

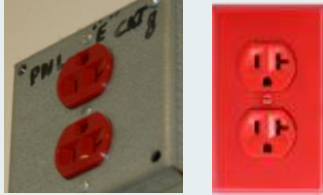
How to Prepare for a Power Failure in the Lab

Lab Safety Discussion - Merchant Lab

26 November 2014

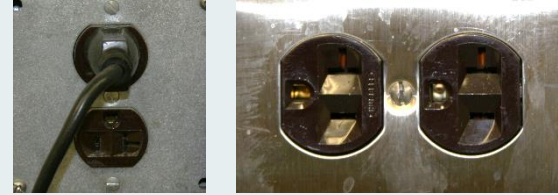
1. Before the power fails

- Designated emergency contact/s (not just for power outage)
 - familiar with the chemicals in the lab, familiar with emergency procedures
 - door signs with emergency contact numbers
 - telephone chain
- Battery powered flashlights
 - everyone should have a flashlight (in the lab or office)
 - please check
 - that you have one
 - that you know where it is
 - that it's working (batteries, bulb)
- Essential equipment on emergency power
 - -80 freezer, personal freezers, common freezers



On emergency power

- -80 freezer
- -80 upright freezer
- all manual defrost freezer
 - under-counter freezer
 - enzyme freezer in 5043
 - all freezer in 5069
- liquid nitrogen freezer
- the 2 new large fridges in 5043



Not on emergency power

- Incubator shakers, standing incubators
- Centrifuges
- (q)PCR machines
- A/C, steam, hot domestic water, DI water (should be independent from the power system)
- miliQ
- Computers
- the freezer-fridge combination in 5043
- under-counter fridges

1. Before the power fails

- General lab hygiene
 - Don't leave open chemicals in the fume hood when the fume hood is unattended. Always safely store chemicals after use.
 - All fume hoods should have a physical, nonelectrical indicator that they are running, like a strip of tissue paper
 - No large items clotting the ways, no excessive clutter
- Ensure that no flammable chemicals are stored in non-approved fridges and freezers.
 - When the power returns to these appliances, a reaction may be ignited by the refrigerator light or other electrical source.

2. *While the power is off*

- Shut down experiments that involve hazardous materials
 - Make sure experiments are stable and won't create uncontrolled hazards.
 - Shut off gas and Bunsen burners, close chemical containers
 - Note: the chemical fume hoods won't work
- Assess the extent of the outage in your area
 - actions required depend on the length of the outage
 - Do not treat a longer power outage as "business as usual"
 - one or two minutes is not a big deal, but if it takes longer than a few minutes some actions are required
- Help co-workers in darkened work areas move to safe locations
 - restroom, stairwells, or other areas with no windows or natural lighting
 - EXIT signs are lit
 - Most rooms have Power Failure Lights
 - are plugged into a power outlet and turn on automatically, when the power is off



2. While the power is off

- Check equipment on emergency power to ensure it's running properly
 - Note: It may take 20 to 30 seconds for emergency power to activate after a power failure
 - Note: Our emergency power is tested every month (it failed once before during a power outage)
- Transfer vulnerable items from cold rooms and refrigerators that have lost power to equipment served by emergency power
- Keep lab refrigerators or freezers closed throughout the outage
 - don't use dry ice in walk-in fridges/cold rooms (risk of suffocation)
- Open windows for additional light and ventilation (during mild weather)

2. While the power is off

- Reduce electrical use and
 - to reduce the risk of power surges
 - the voltage may fluctuate and damage instruments
- Instruments that are not on emergency power
 - Set all equipment and appliance switches to the OFF position (manual switch) or unplug
 - to protect against kicking out the circuit breakers, blowing fuses, or damaging equipment when the full surge or current hits as the power comes back on
 - According to Janette, one of the biggest problems is, that once the power comes back on, all the equipment that is still "ON" draws a lot of power, which causes the power to fail over and over again within seconds
 - Repeated power changes are particularly problematic for everything with a compressor (like A/C, freezer)
 - Turn off all light switches, leave on an obvious light in the waiting area to know when the power comes back on

2. While the power is off

- Reduce electrical use and
 - to reduce the risk of power surges
 - the voltage may fluctuate and damage instruments
- Instruments on emergency power
 - Disconnect equipment that runs unattended
 - Turn off unnecessary light and equipment that doesn't immediately require emergency power
- If you are asked to evacuate your building, secure any hazardous materials work and leave the building.

3. When the power returns

- Check equipment
 - Reset and restart equipment
 - Critical equipment first
 - gradually turn on other equipment
 - Check that airflow in fume hoods is restored
 - Keep doors closed on refrigerators and freezers for some time after power returns, until they reach their temperature again
 - Some refrigerators and freezers require a manual restart
 - we don't have any of those, but it still is good to check all freezers and fridges
 - Check equipment directly after power returns but also several hours after

General Safety also during Power Outage

- Emergency exit routes from the building
- Emergency Assembly Point
- Nearest fire extinguishers, nearest fire alarm pull station, lab emergency shower/eyewash and first-aid kit

-80 freezer failure

- if the -80 freezer fails (but the power is still on) there is an established emergency procedure to save our precious resources
 - call everyone in to help
 - check and arrange space in 6th floor freezer
 - if necessary, organize other/more space in freezers from other labs
 - fill the bottom of the dish cart with dry ice blocks, add a second layer on diapers/plastic sheets (keep blocks intact)
 - with two people, lift second layer out, fill cart with two racks, add second layer back; having the blocks on a sheet or something like this is the fastest way to move them
 - at the same time, one person should call the elevator, another should be on stand-by
 - bring cart up to 6th floor, one person keeps elevator on that floor, the other(s) transfer racks
 - bring cart down, one person stays at elevator and keeps it on 5th floor, the others get new racks- repeat.
 - keep an eye on 6th floor freezer temperature, you might need to take a break in between or that freezer will warm up too much
 - when finished, leave note on freezer with contact info and reason for using freezer, write to Stacie too.

-80 freezer failure

- if the -80 freezer fails (but the power is still on) there is an established emergency procedure to save our precious resources
 - first racks to be stored are the cosmid libraries and the racks marked SM (lab glycerol stocks etc)
 - than it is full boxes
 - Everyone should have their boxes inventoried and the cover sheet printed
 - That sheet has the information on which box should be kept at -80, which can be at -20 and which can be discarded
 - if necessary, fill a second cart and use this to rearrange boxes in the racks

Lab business

- EH&S follow up visit
 - unannounced PPE inspection yesterday
 - serious finding (food in the lab)
 - follow up visit within 48h (= today, since holiday tomorrow)
- Do we need a phone in the kitchen?
- Anything else?

Happy Thanksgiving!!

