

**POWER DESIGN
ENCLOSURE EXTENDS
BATTERY LIFE FOR
MAJOR IOU**



Insulated and air-conditioned enclosure reduces battery overheating and ensures longer battery life.



BENEFITS

- Pre-wired: fully assembled at factory
- Reduces battery maintenance cost over time and improves reliability
- Easy installation with standard line truck
- Safer: less need to handle heavy batteries when they last longer.
- Easy access to batteries and equipment



THE CHALLENGE

A major NC investor-owned utility was challenged to prevent their substation batteries from failing prematurely. The problem is not the batteries, but rather the environment in which they operate. The lead-acid batteries have been lasting 5—8 years before needing replacement when stored in free-standing, metal enclosures versus 20+ years plus when in conditioned environments like station control buildings. The batteries are designed to be kept in approximately 70 degrees Fahrenheit for optimum performance and life.* The free standing metal enclosures that are typical for the industry are not insulated or conditioned. With direct sunlight the enclosures can reach significantly high temperatures. As one station maintenance supervisor said, “You could fry your eggs on top of those cabinets.” With a material cost of over \$5k for a 100Ahr set of batteries, coupled with labor and downtime costs, the IOU needed a better enclosure.

Battery Life Stipulations

*The optimum operating temperature for the lead-acid battery is 25°C (77°F). As a guideline, every 8°C (15°F) rise in temperature will cut the battery life in half. VRLA, which would last for 10 years at 25°C (77°F), will only be good for 5 years if operated at 33°C (95°F). Theoretically the same battery would endure a little more than one year at a desert temperature of 42°C (107°F).

THE SOLUTION

Utility engineers worked with Power Design, Inc., a manufacturer of fiberglass primary sectionalizing cabinets and primary metering equipment, to create a better operating environment for the batteries. Critical needs of the enclosure, outside of housing the batteries and charger, are AC/DC load centers, insulation, air conditioning, a timed exhaust fan, and portable battery connects. ‘Operations’ needed safe and ergonomic access to all components. Optimizing cost with field needs, it was concluded a 4’ x 12’ x 7’6” tall enclosure would provide easy and safe access to the different components without taking too much station real estate. The enclosure is prewired and factory assembled with all components with the exception of the battery charger and batteries which are provided by the utility. The enclosure will improve reliability of the station batteries while reducing maintenance costs.

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