

University of Washington  
Department of Electrical Engineering  
**Biorobotics Laboratory (BRL)**

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|---------------------|--------------------------|
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| Approvals:          |                          |
|                     | _____<br>Blake Hannaford |
| _____<br>Sam Burden | _____<br>Howard Chizeck  |

Physical Location: rooms 449, 455, 461 EE 1  
185 Stevens Way / Seattle WA, 98195-2500

PI's: Sam Burden 206-221-3545 (office)  
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## BRL Accident Response Procedures

### In Case of Accident or "near miss"

1. Notify your PI and the lab manager as soon as possible of your accident, incident, or near miss. Then proceed to Step 2.
2. Fill out the online accident report (OARS) form and submit it within 24 hours. The OARS form is located here: <http://www.ehs.washington.edu/ohsoars/index.shtm>. The supervisor, lab manager, or person who had the accident can fill out the form.
3. For any serious accidents and each time a visit to the hospital is needed, call EH&S at 543-7262 within 4 hours (during regular business hours). After regular business hours, call UW Police at 206-685-UWPD (8973) and they will notify EH&S. Do not clean up or move any equipment involved in a serious accident until EH&S has received clearance from State investigators.

**FOR ANY LIFE THREATENING INCIDENT, CALL 911 IMMEDIATELY**

### Definitions:

- **Shop Chemicals:** Chemicals used in assembly or maintenance of BRL experiments, devices, or systems including lubricants, solvents, paints, adhesives and cleaning supplies.
- **Office Chemicals:** correction fluid, cleaning supplies, paper adhesives, printer cartridges, dustoff spray.

- **Chemicals:** “chemicals” without the designation “shop” or “Office” refers to any chemicals such as reagents, reactants, acids, bases, and any chemical that does not fall into the “Shop Chemicals” or “Office Chemicals” categories.
- **Biorobotics Lab.** Directed by three PI’s, the Biorobotics Lab consists of the three rooms 449, 455, 461 of the EE building.
- **Shop:** rm 449
- **Labs:** rms 455, 461

## Training Requirements

The following training needs to be completed by all BRL members who do any work in the labs or shop. Required training is broken down by roles:

| Role                       | Training Course Links                    |  |   |
|----------------------------|--|--|---|
|                            | <a href="#">Fire Extinguisher Online</a> | <a href="#">Electrical Safety, Basic, Online</a> | <a href="#">Laboratory Safety and Compliance Registration</a> |
| Burden, Chizeck, Hannaford | X  | X  | X   |
| All Others                 | X  | X  |   |

When you complete training, either required training (above) or SOP required training (below), you must log your training on the [electronic training log](#) (see link in the BRL website Safety page).

## Safety Policies of the Biorobotics Lab (apply to all rooms)

1. The Biorobotics Lab will define its research topics and processes and conduct its work to specifically avoid any methods or materials which would be classified by WAC 296-828-100 as a Chemical Laboratory.
2. BRL room 449 is a shop space.
3. Safety in the BRL is governed by the Departmental Health and Safety Plan of the Electrical Engineering Department, and secondly by this safety manual.

## Specific Rules:

1. No chemicals or chemical experiments (mixing of chemicals) in BRL.
2. No hazardous biomaterials in BRL.
3. No radioactive materials in BRL.
4. Shop chemicals may only be used in 449.
5. You may only use power tools in 449.
6. You may only use power tools in 449 when at least two people are present in the room.
7. You must use Protective Eyewear when using power tools.
8. If a "Process Standard Operating Procedure" appears below, then you must read it and complete the required training before using that process.
9. If you need to use chemicals, radioactive material, or hazardous biomaterials for your research, consult with Prof. Hannaford to create a safety plan and SOPs for that work.

## BRL Safety Related Job Descriptions

### BRL safety manager

- Serve as a point of expertise for safety related questions and guidance.
- Manage proper reporting of all injury incidents.
- Ensure that BRL members are aware of the BRL Safety Manual and how it applies to their work.
- Periodically review the three rooms for compliance with the [UW Laboratory Safety Checklist](#)
- Update and maintain the [UW Mychem database](#) for all Shop Chemicals.

### BRL shop manager

- Be aware of safe procedures for use of power tools
- Manage proper reporting of all injury incidents.
- Check out BRL members who need to use power tools and keep a list of the names and dates.
- Maintain PPE (safety glasses, gloves and solder fume extractors etc.) in the shop and replace when necessary.

## Process Standard Operating Procedures:

All BRL Process SOPs will use the following outline.

### Process SOP Outline:

1. Process Name
2. Required Training
3. Shop Chemicals Used
4. Environmental or Ventilation Required
5. Special Handling and Storage Requirements
6. Spill and Accident Procedures
7. Waste Disposal
8. Approvals

The following SOPs are to follow this manual when it is in bound form

- [Soldering](#)
- [Power Tools](#)
- [Spray Painting](#)
- [Propane Torch](#)
- [Solvents and Adhesives](#)
- [Lubricants](#)

## Disposal of Hazardous Waste

Unless it is obvious that they are safe, shop chemicals should be disposed of as hazardous waste. At UW, hazardous waste is picked up by Environmental and Health Services when the Lab Safety Manager completes a [Hazardous Waste Pickup Request](#).

When you are done with a Shop Chemical, follow the BRL Waste Disposal System:

- Yellow buckets are provided and labeled according to
  - Adhesives
  - Aerosols (**empty** spray cans are **not** hazardous waste!)
  - Lubricants
  - Paints
  - Solvents
  - Soldering Waste
- Used containers should be placed in the appropriate bucket

Special procedures for some waste (including solder waste and aerosol cans) are governed by appropriate BRL Process Standard Operating Procedures.