

# Diagnosing Your Critical Sites

## Establishing an efficient and effective real estate strategy

### EXECUTIVE SUMMARY

- Jones Lang LaSalle has identified four key areas that represent real challenges for critical site management.
- With the increased focus on environmental sustainability coming from all areas of the property sector, pressure is mounting on large energy consumers to look at more efficient supplies of power. The two big energy issues for critical sites are: the power supply required to support the huge load of data equipment found in most critical sites and the heating, ventilation and air conditioning (HVAC) requirements needed to maintain the temperature of the equipment.
- Developing a collaborative partnership with your critical site service provider is possible through the establishment of reliable and unambiguous communication procedures, management of foreseeable risks, effective incident management, autonomous monitoring and the quality and quantity of human resources.
- Critical sites must evolve to incorporate a clear emergency communications plan. When faced with a critical site incident, where standard telecommunications networks are interfered with, emergency communications networks are crucial components of a response strategy.
- Once all critical site factors have been assessed and requirements are set, the next challenge is to find an appropriate location. When looking for the location, site selection is driven by a number of competing real estate, infrastructure and technological requirements. Ultimately, establishing a data centre comes down to what can and cannot be traded to make a site viable.

## INTRODUCTION

Every finance and insurance organisation's real estate portfolio includes some form of critical environment. They can be as basic as a telephone PABX or as complex as entire facilities devoted to data and call centres. Critical equipment can include uninterruptible power supplies (UPS), emergency generators, critical cooling equipment, data servers, building automation and fire protection systems. However diverse their scope and complexity may be, critical environments share at least one thing in common – they are critical to the continuing operation of the company.

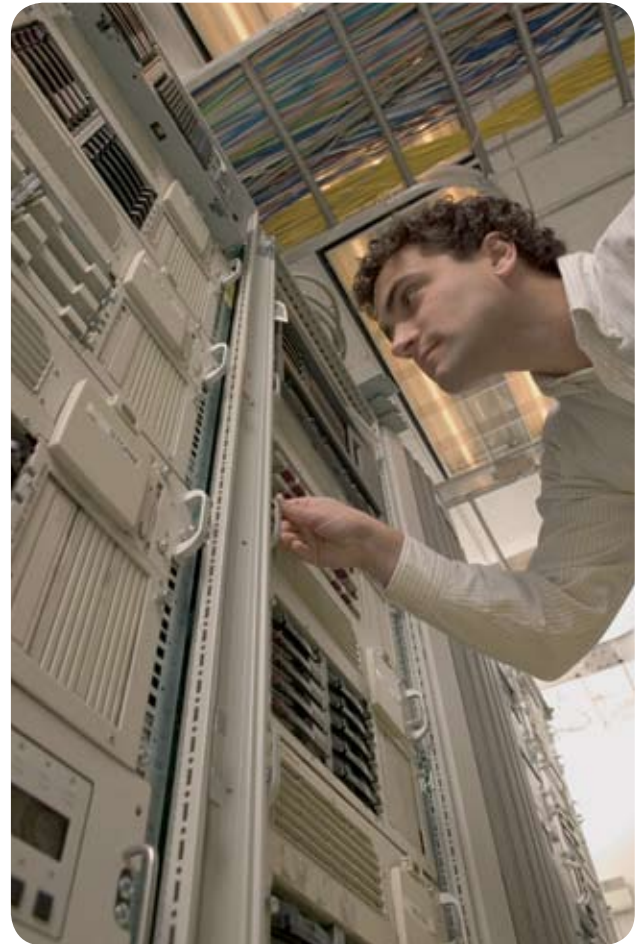
Today, the focus is not solely on ensuring 100% uptime of critical sites, but also on energy efficiency, with finance and insurance organisations among the largest consumers of energy. Legislation is also influencing the actions of large organisations, with the Australian Federal Government passing into law the *Energy Efficiency Opportunities Act 2006* on 1 July 2006. The Act is aimed at encouraging energy efficiency in the estimated 250 Australian businesses, Large Energy Users, using more than 0.5 petajoules (PJ) of energy per year.

Jones Lang LaSalle has identified four key areas that represent real challenges for critical site management. The question for organisations who own and operate critical sites is; how will you minimise risk, maximise value and implement real sustainable solutions?

## INCREASING ENERGY EFFICIENCY

With a growing focus on environmental sustainability coming from all areas of the property sector, along with resource shortages and the increasing cost of energy, pressure is mounting on large energy consumers to look at more efficient supplies of power. However, achieving energy efficiency presents unique challenges in critical environments. This is due in part to the very nature of a site that needs to be operational 24/7.

There are two big energy issues for critical sites. The first is the power supply required to support the huge load of data equipment found in most critical sites. The second issue is the HVAC required to maintain



the temperature of the equipment. There are also a number of other power users such as transformers, UPS systems and lighting.

As data centres grow, adding more and more equipment, they require increased power supply and enhanced cooling systems. Scaleability of infrastructure often becomes a problem, as existing power supplies are often not enough to meet demand, and advances in cooling technology cannot keep up with the requirements. Many sites may reach capacity limits in regard to floor space, power and cooling infrastructure and this represents risks for the ability to maintain 100% uptime for critical facilities.

There is another risk to banking and insurance organisations that seek to demonstrate their sustainability credentials across their property portfolio. If energy use in critical sites is factored into their assessment processes, this will have a huge impact on overall energy consumption and greenhouse gas emissions.



While achieving energy efficiency in critical sites and data centres is a science still in its infancy, there are a number of areas that can be looked at to reduce energy consumption:

- **Energy efficient equipment** – a higher upfront cost may be offset by potential energy savings over the life cycle of the equipment. This can include servers, power supplies, lighting or HVAC systems.
- **Servers** – ensure servers are configured correctly in order to run at peak efficiency.
- **HVAC systems** – investigate the most energy-efficient heating and cooling options and ensure that they are commissioned and maintained correctly.
- **Consolidation** – consolidating servers and other equipment can significantly reduce equipment load and subsequent power supply needs.
- **Virtualisation** – the use of one server to host multiple virtual software servers is one way of consolidating and reducing equipment load.
- **Power management** – turning on power management where available or manually turning off non-critical equipment when not in use.

### An effective energy management programme must consider the following:

- Understand the energy goals of the company
  - Understand existing usage and consumption patterns
  - Carefully and accurately estimate cooling requirements
  - Set benchmarks and specific energy goals
  - Have an energy management plan in place
  - Have processes in place for monitoring, measurement and controls
  - Ensure staff are aligned and trained in their roles and responsibilities
- **On-site power generation** – some critical sites may offer potential to generate power on-site.
  - **Commissioning process** – a robust commissioning process will ensure operating efficiency is enhanced for new developments or new equipment.
  - **Energy efficient lighting** – although critical sites are generally lightly occupied, small gains are achievable through the use of energy-efficient lighting.
  - **Power supply** – optimise the quality of power supply and select energy efficient backup UPS's or purchase power from renewable sources.
  - **Alignment** – ensure that your infrastructure is aligned with your load requirements, and your backup power requirements are accurately provisioned.
  - **Layout** – consider the floor layout, particularly for a new development, to optimise ventilation and airflow.

### Spotlight on IBM's Green Data Centre

Transitioning to a green data centre and optimising operating efficiency can be a complex undertaking. There are multiple components to factor into the equation—and best results can often be achieved by integrating improvements from multiple fronts. The good news is that there are many solutions and techniques available to support such a transition. Furthermore, the process can occur in a step-wise manner, reducing risks and helping to realise benefits along the way. Going green is becoming more than an altruistic aspiration to save the planet. It's now clear that going green is a necessity that companies will need to embrace—sooner rather than later—to survive economically.

**As governments and organisations intensify their focus on reducing energy demands and greenhouse gas emissions, pressure to improve data centre energy efficiency will continue to grow.**

### Transitioning to a green data centre

Although there is clearly no single 'right way' to create a green data centre, experts believe that the most productive first step is to conduct a best practices assessment and energy audit. This systematic check-up offers a real-time profile and model of the data centre's energy use conditions and makes it possible to pinpoint areas of high energy use, while establishing a baseline for further planning.

At the same time, companies should develop a holistic view of the environment, taking the following factors into account:

- An inventory of your current systems, their power usage and locations
- Your company's business and growth plans—to help forecast future needs
- Current or planned governmental energy efficiency regulations in your area

- Available energy efficiency rebates or economic incentives from government sources or your energy provider
- Any already established goals for reducing your company's carbon footprint—and the timeframe set for achieving those goals

A careful review of the assessment and profile will allow companies to build a list of opportunities to drive maximum energy efficiency in the data centre. If the team hasn't yet looked closely at the thermal characteristics of the company's data centre, it's likely that they'll find many opportunities to improve energy efficiency. They can range from major infrastructure upgrade projects such as upgrading chillers or uninterruptible power supplies (UPS) to simple and inexpensive measures, including:

- Blocking cable openings to prevent cold air waste in the hot aisle
- Removing under-floor cable blockages that impede airflow
- Turning off servers that are not doing any work
- Turning off computer room air conditioning (CRAC) units in areas that are over provisioned for cooling.

As governments and organisations intensify their focus on reducing energy demands and greenhouse gas emissions, pressure to improve data centre energy efficiency will continue to grow. IBM believes that the following 'four Rs' must play an essential role in the development of any initiative to create a green data centre:

- Regain power and cooling capacity
- Recapture resiliency
- Reduce energy costs
- Recycle end-of-life equipment

Successful organisations will make these four Rs their mantra. And in doing so, their ongoing efforts to think green will help keep their companies operating in the black.

*Courtesy of IBM Research - 'The Green Data Centre. More than social responsibility: a foundation for growth, economic and operating stability.'*

## ESTABLISHING THE RIGHT BALANCE WITH YOUR SERVICE PROVIDER

Many finance and insurance organisations outsource the management of critical sites to third parties as they are often better able to provide the infrastructure for more effective management. However, businesses should be aware that they cannot outsource their responsibilities. Third parties will not have the overall business knowledge to recognise the real consequences of unplanned downtime to the business and will not have intimate knowledge of all the businesses processes and procedures. An adversarial relationship with a service provider, involving penalty clauses, will not have as much success as one that is a collaborative partnership.

The relationship between client and service provider will affect the critical site's operations at all levels, with roles and responsibilities resting on both parties. The client needs to maintain a level of in-house knowledge around the complex and critical nature of operating and managing a critical site. This knowledge is needed to ensure push back occurs within the client business when required. Regardless of the relationship, an outsourced provider will not have the same leverage as a respected in-house team member. The client needs to ensure recommendations from the service provider are pushed within the business, especially as many of these may come with significant expenditure. It is easy for the business to either defer or ignore recommendations from a third party, which can have significant risk and business implications.

Often, planned 'changes' are pulled at the last minute and the client needs to understand the impact of moving or pulling scheduled services. In a multi-vendor/client delivery environment, critical windows are limited and pulling planned changes impacts on-going change schedules and increases equipment risk.

Significant responsibilities also rest with the service provider and, as such, need to be engaged at the highest level around the critical environment's strategies and load growth. The intimate knowledge gained by operating critical environments usually

swings from the client to the service provider in an outsourced model. Hence, by not including the service provider in strategy discussions, aspects of delivery/production can be overlooked and, ultimately, client deliverables may not be achieved.

The service provider must be linked directly to the client critical success (or failure) factors. This type of model ensures that the service provider is continually pushed to achieve results. In doing so, the client empowers the service provider and provides adequate resources (opex and capex) to assist in the delivery of common objectives.

### Key factors in establishing a collaborative partnership

#### Reliable and unambiguous communication structure and procedures

Both parties, service provider and client, must be willing and committed to establish, maintain and develop effective and reliable communication systems and procedures. Without good and clear communication procedures in place, it would not be realistic to expect successful outcomes from the other resources/measures/systems put in place.

#### Adherence to established change management procedures

Change management can be described as the management of foreseeable risks in a critical environment. Therefore, careful management of changes is essential in maintaining the availability of critical environment systems. This is achieved by total adherence to established change management procedures by both parties, especially for the critical environment service provider.

#### Effective incident management

Despite having a good change management system in place, problems still occur and can be quite detrimental to the operations of a critical environment. A service provider does not have intimate knowledge of all the client's processes and procedures. As such, it may not have the overall business knowledge to recognise the

**All systems and equipment are designed to operate effectively only within a specified range of environmental conditions. If conditions get out of bounds, then unpredictable and potentially catastrophic results can occur**

real consequences of unplanned downtime to a clients' business. In this light, a client should take control and manage all incidents to minimise the impact to the critical environment and the clients' business continuity. In a collaborative partnership arrangement, one would expect the critical environment client to organise communication, coordination and documentation during incidents, while the service provider facilitates resolution of the problem by using all its resources.

#### **Autonomous monitoring**

All systems and equipment are designed to operate effectively only within a specified range of environmental conditions. If conditions get out of bounds, then unpredictable and potentially catastrophic results can occur to cause system failure, application failure or network problems. To protect these resources from unpredictable conditions or abnormal situations, an effective monitoring system is a must for any third-party critical environment service provider. However, from the client's point of view, total reliance on the

service provider's monitoring of its critical assets may not be an acceptable risk. If this is the case, it would be advisable for the client to monitor its mission critical equipment using its own monitoring tools. This would allow the client to obtain a comprehensive snapshot of events, occurring either inside its mission critical equipment or within its environment, as the events occur.

#### **Quality and quantity of human resources**

It is paramount for both critical environment service providers and clients to employ able and experienced professionals. Despite implementing the best change management, incident management and monitoring systems and establishing the best procedures required for a critical environment operation, it will ultimately be the quality of the people who use these systems that will be the deciding factor for success. To maintain business continuity and to minimise the impact of incidents that occur, quantity of the available quality professionals from both parties, plays a crucial role in the quick resolution of problems.

Additionally, usage of a detailed but clear and well prepared service level agreement (SLA) should greatly contribute to the success of the relationship between the critical environment's client and the service provider. A well documented SLA will enable both parties to realise their obligations correctly and facilitate the prevention of serious misinterpretations, which may cause harm to their relationship. Regular independent external audits will help both parties make sure that SLA obligations are being executed as expected. (Refer to emergency communications)



Over the coming years, critical sites that are well-managed will have in place business contingency plans that include effective emergency communications networks.

## ESTABLISHING EFFECTIVE EMERGENCY COMMUNICATIONS

In today's atmosphere of security threats and unpredictable climate, critical sites must incorporate a clear emergency communications plan. In tackling a critical site incident, where standard telecommunications networks are interfered with, establishing an emergency communications networks is vital for an effective response strategy.

Over the coming years, critical sites that are well-managed will have in place business contingency plans that include effective emergency communications networks. Essential components to an effective emergency communication strategy include:

### A centralised facility

A single point of contact and a centralised facility will ensure a consistent and reliable response that covers people, facilities, processes and technology, and ensures continuity of property services. This central communications hub should have professionals with a full understanding of the critical site (processes, implications etc.) and the ownership to make property-level decisions. This will ensure that the appropriate action plan can be put into motion immediately, with all parties alerted and informed of their roles in the shortest possible time frame.

### A variety of mediums

The ability to be able to communicate with this centralised facility through different mediums, including phone, web, email and fax, is essential to ensure that communications will still operate effectively in the event of a technological failure. (Refer to telecommunications redundancy)

### Emergency Communications Preparation Checklist

- Avoid locating your building's automation and computer systems on the first floor where they will be most vulnerable to flooding.
- Gather alternate out-of-state numbers for employees' close relatives and tenants' headquarters or regional centres.
- Maintain an accessible list of third-party support services such as insurance representatives, legal counsel and critical vendors, with out-of-state numbers when possible.
- Develop a list of names and numbers of emergency response personnel such as local and state police, fire department, local hospitals, the mayor's office or the governor's offices. Follow the same procedure for key utility providers.
- Set up and publicise an emergency, out-of-state, toll-free or calling card number and website for employees and/or tenants to check after a disaster.
- Prepare a concise checklist of suggested items employees should take with them if they need to evacuate their offices.
- Back up all of your important programs and information. Keep at least one transportable set of backup disks and all important paperwork off-site.
- Keep copies of emergency response handbooks and fire fighting manuals at the home of the chief engineer or building manager, as well as the regional manager, if possible.

In general, provide as many ways as possible to reach all important parties as quickly as possible.

### Communications tracking

The ability to track the progress of communications and requests at any time is also essential. This ensures that all parties are up to date on the emergency response strategy, and enables the strategy to be improved as opportunities and risks are identified and evaluated. The system should also be scalable and flexible to adapt to the required delivery as needed.

### Contractor management

The system should have access to best practice contractor management to ensure fast response and completion times. It should ensure full insurance compliance and records keeping so that any work completed at the critical site are 100% guaranteed and can be relied upon in the event of any incident.

#### Case Study: ANZ

Following Cyclone Larry, Jones Lang LaSalle Facilities Manager ANZ Account Queensland was involved in the critical response team responsible for re-establishing operations in the affected ANZ Innisfail branch. Amidst extremely difficult conditions, the team managed to secure the building, re-establish ATM services and keep key stakeholders updated daily using the only means available, the branch fax line and occasional functioning mobiles.

With no power available, the combined Jones Lang LaSalle/ANZ team located a temporary generator to run several circuits and maintain critical functions. Jones Lang LaSalle local contractors were engaged to assess structural damage and conduct site clean-up. Electrical, IT, security, and banking and facilities personnel worked as a collaborative team to offer selected teller line services within 72 hours. Throughout the process, the landlord was kept appraised and his support was secured to cover structural damage repair to the roof and ceilings.

### Configuration management

Configuration management, the discipline of updating inventories of assets, is another beneficial practice. It allows operators to continuously assess the effectiveness of their library of remedies and understand if they need to be replaced or merely maintained.

Ensuring an emergency communications network is in place, which takes advantage not only of the technology available but also includes robust backup communications plans across multiple mediums, will ensure that all parties responsible as part of a response strategy will be coordinated effectively. This will ensure the critical site is returned to operation as soon as possible and uptime is maximised.

## IDENTIFYING THE IDEAL CRITICAL SITE LOCATION

After organisations have established their critical site requirements, they will need to thoroughly assess both site selection and availability in order to meet all their needs. When looking for an appropriate location, site selection is driven by a number of competing real estate, infrastructure and technological requirements. Ultimately, establishing a data centre comes down to what can and cannot be traded to make a site viable.

Real estate requirements include the following:

- The safety of the location. It must be away from areas prone to natural disasters, like floods and bush fires, and away from airport flight paths and industrial zones that store or produce hazardous materials.
- Access to the site must be guaranteed at all times, with no traffic restrictions or likely road closures due to public events in the neighbourhood.
- The site should be zoned appropriately, and there should be no local restrictions for installation of communication towers or satellite dishes.

Site infrastructure requirements can be onerous as well. These include the following:

- The site should have diverse paths of access, with secure utilities and service provider feeds into the site with no single points of failure.

- The site should support multiple telecommunications carrier options and allow carrier diversity.
- The ability to install back-up generators.
- Fuel and water storage tanks to support full operational capacity for at least one week.

Site security requirements can also be restricting especially when considering extreme incidents like bomb threats and sabotage.

The Uptime Institute in USA has published the Site Infrastructure Performance standards for data centres and most corporations are aiming at achieving between Tier II to Tier III classification for their new data centre facilities. This is no easy task as it means between 99.741 % and 99.982% guaranteed availability of operations.

**As finance and insurance organisations become increasingly dependent on technology to transact with customers, the demand for data centre facilities has become an expensive critical infrastructure requirement**

Finance and insurance organisations face two options when looking at site availability, either look at re-adapting existing buildings or build new facilities on greenfield sites. Re-adapting existing buildings can be cumbersome and expensive, and in some cases impossible. This is due to the inadequate structural capacity to support the high floor loading requirements of the modern day ‘dense servers’ environment.

On the other hand, finding greenfield sites that have all the requisite attributes is unaffordable in the metropolitan districts. Considering more distant regional precincts can be futile due to the unavailability of adequate utilities and telecommunications infrastructure.

As finance and insurance organisations become increasingly dependent on technology to transact with customers, the demand for data centre facilities has become an expensive critical infrastructure requirement and a very complex challenge for corporate real estate professionals.

## CONCLUSION

In the heavily regulated space of finance and insurance, critical site real estate will continue to be an expensive and complex issue for corporate real estate professionals. Many organisations are looking to move away from the traditional model of hosting their data centres in established commercial office premises. Instead, they are now looking to build their own sites or identify established sites operated by third party-providers. As logical a step as this may seem, there is significant planning that must be undertaken first in order to establish the key objectives.

An effective critical site should successfully align the four key stages highlighted in this paper with an organisation’s business strategy. Addressing these issues will help achieve more sustainable critical business operations.

While a complex challenge, Jones Lang LaSalle believes there are sustainable alternatives available to the finance and insurance sectors. These solutions will allow companies to meet their dependency on technology, while at the same time minimising their corporate footprint.

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Greg joined Jones Lang LaSalle in March 2001. In his current role, he provides the Engineering and Operations Management at a national level for our Retail and Integrated Facilities Management business lines. Greg is responsible for ensuring that Jones Lang LaSalle's Engineering and Operations service delivery is maintained at the highest level and continues to exceed the expectations of our clients. He is the Chairman of the Australasian Critical Environment Management Board and is also a member of the Regional Board.



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Mark oversees Jones Lang LaSalle's help desk strategy in the Asia Pacific region and runs the North Sydney Property Service Centre Hub on a day-to-day basis. He is primarily focused on business development, driving efficiency, innovation, staff development and career planning. The role is backed by a strong management team which includes an operations manager and team managers. As well as being an electrical contractor, Mark has an extensive contact centre background, leading contact centres for TeleTech, Custom Call and TNT Express.



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## ABOUT JONES LANG LASALLE

Jones Lang LaSalle (NYSE: JLL), the only real estate money management and services firm named to *Fortune* magazine's '100 Best Companies to Work For' and *Forbes* magazine's '400 Best Big Companies', has approximately 160 offices worldwide and operates in more than 450 cities in over 50 countries. With 2006 revenue of over USD 2 billion, the company provides comprehensive integrated real estate and investment management expertise on a local, regional and global level to owner, occupier and investor clients.

Jones Lang LaSalle is an industry leader in property and corporate facility management services, with a portfolio of over 1 billion square feet worldwide. In 2006, the Firm completed Capital Market sales and acquisitions, debt financing, and equity placements on assets and portfolios valued at USD 70.9 billion. LaSalle Investment Management, the company's investment management business, is one of the world's largest and most diverse real estate money management firms, with approximately USD 44.3 billion of assets under management. For further information, please visit our web site, [www.joneslanglasalle.com](http://www.joneslanglasalle.com).

Jones Lang LaSalle has over 45 years of experience in Asia Pacific. With over 12,500 employees operating in more than 60 offices in 13 countries across the region, the company is positioned to partner with clients to provide the quality advice needed for making quality decisions.

*The Little Book of Real Estate Definitions – Asia Pacific* by Jones Lang LaSalle is a useful resource to gain a better understanding of the most commonly used real estate terms in the region. To enhance your knowledge, please visit [www.joneslanglasalle-dictionary.com](http://www.joneslanglasalle-dictionary.com).

More than ever before, your success depends on the quality of your decisions.

As the global leader in real estate services and money management, Jones Lang LaSalle is positioned to partner with you to provide the quality advice needed for making quality decisions. The world's best real estate intelligence and knowledge base puts our clients in the best position to make the right decisions.



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