

The University of Texas at Austin

# LASER SAFETY PROGRAM

(Rev. 04/5/2012)

## INTRODUCTION

The University of Texas at Austin (The University) has established a Laser Safety Program to provide controls and safety guidance for research and educational activities involving lasers. This Program is established to meet the requirements of 25 Texas Administrative Code 289.301 and to institute prudent safety practices. If any conflict occurs between this Program and the Texas Code, the latter shall prevail. The primary guidance document for safety practices is the American National Standards Institute Safe Use of Lasers (ANSI Z-136.1).

## ORGANIZATION AND AUTHORITY

The Laser Safety Program shall be administered under the authority granted to the Laser Safety Committee (The Committee) by the President of The University. The Committee shall have the authority to authorize, suspend, and specify conditions of use of all lasers at facilities of, and areas of administration by, The University of Texas at Austin.

## SCOPE

This program applies to all lasers and laser systems operated under the authority of the University of Texas at Austin. This includes acquisition, manufacture, registration, use, monitoring, transfer, and disposal of lasers. The proper implementation of this program will ensure that laser exposures are always below the maximum permissible exposure (MPE) limits.

## ROLES AND RESPONSIBILITIES:

Laser safety is the responsibility of all faculty, staff, and students who are directly or indirectly involved in the use of lasers.

## LASER SAFETY COMMITTEE

The Laser Safety Committee reports to the President and is responsible for the review and approval of policies and practices regarding the acquisition, manufacture, registration, use, monitoring, transfer, and disposal of lasers at The University of Texas at Austin. The Committee will meet at least once each regular semester on a called basis, or as required. Three members shall constitute a quorum.

The Committee shall be consulted by the Office of Environmental Health and Safety (EHS) regarding regulatory issues and the current standards for safe use of lasers. EHS shall assist the Committee concerning any unusual or exceptional action that affects the administration of the Laser Safety Program, and provides operational support to implement the program.

### **LASER SAFETY OFFICER**

The Laser Safety Officer (LSO) shall be designated by official correspondence with the State of Texas. The LSO shall have the responsibility and authority to ensure compliance with this program. The LSO shall:

- Ensure the proper classification of all lasers, including user modifications
- Ensure proper registration of class 3B and 4 laser with the State of Texas
- Perform hazard evaluations for all class 3B and 4 lasers and laser work areas
- Specify control measures for all class 3B and 4 lasers and ensure implementation
- Approve procedures, SOPs, laser eyewear, protective equipment, signs and labels
- Inspect laser eyewear and other equipment, for proper condition and function
- Ensure that all laser personnel receive appropriate safety training
- Maintain accurate inventory of class 3B and 4 lasers
- Monitor the program and ensure compliance with safe practices
- Maintain program records
- Implement State requirements for laser use.

The LSO shall have final authority in determining laser control measures and may approve alternate controls when these are appropriate based on the judgment of the LSO. Class 3B and class 4 lasers shall be operated only with the written approval of the LSO. The LSO shall have the authority to terminate laser operations at any time.

The LSO may appoint a Laser Safety Manager (LSM) and may delegate duties to the LSM in accordance with ANSI Z136.1.

### **PRINCIPAL INVESTIGATOR**

The Principal Investigator (PI) shall be designated by the LSO or LSC for each class 3B or 4 laser. The PI shall have the responsibility and authority to ensure laser safety compliance for their personnel and equipment. The PI shall:

- Ensure all lasers have been properly classified
- Ensure proper registration of class 3B and 4 lasers with the LSO
- Have direct accountability for all class 3B and 4 lasers and laser work areas
- Implement approved control measures for all class 3B and 4 lasers
- Generate SOPs for laser use and alignment, and submit to LSO
- Ensure that all laser personnel receive appropriate safety training
- Actively ensure lab practices are in compliance with safety requirements
- Maintain records of laser purchases, use, transfer, and disposal

## **LASER CLASSES**

Class 1 laser systems are incapable of producing damaging radiation levels during normal operation and are exempt from any control measures. Class 1 laser systems may contain embedded higher class lasers and may produce laser hazards if operated with interlocks defeated. Only authorized personnel may operate those class 1 laser systems with interlocks defeated.

Class 1M laser systems are incapable of producing hazardous exposure conditions during normal operation unless the beam is viewed with optical instruments.

Class 2 laser systems emit visible light only at a power level of 1 milliwatt or less. The normal aversion response to bright light is adequate protection. Staring into the beam of a class 2 laser is hazardous.

Class 2M laser systems emit visible light only. The normal aversion response to bright light is adequate protection for unaided viewing. However, viewing the beam with optical aids is potentially hazardous.

Class 3R laser systems are potentially hazardous under some viewing conditions, but the probability of an actual injury is small, and the control measures for safe use are straightforward. (Most lasers previously classified as class 3a fall in this category.)

Class 3B laser systems are eye hazards for intrabeam viewing and specular reflections, even for momentary exposures, but diffuse reflections are not usually hazardous. Class 3B laser systems shall be operated only in laser controlled areas by authorized operators. Operators of class 3B laser systems shall receive approved laser safety training. A written Standard Operating Procedure (SOP) is required for class 3B laser operation.

Class 4 laser systems are eye hazards and skin hazards for intrabeam exposures, specular reflections, and diffuse reflections. They are also fire hazards and may produce laser generated air contaminants. Class 4 laser systems shall be operated only in laser controlled areas by authorized operators. Operators of class 4 laser systems shall receive approved laser safety training. A written Standard Operating Procedures (SOP) is required for class 4 laser operation.

## **LASER REGISTRATION**

All class 3B and 4 lasers shall be properly documented and registered with the State of Texas. The agency currently responsible for enforcing State laser regulations is the Texas Dept. of State Health Services, Radiation Control Program

## **TRAINING REQUIREMENTS**

All operators of class 3B and 4 lasers and laser systems and all incidental personnel or spectators who may be allowed to enter laser controlled areas shall receive approved laser safety training before operating the laser or entering laser controlled areas.

## **NOTIFICATIONS AND REPORTS**

Notification of laser injuries will be made to the State by telephone as soon as practical, but not to exceed 24 hours from the time of the incident. A written report on the incident and any injuries sustained will be made to the State within 30 days of the incident.

## **MEDICAL SURVEILLANCE**

Response to laser injuries will be handled on a case-by-case basis, with emphasis on limiting injury and regaining health. Written guidelines shall be available, for immediate actions and ongoing treatment, and for administrative processes.

Laser personnel shall report any suspected hazardous exposure to the Laser Safety Officer immediately.

Baseline eye exams are not required. A medical eye exam may be required immediately following a suspected hazardous exposure, under the guidance of medical personnel.

## **CONTROL MEASURES**

All class 3B and 4 lasers shall be operated in a laser controlled area. The requirements for individual laser controlled areas shall be determined by the LSO. The minimum requirements for laser controlled areas are:

- Entryway controls to allow only authorized personnel or approved spectators to enter the laser control area. (Administrative controls are acceptable.)
- Conspicuously posted sign or signs, giving adequate instruction for the protection of personnel.
- Laser safety eyewear available and used in accordance with the SOP for class 3B and class 4 lasers.
- Beam control (barriers and beam blocks) to limit laser hazards within the controlled area.
- Written SOP for class 3B and class 4 lasers.
- Training of operators of all class 3B and 4 lasers.

## **EYEWEAR POLICY**

Laser safety eyewear is normally required for the operation of class 3B and class 4 lasers with exposed beams. The LSO will require eyewear or approve laser operation without eyewear on an individual basis, based on a hazard evaluation performed by the LSO.

Eyewear shall be selected for providing an adequate level of protection from the laser and for suitability to the wearer and environment. Eyewear shall be inspected annually to ensure that the protection level has not degraded through use and beam exposure.

## **RESPONSIBILITIES OF EMPLOYEES WORKING WITH LASERS**

Employees who work with class 3B or 4 lasers with the beam exposed shall:

- Energize or work with lasers only when authorized to do so.
- Comply with laser safety rules and work procedures.
- Notify their supervisor, lab safety contact, or the LSO in case of potential accident or injury, or in case of a suspected unsafe condition.

## **AUDITS**

An audit of all class 3B and 4 lasers and the Laser Safety Program shall be conducted annually by the LSO or his designee.

## **RECORDS**

The LSO shall maintain records which document the Laser Safety Program. These records shall include:

- Laser hazard analysis reports for all class 3B and 4 lasers
- Training records for all operators of class 3B and 4 lasers
- Standard Operating Procedures for all class 3B and 4 lasers
- Approvals of alternate laser control measures
- Laser Safety Audit reports
- Laser Inventory
- Laser Accidents and Laser Incidents

Specific records and retention periods are required by State regulation. These records will also be maintained by the LSO, and will be available for inspection at the request of State agents.