



## Laser Safety Procedures in the absence of LSO

January 15, 1996

### OBJECTIVE

To provide a guidance to Health and Safety Group regarding laser safety issues when the LSO (Tim Miller) is away from the lab.

### DISCUSSION

The LSO provides most of the laser safety oversight at the Lab which includes laser safety training. And although the overall duty cycle for this function is relatively small, it seems as though laser safety issues tend to arise whenever the LSO is absent from the Lab. A back-up person is not a good option because laser safety is fairly complex and there is minimal opportunity for an LSO to “practice” laser safety at the Lab. Therefore, even a reasonably knowledgeable and motivated “fill-in” would probably get lost if only called upon a few times per year.

As an alternative, these procedures should be followed when the LSO is not available. These procedures should address >90% of the “emergencies” which arise. These procedures are based on FESHM Chapter 5062.1 which should be referred to as needed.

### EQUIPMENT

N/A

### PROCEDURE

- 1. Laser training** - Laser training is required for persons who wish to work with a hazard class 3b and 4 laser in a way which has a potential for exposure to personnel exceeding the maximum permissible exposure limit<sup>1</sup>. Simply put, this means using a class 3b or 4 laser without a proper enclosure<sup>2</sup>. Training is not

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<sup>1</sup> Laser eye exams are also required for such individuals. These are coordinated through the Medical Department and typically have a several day to several week lead time.

<sup>2</sup> Light path is physically inaccessible. Access points (doors, connectors) must be interlocked to beam or “locked” (i.e., attached in a way which requires a tool or key to open).

required for hazard class 1, 2, 2a, or 3a lasers or for properly enclosed hazard class 3b and 4 lasers. In a pinch, untrained personnel may be able to secure a “qualified laser operator” to operate their laser<sup>3</sup>. The untrained people may then participate as “spectators.” The actual training will be provided upon request when the LSO returns. See definitions below.

Qualified Laser Operator - an individual who has received laser safety training and a laser eye exam and is knowledgeable in the operational and hazard control parameters of the laser under his control.

Spectators - people who have not had appropriate laser training and/or eye exams, but whose access to an NHZ is controlled by the qualified laser operator.

The qualified laser operator must assure that the spectators are briefed regarding hazards and following applicable precautions.

2. **Laser requisitions** - The purpose of routing requisitions past the LSO is for information only. Over time, the desire for a photocopy has been corrupted into signature approval. If a laser requisition comes by, sign it (if necessary) and keep a photocopy for the LSO. The lead time for ordering lasers generally increases with increasing hazard (from weeks to months).
3. **Laser accidents and unauthorized use** - With an injury, we would like to be able to characterize what happened. If the injury were serious, we probably would want to keep everything where it is until a formal investigation could be completed by the LSO. Unauthorized<sup>4</sup> unenclosed operation of a hazard class 4 laser clearly can be a serious matter -- even diffuse reflections can cause eye injury within the time it takes to blink! If such an activity is discovered, it should be immediately terminated and brought to the attention of the D/S ES&H Group. If the operation has been approved by the LSO, the operators should be able to produce some documentation to that effect.
4. **Miscellaneous** - The LSO also provides technical guidance on laser safety, maintains a sitewide database of laser systems, classifies the radiation hazard of laser systems, provides laser radiation hazard warning signs, determines appropriate protective laser eyewear, and reviews and approves written operating procedures. Most of these functions can easily wait until the LSO returns because of the long typical lead times involved. Sign designs are specified in FESHM Chapter 5062.1. Laser sign “blanks” can be found in the LSO's desk, but any reasonable facsimile is acceptable until the LSO returns.

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<sup>3</sup> The Physics Section and Research Division have large numbers of people who are qualified to operate hazard class 3b nitrogen lasers. Good starting contacts are John Krider and Bill Nicholson.

<sup>4</sup> Unauthorized means not formally approved for operation by the LSO or designee.