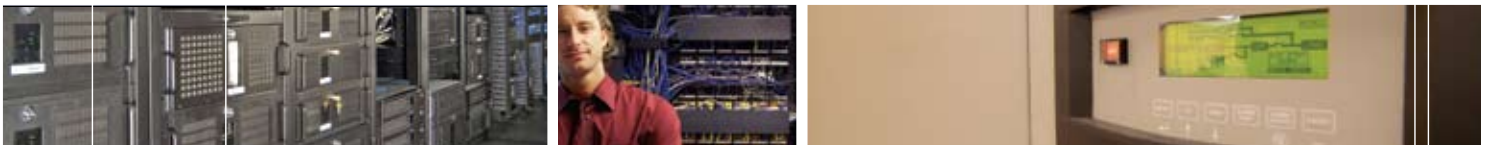


# Get More From Your Data Center

Rely on Liebert for System Availability and Integrity

**GET MORE!™ BUSINESS CONTINUITY APPLICATION GUIDE**





## When IT Goes Down

Over the last three years, business continuity and disaster recovery have been among the top 10 IT initiatives for mid-sized businesses. It is rare for companies to install new IT applications without addressing how they'll protect them from downtime caused by security threats, hardware failures and power outages.



## Warning signs that your infrastructure may not be as resilient as it needs to be.

Is your IT infrastructure ready to meet the demands of your business? Here are situations that may require you to evaluate whether your power and cooling systems can ensure business continuity.

- You have hot spots in your data center or racks.
- Your critical power system consists of multiple small UPS units rather than a centralized UPS system.
- You are adding blade servers without resolving high density heat.
- You are adding IT or network equipment in spaces not designed for IT infrastructure.
- You have dual corded equipment without sufficient redundancy for continuity objectives.
- You are using comfort cooling systems for critical IT spaces.
- You have no way to monitor remote IT or network spaces.

# Create IT Resiliency

Business continuity was once only a concern of large organizations. Today, as IT has threaded itself into virtually every business process, continuity has emerged as an issue no business can afford to ignore.

In fact, according to The Definitive Handbook for Business Management, between 60 and 90 percent of companies that don't have a proactive disaster plan find themselves out of business within 24 months of experiencing a major disaster.

Power and cooling are becoming more important in every IT initiative for ensuring business continuity.

Achieving business continuity requires a power and cooling infrastructure that protects the availability and integrity of your IT systems. Liebert solutions from Emerson Network Power can help you:

- Improve the resiliency of your IT system
- Reduce downtime
- Shorten recovery times
- Eliminate disruptions when new technologies are added

This guide is designed to help you get more from your business continuity initiative. It can help you:

- Identify and resolve gaps in your IT infrastructure that may leave your business vulnerable to downtime
- Understand how to apply new infrastructure technologies that give you greater resiliency against unforeseen events
- Accommodate future IT growth without disruptions

## The Challenges

It's no longer enough for you to think just about disaster recovery in ensuring the continuity of your IT environment and business. You need to develop an IT strategy that avoids downtime in the first place, but this places new challenges on the IT infrastructure.

### Physical Security

IT equipment is vulnerable to failures caused by unauthorized access. More than one company has suffered equipment failure from someone adding new servers to a rack that overloaded circuits, or from inadvertently shutting down equipment.

### Power Disruptions

Changes in UPS requirements must be addressed as applications and systems change. A business that fails to properly size and manage its power system and add capacity, scalability and redundancy as it grows will end up compromising the availability and integrity of its systems, creating unnecessary business risks.

### Heat

As heat densities rise, cooling takes on a more important role in protecting IT equipment. You may have been able to rely on building air conditioning in the past, but with higher capacities and densities comes the need for precision IT cooling and even high density cooling.

### Visibility and Control

Enhanced monitoring has become essential to business continuity. Data centers must be monitored for assured equipment utilization and for adverse environmental conditions, such as high temperature humidity and water leaks. Proactive monitoring and trend analysis have replaced break fix approaches to system maintenance.

### Maintenance and Service

Lack of scheduled maintenance and service can cause unplanned downtime that reduces IT resiliency and increases the cost of ownership for power and cooling equipment. Extending the useful service life of the equipment through proper maintenance, predictive monitoring, and keeping the system up to current revisions increases the availability and integrity of those systems.



A key consideration in cooling is ensuring enough capacity for new equipment. For example: when Pomona Valley Medical Center installed equipment to support its move to digital imaging and electronic medical records, its data center started to heat up and equipment started to fail.

After multiple equipment failures from high heat, Pomona Valley's CIO Kent Hoyos installed Liebert XD cooling systems in his data center. These systems eliminated the heat problem, reduced equipment damage by \$300,000 annually and allowed him to more fully populate his data center. "All of a sudden, the help desk got quiet," Hoyos said. "The problems that we were experiencing because of un-optimized conditions just ceased."

A Liebert Network Solutions Partner, working with your local Liebert Representative, can help you evaluate cooling options and design a cooling system that can meet your needs today while ensuring the scalability that can carry you well into the future.

## Enhancing business-critical continuity

### Key steps to business-critical continuity

Here are steps you can take to eliminate infrastructure risks and vulnerabilities, thereby reducing the likelihood of IT failure.

#### 1. Assess your situation

First, review your existing infrastructure systems and familiarize yourself with the technologies available to enhance business-critical continuity. Power and cooling partners, such as Emerson Network Power, can work with your local solutions provider to conduct assessments that identify business continuity risks related to power and cooling and help you understand your best approach to risk management.

#### 2. Ensure the physical security of your equipment

While large data centers often have strict access policies and procedures, smaller data centers and more remote IT locations may not. It's important to use racks, like the Knurr line from Emerson Network Power, that come with key or card swipe locks and contact closures that protect against unauthorized access.

Within the rack, smart PDUs, such as the Liebert MP Advanced PowerStrips, enable individual receptacles to be activated or turned off. This prevents unauthorized individuals from adding equipment that can overload circuits, creating a power outage to the equipment.

#### 3. Keep your cool

If you rely upon building air conditioning for data center and other IT spaces, you may need precision cooling or even high density cooling to ensure the operation of new equipment. IT equipment often requires 24x7 dedicated

cooling and may require more airflow and more precise temperature, humidity and air filtration control at levels provided only by precision cooling.

Typically, racks with 1kW to 3kW need dedicated cooling. At 5kW and above, high density cooling is often required to adequately protect equipment. ASHRAE, the American Society of Heating and Refrigeration Engineers, recommends a stable operating range of 68 to 77 degrees F for data centers. System availability can be compromised with the rise in heat densities.

A number of Liebert solutions are available for cooling IT spaces:

- **Integrated cooling cabinets.** These provide a power protected, climate controlled, physically secure environment for critical equipment. They are ideal for small spaces where equipment needs physical security and cooling. Examples of these systems include the Liebert Foundation MCR (Mini Computer Room) for loads up to 1.6kW and the Liebert XDF for loads up to 14.4kW. Both come with options for power management and monitoring.
- **Ceiling mount precision cooling.** Compact precision cooling systems, like the Liebert Mini-Mate2, can be ceiling mounted to provide a zero-footprint cooling solution.
- **Floor mount precision cooling.** Floor mount systems, like the Liebert DS and Liebert Challenger 3000, are available in a variety of configurations.

- **Wall mount precision cooling.** The Liebert DataMate lets you cool spaces without taking up a lot of floor space.

#### 4. Ensure UPSs are sized for growth

UPSs installed years ago may not support current IT requirements. Ensure that UPS and backup are adequate for today's needs and future growth.

Growth strategies that depend only on multiple small UPSs may add potential points of failure to the IT system. When total loads exceed 15kW, consider UPS consolidation to replace multiple rack-based UPS systems with room level UPSs such as the Liebert NX or Liebert NX with Softscale technology. Softscale technology lets you increase capacity via a software key without adding hardware.

#### 5. Ensure you have sufficient run time for graceful shutdowns or for switching to a secondary power source like a generator

When the power goes out, your UPS system is your first line of defense. Unfortunately, battery failure is the number one cause of UPS related downtime. If your UPSs were installed when there were fewer demands on the network or data center and your batteries haven't been maintained consistently, they may not give you the amount of run time you originally required.

### *Enhancing business-critical continuity (cont.)*

As seen in the accompanying chart, based on a survey by Liebert Services, battery related issues are the single highest cause of UPS failure. This chart also points out just how often inadequate runtime is an issue, seen as the 19% of downtime caused by end of discharge problems. This indicates that a lot of customers are not adequately planning for the runtime they need.

When batteries fail, they fail quickly, and almost always when they encounter a stressful event, such as a discharge. When they fail under discharge, that means the power to the protected equipment is dropped. Most UPSs conduct automatic battery tests every two weeks, but they can pass that test one week and fail a few days later.

To reduce battery failure risks, conduct manual monitoring or remote monitoring – and then have a battery replacement schedule in place.

Alliance Systems president Rusty Cone learned the lesson about UPS battery capacities when his previous company barely survived a major fire. When he joined Alliance, Cone made business continuity a priority. An assessment of Alliance's IT infrastructure revealed several vulnerabilities. In particular, battery capacities were not sufficient to meet the needs of the new IP telephony system and the company was dependent on too many small UPS systems that were difficult to manage and offered questionable reliability.

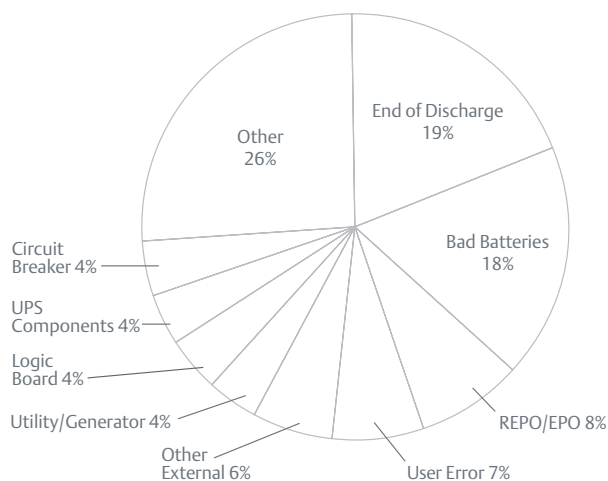
The company replaced its multiple small UPS systems with a single large Liebert UPS and added an extra battery cabinet to extend run times to one hour. The result has been five nines of availability and the flexibility to accommodate growth.

A Liebert Network Solutions Partner, working with your local Liebert Representative, can help you evaluate cooling options and design a cooling system that can meet your needs today while ensuring the scalability that can carry you well into the future.



Some IT departments manually assess UPSs to see if the battery alarm is sounding or the fault indicator light is on. You can also monitor UPSs remotely via network communications software and monitoring software, such as the Liebert Intellislot Web Card and Liebert Nform. The alarms will be picked up by the software and sent over the network – but again, someone has to be checking the logs and doing something about the problems. One major benefit to having network monitoring of your UPS is that it minimizes labor costs and if properly reviewed can effectively reduce battery problems.

Top Causes of UPS Failure



Generators provide the greatest flexibility in delivering extended backup times but aren't feasible for every business. Many businesses will find adding battery capacity to the existing UPS system a more economical approach to backup power. With external battery cabinets, UPS systems can be configured with an hour or more of runtime, providing continuity through all but the most extreme outages.

## 6. Add redundancy

You can reduce risks to your IT systems by installing infrastructure redundancy.

Most IT and network equipment is dual corded. In a rack setup, this allows you to connect the device to dual PDUs, dual UPSs and dual circuits – the ultimate in high availability. Room level UPSs serving multiple racks also can be configured for various levels of redundancy.

Cooling systems also can benefit from component redundancy to ensure their operation if any one component fails or is taken offline for maintenance.

## 7. Ensure visibility and proactive monitoring

Regardless of the size of your facility, there are tools available that allow you to have better visibility and control of your IT infrastructure.

The power and cooling equipment your IT systems depend on can be monitored and managed over your network. Alarms then automatically trigger specified event actions such as e-mail alerts or local notifications. Monitoring your power and cooling equipment can ensure proactive capacity planning and preventative maintenance.

If monitoring of critical systems is time consuming and something you cannot do, consider Liebert remote monitoring options.

### *Enhancing business-critical continuity (cont.)*

In addition, the latest generation of power strips is bringing monitoring to the equipment level. These power strips provide load monitoring and control to each receptacle for easy, centralized management of rackmount equipment.

Environmental conditions — temperature, humidity and water leakage — also must be monitored. The Liebert EM devices can provide this protection against risks.

## **8. Have a strategy for service**

Ensuring business continuity requires diligence. Extending the useful service life of the power and cooling equipment through proper maintenance, predictive monitoring, and keeping the equipment up to date increases equipment life spans and maximizes performance.

Also rely on factory certified service technicians. Liebert service providers are factory certified and are part of a continuous training program. Liebert service contracts guarantee a four hour onsite response time.

For small IT systems, the Liebert Power Assurance Package provides onsite service and battery replacement programs for the Liebert GXT rack or tower mount UPS.

By making Emerson Network Power part of your business continuity strategy, you're removing the power and cooling barriers that keep you from getting more from your IT equipment, all with products that are easy to buy, install, use and maintain.

## Liebert Checklist for Business Continuity

Below is a checklist to help you evaluate your IT infrastructure for business continuity. Be sure to work with your local Liebert Network Solutions Partner to review your needs and determine exact equipment requirements.

Availability Considerations	YES	NO
Have you calculated your cost of downtime for IT equipment to help determine your desired availability levels supported by your power and cooling infrastructure?		
Have you assessed your power and cooling infrastructure for risks and vulnerabilities to business continuity?		
Physical Security	YES	NO
Are your IT spaces secure from unauthorized physical entry?		
Do you need to secure cabinets?		
Do you want to be alerted when a cabinet is opened?		
Do you need to maintain tighter controls over who makes equipment changes?		
Power	YES	NO
Has your UPS capacity been calculated based on a combination of real power usage and planned expansion?		
Are you using full loads and not nominal loads to size the UPS?		
Are your line drawings up to date so you can identify single points of failure?		
For dual corded equipment in redundant configurations, are you using dual UPSs, PDUs and circuits?		
Do you know if your UPS batteries can still provide the runtime originally specified?		
If you are using a generator, do you switch your load to generator to test, instead of just turning on your generator?		
If you are using a generator, are your UPSs compatible with generators?		

*Liebert Checklist for Business Continuity (cont.)*

Cooling	YES	NO
Have you calculated the amount of time your IT spaces can operate without cooling in the event of an outage?		
Are you using dedicated or precision cooling for critical IT systems?		
Are your racks arranged in hot aisle / cold aisle configuration to facilitate heat removal?		
Do you have adequate cooling redundancy with loads distributed between multiple cooling systems?		
Do you inspect your racks routinely for hot spots and document temperature measurements for trending?		
Do you have hot spots or racks with more than 5kW of equipment power load?		
Monitoring & Management	YES	NO
Do you use network communications software?		
Do you want to monitor power and cooling equipment via your network?		
Do you want to be able to send alerts, initiate graceful shutdowns of equipment and control power usage within the rack?		
Do you monitor for heat, humidity, and water leakage in your IT spaces?		
Do you have UPS battery monitoring systems in place and a preventative maintenance program?		
Do you routinely review your monitoring logs?		
Preventative Maintenance & Rapid Response Service	YES	NO
Do you do UPS and battery checks or other types of UPS preventative maintenance?		
Do you evaluate your outside service level agreements at least once a year?		
Are your service providers factory certified?		
Do you have immediate phone support for service — 7 x 24 x 365?		
Do you know the MTBF and expected life span of your cooling equipment components to ensure you have performed adequate preventative maintenance?		
Do you need a long term warranty and service package to provide preventative maintenance and repair?		

For assistance with power and cooling solutions, contact your local Liebert Network Solutions Partner.

## Key Liebert Products For Business Continuity

PRODUCT	WHY IT'S RIGHT FOR BUSINESS CONTINUITY
<b>Racks &amp; Cabinets</b>	
Knurr Racks & Cabinets	<ul style="list-style-type: none"> <li>– Locks and contact closures can be monitored remotely to protect against unauthorized access</li> <li>– 83% perforated doors facilitate airflow for improved removal of potentially harmful heat</li> </ul>
Liebert MP Advanced Power Strips	<ul style="list-style-type: none"> <li>– Protect against unauthorized equipment adds and changes</li> <li>– Allow remote control of power usage at the receptacle level to avoid circuit overloads</li> </ul>
<b>Monitoring</b>	
Liebert Intellislot Web Card	<ul style="list-style-type: none"> <li>– Provides network communications for Liebert UPSs</li> </ul>
Liebert Nform	<ul style="list-style-type: none"> <li>– Alerts you to adverse equipment and environmental conditions before they create problems and provides for graceful shutdown if required</li> <li>– Dashboard view of infrastructure status</li> </ul>
Liebert eVM-14	<ul style="list-style-type: none"> <li>– Monitors temperature, humidity and water leakage and contact closures</li> </ul>
Enterprise Remote Monitoring	<ul style="list-style-type: none"> <li>– Monitors power and cooling systems and environmental conditions when customers lack the time or personnel</li> </ul>
<b>Power Protection</b>	
Liebert GXT Rack or Tower Mount UPS	<ul style="list-style-type: none"> <li>– Provides twice the reliability as commonly used line interactive UPSs</li> <li>– Fully conditions all power irregularities that can adversely affect IT equipment</li> <li>– Easily paralleled for power redundancy and capacity</li> </ul>
Liebert NX with Softscale Technology	<ul style="list-style-type: none"> <li>– Room level protection to consolidate smaller UPSs and reduce potential points of failure</li> <li>– High reliability, faster response to power demand changes, longer product life and lower energy costs than rack systems</li> <li>– Software scalable — lets you purchase the capacity you need today and increase capacity later without adding hardware</li> </ul>

Key Liebert Products For Business Continuity (cont.)

PRODUCT	WHY IT'S RIGHT FOR BUSINESS CONTINUITY
<b>Cooling Systems</b>	
Liebert Foundation MCR (Mini-Computer Room)	<ul style="list-style-type: none"> <li>– A secure, integrated cooling cabinet for up to 1.6 kW of equipment</li> <li>– Optional power management and monitoring accessories</li> </ul>
Liebert XDF	<ul style="list-style-type: none"> <li>– A secure, high density cooling cabinet for up to 14.4 kW</li> <li>– Optional power management and monitoring accessories</li> </ul>
Liebert Mini-Mate 2 – Ceiling Mount	<ul style="list-style-type: none"> <li>– Provides more effective precision cooling, humidity control and air filtration than comfort cooling systems</li> <li>– Takes up no floor space</li> <li>– Designed for small data centers where floor space is not available</li> </ul>
Liebert DS – Floor Mount	<ul style="list-style-type: none"> <li>– Provides more effective, precise, reliable control of room temperature, humidity and airflow for proper operation of critical electronic equipment than comfort cooling</li> <li>– High energy efficiency</li> </ul>
Liebert Challenger 3000 – Floor Mount	<ul style="list-style-type: none"> <li>– Provides more effective control of temperature, humidity and air filtration than comfort cooling</li> <li>– Small footprint for space constrained data centers</li> </ul>
Liebert DataMate – Wall Mount	<ul style="list-style-type: none"> <li>– The perfect solution for cramped quarters requiring temperature and humidity control and air filtration</li> </ul>
Liebert XD Supplemental Cooling	<ul style="list-style-type: none"> <li>– High density cooling adds capacity to eliminate hot spots</li> <li>– Highly efficient because they put cooling in the rack row or close to the IT equipment</li> <li>– Multiple form factors to accommodate space requirements</li> </ul>
<b>Service &amp; Maintenance</b>	
Service & Maintenance	<ul style="list-style-type: none"> <li>– Liebert service and maintenance contracts for larger power and cooling systems ensure systems are trouble free and up to date</li> <li>– Guaranteed 4-hour onsite response times, and often less in practice</li> <li>– Liebert 5-Year Power Assurance Package provides onsite service and battery replacement for the Liebert GXT</li> </ul>

## How to get started

Preparing your IT infrastructure for successful business continuity can be intimidating, especially for IT managers with little or no experience dealing with power and cooling technologies. Fortunately, there are professionals who can help identify and correct business continuity risks and vulnerabilities.

Your local Liebert Network Solutions Partner, working with a Liebert Representative, can evaluate your IT environments and prescribe solutions. And when you rely on Liebert's full range of solutions, you know that your system is backed by the most comprehensive service network in North America bigger than the service networks of our three largest competitors combined.

To find a Liebert Network Solutions Partner near you, **call 1-800-844-8816.**

## Emerson Network Power.

The global leader in enabling Business-Critical Continuity™.

[EmersonNetworkPower.com](http://EmersonNetworkPower.com)

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| ■ DC Power     | ■ Monitoring         | ■ Precision Cooling         | ■ Surge Protection            |

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