

## **Be Prepared for Power Failures**

Like any other part of the infrastructure, electrical power to the campus can fail, either as an isolated incident (e.g., tripped circuit breakers or blown fuses) or as part of a larger event (regional power outages or earthquake). When power failures occur, health and safety issues may need to be addressed.

### **General**

#### **Emergency Lighting**

Emergency lighting provides enough light for a safe exit. Batteries in these lights should last a couple of hours, but may fail sooner. It is important that lighting in hallways and stairwells is monitored during a power outage to ensure occupants can exit safely. If natural or emergency lighting in hallways and stairwell begins to diminish to one foot candle (about the light provided by a full moon), building occupants should evacuate the building. Outlet-mounted and handheld emergency flashlights are useful in rooms without windows or areas where work is conducted at night.

#### **Hazardous Equipment**

Identify hazardous equipment that should be turned off after power fails because it might cause injury when restarted after power returns. Unless there has been an order to evacuate the building, assign an employee to shut off the power to all hazardous equipment in the work area, such as shop machinery, after a power failure.

#### **Data Backup**

Back up your computer files regularly so as not to lose data when the power goes off suddenly. Use an Uninterruptible Power Supply (UPS) for critical machines such as servers.

### **Power Failure**

1. All hot work should cease immediately and not be left unattended until surfaces have cooled to a safe temperature.
2. Any machinery and equipment in use should be switched to the off position to prevent unexpected or sudden start up when power is restored. This does not apply to fridges and freezers.
3. Turn off all light switches. The voltage may fluctuate and damage any lights that are on.
4. Set all equipment and appliance switches to the OFF position. This is 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.
5. Report all persons trapped in elevators to University Police.

6. If it becomes necessary to evacuate the premises during a power failure, be sure to protect all valuables and make sure that all equipment is safe when the power comes back on.
7. When there is a power failure, do not use the elevator. It may become inoperative and a trap.
8. Assist disabled persons in exiting the building. If these persons are unable to use the stairs, call University Police for assistance.

## **Power Failure in Laboratory Buildings**

A power failure in a building can result in hazardous conditions in laboratories. Power outages can result in chemical fume hood failure. Pressure may buildup in equipment that relies on electronic control. Control of chemical reactions that require cooling dependant on electrical power can fail. A flammable atmosphere may accumulate in chemical fume hoods.

In a brown-out or black-out condition, power failure may damage sensitive equipment or experiments. A brief period should not drastically affect the temperature in coldrooms, or in freezers. However, sensitive electronic equipment, instruments and computers should be shut down before a planned outage. Power surges caused by resuming power may damage equipment or create an unsafe condition. Please evaluate your laboratory for this situation.

### **Planning for an outage**

- Designate an emergency contact for information in the event of an unexpected shut down. Post with the emergency information on the door.
- Maintain a log of equipment that must be reset, restarted or require special attention. Keep this log available. Equipment that runs unattended should be programmed to shut down safely and not restart when power returns.
- Identify an emergency source of dry ice if you have items that must be kept cold. (Note: Refrigerators and freezers will maintain their temperature for several hours if they are not opened. **Do not use dry ice in walk-in refrigerators or other confined areas** because hazardous concentrations of carbon dioxide gas will accumulate.)

### **Immediately Before a planned outage:**

- Turn off lights and equipment that do not need power.
- Check if your cold room is on emergency power. If not, move temperature sensitive materials or arrange for a dry ice delivery.
- Shut down experiments that involve hazardous material or equipment which automatically restarts when power is available.

A disruption may damage computers, equipment or instruments with automatic resets or logic functions. Turn these off if it is not essential for continuous operation. Back up computers routinely.

### **When power is off**

- Ensure experiments, equipment, machinery or apparatus are stabilized or safe.
- Cap volatile materials in fume hoods and close the sash. Do not use laboratory facilities during the shutdown or enter areas that have storage of material that require mechanical ventilation..
- Check equipment on emergency power to ensure that it is running properly. Do not connect items not intended to be on emergency power during a disruption period.
- Check on items stored in cold rooms, refrigerators or freezers. Transfer to emergency cold rooms or use dry ice if needed.
- Make sure that experiments are stable and do not create uncontrolled hazards such as dangerous vapors in a non-functioning fume hood.
- Check chemical fume hoods. Stop any operations that may be emitting hazardous vapors. Cap all chemical containers that are safe to cap, and then close the fume hood sashes. Leave the room and contact EHS if you notice any odors or physical symptoms.
- Disconnect equipment that runs unattended, and turn off unnecessary lights and equipment. This will reduce the risk of power surges and other unforeseen damage or injury that could result when the power comes on unexpectedly.
- Check items stored in cold rooms and refrigerators. You may need to transfer vulnerable items to equipment served by emergency power.

### **After Power Outage**

- Reset or restart equipment. Ensure that equipment is returned to a safe operation mode.
- Check chemical fume hoods for proper operation. If fume hoods are not exhausting do not use hazardous chemicals.
- Check cold / environmental room set points and if necessary have the controls reset.

Have a flashlight available in the event that emergency lighting fails. If it does, check unlit rooms/halls/bathrooms to see if someone needs assistance.