

Earthquake Checklist

Allianz Risk Consulting



Introduction

Earthquakes are one of nature's most severe natural hazards. The amount of ground movement that occurs in an earthquake is dependent upon the magnitude, the duration, the distance from the fault and the local geological conditions. The United States Geological Survey (USGS) estimates that there are 500,000 detectable earthquakes in the world each year and 100 of them cause damage. While earthquakes cannot be accurately predicted or prevented, the potential damage resulting from an earthquake can be mitigated by understanding the hazard and by planning carefully. It is important to note that most building codes are intended to prevent the collapse or failure of a building for the primary purpose of reducing loss of life. These provisions will not necessarily prevent damage to a building or allow for a quick and simple repair.

Damage from an earthquake can range anywhere from a minor inconvenience to a major catastrophe. Buildings can suffer both structural and non-structural damage.

Infrastructure damage can include broken automatic fire sprinkler systems and flammable gas piping, the shifting of major production and facility support equipment, and the toppling of finished products in rack storage. This damage can lead to a significant business interruption.

In an effort to help you minimize the damage that may occur as a result of an earthquake, Allianz Risk Consulting has developed the following checklist that should be completed before, during and after an earthquake. This checklist is not intended to be all inclusive and should be used as a guide, taking into consideration your specific site conditions and processes.

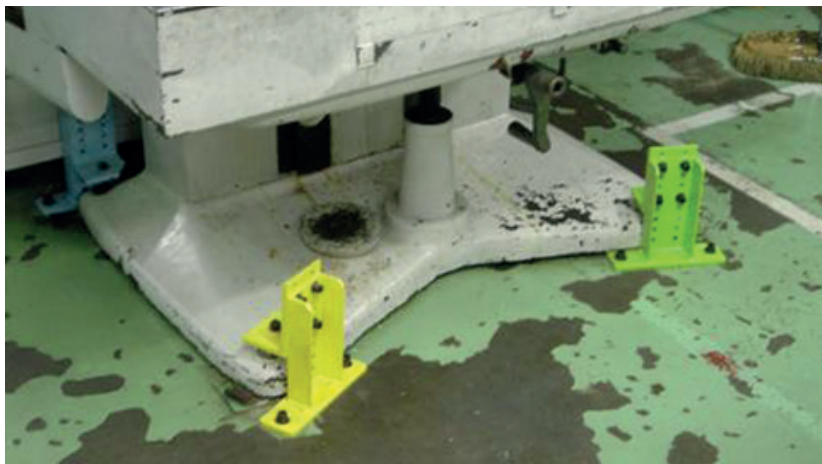
Should you have any questions about earthquakes or want to discuss any aspect of risk management in greater detail, please feel free to contact your local engineer at Allianz Risk Consulting. For any insurance claims, please contact your insurance broker or Allianz Global Corporate & Specialty.

Pre-Earthquake Planning

The key to minimizing earthquake damage is adequate preparation before the event.

If your site is subject to earthquakes, the following should be completed:

- Develop a comprehensive, written earthquake emergency plan to mitigate the exposures. The plan should include:
 - Assigning emergency organization roles and responsibilities.
 - Providing training at least annually.
 - Assembling emergency supplies and equipment, such as tools, fire extinguishers, portable electric generators, emergency lighting, medical supplies, etc.
 - Planning for salvage and recovery, including maintaining a list of key vendors, contractors, and salvage services.
 - A business continuity plan for restoring operations after the event.The plan should be reviewed at least annually and updated as needed.
- Verify equipment, especially tall, slender objects, is properly braced and/or anchored to prevent movement, such as:
 - Production & process equipment.
 - Flammable liquid or gas piping.
 - Fire protection systems, such as sprinkler piping, water tanks, fire pumps, drivers and controllers, etc.
 - Utility equipment, such as boilers, HVAC equipment, cooling towers, air compressors, generators, transformers, switchgear, etc.
 - Storage tanks, silos and bins.
 - Storage racks and shelving.
 - Computer server equipment racks.
 - Any suspended equipment, such as space heaters, suspended ceilings, piping, electrical bus ducts, etc.
 - Tall office furnishings, such as filing cabinets, bookcases, etc.



Production equipment anchored to the floor



Sprinkler riser with sway bracing

Earthquake Checklist



Computer server racks anchored to the floor



Flammable liquid tank strapped to wall

- Install seismic shutoff valves on all flammable liquid and gas piping systems. For main natural gas and propane service lines, install the seismic shutoff valve between the utility meter and where the piping enters each building.
- Provide flexible gas connections between gas-fired equipment and piping.



Seismic shutoff valve for natural gas line

During an Earthquake

- If safe to do so, consider shutdown of:
 - Production & process equipment.
 - Building utilities, such as electricity, gas, domestic/process water, compressed air, HVAC, steam, etc. Important: Always maintain fire protection systems in service.
 - Computer server equipment.

After an Earthquake

- Secure the site to prevent unauthorized entry.
- Organize and prepare emergency crews for salvage and cleaning operations.
- If safe to do so, conduct an immediate damage assessment, paying particular attention to the following:
 - Structural damage to the building.
 - Fire protection equipment, maintaining as much fire protection in service as possible by isolating damaged sections, then making repairs and restoring systems back to service as soon as possible. Notify ARC if any system will be impaired for more than 10 continuous hours.
 - Utilities, including electricity, gas, water, compressed air, HVAC, steam, etc. (isolate as necessary).
 - Production & process equipment.
 - Any combustibles in contact with potential ignition sources, such as electrical or heating equipment.
- Notify utility companies of any outages or damage.
- Call in key personnel and notify contractors to begin major repairs. Make sure facility safety procedures are fully implemented before work commences. This includes controlling ignition sources such as smoking and hot work. Follow all hot work permit procedures.
- Initiate salvage operations; however, be aware the fire danger is greater soon after earthquakes.
- Review the effectiveness of the earthquake emergency plan and revise as needed.

If needed, please contact your insurance broker or Allianz Global Corporate & Specialty for assistance in reporting a claim.