

Nominee: SECURE TECHNICAL ROOMS SL

Nomination title: VIBRATION PROTECTION OF RACKS AND DATA CENTERS

Regarding a new building construction next to a live Data Centre and the concern that such construction (mainly the piling part) could generate vibration in the Data Centre which may lead to a risk of service interruption or equipment performance issue, and because of the geographical location, the installation of a vibration protection is proposed in the IT area equipment to protect against future possible earthquakes and vibrations in general.

Effects of vibrations in disk drives

Low frequency forces generated by seismic waves are generally more destructive than the higher frequency vibrations due to its longer periods generated with larger amplitudes.

According to the different manufacturers, disk drives have an even lower limit servers, see for example the values of Hitachi Disk Unit 9900 (formerly Sun 9900) indicating only 0.49 m/s², considering in normal operation has a value of 0.10 m/s².

Latency and Natural Frequency

Latency Study in SUN disk drives, effect produced after suffering vibrations within the range accepted by the manufacturer, which results in loss of time while the discs are seeking their position.

If due the vibrations the rack go into resonance because the own frequency, latency could be really high causing problems such:

- High Latency in the operations causing delays in calculus and storage
- Due the increase of latency, increase of power consumption for the extra time
- Errors of reading / writing data

- Corruption of Data Bases
- Losing of information
- Broken Hard Disks
- Raised Floor Collapse

Vibration Standards in Data Centers

UPTIME INSTITUTE in the Data Center site Tier Standard: Operational Sustainability summarizes the vibration & seismic limit of IT devices in the level of 0.8m/s².

The specific rules of vibration protection of Data Centers (ASHRAE TC 9.9 Structural and Vibration Guidelines for Datacom Equipment Centers), there are experiments conducted by IBM on the maximum acceleration that could overcome the hard disks of servers, which is the most critical part, without damage. As mean value of the measurements was obtained IBM 0.7m/s², which is quite similar to the securities offered by different manufacturers in their data sheets.

However, the above calculations assume to maintain an acceleration of 0.7 m/s² max servers to avoid failures in their processes read / write, such as ASHRAE says. If we go to 63-CORE Telcordia (used to rate seismic racks in different manufacturers), who recommended for Data Centers level IV protection tested with a graph whose peak value are 16m/s², increases the level of protection significantly.

The difference is that while ASHRAE protects the "functioning" of equipment, Telcordia is more focused on the physical integrity of the racks and devices, that is, they do not fall, do not break, etc.

SECURE TECHNICAL ROOMS design and manufacture vibration & seismic protection for data centers, using military technology of metallic shock control, to minimize the effect of vibrations in ICT devices. Individual solutions, plinth for whole row and concrete slab for the whole data center solutions are designed under ASHRAE and UPTIME INSTITUTE standards to offer best protection of the sensible information of the Data Center.

Why nominee should win

SECURE TECHNICAL ROOMS is the only company in the world focus in the vibration & seismic protection of Data Centers, next 5 bullet points:

- Only vertical & horizontal protection system in the Data Center market, vertical vibrations are produced by nearby Civil Works, railways, heavy road traffic, underground, data center growing, etc, while horizontal vibrations are mainly from earthquakes.
- Metallic design to avoid problems of flammability in the event of FIRE.
- Military technology able to absorb huge quantity of energy in few space and totally independent of the load to be useful during the life of the racks with few servers installed or full of them.
- Patented solution based in proved technology of absorption of energy used in F1, high speed trains, aeronautics, etc.
- Successfully installations all around the world with clients totally satisfied with performance.