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# Best battery performance: efficient installation and maintenance

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*Providing your own power when Eskom fails is a standard requirement for businesses in South Africa. Unfortunately, while there are many competent suppliers and installers of UPS and battery solutions, many companies fall down when it comes to the efficient maintenance of these systems.*

Master Power installed UPS systems for a client twelve years ago. When it came time to replace the batteries, the client went out to tender and awarded the job to another company. Unfortunately, when removing the old batteries, the new service provider damaged the battery management cards and elected not to replace them. Shortly after replacement, the batteries caught fire.

Most people think they need to simply replace one block of batteries with another, which at the most basic level is accurate, but there is a process that needs to be followed to ensure it is done correctly.

The following points should be considered when replacing UPS batteries:

- When replacing batteries, ensure the new batteries possess the same characteristics as the old ones – the UPS is set up for individual battery requirements: charge voltages, capacity monitoring, end of discharge limits, discharge rates etc.

are very important. If the batteries are not replaced with ones of the same characteristics, then the UPS system must be re-adjusted for the specific batteries used.

- If there is a battery manager installed, it should be disconnected properly before removal. If this is done incorrectly, there can be very high voltages on the inputs that can damage the cards and cause short circuits with sometimes devastating results.
- Be sure to follow the correct procedure in the initial stages of the replacement to prevent later problems. For example, the initial charging of the batteries is very important because failing to do so properly may result in batteries that may never equalise over their lifespan and cause premature failure. Most batteries are charged with a basic initial charge and arrive at site between 80% to 90% of the full capacity, but have not gone through the full charge process. Most battery agents

don't even know the process they have gone through, let alone their batteries' full capacities. After the batteries are installed and have a reasonable charge, the installer must also do a health check via a discharge. It does not necessarily have to be a full capacity check, but at least check each block voltage during a reasonably high rate load discharge, and reasonable depth of discharge.

- During installation, delivery or installation teams can damage the batteries due to rough handling. Batteries are large and heavy and people often consider them indestructible, which is a fallacy.
- It is also important to monitor the bank closely for the first week as this is a critical time. Moreover, the maintenance process needs to be recorded throughout the life of the bank, even if manually done.
- When a battery reaches an unhealthy state, it either needs to be switched off or replaced. We often see that, despite technicians recommending replacement, companies try to extend the useful life of the batteries to save money. This is not recommended as batteries in a bad state can explode causing even more problems.
- Ensure the battery room is well ventilated and try to ensure that the temperature in the room is controlled between 20°C and 25°C. High temperatures reduce the lifespan of a battery.

Although battery issues are complex, they are also simple from an operational point of view if simple processes are followed. Decent batteries provide a substantial warning before failure if maintained correctly and diligently. And the effort is worth the cost since, with the right maintenance and monitoring, batteries are still the most economical storage process for UPS systems.

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A UPS control panel.