Laser Use Registration Application (L.U.R.)

Instructions:
- Please complete a separate LUR application for each laser >5 mW (Class 3b or Class 4 laser).
- Forward the completed application to the Laser Safety Officer (Linda Vadura) c/o of the COSE Dean’s Office.
- Do not operate your new laser until the Non-Ionizing Radiation Committee (NIRC) has reviewed and approved your application.

Part I Registration Details

A. Contact Information
Name of Responsible Person(s): ____________________________
(Principal Investigator/Lab Supervisor)-Primary
Dept: ____________________________ Telephone: ____________________________ Email: ____________________________
Name of Responsible Person(s): ____________________________
Secondary Contact (if any)

B. Background Information
Laser will be in which building?
- Thornton Hall
- Hensill Hall
- Science Bldg
Room # ____________________________
What is the primary use of the laser?
- Teaching
- Research
Briefly describe how the laser will be used: ____________________________

C. Laser Information
Make & Model ____________________________ Serial No. ____________________________
Laser Classification
- Class IIIb 5mW-500 mW (<125mJ pulsed)
- Class IV > 500 mW
Continuous Wave OR Pulsed Wave
Beam Diameter at Aperture mm
Beam Divergence mrad
<table>
<thead>
<tr>
<th>Continuous Wave</th>
<th>OR</th>
<th>Pulsed Wave</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum</td>
<td>W</td>
<td>Maximum Pulse Frequency</td>
</tr>
<tr>
<td>nsec</td>
<td>Hz</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please check all items that apply to your operation:
- Invisible Beam
- High Voltage (660V)
- Laser Modification
- Exposed Beam Path
- Beam Focusing Optics
- Laser Cutting/Welding
- Frequency-doubling Crystal
- Cryogenic Liquids
- Compressed Gases
- Tunable Laser
- Dye Laser
- SFSU Fabricated Laser

For Office Use Only
Received by LSO on ____________________________ Date ____________________________
Approved by NIRC on ____________________________ Date ____________________________
Part II – Hazard Assessment and Safe Practices

A. Security and Access Controls

Goal: Preventing unauthorized or accidental access to the laser system.

1. Describe the engineering or administrative controls you will have in place to prevent skin or eye contact with the laser beam(s) during adjustment or maintenance.

2. How will you prevent unauthorized users from entering the control area? How will you protect visitors, custodians or other “civilians” when the laser is operating?

GOAL: Preventing the laser beam from making contact with a person’s eye, skin or clothing

1. Describe your interlocks or other engineering controls. If none, explain your alternative method.

B. Personal Protective Equipment

When will you require laser users to wear eye protection?

- While using the laser? □ NO □ YES
- During alignment? □ NO □ YES
- During maintenance? □ NO □ YES

What wavelength(s) are you protecting against?

What is the expected duration of exposure?

Brand and Model of Eyewear

Rated wavelengths:

If no eye protection will be required, please explain.

__________________________________________________________

Page 2 of 5
Diagram of Laser/Laser System Setup

Show location of beam stops, interlocks, shielding, mirrors and other relevant details or attach drawing.
V Administrative

A. Safe Operating Procedures (SOP)

1. Please attach a written procedure for each of the following tasks:

☑ Maintenance or Adjustment (include lockout instructions)
☑ Laser startup/shutdown
☐ Other: ____________________________________________________________

(Optional)

Once you have assessed the hazards in your operation, you must go on to the next step: writing operating procedures that all laser users under your supervision must follow. Review the General Laser Operating Guidelines in the Laser Safety Manual.

When writing your procedures, please take into consideration the hazard assessment and protective measures and common laser lab hazards reviewed in this section. For more guidance, the General Laser Operating Guidelines, in the Laser Safety Manual, offer a good description of the basics involved in using lasers.

B. Administrative Checklist

☑ Copy of completed Laser Safety Plan and LUR package
☐ Laser system labeled with class, wavelength and hazard information
☐ Appropriate warning signs (per ANSI Z136.1-2000) posted
☐ Written alignment, start up and shut down procedures posted
☐ List of authorized laser users for current year is posted
☐ Laser users have received their basic laser safety orientation and baseline laser eye exams
☐ Eye protection for wavelength(s) of laser available
☐ Training documentation on file for laser users in lab-specific practices

_________________________ Date Submitted to LSO
Signature of Principal Investigator or Lab Manager

_________________________ Date Submitted to LSO
Signature of 2nd Principal Investigator or Lab Manager

For Official NIRC Use Only

☐ LUR APPROVED as submitted
☐ LUR NOT APPROVED as submitted

_________________________ Comments:

_________________________
Signature of Laser Safety Officer Date
Appendix: Hazard Assessment Guide

- OSHA’s required Illness and Injury Prevention Program. Performing a hazard assessment to identify work hazards is essential to creating a safe work area. Before you can minimize risks, you need to know what the risks are. The chart below summarizes hazards and protective measures common to laser operations.

1. Example of a hazard assessment

<table>
<thead>
<tr>
<th>Common Laser Beam Hazards</th>
<th>Indirect Laser Hazards</th>
<th>Protective measures that minimize risk of injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beam crossing a pathway</td>
<td>• Jewelry</td>
<td>• Securing beam stops</td>
</tr>
<tr>
<td></td>
<td>• Mirrors</td>
<td>• Shielding to contain stray beams</td>
</tr>
<tr>
<td></td>
<td>• Shiny metal objects</td>
<td>• Using low power alignment lasers</td>
</tr>
<tr>
<td></td>
<td>• Damaged or burned clothing</td>
<td>• Restricting access</td>
</tr>
<tr>
<td></td>
<td>• Burned or damaged skin or eyes</td>
<td>• Wearing eye protection</td>
</tr>
<tr>
<td></td>
<td>• Escaping beam causing combustible materials to burn – fire hazard</td>
<td>• Warning signs clearly posted</td>
</tr>
<tr>
<td></td>
<td>• Damage to walls and equipment</td>
<td>• Mapping the beam path(s)</td>
</tr>
<tr>
<td></td>
<td>• flash blindness</td>
<td>• Removing jewelry</td>
</tr>
<tr>
<td></td>
<td>• temporary vision loss</td>
<td>• Using interlocks</td>
</tr>
<tr>
<td></td>
<td>• damaged cornea</td>
<td>• Training</td>
</tr>
<tr>
<td></td>
<td>• burned retina</td>
<td>• Locking out during maintenance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Using lowest practical power</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Consistently enforcing safe practices</td>
</tr>
</tbody>
</table>

2. Note commonly observed unsafe practices that cause preventable laser accidents:

- Isolate the area during alignment
- Choose the correct eye wear
- Wear the provided eye wear
- Mark the back side of each beam stop
- Double-check beam stop locations
- Use the lowest practical power setting
- Take off jewelry
- Set beam paths below eye level of people working in the area
- Clearly mark any beam directed out of a horizontal plane
- Don’t allow unauthorized or unnecessary people in the room during alignments

3. Example of an SOP for alignment with included hazard assessment

According to the LSO at Lawrence Berkeley National Laboratory, 60% of laser accidents in research settings occur during the alignment process.

Alignment

<table>
<thead>
<tr>
<th>Potential Hazards</th>
<th>Protective Measures</th>
<th>SAMPLE: Alignment Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Beam hitting an eye</td>
<td>Isolate the area during alignment</td>
<td>1. Put up a shielding curtain.</td>
</tr>
<tr>
<td>2. Beam hitting flammable or combustible materials</td>
<td>Choose the correct eye wear</td>
<td>2. Make sure warning sign “Keep Out. Alignment in progress”</td>
</tr>
<tr>
<td>3. Injury to visitors</td>
<td>Wear the provided eye wear</td>
<td>UVEX laser goggles.</td>
</tr>
<tr>
<td>4. Beam escaping confines of the optics table</td>
<td>Mark the back side of each beam stop</td>
<td>4. Check beam stop locations and secure them.</td>
</tr>
<tr>
<td></td>
<td>Double-check beam stop locations</td>
<td>5. Power up the system.</td>
</tr>
<tr>
<td></td>
<td>Use the lowest practical power setting</td>
<td>6. Take the He-Ne alignment laser and align the beam as required.</td>
</tr>
<tr>
<td></td>
<td>Take off jewelry</td>
<td>7. Identify and terminate each and every stray beam coming from any optical component moved.</td>
</tr>
<tr>
<td></td>
<td>Set beam paths below eye level of people working in the area</td>
<td>8. Make sure beam paths are at a safe working height below the eye level of the user(s) before you leave.</td>
</tr>
<tr>
<td></td>
<td>Clearly mark any beam directed out of a horizontal plane</td>
<td></td>
</tr>
</tbody>
</table>