



Why do we not have a 'Low Voltage Disconnect' (LVD) in our systems?

When small sealed lead acid batteries are discharged deeply, their lifespan is shortened dramatically. The purpose of adding a Low Voltage Disconnect function into the circuitry for the lamps is to prevent the battery from discharging too deeply. The idea is that, when the battery voltage reaches the LVD point, the lamps will automatically shut off, preventing further discharge. The LVD might be set at 11.8 volts or 12.3 volts, or somewhere in between. There are many opinions as to where it should be set.

In our experience, the LVD function left people in the pitch-dark of night just when they really needed light. We did not want a system that refused to turn on when, for example, a baby needed to be diapered at 3 a.m.

Also, we found that families would often wire another appliance (eg. a small radio) to the battery terminals. This would completely by-pass the circuitry of the lamps, making the LVD function useless. To solve this problem, the initial impulse might be to try to prevent people from being able to get at the battery, by enclosing the battery in a sealed box, etc. However, in time, people are going to have to break into that sealed box to replace the battery. One way or the other, people will have access to their battery at some point.

The other frustration is that the LVD function prevented people from utilizing a battery right to the very end of its life. Without the LVD function, people can get another year of use out of a battery, and that makes a difference.

We found that there were only two ways to motivate people to protect their battery and not use it for inappropriate purposes. The first was education.

We began to teach people that these systems are for light and light only. We explained that, during any particular day, they can use one lamp for 12 hours, or 3 lamps for four hours, or 4 lamps for three hours, but the combination of lamps and hours should not be more than 12 "lamp-hours" per day. We said that, if they used the systems inappropriately, the battery would die early and they would have to find the money to replace it themselves.

The second way to motivate people to utilize their battery properly is to have them pay for their systems. This was so effective that we have entirely stopped donating systems in the Dominican Republic. It is a simple truth that, if people pay for something, they are far more likely to take care of it. And, if they have a problem with something they are paying for, they will tell you, rather than just throwing it out in the trash. Since we started asking people to pay for their systems, we have seen the problem of inappropriate use virtually disappear.

Since most people cannot afford to pay for a lighting system in one payment, we have also had to set up a financing system, so that, instead of making payments for candles and kerosene gas, they start to make monthly payments for the lights. This requires more work and infrastructure, but it is well worth the effort. People feel really proud when they gradually pay off a debt, and they start to see that they do have the power to make purchases, as long as they are given the opportunity through reasonable loan structures.

Returning to the issue of the LVD circuitry, we realized that this function was theoretically useful, but practically useless. Therefore, our lamps do not contain an LVD. And our batteries in the field are lasting four to five years, which is excellent.