefficiencies; however, electrical savings in the motive battery re-charging process is often overlooked or ignored.

Previously, there was little management could do to objectively analyze and minimize the cost of re-charging their fleet of motive batteries, nor were technologies available to remedy those inefficiencies, once discovered. With the advent of advanced sulfation elimination techniques and the new concept of a "Battery Optimization Scanning System" (BOSS), the warehousing operator can scientifically analyze and compute the electrical efficiency and "fine tune" their motive battery operation to achieve maximum electrical efficiency.

The Batt-Recon process of sulfation elimination allows the warehousing operation to quickly optimize battery-charging performance, in their facility, while maximizing battery runtime. An "Optimized" battery charges faster, using less electricity and runs much longer, requiring fewer charging cycles per week. By contrast, the typical battery operation allows sulfates to accumulate until a noticeable degradation of performance is observed, before taking corrective actions.

Traditional methods result in numerous inefficient charging cycles wasting large amounts of electricity, producing increasingly shorter runtime capacities. The diminished runtime now requires even more frequent, increasingly inefficient charging cycles, which deliver increasingly inefficient battery capacities. The combination of long, inefficient charging cycles and ever shortening runtime capacities; result in a slow, spiraling increase in electrical cost of approximately 20 to 30% of your total battery energy cost.

The Battery Optimization Scanning System is a comprehensive process that provides an objective, scientific methodology to determine the optimal battery performance characteristics, for each unique operation, minimizing electrical use and cost while maximizing battery efficiency. By identifying and measuring battery operational characteristics, the BOSS System can determine the specific rate of sulfation accumulation and prescribe an appropriate sulfation elimination response. That minimization process can now be viewed as; "… the ability of the warehousing manager to establish the amount of electricity they are willing to waste," while charging the battery fleet.

This new scientific approach considers and weighs environmental factors that the battery must operate within, rather than simple testing in controlled environments. The most important measurement of battery cell's operational efficiency is the applied load test. The load rating process must consider the delivery characteristics of different types of battery cells, and that the testing process is non-linear with respect to the environment. Environmental conditions such as temperature have a dramatic effect on the load performance of a battery, while different types of batteries have different temperature co-efficiency ratings.

A motive battery rated at 600 amp hours is expected to produce 100 amps per hour, for six hours, until such time as the battery power is totally consumed. Typical industry standards are to divide the rated capacity of the battery, in this example the 600-amp hours capacity "C," by six hours (C/6 = 100) and apply the load of 100 amps to the battery for a 5-hour period, corresponding to an 80% discharge rate. If any cell voltage drops below 1.7 volts, then the cell is determined to have less than full capacity.

The Linearity Variable states that the discharge capacity of the battery is not the same at high discharge rates, as it is for a low discharge rate, thus non-linear. If you discharge the same battery used in the example above at 150 amps, the battery will not deliver all the expected amp hours before it goes dead. If you discharge the same battery at 50 amps applied load, the battery will deliver more than the expected amp hours before it goes dead.

The Deep Discharge Variable states that batteries (cells) that have been deeply discharged during normal use will have a shorter lifespan than those that are not as deeply discharged. The same battery used in an operation with continuous excessive deep discharging, will have a lowering of the capacity profile when compared to the same battery without deep discharging events. The same battery with no deep discharging events would have an improved capacity profile.

The Temperature Variable states that a warm battery cell will have a higher capacity profile (more capacity) than a cooler battery cell. A battery cell that is operated in a 34 degree F environment will have a maximum capacity of 80% of the same battery operated at 75 degree F environment. Temperature has an additional affect on battery cell longevity. Batteries (cells) that are operated in cold environments have an increased statistical life expectancy, while batteries operated at elevated temperatures have a reduced life expectancy.

An often-overlooked "twist" in the Temperature Variable, is that when the electrolyte is cold, the voltage is actually higher than when the electrolyte is warm. Most battery chargers have a charging profile consisting of a high rate primary charge, followed by a lower rate finish charge. The change between high and low rate charging is determined by the battery voltage, therefore "cold soaked" batteries switch into the finish charge rate sooner than warm batteries. Thus, cold batteries receive less amp hours than the equivalent warm battery, prior to the top charge rate being applied. If un-corrected, the cold storage battery will be less electrically efficient than a warm battery.

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These are a few of the many factors to consider when maximizing battery operational efficiencies. We as service providers must continue to provide leadership by applying technology to reduce the end-users costs and minimize their "Carbon Footprint." The trend towards increased electrical efficiency will accelerate; particularly as looming "Cap and Trade" mandates will soon become reality. The warehousing industry service provider has the opportunity to take an environmentally friendly, leadership position by providing Battery Optimization techniques to their motive battery maintenance operations.

For more information on advanced battery operational diagnostic techniques, please feel free to contact Bravo Zulu International at 951/928-0595, or visit us on the web at www.battrecon.com.

BATT-RECON: The Emerging Technology

The Model 4800 F System:

Creates New Service Clients
Generates Cash Flow
Saves Electricity Costs
Extends Battery Life

As lead-acid batteries cycle between charge and discharge, sulfates accumulate on the internal lead plates of the battery preventing the efficient flow of electricity. This results in longer charging times, fewer operating hours of use, 10-40% wasted charging electricity and premature replacement of the battery. The Batt-Recon Patent Pending Process of Sulfation Elimination restores most batteries to a serviceable condition saving you time and money!

Zulu 3n2

The Battery Optimization Scanning System

"New Tech Inc., Offers Batt Recon Services as a true cost savings program. Our clients save money by extending their battery life, reducing their battery service frequency and reducing their electrical charging costs by about 20%. As an industry leading service provider, we are committed to the advancement of technology that benefits our clients!"

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