Ensuring Business Resilience

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In today's digital economy, the importance of taking a bottom-line view of your organization's electrical power strategy – and in particular, ensuring the clean, uninterrupted flow of electrical power that keeps your mission-critical operations on line – has never been greater. And now, it appears, the stakes have never been higher.

According to published reports in any of a number of leading IT periodicals, the list of companies whose business operations have been adversely impacted by electrical power-rooted problems reads like a "Who's Who" of the leading e-commerce, transaction processing, networking, software, financial services, and IT services business leaders.

These companies, as technology-savvy as they are, have learned the hard way that failing to understand the symbiotics between their IT systems and their electrical power infrastructure can create operational and financial havoc. Because electrical power and IT operations are so tightly interwoven, power problems cut directly into a company's ability to keep their mission-critical computing on-line... or even maintain a high level of insight into power-related problems. Consider:

- The daily cost per for *planned* [versus unplanned] mission-critical application downtime ranges from $167,200[1] to $800,000[2] depending on the size of the company.

- For large companies, a gain of just one percentage point of availability is worth $7,358,400 per year. Even at an average size company, one hour of downtime translates to $10,000 off the bottom line; with a 5% power availability gap, such companies risk $3,679,000 per year. [3]

Or, put even more succinctly: "Companies that do not have comprehensive Business Continuity or Disaster Recovery programs in place are on a collision course toward destruction." according to the IT consulting firm, Gartner Group.[4]

Power Problems: An Inside Job

Without really understanding the health of the electrical power infrastructure – which in a very real sense, serves as the "central nervous system" that keeps their mission critical operations on line – businesses run the risk of lapsing into the business equivalent of a coma.

Amazingly, 30-40% of all business downtime stems from power quality problems[5] and 80% of all electrical disturbances have been shown to originate from inside facilities... with most caused by the day-to-day operation of ordinary equipment and appliances.[6]

More than 500,000 businesses and consumers experience electrical power problems every day... with the average power outage lasting two hours[7]. The annual cost to the U.S. economy due to these power disruptions is estimated at $104–$164 billion... not including up to another $24 billion due to power quality phenomena.

The plans and processes designed to protect businesses from such catastrophic situations is called "Business Resilience." As defined by IBM, a leader in such products and services:

> *"...Business Resilience is the ability to rapidly adapt and respond to risks, as well as opportunities, in order to maintain continuous business operations, be a more trusted partner, and enable growth. Effective Business Resilience cuts across all layers of business and technology...* ***hardware, software, or disaster recovery alone will NOT address resilience requirements****."*[9] *(Emphasis added)*
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> Roger Schwanhauser
> Director, Operational Efficiency Services
> IBM Global Services

Certainly true, but not for lack of spending: according to the Freedonia Group, a leading international business research company, governments and businesses will purchase more than $156 billion in electrical power equipment[10] in 2006, much of it for on-premise power generation systems, uninterruptible power supplies (UPS), industrial batteries, and other electrical problem-mitigation equipment. And even that does not include investments in fault-tolerant computing, redundant systems, advanced data storage and networks, hardened environmental systems, mission-critical facility consulting services, as so on.

But despite all of these investments in technology, the $164 billion-per-year problem remains: how can a company ensure Business Continuity by attacking the root cause, e.g. preventing electrical power problems to begin with? Or, to use an automotive example, is it possible to make the deployment of an airbag unnecessary, because of advances in "collision avoidance" technology?

Designing Continuity In, Problems Out

It's been proven time and time again that cost of developing a business continuity plan and implementing the technology infrastructure to support the plan is minimal when compared with the daily financial impact once disaster strikes.[11] Accepting as true that the biggest threat to a company's Business Continuity lies deep in its electrical power infrastructure, companies only needs to ask two simple questions:

1. How can companies quickly find potential electrical power problems, and how can they correct them without taking their entire system off-line to inspect it?

2. Or, if they are redesigning or building new infrastructure, how can they make sure that they're not designing potential problems into our facility?

Two questions, one answer: the best way to predict and preempt electrical power problems is to have an exhaustively detailed understanding of the equipment, components, and operating specifications that make up your infrastructure... and then, use that information to rigorously validate the interactions between them.

Understanding these interactions will give you visibility into "The Holy Grail," of your electrical power infrastructure: the ability to assess, in real-time, your system's:

- **Reliability** – The trustworthiness of the system to perform as designed; the probability and frequency of failures... or more importantly, the lack of failures. Reliability metrics include probability of failure on demand (POFOD); rate of failure occurrence (ROCOF); mean time to failure (MTTF); and availability or uptime (AVAIL).

- **Availability** – The percentage of time that data can be instantly accessed, and that a system is available to deliver failure-free performance under stated conditions. The term is mostly associated with service levels that are set up either by the internal IT organization or that may be guaranteed by a third party datacenter or storage provider.

- **Capacity** - The storage and transaction processing capability of computer systems, the network and/or the datacenter. Capacity planning requires insightful forecasting, e.g. what if traffic triples overnight; what if a company merger occurs, etc. As a result of such the analyses and forecasts, systems can be upgraded to allow for the projected traffic or be enhanced so that they can be ready for a quick changeover when required.

- **Configurability** – The ease in which IT infrastructure and related systems can be maintained, upgraded, redeployed, and retired from mission-critical use. For example, understanding the effective life of specific hardware and software technology – while taking into account a systematic technology upgrade policy – allows companies to seamlessly 1) maximize the life of their technology investments, 2) incorporate new technologies, and 3) phase out older systems as their relative performance warrants.

"Perfect on Paper"
Using advanced "Power Analytics" software tools, EEs and infrastructure design experts are able to design facilities with these factors in mind, and even understand – down to the smallest detail – how the overall system will function when it is completed, and how it will respond to scenario-driven problems that may occur.

Mastering this depth of knowledge allows companies to "crack the code" to their most pressing IT and critical systems questions:

- How close am I to maxing out my capacity?
- What happens to my reliability if I add equipment?
- What's the right sequence for my technology upgrade?
- What happens if I change my configuration?
- What's the reliability of my system today?
- What happens if we lose power?
- What is the overall "health" of my system right now?
- Why are readings different from the spec?

After the facility design is fully optimized – after being rigorously tested and retested under a wide range of scenarios, until all potential points of failure are "designed out" of the system – such Power Analytics tools can be deployed in "on-line" mode.

This involves connecting the "designbase" used to engineer the facility to live operations data... in order to allow the system to make real-time, expert assessments about the health of the system. By comparing thousands of specifications and making "actual vs. as-designed" calculations per second, Power Analytics systems actually predict when and where electrical power problems may be in the formative stages... typically with 99.95% accuracy, and long before potential problems actually strike.

As a result, companies not obtain visibility to their infrastructure's "desired" operations, but secure the means to validate that the fielded systems are operating within the acceptable parameters defined in the design stage.

Summary

For companies with extraordinary Business Resilience requirements, Power Analytics has been proven effective in predicting and preempting business disruptions rooted in electrical power problems.

Using the tandem of "Perfect on Paper" design, coupled with real-time predictive analytics, billions of dollars of mission-critical infrastructure are now being protected by proven, fielded systems. At this writing, Power Analytics Corp.'s own "power analytics" solution – in various levels of deployment by more than 1000 companies – have never experienced a single quality assurance failure.

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Sources and Footnotes:

1) IBM Corp., "Best Defense Against Worst-Case Scenarios"

2) Oracle Corp. research report

3) Oracle Corp. research report

4) Gartner Group, "Best Practices in Business Continuity and Disaster Recovery"

5) Electric Light & Power magazine

6) Electric Power Research Institute

7) EYP-MCF / Critical Power Coalition whitepaper, "Critical Power"

8) Electric Power Research Institute

9) IBM Corp. "Homeland Security Resilience & Availability"

10) Fredonia Group research report

11) International Association of Emergency Managers