

If you are involved in testing your facilities **critical battery banks**, please read below OR pass this along to the applicable person(s). Below is a \$495. half day course for free and takes 2 minutes to read.

ProgUSA is a provider of various Battery Bank testing Equipment and maybe you don't need to buy anything from us!! Here's the **EIGHT levels of competency** in verifying the battery energy is THERE, when you need you it.

1. **IGNORE-** Believe it or not this is common practice in the US. Batteries are not too exciting, so let's ignore testing them until they fail, then we'll replace them.
2. **VISUAL** – Looking for acid leaks and verifying electrolyte levels. Leaks and low electrolyte is bad. Some look for deposit accumulation in bottom of jars (age=decomp)
3. **CELL VOLTAGE-** Measure overall bank voltage and also each individual cell. Better if charger is turned off for this, although a dead individual cell will show up with charger on or off. A simple DMM will do this test. Or a data-logging DMM like the Cellizer TMC2001E or Dv Power's BVR for \$3200. from ProgUSA will do this with nice report writing software.
4. **RESISTANCE** – (aka impedance or capacitance test) – Test with a specialized voltage and resistance tester that draws 20-50A from each cell to measure the resistance accurately. It gives a better health check than just voltage. Problem here is the resistance in healthy battery cells will vary from cell to cell, and manufacturers do not specify this parameter, so this must be a comparison test with previous benchmark test numbers. Also trending impedance can tell if cell starting to fail but doesn't tell how bad it really is. (loading will) For this test there are multiple manufacturers that measure resistance, impedance or conductance. The new wording for this testing is OHMIC testing, which encompasses all technologies and trending every so many months is the key to getting value from this test.
5. **SPECIFIC GRAVITY-** Verifies the electro-chemistry of the electrolyte. Used for flooded cells for many years. Usually combined with test 3 above and sometimes with 4. For this test ProgUSA offers a \$4500 accessory that interfaces to the TMC2001RT or the TMC2001E. This old school test giving way to Impedance testing.
6. **LOAD TEST** – Disconnect the charger and even leave the critical load connected and use DV Power BLU200A or BLY360V to stress the battery bank and ensure the specified energy is still there. This can be a long discussion and basically many utilities got away from load testing because it was thought to age or destroy batteries. It only destroys the batteries if you pull down the voltage too low like less than say 85% of the value and certainly if a cell reverses polarity. When you look at the discharge graph, most of the AH capacity is within the top 90% voltage of the battery. So why take it below 85%. You need a smart load bank to stop at critical point. The DV Power BLU series from ProgUSA does this. Cost starting at \$13K. Plus it can be expanded with smart slave units for additional loading capacity. Note: IEEE recommends load testing flooded cells every 5 years, and VRLA's every year. NERC recommendations are similar and new NERC regulation PRC-005-2, accepts load tests every 6 years on flooded cells, more often on Ni-Cad and VRLA's.

7. LOAD TEST and CELL VOLTAGE COMBO– Item 6 plus add the DV Power BVS cell by cell voltage scanning unit. This combo makes it so easy to find bad cells and document the test with handy DV Win PC software control and report writing software. **The ideal solution with the highest battery testing competence.** Both units here from ProgUSA and common software controls the combo. Combo cost starting at \$29K. The new Polytronic PCIO system offers a different cell by cell communications scheme with fiber cable. The PICO will also be lower cost per cell but has different software. Bonus PICO consideration if permanent monitoring tool.
8. Load test, Cell voltage and impedance in one portable fast test system. It's a new combo system that is best of all worlds by simply adding a DC current clamp to item 7 systems above. It satisfies NERC's impedance test requirement with **added competency** of capacity testing

Congratulations, if you read this far you now know lots [more](#) about battery testing. For further tech or sales help go to [www.progusa.net](http://www.progusa.net) to find your local rep or contact as below. All products are on [www.progusa.net](http://www.progusa.net)

How healthy are your battery banks????....a very critical energy source in times of disaster!!

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NOTES: Always use protective clothing (fireproof overalls are best) and face shields when testing batts with Impedance or loading.  
Comments and DISCLAIMER: Any field testing experience comments on above are certainly welcome to the author above. The content herein is based on a collection of experience and discussions with US utilities, and by no means should be adopted as a standard to meet IEEE or NERC standards. A comprehensive battery maintenance plan should be evolved by respective utilities or test companies once NERC and IEEE guidelines have been studied.