

Example of a written procedure (protocol) for a Class 3B and Class 4 Laboratory

Working in laser laboratories requires all users to give careful consideration to safe operation and practices, both for their own benefit and for that of other workers in the area. The points made in this protocol are intended to provide maximum information at all times to all users; to minimise inconvenience to others; and to encourage good working practices.

1. There is an indicator on each door to show when a laser is energised in that laboratory. A white board is provided by the door for those responsible for operating each system to record the status of the laser e.g. ALIGNING, TOTALLY ENCLOSED etc.

This information should be initialled, dated and timed so that it is always clear that it contains current, up to the minute information. To be credible the time and date must show that the information really does reflect what is currently being undertaken with the system.

2. Each authorised individual will have an access tag which is hung on the rack when they enter the lab.

3. On the doors of the laboratory there is an installed interlock system which mean that unauthorised entry will result in the power supplies of the lasers, in switching off or of a shutter in front of the laser being activated. These interlock systems are connected to a key pad on the outside of the laboratory and to an override button and a power supply unit on the inside of the laboratory.

The following procedures should be observed in order that these systems provide an effective method of preventing unauthorised access while laser systems are in operation whilst minimising the inconvenience to those working in the laboratories.

In order to activate the power supplies (or open the shutter) the power supply unit on the inside of the laboratory door should be switched on using the key switch. It will then be possible to switch on the power supplies to the laser(s). The warning light on the outside of the door will inform others that the laser is in operation and at that point if the door is opened without the correct code being entered on the key pad this will cause the power supplies (shutter) to switch off. Anyone wishing to leave the laboratory should press the override button on the inside of the laboratory. Both the correct operation of the key pad and the use of the override button give time for someone to enter/leave the laboratory easily. If someone does make an unauthorised entry to the laboratory this will result in the power supplies being shut off and the laser user will have to reset the system from the power supply unit on the inside of the door.

The code to the relevant key pad will be given **ONLY TO REGISTERED LASER USERS FOR THAT LABORATORY**. It is the responsibility of those laser users to ensure that the code is NOT given to anyone who is not a registered laser user FOR THAT LABORATORY. This is to be taken seriously and anyone found to be abusing this system will have their registration as a laser user reviewed.

Postgraduate students starting work in a laboratory and visitors to the laboratory should only be given the code after they have undertaken a period of training as indicated on the *Project Supervisory Requirements Form*. Undergraduate project students will not be given the code. In the protocol for undergraduate projects in laser laboratories it is implicit that they will be adequately trained, and supervised, at all times. At no stage must they enter the laboratory without first obtaining the permission of their laboratory supervisor or designate.

The code for the doors will be changed at intervals and users will be informed of these changes in advance.

If a user is not involved in the laser experiment taking place and, exceptionally, is not aware of the condition of the laboratory (scattered light, knowledge of requirements for protective eye wear etc.) it is good practice for that user to knock in order to gain entry into the laboratory. In the event that there is no response they should not enter the laboratory at that time. Good practice should be for the user in the laboratory to respond if there is a knock on the door. In the event that a laser is left operating in a laboratory unattended this should be indicated on the white board provided by the door/screen and the door should not be locked. Best practice is that a laser should not be left running unattended for more than a matter of 10 minutes. Section 3.5 (ix) of the CVCP guidelines makes it clear that lasers should only be left running unattended if in Designated Laser Areas or in a total enclosure.

4. In each Designated Laser Area there are a number of design features and well thought out administrative controls which are in place in order to reduce the possibility of exposure to stray radiation. However there will probably still be times when access is required to open beams during alignment and maintenance procedures. At times like this consideration must be given to the use of appropriate eye protection in accordance with Section 3.5 (ix) of the CVCP Guidelines.

Please note that in section 16.2 of the B.S.I. document on Radiation Safety of Lasers it states that Eye protection that is designed to provide adequate protection against specific laser radiation should be used in all hazard areas where class 3B or class 4 laser products are in use and where there is a reasonably foreseeable risk of injury to eyes. Exceptions to this are:

- a. when engineering and administrative controls are such as to substantially eliminate potential exposure to excess of the applicable MPE;
- b. when, owing to unusual operating requirements, the use of the eye protection is not practicable; such operating procedures should only be adopted with the approval of the laser Supervisor.'