

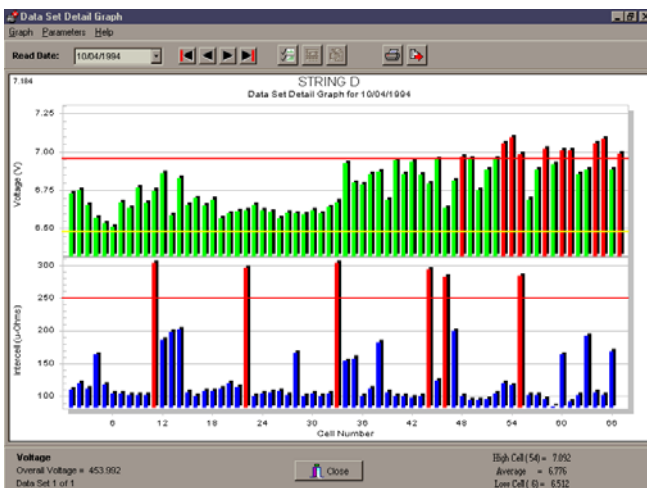
# More is less...

More battery monitoring systems - More portable battery testing systems-More critical battery users-More battery failures- Impedance or conductance and More confusion.

So what's going on?

June 1990 – Four 400kva critical battery systems, more than 16000 hand-crimped connections, 3 crew, a van load of cable trunking, too much vending machine coffee and 10 days later a fully automated battery monitoring system checking the whole system every 4 seconds was signed off and put into service at probably London's most famous financial institute. The inaugural system was fitted, working, had remote dial-up and constantly watched and checked all the battery parameters that really mattered. Fourteen years later battery monitoring technology, battery maintenance and battery awareness have moved on. Unfortunately battery failures are still commonplace, end users are more confused than ever, consultants ask for impedance and everybody thinks they need a more 'scientific' approach forgetting the real 'back-to-basics' battery monitoring, testing and maintenance fundamentals. In fact most users bypass all of the battery standards, guidelines and recommendations set down by the usual organisations.

Technical performance of battery product, after-sales customer service departments, on-site service teams and system engineering have been pushed aside for the sake of meeting the all too familiar 'lowest-bid-price' requirement. The philosophy of 'once it's in and signed off who cares' may be all too familiar.



Any data collected from either a fixed battery monitoring system or portable impedance / resistance device is useless unless checked, analysed and actioned upon. All data needs to be referenced back to known quantities, viewed and adjusted depending on the batteries age and operating environment. One set of rules or alarm values for a new modern installation will be pointless for an 8 year old basement with a battery shoe-horned into a corner next to the building AC vents with a charger that has no compensated output and that hasn't been checked or adjusted since installation.

## What types of batteries are being used today and how should they be maintained.

The choice facing the user is wide, the criteria on which to base that choice is often confusing, claims from manufacturers vary, yet still the most confusing aspect of all is expected battery life.

The application to which a rechargeable battery is to be put will produce a short list of possibilities with two technology types currently in wide use, Lead-acid and Nickel Cadmium.

The factors governing choice between these two are usually down to initial price and severity of environment, although a close examination of total lifetime costs can provide interesting results.

If the environment is subject to severe climatic fluctuations and frequent supply interruptions are anticipated then Ni-Cad should be the automatic choice.

Europe's most popular batteries are usually *Valve Regulated Lead Acid* (VRLA) and are often located in office type accommodation where the environment is believed to be ideal. However user experience shows this is not always the case, often insufficient attention is given to accessibility or to adequate ventilation, ignoring the recommendations given in the standards. The net result is a reduction in reliability and battery life, with the attendant replacement costs. Worldwide this problem is coming under the spotlight; there is a tendency for squeezing battery systems into ever-smaller spaces under the misapprehension that VRLA batteries are 'maintenance free'.

### **Ensure that the battery system is fit for purpose when newly installed.**



A full autonomy test should be conducted before putting any system into service. First however the integrity of all inter-cell, inter-tier, inter-row and take off connections must all be validated. Failure to undertake this test has been known to be the cause of a fire, generated by the considerable heat at a high resistance joint. We have and still do find bad and loose inter-cell connectors.

It is essential that each battery be tested at its operational duty and to the actual minimum voltage specified in the design. The performance of each cell/block must be logged ensuring that each 'link in the chain' is up to the mark. It serves no useful purpose, for example to carry out a 10-hour discharge test, if the application is for a 30-minute UPS duty.

The unique 'fingerprint' of the installation is thus established giving the actual autonomy time, corrected to the design temperature, against which all future assessments will be compared.

It essential that all this data is recorded in and stored with the battery operating and maintenance manual provided by

the manufacturer.

In the final analysis this information will be used to determine when replacement is necessary.

End of life is usually defined as the point where the battery achieves 80% of its specified duty. For very critical installations initial over sizing is undertaken, usually adding 25%, the end of life then becomes failure to achieve 100% of the duty cycle.

### **How frequently should the installation be tested?**

The values obtained for individual cell/block float voltages will settle down after about 6-9 months, taking typical manufacturers recommendations at 20°C, a tolerance of  $\pm 0.1$  Volt is expected. Thereafter the limits tighten to  $\pm 0.06$  Volt, a further discharge just before the one-year point is a wise precaution.

A good practice at the initial installation time and every 6 months is to obtain readings of internal cell/bloc resistance, a characteristic defined by all reputable battery manufacturers. As batteries age this

value, as does float current, rises - logging both characteristics over time gives valuable trending information. The data obtained helps to decide when additional autonomy tests need to be undertaken.

Typically this may indicate a frequency of every two or three years but rising as end of life approaches.



**VAT? Volts, Amps and Temperature** - Is that all I need to check. It really doesn't matter whether you use a fixed battery monitoring system or portable battery tester as long as you check and monitor the right things correctly! Obvious as this statement may be most users and monitoring systems often only check a few parameters. If you took your car in for service with a performance problem and the mechanic only checked the tyre pressures you would be rather un-happy with his findings.

### **It's Life but not as we know it – or is it fact?**

No Standby battery, No Power = No revenue. User education and product awareness are the obvious issues. Unfortunately most seem to be confused and have no point of reference for advice and no clues as to industry good practise. Searching, as we all do, via the Internet for battery advice or battery testing throws up millions of pages. Well worth the monthly broadband fee!

During the late 80's and early 90's a few battery user conferences took place and proved both popular and useful to all involved. Indeed the popularity of Alber's Battcon conference held in Florida goes some way to prove this problem is not unique to the us here in Europe. Over the last year we have been working on the concept of re-launching a 'users' club in conjunction with the leading industry publication batteries international. Any such club or organisation could allow members to sign up and be part of group sharing system knowledge, user problems and real life issues. Using the latest mediums such as the Internet and email will bring this project to life providing a home and focus in-between the conferences and forum meetings. The Standby Power Owners Club, 'SPOK' has been welcomed by all those contacted in the pre-launch phase. The 'Klub' will be officially launched later this month and a major 'users' conference will be held in September later this year. For up to date conference news and club registration users can visit [www.spok.biz](http://www.spok.biz)

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CellCare Technologies Limited is a privately owned independent company based in Leicestershire. The company provide a range of complementary battery system products and services. These range from battery monitoring systems, on-site testing services, consultancy, portable battery testing systems, battery awareness and maintenance training courses. For more information please visit our web site at [www.cellcare.com](http://www.cellcare.com). The author, David Smith has worked in the standby battery industry since 1989 and is the founder and managing director of CellCare Technologies Limited.