

Power Analytics and Business Continuity

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All successful CFOs know that “Time is Money” and “Knowledge is Power” – but there’s no business axiom to describe what “Power” is. CFOs in most industries understand that electrical power is the central nervous system for their organization: without it, manufacturing lines grind to a halt; data centers and NOCs are knocked off-line; supply chains are blinded or shut down altogether; even knowledge workers are left in the dark without HVAC, computers, telephones, or e-mail.

But few CFOs realize that those problems are just the proverbial tip-of-the-iceberg: long before the worst-case scenario of an actual outage, failure to have comprehensive electrical power strategy – especially for worst-case, business continuity scenarios – can take a huge financial toll on an organization’s planning, IT strategy, and bottom-line operations. (For more information, see the whitepaper: “Ensuring Business Continuity.”)

Monetizing the Problem

It has long been established that electrical power outages, surges, and spikes cause more than \$150 billion in damages to the U.S. economy every year... more damaging to an organization’s electrical infrastructure than fires, floods, earthquakes, network outages, service failures, and hardware problems *combined*. But what fewer executives know is that 80 percent of power problems occur within an organization’s own electrical power infrastructure... not because of external causes, e.g., their public utility.

The seriousness of a power outage to an individual company varies by industry and application – ranging from “costly and disruptive” to “costly and life-threatening” – with some industries losing as much as *\$6.45 million per hour* of business downtime:

- In consulting services firms or software development facilities, hundreds of highly-paid professionals are left stranded... and frequently return to crashed computer systems, lost data, and hundreds of man-hours of work that needs to be recreated.
- In pharmaceutical plants, petrochemical refineries, microelectronics fabs or food processing plants, millions of dollars of in-process product frequently have to be scrapped due to damage, spoilage or contamination.
- In control centers – for air traffic, telecommunications, or utilities – the safety and satisfaction of millions of customers can be jeopardized. And in data centers – for financial services firms, insurance companies, or ISPs – thousands of records and real-time transactions are knocked off-line.
- In military systems valuable personnel, equipment, and weaponry become unprotected and powerless... and thus, vulnerable to attack.



- In hospitals and care facilities, where patients' lives are dependent on health monitoring and life support systems, a loss of power could translate to loss of life.
- In entertainment facilities, the loss of power forces the costly cancellation of revenue-generating events or routine operations. A recent multi-day power outage in a casino, for example, resulted in losses exceeding \$1 million per day.

No clear-thinking businessperson would build a multimillion-dollar facility on a major geological fault line; but every day, seasoned executives build multimillion-dollar production or operations facilities atop electrical power infrastructure that is overdue for failure. Need proof? Perform a Google™ search on the terms “power outage” and “business,” and you’ll find more than a million accounts of some of the world’s most prestigious companies having their operations disrupted by electrical power problems.

First-Generation Solutions

The first-generation approach to mitigating – but not preempting – the effects of electrical power problems are monitoring and SCADA technologies, coupled with fault-tolerant systems, uninterruptible power supplies, battery rooms, generators, etc. For organizations concerned about maintaining business continuity, these technologies are a wise investment for reducing the disruptions and damage caused by power problems.

Many facilities continue to rely only on monitoring and SCADA technology that operate in a reactionary mode... and deluge users with thousands of lines of information per second. This makes it nearly impossible for facility operators, managers and technicians to gain an accurate understanding of the health of their mission critical power system operations; so, like the car alarm that has become more of an annoyance than an alert that a car is being stolen, operations often ignore – or even just turn off – these systems.

As a result, these systems should now be thought of as “airbag” technologies: they cannot prevent power problems, they merely reduce their business and financial impact by maintaining a higher degree of business continuity until a more permanent power solution can be enacted. Like the airbag in an automobile, they are not a substitute for “collision avoidance” systems that prevent accidents from occurring in the first place.

The Case for Power Analytics

Power Analytics is the “collision avoidance” solution that predicts and prevents electrical power problems from occurring to begin with. Just as “Business Analytics” – those complex mathematical models developed by risk analysis companies like Experian and Fair Isaac – help financial institutions predict lending risks and prevent fraud, “Power Analytics” enable organizations to predict electrical power problems before they occur, by continually assessing the real-time health of their electrical power infrastructure

Power Analytics systems act as an on-board electrical power system expert, to intelligently filter the power system sensory data, help owner/operators understand the real-time health of their electrical power system, as well as diagnose whether that health is stable, deteriorating, or becoming overloaded.

Thus, business-impacting decisions rooted in the health and reliability of electrical power can be made now, not after a problem occurs.

As examples:

- How much more capacity can our existing facilities accommodate, before it becomes necessary to make arrangements for new facilities?
- What would be the operational impact of adding new equipment, changing configurations or adopting new technology?
- If we were to outsource our manufacturing – or we needed to monitor our suppliers' facilities to ensure the integrity of their systems – how could we do so?

How Power Analytics Work

Just as the human body has normal “vital signs” – and irregular signs like high temperature or elevated blood pressure, heart rate, or respiration rate are indicators of potential longer-term health problems – so does electrical power infrastructure.

“Normal” electrical system readings are defined by manufacturer’s equipment specifications, or the day-to-day readings of equipment while in routine operation. Even negligible deviations or changes in measurements – combined with other readings in a seemingly unrelated area – could be an indication of the early stages of a power problem.

Within a Power Analytics system a detailed design database, called a designbase, stores the manufacturer’s specifications and historical operating measurements for all equipment and components. Like a skilled physician, Power Analytics knows how to check, interpret, and cross-reference “symptoms” in your electrical infrastructure. When it detects a reading that warrants further investigation, Power Analytics automatically knows what surrounding components to scrutinize... and, based upon its findings, determine when and where problems could be in the formative stages.

As a result, Power Analytics provide a far more detailed assessment of potential electrical power problems... in most cases, long before they actually occur and can have a devastating effect on your company’s bottom line.

Summary

Whether your organization relies on electronic commerce, call centers, automated production systems, process control systems, or C3 to achieve its objectives, electrical power is what keeps your operations online. Like homeowners who purchase a security system after they’ve been robbed, the most power-savvy CEOs are the ones who’ve been burned by costly, business-disruptive power outages... and thus, made an unwitting contribution to America’s \$150 billion per year power problem.



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