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ASSET MANAGEMENT:

The Business Case for Battery Monitoring

Asset Management: The Business Case for Battery Monitoring

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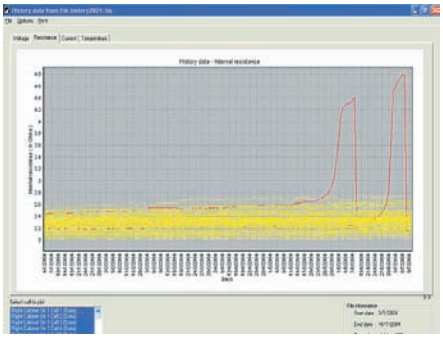
In a power critical environment (Tier 2 upwards) it is essential to know the state of health of the lead acid batteries supporting the critical load.

Despite the cutting edge technology which resides inside today's UPS systems, when a building's AC power fails, the UPS needs to draw its power from banks of lead acid batteries to feed the critical load until it is able to start and synchronize the standby generators. There is a strong business case to be made for investing in a state-of-the-art battery monitoring system to manage these assets and ensure that critical batteries are in a good state of health and will function when required. The business objectives include:

1. Minimize the likelihood of unplanned downtime
2. Reduce costs
3. Increase operating efficiency
4. Improve budgetary controls and spending

Until such time as these critical batteries are required they are typically kept in a state of full charge to ensure the maximum run time when called upon (typically 5 to 25 minutes). The fact is most UPS power failures are not due to UPS problems but actually are due to battery failure. In many cases valve regulated lead acid (VRLA) batteries can fail within just a few days. (See graph below.)



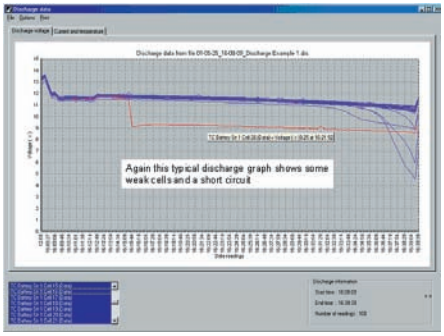
(This real world example shows the daily ohmic value of two cabinets of VRLA batteries. The two red lines indicate the failure of two of these jars over the course of just a few days. Only daily ohmic measuring can show these results in such detail.)

The most modern battery monitoring systems have been specifically designed to monitor the ohmic value of all of the jars every day. They can do this because of the very light test load used, combined with superior electrical noise filtering techniques. Such systems can also monitor generator start batteries that are often neglected until needed.

A battery monitoring system can:

1. Provide a "window on your battery" with its continuous, accurate monitoring and alarm notification.
2. Provide clear information in the form of graphs for forensic analysis.
3. Reduce manpower demands and increase safety during maintenance.
4. Allow extended life of the batteries through efficient and rapid preventative maintenance.

The graph below shows what such a system automatically records when any discharge takes place.



(This real world example of a 30 minute witness discharge test clearly shows one bad (shorted) cell and several weak cells within the strings — these cells were immediately replaced.)

Cost justification on a disaster recovery basis

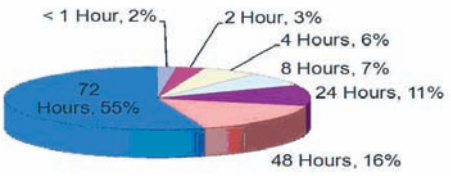
For most major data-oriented businesses today, unplanned downtime is to be avoided at all costs and is typically a major subject in any company's disaster recovery plan and Mean Time To Recovery (MTTR) calculations.

It is assumed here that the reader knows the full costs and implications of his own company's downtime but for purposes of this discussion here are some typical known business statistics:

Brokerage Operations	$8 million per hour
Credit Card Sales	$3.5 million per hour
Pay per View	$200 thousand per hour
Home Shopping	$150 thousand per hour
Catalog Sales	$100 thousand per hour

(Data courtesy "Media Disaster Recovery Reaction" 2003)

The graph below shows the likelihood of a company going out of business in relation to the time they are not functioning due to an unplanned outage.



(Data courtesy "Contingency Planning Research)

So, it can be seen the cost of any outage within a critical installation can be highly expensive at best. At worst, the entire business is in peril.

The benefits of having a modern battery monitoring system:

Managing the assets of a data center with a modern battery monitoring system provides a number of benefits. A system that provides daily ohmic value readings can:

1. Greatly reduce the risk of unplanned downtime due to battery failure.
2. Reduce the workload for the maintenance team, increase battery and workforce efficiency and provide the proper management of very large numbers of batteries.
3. Ensure that the entire battery system is

available by monitoring generator start batteries.

4. Through continual automatic information gathering provide
   a. Good clear baseline readings during acceptance test.
   b. Clear decisions on warranty claims.
   c. Performance information during unplanned outages.
5. Provide immediate notification of detected faults.
6. Ensure that future battery replacement is carried out in a properly timed and budgeted manner.
7. Improve health and safety conditions for personnel tasked with battery maintenance.

The risk of not having battery monitoring

Any power backup system that does not take into consideration the condition of the batteries within it is incomplete and as such the risk of failure of the entire system due to an unforeseen battery failure is very real. Furthermore, as well as being impossible to determine the probability of battery uptime when required, it is also not possible to manage this expensive battery asset correctly, resulting in batteries either being replaced too late (unplanned downtime) or too early (overspending and with negative environmental implications).

Meeting the business objectives

A state-of-the-art battery monitoring system requires a small initial investment of capital and training. But once installed and used properly, such a system readily meets the business objectives listed at the beginning of this article:

1. Minimize the likelihood of unplanned downtime. The battery monitoring systems helps ensure that the standby batteries, including the generator batteries, are functioning and at full power when needed.
2. Reduce costs. In addition to helping prevent the cost of unplanned downtime, the battery monitoring system reduces the requirements for ongoing maintenance.
3. Increase operating efficiency. With advanced knowledge of battery conditions and possible failure, the data center manager can avoid schedule disruptions, deploy technicians more effectively and even monitor remote sites without dispatching personnel.
4. Improve budgetary controls and spending. Ongoing maintenance and battery replacement become more predictable. Failing batteries can be replaced while still under warranty. Instead of bulk replacement after two or three years, the data center can safely keep batteries much longer, replacing only the ones that are starting to fail.

In terms of asset management, cost reduction and efficiency of operation there is a strong business case for battery monitoring.

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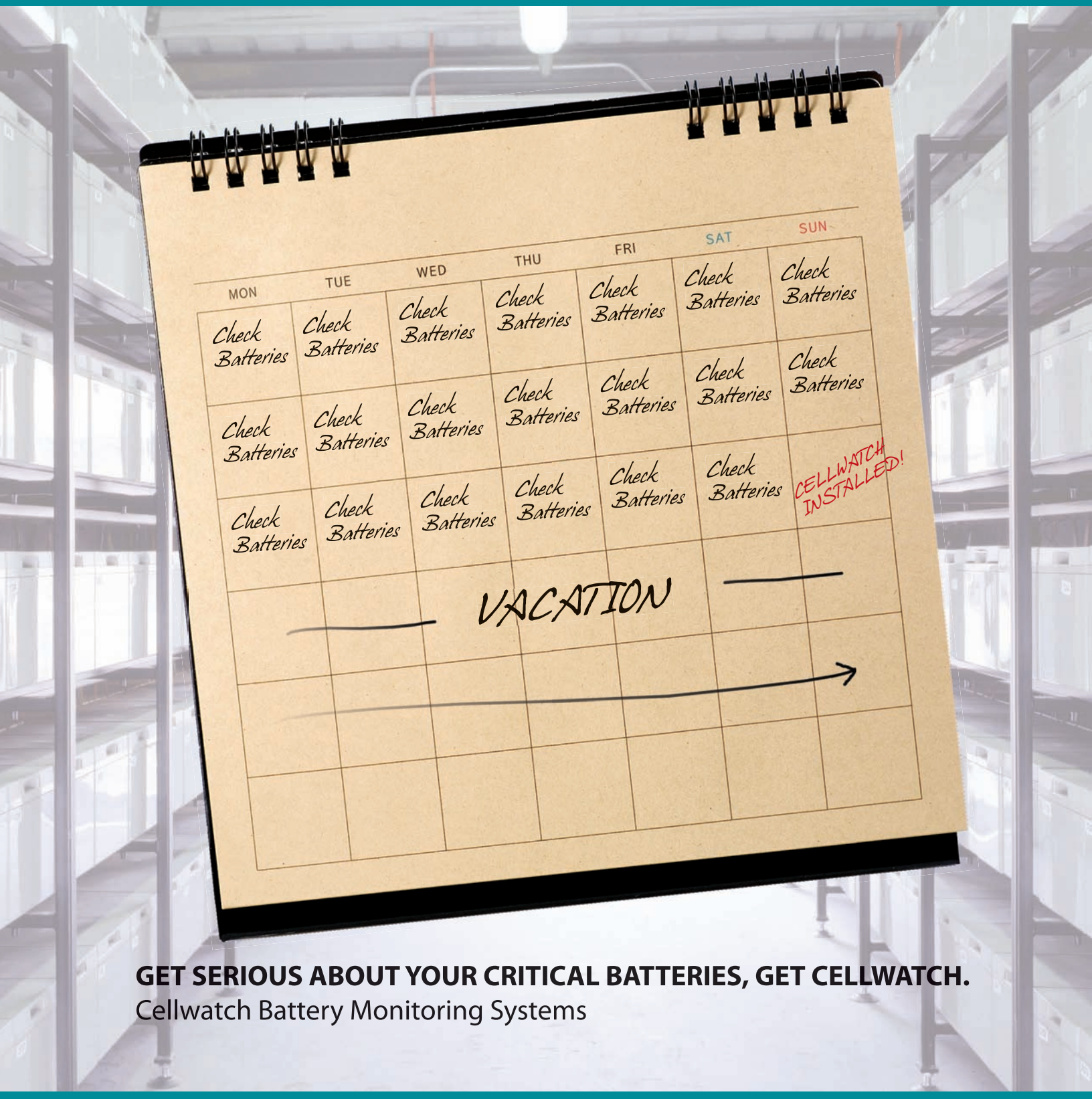

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