

12 Things IT Managers Need to Know About Critical Power System Installation



Quality Power Solutions

Are you considering managing your next power system installation in-house?

As an IT manager or other technology professional, you're tasked with maintaining a reliable backup power system. Part of that challenge entails not only choosing the right equipment, but also how to handle installation of the project internally.

Critical power systems like UPS systems, generators and power conditioners can be highly complex on their own. Installation of these systems as a full turnkey project can be even more challenging. A UPS and generator need to be compatible with each other and properly designed. Simple installation does not always ensure your critical loads are protected.

We've gathered twelve of the most crucial things to consider if you're going to manage the installation of your own critical system.



#1 Load Analysis

Talk to Your Stakeholders

First, determine who the stakeholders are that might be affected during a power outage. These may be internal as well as external customers who may be affected.

A load analysis should answer these questions:

- Your projected loads should be analyzed to ensure that your total power consumption, inrush current and harmonics are all taken into consideration.
- Have you pinpointed your required backup times?
- Have output specifications been set?
- Do you have other equipment that could disrupt your electrical infrastructure?

Conduct a Downtime Analysis

If you are unsure what equipment or which employees should be on emergency power at your facility, a cost of downtime calculation should be performed to determine the impact of a power outage.



Need to know your company's estimated cost of downtime?

[Download our free cost of downtime calculator](#)

#2 Structure & Infrastructure



Ensure Your Data Center is Ready

Where will you install your critical power system? The room must be examined to determine if it has the necessary structure and infrastructure to support your desired equipment. If it will be installed over a raised floor, check to see how your flooring will handle the weight of the UPS and battery cabinets.

Cable entry to the UPS may be located on the top, bottom or side of a unit. This makes a difference on where the system may need to be installed. Verify that you have adequate clearances that meet code.

Also account for equipment with a long lead time of arrival to ensure those pieces are there when you need them.

#3 Electrical Infrastructure

Assess Your Electrical Capacity – Now and in the Future

Your electrical panel, circuits and breakers all need to be sized properly and installed according to code. Furthermore, if your IT equipment is housed in a manufacturing facility or in a building that also houses equipment with an inductive load, this may cause electrical disruptions throughout your building. Proper analysis and surge suppression are key to ensuring load integrity.

Discuss and determine the need for an external maintenance bypass that allows you to isolate your UPS system for maintenance or emergency repair.

Future infrastructure and load growth should also be discussed and taken into consideration during this period.

As your IT equipment becomes more efficient, it can also become more energy dense. Your kW consumption per rack may actually increase with time. As your energy demand grows, you want to ensure this equipment will be able to handle the added capacity.



#4 Temperature & Humidity

Check Your Environmental Controls

Room temperature and humidity control must be designed and correctly installed.

A static UPS system is designed around batteries, and heat quickly reduces a battery's life. In fact, industry standard shows that for every 15°F increase in temperature, the life of the battery is reduced by 50%.



**Every 15-degree
temperature increase**



**50% reduction in
battery life**

#5 Fire Suppression

Be Prepared to Handle a Fire at Your Facility

Fire suppression must be designed and properly installed. In a data center or other critical space, water from sprinklers can often cause costly damage to equipment and servers. This may result in extended downtime, disruption to business and loss of critical data. Installing a clean agent system, like an FM200 or Novec 1230, is an excellent way to protect from fire hazards while leaving behind no residue or damage to electronics.

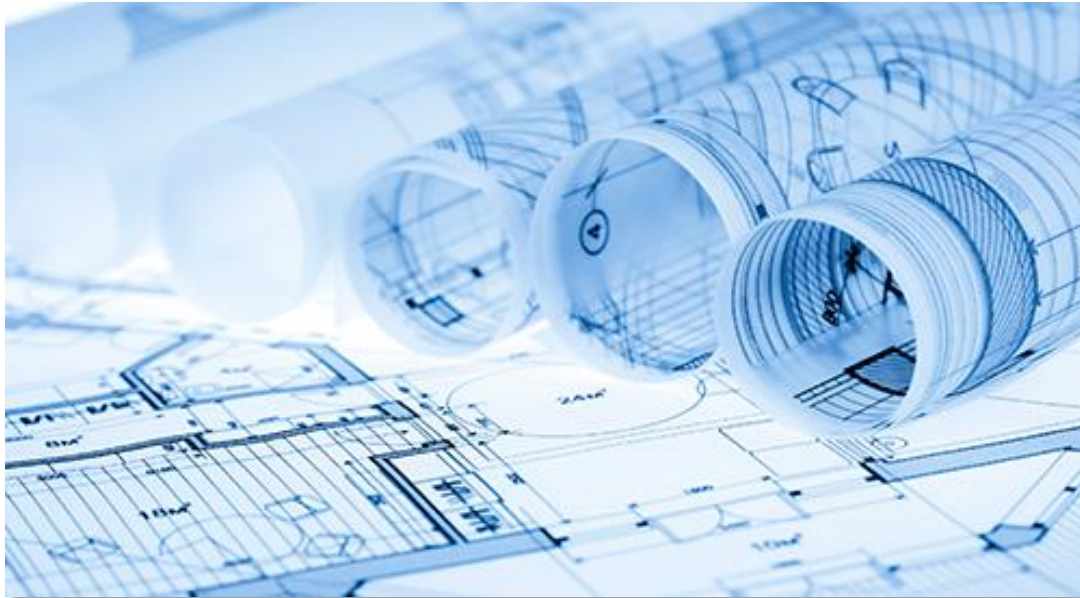
You'll also need to consider your EPO (Emergency Power Off) requirements and ensure that they are designed to work with your UPS system in the event of a fire. Installing a clean agent system ensures early detection by utilizing sensitive smoke detectors, intelligent control panels and pressurized cylinders and nozzles to discharge the agent in the event of a fire. Each system is designed with specific agent flow calculations, engineered and unique for that particular hazard space.



#6 Drawings

Plan Your Space in Advance

Plans must be accurately drawn out, depicting where each piece of equipment will fit into the facility. These may be simple one-line diagrams or full electrical drawings dependent on the project scope. Finding a balance in design and cost can be difficult.



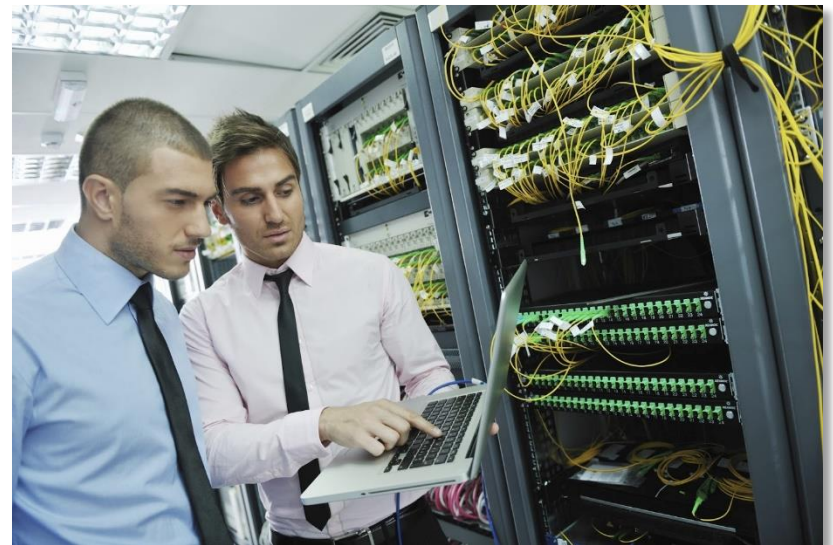
#7 Permits

Local permits must be submitted and approved, often for multiple disciplines and sometimes from multiple governing bodies.

#8 Safety Requirements

Not only is compliance with local and national codes required, but safety is a top priority. Is your staff able to ensure that proper safety procedures are in place? Discussion on the type of equipment that will be installed should also include talks on safety.

Some battery systems will need containment and eye washing stations. Your room EPO must be installed correctly to immediately disconnect power to the UPS and also may need to isolate the battery system to prevent thermal runaway in the event of a failure or catastrophic event.



#9 Scheduling & Project Management

Managing all the pieces of a complex critical power system installation means staying organized.

- How much time should be allocated for startup and commissioning?
- Will the electrical contractor need additional time to install a new panel or bypass?

Making sure that all of the pieces are in place will ensure that a proper schedule is developed and the project stays on point.



#10 Approvals

Both internal and external approvals can be difficult to manage. Staff members overseeing critical equipment need to be aware of and approve outages for equipment installation if required. A good project manager should help to keep the key stakeholders on schedule and work hard to enable good channels of communication. Change control orders, blackout dates and other maintenance or projects can be disruptive and make it difficult to hit important deadlines.



#11 Contractor Management

In order to address all the necessary power system considerations you will most likely outsource some tasks. Unless you speak the same language as the specialty trades, it will be difficult to ensure the contractors are fulfilling the exact job you need completed.

Additionally, you will have to act as mediator when the trades require the same room at the same time to work, or if they want the same wall space to mount gear, etc.

#12 Punch-List & Payments



Monitor Your Costs and Protect Your Investment

Installing a complete critical power system is a long-term investment for your company. Keep track of every aspect of installation to ensure your money is giving you exactly what you paid for. Take the time to create a document or template that will allow you to keep vendors and stakeholders on task. Collaboration is one of the most important components of a good project. Missing a step or overlooking a vendor request could set you back or easily put the project well over budget.

Bonus: In addition to these steps, a good installation will include a thorough commissioning, which should test the entire installation to ensure that it works as designed. This helps to uncover areas that may be vulnerable or perhaps show a manufacturer defect in a new piece of equipment. This is a critical step to making sure that your new system is fully operational and ready for whatever is thrown its way.

Ready to get started?

These twelve items are common to many power system installation projects, but every facility will also face unique challenges to their situation. Managing this process on your own is certainly possible if you accurately assess your needs, stay organized and keep an eye on costs.

Could your team use assistance with installation?

Another approach to consider is a turnkey installation, where you hire an experienced company to meet your critical power goals. The company may not complete every aspect of the installation themselves, but they'll handle all the various trades, approvals and scheduling in addition to contracting out other necessary work for you. They'll serve as a backup power partner and help you navigate the installation, which quickly becomes more complex when it comes to mission critical equipment.

About Quality Power Solutions

Quality Power Solutions (QPS) provides power backup systems, customized solutions and maintenance services nationwide with a strong presence in the upper Midwest, including Wisconsin, Michigan, Minnesota, Missouri, Illinois, Indiana and Iowa.

Among the services QPS provides is knowledgeable critical power system installation management. Our team of Certified Power Quality professionals ensure every checkpoint of a mission critical installation is addressed, giving clients reassurance that all components will meet their backup power requirements.

Have questions about an upcoming power system installation for your facility?

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