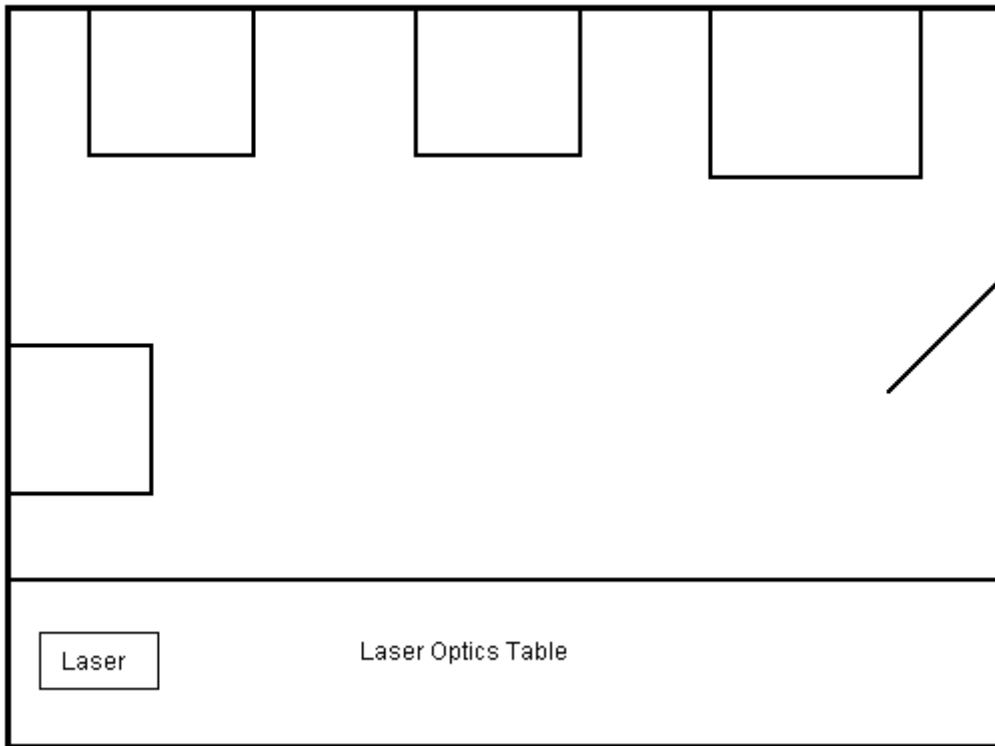


EXAMPLE

Laser Safety Standard Operational Procedure (SOP)

I. Introduction

- a. Laser location- Penn State University, University Park, 420 Davey Lab
- b. Diagram of Room



- c. Description of Laser - Lexel Laser Model 85
 - i. Class - IV
 - ii. Lasing medium - CW Argon Ion Laser
 - iii. Beam characteristics – TEM 00
 - iv. Divergence – 0.7 mrad
 - v. Aperture diameter – 1.1 mm
 - vi. Pulse length - CW
 - vii. Repetition rate – N/A
 - viii. Maximum output – <150 mwatts, single mode
- d. Application of the beam – Light scattering experimentation

EXAMPLE

EXAMPLE

II. Hazards

- a. Beam and Non-beam Hazards - Optical and Electrical hazards
- b. Analysis and Control – Safety goggles must be worn to prevent optical hazards and a single isolated circuit with breaker for electrical hazard

III. Controls

- a. Access controls - The door to the room should be kept locked and warning sign displayed
- b. Beam controls – Power supply is key locked, and beam shutter on laser head
- c. Electrical controls on High Voltage – circuit breaker
- d. Eye protection types – goggles OD 6 @ 450-515nm
- e. Any medical surveillance requirements – none required
- f. Other controls needed – none needed

IV. Operating Procedures

- a. Initial preparation of laboratory -
 - i. Closed door will be locked
 - ii. Warning sign on door “Laser in Operation”
 - iii. Identification of all personnel present
- b. Personnel protection requirement acknowledged by persons present
- c. Target area – Enclosed
- d. Turn on water supply
- e. Turn Key Control to the ON position
- f. Press the POWER ON switch. The LASER RADIATION EMISSION INDICATOR will light
- g. Wait for the READY indicator to light
- h. Countdown procedures – Verbal warning issued before CW operation begins

EXAMPLE

EXAMPLE

- i. Press LASER START switch
- j. Shutdown procedures –
 - i. Push the POWER OFF switch
 - ii. Turn key Off and remove
 - iii. Turn off cooling water (Never turn cooling water off first)
- k. Special procedures-
 - i. Emergency procedures –
 1. For a life-threatening emergency such as electrical shock, fire, etc., dial 911 for emergency response. Contact Supervisor at 570-385-6059 and EHS at 814-865-6391. Inform EHS that you need to contact the Laser Safety Officer immediately.
 2. Non- life-threatening emergencies notify your supervisor and EHS. The appropriate medical attention should be sought if warranted by the supervisor, or EHS, for the persons exposed to the hazard.
 3. EHS will begin an investigation as to the circumstances of the event. The system in question shall remain out of service pending the results of the investigation and completion of any corrective actions, if needed. EHS Laser Safety Officer or designee may only return the system to service following approval.
 4. Maintenance will lock-out-tag-out the equipment. This will be done by shutting off the disconnect which is fed through panel ED-3 Breaker #22 & #24. Apply Pandiut lock-out-tag-out kit which can be found in the maintenance electrical work station. The campus electrician shall maintain lock-out-tag-out procedures.
 - ii. Alignment procedures – Only experienced personnel will be involved with alignment of the laser.
 1. All participants and observers must wear safety glasses.
 2. Initial alignment will be performed with a low power (< 1mW) He-Ne laser.
 3. Final fine adjustment will be with main laser operating at low power (< 5mW). Only when alignment is accomplished will laser power be increased to maximum

EXAMPLE

EXAMPLE

V. Training

- a. Environmental Health & Safety Training - Prior to beginning work with any lasers Supervisor and users of lasers shall complete the fundamental laser safety training class offered by EHS online. The training will consist of the following general topics: Laser Fundamentals, Laser Hazards, Non-beam Hazards, Laser Accidents, Control Measures, and Elements of PSU's Laser Safety Program.
- b. Specific training for laser use – The Supervisor shall provide training to users in the operating and safety procedures of individual laser systems
- c. Maintenance and repair training if applicable – N/A (manufacturer will do any maintenance or repairs)

VI. Responsibilities

- a. Supervisor for normal operations - Supervisors are responsible for the safe operation and maintenance of the lasers and shall provide training to users in the operating and safety procedures of individual laser systems.
- b. Emergency coordinator - Following-up on reports of unsafe conditions, ensuring work with the laser is suspended until the unsafe conditions are rectified, and completing and documenting the required inspections, that include but are not limited to, laser specific information, administrative controls, and engineering controls.
- c. Operators and other personnel – Are required to complete the laser safety training provided by EHS before beginning work with lasers, to follow written operating procedures, to perform all work in a safe manner and use approved personal protective equipment. Users are also responsible for reporting to the supervisor any unusual or unsafe condition they discover with the laser, and for suspending work with that laser until the unsafe condition is rectified. The user is responsible for immediately informing the supervisor in the event of any exposure to the laser

VII. Miscellaneous

- a. Visitor regulations at site – No unsupervised visitors permitted

EXAMPLE