

LiVSafe is a conscious safety initiative of Liberty Videocon to help people live safer, secure lives through an education series of proactive and preventative suggestions in the safety arena. This document does not purport to promote any product directly or indirectly.

Measures to achieve safety in company data centers

Overview

Data Centers or server rooms are the heart of a company's information structure. They are extremely critical assets as loss of data can have a devastating impact on a company's business; and seriously impair and one of the most important corporate objectives, that of business continuity. A typical server room in a company houses computers and networking equipment that makes information available throughout the company. Servers are used not only by IT and IT enabled companies, but also by many manufacturing and service companies who have computerized production or operation systems.



Source: <http://www.synergyit.ca/demo/wp-content/uploads/2014/07/Data-Centre-Cabling.jpg>

We at Liberty Videocon General Insurance understand the importance of achieving and maintaining safety in company data centers for preventing loss of critical data, productivity and associated costs; and intend to suggest some effective ways to avoid data center hazards. We hope that the measures suggested in this document will help in achieving adequate safety levels in data centers.

Hazards and Loss Exposure


- Disorganized and unprotected server rooms are inherently unsafe, and the likelihood of accidents increases with the level of disorganization. These accidents can result in personal injuries and server room outages.
- The constant presence of the ignition source (electricity) and combustible material put at stake people's life and costly business critical assets. About 6% of infrastructure failures in data centers are related to fire.
- The air surrounding the hardware needs to be in a range that keeps heat from damaging servers. Servers generate heat in addition to impact on temperature from outside the room such as direct sunlight or other factors that may raise temperature. Countless servers have been lost to the warm environment.

Typical Fire Hazards


- Overload or short circuit of electrical components (e.g. switch or inverter power supply).
- Failure of the cooling system so that electronic components overheat considerably (e.g. power supplies and power electronics).
- Wet cell batteries used in UPS bank generates hydrogen on over charging. Sufficient ventilation and space surrounding equipment required for air to circulate.
- Electrocutation can occur because of exposed wires, arcing faults due to high voltage, and equipment repair.
- Slips and trips are other safety hazards of computer labs. The University of Edinburgh explains that obstructions and wires across hallways and passageways can lead to falls in places with a lot of electrical equipment.

Safety Tips


Location

- Site locations should be safe from exposure to fire, flood, explosions and other similar hazards. The server room should not be located close to areas where hazardous processes are carried on. 
- Basement areas should be discouraged for the location of server rooms. Due to unavoidable reasons, if the server room needs to be located in a basement, precautions should be taken to facilitate smoke venting and to prevent flooding from interior and exterior sources that can occur, including a fire on an upper floor.
- The server room should be separated from other areas within the building. Server room must be located in a fire resistive, noncombustible, or tilt-up construction.


Housekeeping

- Accumulations of paper, cardboard boxes, spare or replacement equipment, and combustible materials should be avoided in the server room. 
- There should be adequate lighting provision, clean aisle areas and proper floor cover preventing slips and trips.

Security


- Unauthorized or unsupervised visitors should not be allowed in server room. 
- All entrances should be properly secured, and with alarms.
- Use of card readers and electronic locks to permit access is recommended over traditional keys; if keys are used, they must be marked 'Do Not Duplicate'.

Temperature Control


- The server room must have sufficient temperature control to maintain temperatures within the operational limits defined for the hardware located in the room. 

- The server room should have dedicated, redundant air conditioning sufficient to maintain temperatures between 18 and 22 degrees celsius.
- Environmental monitoring should be configured to alert administrators in the event of a cooling failure.

Fire Detection and Protection

- Very early fire detection plays an integral part in fire protection of server room. In the room and below the raised floor, smoke detectors should be installed connected with continuously monitored alarm panel. 
- Each server room may have an easily visible and accessible clean-agent fire extinguisher. A standard ABC fire extinguisher is not recommended for use around electronic equipment.
- Fixed automatic fire suppression systems like a clean agent fire suppression system as listed in NFPA 2001, should be installed in the server room and below the floor in rooms not exceeding 25,000 square feet. Expertise should be consulted in determining the most suitable agent.

General

- The manager of the server room must maintain an accurate inventory of all systems in the server room. 
- Server rooms should not have conspicuous signage that could attract unnecessary attention or attack.
- Data backup is a must. Back-up copies must be segregated in a protected environment (fire resistive safe, vault, room or remote site). There must be at least one current back-up copy.
- Server rooms should have emergency lighting to provide for life safety in the event of a power outage.
- All systems must be properly grounded.
- Critical systems should be connected to uninterruptable power supplies (UPS) and/or generator power, depending on the business requirements for server uptime.

Data Center Facts

- The world's biggest data center is based in Chicago, and is backed up by 53 generators. It utilizes 8.5 million gallons of cooling fluid per year. It is 1.1 million square feet in size and was converted to telecom use back in 1999.
- Google's data centers use around 260 million watts of power which accounts to 0.01% of global energy. This power is enough to consistently power 2,00,000 average homes.
- With a count of 1 billion users and 1,00,000 servers, Microsoft has so far spent around \$23 billion on its data centers.



Source: <http://www.idesignarch.com/wp-content/uploads/Google-Council-Bluffs-Iowa-Data-Center-Plastic-Curtains.jpg>

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