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!!