Radiation Safety
110 Suffolk Hall
Stony Brook, NY 11794-6200
631-632-6410 (Office)
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Serving Stony Brook University, Stony Brook Medicine, & Article 28 facilities

Laser System Registration & Standard Operating Procedures

In line with the ANSI Z136 family of standards, Permit Holders must submit Standard Operating Procedures (SOP) for Class 3B and Class 4 laser systems used in research settings.

Fill in the fields provided on this template to register your laser and create an SOP for each setup.

This SOP shall address safety considerations and controls applying to beam alignment, normal operations, servicing and any non-beam hazards. Keep the SOP focused and concise so that it can be an effective reference for users and supervisors alike.

INSTRUCTIONS

- Permit Holders, or their delegate(s), shall ensure that all laser users review and understand this laser standard operating procedure (SOP) as part of their lab-specific training before performing activity involving lasers.
- Make SOP document available in a location near the laser in question, and ensure it can be readily accessed by all laser users. All SOPs shall be immediately available for review upon request by Radiation Safety personnel.
- Knowledge of this or any associated document does not take the place of practical lab-specific training or required safety courses indicated by Environmental Health & Safety.
- Your permit and/or this SOP will need to be amended in some situations. If any of the following happens, contact Radiation Safety at (631) 632-6410:

  a) A new laser is to be installed at the research location,
  b) An existing laser is modified resulting in changes to safety features or beam properties,
  c) An existing laser is deactivated, moved to a new location or transferred to a new PI,
  d) Changes in research activities/environment introduces hazards outside those addressed in this SOP,
  e) Work plans, set up, or an incident without injury reveals aspects of this SOP to be deficient or impractical.

PART I: LASER REGISTRATION

Section A: Laser Holder and General Information			
Permit Holder Name:			
Office Phone Number:		**E-mail Address:**	
Laser Manufacturer:		Check box if this is a Stony Brook Fabricated Laser	
Model Name/Number:		**Serial Number:**	
Type of Registration:	New laser/laser system acquisition or installation Alteration/ transfer/status change of an existing laser system* Explain:		
Laser Nickname:	_____ (Use this brief unique nickname to refer to laser in protocols)		

Section B: Location and Basic Laser Details			
Building:		**Room Number:**	
Laser Classification (Choose one):	**Class 3B** **Class 4**		
Active Medium (i.e. Argon, Ruby, Nd:YAG, Diode):			
Tunable Laser? (Check one):	☐ Yes ☐ No	**Details (if yes):**	
Wavelength(s) (nanometers)			
Beam Divergence	**mrad**		
Beam Diameter at Laser Output:	**mm**		

Section B.2: Additional Output Parameters (enter all available/applicable information)				
☐ Continuous Wave Laser	**Maximum Power (W):**		☐ **W** ☐ **mW**	
☐ Pulsed Laser	**Energy per Pulse (J):**		☐ **J** ☐ **mJ**	
	Pulse Duration:		☐ **ms** ☐ **µs** ☐ **ns**	
☐ Repetitively Pulsed Laser	**Maximum Average Power:**		☐ **W** ☐ **mW**	
	Pulse Repetition Frequency:		☐ **Hz** ☐ **kHz** ☐ **MHz**	

*Alterations include any change(s) that substantially increases or decreases the output or wavelengths produced. Relocation from one workspace to another or transfer to a new owner is also an “alteration”.

PART II: LASER OPERATION

To comply with ANSI Z136 family of laser safety standards, permit holders must create or maintain Standard Operating Procedures for Class 3B and Class 4 lasers and laser systems used in research settings. The SOP is required to address safety considerations and controls applying to beam alignment, normal operations, maintenance & service. An SOP should be a focused and concise document that serves as a useful reference to users of various experience levels.

Multiple lasers may be grouped under a single SOP document. Alternatively, there may be a dedicated SOP for each laser employed. The requirement is that each Class 3B and Class 4 laser has a known, associated SOP that adequately addresses its safe operation.

If you have documents that are already used as a reference for safe operation of the laser you are registering, please submit them for LSO review and indicate by marking the appropriate boxes below.

Procedures covering safe operation of this laser & attached for LSO review (if attaching any, skip to Section E):

- ☐ Manufacturer's Manual
- ☐ Common Lab Safety Policy/Procedures
- ☐ Protocols for Experiments Using this Laser
- ☐ Pre-existing SOP

Section C: Laser Operation

I. Start-up and Operation (List the basic sequential events that describe the complete operation, including when to turn on the laser warning light, laser setting, etc. The procedures shall be written for the benefit of the laser user who must read and understand them to perform the operation safely)

II. Shutdown (Describe normal shutdown procedures)

Section D: Laser System Beam Alignment Procedures (When performing beam alignment, follow all applicable safety measures listed below). Check here if no alignment performed. ☐

1. Exclude all unnecessary personnel from the LCA during alignment procedures.
2. If possible, use a low power alignment laser or use the lowest possible laser power setting.
3. Always wear the proper laser protective eyewear during alignment.
4. For aligning invisible (IR, UV) beams, use beam display devices (i.e., image converter viewers or phosphor cards to locate beams.
5. Use a shutter or beam block to block the high-power beams except when needed for alignment.
6. Use a laser rated beam block to terminate high power beams downstream of the optics.

7. Locate and block all specular reflections as close to the source as possible.
8. Ensure all beams and specular reflections are terminated before high power operation.
9. Only trained laser operators are permitted to perform laser alignments.
10. **Include below any specific beam alignment instructions for the laser.**
11. Ensure all laser operations are performed in accordance with the permit holder instructions and the Laser Safety Program Guide.

Comments or Additional Information:

Section E: Laser Protective Eyewear

For enclosed beams, all personnel utilizing a Class 3B and/or Class 4 laser or laser system MUST wear laser protective eyewear. Inspect all eyewear periodically and ensure it is in good condition. Ensure eyewear with the correct Optical Density (OD) and wavelength is provided to all laser operators and individuals in the Laser Control Area during open beam operation. Appropriate wavelengths and optical density can be confirmed on the LIA website: https://evaluator.lia.org/od.php

☐ Eyewear with correct OD and wavelength is available and readily accessible.

☐ Requesting assistance from Laser Safety Office in selecting appropriate protective eyewear.

Section F: Beam Hazards associated specifically with this laser.

Check if Present	Beam Path Characteristics	Comments
☐	Beam Paths are Clearly Identified	
☐	Beam is Enclosed as Much as Possible	
☐	Beams are Not Directed Towards Windows or Laser Control Area Entry Points	
☐	Beam is Terminated at the End of its Useful Path	
☐	Stray Reflections are Minimized	

Section G: Non-Beam Hazards associated specifically with this laser.		
Present	**Non-Beam Hazards**	**Comments**
☐	Electrical Hazards	
☐	Collateral Radiation Hazards	
☐	Plasma Radiation Hazards	
☐	Noise Hazards	
☐	Glass or Nanoparticle Hazards	
☐	Laser Generated Air Contaminant Hazards	
☐	Laser Dye and Solvent Hazards	
☐	Cryogenic Liquid Hazards	
☐	Biological Agent Hazards	
☐	Trip Hazards	
☐	Other (Specify)	

Section H: Laser System Maintenance- EH&S will provide 'Laser Service in Progress' door placards upon request.

Comments or Additional Information:

Section I: In Case of Emergency			
Laser Safety Officer:	Can Erdonmez	**Phone:**	(631) 601-7447 (Work Cell) or (631) 632-6410 (Main Office)
Email:	can.erdonmez@stonybrook.edu		
Medical Emergencies and Fire:	University Police	**Phone:**	(631) 632-3333

1) Shut the laser off immediately and remove the interlock key. If not possible, alert everyone to exit the laboratory.

2) If there is a fire or medical emergency, call the University Police Department (631) 632-3333 as necessary. (Laser induced medical emergencies include severe injuries from beam exposure such as suspected eye exposure, vision loss, bleeding from the eye, and burns to areas around the eyes and/or on the face).

3) Do not alter the laser setup. It is important to analyze the setup as it existed at the time of injury so we can help find the cause of accident and develop corrective actions to prevent a recurrence.

4) Call the permit holder and the Laser Safety Officer.

Comments or Additional Information:

Section M: Standard Operating Procedure Approvals
These Standard Operating Procedures have been reviewed and approved by the Permit Holder and Laser Safety Officer (LSO). Future changes to this SOP must be submitted, reviewed, and approved by the LSO.

_____ _____

Signature of Permit Holder/Principal Investigator Date

_____ _____

Approval Signature of Laser Safety Officer Date