STANDARD OPERATING PROCEDURE

FOR THE [specific name & class of laser (ex. He-Ne 3B)] LASER

Location [identify building-room here]

OPERATED BY [enter your name & date]

Fill in information regarding the following:

Prerequisites

Training

All persons who intend to operate a laser or who could be exposed to a hazardous laser beam or its reflection must receive documented CSULB Laser Safety Training from the Principle Investigator or the CSULB Laser Safety Officer.

Persons intending to operate a laser must receive training from the Principal Investigator or their designee, with respect to the safe operation of the particular laser. This training must be documented.

Medical Surveillance:

Not required at this time.

Responsibilities (see LSP):

Principal Investigator:

- Details regarding how laser users receive adequate and appropriate laser safety training prior to operating the laser(s). This training must include the review of the "CSULB Laser Safety Manual" and the "CSULB Laser Safety Training Document". This training must be documented. The PI is also responsible for training laser users in the specific operation of individual lasers; this training should be documented. Each student must have ready access to a copy of the written operations guide.
- Ensure that all appropriate safety procedures are followed, that any laser safety devices (interlocks etc.) are functioning properly.
- Ensure that properly rated goggles are worn if a user could potentially be exposed to a hazardous beam or its reflection.
- Determine the nominal hazard zone (NHZ) of the laser. Safety devices such as beam stops, wall blocks, interlocks etc. must be used whenever possible to reduce the size of the NHZ.
- Supervise or otherwise ensure the adequate supervision of users, visitors and service personnel as appropriate, and provide adequate security to prevent unauthorized use.
- Correct and control all laser equipment and laser hazards, as appropriate.

Laser Users

- Must be authorized and appropriately trained to either operate or be in the presence of a potentially hazardous laser,
- Must wear properly rated goggles if she/he could be exposed to a hazardous beam or its reflection.
- Adhere to all appropriate rules and procedures.
- Immediately report accidents or potentially dangerous situations to the LSO, Supervisor and/or safety personnel. Common sense and prudent practice must be considered at all times when operating a laser.

The Laser Safety Officer (LSO) is responsible for implementing the CSULB laser safety policies. Specifically, the LSO will be responsible for periodic safety review of laser facilities, performing basic laser safety training, evaluating protective equipment, and initiating corrective measures as necessary.

Protective Equipment

Protective eyewear must be worn that is appropriate for the power and wavelength(s) of the lasers in use must in accordance with Section 6.0 of this procedure.

A lab coat or other protective apparel should be worn by personnel if laser operations involve the emission of UV radiation.

A lab coat and fully enclosed chemical splash goggles will be worn at all times while working with chemicals that could injure the eyes or skin. Appropriate laser goggles shall be worn in lieu of chemical goggles when the potential exists for the eyes to be exposed to a hazardous beam or its reflection.

<u>Alignment</u>

For the Laser Alignment Process, describe your alignment procedure step-by-step.

- Include all safety features described below which apply to your setup.
- Describe how your setup will prevent someone accidentally getting expose to the beam.
- Detail appropriate security measures to restrict access to the laboratory during the Alignment Process to protect personnel not wearing protective equipment from exposure.
- Assemble all needed items or tools to perform the alignment. Remember to keep objects off the laser table which may cause specular reflections.
- The laser should be set to the lowest practical power while performing alignments.
- Avoid working with the room lights off. Reducing the illumination in the room causes the pupils to dilate and increases the possibility of eye injury. The potential for electrical shock or other hazard also increases when vision is hampered.

- Appropriate eye protection must be worn by persons performing alignments and persons present in an area where a direct or reflected source of laser light could come into contact with their eye.
- Beam stops should be in place at locations where the beam may leave the table or stray off its intended path. If beam stops, enclosures or other safety devices were moved to perform an alignment, they must be replaced prior to operation.
- Never look directly into the beam. If intra-beam viewing is required to align the beam, use a remote viewing camera.
- In the case of invisible laser emissions, a visible low power laser should be used for the purposes of alignment wherever possible.

Remember that 60% of laser accidents occur during alignment and beam manipulation. Use beam splitters with extreme caution and never fully rely on attenuating filters as they may fail

Engineering & Administrative Controls

Engineering controls are interlocks or other physical restraints which limit the operation of the laser or impede access to the beam.

> **List applicable engineering controls** e.g. locks on lasers, beam is enclosed by a plastic/metal/cardboard tube, laser is fastened to stationary base, laser is in locked area etc.

Administrative controls are policies and procedures which laser users are obligated to comply with. Users must comply with policies and procedures described in this SOP.

> **List applicable administrative controls** in addition to those described in this SOP e.g. only faculty have keys, faculty send all students to Laser Safety Officer for training prior to laser use, etc.

Operational Steps

- Set-up all necessary equipment for the experiment, with power off.
- For Start-up: Describe start-up procedure in detail. If keys are used, include who has keys and where they are kept.

Procedural steps

Briefly (three to four paragraphs is typical), describe what you do during a typical experiment. Please give the actual "hands on" procedure, not the theory behind your experimentation.

Shut down

Describe in detail