Laser SOP and Alignment Guidelines

Laboratory Name: SOP Prepared by: Date of Last Update:

The ANSI Z136.1 standard for the safe use of lasers requires a written standard operating procedure (SOP) for activities requiring access and use to class 4 lasers, and are recommended for Class 3B. An SOP for laser equipment is a concise document that gives both general safety guidelines and step by step instructions for safe use such as in the alignment procedure attached to the SOP. The following is a guide for developing your laser SOP.

Approval and Training

Performing this procedure requires principal investigator approval: Yes: ☐ No: ☐
Changing this procedure requires principal investigator approval: Yes: ☐ No: ☐
This procedure is prohibited for personnel working alone: Yes: ☐ No: ☐
Performing this procedure requires the following training:

System Description

Location of laser (site, building, room):	
Principal Investigator responsible for the lab, personnel, and work:	
Laser type and ANSI Z136.1 classification:	
Intended application, as well as power and energy to meet requirements:	
Description of laser (wavelength, power of CW lasers, energy per pulse, pulse duration and repetition rate of pulsed lasers, output beam diameter and shape, beam divergence):	

Hazards and Controls

List the hazards of the operation below, including any other recognized hazards associated with the laser. Describe mitigation of each hazard and briefly state the control measures to be used. Make sure to include:
- Specific type of eyewear that is provided
- Laser controlled area description and entryway controls
- Reference to the equipment manual
- Alignment guidelines or reference to manufacturer guidelines

Type of Hazard	Hazard Description	Controls
Radiation to Eye (Direct or Scattered)		
Radiation to Skin (Direct or Scattered)		
Electrical		
Chemical		
Other Recognized Hazards		

Protocol Instructions

List the experimental procedure step-by-step instructions and any relevant safety information for each step. Add additional rows for each step. Make sure to include laboratory environment setup (warning lights, interlocks, key position), personal protection (eyewear, barriers), target preparations, countdown procedures, and shutdown procedures.

Experimental procedure step	Safety considerations for step

Incident Response

Include a summary of instructions for responding to potential emergencies. Include information regarding unusual experiment/equipment behavior, specific rescue/evacuation procedures, and emergency contact information.

Approved Personnel

List by name all individuals who are approved to operate the laser in a Class 3B or Class 4 mode with and/or without supervision.

Laboratory Layout

Provide a schematic of the laser setup and locations, including directions of beams.

Alignment Guidelines Recommended for Class 3B and Required for Class 4 Lasers

1. Allow only trained personnel to be present during alignment.
2. Minimize the number of personnel present during alignment.
3. Ensure that all personnel wear appropriate laser protective eyewear.
4. The person who turns on the laser is responsible for the beam.
    - Check personnel for eyewear
    - Know where the beam is going
    - Give an audible warning
5. Where feasible, use low power (Class 2 or 3R) visible lasers to simulate the path of high power and/or visible lasers.
6. Where feasible, terminate laser beams and specular reflections on diffusely-reflecting beam blocks.
7. Use phosphor cards (Nd: YAG), IR viewers, video cameras, thermal paper, or other beam display devices to locate invisible beams.
8. Locate any specular reflections of the beam and block them as close to their source as possible.
9. Whenever possible, reduce all high-power laser beams to the minimum possible power.
10. Use beam shutters to block high power beams any time they are not actually needed.

Approved by: Date:

Principal Investigator