MIND your business

Protect your data and data centre from earthquakes

Both data and data equipment are at risk if businesses do not take steps to protect themselves from an earthquake.
All 4-post and 2-post computer racks should be seismically rated. Seismically rated racks are generally stronger than common computer racks.

All mechanical, electrical, and plumbing (MEP) equipment on which computers rely must be seismically anchored, including snubbers for equipment on spring isolators. Brace suspended pipes, conduit, cable trays, and heavy suspended HVAC equipment against sidesway and provide flexible connections at expansion joints and equipment connections. Battery racks should be strongly anchored to resist seismic loads, braced against sidesway in both directions, with restraint around all sides and foam spacers between batteries.

All raised access floors must be seismically anchored and (ideally) captured by walls on all four sides. Brace tall pedestals against sidesway as recommended by the manufacturer to resist seismic loads. Equipment resting atop the raised access floor needs supplemental seismic restraint such as diagonal splay wires with aircraft cable from the equipment to the concrete floor beneath the raised access floor.

Restrain or remove all loose items such as carts, tables, ladders, supplies, bookcases, filing cabinets, and desks in computer rooms and electrical rooms to prevent them from impacting computers.

Consider removing suspended ceilings in computer rooms to avoid dust contamination in the event of collapse; otherwise ensure good seismic installation of suspended ceilings with compression posts and splay wires (See ICLR’s Protect your business from earthquakes: Non-structural protections, May 2024).

Expect extended failure of commercial water supply, so consider closed-loop cooling rather than evaporative cooling or install makeup water tanks with two weeks of hot-weather supply and plan for tankers to deliver makeup water.
Expect extended failure of commercial electricity, so ensure the proper seismic installation of emergency generators and all ancillary equipment (day tanks, starter batteries, fuel lines, and fuel tanks), and plan for two weeks of refuelling. Regularly test generators and replace diesel fuel every 6 to 12 months or as recommended by the generator manufacturer or supplier.

The building will be the least expensive part of the data centre. For new design, insist on immediate occupancy design, at least 50% to 100% stronger and stiffer than code minimum. Consider the cautionary lessons of FEMA P-2343 for high seismic locations and near-fault locations: limited displacement capacity means that buildings in these locations do not perform as well as expected if designed to code minimum, even if designed as a post disaster structure.

Businesses should consider installation of an uninterruptible power supply (UPS), as power outages are common after an earthquake. A UPS provides battery or other backup that aids in saving data by keeping computer systems running without interruption when the power fails. UPS equipment and automatic transfer switches must all be seismically installed to ensure that they work when needed.

Consider meeting with information technology specialists, earthquake engineers and business continuity experts to determine a solution and plan that best fits your company’s needs. A qualified earthquake engineer should be experienced and familiar with leading standards for the seismic screening, installation, and retrofit of electrical and other data-centre equipment, especially FEMA E-74 and IEEE 693.

Institute for Catastrophic Loss Reduction

Mission
To reduce the loss of life and property caused by severe weather and earthquakes through the identification and support of sustained actions that improve society’s capacity to adapt to, anticipate, mitigate, withstand and recover from natural disasters.