

The following guide is designed to help Department Chairs, Principal Investigators, Lab Supervisors, and Lab Personnel perform an earthquake preparedness self-assessment for their labs and provides recommendations for what to do during and after an earthquake.

PREPARATION

- While in your lab, if an earthquake occurred, where would you go for protection?
 - Locate safe and danger spots in your area. Decide if you would go under a desk or table, in a safe corner, or out of the lab against a corridor wall.
 - Consider flying glass hazards from windows and glass and falling hazards from light fixtures, books, pictures, and equipment when selecting safe spots.
 - Take careful note of potential chemical/biological/radiological hazards from broken containers and spills, asphyxiation hazards from spilled cryogenics or damaged superconducting magnets, and physical hazards from failed high-pressure systems, furnaces, etc.

- Do you know the evacuation routes from your building?
 - Be familiar with the location of all stairwells and routes.
 - Be familiar with your building outdoor evacuation assembly areas
 - Do not use elevators.

- Are gas cylinders well secured in an upright position?
 - Are pressure regulators removed and cylinder caps in place on cylinders that are not in use?
 - Two cylinder chains fastened to the lab wall are required for each cylinder.
 - Nylon/polyester/polypropylene straps are not acceptable for cylinder restraint; incombustible steel chains must be used.

- Are liquid nitrogen vessels well secured in an upright position?
 - “Large” (multi-liter) liquid nitrogen Dewars must be secured. (A precise definition of “large” is not yet decided upon, but in general, any Dewar too large to be carried should be restrained, unless extremely short and wide-based.)
 - Pressurized Dewars must be secured regardless of size.
 - Liquid nitrogen freezers should be restrained.
- Are chemicals stored properly?
 - Are chemicals recapped and returned to their storage cabinets immediately after use?
 - Are chemical storage cabinets closed and latched?
 - Are chemical storage cabinets secured to prevent tipping or movement?
 - Are chemical storage shelves equipped with lips or restraints to keep chemicals and glassware in place?
 - Are waste chemicals removed regularly?
 - Are chemicals stored in secondary containment trays or tubs?
 - Are non-compatible chemicals stored separately?
- Are fume hood sashes closed as far as possible to contain spills?
- Is heavy equipment and furniture that might block exit routes secured? When large items fall into the path of egress, your ability to exit may become compromised. In addition, large items could cause significant injury. Work with Facilities Management Services to secure equipment, furniture, shelves, and other items.
- Are exits and aisle ways maintained free and clear of obstructions including boxes, equipment, bottles, etc. on floors?
- Do you have equipment and/or processes that could be damaged or pose a fire or health hazard if power was suddenly lost?
- What contingencies have been made to provide backup or emergency power to maintain critical systems?

- Are safety systems (i.e., fire extinguishers, safety showers, eye washes) accessible and in proper operating condition? Does everyone in the lab know how to operate them?
- Do you have extra spill containment equipment available?
- Do you have emergency supplies such as drinking water, flashlight, radio and batteries available? (USC Emergency Supply Vendor: www.sosproducts.com)
- Does your research group have an internal emergency plan, which all members have been trained on?

DURING AN EARTHQUAKE

If you are in an **office**:



DROP where you are, onto your hands and knees. This position protects you from being knocked down but allows you to move if necessary.



COVER your head and neck with one arm and hand

- If a sturdy table or desk is nearby, crawl underneath it for shelter
- If no shelter is nearby, crawl next to an interior wall (away from windows)
- Stay on your knees; bend over to protect vital organs



HOLD ON until shaking stops

- Under shelter: hold on to it with one hand; be ready to move with your shelter if it shifts
- No shelter: hold on to your head and neck with both arms and hands.

If you are in a **lab**:

Every lab has different hazards. Therefore, it is very important to have considered your options on where to go in advance, based on the particular lab. Hazards could be chemicals, bio-hazards, radiation hazards, glassware, open flame, or other unique hazards. In most labs, dropping to the floor may be dangerous when hazards are present.

- Unless the lab is known to contain only minimally-hazardous materials and equipment, the best plan is almost certainly to move to the corridor and take cover next to an interior wall. Although there is some possibility of being injured in the corridor from items falling from the ceiling, remaining in the lab may give a much greater potential for injury.
- If the corridor is far away, but the lab has an adjoining office or other room not containing hazardous materials (e.g. a microscope room) and close by, then drop, cover, and hold in the space.
- **It cannot be stressed enough that as a matter of routine safety planning, all lab personnel and all research groups should carefully consider the hazards in their labs and the physical layout of the labs, and based on this, they should work out the best place to shelter. This planning should be gone-over every time new personnel join the lab. Please ensure a lab-specific plan for sheltering is worked out before an earthquake strikes!**

If you are in a building that contains labs, whether or not your room is a lab or an office, as soon as the shaking stops:

- After a moderate-to-severe earthquake, lab buildings may rapidly become hazardous as spilled harmful materials, non-functioning fume hoods, and failed ventilation systems combine to create a toxic atmosphere. After the shaking stops:
 - Quickly grab important belongings, shut doors, and vacate building.
 - Hazmat personnel with appropriate protective equipment will assess the internal conditions in lab buildings before you will be permitted to reoccupy the building.

OPERATIONS AFTER AN EARTHQUAKE

Depending on the time and circumstances of the earthquake, you may be asked to stay out of the building for a few minutes to a few weeks, or indefinitely.

- Following a “minor” earthquake, when there are no obvious signs of smoke/fire alarms, structural damage or other hazards, lab personnel should methodically check:
 - That all fridges, freezers, fume hoods, glove boxes, incubators, and other safety-critical or otherwise important equipment is functioning properly.
 - That there are no containers fallen-over, leaking, spilled, damaged, or broken in any fridge, freezer, chemical cabinet, flammable cabinet, or any other place where hazardous materials are stored. (Search **everywhere!!**)
 - That there are no broken mercury-containing items, including bottles, thermometers, manometers, barometers, or bubblers.
 - That the joints are not dislodged or leaking on glass apparatus.
- Is your short-term evacuation checklist posted near the exit of your lab? This is a check list of essential steps to take before leaving the building. These include, but are not limited to:
 - Turn off gas burners
 - Check quickly for fires, fire hazards, or spilled chemicals
 - Check for injured or physically limited people who might have trouble evacuating the building
 - Bring emergency supplies (first aid kit, flashlights, etc.) to the emergency assembly area
 - Close the lab door as you leave
 - Report crucial items or hazards to the appropriate official at the emergency assembly area and to DPS at 213-740-4321 (UPC) / 323-442-1000 (HSC)

- Do you have a long-term plan in case you could not get back into your lab for at least a week?
 - Which cell lines/experiments/data are your first priorities?
 - Are provisions made for taking care of lab animals and maintaining freezers? (Remember that normal distribution systems will not work, so you should have your own supply.)
 - Do you have backup copies of important data stored off campus?

SUMMARY

Each of these issues and items could be critical for the health and safety of laboratory occupants. While this guide is directed toward earthquakes, please remember that building fires and other natural or manmade disasters could have a similar impact on your laboratory space and staff. We encourage you to discuss these plans among your staff and take the actions necessary to see that all issues are addressed. It is a good idea to practice your disaster plans periodically to ensure:

- the plans meet the requirements of current laboratory operations,
- all staff are familiar with both the overall plan and their specific role, and
- the plan is successful in accounting for staff and in reporting staff and laboratory conditions to key department administrators.

Your cooperation and preparation will be appreciated by all. For more information about emergency preparedness at USC, contact the Office of Fire Safety & Emergency Planning at sgoldfar@usc.edu. For laboratory safety information, please contact the USC Office of Environmental Health and Safety (EH&S) at labsafety@usc.edu or visit <http://adminopsnet.usc.edu/EHS>.