

building OPERATING management

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Successful control
upgrades start
with attention
to details



TURNING COMPLAINTS INTO KUDOS

Here's why occupants
complain and how facility
staff should respond

3 HVAC ENERGY-SAVING OPTIONS

ELECTRIC POWER COSTS
GETTING ALL SHOOK UP

Fire & Life Safety





criticalfacilities

Is This Operation Really Critical?

A step-by-step process can help facility managers determine the real impact of downtime *by scott offermann*

THE TERM “CRITICAL OPERATIONS” has become an enigma in today’s business world. The definition differs from one organization to the next, and even within the same company. For example, managers of departments or business units often think their most important operations are critical, but that’s often untrue. What’s more, when asked to identify the critical operation, most people will identify systems and components rather than identifying the true critical operation required to support the business.

All of this puts the facility manager in a difficult position. It is true that every business has operations that cannot be disrupted without jeopardizing its success. And those operations may well justify investments in facility infrastructure — for example, an emergency generator — to prevent unacceptable downtime. But the facility manager cannot assume that every operation called “critical” is in fact critical. For an organization to minimize risk — and to determine how much to invest

in doing so — it’s essential for facility managers to understand how to identify, comprehend, and document the extent to which operations are critical.

This analysis is particularly important when it comes to data centers. Data centers have become increasingly important to business operations. But that doesn’t mean every data center is mission critical, or that one merits a substantial investment in redundancy.

UNDERSTAND REQUIREMENTS

The starting point is to understand what is required to keep the business functioning. A critical operation can be defined as a business output that, if interrupted during the operational period, will cause financial loss, damage, or interruption to the delivery of goods or services essential to the organization’s continued operation or success. The most common misconception is to identify equipment or components as the critical operation, rather than the output. Paying attention to the actual output, not systems and

components, will enable the organization to focus on how the business will be managed if the operation is not available, as opposed to management of specific equipment failure.

It’s important to distinguish between critical and important operations. “Critical” is a business output that, when disrupted during the critical operational time period, impacts the entire operation or multiple business outputs, causing significant financial loss or the potential of serious injury or loss of life. “Important” is a business output that, when disrupted during the critical operational time period, will disrupt the efficient management and output of the operation.

Another distinction is also necessary. Some disruptions impact a single business unit while others affect the entire organization. A loss of output that affects the entire operation or multiple business lines is considered “mission critical” or “mission important,” depending on the impact. A disruption that affects a single business unit is considered “business critical” or “business important.” The business/mission important deliverables can be replaced with alternates, although this will require

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3 STEPS IDENTIFY CRITICAL FACILITIES' DOWNTIME RISKS

Use these forms to gather information needed to analyze whether to consider additional redundancy for systems.

Step 1: Understand the Impact of Downtime

Business Output	Operational Period	Critical Ranking	Unit of Measurement	Financial Impact Per Unit of Measurement	Acceptable Downtime

This information provides the facility manager a starting point for determining the risk of unacceptable downtime.

Step 2: Analyze Primary and Redundant Systems

Business Output				
Acceptable Downtime				
Impact of Interruption				
Supporting Service	Supporting Systems	Is the System Primary or Redundant?	Designed Operating Time	Owner

It is important to identify an individual system's design parameters in order to understand the implications of a single system failure. The system owner should also be determined to make sure that the process is truly critical.

Step 3: Identify Systems at Risk

Business Output				
Supporting Service				
Acceptable Downtime				
Impact of Interruption				
Supporting Systems	Primary (P1, P2, etc.) Redundant (R1, R2, etc.)	Designed Operating Time	Potential Exposure Time	Manual or Automated System

Potential exposure time can be determined by comparing Designed Operating Time of redundant systems with Acceptable Downtime. With this information, the facility manager can identify any system that does not meet the requirements for acceptable downtime and that will require additional evaluation. If a system is automated, operating it manually is a possible backup.

increased resources, additional processing time, or additional procedures at a higher cost or at a reduced delivery. Organizations often overlook the need to understand what each operation affects and which business units are interdependent. Seemingly unrelated business outputs that will impact the entire operation must be identified.

In some situations, there is a specific time period when the business output is critical, while at other times it is not required. The time frame during which the business output is critical is referred to as the critical operational time period. For example, with a global e-commerce site, the critical operational time period is 24 hours per day, seven days per week. By contrast, the critical hours for a retail store are the times the store is open. It's also important to understand business cycles when determining the critical operational time period. When the critical period is 24 hours a day, seven days a week, the organization must also identify time periods when an interruption will have less impact. Seasonal or event situations will also need to be considered — for example, Cyber Monday for an online store. The critical operational time period can also be identified as a specific period, such as the last three days of the financial month, or a specific event, such as the accounting department's output of paychecks.

LEVELS OF SUPPORT

For every critical operation, two levels of support are essential: the service and the systems. A service is a grouping of systems designed to provide a specific deliverable required to directly support the business output. A system is the grouping of equipment, components, parts, and human resources used to deliver the specific

service; multiple systems that are interconnected, operating independently or synchronously, may be involved in delivery of the services and any required redundancy. When documenting services, identify everything required to support the business output, capturing any unidentified or misclassified critical systems.

It's also necessary to pinpoint the primary and redundant critical systems. A redundant system is designed to operate for a limited time; as a result, the run time has to be documented. When calculating run time, do not include maintenance steps to keep the systems operating for an extended time, such as refueling of generators.

Another key piece of information is the system owner and point of contact. Many times, system owners, once identified, report that supposedly "critical" systems have been replaced or taken out of service.

BOTTOM LINE IMPACT

The negative impact of a disruption in business output can be quantified by converting lost productivity into a financial measurement. The first step is to identify a unit of productivity. For most operations, the losses will be in minutes, hours, or days, but other measures can also be used, such as units produced, quantity lost, or cost of units not being sold per hour. The unit of productivity can be used to calculate the financial impact per unit. It is possible to have multiple productivity measurements based on each business output.

Once the productivity measurement and the potential financial loss of the disruption are defined, it is possible to determine the financial impact of a disruption. This creates a

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financial baseline to use when making decisions.

The financial information makes it possible to define "acceptable downtime" — that is, the maximum time that output can be lost without the business being permanently damaged. Once the acceptable downtime and the impact of any downtime have been calculated, unbiased decisions supported by facts can be made about the critical operation.

Using all the information gathered, a gap analysis can be completed to compare the designed operating time of redundant systems against the acceptable downtime. If the acceptable downtime is greater than the designed operating time, this indicates an area of concern. In many applications, several systems are engaged in sequence to provide a more robust and longer designed

operating time. For example, if the utility power is interrupted, an uninterruptible power supply will carry the critical load until the generator takes over and produces the electricity needed to operate the systems. Each system has a limited operating time, and it is important to identify the individual system's design limitations in order to understand the implications of a single system failure.

In some instances additional or enhanced redundant systems will be required, while in other instances the identification of alternate processes or paths will be the best method. A financial analysis model can document the cost of downtime versus the cost of the systems. This considers the cost to install or upgrade and historic frequency versus the impact of the interruption. For example, a business output may have an eight-hour acceptable downtime with an impact of \$100,000. If power is lost, the business will not be able to operate. Currently there are no redundant systems. Installing a generator will cost \$250,000. If the building historically has never lost power for more than one hour, then it would appear that the return on investment is not there. If, however, historically power is lost two to three times during the year due to storms, and the outages last 12 to 24 hours each, then there is a very strong financial case for installing the generators.

Sometimes services are not duplicated using redundant systems, but by identifying alternate paths, processes, or procedures. Shifting the operation temporarily from one location to another changes the path. Going from an automated system to a manual system provides for an alternate process, and enacting temporary procedures — such as having a person manually control the chiller plant if the

automated system is disrupted — can provide the required redundancy. The organization also has to decide whether to prepare for the most likely event rather than a catastrophic failure. This could be having a UPS that will carry the load for 15 minutes in the event of a power failure, if the historic power failures are only two to five minutes in duration. These options will need to be discussed, and a recommendation agreed upon, by the senior management of each organization.

The analysis of business-critical operations for fully understanding the options available is essential in risk mitigation. Effectively identifying, comprehending, and documenting the full impact of these operations will enable the appropriate planning required to minimize risk and ensure the continuing business operation in the worst scenarios. Understanding the critical operation, analyzing the services and systems needed to support the operation, and understanding the system design limitations provide the information needed to analyze the potential exposure. Formally identifying the owners of the systems and creating redundancy plans using either duplicate systems or alternate processes is the foundation of a risk mitigation program. ■

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