# Laser Standard Operating Procedure Example

Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Procedure Approval

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| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| Principal Investigator (PI) Name |  | Signature |  | Date |
|  |  |  |  |  |
| Laser Safety Officer (LSO) Name |  | Signature |  | Date |

1. **Purpose**

This Standard Operating Procedure (SOP) outlines requirements to be considered by an authorized user for the work outlined below.

Nature of Laser Work: (Brief explanation of activity)

# Personnel

* 1. Authorized User – The laser equipment may be operated only by authorized users who are fully cognizant of all safety issues involved in the operation of this equipment. These personnel are to ensure that the laser is only operated in the manner consistent with this document. To become an authorized user, one must:
		1. Complete Laser Safety Awareness Training.
		2. Read and fully understand the SOP.
		3. Receive on-the-job training for this system and demonstrate competency in using the laser.
		4. Sign the authorized user sheet to affirm that the above steps have been completed.

Steps 1-4 only apply to individuals who have a potential for laser radiation exposure.

* 1. Unauthorized Personnel – Visitors or other staff who do not have any potential for laser exposure and do not manipulate the laser system may not enter during laser operation unless accompanied by an authorized user. All visitors must be briefed on proper safety protocol and must wear laser safety goggles located on the premises.

# Hazards

The work in this area presents many personnel hazards. Indicate which hazards are present:

|  |  |
| --- | --- |
| Biohazard |  |
| Radiation |  |
| Chemical |  |
| Electrical |  |
| Compressed Gases |  |
| Cryogens |  |
| Electrical |  |
| Hazardous Materials |  |
| Laser (Class 3B or IV) |  |
| Other: |  |

# Hazard Controls

Indicate control measures for hazards indicated above.

* 1. Lasers – General Laser Safety Guidance
		1. Only authorized users will operate lasers.
		2. The laboratory doors will be closed, and a sign posted when the laser is operated.
		3. During alignment, the laboratory doors will be closed, and a sign posted stating “Laser alignment in progress. Do not enter. Eye protection required.”.
		4. Unauthorized personnel will be only allowed entry to the laboratory during laser operation with the supervision of an authorized user under the terms specified in section II.B.
		5. Laser protective eyewear for sufficient protection against accessible wavelengths are available. Laser protective eyewear must always be worn when the laser is in operation.
		6. Specular and diffuse reflections will be controlled using apertures, beam housings and enclosures, and optics. All of these control methods must be in place during normal operation.
		7. Laser alignment must be performed only by following the steps outlined in the alignment procedure supplement or alignment section.
		8. Perform physical surveys to determine if there are stray beams, specular or diffuse, emanating from each laser and its optics and block such reflections as well communicate the findings to others in the lab.
		9. If the beam path must be changed significantly by relocating the laser or optics, all users must be notified of the change, as well as when the laser beam can exit the laser.
		10. The same precautions that are taken for safe operation of the laser must also be followed when adjusting any of the optics in use with the apparatus.
		11. Remove jewelry and reflective objects from yourself (ID badges, access cards).
		12. Communicate your intentions to others always present, for example, before opening and closing shutters, removing beam blocks, or actions that might put others unintentionally at risk.
		13. Use low power beams for alignment, when possible.
		14. Consider the use of remote viewing methods.
		15. All optics are to be securely fastened to the table.
	2. Laser Specific Controls – Document any set-up of controls.
		1. Master key switch – to be removed when not in use.
		2. Beam curtain.
		3. Collecting optic filter must be in place when viewing through lens.
		4. Laser eyewear must be worn when laser is energized.
		5. Signage to be posted when beam is energized to communicate active laser.
	3. Laser Alignment – Techniques for laser alignment listed below will be used to help prevent accidents during alignment of any laser system.
		1. Perform alignments with a colleague.
		2. Review alignment procedures.
		3. Identify equipment and materials necessary to perform alignment.
		4. Remove all unnecessary equipment, tools, and combustible materials to minimize the possibility of stray reflections and non-beam accidents.
		5. Persons conducting the alignment must be authorized by the principal investigator (PI).
		6. Use of non-reflective tools should be considered.
		7. Access to the room or area is limited to authorized personnel only.
		8. System specific alignment procedures (list).
	4. Non-Beam Hazards, Electrical – List hazard controls
		1. Enclosures for protection against the high voltages of the laser power supply or laser head may only be removed after the power supply has been unplugged from the outlets and after following the safety procedures outlined in the safety and operations manual provided by the manufacturer.
		2. Only qualified personnel may perform all internal maintenance to the laser. More than one user must be present when performing said maintenance.
		3. Every portion of the electrical system, including the printed circuit cards, should be assumed to be at dangerous voltage levels.
	5. Chemical – List hazard controls. Verify the SDS for each chemical is available.
	6. Other – List hazard controls

# Emergency Procedures

Authorized laser users will be familiar with the location of emergency equipment and exits, and emergency procedures for fires, natural disasters, and evacuations. Emergency shut-off for lasers is located (user to fill in).

* 1. Suspected Laser Injury – Accidental laser beam exposure is a serious incident. In the case of suspected laser injury, operations must cease, master keys shall be removed, and the set-up shall remain unchanged to allow for analysis of the cause of the accident.
		1. Those subject to a suspected or real laser eye injury should seek a medical evaluation within 24 hours.
		2. Notify any staff in the area, as well as the PI, who must inform the Laser Safety Officer. The incident must be reported to Health, Safety within 24 hours.
	2. Ensure that the laser system is shut off.
	3. Provide for the safety of the personnel, such as first aid and evacuations, as needed.
		1. In case of emergency call 911.
		2. Then call Campus Security at 306-585-4999.

# Authorized Users

I have read and understand the standard operating procedures & completed on-the-job training consistent with my activities.

|  |  |  |  |
| --- | --- | --- | --- |
| Name (print) | Signature | Date | PI Initial |
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