

A Critical Lesson in UPS Transfers

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Uninterruptible power supply (UPS) transfers are tricky yet critical undertakings for many organizations' infrastructures. No matter what form an electrical apparatus takes, it must provide conditioned power to a load. For many organizations, losing that power supply is not an option – and because of that, backup reserves need to be a mandatory component to the power design.

When considering that power design, engineers transfer IT loads from utility power to generator power – a different strategy than typical emergency power systems or standby generators, but one that is much more reliable. For instance, when the utility power source fails, a UPS transfer to generator power provides near-instantaneous protection from input power interruptions, supplying stored energy instead. In a situation where unexpected power disruption could occur, data centers and expensive equipment requires this level of backup and security during maintenance, otherwise the power loss could cause serious business problems and even result in data loss.

The challenge with a UPS transfer in a critical data center is that it requires technicians to move the IT load from utility power to generator power and back again without its critical loads seeing any interruption. While it is a preferred strategy for businesses, a UPS transfer can be very dangerous if it is not performed correctly - from both a business and safety perspective in some cases. These transfers need to be done only when all safety precautions are in place, as the electrical load being moved could seriously hurt the technician moving it if not done properly. In addition, there is a risk of a loss of information due to human error, which makes the need for following industry best practices even more prevalent.

So how can an IT team safely work on critical electrical equipment without any risk to the systems or themselves? Start by following these steps:

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1. Create a method of procedure (MOP) – having in written detail the sequential steps that will be taken during the transfer is equally important. It is advised that each step be signed off by a technical supervisor prior to moving to the next step, and the safety precautions for each event be laid out in major detail.
2. Hold a safety meeting – before any critical maintenance is performed, a safety meeting is important to go over the transfer and MOP, ensuring all participants are on the same page and know the course of action.
3. Get the generators running – here’s where the fun starts. Once the generator start is initiated, the generator and switchgear synch together to support the electrical load.
4. Transfer the load – now that the generators are running and ready to support the load, IT staff wearing personal protective equipment (PPE), switch to generator power, which takes only about three seconds. During this time, batteries provide current to the critical IT load. At this time, power is still flowing through the UPS modules, so they are not yet safe to work on.
5. Static bypass transfer – this is the first step to electrically isolate the UPS modules. This process is automated and initiated through UPS controls, typically a 50 millisecond transition. Both sources are then briefly paralleled when manually transferred from static bypass to maintenance bypass.
6. Perform UPS maintenance – the modules have no power flowing through them anymore, so the work can be performed.
7. Switch back – following the critical maintenance that needs to take place on the UPS modules, repeat the steps in reverse to regress to utility power.

From the initial safety meeting to the exact steps taken to electrically isolate the UPS so maintenance can be performed, these steps ensure a successful UPS transfer so that a business runs as if the transfer was not even taking place.

As always, careful planning and execution, including ensuring a data center’s operational staff is up to speed on rules and regulations, will prevent data loss and provide the best possible environment for work on critical systems within a data center infrastructure. By following these industry best practices for a successful UPS transfer, operations personnel ensure that maintenance is performed and systems are restored to their normal configuration without an interruption of service.

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