Seismic Protective Systems for Computers and Data Processing Equipment

by Tsu T. Soong

Abstract

Data processing installations, intelligent workstations, personal computers and related types of equipment are vital to the successful operation of business, education, research, service and industrial operations in today's world. Any interruption in the operation of data processing or computer equipment can halt or significantly impact the operation of business activity. Especially important are such items as on-line banking, process controls, communications, hospitals and emergency facilities. This scenario, coupled with the occurrence of an earthquake, can lead to total chaos if the computers fail due to the earthquake shock and vibration effects.

In cooperation with IBM and other industrial participants, NCEER researchers have been developing innovative restraining devices (passive, semi-active, and active) for sensitive instruments and equipment. A series of experiments involving computer equipment using some of the innovative support systems as well as conventional systems have been conducted. Some of these innovative support systems show significant performance improvements over conventional systems. The types of innovative devices include: viscoelastic restraints, wire ropes, shape-memory alloy materials, electro-rheological fluid isolation systems, and isolation systems with active or passive control.

The end product of this research effort will be the development of innovative protective systems for computers and sensitive equipment, and formulation of a set of industry-wide guidelines for installation of computer systems, in the form of handbooks or computer code.

Collaboration

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