



LSO Workshop 2011 On the Job Training

Ken Barat

Lawrence Berkeley National Laboratory

Kbarat@lbl.gov



Laser Safety Training

- Class 3B and Class 4 lasers are recognized as potential hazards to the eye.
- Therefore every laser standard or national policy requires some basic laser safety training
- Any consultant will tell you that
- The hope is this training make the trainee safer
- As an example of the first bullet:



From ANSI Z136.1-2007

4.4.3 EDUCATION & Training

- Education & training shall be provided for operators, maintenance, and service personnel for Class 3B or Class 4 laser or laser systems

A1.2(9) Training



- The LSO shall assure that adequate safety education & training are provided to laser personnel.

In reality what is the purpose of institutional laser safety training?

- Not to make experts out of those attending
- Rather it is to raise their awareness of laser hazards and controls
- Hopefully they will go back to their work space and ask questions concerning laser safety
- Which is exactly what I hope you do



So how do we keep our users safe?

- Appoint Laser Safety Officer
- Institutional rules
- Institutional training
- Audits
- Control measures
- All these help, but if one is honest with themselves it is:
- On the job training/Mentoring that does the job day in and day out



Successful OJT

- Requires a real commitment by the mentor
 - Without this all parties are wasting their time
- Equally important is the desire or willingness of the student to be trained
 - “I know it all already” attitude will lead to a waste of all parties time

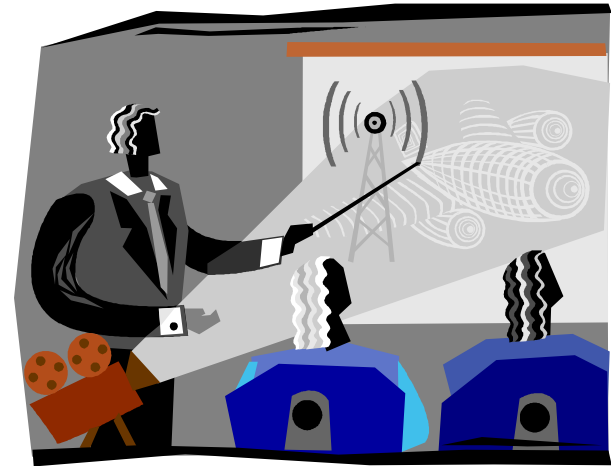


There is a core of basic Laser Safety Elements that need to be emphasized

- Selection of proper eyewear
- Check condition of eyewear
- Alert others prior to turning on laser and of open beams
- Check for stray reflections, thoroughly & often
- Block stray reflections
- Demonstrate beam detection methods
- Understand controls for different laser intensity levels
- Read & Familiar with controls per SOP
- Familiar with equipment
- Means to communicate changes with other
- Housekeeping

Task Specific OJT

- After basics items covered attention turns to site or task specific:
- Operation
- Hazard awareness
- Safety stops

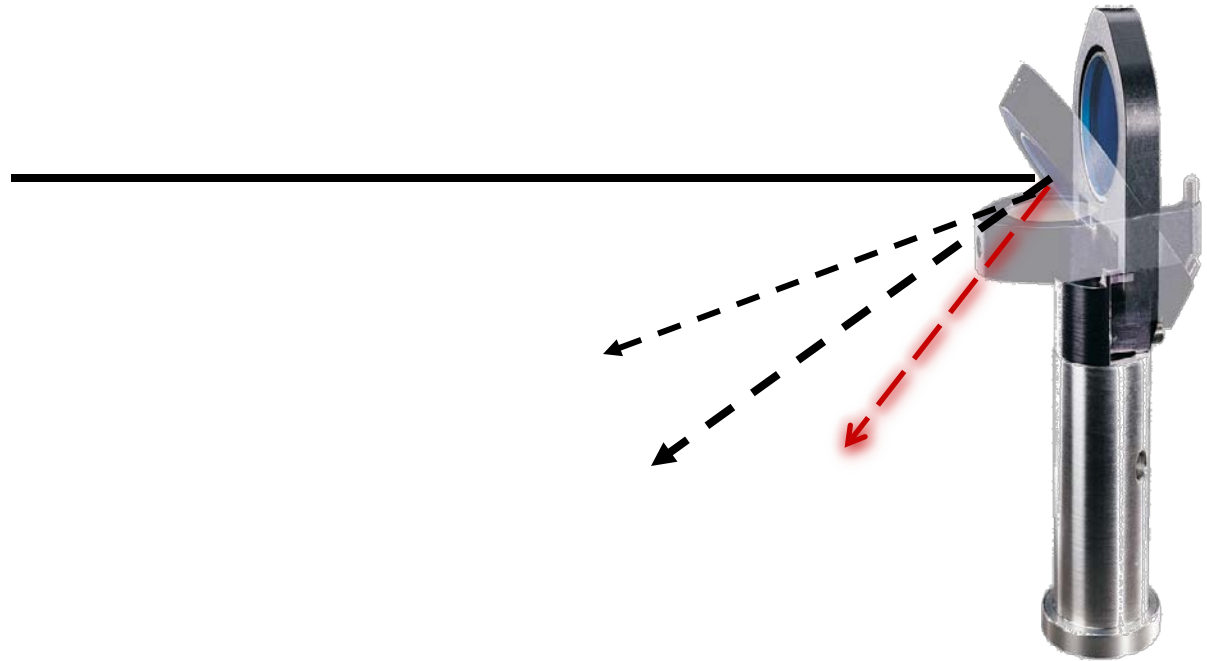


Commitment to OJT

- Trainer must understand their responsibilities
- Have goals in mind
- Have resources
- Know this type of training has no set time limit or duration
- Should not be based on peer pressure

Skill of the craft trap: What could be called skill of the craft to one maybe new information to someone else

- FLIPPER MOUNT: *Beware to ALWAYS consider reflected beam DURING flipping motion. NEVER flip while a laser beam is present !!!*



Another OJT basic item example, facts about IR viewing cards



Sensor cards are not invincible, know your expected irradiance, you can burn through these cards and present fire hazard. As a general rule, NEVER leave a IR sensor card nor any combustible card/plastic/beam blocks in a beam path unsupervised for an extended period of time

- **Laminated IR-viewing cards**
The IR viewing card is designed to allow one to see invisible infrared beams. The majority of IR cards found in laser labs to protect the fluorescent material from oxidation are covered with a plastic film. Unfortunately this yields a specular reflector, they are often held by hand (and hence wobbling at all angles). One suggestion is to peel off the coating or use non-laminated ones. Sensor cards can also be found for ultra violet wavelengths, but less commonly used. **It is important to ALWAYS tilt the IR sensor card DOWN so that any reflection are not directed to yourself nor anyone else standing around.**

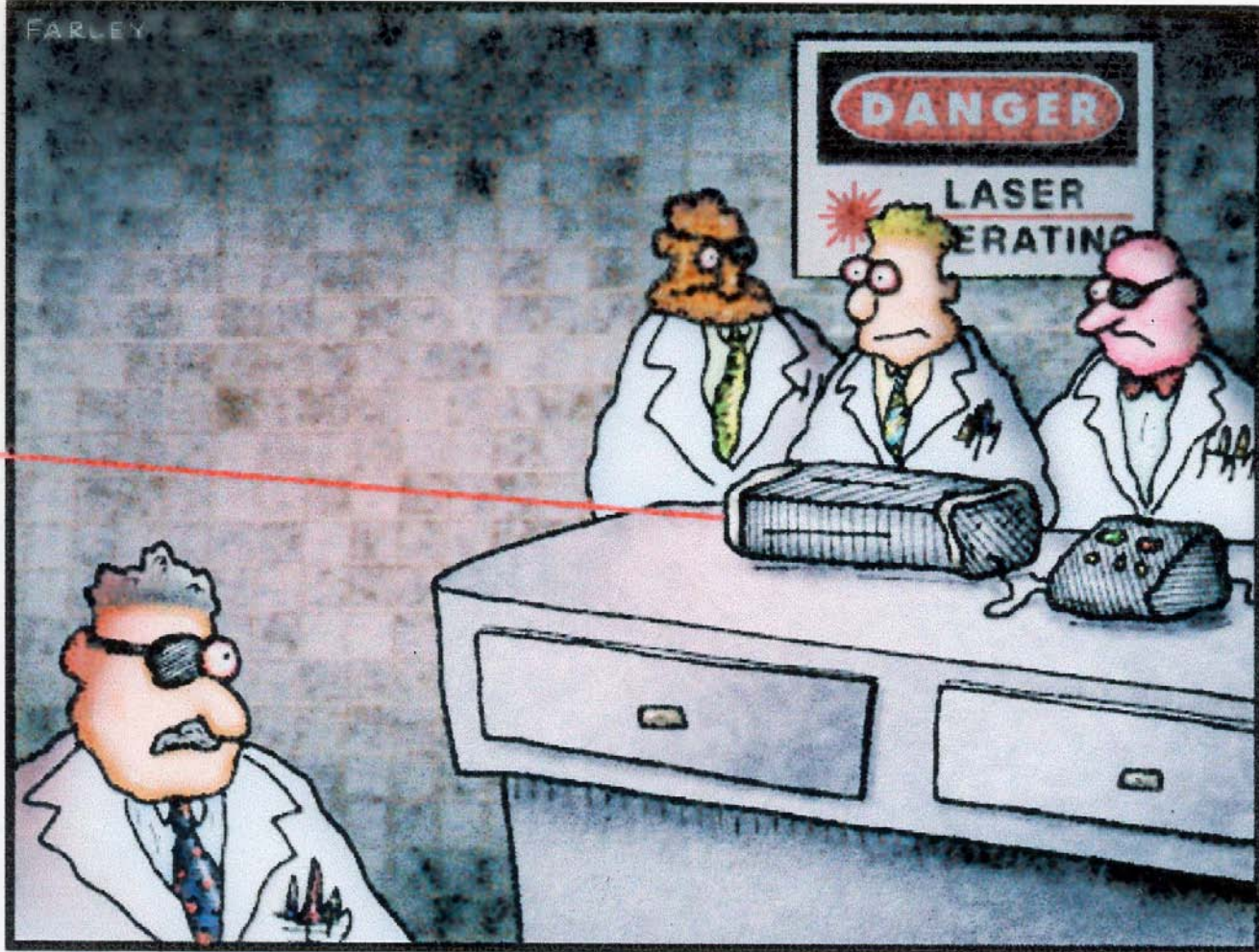
While the problem with perception of 800 nm beams should be part of basic laser safety training, it has more affect when shown and demonstrated at the actual work set up



Propagation of bad habits

- It is extremely easy for a mentor to pass on poor or incorrect instructions or techniques
- Teach instructions without knowing why
- Give the impression step or safety is not important
- Teaching unsafe tricks

DOCTOR FUN



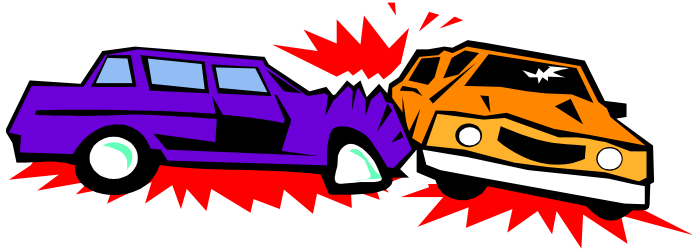
Peer pressure in the laser lab

Another bad habit on many levels



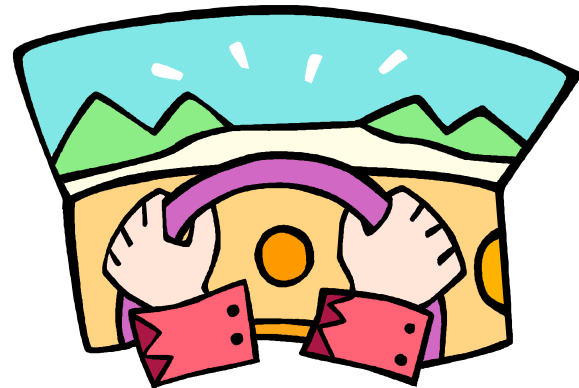
Learning to drive

- Put the key in the car
- Put the Car in Drive
- Press down on the GAS



- You decide which is the better OJT

- Get behind the wheel
- Get comfortable in the seat
- Set mirrors so you can see
- Put key in car
- Put foot on brake
- Look behind you
- Slowly back out



Documentation

- From an institutional perspective OJT needs to be documented
- Avoid- I was never trained or told that response or defense



When & how often

- Sign off when trainee can do the task unsupervised
- How often either once all steps are learned or
- Step by step
- This is the trainers call
- Do not be afraid to re-evaluate the skill several weeks later to see how well it is being performed

Goal of presentation

- To remind all of the importance of OJT
- Hope to make you review how it is accomplished at your home institution
- May I ask you how many have a formal OJT requirement?
- Have a procedure to document it?
- LBNL Laser Reference Guide full of useful OJT facts- found on LBNL Laser Safety Web page,
- Easy location A-Z index, under L

As the sun sets on this
presentation

Are there any questions?

