27 October 2022

So far in 2022 we have had **2361 hours** of national loadshedding

Eskom Load Shedding Effects on Backup Batteries:

After Eskom's systematic load shedding schedules announcement some questions have arisen about the impact on backup batteries. Eskom's load shedding schedules propose daily blackouts in a range of up to 4 hours at a time. The reality is that it could be shorter, longer and with frequencies from twice per day up to 4 times a day, additionally the time period for this situation to reach an end is unknown. This daily load shedding condition represents a cyclic application and premature capacity loss can be expected, leading to early battery failure.

Eskom increases load-shedding without warning after five generating units break down, 18 October 2022.

This latest escalation in rotational power cuts comes as Eskom struggles to bring one of its longest stretches of load-shedding under control. Barring one Sunday in the second week of October, **Eskom has implemented load-shedding every day since 6 September**. These peaked at stage 6 for several days from Sunday, 18 September 2022, following a flurry of unit breakdowns. On 7 October, after a month of constant (daily) power cuts, Eskom announced that it would suspend load-shedding on the weekend of 8–9 October. Load-shedding continued until 05:00 on Saturday, and that Sunday was load-shedding free. However, it was not to last, with Eskom announcing it would implement stage 2 load-shedding every day during the evening peaks.

Eskom's record load-shedding year, Data from load-shedding tracking app EskomSePush shows that South Africa's had 2361 hours of load-shedding in 2022 so far. With over 140 days where load shedding has been implemented.

2022 has been Eskom's worst year on record for power cuts, closing on double the 1,153 load-shedding hours from 2021 — its previous worst. EskomSePush's raw count of load-shedding hours does not factor in the stages of power cuts, which have also been worse this year.

There are two problems associated with continuous blackouts:

1. **Your batteries don't have enough time to charge.**

Stage 1 | Bulk Charge, The primary purpose of a battery charger is to recharge a battery. This first stage is typically where the highest voltage and amperage the charger is rated for will actually be used. The level of charge that can be applied without overheating the battery is known as the battery's natural absorption rate. For a typical 12 volt battery, the charging voltage going into a battery will reach 14.2-14.8 volts. If the charger is a 10 amp charger, and if the battery resistance allows for it, the charger will put out a full 10 amps. This stage will recharge batteries that are severely drained. There is no risk of overcharging in this stage because the battery hasn't even reached full yet.

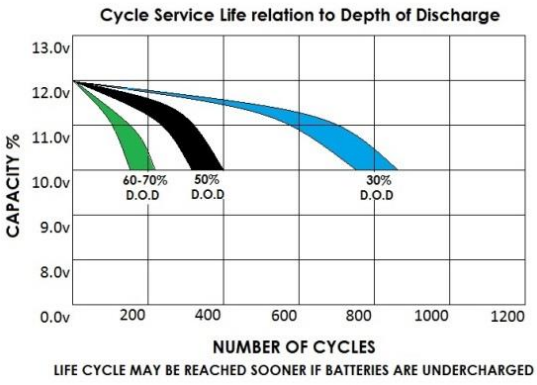
Stage 2 | Absorption Charge, Inverter chargers will detect voltage and resistance from the battery prior to charging. After reading the battery the charger determines which stage to properly charge at. Once the battery has reached 70-80% state of charge, the charger will enter the absorption stage. At this point most chargers will maintain a steady voltage, while the amperage declines. The lower current going into the battery safely brings up the charge on the battery without overheating it. This stage takes more time. For instance, the last remaining 20% of the battery takes much longer when compared to the first 40-60% during the bulk stage. The current continuously declines until the battery almost reaches full capacity.

Stage 3 | Float Charge, Some chargers enter float mode as early as 85% state of charge but others begin closer to 95%. Either way, the float stage brings the battery all the way through and maintains the 100% state of charge. The voltage will taper down and maintain at a steady. The current will also decrease to a point where it's considered a trickle. That's where the term "trickle charger" comes from. It's essentially the float stage where there is charge going into the battery at all times, but only at a safe rate to ensure a full state of charge and nothing more. The inverter charger does not turn off at this point, yet it is completely safe to leave a battery in float mode for months to even years at a time.

2. **The battery Life-cycle.**

Lead acid / GEL batteries, used daily, but meant for backup power, will reach its life cycle sooner and as a result will need to be replaced.

Our gel batteries are rated to last 150-500* cycles, and due to the constant / daily load shedding and insufficient charging times, these cycles will be depleted within a few months.



Based on the total hours of load shedding in 2022, unplanned breakdowns and planned maintenance, batteries will reach its life cycle sooner, leading to substantially shorter run times in just a few months.

As of 27 October 2022, there has been over 2361 hours of load shedding, varying from stage 2 – 6, with an average outage time of 2.5 hours, **that is 900+ load shedding cycles this year alone**. This does not include the unplanned outages, etc. As a result, batteries prematurely fail due to daily cycling and undercharging.

A battery that has reached its life time / life cycle is no longer able to hold a charge and will operate at a reduced run time (reduced AH capacity).

Our warranty becomes void when a battery which is meant for backup is used in a cyclic (daily) application or upon verification is found to be cycled out where it is determined that the frequency of discharge in relation to the depth of discharge has exceeded the acceptable levels.

Please refer to our website terms & conditions for more information.

Yours sincerely,

Wesley Moodley | Director

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