



Laser Safety Plan

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Facilities Development and Operations Department
Environmental Health and Safety

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I. INTRODUCTION

A. PURPOSE

San José State University (SJSU) is home to a rich culture of scientific exploration and innovation aimed at pushing the bounds of scientific knowledge in our teaching and research laboratories. As part of our mission to train the next generation of scientists, we take pride in providing our students, researchers, and staff with the tools needed for a lifetime of success, which includes a solid foundation in how to innovate and experiment safely.

The purpose of the SJSU Laser Safety Plan is to provide guidance and expectations for safely using lasers, laser systems, and high intensity light sources in teaching and research at SJSU. The Laser Safety Plan provides direction on the types of procedures, equipment, work practices, and personal protective equipment that are combined to protect our laser users from the potential health and physical hazards inherent to working with lasers.

B. SCOPE

The policies in this Laser Safety Plan apply to all departments, laboratories, and individuals using, possessing, or storing Class 3B or 4 lasers or laser systems. This includes lower class lasers and laser systems that produce an output power that qualifies as a Class 3B or 4 laser system (e.g. a focused Class 3R laser). The Laser Safety Plan also applies to Class 1 systems with embedded Class 3B or 4 lasers if they are to be used, aligned, serviced, or otherwise operated with interlocks defeated. The Laser Safety Plan applies to all laser use at the main SJSU campus, South Campus, Moss Landing Marine Lab, and any affiliated satellite facilities.

II. ROLES AND RESPONSIBILITIES

A. UNIVERSITY LEADERSHIP: PRESIDENT, PROVOST, AND VICE PRESIDENTS

- Provide institutional leadership to promote a culture of safety at San José State University.
- Have the ultimate responsibility to ensure compliance with the Laser Safety Plan. The President has delegated this authority via Executive Order 1039 to Environmental Health & Safety and the Campus Laser Safety Officer to maintain and enforce compliance with the Laser Safety Plan.

B. LASER SAFETY OFFICER

The Laser Safety Officer works with and is part of Environmental Health & Safety (EH&S). O

- Ensuring that all Laser Users and Non-Users have satisfactorily completed required laser safety training (general and laser-specific) before working within a laser Nominal Hazard Zone.
- Meeting University requirements for equipment and laboratory posting, access control, personal protective equipment, and training.
- Reporting any known or suspected incidents or injuries involving laser equipment to the Laser Safety Officer.
- Informing the Laser Safety Officer prior to relocating, purchasing, or acquiring a Class 3B or 4 laser or laser system. The Laser Safety Officer should be notified in advance of any laser acquisition in order to ensure the intended laser location Laser Safety Officer

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III. LASER CLASSIFICATIONS

All lasers are classified by the manufacturer and labeled with the appropriate warning labels. Any modification of an existing laser, fabrication of a custom laser, or an unclassified laser must be classified by the Laser Safety Officer prior to use. The following criteria are used to classify lasers:

A. CLASS 1

Class 1 lasers and laser systems are those which under normal operating conditions cannot produce damaging light radiation, and are therefore exempt from control measures in ac 0 Tw 1211.TJ0 Tc 0 Tw 1

F. TEMPORARY LASER CONTROL AREA

Service, maintenance, and alignment of Class 3B or 4 lasers embedded within Class 1 systems shall require a temporary Laser Control Area to be established and approved by the Laser Safety Officer. Temporary Laser Control Areas are subject to the normal Standard Operating Procedure approval process and training requirements.

G. STANDARD OPERATING PROCEDURES

A written Standard Operating Procedure is required for all Class 3B and 4 lasers or laser systems. The Standard Operating Procedure must be written by the Principal Investigator and be provided to the Laser Safety Officer for approval as part of the Laser Use Authorization registration process. Updates or changes to approved Standard Operating Procedures must also be approved by the Laser Safety Officer.

The Standard Operating Procedure will cover laser operations (i.e. description of activities/experiments, hazards and hazard mitigation, alignment procedures, schematics of laser set-up), non-beam hazards (e.g. potential for fire, high voltage equipment, laser-generated air contaminants, laser dyes), and other relevant hazards in the laser environment (e.g. compressed gases, chemicals, biohazards). The Standard Operating Procedure may also be used to document any lab-specific administrative controls relevant to laser activities. Standard Operating Procedures should be used to train laser users in the facility.

Standard Operating Procedures become exceptionally useful and a basis for consistent safe work practices when they are kept up-to-date and are reinforced by the Principal Investigator through example and action.

H. LASER SAFETY AND USE AUDITS

All laser facilities are inspected by the Laser Safety Officer at least annually to assure that the lasers are being operated in a safe manner. The Laser Safety Officer maintains records of all inspections performed. Copies of the inspection reports are provided to the Principal Investigator for review and, if necessary, corrective action. The Laser Safety Officer will also re-inspect laser facilities to verify the correction of unsafe condition(s). The Laser Safety Officer reviews the compliance status for all Laser Use Authorizations on an annual basis. Principal Investigators with consistently uncorrected safety violations will be asked to work with their department chair or college dean to ensure the violations are resolved.

V. LASER INCIDENTS

Most of the major causes of laser incidents are eye exposure during alignment, misaligned optics and upwardly directed beams, available laser eye protective eyewear not used, improper handling of high-voltage circuits, and fires. It is essential that all beam and non-beam hazards are addressed to commencing work with lasers. The safety precautions described in the Laser Safety Plan have been put in place to safeguard our Laser Users.

The Laser Safety Officer and the Principal Investigator must be informed immediately (or as soon as practical) of any suspected laser incidents. Following the incident, the Principal Investigator (or direct supervisor) is responsible for filing the appropriate injury report forms.

- For employees: follow [directions on the University Personnel website](#) and submit the [Employer's Report of Occupational Injury](#) form within 24 hours.
- For students or Visitors: Follow [Risk Management's guidelines](#) for submitting the [Student and Visitor Accident Report](#) form within 24 hours.

The Laser Safety Officer, with collaboration of the Principal Investigator (or direct line supervisor), is responsible for investigating any suspected laser incidents. The Laser Safety Officer maintains a record of incidents and distributes lessons learned reports as appropriate.

A. INJURY AND EMERGENCY RESPONSE PROTOCOL:

1. Shut down the laser system.
2. Check the scene to ensure it is safe: Do not become the next victim!

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- 7 a. If it is safe to do so, provide first aid to the injured person.

B. MEDICAL EXAMINATIONS

If you have an actual or suspected laser-induced eye injury, seek medical attention as soon as practical (usually within 24-48 hours). Do not drive yourself to the clinic. To ensure appropriate medical referral, you will need to provide characteristics of the laser, including exposure wavelength, emission ch

(OD) Optical density describes the protective factor laser eyewear (or other laser viewing material) provides to the user. It is based on a logarithmic scale, such that OD 1 allows 1/10th of the laser light through, OD 2 lets 1/100th of the laser light through, and so on.

Viewing the reflection of a laser beam off of a mirrored surface.

VIII. REFERENCES

This Laser Safety Plan was created with reference to the laser safety manuals at University of California, Davis and University of Connecticut as well as the 2014 edition of the American National Standards Institute (ANSI) standard governing the safe use of lasers (Z136.1).

IX. REVISION HISTORY

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