

Battery Maintenance

How to maximize performance and reliability of rechargeable batteries

Why batteries need more than charging...

Every battery has a finite life. Battery maintenance analyzes and conditions batteries to provide reliable performance and long service life.

Why is battery maintenance necessary?

Battery maintenance is a requisite if any of the following problems occur:

- unable to determine a good battery from a bad one
- the battery fleet has become unreliable and cannot be trusted
- battery life is short and replacement costs are staggering

What does battery maintenance entail?

Nickel Cadmium batteries in use and on standby must be exercised once a month by applying a discharge and charge with a battery analyzer. If omitted, "memory" robs the battery of its capacity, resulting in premature failure.

A single bad battery can make your entire communication system unreliable.

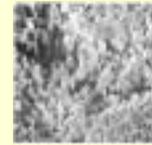
What are the benefits of battery maintenance?

The performance of portable equipment hinges mostly on the battery. The loss of adequate battery power is as detrimental as any other malfunction in a system. Well-managed battery maintenance provides:

- consistent and reliable performance of ALL batteries
- doubling or tripling of battery life
- 50% reduction of battery replacement costs.

What is memory?

The active materials of a NiCd battery are present in finely divided crystals. In a good cell, the crystals are small and obtain maximum surface area. A battery with memory has enlarged crystalline formation and the surface area is reduced. Applying a full discharge reverses this condition.



New NiCd cell



Cell with crystalline formation



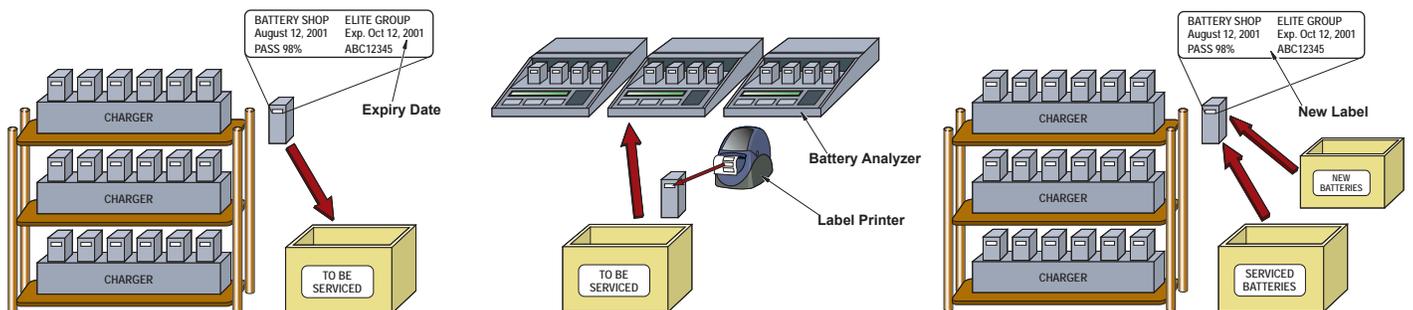
Restored cell

What is reconditioning?

Many analyzers only cycle the battery and a full restoration often cannot be achieved. Cadex analyzers apply a secondary deep discharge that breaks up the crystalline formation, resets the chemical cell structure and restores the battery.

The Cadex Battery Maintenance Program

Battery labeling offers a simple, self-governing way to maintain batteries. With this method the user only picks a battery that is properly documented with service date and capacity. Here is how it's done:



1) Sorting batteries to be serviced.

Each time a battery is taken from the charger, the user checks the service date on the attached label. If the date has expired, the battery is placed in a box marked "To be serviced."

2) Servicing expired batteries.

Batteries with expired dates are exercised. Those that fail to recover are reconditioned. Restored batteries are recertified by attaching a new label with dates and capacity reading.

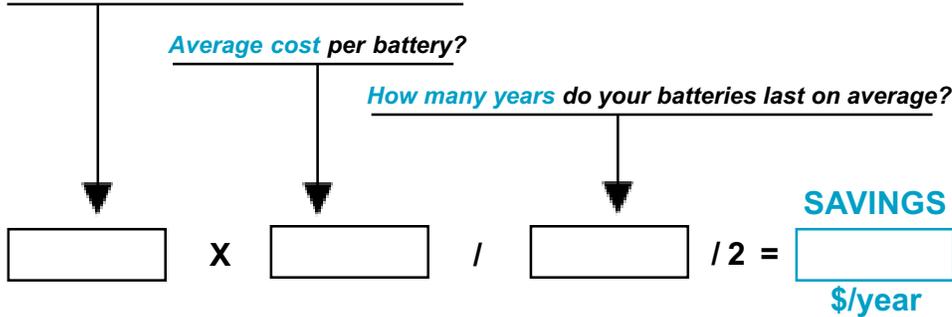
3) Returning batteries.

After service, the restored batteries are returned to the charger; those that fail are replaced with new packs. All batteries in the system are certified to perform.

How much money can I save?

Fleet managers using battery maintenance enjoy a 50% reduction in battery costs. How do cost savings apply to your battery fleet?

How many batteries in your battery fleet?



Choosing a battery analyzer

Advanced Battery analyzers simplify operation, decrease runtimes and offer more effective battery restoration than low-cost alternatives. When shopping for a battery analyzer, ask these questions:

- Is the analyzer **programmable** and easily adaptable to new battery types?
- Can the analyzer restore NiCd batteries with a **Recondition** program?
- Does the analyzer offer battery **Quickest™** and **Boost** programs?
- Does the analyzer provide **service labels** and **printed reports**?
- Is **PC software** available to monitor and retain test results?

The Cadex 7200 and 7400 analyzers fulfill all these requirements.

Example of cost savings

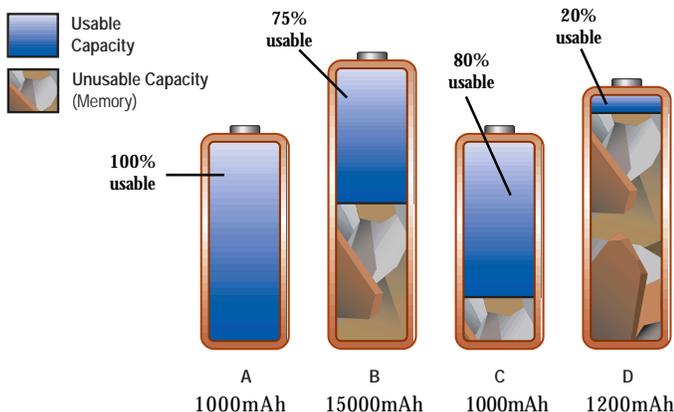
To reduce battery replacement costs, *GTE Government Services* completed a cost analysis on three US Naval Ships. Three maintenance methods were applied which consisted of *Charge and Use*, *Exercise* and *Reconditioning*. Reconditioning is a deep discharge that is exclusive to Cadex analyzers.

Maintenance Method	Annual % of Batteries Requiring Replacement	Annual Cost
Charge & Use Only	45%	\$40,500
Exercising Only	14%	\$13,500
Reconditioning	5%	\$4,500



The green light lies

Does the green 'ready' light on the charger indicate a good battery? **The answer is NO.** Even a battery with dismal performance will indicate 'ready' when full.



Each of the four batteries show large variations in usable capacity. The larger batteries (B & D) offer less capacity than the smaller ones (A & C). The weak batteries charge quicker and remain on 'ready' longer than good packs. The weak batteries become a target for the unsuspecting user.

Cadex BatteryShop™ retains battery history from birth to retirement

Cadex BatteryShop™ software provides a simple yet powerful PC interface to control and monitor Cadex 7000 Series battery analyzers. Programming the analyzer occurs by selecting the battery from the database and clicking the mouse. All service data are stored for future reference. BatteryShop™ is equally proficient supporting one analyzer of a fully extended system of 120 units.



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