

Laboratory Shutdown Procedures

Introduction

Unplanned or spontaneous events can disrupt daily operations on campus. In the event that an incident may interrupt your laboratory or facility operations, preparation of an emergency shutdown plan will familiarize faculty, staff and students with actions to mitigate the loss of research, property, or life. Please be aware that the unpredictable events of nature do not always allow for an orderly progression for emergency response as outlined in the list below. A copy of your facility emergency plan must be printed and posted with your safety plan or in a conspicuous location (ex. Lab Door) in your laboratory.

As you know, any type of campus emergency has the potential to increase in severity at any time during the emergency. Since this is the case, each laboratory on campus must maintain a level of readiness to respond to changing circumstances.

Alert Phase: *Initial notification of a potential threat to campus. This type of emergency would have little or no impact on personnel or normal operations outside the localized area. Timeframe will be based on imminent threat to the University (hours to days). Consider necessary steps to shutting down.*

Partial Activation: *Emergency that disrupts a sizable portion of campus and may require external assistance; normal operations may be suspended. Event is expected to impact Lehigh University within 48 hours. Active shut down measures commence.*

Full Activation: *Significant emergency that directly affects a sizable portion of the campus, or poses a considerable, immediate threat to portions of the campus population. Operations are suspended. Event is imminent; event may also have already occurred and directly impacted the University; shut down procedures are immediate. **MANDATORY ACTION IS REQUIRED.***

Laboratory Emergency Planning

Consider the following questions in regards to your laboratory or facility and address each item with specifics (assembly locations, supplies needed for a shutdown, contact persons, and alternate locations). Action plans must be written, reviewed by staff and conspicuously posted in the facility.

- Is the following information posted on the outside of the entrance doors, with current information?
 - Names and contact numbers for the principle investigator/lab manager, graduate students, EH&S, and University Police.
- Appropriate door signs, if the laboratory contains (Radioactive Materials, Lasers, Carcinogens, Biohazards, Reproductive Hazards, etc.).

- Are all items removed from window ledges?
- Are all containers housing chemical, radioactive, and biohazardous liquids securely capped, properly labeled and stored safely?
- Are all containers securely stored above floor level in case of water events? Check all hazardous waste storage areas (chemical, biohazardous, radiological).
- Are all compressed gas cylinders properly secured and stored in an up-right position?
- Do compressed gas cylinders, not in use, have their valve caps tightly secured?
- Have chemicals been removed from laboratory benches and shelves? Are they stored in the appropriate chemical storage area?
- Are all incompatible chemicals stored separately from one another?
- Are there chemicals that need special storage?
- If you are working with animals, have you made arrangements for protective care?
- If you are working with electrical equipment, have you reviewed proper shut down procedures and measures to prevent surging?
- Do you know what power backup system is available to your building?
- Is your critical equipment tied into the emergency backup?
- Is your intellectual property (lab notebooks, ledgers, CDs) removed or safely stored?
- Will your experiments take more than 24 hours to safely shut down and secure? If so – what is the shutdown process and its contingencies?

Planning Suggestions

Laboratories with outside windows should develop a secure area for the storage of water reactive chemicals and biological agents. These secure areas should be in the inner rooms of the building, preferably above the first floor and below the top floor.

Laboratories using radioactive materials and other controlled substances should place these materials in their designated secure storage location as approved by EH&S. If these areas are in labs with outside windows, and/or on the first floor, the material should be placed on shelves, inside the designated secured storage cabinet, at least 2 feet above floor level.

A hazard categorized laboratory emergency planning checklist is included for specific guidance related to compressed gases, radioactive materials, biological agents, chemical agents and electronics. This document may also be used as an action tool in the event of an emergency.

Alert Phase - Begins with the initial notification of an imminent event. The severity and timeframe are contingent upon the event and will be better established in the coming hours.

- Begin the shutdown process if your facility may be impacted; review your laboratory emergency shutdown procedures, gather necessary supplies, make arrangements for storage of hazardous materials, animals as deemed necessary; review powering down procedures for electrical equipment.

Partial Activation - Begins with notification and when the event is expected within the next 48 hours.

- Have all windows been properly closed and secured?
- Have you disconnected and secured all electrical equipment, not in present use, from water exposure?
- Are aisle spaces unobstructed?
- Are all floors and counter space clear of equipment, papers, chemicals, etc.?
- Have you placed all containers of water reactive, radioactive, or biohazardous wastes inside plastic break resistant containers (secondary containers)?
- Did you fill out and attach a label, identifying contents, on secondary containers?
- Are all documents, records, CDs, etc., in plastic leak proof containers and stored in a secure area away from windows and above floor level (if on first floor)?
- If you are working with animals have you made arrangements for protective care?
- Is it necessary to bleed pneumatic lines?
- Have regulators been removed from gas cylinders and secure valve caps put on all compressed gas cylinders?
- Lower the temperature in refrigerators and freezers to preserve contents in the event of a prolonged power failure.
- If electronic equipment has an auto-restart function, has this been disabled?
- Will your experiment take more than 12 hours to safely shut down and be secured? If so - start the process immediately

Full Activation - Mandatory Action Level

Begins with notification that the event is likely to occur within 36 hours or is of such magnitude that an instantaneous alert is issued.

- **Immediately end all experiments in progress and stop all use of chemicals, radiological, and biohazardous agents. Safely shut down and secure your experiments.**

If time permits:

- Have you unplugged and covered all non-critical electrical equipment?
- Is equipment protected in areas with windows from hazards associated with broken glass, rain and wind?
- Is there a cover on each piece of electrical equipment with large plastic bags or suitable plastic? Do not cover ventilation vents and/or fan motors that could result in overheating and possible fire. *CAUTION: Electronic equipment must be turned off, and unplugged from the wall outlet, before covering with a garbage bag or plastic. Failure to do so could result in overheating and possible fire.*
- Are all bench-top items shelved and secured?
- Is all hazardous, biological and radioactive waste containerized, sealed, labeled and stored in their designated secure storage locations?

- Is all material and equipment removed from inside ventilated hoods?
- Have all utility valves been closed?
- Have all refrigerators, freezers, incubators been locked or taped shut?

Recovery Phase

This phase begins when University Administration releases the campus from a state of emergency and notifies the campus population.

Upon returning to your laboratory or facility:

- Visually inspect the laboratory through the room or door windows to determine lab condition before entering.
- If appropriate, conduct a damage assessment of the lab.
- Submit a damage assessment report with photo documentation to Risk Management (X83899) to begin the process of completing claim forms.
- Contact EH&S to report lab damage or hazardous material spills.

Supplies

In order to shut down operations, please have the following items in supply:

- Storage of water reactive, radioactive, and biohazardous materials via break resistant plastic containers with screw type closures. These are secondary protective containers and must be large enough so breakable primary containers can be placed inside and secured. They are used to protect against the release of harmful materials into the environment.
- Protection from water damage: Use large garbage bags, smaller sealable bags or plastic sheeting to cover electrical equipment and data from possible water damage.
- Labels, to place on all containers and bags for identification.
- Permanent Markers, to write on the labels.
- Tape, to secure container screw top lid and tie off garbage bags.
- Chemical Spill Kits: assure the proper chemical spill supplies are readily available for the types of materials you have in your lab. These materials should be readily available and stored in a designated location, at least 2 feet above floor level.

Examples of events impacting campus could include, but are not limited to: Hurricanes or Flooding Events; Snow or Ice Storms, Fires, Train Derailment, Terrorism Event (bomb/sabotage/shooter), Utilities Related Emergencies (ruptured gas line).