Application note

Battery quality in UPS application

A typical UPS installation uses Valve Regulated Lead Acid (VRLA) batteries. As a mission critical device, the UPS battery is one of the most important components in it.

An Eaton 3-phase UPS typically has a long string of 30 to 40 batteries connected in series. However, a **battery string is only as resilient as the weakest link in the chain**, meaning that **battery quality is paramount** and that batteries must be at their optimum. Any UPS manufacturer delivering thousands of units each year must ensure they are providing a consistent quality to customers, and as such, must pay attention **to selecting the appropriate battery manufacturer and model**. After all, there are a lot of battery manufacturers in the world.

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Eaton is actively working with select manufacturers that have proven quality products, which are used in Eaton manufactured hardware. Of course, there are other high-quality batteries available that are suitable for UPS applications.

Experience:

Eaton has been using **VRLA batteries since the 1970s**, it has valuable experience with them, has analysed dozens of manufacturers and extensive knowledge in the field of testing batteries in UPS applications.

Validating a battery vendor goes beyond compliance-testing of a battery with a UPS, and associated tests, to research the vendor itself so that **Eaton understands the maturity level** of the vendor and its ability to provide **a consistent and steady quality, as well as quantity**, of supply.

Battery cells must be equal in quality to avoid cell differences that would accelerate the degradation of the performance of the series string. **Sample testing analyzes** uniformity of the quality in a sample batch and between batches. Eaton use vendor-selected batches to do this, as well as testing random samples to get a more objective view of the model.

Some battery brands will white-label batteries made by other manufacturers, and over the years may change the original manufacturer of the battery, which can impact quality or consistency.

Validating battery types is also a result of many actions that Eaton undertakes as part of its validation process when choosing new battery models. This includes **stress testing** the batteries, compliance testing with UPSs, **analyzing steadiness** of the quality between cells, **reviewing safety** aspects and also mechanical compatibility of the existing designs.

Quality control:

All the models selected for standard Eaton UPSs face **rigorous quality controls**. Batteries installed in an Eaton 3-phase UPS or dedicated Eaton External Battery Cabinet (EBC) undergo **regular sample testing** to ensure a consistent high quality, discharge-testing to detect any weak batteries, and final **quality checks** before shipping to customers.

In addition to normal, testing and validation, Eaton performs additional testing required by customers. For example, some customers need to conform to industry regulations on runtimes at designed loads, so Eaton will perform factory acceptance runtime tests on the appropriate sized battery. These additional **tests have resulted in vast amounts of data on battery performance and suitability.**

All of this adds up to the knowledge that choosing an Eaton 3-phase UPS gives more than just a UPS with a battery, it ensures peace of mind.

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