

PLANT MAINTENANCE: YOUR UPS SERVICE PLAN *by Kyle Tessmer*

Your plant or data center is a sum of its parts. It is the end result of what seems like countless hours of planning and support from your team along with the cooperation of various vendors. The equipment onsite can include Uninterruptible Power Supplies (UPSs), generators, environmental control systems, security systems, IT equipment, and more. When those parts are synchronized without interruption, the results may not be realized at the moment, but they provide your business with the reliability needed to help drive revenue, meet customer commitments, maintain safe working conditions, and the list goes on and on. Think of your UPS as a safety net or parachute. In emergency cases, the UPS provides the reliability needed to maintain optimal conditions at your data center.

Any disruption in the continuity can result in immediate negative impacts. Lost revenue, rework, and unsafe working conditions are just a few examples.

A recent incident that made national headlines was Delta Airlines. In January 2017, Delta was forced to cancel 280 flights as a result of a major IT system outage. In addition to expensive repairs, the company was forced to issue refunds and reschedule flights, resulting in lost revenue and unhappy customers. The estimated costs were roughly \$150 million, not including damage to the company's brand.

The Delta Airlines scenario is simply an example of the true costs associated with experiencing downtime, making routine maintenance crucial. Routine maintenance is a critical factor to ensure your plant is maximizing uptime.

There are four commonly categorized causes of unplanned data center downtime:

1. Human error – poor infrastructure management
2. Improper maintenance and lifecycle strategy
3. Data center site selection and poor risk mitigation
4. All other causes – utility outages, natural disasters, etc.

Based on a Ponemon Institute study in 2013, it was observed that 83 percent of survey respondents were able to pinpoint the cause of unplanned outages. Of those instances, 55 percent were due to UPS equipment failure. Of those involving a UPS, 48 percent stemmed from human error, and 46 percent were caused by exceeding UPS capacity. Data center managers would be well advised to address these four failure factors when implementing their data center

infrastructure management strategy.

At the top of the list is human error. This is a category that can never be completely eliminated, but there are steps to significantly reduce its probability. One of the best ways to mitigate this category is with documented processes that establish procedures for your entire facility. This can include standard operational procedures, maintenance or contingencies, along with general guidelines for daily functions. Method of procedure documents are another way for managers to best control their data center activities – particularly for maintenance or site testing.

Having these procedures in place is step one. Implementing and training on these procedures is the next step. This step is critical for managers to ensure their team members are on the same page and are following each procedure as it was intended. It may be beneficial to engage your original equipment manufacturer to discuss training options. Each team member should have an in-depth understanding of all processes within your data center. This creates a system where a team member is essentially prepared to provide support if another team member is absent.

After human error, improper maintenance, and life cycle strategy is the most common cause of unplanned outages. The importance of proper maintenance and life cycle replacements cannot be stressed enough. A qualified maintenance provider should provide your team the reliability in knowing your equipment is being serviced by a trained professional within a consultative role to your organization. Your comprehensive service program should include equipment inspections, predictive and preventive maintenance, including onsite testing and any necessary corrective maintenance. Another key factor in your service program should be the life cycle replacement schedule.

Let's re-visit the UPS and parachute analogy. If you have ever been skydiving, your main concern is the parachute functionality – for obvious reasons. Similarly, your service program should ensure your UPS is running at optimal conditions. This would include predictive and preventive maintenance, life cycle replacements (including the batteries), and emergency support structure. Regular maintenance can ensure maximum reliability by taking a proactive approach in maximizing uptime and avoiding potential failures. The basis behind regular maintenance is to apply a scheduled approach to address potential issues before they evolve into something more severe. A reliable maintenance program can be highlighted using a number of

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key factors:

1. Schedule routine maintenance: this significantly reduces the risk of UPS or battery failure. UPS and batteries that receive two Preventive Maintenance (PM) visits per year have a significantly less chance of failure compared to those systems that do not. The philosophy can hold true to other equipment in your data center. These PM's can increase the longevity of your equipment and even improve efficiencies and energy consumption.
2. Creating a standardized checklist or procedure: as addressed earlier, having procedures in place ensures accountability among your team – your service provider is certainly included in this process. Your service technician should have a game plan established before they even walk into your data center. The manufacturers recommended maintenance schedule should play a role in these procedures as well.
3. Enforcing your established procedures: as an example, quarterly maintenance work should be conducted every three months. If a service falls outside of the scheduled window (for various reasons, schedule availability, site issues, etc), your equipment would fall outside of these procedures and should be serviced in a timely fashion.
4. Service provider follow up: this includes proper documentation and data behind each PM. By measuring and benchmarking your systems performance, you can better gauge the data and take necessary measures when appropriate. Having documentation behind each PM provides the historical data for trending analytics or identifying unsafe operating conditions. It can also serve as a tool for your team to gauge your overall data center performance while maximizing uptime and reducing costs.
5. Remote monitoring: this software package should be available for your equipment. A remote monitoring package provides your team the ability to monitor your system in between PM visits. The packages can vary in offerings but are pertinent for UPS and battery maintenance. Once they approach the end of life expectancy, your battery system can rapidly decline and may need increased attention to monitor the readings. Once they approach life expectancy (three to five years) they should be replaced appropriately.
6. Safety: last but certainly not least. Your Data Center has a number of potential hazards that can impact the safety of your team. Your team should be aware of these hazards when performing maintenance. This is when a specialized UPS service technician can pay dividends by utilizing a regular PM schedule.

These are just a few main points but the underlying theory is that your service provider should play an integral role with your team, everything from preventive maintenance, 24 x 7 emergency support,



and corrective service. Take time to evaluate your specific needs and concerns when selecting a service provider. The manufacturer's recommendation is a good place to start but have a set of questions prepared when interviewing potential service providers. A good set of questions could be:

- Where is your closest technician to my data center?
- Are your technicians trained by the manufacturer?
- How often do your technicians attend updated training courses?
- How much experience do your technicians have in dealing with

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mission critical equipment?

- Do you have emergency support and access to critical spare parts?
- Do you have an internal support system designed to keep our facility running at optimal conditions?

Your particular questions can vary depending on your specifications and needs but the above list provides a general guideline.

In your critical environment, continuity is a top priority. Utilizing a regular maintenance schedule keeps your systems up to date and can provide the reliability needed in today's marketplace. By taking a proactive approach to your data center maintenance and using the above guidelines, you place your Data Center on the right path to ensuring reliability, maximum uptime and increased efficiencies.