

# Engineering Research Complex (ERC)

## SAFETY MANUAL

August 2015

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### Introduction

Safety is an important issue that needs to be placed at the highest priority when conducting experiments or working in laboratories. Please take time to read and understand this Safety Manual. If you have any questions, comments, or suggestions, please email them to any of the professors involved with research at the ERC, or stop by their offices.

### Policies and Procedures

Students working in the ERC are REQUIRED to read this manual and sign that they have read and understood the material.

*I have read and understood all of the material in the Laboratory Safety Manual. I am aware of the dangers in the Lab and know the precautions to be taken to avoid injury to myself and others in the Lab.*

Bangle Id No.: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

### Facilities

#### Know Your Building!

Get to know your building! See the floor plans posted on the walls throughout the building for a graphical description of the building. Walk around the building and notice where all the exits are located.

#### Responsibilities

It is the responsibility of the individuals to read and understand this manual and to obtain the proper training for operating the lab equipment. Any concerns should be addressed to your projects Principal Investigators.

## Exit Locations

There are four exits of the ERC building. One is located in the main entrance area of the Measurement and Control Engineering Research Center (MCERC), one is located in the bay area (currently used by facilities) with a big roll up door. One exit is located next to the Structural Dynamics Laboratory, and one is located in the Water Resource laboratory

Know where they are located and recognize the closest exit to your office and the closest exit to other locations within the building. In case of an emergency evacuation of the building, one should always have two means of egress from the building. Study the floor plans know your two means of egress from various places in the lab.

## Emergency Procedures

The building only emergency alarm is the fire alarm system. When the fire alarm is sounding do the following:

- Leave the building immediately using the safest route possible.
- Once outside of the building, place yourself at the edge of the parking lot in front of the ERC building, next to the ISU sign, and await instructions from the building coordinator.
- Reenter the building only after the Safety Personnel have signaled that it is safe to do so.

## Emergencies

- Fires

Never enter a room if the top half of the door is warm to touch.

Never enter a room that is smoke filled.

Never enter a room containing a fire without a backup person.

Report any problems with fire alarms, fire extinguishers, or other fire protection devices to the Laboratory Personnel.

- Small Fires

Small fires are defined as those fires confined to a specific, small area or piece of equipment where flames cannot easily reach other combustibles. These types of fires can be extinguished without evacuation. However, an immediate readiness to evacuate is essential in the event the fire cannot be controlled. See below for proper use of fire extinguishers.

What you should do:

- Alert people in laboratory and, if there is any chance you may not be able to put out the fire, activate alarm or call 911 and report fire.
  - Smother the fire or use the correct fire extinguisher. If an electrical fire, first turn the power off at the circuits' electrical panel.
  - Always maintain an accessible exit.
  - Avoid smoke and fumes.
  - Report the fire to the Laboratory Personnel.
  - Report the fire to your supervisor.
- Major Fire or Explosion  
Major Fires in the context of this Safety Manual, are those fires that are not Small Fires, or are beyond the control of Lab personnel.

What you should do:

- Alert people in the area to evacuate.
- Activate nearest fire alarm. Call 911 and report the fire. Give exact location and extent of fire and any special circumstances that could be hazardous, such as chemicals or faulty equipment. If unsafe to call from the lab, go elsewhere to call.
- If it can be done safely, shut off any electrical equipment that may be involved.
- Assist any who needs help to evacuate, if it can be done safely. If someone's clothing is on fire, roll the person around on the floor. Refer to the next section on Personal/Medical Emergencies for details on assisting injured people.
- Close doors to confine the fire.
- Evacuate to a safe area or exit the building through a stairwell. Preplan your evacuation route, plus an alternate. If your immediate evacuation would result in a hazardous situation and if you are not in immediate danger from the alarm-causing incident, stay just long enough to put your area in a safe condition.
- Have a person knowledgeable of the incident.
- Account for each person in your work area. Report anyone who is missing to fire or police personnel.
- Do not reenter the building (even if the fire alarm bells/horns stop) until you are advised to do so by Safety Personnel.

#### Fire Extinguishers and Proper Usage

There are 2 types of fire extinguishers:

- Carbon Dioxide (CO<sub>2</sub>): Flammable Liquids or Electrical Fires
- Dry Powder (ABC): Ordinary Combustibles, Flammable Liquids or Electrical Fires

Remember **PASS** when using a fire extinguisher:

**P:** Pull the pin.

**A:** Aim the extinguisher at the base of the fire.

**S:** Squeeze the trigger. Keep the extinguisher upright.

**S:** Sweep the nozzle from side to side.

#### Personal Injury/Medical

If an injury is life threatening, you should call 911 for immediate medical response.

##### *Clothing on Fire*

- Roll the person around on the floor to smother the flames. If water is immediately available, drench the person with water.
- Obtain immediate medical attention.
- Report the incident to the Laboratory Personnel.

##### *Thermal Burns*

- Any burn covering an area larger than the palm of a hand or any burn on the face or head should be treated as a major injury.
- For burns with no open blisters, flush with lots of cool running water. Apply moist, sterile dressings and bandage loosely.

- For burns with open blisters, apply dry, sterile dressings and bandage loosely. Do not use water as it increases the risk of shock.
- Obtain immediate medical attention.
- Report the incident to the Laboratory Safety Personnel.
- Report the incident to your supervisor.

#### *Minor Cuts and Puncture Wounds*

- Vigorously wash the injury with soap and water for several minutes.

#### *Major Injury from Explosion, Fall, etc. (including minor injuries that cause shock or unconsciousness)*

- Remain calm. This is critical in assisting the injured person.
- Initiate lifesaving measures if required. For severe bleeding, apply direct pressure.
- Call 911 and give the name of the injured (if known), exact location, and description of the problem.
- Do not move the injured person unless there is danger of further harm.
- Maintain the injured person's body temperature, adding cover(s) if needed.
- If the injured stops breathing, immediately obtain the assistance of someone who knows CPR.
- Remain with the injured person until medical help arrives. When medical help arrives, inform them of the circumstances (if known).
- Report the incident to the Laboratory Personnel and your supervisor.

### **Theft & Security**

#### Disclaimer

Idaho State University is not responsible for loss, damage, or theft of personal property.

#### Prevention Guidelines

To prevent theft, make sure that the buildings doors are shut and locked behind you whenever you leave the building during the evening hours. Also, lock your office door when leaving for the day. Valuable personal property should be kept on you or in locked drawers or cabinets. Minimize the amount of valuable personal property kept in the University buildings. It is advisable to always carry your Bangle ID card with you when you are in the University buildings as a means of positive identification. Immediately report all lost or stolen keys and all problems with locks or keys to the Public Safety Office.

#### Water Leaks, Floods, Gas Leaks

What you should do:

- Report all emergency items directly to the Laboratory Personnel.
- If after normal working hours, report all emergency items to Public Safety Office, 282-2515.
- Always give the following information: your name, exact location of the problem, and a description of the problem.

If the problem is an immediate hazard to life or health:

- evacuate the area,
- close doors and prevent entrance into the affected area,
- call Public Security, 282-2515, immediately, giving your name and exact location and description of the problem,
- have a person knowledgeable of the incident.
- Also report the problem to the supervisor of the affected area.

### Tripping Hazards

Broken floor tiles, torn carpets, debris, cords, etc in common pathways

What you should do:

- Report the location and description of these hazards to the Laboratory Personnel.

### Electrical Hazards

Placement and usage of the following items have been tagged as safety concerns to the University:

- Improper usage of electrical extension cords
- Improper usage of electrical power strips
- Heating pads, heat lamps, coffee pots, cup warmers, etc.
- Use of damaged cords or receptacles
- Anything else you think might seem unsafe

What you should do:

- Consult with Laboratory Personnel to correct or to check guidelines concerning any of these conditions.

## **Operating Equipment:**

### *Drills and Drill Presses*

Users should follow these guidelines when operating any machinery in the building:

- Always wear safety glasses. If none are located by the equipment, ask the Laboratory Personnel for a pair.
- Keep long hair tucked away.
- Remove all jewelry before operating the equipment.
- Use extreme care if wearing loose fitting clothing.
- Understand the limits of the equipment. Drill motors tend to overheat when pushed too hard.

### *Soldering Irons*

Users should follow these guidelines when operating any soldering irons in the lab.

- Always wear safety glasses when soldering.
- Turn off power to the circuit being soldered and unplug the power cord from the wall.
- Keep long hair tucked away.
- Never leave an unattended powered soldering iron.
- Always place the soldering iron in its holder. Never place the soldering iron on anything else.

## **Electrical and Electronic Safety**

Please follow these general guidelines pertaining to electrical safety.

- Turn off power and unplug from the wall before working on electric or electronic circuits, except when absolutely necessary.
- Do not use extension cords as a permanent power source. It is against the fire code and will result in fines if these are found by an inspector.

- Do not work on electrical equipment in a wet area or when touching an object that may provide a hazardous earth ground path.
- Turn off power and unplug equipment before checking or replacing fuses. Locate and correct the cause of a blown fuse or tripped circuit breaker before replacing the fuse or resetting the circuit breaker.
- Replace defective cords and plugs. Inspect cabling for defects such as frayed wiring, loose connections, or cracked insulation.
- Remove metal jewelry, watches, rings, etc., before working on electrical circuits.
- Always check the electrical ratings of equipment you use and be sure you use that equipment within its ratings.
- Never overload circuits.
- Never leave unprotected systems unattended.
- Never place containers of liquid on electrical systems.
- Never defeat the purpose of a fuse or circuit breaker. Never install a fuse of higher amperage rating than that specifically listed for your circuit.
- Make sure equipment chassis or cabinets are grounded. Never cut off or defeat the ground connection on a plug.
- Safely discharge capacitors in equipment before working on the circuits.

Questions regarding operation, maintenance, or safety of electrical or electronic equipment should be directed to your lab supervisor or an appropriate electronics expert.